BEFORE THE ILLINOIS POLLUTION CONTROL BOARD

EXXONMOBIL OIL CORPORATION,	)	
	)	
Petitioner,	)	
	)	
v.	)	PCB _____
	)	(Variance – Water)
ILLINOIS ENVIRONMENTAL PROTECTION AGENCY,	)	
	)	
	)	
Respondent.	)	

NOTICE OF FILING

TO: Mr. John T. Therriault
Assistant Clerk of the Board
Illinois Pollution Control Board
James R. Thompson Center
100 West Randolph, Suite 11-500
Chicago, Illinois 60601
(VIA ELECTRONIC MAIL)

Division of Legal Counsel
Illinois Environmental Protection Agency
1021 North Grand Avenue East
Post Office Box 19276
Springfield, Illinois 62794-9276
(VIA FIRST CLASS MAIL)

PLEASE TAKE NOTICE that I have today filed with the Office of the Clerk of the Illinois Pollution Control Board an **ENTRY OF APPEARANCE OF KATHERINE D. HODGE, ENTRY OF APPEARANCE OF MATTHEW C. READ,** and **PETITION FOR VARIANCE**, copies of which are herewith served upon you.

Respectfully submitted,

EXXONMOBIL OIL CORPORATION,
Petitioner,

DATE: July 21, 2015

By: /s/ Matthew C. Read
One of Its Attorneys

Katherine D. Hodge
Matthew C. Read
HODGE DWYER & DRIVER
3150 Roland Avenue
Post Office Box 5776
Springfield, Illinois 62705
(217) 523-4900

CERTIFICATE OF SERVICE

I, Matthew C. Read, the undersigned, hereby certify that I have served the attached an ENTRY OF APPEARANCE OF KATHERINE D. HODGE, ENTRY OF APPEARANCE OF MATTHEW C. READ, and PETITION FOR VARIANCE upon:

John T. Therriault
Assistant Clerk of the Board
Illinois Pollution Control Board
James R. Thompson Center
100 West Randolph Street, Suite 11-500
Chicago, Illinois 60601

via electronic mail, on July 21, 2015; and upon:

Division of Legal Counsel
Illinois Environmental Protection Agency
1021 North Grand Avenue East
Post Office Box 19276
Springfield, Illinois 62794-9276

by depositing said documents in the United States Mail, postage prepaid, in Springfield, Illinois on July 21, 2015.

/s/ Matthew C. Read
Matthew C. Read

BEFORE THE ILLINOIS POLLUTION CONTROL BOARD

EXXONMOBIL OIL CORPORATION,	)	
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	)	(Variance – Water)
ILLINOIS ENVIRONMENTAL PROTECTION AGENCY,	)	
	)	
	)	
Respondent.	)	

ENTRY OF APPEARANCE OF KATHERINE D. HODGE

NOW COMES Katherine D. Hodge, of the law firm HODGE DWYER & DRIVER, and hereby enters her appearance in this matter on behalf of ExxonMobil Oil Corporation.

Respectfully submitted,

DATE: July 21, 2015

By: /s/ Katherine D. Hodge
Katherine D. Hodge

Katherine D. Hodge
HODGE DWYER & DRIVER
3150 Roland Avenue
Post Office Box 5776
Springfield, Illinois 62705
(217) 523-4900

BEFORE THE ILLINOIS POLLUTION CONTROL BOARD

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ILLINOIS ENVIRONMENTAL PROTECTION AGENCY,	)	
	)	
	)	
Respondent.	)	

ENTRY OF APPEARANCE OF MATTHEW C. READ

NOW COMES Matthew C. Read, of the law firm HODGE DWYER & DRIVER, and hereby enters his appearance in this matter on behalf of ExxonMobil Oil Corporation.

Respectfully submitted,

DATE: July 21, 2015

By: /s/ Matthew C. Read
Matthew C. Read

Matthew C. Read
HODGE DWYER & DRIVER
3150 Roland Avenue
Post Office Box 5776
Springfield, Illinois 62705
(217) 523-4900

BEFORE THE ILLINOIS POLLUTION CONTROL BOARD

EXXONMOBIL OIL CORPORATION,	)	
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Petitioner,	)	
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	)	(Variance – Water)
ILLINOIS ENVIRONMENTAL PROTECTION AGENCY,	)	
	)	
	)	
Respondent.	)	

PETITION FOR VARIANCE

NOW COMES ExxonMobil Oil Corporation ("ExxonMobil"), by and through its attorneys, HODGE DWYER & DRIVER, and, pursuant to Section 35(a) of the Illinois Environmental Protection Act ("Act"), 415 ILCS 5/35(a), and 35 Ill. Admin. Code § 104.100 *et seq.*, hereby petitions the Illinois Pollution Control Board ("Board") for a variance from the deadline for complying with the chloride standard at 35 Ill. Admin. Code § 302.407(g)(3) ("Chloride Standard") for its Joliet Refinery ("Refinery") pursuant to the terms and conditions outlined in this Petition for Variance ("Petition").

ExxonMobil, as more fully discussed below, requests that the Board grant a five-year variance from the July 1, 2018, deadline for complying with the Chloride Standard. This variance from the Chloride Standard is necessary because immediate compliance with the Chloride Standard imposes an arbitrary and unreasonable hardship on ExxonMobil. In addition, certain factors prevent the Lower Des Plaines River ("LDPR") from fully attaining its designated use.

Road deicing activities in the region may lead to elevated chloride levels in the LDPR, thereby eliminating the opportunity for ExxonMobil to comply with the Chloride Standard through the use of allowed mixing. The overwhelming majority of the chloride present in the

LDPR comes from discharges outside the control of ExxonMobil. Therefore, even if ExxonMobil eliminated its discharge, the waterway could still exceed the Chloride Standard in the winter when deicing occurs. In the event that allowed mixing for chloride in the LDPR is unavailable, ExxonMobil will need to pursue an alternative compliance approach. With the encouragement of the Illinois Environmental Protection Agency ("Illinois EPA"), ExxonMobil has actively participated in a newly formed chloride workgroup, with the goals of: 1) obtaining long-term regulatory relief from the Chloride Standard for the Chicago Area Waterway System ("CAWS") and LDPR; and 2) reducing the loading of chloride in the CAWS and LDPR. However, it is not clear whether the workgroup will be able to obtain regulatory relief for the CAWS and LDPR by July 1, 2018, the delayed effective date of the Chloride Standard.

On the other hand, if mixing is allowed for chloride, ExxonMobil likely will be able to maintain compliance without any alternative compliance approach. The availability of mixing and, therefore, the compliance path will depend primarily on the upstream chloride discharges to the CAWS and LDPR. Without more time to study the issue and participate in a workgroup, ExxonMobil cannot be sure whether the alternative compliance approach will in fact be necessary. If an alternative compliance approach is required, such as a waterbody variance, ExxonMobil needs time to gather data, file a petition, and pursue a compliance plan, preferably in collaboration with other members of the chloride workgroup.

Therefore, compliance with the Chloride Standard on July 1, 2018, its delayed compliance date, imposes an arbitrary and unreasonable hardship on ExxonMobil. A variance will allow ExxonMobil time to identify whether a long-term alternative compliance approach is necessary and then to pursue the appropriate compliance plan.

ExxonMobil's request follows the recent adoption of the Chloride Standard by the Board.[1] Since this Petition is filed within 20 days after the effective date of the rule, the operation of the Chloride Standard shall be stayed as to ExxonMobil pending the disposition of the Petition. *See* 415 ILCS 5/38(b); 39 Ill. Reg. 9388 (July 10, 2015).

In summary, ExxonMobil requests a five-year variance from the deadline for complying with the Chloride Standard at 35 Ill. Admin. Code § 302.407(g)(3). In the meantime, the existing site-specific standard[2] would continue to apply to ExxonMobil in the winter, and ExxonMobil agrees to either obtain alternative regulatory relief or comply with the Chloride Standard upon expiration of the variance.

I. COMPLIANCE WITH THE CHLORIDE STANDARD IMPOSES AN ARBITRARY AND UNREASONABLE HARDSHIP ON EXXONMOBIL

The Board's Chloride Standard imposes a numeric limit for chloride in the winter on the stretch of the LDPR into which the Refinery discharges, for the first time. Upstream sources of chloride, most notably those related to salt from road deicing, may cause elevated chloride levels in the stretch of the LDPR into which the Refinery discharges, thereby eliminating the opportunity for ExxonMobil to comply with the Chloride Standard using allowed mixing. Without allowed mixing for chloride, ExxonMobil likely will need to seek an alternative compliance approach. Since the Chloride Standard is newly promulgated, ExxonMobil and other dischargers are not afforded adequate time to determine whether an alternative compliance approach is necessary and, if it is, to select and implement the proper one. As recommended by Illinois EPA, ExxonMobil is participating in a chloride workgroup, which is working towards a

[1] Adopted Rule, Final Notice, *In the Matter of: Water Quality Standards and Effluent Limitations for the Chicago Area Waterway System and the Lower Des Plaines River: Proposed Amendments to 35 Ill. Adm. Code Parts 301, 302, 303, and 304*, R08-9(D) (Ill.Pol.Control.Bd. June 18, 2015) (rulemaking hereinafter "R08-9" and order hereinafter "Final Notice").

[2] The site-specific standard at 35 Ill. Admin. Code § 303.445 currently applies to the Refinery's discharge.

waterbody variance and chloride reductions, achieved through improved work practices (i.e., best management practices). However, it is not clear how long the waterbody variance will take to develop and adopt. The leading treatment option, reverse osmosis ("RO"), is costly and cannot be implemented by July 1, 2018. Therefore, immediate compliance with the Chloride Standard on July 1, 2018, poses an arbitrary and unreasonable hardship.

A. The Chloride Standard Imposes a Numeric Limit on Chloride in Winter on the Stretch of the LDPR into which ExxonMobil Discharges, for the First Time

The Board adopted the Chloride Standard in the R08-9(D) rulemaking. Without regulatory relief, the Chloride Standard will be applicable to the stretch of the LDPR into which the Refinery discharges on July 1, 2018. Specifically, the Refinery discharges into waters designated as Upper Dresden Island Pool ("UDIP") Aquatic Life Use ("ALU") Waters. *See* 35 Ill. Admin. Code § 303.230. Most of the UDIP ALU waters are currently subject to the Board's interim standard until July 1, 2018, which includes a summer chloride limit of 500 mg/L and a winter limit of 1,500 for total dissolved solids ("TDS"). However, ExxonMobil currently discharges under site-specific standards applicable to two segments of the LDPR. *See* 35 Ill. Admin. Code § 303.445. From the ExxonMobil discharge point to the Interstate 55 Bridge (the UDIP segment), the TDS limit for the winter months (November 1-April 30) is 1,686 mg/L. 35 Ill. Admin. Code § 303.445(a). From the Interstate 55 Bridge (the General Use segment) to the confluence of the Des Plaines River with the Kankakee River, the TDS limit for the winter months is 1,686 mg/L. 35 Ill. Admin. Code § 303.445(b).[3]

During the winter months, the site-specific standard applies in lieu of the interim standard for chloride. The Board confirmed in its Second Notice Opinion and Order that since Illinois EPA did not raise any concerns and the United States Environmental Protection Agency

[3] There is no longer a TDS standard imposed on General Use Waters. *See* 35 Ill. Admin. Code 302.208.

("USEPA") previously approved it, "the site-specific TDS standard of 1,686 mg/L will continue to apply to this segment during the three year interim period."[4]

However, on July 1, 2018, a new year-round chloride standard of 500 mg/L will be imposed on this segment of the LDPR in the absence of a variance. 35 Ill. Admin. Code § 302.407(g)(3). The Chloride Standard imposes a numeric chloride limit in the winter on the LDPR segment into which the Refinery discharges, for the first time.

B. Upstream Discharges Add Significant Amounts of Chloride to the LDPR and Jeopardize the Future Availability of Chloride Allowed Mixing for ExxonMobil

In its adoption of the Chloride Standard, the Board recognized that rivers draining the Chicago area have experienced increased concentrations of chloride beginning in the 1960s, due primarily to runoff impacted by deicing road salt applications during winter storms.[5] The Board highlighted the leading contributors of chloride in the waterways of the State, as documented by the Kelly Report. Final Notice at 27. In particular, road salt is the leading contributor of chloride to waters in the State, with an estimated annual average of 471,000 metric tons each year, focused primarily in the Chicago area. Kelly Report at 7. This is followed by 373,000 metric tons from potassium chloride in fertilizers, and 175,000 metric tons from effluent discharged by the Metropolitan Water Reclamation District of Greater Chicago ("MWRDGC"). Kelly Report at 7. Due to the geography and nature of the application of fertilizer, its impact on waterways in the Chicago area is less significant. *See* Final Notice at 27. However, discharges related to road salt from deicing efforts in the Chicago area and MWRDGC's wastewater

[4] Proposed Rule, Second Notice, R08-9(D) at 89 (Ill.Pol.Control.Bd. Mar. 19, 2015).

[5] Final Notice at 27 (citing Kelly, Walton R., Samuel V. Panno, Keith Hackley, *The Sources, Distributions, and Trends of Chloride in the Waters of Illinois, Illinois State Water Survey*, at iii, 8, 17, Prairie Research Institute, University of Illinois at Urbana-Champaign, March 2012 (attached hereto as Exhibit 1) (hereinafter "Kelly Report")).

discharges are located upstream of the Refinery's discharge, making them significant contributors of chloride to the stretch of the LDPR into which the Refinery discharges.

The Board acknowledged in its Final Notice in R08-9(D) that since the CAWS and LDPR are located in highly urbanized watersheds of Chicago and suburban Cook and Will Counties, the waterways are impacted from non-point sources related to deicing road salt in the winter. Final Notice at 27. The Board pointed to evidence presented by Illinois EPA and Citgo Petroleum Corporation and PDV Midwest Refining, LLC ("Citgo/PDV") showing that segments of the CAWS and LDPR exceeded 500 mg/L in two to thirteen percent of historical samples. Final Notice at 29. In particular, historical data from the Des Plaines River and the Chicago Sanitary and Ship Canal (which provides the majority of the flow to the LDPR) from 2001-2012 analyzed by Illinois EPA showed exceedances six percent of the time.[6] The Illinois EPA witness in the R08-9(D) rulemaking, Scott Twait, acknowledged that Illinois EPA expects violations of the Chloride Standard in winter months when road salting occurs.[7]

The Board noted in the R08-9(D) rulemaking that, although chloride reduction techniques were discussed, no information in the record demonstrated that sources were planning to reduce the use of road salt such that compliance with the 500 mg/L limit could be achieved in the foreseeable future. Final Notice at 13. The Board further noted that high chloride concentrations will continue to occur in the winter for the foreseeable future, even without the input of chloride by point source dischargers. Final Notice at 14.

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[6] Comments of the Illinois Environmental Protection Agency on the Illinois Pollution Control Board's Subdocket D First Notice Opinion, PC 1415, R08-9(D) at Attachment 1 (Ill.Pol.Control.Bd. Nov. 21, 2014) (hereinafter "Illinois EPA First Notice Comments") (attached hereto as Exhibit 2).

[7] Pre-Filed Testimony of Scott Twait, Rulemaking Exhibit 2, R08-9 at 9 (Ill.Pol.Control.Bd. Dec. 21, 2007) (attached hereto as Exhibit 3).

Chloride compliance strategies for point source dischargers are dependent on the chloride levels in the receiving waters. In the absence of the elevated chloride concentrations in receiving waters, the Refinery will be able to use the Illinois mixing provisions at 35 Ill. Admin. Code § 302.102 to demonstrate compliance with the Chloride Standard. But mixing is not allowed "where the water quality standard for the constituent in question is already violated in the receiving water." 35 Ill. Admin. Code § 302.102(b)(9). Illinois EPA's past data summarized in the R08-9(D) rulemaking suggests that mixing may not be available to the Refinery.

If no mixing is allowed, and the Refinery cannot mix with receiving waters to achieve compliance, then it must meet the water quality standards at the end-of-pipe. As acknowledged by the Board, winter season chloride water quality standard violations in the receiving water most certainly are a result of chloride discharges by non-point sources related to the application of road salt in response to winter conditions. The Board also has acknowledged the potential allowed mixing implications. Final Notice at 27-28.

C. As Suggested by Illinois EPA, ExxonMobil is Currently Participating in a Chloride Workgroup to Reduce Chloride Levels and Develop a Waterbody Variance, but a Waterbody Variance May not be Obtained and Chloride Reductions May Not be Achieved within Three Years

In its First Notice Comments in the R08-9(D) rulemaking, Illinois EPA described a plan for addressing the issue of chloride discharge from deicing activities.[8] Illinois EPA described a strategy for establishing a workgroup to focus on the reduction of chloride concentrations in the CAWS and LDPR, and development of an approvable waterbody variance. *Id.* at 9. At the time of filing its First Notice Comments, Illinois EPA had already held conference calls with MWRDGC to work on the details of a kickoff meeting schedule for January 2015. *Id.* at 9-10. Since that time, representatives from ExxonMobil attended the chloride workgroup kickoff

[8] Illinois EPA First Notice Comments at 9.

meeting at MWRDGC's Stickney Water Reclamation Plant on January 27, 2015. The next workgroup meeting is scheduled for August 4, 2015. In addition, Illinois EPA and dischargers have scheduled a meeting for workgroup dischargers to the LDPR on July 23, 2015. ExxonMobil plans to attend this meeting and work in cooperation with Illinois EPA to develop a waterbody variance.

Illinois EPA also outlined a strategy for how the regulated community should seek a waterbody variance. Its strategy involves identifying chlorides, permittees, and waterbody or waterbody segment subject to the variance. *Id.* at 10. The demonstration would focus primarily on two factors found in 40 C.F.R. § 131.10(g). *Id.* The Agency anticipated a long-term variance option with the possibility of renewal if documentation shows progress and why more time is needed. *Id.* The workgroup would compile the documentation needed to support a renewal. *Id.*

At Final Notice in the R08-9(D), the Board determined that the three-year delayed effective date of the Chloride Standard would allow time for determining the best course of action. Final Notice at 29. The Board explained that the three-year interim period "is intended to allow time for the work group to develop a proposal to address chloride and a water body wide variance as well as for others who may be seeking alternatives." Final Notice at 29. Despite the workgroup's progress, it is not clear whether a waterbody variance will be obtained by July 1, 2018. If it is not, dischargers run the risk of being out of compliance, despite their best efforts to come to a system-wide solution. Moreover, the leading treatment option, RO, is costly and cannot be implemented by July 1, 2018.

D. <u>These Circumstances Make Immediate Compliance with the Chloride Standard on July 1, 2018, an Arbitrary and Unreasonable Hardship</u>

The Board's Chloride Standard imposes a numeric limit for chloride in the winter on the stretch of the LDPR into which the Refinery discharges, for the first time. But upstream sources

of chloride, most notably those related to road deicing, may cause elevated chloride levels in the LDPR, thereby eliminating the opportunity for ExxonMobil to comply with the Chloride Standard using allowed mixing. Without allowed mixing for chloride, ExxonMobil likely will need to seek an alternative compliance approach such as a waterbody variance and/or operational changes. As described below, RO, the leading treatment option, is costly and cannot be implemented by July 1, 2018. Since the Chloride Standard is newly promulgated, ExxonMobil and other dischargers are not afforded adequate time to determine whether an alternative compliance approach is necessary and, if it is, to select and implement the proper one. As recommended by Illinois EPA, ExxonMobil is participating in a chloride workgroup, which is working towards a waterbody variance. However, it is not clear how long the waterbody variance will take to develop and be granted by the Board. Dischargers should be given adequate opportunity to collaborate with other dischargers and pursue a waterbody variance and system-wide reductions through the chloride workgroup. ExxonMobil should not be required to comply with the chloride standard if the workgroup is progressing but relief is not obtained by July 1, 2018.

The two leading contributors of chloride to the system, road salt runoff and MWRDGC effluent, are discharged upstream of ExxonMobil, and ExxonMobil has no ability to reduce chloride levels in those discharges. Illinois EPA expects exceedances, and the Board did not find any evidence that the largest chloride source, runoff from road salting, is being reduced. Requiring the Refinery to control chloride will have little impact on whether the LDPR meets the Chloride Standard. Therefore, immediate compliance with the Chloride Standard on July 1, 2018, poses an arbitrary and unreasonable hardship.

II. REGULATIONS FROM WHICH VARIANCE IS SOUGHT

ExxonMobil seek a five-year variance from the deadline to comply with the Chloride Standard at 35 Ill. Admin. Code § 302.407(g)(3). Section 302.407(g)(3) states:

> 3) Beginning July 1, 2018, the Chloride and Total Dissolved Solids standards in subsection (g)(2) of this Section are repealed and the following concentration for Chloride shall not be exceeded except in waters for which mixing is allowed pursuant to Section 302.102 of this Part:
>
> | Constituent | Unit | Standard |
> |---|---|---|
> | Chloride | mg/L | 500 |
>
> where:
>
> mg/L = milligram per liter

The Chloride Standard is applicable to the Refinery because it discharges to a stretch of the LDPR designated as UDIP ALU Waters. *See* 35 Ill. Admin. Code § 303.230. The Chloride Standard became effective on July 1, 2015. 39 Ill. Reg. 9388 (July 10, 2015).

III. ACTIVITY OF EXXONMOBIL

A. Description of ExxonMobil's Joliet Refinery and Operations

The Refinery, which began operating in 1972, is located on a 1,300-acre tract of land in Channahon Township in unincorporated Will County. The site is adjacent to Interstate 55 at the Arsenal Road exit, approximately 50 miles southwest of Chicago. To the immediate north of the Refinery is the Des Plaines River, while east and south of the Refinery is the former Joliet Army Arsenal, which has been redeveloped as an industrial complex, and the Midewin National Tallgrass Prairie.

The Refinery employs approximately 735 full time employees, who operate, maintain, and manage the facility, which operates 24 hours a day. The Refinery processes crude oil and is

capable of processing approximately 248,000 barrels per day for the production of gasoline, diesel fuel, and other refined products.

B. Identification of Permits, Location of Points of Discharge, and Nature and Amount of Chloride Discharge

The Refinery discharges water to the LDPR and Jackson Creek tributary as authorized by NPDES Permit No. IL 0002861 ("NPDES Permit") (attached hereto as Exhibit 4). The Refinery has ten permitted outfalls: seven storm water outfalls (two discharge to Jackson Creek and five discharge to the LDPR) and three other outfalls that are combined into a 48-inch diameter pipe and discharged into the LDPR through a manmade open channel (Outfalls 001, 002, and 003). The discharge channel enters the LDPR approximately 1,600 feet upstream of the I-55 Bridge.

Outfall 001 consists of treated process effluent, sanitary effluent, and stormwater. Outfall 002 consists of non-contact cooling water, boiler blowdown, zeolite water softening regeneration streams, condensate, potable water, firewater, and overflow of excess river/well water from utility makeup water systems. Outfall 003 consists of stormwater run-off and hydrostatic test water from tankage area and coke storage area, well test water, and emergency once-through cooling water.

The permitted average flows from Outfalls 001 and 002 are 4.32 MGD and 10.476 MGD respectively. Flows from Outfall 003 are intermittent. The combined effluent flow of approximately 14.8 MGD is approximately 1.5 percent of the 7Q10 flow in the UDIP. Because the Refinery effluent is a small fraction of the river flow, the water quality impacts of the effluent on the LDPR are small, and for many effluent constituents, undetectable.

Both process outfalls and stormwater outfalls discharge chloride. ExxonMobil sampled its discharge for chloride ten times between March and August of 2010. The average chloride concentration in those 24-hour composite samples was 903 mg/L. More recently, in May and

June of 2015, ExxonMobil measured chloride concentrations in its effluent of 414 mg/L and 554 mg/L, respectively.

Processes that contribute chloride to the Refinery discharge include crude desalting, boiler and wet gas scrubber water treatment, and blowdown from cooling towers. Notably, the Refinery uses water from the LDPR for cooling tower makeup. Water containing chloride from the LDPR is withdrawn by ExxonMobil and discharged back to the LDPR as cooling tower blowdown. Cooling towers operate by evaporation which concentrates the salts in the intake water. In the winter, when the LDPR is impacted by road salt runoff, chloride contributions from the cooling tower blowdown discharge are higher than during the other seasons. Chloride from LDPR water makes up between 33% and 60% of chloride discharged from the Refinery. The Refinery does not currently have sufficient data to precisely allocate chloride contributions to other individual processes. However, a variance will allow ExxonMobil time to quantify those contributions. Chloride contributions from stormwater outfalls in the winter come primarily from salt runoff following deicing activities.

C. Prior Variances Issued to ExxonMobil or Any Predecessor Regarding Similar Relief

Neither ExxonMobil nor any of its predecessors have been issued a prior variance regarding relief that is similar to what is requested in this Petition.[9] However, ExxonMobil has received one variance and one provisional variance, both related to its air emissions.[10]

[9] Note, however, that the Board issued a site-specific rule for TDS for segments of the LDPR, the first of which begins at ExxonMobil's discharge point. Adopted Rule, Final Order, *In the Matter of Revisions to Water Quality Standards for Total Dissolved Solids in the Lower Des Plaines River ExxonMobil Oil Corporation: Proposed 35 Ill. Adm. Code 303.445*, R06-24 (Ill.Pol.Control.Bd. Feb. 15, 2007); 35 Ill. Admin. Code § 303.445.

[10] *ExxonMobil Oil Corporation v. Illinois EPA*, PCB 11-86, 12-46 (cons) (Ill.Pol.Control.Bd. Dec. 1, 2011); ExxonMobil Oil Corporation v. Illinois EPA, IEPA 06-002 (Sept. 13, 2005).

D. Number of Persons Employed & Age of Facility

Construction of the Refinery began in 1970, and operations at the facility began in 1972. Currently, there are approximately 735 full time ExxonMobil employees at the Refinery, and an estimated 300 contractor employees work full time at the Refinery providing primarily maintenance services. During turnarounds, when portions of the Refinery are shut down for construction or large-scale maintenance projects, approximately 2,000 contractor employees may be on site.

E. Nature and Amount of Materials Used In Activity for Which Variance Is Sought and a Full Description of the Particular Process or Activity in Which the Materials Will be Used

As described above, chloride sources at the Refinery include crude desalting, boiler and wet gas scrubber water treatment, blowdown from cooling towers, and road salt. The Refinery does not have sufficient data to precisely allocate chloride contributions to individual processes. A survey of recent years found that the Refinery applies between 200 and 400 tons of salt to roads for purposes of deicing.[11]

F. A Description of the Relevant Pollution Control Equipment Already in Use

The Refinery wastewater treatment system consists of primary and secondary oil-solids separation followed by biological treatment using the activated sludge process. These treatment processes have no effect on the wastewater chloride content.

IV. COMPLIANCE WITH THE REGULATION CANNOT BE ACHIEVED BY THE APPLICABILITY DATE

The Refinery's approach for achieving compliance will be directly dependent on the significant upstream chloride impacts on the LDPR. The Board has noted that high chloride concentrations will continue to occur in winter for the foreseeable future, even without input

[11] This includes deicing associated with extreme winter weather in 2014 (January – March).

from point sources. Final Notice at 14. In the event the water quality standard for chloride is violated in the LDPR, ExxonMobil will be required to meet the Chloride Standard at the end-of-pipe. This may require significant changes in operations at the Refinery, which cannot be implemented by July 1, 2018. An RO system, as described below, would take more than three years to design, engineer, construct, and bring online. However, ExxonMobil is working towards a collaborative solution with Illinois EPA and other dischargers that are participating in the chloride workgroup.

V. EFFORTS NECESSARY TO ACHIEVE IMMEDIATE COMPLIANCE

Because the chlorides that are present in the Refinery wastewater are contributed by process sources such as crude desalting, concentration of salts in the intake river water by evaporation in cooling towers, and deionization treatment of intake water to provide boiler feed water and steam, source reduction is not a feasible alternative for significantly reducing the Refinery's chloride discharge to the LDPR. Segregating high-chloride wastewater streams and transporting them to an off-site location where they can be treated and discharged is also not an acceptable alternative, because the sources of salt are the intake river water, water treatment wastes, and crude petroleum feedstock and, thus, the entire effluent flow contains chlorides. Therefore, end-of-pipe desalination of the wastewater to achieve the chloride water quality standard in the final discharge is the only known available alternative.

The potentially feasible technologies to meet the Chloride Standard include: thermal distillation, RO, and electrodialysis. All of these methods generate a brine stream (high salt) that requires disposal. The brine disposal methods include concentration to either a high solids liquid or to a solid for off-site disposal. The RO process is currently the leading desalting technology for both seawater and brackish water and is considered the only currently practical end-of-pipe

treatment alterative for the refinery wastewater. Pretreatment required for RO systems include trace organic chemicals removal (to prevent fouling of the membranes), removal of certain inorganic constituents that can foul membranes (calcium compounds), and removal of suspended solids.

ExxonMobil has calculated conceptual design-level capital and operating costs for an RO system that should achieve the chloride standard in the LDPR. The cost estimates include brine disposal. It is assumed that once-through cooling water and storm water would not be treated for chloride removal, recognizing that during time periods when the LDPR intake water exceeds the chloride standard the once-through cooling water would also exceed the standard. Based on these assumptions, the conceptual-level capital cost for the RO treatment system would be approximately $54 million and the annual operating cost would be approximately $22 million. The estimated electric power usage would be 22 million kilowatts annually.

These costs are clearly unreasonable, especially given the fact that treating the Refinery's discharge to less than the chloride standard would have virtually no effect on the chloride concentrations in the LDPR, because the refinery effluent flow constitutes about 1.5% of the 7Q10 flow in the river, and a much lower fraction at higher river flows.

VI. COMPLIANCE PLAN AND SUGGESTED CONDITIONS

The Chloride Standard imposes an arbitrary and unreasonable hardship on ExxonMobil. Accordingly, a delay in compliance with the Chloride Standard is warranted. ExxonMobil proposes that the Refinery comply with the Chloride Standard or chloride limits established pursuant to alternative regulatory relief, by July 1, 2023. In the meantime, ExxonMobil proposes to participate in the chloride workgroup in pursuit of a reduction of chloride concentrations in the LDPR and long-term regulatory relief, such as a waterbody variance, if necessary. ExxonMobil

will provide periodic reports to the Board describing its progress with the workgroup and chloride reduction efforts. ExxonMobil recommends the following variance conditions should the Board grant its request:

a. ExxonMobil shall comply with the applicable Chloride Standard at 35 Ill. Admin. Code § 302.407(g)(3) or conditions established pursuant to alternative regulatory relief, by July 1, 2023.

b. Before July 1, 2023, ExxonMobil shall comply with the site-specific TDS standard at 35 Ill. Admin. Code § 303.445 during the winter months.

c. Before July 1, 2023, ExxonMobil shall participate in the chloride workgroup in pursuit of a reduction in chloride concentrations in the LDPR and long-term regulatory relief, such as a waterbody variance, if necessary.

d. ExxonMobil will provide periodic reports to the Board describing its progress with the workgroup and chloride reduction efforts.

VII. ENVIRONMENTAL IMPACT

Granting ExxonMobil's requested variance will have nonmeasurable impact on whether the LDPR achieves the 500 mg/L limit in the Chloride Standard. As described above, upstream discharges related to road salt and MWRDGC effluent are two of the three largest contributors of chloride in Illinois. On the other hand, if the variance is granted and ExxonMobil collaborates with other members of the workgroup and effectively pursues a waterbody variance and system-wide chloride reductions, then significant reductions of chloride may occur in the LDPR. During the period of the variance, ExxonMobil will participate in the chloride workgroup and implement best management practices the workgroup and ExxonMobil deem appropriate.

VIII. PROPOSED VARIANCE PERIOD

ExxonMobil proposes a five-year variance, or until July 1, 2023, from the deadline for complying with Chloride Standard set forth at 35 Ill. Admin. Code § 302.407(g)(2). Since the

Chloride Standard does not apply to UDIP ALU Waters until July 1, 2018, ExxonMobil proposes that the variance begins on that day.

IX. CONSISTENCY WITH FEDERAL LAW

Under Title IX of the Act, 415 ILCS 5/35-38, the Board is responsible for granting variances when a petitioner demonstrates that immediate compliance with the Board regulation(s) would impose an "arbitrary or unreasonable hardship" on the petitioner. 415 ILCS 5/35(a). The Board may grant a variance, however, only to the extent consistent with applicable federal law. *See* 415 ILCS 5/35(a).

Section 104.208(b) of the Board rules states the following with regard to consistency with federal law for all petitions for variances from the Board's water regulations:

> b) All petitions for variances from Title III of the Act, from 35 Ill. Adm. Code. Subtitle C, Ch. I "Water Pollution", or from water pollution related requirements of any other Title of the Act or Chapter of the Board's regulations, must indicate whether the Board may grant the relief consistent with the Clean Water Act (CWA) (33 USC 1251 et seq.), USEPA effluent guidelines and standards, any other federal regulations, or any area-wide waste treatment management plan approved by the Administrator of USEPA pursuant to Section 208 of the CWA (33 USC 1288).

35 Ill. Admin. Code § 104.208(b). In this instance, there are no applicable federal laws or regulations that preclude granting the instant variance request.

However, the USEPA has discussed limiting variances to instances when a demonstration is made similar to that made for a change of use. Variances in Water Quality Standards, Memorandum, Edwin L. Johnson, Director, Office of Water Regulations and Standards, USEPA to Water Division Directors (Mar. 15, 1985) (attached hereto as Exhibit 5). As described in USEPA's Water Quality Standards Handbook, "a state or tribe may adopt a WQS variance if the state or tribe can satisfy the same substantive and procedural requirements as a designated use

removal, which are described in 40 CFR 131.10(g)." Water Quality Standards Handbook, Chapter 5: General Policies (40 CFR 131.13) (Updated Sept. 2014) (attached hereto as Exhibit 6). Factors listed at 40 C.F.R. § 131.10(g) are commonly referred to as "UAA factors." These factors include the following:

> (1) Naturally occurring pollutant concentrations prevent the attainment of the use; or
>
> (2) Natural, ephemeral, intermittent or low flow conditions or water levels prevent the attainment of the use, unless these conditions may be compensated for by the discharge of sufficient volume of effluent discharges without violating State water conservation requirements to enable uses to be met; or
>
> (3) Human caused conditions or sources of pollution prevent the attainment of the use and cannot be remedied or would cause more environmental damage to correct than to leave in place; or
>
> (4) Dams, diversions or other types of hydrologic modifications preclude the attainment of the use, and it is not feasible to restore the water body to its original attainment of the use; or
>
> (5) Physical conditions related to the natural features of the water body, such as the lack of a proper substrate, cover, flow, depth, pools, riffles, and the like, unrelated to water quality, preclude attainment of aquatic life protection uses; or
>
> (6) Controls more stringent than those required by sections 301(b) and 306 of the Act would result in substantial and widespread economic and social impact.

Id. at §§ 131.10(g)(1)-(6).

USEPA Region 5 recently disapproved a variance issued by the Board to CITGO Petroleum Corporation and PDV Midwest Refining, L.L.C. because "Illinois did not provide

appropriate technical and scientific data and analyses demonstrating that the indigenous aquatic life designated use was not attainable for any of the reasons specified at 40 CFR 131.10(g)...."[12]

USEPA proposed clarifying revisions to its water quality standards regulations in September 2013.[13] The proposed revisions include codifying requirements for water quality standard variances and variance renewals. *Id.* In the preamble, USEPA explained that it interprets its regulations to authorize a water quality standard variance only where a state demonstrates that the variance meets the same requirements as a permanent designated use change. *Id.* at 54531. "Variances are different from changes to the designated use and associated criteria in that they are intended as a mechanism to provide time for states, authorized tribes and stakeholders to implement adaptive management approaches that will improve water quality where the designated use and criterion currently in place are not being met, but still retain the designated use as the long term goal." *Id.* USEPA proposes to add a regulatory provision specifying that in order to document the need for a variance, the state must demonstrate that attaining the use and criterion is not feasible because of one of the six factors listed in 40 C.F.R. § 131.10(g). *Id.* at 54534.

The LDPR at the point of the Refinery's discharge is designated UDIP ALU Waters. These are designated as follows:

a) Lower Des Plaines River from the Brandon Road Lock and Dam to the Interstate 55 bridge is designated as the Upper Dresden Island Pool Aquatic Life Use. These waters are capable of maintaining, and shall have quality sufficient to protect, aquatic-life populations consisting of individuals of tolerant, intermediately tolerant, and intolerant types that

[12] Letter from Susan Hedman, USEPA Region 5 Administrator to John M. Kim, Director, Illinois EPA at 2 (Mar. 15, 2013), *CITGO Petroleum Corporation and PDV Midwest Refining, L.L.C.*, PCB 12-94 (Ill.Pol.Control.Bd. Mar. 15, 2013) (attached hereto as Exhibit 7); *accord* Exhibit B to Recommendation of the Illinois Environmental Protection Agency, *Sanitary District of Decatur v. Illinois Environmental Protection* Agency, PCB 14-111 (Ill.Pol.Control.BD. Apr. 7, 2014) (Letter from Tinka G Hyde, Director, USEPA Region 5 Water Division to Marcia T. Willhite, Chief, Bureau of Water (Mar 21, 2014)) (attached hereto as Exhibit 8).

[13] *Water Quality Standard Regulatory Clarifications*, 78 Fed. Reg. 54518 (Sept. 4, 2013).

> are adaptive to the unique flow conditions necessary to maintain navigational use and upstream flood control functions of the waterway system. Such aquatic life may include, but is not limited to, largemouth bass, bluntnose minnow, channel catfish, orangespotted sunfish, smallmouth bass, shorthead redhorse, and spottail shiner.

35 Ill. Admin. Code § 303.230(a). As such, they must meet the Chloride Standard. *Id.* at 303.230(b).

Here, there are natural conditions, human caused conditions, hydrologic modifications, and physical conditions that will prevent attainment of the UDIP ALU during the lifetime of this variance. In addition, controls more stringent than those required by sections 301(b) and 306 of the Act would result in substantial and widespread economic and social impact. Accordingly, all six UAA factors apply and justify this variance. Therefore, the requirements for removing a use are satisfied, and the variance is justified under USEPA's interpretation of the variance process.

X. REQUEST FOR HEARING

ExxonMobil requests that a hearing be held on this Petition.

XI. AFFIDAVIT IN SUPPORT

In support of this Petition, ExxonMobil is filing the Affidavit of Meena M. Nainan (attached hereto as Exhibit 9).

XII. CONCLUSION

It is an arbitrary and unreasonable hardship to require ExxonMobil to comply with the Chloride Standard earlier than July 1, 2023. In addition, certain factors prevent the full attainment of the UDIP ALU. A five-year variance from the compliance date of the Chloride Standard will allow ExxonMobil to participate in the chloride workgroup and work towards a waterbody variance and reduction in chloride levels in the LDPR.

WHEREFORE, Petitioner, ExxonMobil Oil Corporation, respectfully requests that the Board grant a five-year variance, until July 1, 2023, for compliance with the Chloride Standard.

Respectfully submitted,

EXXONMOBIL OIL CORPORATION,
Petitioner,

DATE: July 21, 2015

By: /s/ Matthew C. Read
One of Its Attorneys

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Exhibit 1

Bulletin B-74

The Sources, Distribution, and Trends of Chloride in the Waters of Illinois

Walton R. Kelly, Samuel V. Panno, Keith Hackley

March 2012

Illinois State Water Survey
Prairie Research Institute
University of Illinois at Urbana-Champaign

Champaign, Illinois

The Sources, Distribution, and Trends of Chloride in the Waters of Illinois

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Abstract

Chloride (Cl^-) is a major anion found in all natural waters. It occurs naturally and is also a relatively minor contaminant. Chloride concentrations in Illinois range from less than 0.1 milligrams per liter (mg/L) in precipitation to close to 100,000 mg/L in Paleozoic brines. Chloride is non-toxic to humans, although there is a secondary drinking water standard of 250 mg/L. It is, however, deleterious to some plants and aquatic biota, thus the Illinois Environmental Protection Agency (IEPA) has set an acute standard of 500 mg/L for surface waters in Illinois. Chloride is also a very corrosive agent, and elevated levels pose a threat to infrastructure, such as road beds, bridges, and industrial pipes.

Some streams and aquifers in Illinois have naturally elevated Cl^- concentrations due to surface or near-surface discharge of Paleozoic brines. Of greater concern to water resources in Illinois are anthropogenic sources of Cl^-, including road salt runoff, sewage, water conditioning salts, and fertilizer. Chloride concentrations are elevated in most water bodies in the Chicago region, primarily due to road salt runoff. Concentrations have been increasing since approximately the 1960s, and in general, concentrations continue to increase. These elevated Cl^- concentrations may pose a risk to infrastructure as well as aquatic to ecosystems.

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Introduction

Chloride (Cl^-) is a naturally occurring major anion found in all natural waters. Chloride behaves as a conservative ion in most aqueous environments, meaning its movement is not retarded by the interaction of water with soils, sediments, and rocks. As such, it can be used as an indicator of other types of contamination. Anomalously high concentrations can act as an "advance warning" of the presence of other more toxic contaminants. Concentrations of Cl^- in natural waters can range from less than 1 milligram per liter (mg/L) in rainfall and some freshwater aquifers to greater than 100,000 mg/L for very old groundwaters within deep intracratonic basins (Graf et al., 1966; Psenner, 1989). Its concentration in precipitation in mid-continental regions (far from oceans and other salt sources) is almost always less than 1 mg/L, and often less than 0.1 mg/L (NADP, 2011). Upon contacting land surface, Cl^- concentrations in water increase as a result of interaction with soils, rocks, and biota (waste products), as well as the effects of evaporation. Chloride is the most abundant ion in seawater, with a concentration greater than 19,000 mg/L (Stumm and Morgan, 1996). Extremely elevated levels of Cl^- in surface water are generally due to significant evaporation (e.g., the Dead Sea has a Cl^- concentration > 230,000 mg/L).

Chloride is non-toxic to humans, but elevated levels make water unpotable due to the salty taste. In the U.S., there is a secondary (non-enforced) drinking water standard of 250 mg/L, but in areas of the world with water scarcities, drinking water can have considerably greater concentrations of Cl^-. Chloride is corrosive to steel, thus it may corrode pipes in water treatment and industrial plants. Because it imparts a salty taste to water and is corrosive, elevated Cl^- levels in drinking water supplies can lead to increased treatment costs. Elevated Cl^- in surface water has been linked to damage of terrestrial and aquatic plants and aquatic animals at concentrations as low as 210 mg/L (Environment Canada, 2001; Hart et al., 1991; Kaushal et al., 2005; Wilcox, 1986). The U.S. Environmental Protection Agency (USEPA) recommends a chronic criterion for aquatic life of a four-day average Cl^-concentration of 230 mg/L with an occurrence interval of once every three years (USEPA, 1988). The recommended acute criterion is 860 mg/L, which relates to a one-hour average concentration with a recurrence interval of less than once every three years. The Illinois EPA (IEPA) uses an acute criterion of 500 mg/L, but there is no chronic standard. The government of British Columbia has proposed a lower maximum Cl^- concentration of 600 mg/L and a 30-day average concentration of 150 mg/L to protect freshwater life (Nagpal et al., 2003). Increased Cl^- concentrations in some environments have killed off native vegetation and allowed invasive salt-tolerant species to thrive (Panno et al., 1999).

The objective of this report is to characterize the sources, distribution, and trends of Cl^- in the waters of Illinois, including rainwater, lakes, rivers and streams, groundwater, and wetlands.

Acknowledgements

This study was funded by the state of Illinois. We thank the institutions and individuals who provided data as well as additional information: Metropolitan Water Reclamation District of Greater Chicago (MWRDGC) (Jennifer Wasik), Lake County Health Department (Michael Adam and Kathleen Paap), Illinois State Water Survey (ISWS) (Vern Knapp), and IEPA (Missy Cain and Kevin Zidonis). Peng Wang, Ran Xu, and Mei Zhou, members of Adam Martinsek's STATS 427 class at the University of Illinois, helped with some of the statistical analysis. Tom Holm and Mike Machesky (ISWS) provided helpful comments. The views expressed herein are those of the authors and do not necessarily reflect the views of the Illinois State Water Survey, Illinois State Geological Survey, or the University of Illinois at Urbana-Champaign.

Natural Sources of Chloride

Precipitation

Chloride in precipitation and dry deposition originates from marine aerosols or volcanic gases. Naturally-occurring Cl^- concentrations in rainwater and snowmelt can be several mg/L near the coastal regions of the U.S. due to the contribution of seawater aerosols (Figure 1). Chloride concentrations in mid-continental regions are much lower. Concentrations in Illinois are typically less than 0.1 mg/L (NADP, 2011).

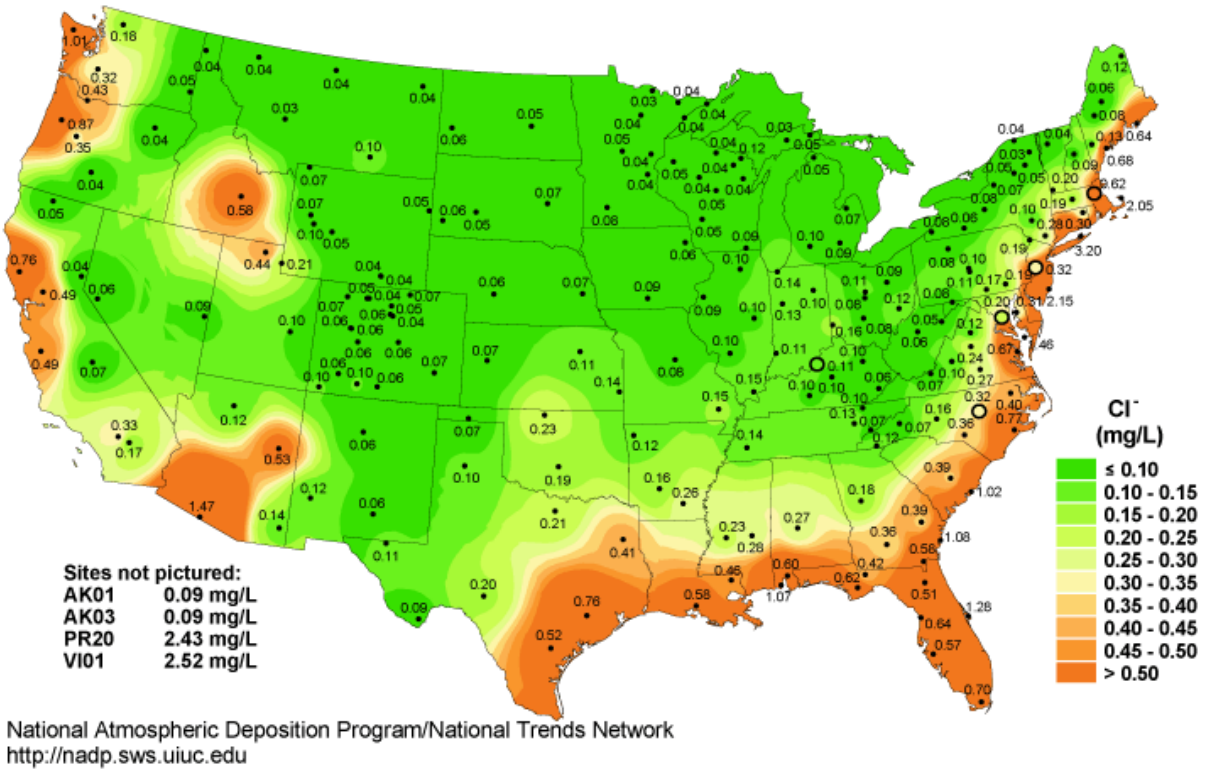

Figure 1. Chloride concentrations in U.S. precipitation for 2009. Map from NADP, 2011.

Rock-Water Interactions

Once rainwater and snow fall to the ground, evaporation and evapotranspiration tend to concentrate the Cl^- in soil water to levels ten or more times their original concentration. Rock-water interactions such as mineral dissolution and desorption within the soil zone and groundwater can further increase Cl^- concentrations.

The largest source of Cl^- in the Earth's crust is the mineral halite (NaCl) in evaporate deposits, which formed over geologic time by the evaporation of seawater. Chloride is also found in other less common salts (e.g., potassium chloride [KCl] and calcium chloride [$CaCl_2$]) associated with these evaporite deposits. Because halite and other chloride salts are extremely soluble, they are not found in areas where there is active circulation of fresh water. There are no known halite deposits in Illinois, although there is evidence from breciated limestone that evaporates may have existed in the geologic past (Willman et al., 1975). Chloride is found in small amounts (1000 to 10,000 parts per million [ppm]) in some silicate and phosphate minerals, including biotite, amphibole, apatite, sodalite, and scapolite (Kamineni, 1987), but these are not common minerals in the sedimentary rocks and sediments of Illinois. Chloride is a minor constituent of sedimentary rocks such as limestone, sandstone, and shale (as well as granitic rocks), but typically at low concentrations. Krauskopf (1979) reported typical Cl^- concentrations of 150, 10, and 200 ppm for limestone, sandstone, and shale, respectively. Chloride is also present within some minerals as fluid inclusions and can have very high concentrations comparable to those of a concentrated brine; however, fluid inclusions are typically very small (a few microns in diameter) and impart very little Cl^- to circulating groundwater. Because of the lack of appreciable amounts of Cl^- in rocks and sediments of Illinois, soils, sediments, and rocks in the shallow subsurface in Illinois would not be expected to have appreciable amounts of naturally-occurring Cl^-.

There are, however, natural brines in Paleozoic sedimentary formations of the Illinois Basin that underlie the southern two-thirds of the state (Figure 2). Meents et al. (1952) sampled over 700 oil field brines in the oil-producing regions of Illinois, primarily in the southeastern quadrant of the state; more than 80 percent of the samples had Cl^- concentrations greater than that of seawater, with a high of ~95,000 mg/L. Panno et al. (2006) summarized data from several studies in the Illinois Basin, and calculated a median Cl^- concentration of 64,600 mg/L, about three times the concentration in seawater.

Naturally saline groundwater in Illinois is very old. The chemical and isotopic compositions of brines in the Illinois Basin suggest they were formed as a result of the partial evaporation of seawater short of the precipitation of halite (Walter et al., 1990; Stueber and Walter, 1991; Kesler et al., 1995). Deeper groundwater in Precambrian granitic bedrock is even more saline, intensified by very long-term rock-water interactions at much warmer conditions than those encountered nearer the surface. Groundwater in the deeper parts of the Paleozoic and crystalline basement bedrock of the Illinois Basin is typically a hypersaline, calcium (Ca)-sodium (Na)-Cl-type brine with total dissolved solids (TDS) concentrations greater than 100,000 to over 250,000 mg/L (Horita, 2005).

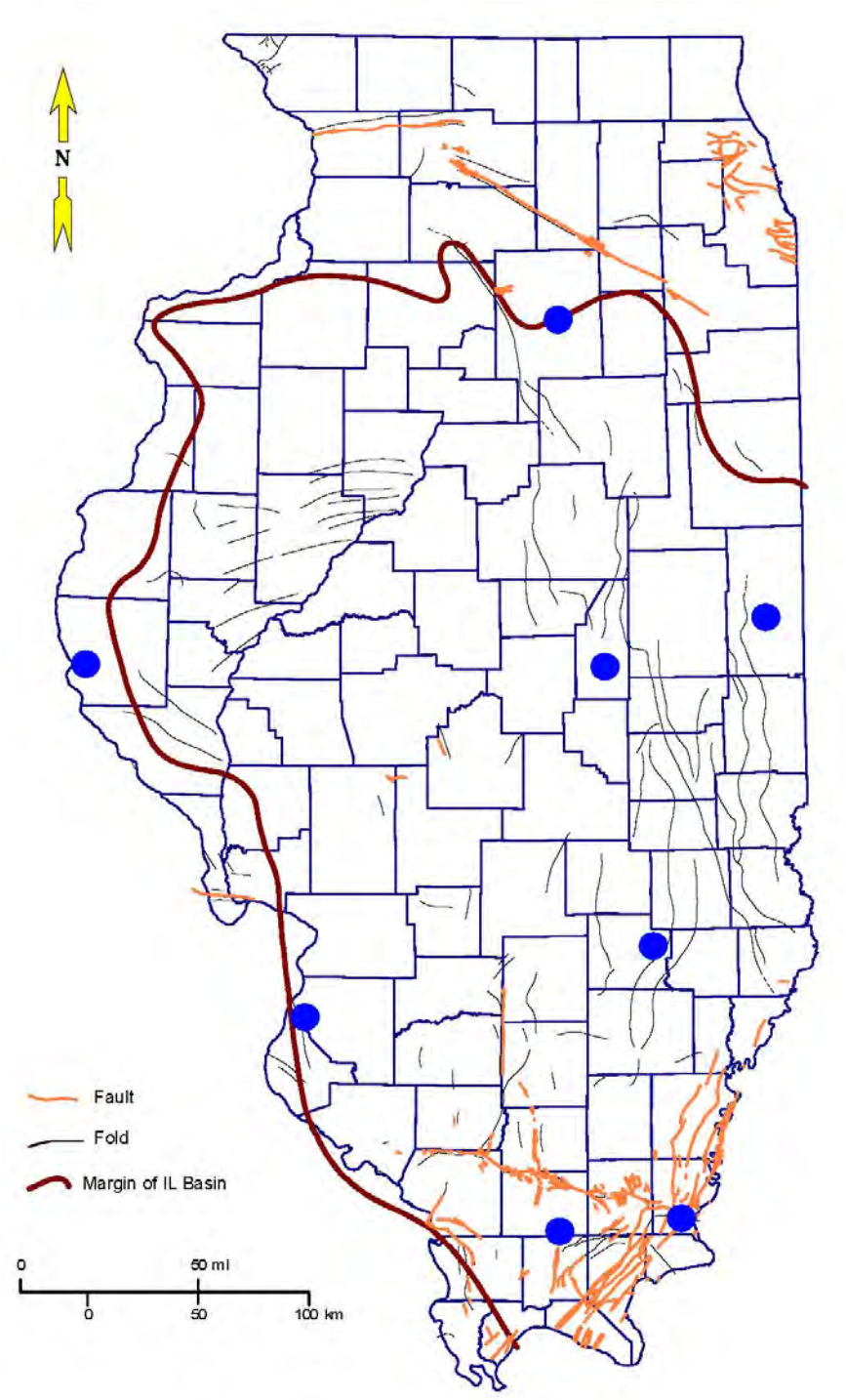

Figure 2. Illinois Basin. Blue circles indicate location of saline springs. Figure from Panno et al. (in preparation).

Saline groundwater in Illinois is under pressure, and at many locations it discharges into shallower aquifers or at the land surface as saline springs (Bartow et al., 1909; Willman et al., 1975; Cartwright, 1970; Panno et al., 1994, 2006). Bedrock discharge into the Mahomet Aquifer in Piatt County in east-central Illinois increases the Cl^- concentration from less than 10 mg/L to concentrations as high as 500 mg/L (Hackley et al., 2010). Thirteen samples of brine-affected groundwater collected by Panno et al. (2006), primarily in the southern part of the state, had a median Cl^- concentration of 474 mg/L. In some parts of Illinois, especially in the south, these deep brines discharge to surface waters, increasing the natural Cl^- concentration. For example, the North Fork of the Saline River in southeastern Illinois, named for its natural saltiness, had a median Cl^- concentration of 109 mg/L between 1978 and 1997 (USGS, 2009).

Background Chloride Concentrations

Despite the existence of saline seeps in Illinois, the vast majority of groundwater has relatively low concentrations of Cl^-, especially in major aquifers. In a study of shallow groundwater (< 100 meters) in northern Illinois, Panno et al. (2006) determined that Cl^- concentrations in shallow aquifers ranged from less than 1 to 15 mg/L. They suggested that concentrations greater than 15 mg/L indicated contamination from human sources. This threshold is probably similar (or lower) for aquifers in the rest of Illinois as well, where urbanization is less (Panno et al., 2005). Prior to human alterations to the landscape, almost all water discharging to surface streams in Illinois passed through the subsurface (i.e., groundwater), and a large majority still does. Thus pristine surface waters in Illinois should have Cl^- concentrations < 15 mg/L. Lusk Creek, for example, which flows through the undeveloped Shawnee National Forest in southern Illinois, had a median Cl^- concentration of 2.3 mg/L between 1978 and 1997 (USGS, 2009).

Anthropogenic Sources

Schlesinger (2004) estimated that more than 140 teragrams (140 trillion kilograms) of Cl^- are annually cycled through various reservoirs on Earth, almost all of it due to human activities. Anthropogenic sources include human sewage, livestock waste, water conditioning salt, synthetic fertilizer (primarily KCl), brine disposal pits associated with oil fields, chemical and other industries, and, in snowy climes, road salt runoff. From a volume standpoint, the most important anthropogenic sources of Cl^- to waters in Illinois are fertilizer, road salt, water conditioning salt, sewage, and livestock waste (Table 1). Chloride concentrations for potential contamination sources of Cl^- in Illinois are shown in Table 2. Once in groundwater, Cl^- and other contaminants can persist for many years if travel times are slow. For example, Howard et al. (1993) estimated that if road salting was stopped immediately in the Toronto area, it would be decades before the Cl^- concentrations returned to pre-1960 levels in shallow groundwater. In rural areas, agricultural sources of Cl^- are of greater importance. Oil field-related contamination problems have occurred primarily in the southern two-thirds of Illinois.

Table 1. Annual Chloride Fluxes in Illinois

Source	*Flux (metric tons)*
Treated Wastewater	
MWRDGC	175,000
Remainder of state	125,000
Atmospheric	18,000
Road Salt	471,000
Water Conditioning Salt	135,000
Fertilizer (KCl)	373,000
Livestock	139,000
Lake Michigan withdrawals	34,000
Groundwater withdrawals	
Public supply wells	12,500
Industrial/commercial	5,300
Irrigation	10,000
Oil-Field Brines	23,000

Note: The treated wastewater fluxes do not include road salt inputs.

Table 2. Chloride Concentrations (mg/L) for Potential Sources in Illinois

Sample Type	*Location*	*Min*	*Median*	*Max*	*Reference*
Tile Drain	Ludlow	10.3	14.5	17.8	Kelly et al. (2010)
	Champaign	23.1	25.4	36.5	Panno et al. (2005)
Treated Wastewater	Stickney (2000-2008)	26.3	145	1,481	MWRDGC
Road Salt Runoff	Willow Springs		8,930		Kelly et al. (2010)
	Pekin		1,572		Kelly et al. (2010)
Agricultural Soil Water	Central Illinois	16.2	17.5	20.8	W. Kelly (unpublished data)
Natural Brine	Central Illinois		6,517		Panno et al. (2006)
	SW Illinois		8,080		Panno et al. (2006)
Illinois Basin Brine		557	64,600	125,000	Panno et al. (2006)
Livestock Manure	Central Illinois	440	847	1,980	Panno et al. (2006)
Septic System Discharge	SW Illinois	20.8	91	5,620	Panno et al. (septic paper)
Landfill Leachate		198	1,284	6,170	Panno et al. (2006)

Human Waste

The median Cl^- concentration in treated wastewater (TWW) discharging from the Stickney wastewater treatment plant (WWTP) in Chicago (the largest in the U.S.) between 2000 and 2008 was 145 mg/L (based on weekly sampling) (MWRDGC, 2010) (Table 2). Kelly et al. (2010) got similar results in samples collected on three dates between 2003 and 2005 from two Metropolitan Water Reclamation District of Greater Chicago (MWRDGC) WWTPs (Stickney and Calumet); they reported a median Cl^- concentration of 141 mg/L. Kelly et al. (2010) also collected samples from the Peoria WWTP, which had Cl^- concentrations that ranged from 113 to 291 mg/L. TWW is generally discharged directly into surface waterways in Illinois.

Livestock Waste

Animal waste contains elevated concentrations of Cl^-; Panno et al. (2006) measured levels as high as 1980 mg/L (Table 2). Because of this, even relatively small concentrations of livestock can create a local problem for shallow groundwater. Large confined animal feeding operations, which can concentrate thousands of animals in a relatively small area, have the potential to produce more widespread contamination of shallow groundwater, streams, and rivers (Wing et al., 2002; Showers et al., 2008).

Road Deicers

The chemical industry and governmental departments handling road ice control are the major importers and consumers of halite in the U.S., accounting for about three-fourths of its total use (Kostick, 2008). Road salt has been linked to groundwater degradation in many urban and roadside areas in snowy climes (Amrhein et al., 1992; Bester et al., 2006; Howard and Haynes, 1993; Huling and Hollocher, 1972; Pilon and Howard, 1987; Williams et al., 2000b). Significant application of road salt began after World War II and accelerated rapidly from the 1960s (Figure 3) (Salt Institute, 2009). Chloride concentrations have been increasing in surface waters and groundwater in urban regions of the northern United States and Canada since the 1960s, primarily due to road salt runoff (Godwin et al., 2003; Howard and Haynes, 1993; Kaushal et al., 2005; Kelly, 2008; Novotny et al., 2009; Kelly et al., 2010).

Two road salt runoff samples collected by Kelly et al. (2010) dripping off road bridges in Pekin and Willow Springs, IL, had very high concentrations of Cl^-: 1572 and 8930 mg/L, respectively (Table 2). Chloride concentrations in road salt runoff samples are extremely variable due to variability in application rates, snowfall amounts, melting rates, etc.; the values measured by Kelly et al. (2010) fall within the range of values reported by others (Amrhein et al., 1992; Environment Canada, 2001; Greb et al., 2000; Pilon and Howard, 1987). Road salt also can increase Cl^- concentrations in precipitation. For example, Williams et al. (2000a) characterized road salt aerosol in suburban areas west and south of Chicago, and measured Cl^- concentrations up to 9.4 mg/L in samples collected after snow events. They also found that Cl^- concentrations in snow samples decreased exponentially with distance from major highways.

Road salt runoff that recharges the soil zone and shallow groundwater can produce very high concentrations of Cl^-. Kelly and Roadcap (1994) measured Cl^- concentrations in excess of 1,000 mg/L in several shallow (< 25 ft; 7.6 m) monitoring wells installed along the uncurbed Interstate 94 in south Chicago, including two exceeding 3,500 mg/L.

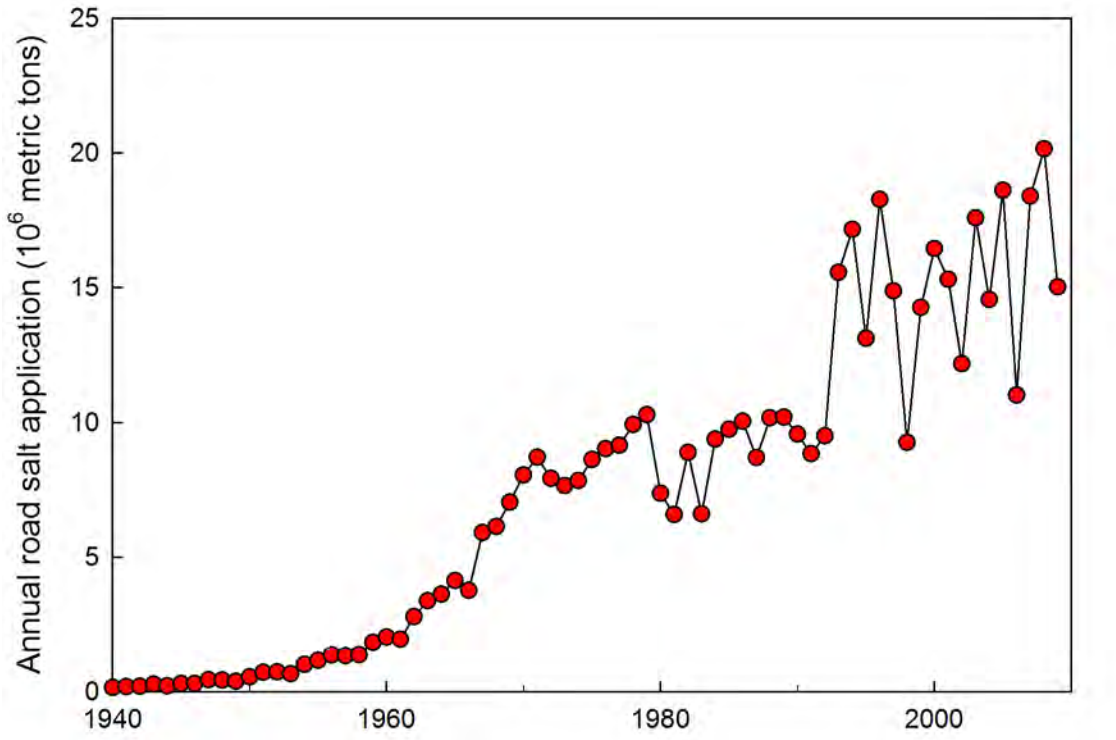

Figure 3. Yearly U.S. highway salt sales. Data from Salt Institute, 2011.

Water Conditioning Salts

In-home water treatment, specifically water softening, typically uses NaCl to recharge ion exchange columns in order to reduce hardness (Ca + Mg) by replacement with Na. For a family of three or four with moderately hard water, the recommended amount of NaCl for water softening is between 1.8 and 2.7 kilograms per day, or 600 to nearly 1000 kg of NaCl per year (Panno et al., 2005, 2007). If a household uses on-site wastewater treatment, the Cl^- is discharged to the shallow groundwater system via the leach field. If the household is connected to a community waste treatment facility, the Cl^- (which is not removed in the treatment process) is generally discharged to streams or rivers.

KCl Fertilizer

Illinois is a major producer of row crops, primarily corn and soybeans. KCl is the most commonly available potassium (K) fertilizer and usually the cheapest, thus it is widely applied in Illinois. Because it is spread over large areas (i.e., non-point source), its impact on soil water and

groundwater quality is less than more concentrated Cl^- applications, such as road salt. In much of Illinois, agricultural fields are tiled to facilitate drainage of soils, and these drain tiles are the major source of water to many streams in Illinois. Panno et al. (2005) and Kelly et al. (2010) collected samples from several tile drains in east-central Illinois, which represent shallow groundwater beneath row crop areas. Chloride concentrations in these tile drain samples ranged from 10 to 37 mg/L (Table 2). This is also approximately the same concentration range found in soil water in agricultural fields in central Illinois (W. Kelly, unpublished data).

Municipal Landfills

Panno et al. (2006) measured Cl^- concentrations in municipal landfill leachate as high as 6,170 mg/L. Roy (1994) reported the greatest Cl^- concentration recorded in municipal landfill leachate to be 27,100 mg/L. Potential sources of Cl^- in landfills include food scraps and pet wastes. Chloride concentrations in landfills are not static, but decrease with the age of the landfill (McGinley and Kmet, 1984; Ham, 1980; Lu et al., 1985). Farquhar (1989) reported that Cl^- concentrations in municipal landfill leachate tend to decrease asymptotically with time, with concentrations 1,000–3,000 mg/L during the first five years, 500–2,000 mg/L during years 5 to 10, 100–500 mg/L during years 10 to 20, and < 100 mg/L after that.

Oil and Gas Exploitation

Leakage of brine-holding ponds associated with oil wells has locally contaminated groundwater with high TDS waters in southeastern Illinois. Hensel and McKenna (1989) installed shallow monitoring wells around two brine-holding ponds in Clay County and measured Cl^- concentrations over 10,000 mg/L in several samples. They identified 384 holding ponds in their study area (~300 mi^2 in southeastern Clay County), so the potential for widespread groundwater contamination is significant and hundreds of acres of farm land were reported to have been made unsuitable for crops due to brine leakage and spillage. However, Hensel and McKenna (1989) found no widespread degradation of groundwater resources in the area.

Identification of Sources of Chloride

There are various methods for determining the source(s) of Cl^- in individual water samples, one of the best being halide ratios. In a recent investigation, Panno et al. (2006) collected more than 100 samples from various Cl^- sources (primarily in Illinois) and, by plotting Cl^- and bromide (Br^-) data on a Cl^- vs. Cl/Br diagram, were able to define domains that distinguish among the sources (Figure 4). TWW can plot outside the septic effluent source domain because there are often multiple sources of Cl^- in TWW. Chicago and many of its suburbs have combined sewers (sewage and storm water), and an average of about 30 percent of the water entering the Stickney WWTP is from storm runoff (J. Wasik, MWRDGC, December 1, 2006, personal communication). The highest Cl/Br ratios in TWW measured by Kelly et al. (2010) were during the winter, which was due to a dominant road salt component.

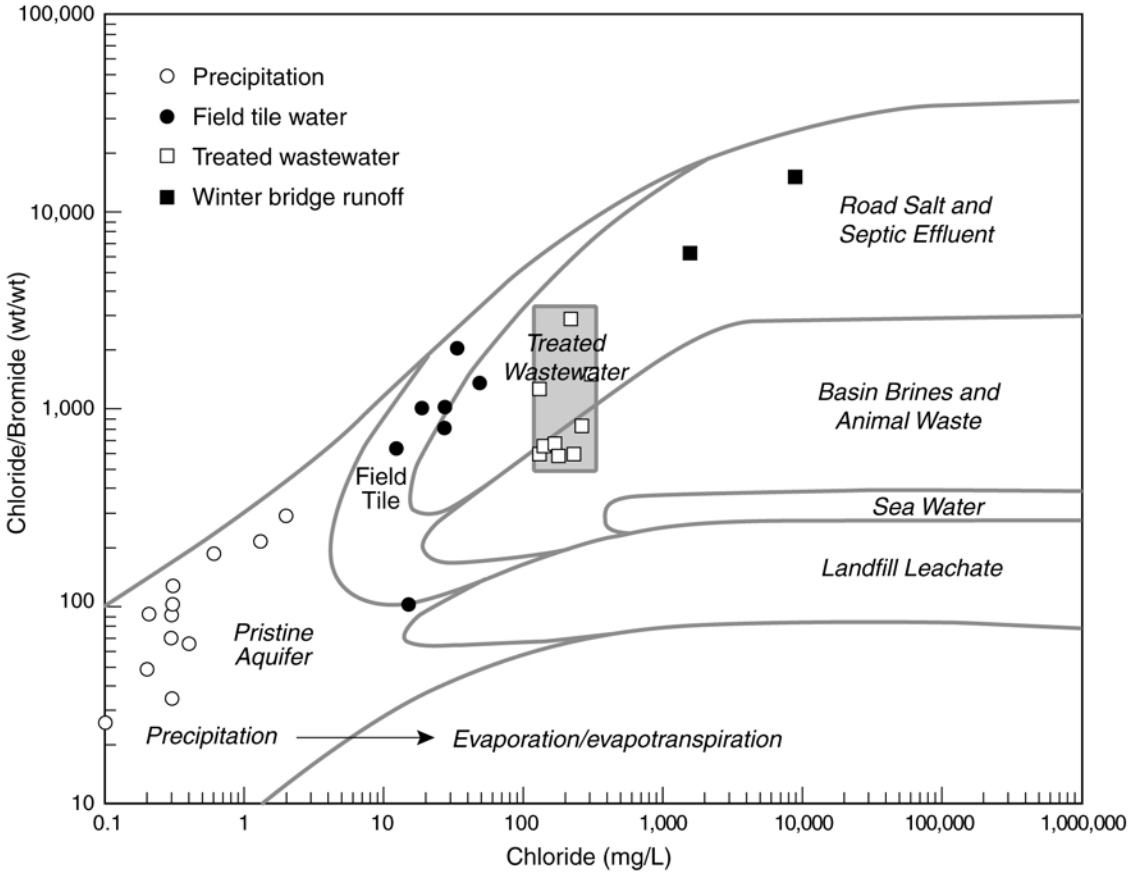

Figure 4. Cl/Br vs. Cl^- plot showing source domains (Kelly et al., 2010)

Annual Fluxes of Chloride in Illinois

The estimated annual flux of Cl^- in Illinois from various sources was determined using the methods of Kelly et al. (2010) (Table 2). They found that Cl^- in the Illinois River Basin was predominantly from road salt, TWW, and KCl fertilizer. An accurate estimate of how much road salt is applied in an average winter is difficult, due to the large number of government agencies and private entities that apply salt to roads and parking lots. Friederici (2004) and Keseley (2006) reported more than 250,000 metric tons of road salt is applied annually in the Chicago metropolitan region, but this is almost certainly an underestimate. Probably the best method for estimating road salt applications is to use road salt sales reported by the Salt Institute (Salt Institute, 2009) as a proxy. Using additional state data from Richter and Kreitler (1993) and Panno et al. (2005), Kelly et al. (2010) estimated that an annual average of 471,000 metric tons of road salt (equivalent to ~283,000 metric tons of Cl^-) were used in Illinois for the years 2002 to 2005, mostly in the Chicago region. Average annual road salt sales have increased since 2005, so the amount of road salt applied in Illinois has undoubtedly increased as well. The amount applied in a particular year generally depends on how much snow and ice fall during winter.

The Cl^- flux for TWW from the Chicago region can be calculated from WWTP discharge and Cl^- concentration data reported by MWRDGC (MWRDGC, 2010), but this calculation is complicated by multiple sources in TWW and the potential for "double counting" of sources. In addition to human waste, TWW includes industrial effluent, water conditioning salt, and road salt, as well as Cl^- present in drinking water sources.

Chloride fluxes from the Chicago WWTPs were calculated using Cohn's equation (Kelly et al., 2010). Road salt contributions were removed from the WWTP loads by assuming that there was no road salt in TWW from May to October. Chloride loads during these months were divided by monthly discharges, and it was assumed that the same load per discharge ratio for non-road salt sources occurred between November and April. The remaining chloride loads between November and April (which varied between 17 percent and 50 percent of the total monthly load) were assumed to come from road salt and were removed from the TWW load calculations.

The seven MWRDGC plants account for almost 60 percent of the TWW discharged to surface water bodies in Illinois. To calculate the Cl^- flux for the remaining TWW, it was assumed that the effluent Cl^- concentration was the same as for the MWRDGC plants, resulting in a flux of 125,000 metric tons.

Human waste actually accounts for a small percentage of Cl^- in TWW. Adult humans excrete between 110 and 250 millimoles of Cl^- per day (3,900–8,860 mg day) (WebMD, 2011). Assuming 5,500 mg of Cl^- per day, a typical value for urine production (1.25 L/day), and a 2010 population of 12.83 million, results in about 32,000 metric tons of Cl^- from human urine annually in Illinois. Another approach taken by Mullaney et al. (2009) is to use per capita salt consumption based on the recommended daily adult sodium intake of 2,300 mg/d, which would include about 3,547 mg of Cl^-. A person on this diet would consume, and release, about 1.3 kg of Cl^- per year, which would be released by wastewater discharge. This would produce almost 17,000 metric tons of Cl^- in Illinois per year. Either estimate represents less than 10 percent of the Cl^- in TWW.

Chloride from water conditioning salt was also estimated from salt sales data. Between 2005 and 2008, approximately 3.2 million metric tons of salt (predominantly NaCl) was sold for water conditioning in the U.S. (Salt Institute, 2009). Assuming that water conditioning salt use was distributed equally across the U.S. based on population, approximately 135,000 metric tons of Cl^- is annually consumed in Illinois by water conditioning.

About 80 percent of corn fields and 30 percent of soybean fields in Illinois receive potassium chloride (KCl) annually (USDA, 2008). The amount of KCl applied in Illinois was estimated from state fertilizer sales data (USDA, 2008). Between 2005 and 2007, an average of 373,000 metric tons of Cl^- from KCl were purchased per year in Illinois.

Between 2005 and 2008, there were approximately 4.23 million pigs and 1.28 million cattle in Illinois (Illinois Agricultural Statistics Service, 2009). A pig produces about 3 gallons of waste a day and a cow produces 14 gal/day. Using Cl^- concentrations of 3,680 mg/L and 3,000 mg/L for pigs and cows, respectively (DeRouchey et al., 2003; Lengemann et al., 1952), an annual total of 139,000 metric tons of Cl^- was calculated to come from livestock.

For Cl^- from precipitation, a Cl^- concentration of 0.12 mg/L and an average annual precipitation of 102 centimeters (cm) were assumed (NAPD, 2011). This gives approximately 18,000 metric tons of Cl^-.

One source of Cl^- that may be overlooked is water extracted from Lake Michigan and groundwater for drinking, industrial, and agricultural purposes. Chicago and many of the inner suburbs obtain drinking water from Lake Michigan, which has a Cl^- concentration of approximately 12 mg/L. Because most of the water Illinois takes from Lake Michigan is discharged outside the Great Lakes Basin, Illinois is limited by U.S. Supreme Court decree to 3,200 cubic feet per second (cfs) (~2,900 billion L/yr) of water from the lake. Assuming Illinois diverts all of this each year, approximately 34,000 metric tons of Cl^- is removed from the lake. Most of this eventually finds its way into wastewater, which would be included in the TWW Cl^- flux, and eventually is discharged down the Illinois River.

Approximately 1,180 million gallons (4,470 million L) of groundwater are withdrawn daily in Illinois (Kenny et al., 2009). About 507 million gallons per day (mgd) (1,920 million L/day) are used for drinking and other household uses, 517 mgd for agriculture (irrigation and livestock), 128 mgd by industrial and commercial applications, 15.5 mgd by mining, and 7.2 mgd for thermoelectric. Most extracted groundwater is not returned to the ground, but eventually finds its way to surface waters. In communities with sewers, most drinking water eventually finds its way into wastewater, which is then discharged to surface streams and rivers, eventually leaving the state. For homes and businesses with private wells and on-site sewage treatment (i.e., septic systems), extracted groundwater is discharged at or just below the ground surface, and most does not recharge underlying aquifers but is either evapotranspired or discharged to nearby streams or other surface waters. The same is true for irrigation water.

Groundwater withdrawal data are available for many public water supply wells and industrial/commercial wells. Of the top 200 pumped public water supply wells, 176 have been sampled sometime in the past 20 years, and the Cl^- concentration and withdrawal data from 2008 were used to calculate the mass of Cl^- removed. In order to not include potential surface contamination sources in shallow wells, it was assumed that the background Cl^- concentration was 15 mg/L in all wells $\leq$ 250 feet deep. These results were then used to estimate Cl^- fluxes

from the other approximately 2,500 public water supply wells for which we have withdrawal data. It was estimated that approximately 12,500 metric tons of Cl^- was extracted from public supply wells.

Sample results were available only for 13 of the top 200 industrial/commercial wells. For 184 of the other 187 wells, samples from a well located near to and at a similar depth to the well in question were found, and the Cl^- concentration from that well was used to calculate Cl^- fluxes. Using these data and the assumption that the background Cl^- concentration was 15 mg/L in all wells $\leq$ 250 feet deep gives an estimate of approximately 5,300 metric tons of Cl^- extracted annually from industrial/commercial wells.

In 2005, the U.S. Geological Survey estimated that approximately 479 million gallons of water were pumped from irrigation wells in Illinois (USGS, 2009). Withdrawal data from individual irrigation wells are lacking in Illinois. Because most irrigation wells are finished in relatively shallow sand and gravel aquifers, it was assumed that the Cl^- concentration was 15 mg/L. This gives a Cl^- flux of approximately 10,000 metric tons from irrigation wells.

It is difficult to get accurate estimates of how much water is withdrawn for oil and gas production. The most recent and most reliable estimates are from the 1980s, when Kirk (1987) reported that 25.5 million gallons per day (~9.3 billion gallons annually) were withdrawn. Almost all of this is reinjected for secondary oil and gas recovery. However, some of this brine was temporarily stored in ponds at the surface, and leakage to surface and shallow subsurface environments has been reported (Hensel and McKenna, 1989). Using the median concentration of 64,600 mg/L reported by Panno et al. (2006), and assuming leakage of 1 percent of the withdrawn brine, gives an annual Cl^- flux of approximately 23,000 metric tons.

Distribution and Trends in Chloride Concentrations in Waters of Illinois

Recent research has suggested that Cl^- concentrations in many water bodies in Illinois are changing (e.g., Kelly [2008] and Kelly et al. [in press]), thus any report on the distribution of Cl^- is a "snapshot in time," subject to change. This is especially true for rivers and shallow groundwater in urban and urbanizing areas, most notably the Chicago region. In order to fully understand the distribution of Cl^- in the waters of Illinois, a discussion of temporal trends must also be included. Trends in Cl^- concentrations in surface water and groundwater can reveal much about the origin, evolution, character, and movement of its sources. Such information is critical to predicting future changes in Cl^- concentrations.

Lakes

As mentioned previously, Lake Michigan currently has an average Cl^- concentration of 12 mg/L, its highest historical level. Concentrations have been slowly increasing since the late 1800s, due to human inputs to the lake (Chapra et al., 2009), with an increase of about 3 mg/L since the 1980s (USEPA, 2011a) (Figure 5). While the increase seems small, it represents an additional annual load of approximately 600,000 metric tons of Cl^- to Lake Michigan.

Natural lakes in Illinois are primarily found in the northern part of the state, especially Lake and McHenry Counties. Most lakes in downstate Illinois are reservoirs created by the

damming of streams and rivers. Their Cl^- concentrations are similar to those found in their stream or river supplies, potentially increasing in summer if there is significant evaporation.

Many lakes in Lake County have been monitored between April and October for dissolved solids since the late 1980s by the Lake County Health Department (LCHD). Chloride concentrations have been routinely monitored only since 2005, but specific conductance, which is highly correlated with Cl^- concentrations, has been monitored from the beginning. Specific conductance values have been increasing with time in most of these lakes (Figure 6). In 2010, the median Cl^- concentration in the 22 lakes being monitored by LCHD was 112 mg/L, with highest concentrations usually measured in the first sample collected (May). Between 2005 and 2010, Cl^- concentrations have generally dropped in many of these lakes, which has been attributed to dilution during the relatively wet summers in recent years (Figure 7) (M. Adams, LCHD, pers. comm.). There is anecdotal evidence that the increasing TDS levels in lakes at golf courses has forced their abandonment as sources of irrigation water due to the deleterious effects on turf. This in turn has led to drilling of new wells, increasing the amount extracted from aquifers in Lake County.

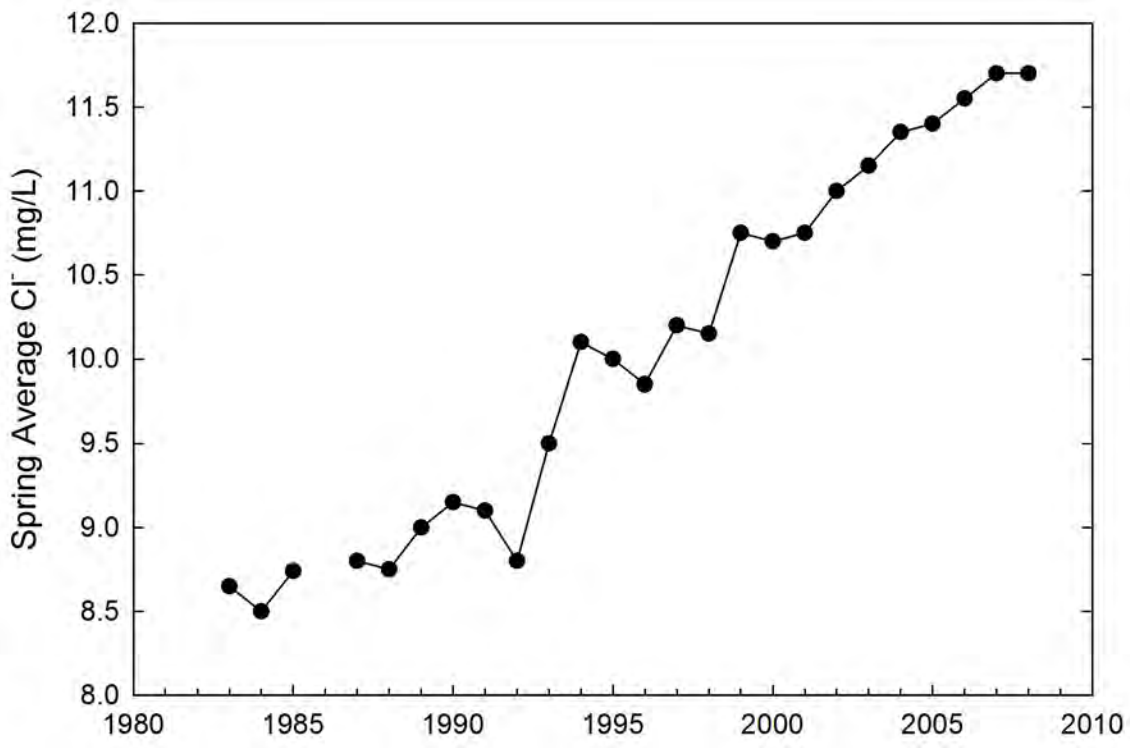

Figure 5. Chloride concentrations in Lake Michigan. Data from USEPA, 2011.

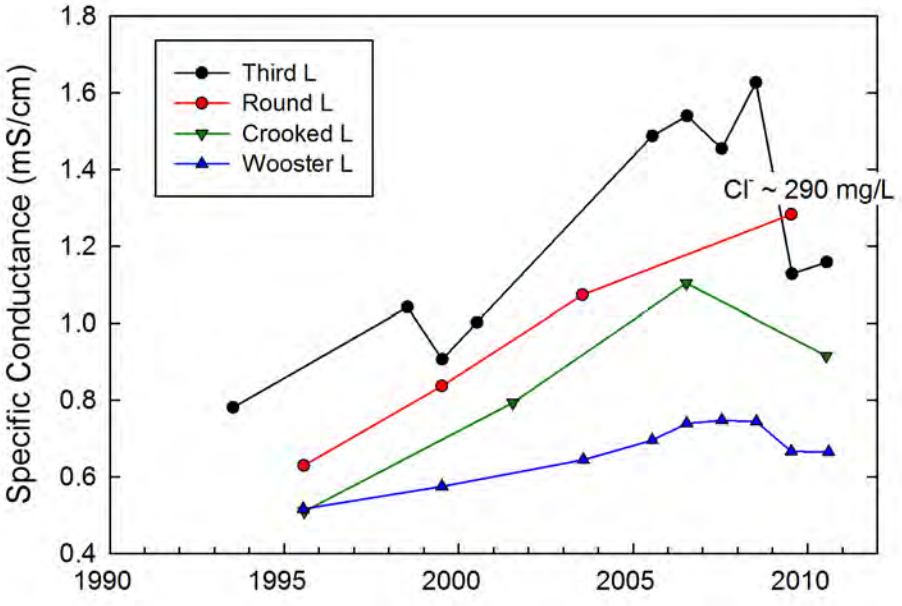

Figure 6. Annual median specific conductance values in selected lakes in Lake County. The chloride concentration for the most recent sample from Crooked Lake is reported. Data from Lake County Health Department.

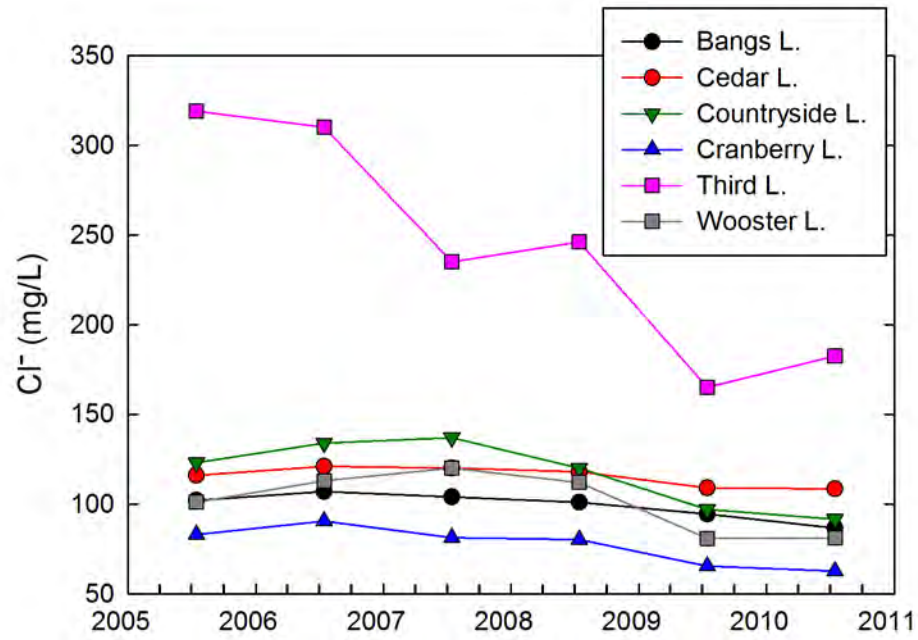

Figure 7. Chloride concentrations in selected lakes in Lake County. Data from Lake County Health Department.

Rivers and Streams

Water quality data for streams and rivers in Illinois are available from several agencies, including the ISWS, USGS, MWRDGC, and IEPA. Chloride concentrations in streams in Illinois are highest in the Chicago region and lowest in streams in forested watersheds in far southern Illinois. The USGS has historical data from a number of streams and rivers throughout Illinois. A comparison of data sets from a time period with the greatest overlap of data (1990–1992) indicates that downstate rivers draining primarily agricultural watersheds (Kankakee, Spoon, La Moine) had median Cl^- concentrations < 30 mg/L (Table 3 and Figure 8). Even though the North Fork of the Saline River drains an agricultural watershed, it has natural sources of Cl^- (geological brine discharge) and thus had a significantly higher median Cl^- concentration (86 mg/L). The Sangamon River, which has several large cities in its watershed (Bloomington-Normal, Decatur, Springfield), had a median concentration (34 mg/L at its most downstream station, Oakford) higher than rivers draining primarily agricultural land. The Fox River, which drains some of the western suburbs of the Chicago region and receives TWW, had an even higher median concentration (70 mg/L at its most downstream station, Dayton). Major Chicago waterways, including the Des Plaines River and the Chicago Sanitary & Ship Canal (CSSC), had median values > 90 mg/L. The median Cl^- concentration in the Illinois River, which receives water from tributaries in the Chicago region as well as down-state, is > 60 mg/L at Peoria and upstream, dropping to around 50 mg/L near its discharge to the Mississippi. Figure 9 shows that there are large annual variations in Cl^- concentrations in rivers throughout Illinois.

The MWRDGC has been monitoring water quality monthly at surface water stations in the Chicago region since 1975, primarily in Cook County but also at a few stations in DuPage and Will Counties (Figure 10). Forty-one stations have been monitored relatively continuously since 1975, with more than 30 others having a shorter period of record. Median Cl^- concentrations in 2008 were > 150 mg/L at about 80 percent of the stations (Figure 11 and Table 4). The highest values tended to be in the smallest streams in northern Cook County, including Higgins Creek, Salt Creek, and Buffalo Creek, as well as the North Branch of the Chicago River. The stream with the lowest values appears to be the North Shore Channel, which receives significant flow from Lake Michigan.

The presence of trends in Cl^- concentrations were determined using Kendall's tau test at the 95 percent confidence level, and annual rates of change were estimated by calculating slope coefficients (β_1) on 5-point running medians (Helsel and Hirsch, 2002). Rivers draining the Chicago region, including the Illinois River, have increasing trends in Cl^- concentrations. Of the 41 stations monitored by MWRDGC since 1975, 35 had statistically significant positive trends in Cl^- concentrations, with a median increase of 2.7 mg/L per year (Table 5). Five stations had increases of greater than 5 mg/L/yr; two of these stations were in the North Branch of the Chicago River. Of a total of 78 USGS stations tested throughout the entire state, 36 had significant positive trends in Cl^- concentrations, and 10 had significant negative trends (Table 6). The positive stations included almost all the Chicago region rivers and canals (Des Plaines River, Fox River, Chicago River, Addison Creek, CSSC), as well as a number of down-state rivers, including the Kankakee, Rock, and Sangamon Rivers. All of the Illinois River stations, as well as those on the Mississippi and Ohio, had positive trends. The stations with negative trends were scattered throughout the state.

Table 3. Median Cl^- Values (mg/L) for Rivers in Illinois for Water Years 1991–1992 at USGS stations. For Rivers with More Than One Station (Ordered from Upstream to Downstream)

River	*Location*	*Station*	*Median*		*River*	*Location*	*Station*	*Median*
Big Muddy	Murphysboro	5599500	31		La Moine	Colmar	5585000	17
Cache	Forman	3612000	10		Little Wabash	Effingham	3378635	30
Cal Sag Channel	Sag Bridge	5536700	105		Little Wabash	Carmi	3381495	34
Casey Fork	Mt Vernon	5595830	67		Lusk Ck	Eddyville	3384450	2.3
CSSC	Romeoville	5536995	109		Md Fk Vermilion	Oakwood	3336645	24
CSSC	Lockport	5537000	91		N Branch Chicago	Deerfield	5534500	131
Crab Orchard Ck	Carbondale	5598245	13		N Branch Chicago	Niles	5536000	146
Des Plaines	Riverside	5532500	158		N Fork Saline	Texas City	3382325	86
Des Plaines	Joliet	5537980	99		Pecatonica	Freeport	5435500	20
Embarras	Camargo	3343395	30		Richland Ck	Hecker	5595200	65
Embarras	Diona	3344000	29		Rock	Rockton	5437500	24
Embarras	Billett	3346550	30		Rock	Como	5443500	38
Fox	Channel Lk	5546700	65		S Fork Saline	Crab Orchard	3382055	32
Fox	S Elgin	5551000	75		S Fork Saline	Carrier Mills	3382100	19
Fox	Montgomery	5551540	85		Saline Branch	Mayview	3337700	51
Fox	Dayton	5552500	70		Salt Fork	St Joseph	3336900	39
Green	Geneseo	5447500	25		Sangamon	Allerton Park	5572125	44
Illinois	Marseilles	5543500	63		Sangamon	Oakford	5583000	34
Illinois	Peoria	5559900	59		Sangamon S Fork	Kincaid	5575500	50
Illinois	Valley City	5586100	52		Spoon	Seville	5570000	31
Iroquois	Chebanse	5526000	40		Sugar Ck (Saline)	Stonefort	3382090	5.9
Kankakee	Wilmington	5527500	27		Sugar Ck (Lk Springfield)	Springfield	5576250	56
Kaskaskia	Cooks Mills	5591200	33		Sugar Ck (Salt Ck)	Hartsburg	5581500	48
Kaskaskia	Venedy Station	5594100	27		Thorn Ck	Thornton	5536275	130
Kishwaukee	Perryville	5440000	43					

Table 4. Median Cl^- Values (mg/L) for 2008 at River Stations Monitored by MWRDGC

Station	*River*	*Location*	*Cl^-*		*Station*	*River*	*Location*	*Cl^-*
12	Buffalo Ck	Lake-Cook Rd	286		34	N Br Chicago	Dempster St	231
43	Cal-Sag Channel	Rte 83	186		37	N Br Chicago	Wilson Ave	166
58	Cal-Sag Channel	Ashland Ave	176		46	N Br Chicago	Grand Ave	159
59	Cal-Sag Channel	Cicero Ave	173		73	N Br Chicago	Diversey Ave	159
49	Calumet	Ewing St	33.5		96	N Br Chicago	Albany Ave	236
55	Calumet	130th St	156		104	N Br Chicago	Glenview Rd	204
74	Calumet	Lake Shore Dr	45.5		31	N Br Chicago (Md Fk)	Lake-Cook Rd	277
100	Chicago	Wells St	105		103	N Br Chicago (W Fk)	Golf Rd	288
40	CSSC	Damen Ave	143		106	N Br Chicago (W Fk)	Dundee Rd	350
41	CSSC	Harlem Ave	175		35	N Shore Channel	Central Ave	21.5
42	CSSC	Rte 83	169		36	N Shore Channel	Touhy Ave	135
48	CSSC	Stephen St	167		101	N Shore Channel	Foster Ave	140
75	CSSC	Cicero	169		102	N Shore Channel	Oakton Ave	72.0
92	CSSC	Lockport	162		39	S Br Chicago	Madison St	134
13	Des Plaines	Lake-Cook Rd	182		108	S Br Chicago	Loomis St	136
17	Des Plaines	Oakton St	196		99	S Br Chicago (S Fk)	Archer Ave	170
19	Des Plaines	Belmont Ave	196		18	Salt Ck	Devon Ave	241
20	Des Plaines	Roosevelt Rd	195		24	Salt Ck	Wolf Rd	252
22	Des Plaines	Ogden Ave	197		79	Salt Ck	Higgins Rd	388
23	Des Plaines	Willow Springs Rd	209		80	Salt Ck	Arlington Hts Rd	235
29	Des Plaines	Stephen St	198		90	Salt Ck	Rte 19	252
91	Des Plaines	Material Service Rd	193		109	Salt Ck	Brookfield Ave	256
86	Grand Calumet	Burnham Ave	138		32	Skokie	Lake-Cook Rd	247
77	Higgins Ck	Elmhurst Rd	452		105	Skokie	W Frontage Rd	181
78	Higgins Ck	Wille Rd	187		54	Thorn Ck	Joe Orr Rd	160
52	Little Calumet	Wentworth Ave	168		97	Thorn Ck	170th St	182
56	Little Calumet	Indiana Ave	172		64	W Br DuPage	Lake St	168
57	Little Calumet	Ashland Ave	191		89	W Br DuPage	Walnut Ln	151
76	Little Calumet	Halsted Ave	170		110	W Br DuPage	Springinsguth Rd	297
					50	Wolf Lake	127th St	64.9

Table 5. Trends Determined by Kendall Tau Statistic and β_1 Values (Reported as Yearly Change in Cl^-) for MWRDGC Stations with Monitoring Data from 1975 to 2008. Kendall Tau Significance Determined at 95% Confidence Level. β_1 Values Reported for All Data (total) as Well as Seasonally.

		Kendall Tau	β_1 (mg/L/yr)				
Station	*River*	*Significant?*	*Total*	*Jan-Mar*	*Apr-Jun*	*Jul-Sep*	*Oct-Dec*
12	Buffalo Creek	Y	5.8	13.2	6.9	1.4	3.0
13	Des Plaines R	Y	3.4	6.9	3.4	2.1	2.0
17	Des Plaines R	Y	3.8	8.2	3.9	2.6	2.7
18	Salt Creek	Y	2.1	6.7	6.4	-0.1	-1.2
19	Des Plaines R	Y	3.7	8.2	3.4	1.6	2.8
20	Des Plaines R	Y	4.1	8.6	3.7	2.2	3.0
22	Des Plaines R	Y	3.3	2.6	3.8	1.2	1.2
23	Des Plaines R	Y	3.4	8.9	4.0	1.1	2.0
24	Salt Creek	N					
29	Des Plaines R	Y	3.3	8.7	3.8	1.0	1.5
31	N Branch Chicago R (Md Fk)	Y	5.2	7.1	5.9	4.8	3.5
32	Skokie R	Y	4.6	5.5	6.3	4.3	3.5
34	N Branch Chicago R	Y	5.5	9.7	6.3	3.5	3.9
35	N Shore Channel	Y	0.17	5.4	2.0	-0.3	0.3
36	N Shore Channel	Y	1.9	5.2	2.1	0.9	2.7
37	N Branch Chicago R	Y	2.7	6.8	2.9	1.3	3.4
39	S Branch Chicago R	Y	2.6	6.4	2.5	0.5	3.0
40	CSSC	Y	2.7	6.4	2.7	0.4	3.2
41	CSSC	Y	2.5	5.2	2.2	1.0	4.2
42	CSSC	Y	2.7	7.0	2.4	1.1	2.3
43	Cal-Sag Channel	Y	1.4	5.2	1.8	0.1	0.0
46	N Branch Chicago R	Y	2.7	6.8	3.2	1.4	2.7
48	CSSC	Y	2.4	5.2	2.5	0.9	1.9
49	Calumet R	Y	0.76	1.7	0.5	-0.1	0.8
50	Wolf Lake	Y	0.51	0.4	0.7	0.6	0.4
52	Little Calumet R	Y	1.9	3.6	2.5	0.4	0.5
54	Thorn Creek	Y*	-4.8	-1.3	-2.8	-6.1	-7.7
55	Calumet R	N					
56	Little Calumet R	N					
57	Little Calumet R	Y	0.07	5.2	1.8	-2.3	-2.5
58	Cal-Sag Channel	Y	1.2	5.0	0.9	-0.1	1.4
59	Cal-Sag Channel	Y	1.2	4.3	1.8	-0.2	0.2
64	W Branch DuPage R	Y	-0.93	4.4	1.7	-2.2	-3.1
73	N Branch Chicago R	Y	2.5	6.7	2.5	1.0	2.6
74	Chicago R	Y	1.1	6.0	2.7	0.0	1.4
75	CSSC	Y	2.9	7.0	1.5	0.6	3.3
76	Little Calumet R	Y	1.4	4.7	10.1	0.6	1.4
78	Higgins Creek	Y	1.6	3.8	9.9	1.0	1.4
79	Salt Creek	Y	7.3	15.9	6.4	5.8	4.6
80	Salt Creek	Y	2.0	6.6	2.3	0.3	-0.6
90	Salt Creek	Y	6.8	12.8	11.1	4.4	3.7

* Negative trend.

Table 6. Trends Determined by Kendall Tau Statistic and β_1 Values (Reported as Yearly Change in Cl^-, mg/L/yr) for USGS Stations. Data Start in 1984, and End between 1997 and 2008. Kendall Tau Significance Determined at 95% Confidence.

Station	*River*	*KT sign.*	β_1		*Station*	*River*	*KT sign.*	β_1
5532000	Addison Creek	Y	9.33		3384450	Lusk Creek	N	
5599500	Big Muddy	N			3336645	Middle Fork Vermilion	N	
3378000	Bonpas Creek	Y*	-1.08		7022000	Mississippi	Y	0.21
3612000	Cache	Y*	0.07		5587455	Mississippi	Y	0.48
5536700	Cal Sag Channel	N			5534500	N Branch Chicago	Y	7.13
5595830	Casey Fork	N			5536000	N Branch Chicago	Y	5.74
5598245	Crab Orchard Creek	N			3346000	N Fork Embarras	Y*	-2.00
5593520	Crooked Creek	Y*	-3.17		3382325	N Fork Saline	N	
5537000	CSSC	Y	3.84		3338780	N Fork Vermilion	Y*	-0.29
5536995	CSSC	Y	5.64		3612500	Ohio	Y	0.23
5528000	Des Plaines	Y	6.00		5435500	Pecatonica	Y*	-0.15
5529000	Des Plaines	Y	6.03		5550500	Poplar Creek	Y	14.2
5532500	Des Plaines	Y	2.11		5595200	Richland Creek	Y	0.99
5537980	Des Plaines	N			5437500	Rock	Y	1.00
5540500	DuPage	Y*	-2.63		5443500	Rock	Y	0.99
3344000	Embarras	N			5446500	Rock	Y	0.98
3345500	Embarras	Y*	-0.40		3337700	Saline Branch	Y	1.63
3343395	Embarras	N			5531500	Salt Creek	N	
3346550	Embarras	N			3336900	Salt Fork	N	
5551000	Fox	Y	5.89		5576500	Sangamon	N	
5551540	Fox	Y	7.11		5583000	Sangamon	Y	0.58
5552500	Fox	Y	1.76		5572000	Sangamon	N	
5550000	Fox	Y	5.56		5573540	Sangamon	N	
5546700	Fox	Y	2.94		5572125	Sangamon	N	
5447500	Green	N			3382100	S Fork Saline	N	
5539000	Hickory Creek	Y	6.52		3382055	S Fork Saline	N	
5543500	Illinois	Y	1.24		5575500	S Fork Sangamon	N	
5559900	Illinois	Y	2.54		3380500	Skillet Fork	N	
5586100	Illinois	Y	0.90		5594450	Silver Creek	Y	2.04
5526000	Iroquois	Y	0.32		5594800	Silver Creek	N	
5520500	Kankakee	Y	0.36		3382090	Sugar Creek	Y*	-0.59
5527500	Kankakee	Y	0.07		5576250	Sugar Creek	Y	2.53
5594100	Kaskaskia	N			5581500	Sugar Creek	Y	1.18
5592500	Kaskaskia	Y*	-2.08		5536275	Thorn Creek	N	
5591200	Kaskaskia	Y	1.68		3339000	Vermilion	N	
5440000	Kishwuakee	Y	0.98		5539900	W Branch DuPage	Y	4.23
5584500	La Moine	N			5540095	W Branch DuPage	N	
5585000	La Moine	N						
3378635	Little Wabash	N						
3379500	Little Wabash	N						
3381495	Little Wabash	N						

* Negative trend.

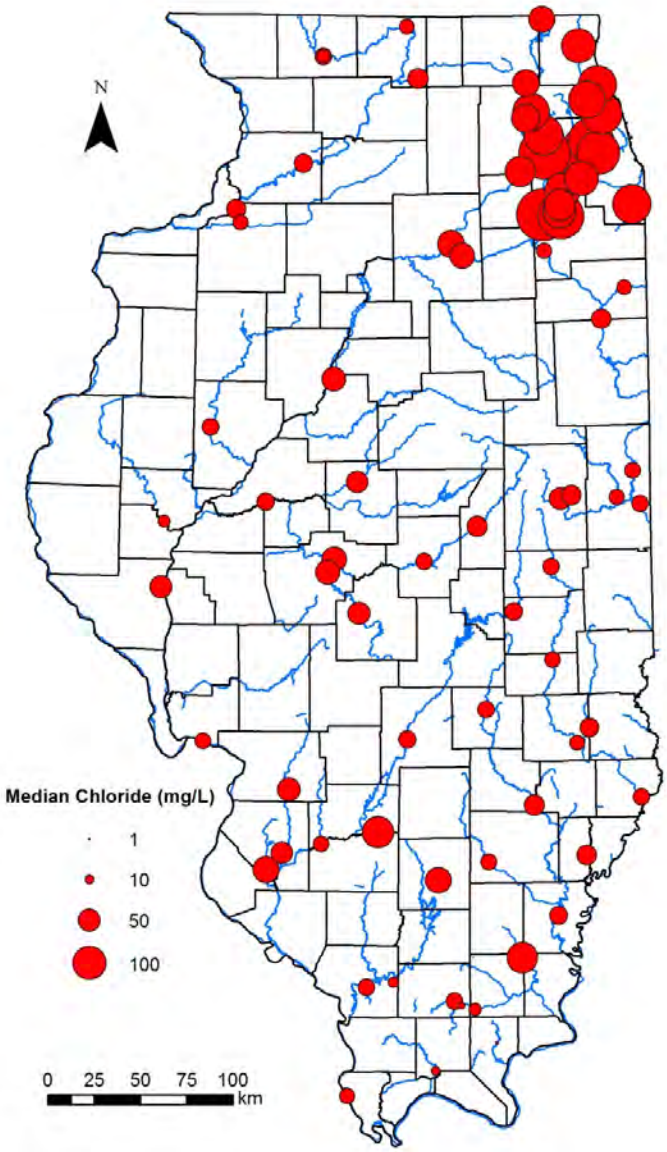

Figure 8. Median Cl^- values in streams and rivers of Illinois for the Water Years 1991-1992 for USGS monitoring stations

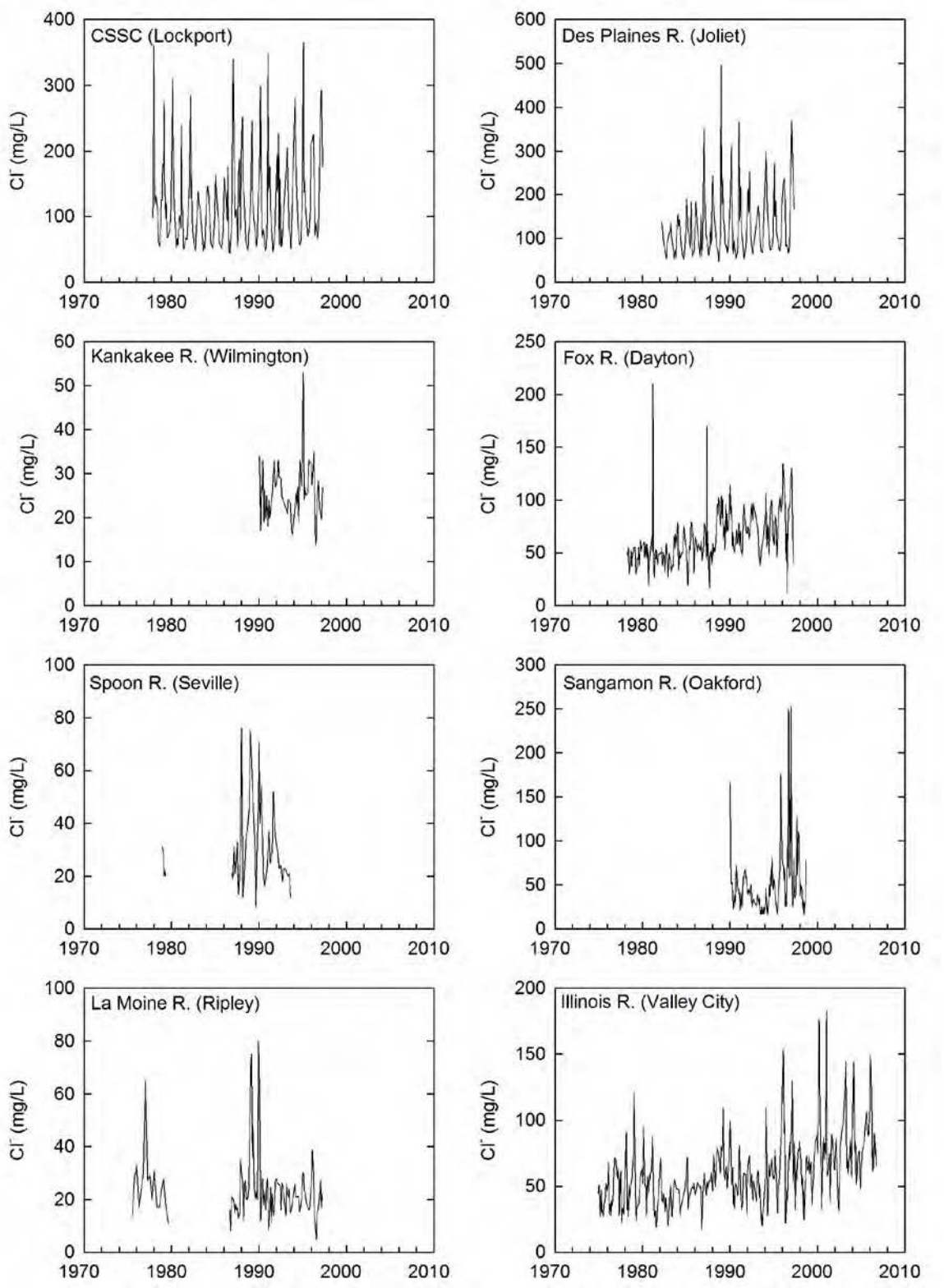

Figure 9. Chloride concentrations at selected USGS monitoring stations in Illinois

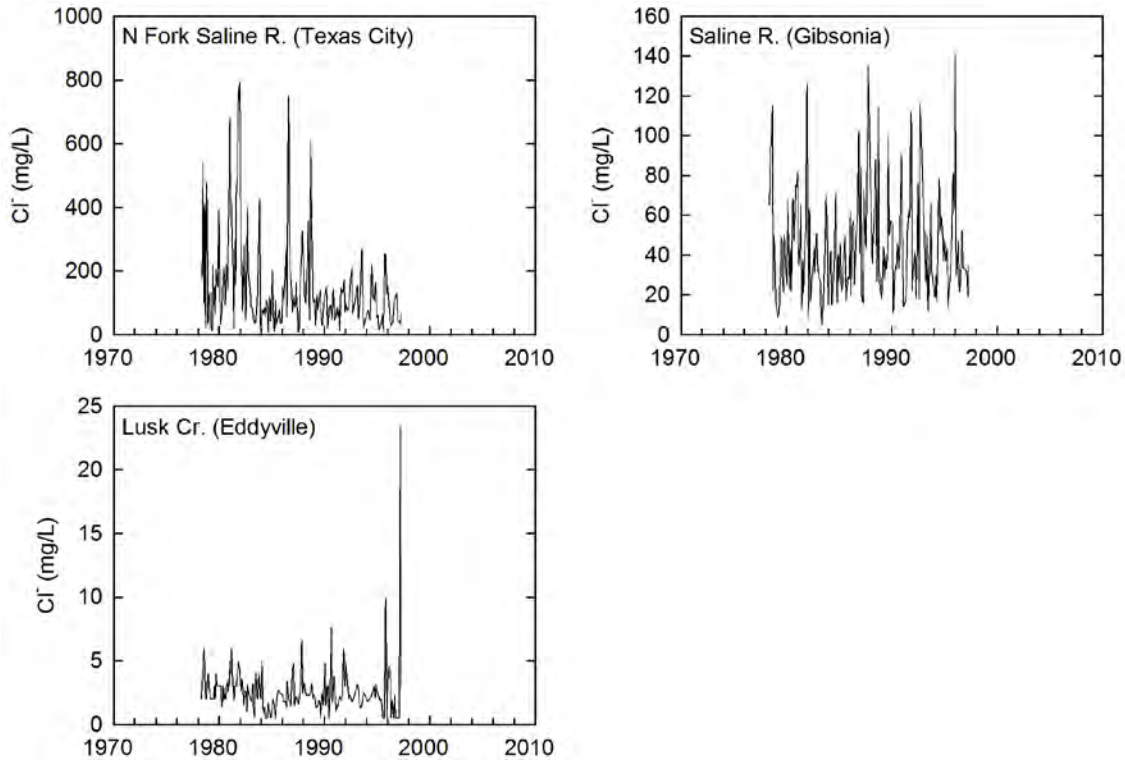

Figure 9. Continued

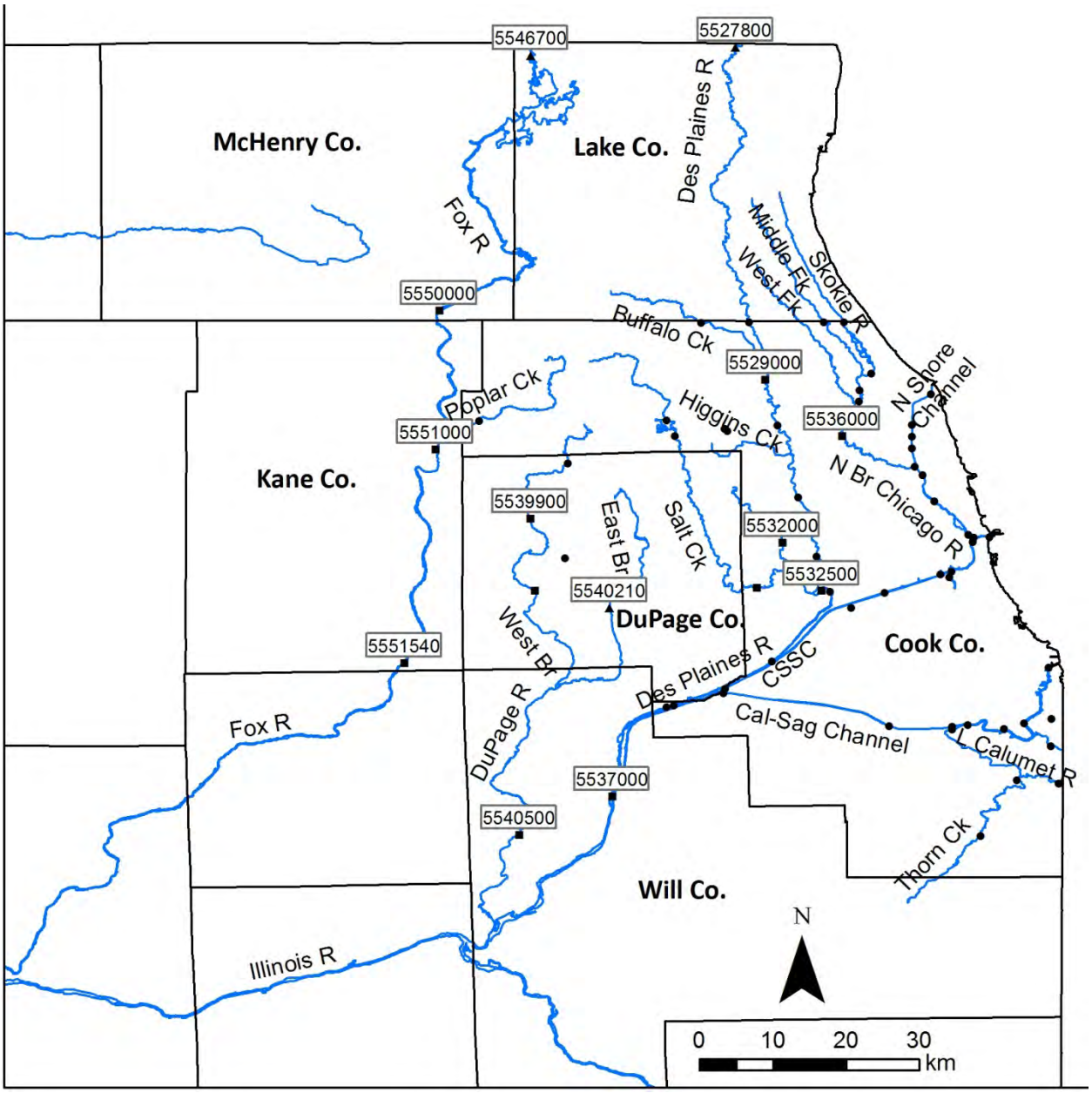

Figure 10. MWRDGC and USGS surface water monitoring stations evaluated in this study. Seven-digit numbers are USGS stations.

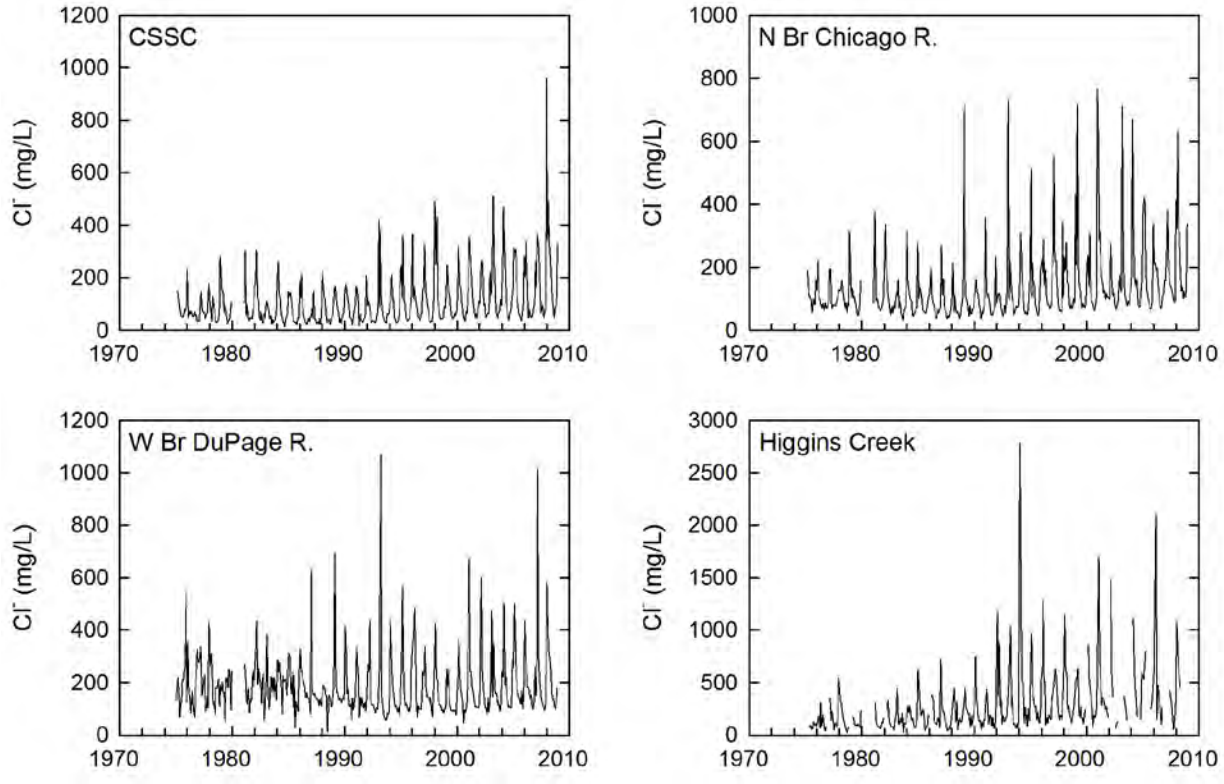

Figure 11. Chloride concentrations at selected MWRDGC monitoring stations in the Chicago region

There are clear seasonal differences in Cl^- concentrations for rivers where concentrations are increasing, with highest values between January and March (Figure 12). At 97 percent of the MWRDGC stations, the largest Cl^- concentrations were in the winter (January–March). At 83 percent of these stations, the winter concentrations were significantly greater (determined by ANOVA on ranks) than each of the other three seasons, and for 16 percent of these stations, concentrations were significantly greater than two of the other seasons. The spring months (April–June) generally had the second highest concentrations (88 percent of the stations), and for 53 percent of these stations spring concentrations were significantly greater than fall or summer. Concentrations were usually lowest in the summer (88 percent of stations). This seasonality is obviously due to road salt runoff. In snowy winters, large applications of NaCl produce Cl^- concentrations and loads in streams and rivers considerably higher than in winters with low snowfalls (Figure 13). It should be noted that during the months when Cl^- concentrations are lowest in the Chicago region (July–October), concentrations still are typically greater than 100 mg/L.

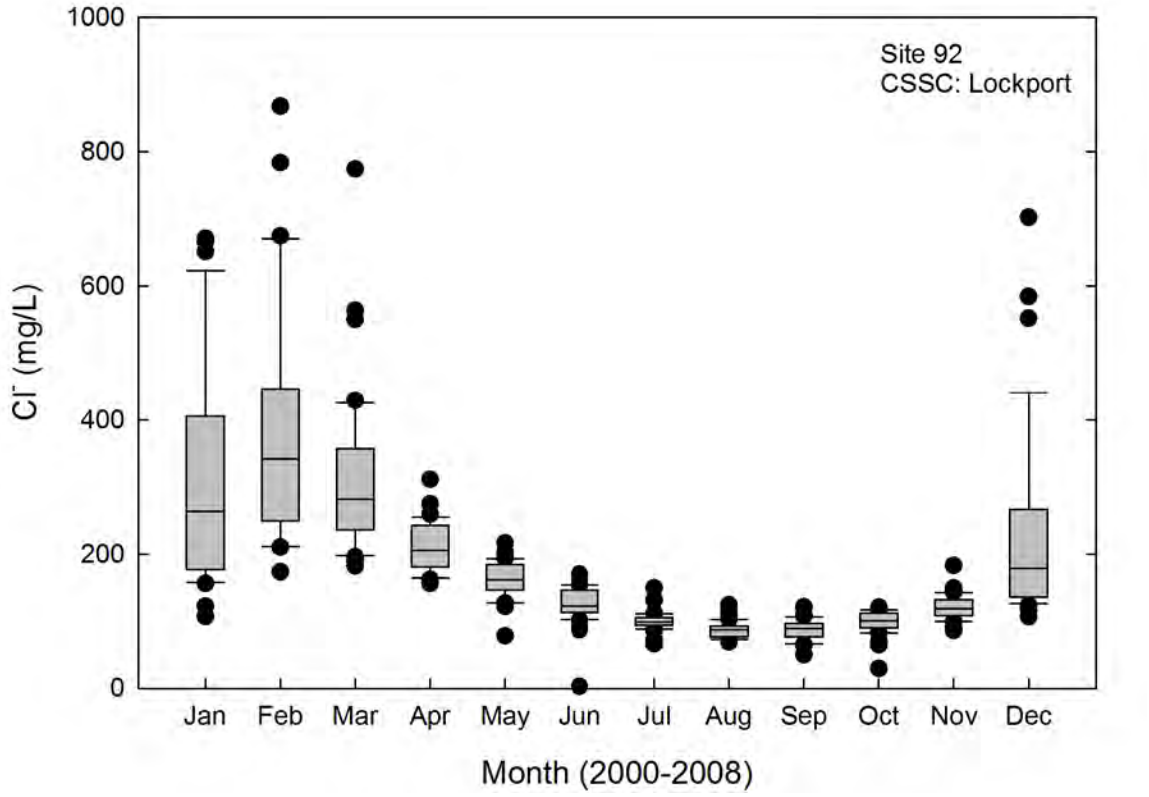

Figure 12. Chloride concentrations by month for MWRDGC station 92 (CSSC at Lockport) between 2000 and 2008. The site was sampled weekly.

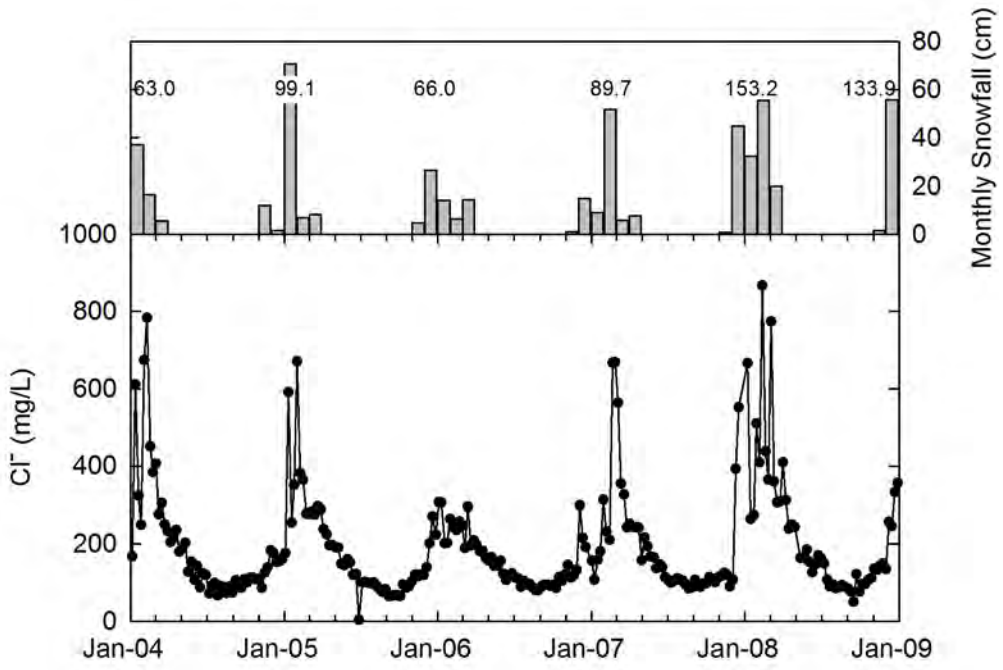

Figure 13. Chloride concentrations at MWRDGC station 92 on the CSSC at Lockport, IL, and monthly snowfall totals in Chicago (winter totals shown above bar). Snowfall data from NOAA, 2010.

Increasing trends in Cl^- concentrations are observed in all seasons at the MWRDGC stations, with the rates of increase following the same seasonal pattern as the concentration data, i.e., greatest increases in the winter and smallest in the summer (Figure 14 and Table 5). This is additional evidence that increases in Cl^- concentrations are the result of road salt runoff.

Rivers outside the Chicago region tended to have different seasonal patterns. Chloride concentrations in the Fox River were significantly lower between April and June than for both autumn and winter samples, and in the Sangamon River, concentrations were significantly lower between April and June than in all other seasons. For both these rivers, the highest Cl^- concentrations were typically measured between October and December. This may be due to leaching of fertilizer, which is typically applied in Illinois in the autumn after harvest. There were no significant seasonal differences for the Kankakee, Spoon, and La Moine Rivers.

Kelly et al. (2010) reported that chloride concentrations were significantly higher when river discharge was low, regardless of season. The USGS data sets showed the influence of discharge on Cl^- concentrations (Figure 15). For every station except CSSC reported by Kelly et al. (2010), Cl^- concentrations at low discharge (bottom 25^{th} percentile) were significantly greater than at high (top 25^{th} percentile) and intermediate (middle 50^{th} percentile) discharges, and concentrations at intermediate discharge were almost always significantly greater than at high discharge. For CSSC, Cl^- concentrations at low discharge were significantly greater than at intermediate discharge.

For the most part, discharge from tributaries to the Illinois River downstream of Chicago dilutes the concentrations of Cl^- and other ions originating from TWW and road salt. Road salt inputs are seasonally variable, with fluxes highest in the winter and early spring; the flux of contaminants from TWW should be less seasonally affected. Thus when the Illinois River discharge is low, there is less dilution of TWW downstream of Chicago. Therefore, Cl^-, which is elevated in TWW, becomes relatively elevated in the river because there is less dilution by downstream tributaries. This relationship can be seen in Figure 16, which shows the fraction of the Cl^- load at Peoria attributable to the load in the CSSC as a function of river discharge at Peoria. When discharge is low, it is not uncommon for more than 60 percent of the Cl^- load at Peoria to be attributable to what is coming out of the CSSC, which is predominantly TWW.

The longest record of data is the Illinois River at Peoria, which indicates that Cl^- concentrations have been steadily increasing since the 1960s (Figure 17). The annual increase since 1960 (from β_1 calculation) is 1.0 mg/L per year (mg/L/yr), and 3.1 mg/L/yr since 1990. Concentrations are highest in the winter and early spring months, and the variability in concentrations during these months has been increasing. The overall temporal increase in Cl^- concentrations is mostly due to increases during January through April; concentrations have increased at rates greater than 4.0 mg/L/yr in all these months since 1990. However, there were positive trends in all months except June, indicating that increases in Cl^- concentrations are due to factors other than just direct road salt runoff. Shallow groundwater in much of the Chicago region has elevated Cl^- due to road salt (Kelly, 2008), and most of this groundwater discharges to tributaries of the Illinois Waterway throughout the year, not just in winter. In addition, the increasing population and concomitant increase in residential acreage and sewage in the Chicago region is likely increasing the Cl^- load to the Illinois Waterway via TWW discharge. The influence of river discharge on Cl^- concentrations can also be seen in Figure 17. Concentrations were relatively low during flood years (e.g., 1972, 1993), and relatively high during droughts (1963–1964, 1977, 1980, 1988–1989).

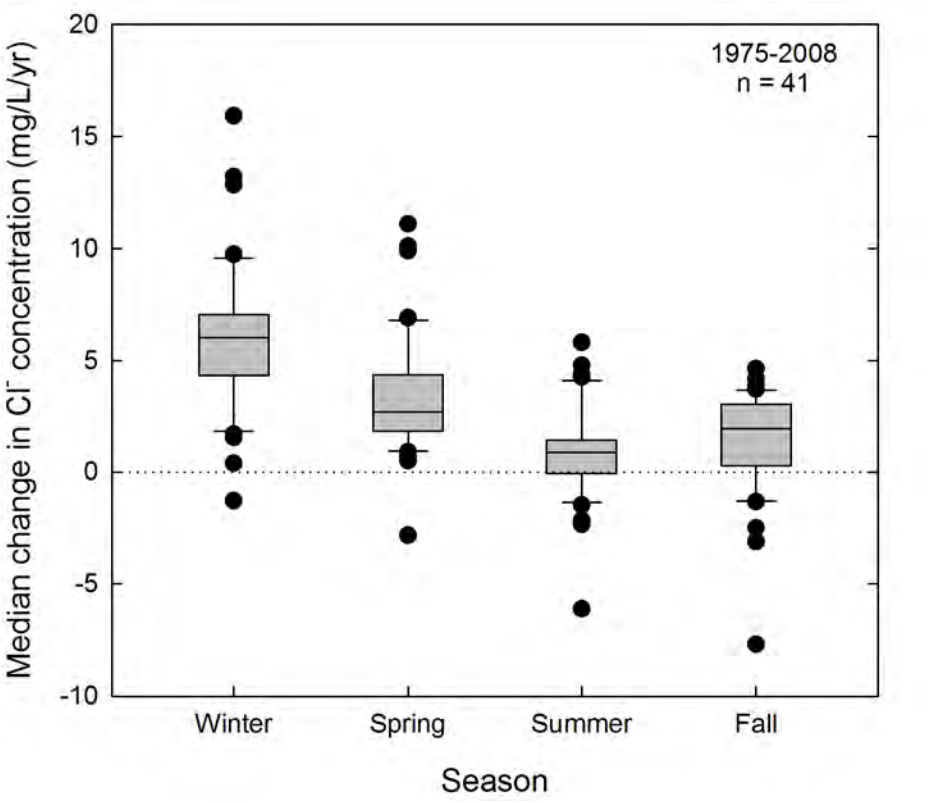

Figure 14. Box and whisker plot of median changes in chloride concentrations for 41 MWRDGC stations monitored between 1975 and 2008, divided by season. Changes calculated from slope statistic ($^{2}_{1}$) for linear regressions. Changes were significantly greater for winter compared to all other seasons, and for spring compared to summer and fall (ANOVA on ranks).

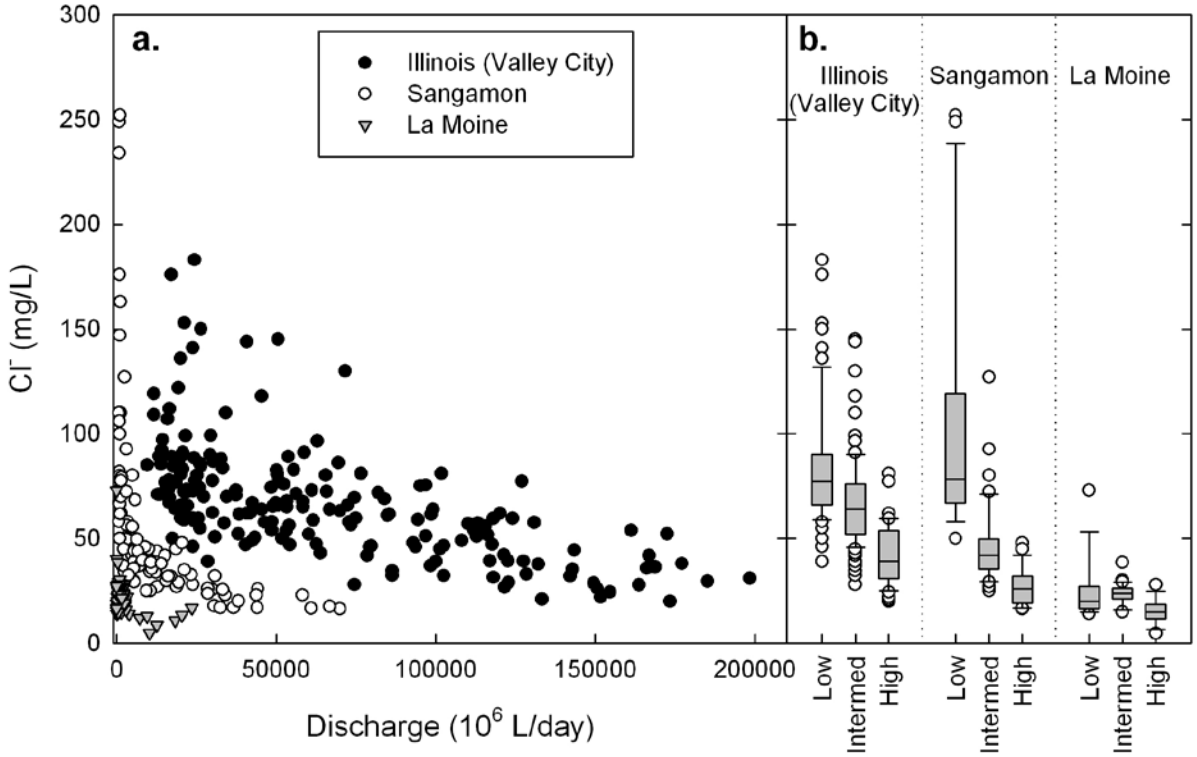

Figure 15. (a) Chloride concentration as a function of discharge for the Illinois River (Valley City), Sangamon River (Oakford), and La Moine River (Ripley). (b) Box plots showing same data as a function of river discharge category; circles are all outliers (< 10%, > 90%). Figure from Kelly et al. (2010), data from USGS (2008).

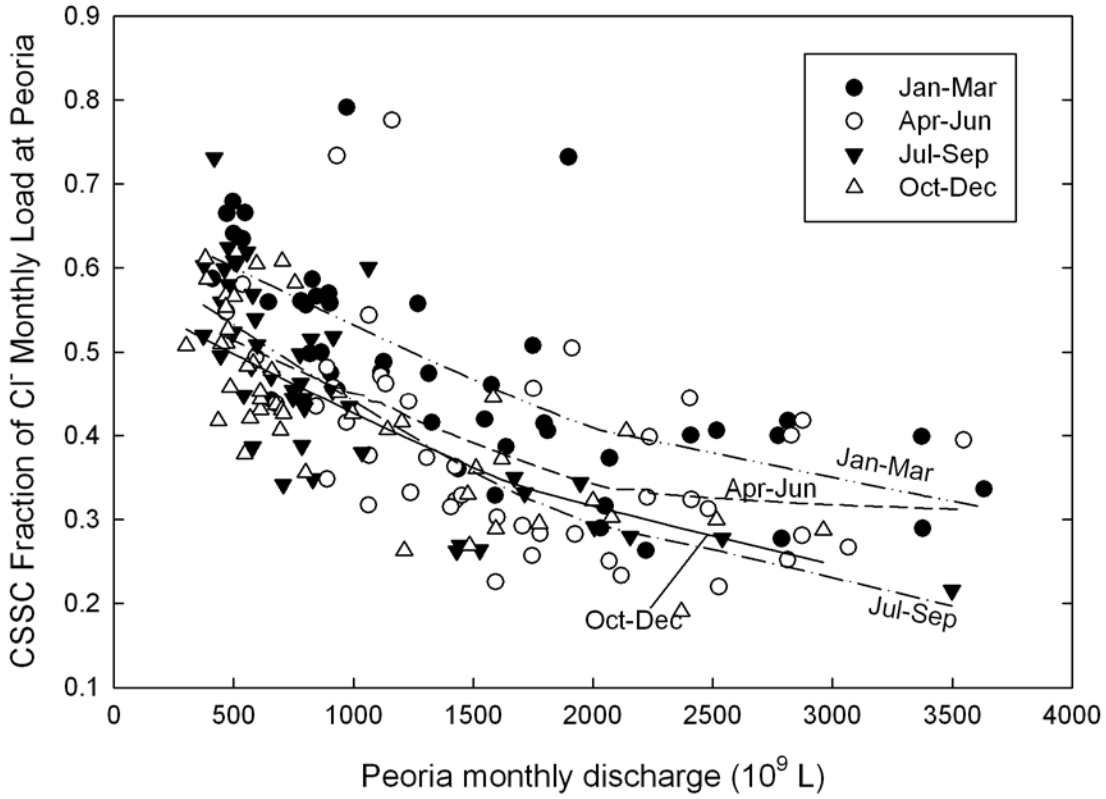

Figure 16. Fractions of the chloride monthly loads in the Illinois River at Peoria that can be attributable to discharge from the CSSC (Romeoville) as a function of monthly discharge at Peoria (1987–2001) Lines are smoothed regressions using LOWESS. Figure from Kelly et al. (2010), data from USGS (2008).

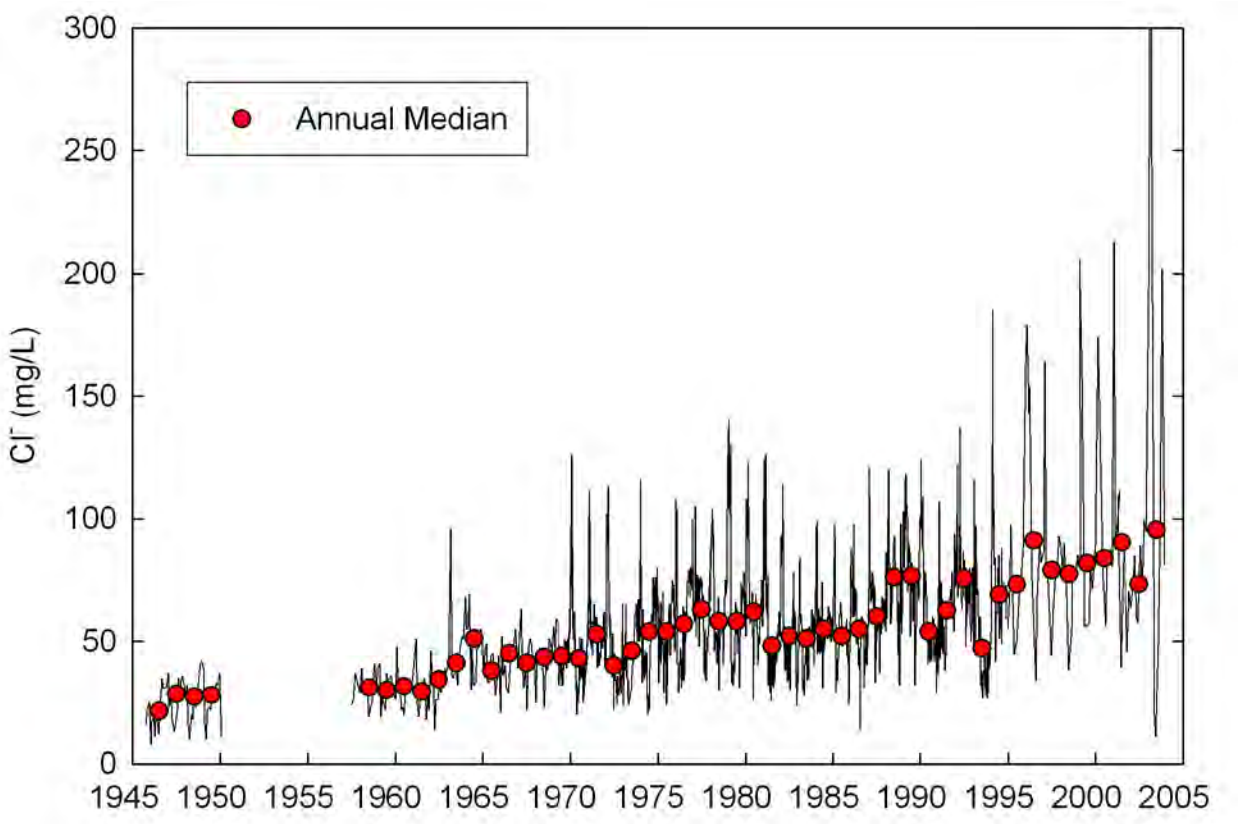

Figure 17. Chloride concentrations in Illinois River at Peoria. Data from ISWS and USGS.

Groundwater

In this report, we use the hydrostratigraphic nomenclature developed by Meyer et al. (2009) to differentiate among aquifers in Illinois. In most of the state, the aquifers closest to the land surface are Quaternary in age. These are composed of unconsolidated sands and gravels deposited by glacial and alluvial processes. Bedrock aquifers in Illinois are all sedimentary rocks (sandstones and carbonates) of Paleozoic age, the youngest being Pennsylvanian and the oldest Cambrian. We divided the bedrock aquifers into three groups (Figure 18), from youngest to oldest: (1) the upper bedrock unit, primarily sandstones of Pennsylvanian and Mississippian age; (2) the Silurian-Devonian carbonate unit, primarily fractured dolomites; and (3) the Cambrian-Ordovician aquifers, which are primarily sandstones. The Cambrian-Ordovician group comprises several aquifers, but because wells are commonly open to more than one of these aquifers, we chose to group them together.

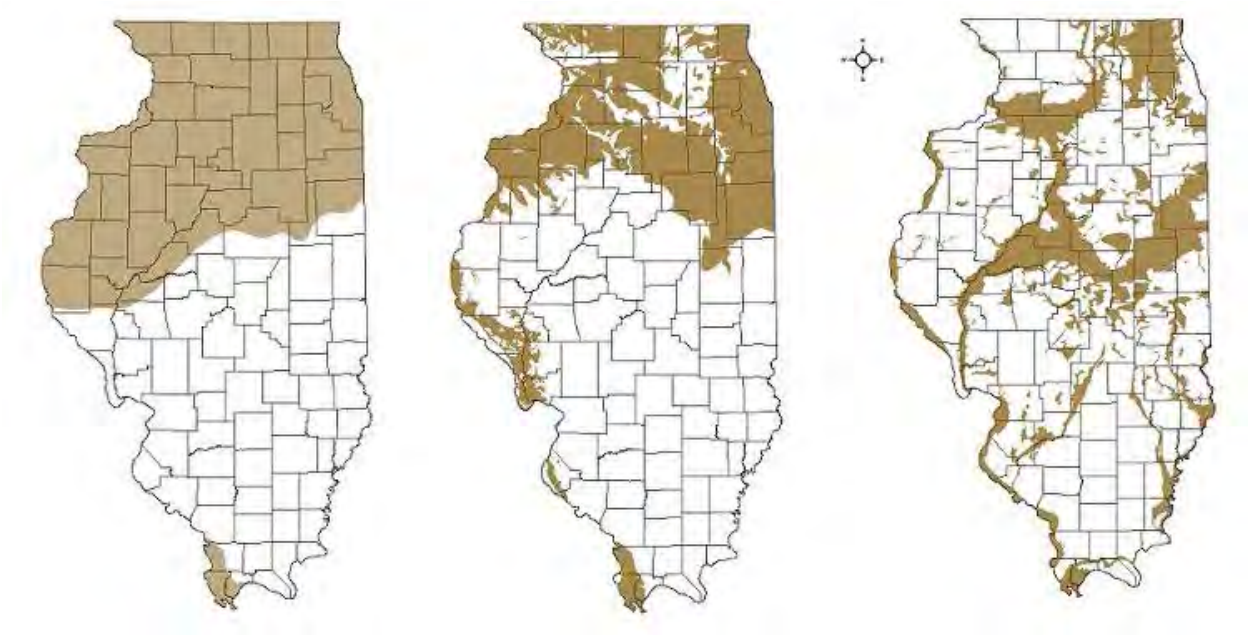

Figure 18. Extents of principal aquifer systems in Illinois (a) Cambrian-Ordovician bedrock; (b) shallow bedrock (Silurian-Pennsylvanian); (c) unconsolidated

Quaternary Aquifers

Sand and gravel Quaternary aquifers are found throughout Illinois (Figure 18c). Alluvial aquifers are found in river valleys; most aquifers in the southern third of Illinois are of this type. Glacial aquifers include buried bedrock valleys filled with sand and gravels and sand and gravel lenses within till deposits. The largest buried bedrock valley aquifer is the Mahomet Aquifer in central Illinois, and other major glacial aquifers are found in the northern half of the state. Chloride concentrations vary greatly in these aquifers (Figure 19).

In the Mahomet Aquifer (Figure 20), chloride concentrations are extremely low in the eastern part of the aquifer, and are < 1 mg/L in parts of Champaign County. Hackley et al. (2010) suggested that recharge from glacial meltwaters recharging the Mahomet aquifer in Champaign County near the end of the Wisconsin Glacial Episode (about 11,500 years BP) leached the fine sediments and sand and gravel of the recharge zone and the aquifer. This resulted in the anomalously low Cl^- concentrations. Near the border between Champaign and Piatt Counties, Cl^- concentrations abruptly increase, due to discharge of brine from Pennsylvanian bedrock. Concentrations then decrease gradually to the west due to dilution. In the western region of the Mahomet aquifer (Piatt, Macon, and DeWitt Counties) where Cl^- concentrations are highest, concentrations along the bedrock valley walls tend to be higher than in the central, thalweg part of the valley. This is likely due to proximity to bedrock discharge along the valley walls and greater dilution in the thalweg. The Mahomet is confined through most of its central and eastern extent, thus surface activities generally do not impact its water quality. In the Sankoty-Mahomet section (Mason and western Tazewell Counties), the Sankoty-Mahomet is unconfined and

surface activities can impact water quality. Elevated Cl^- concentrations in the East Peoria and Pekin regions are probably due to road salt runoff in those urban areas.

Other buried bedrock valley aquifers in Illinois include the Mackinaw and Princeton bedrock valleys northwest of the Mahomet Aquifer. Chloride concentrations are generally low in these aquifers. Burch (2004) reported a median Cl^- concentration of 10.8 mg/L (N = 30) in samples from the Princeton bedrock valley, which included several samples impacted by road salt runoff.

Chloride concentrations in glacial aquifers within till deposits vary greatly. For example, the Glasford Aquifer in central Illinois has Cl^- concentrations ranging from < 1 to about 100 mg/L. Sand and gravel aquifers in northeastern Illinois have been heavily impacted by human activities, with the most obvious sign being increasing Cl^- concentrations. Kelly (2008) showed that Cl^- concentrations in shallow groundwater in the Chicago region have been increasing since the 1960s when road salt began being used in earnest. Over half of the public supply wells finished in sand and gravel aquifers have statistically significant increasing trends in Cl^- concentrations. Widespread sampling of shallow aquifers (< 250 feet deep) in Kane County in 2003 indicated the role of urbanization on shallow groundwater quality (Kelly, 2005). Chloride concentrations were significantly higher in the eastern urban corridor compared with the remainder of the county, which was primarily rural (Figure 21). Figure 21 clearly shows that urban land use increases Cl^- concentrations but rural land uses do not.

Mullaney et al. (2009) reported on Cl^- in unconsolidated glacial aquifers of the U.S. and found that land use significantly affected Cl^- concentrations. Shallow monitoring wells in urban areas had significantly greater Cl^- concentrations (median = 46 mg/L, n = 317) than in agricultural areas (median = 12 mg/L, n = 430), and both were significantly higher than wells in forested areas (median = 2.9 mg/L, n = 50). Their source analysis suggested that Cl^- in urban settings was dominated by deicing and/or water softening salt.

Chloride concentrations in alluvial aquifers in southern Illinois are generally low (< 30 mg/L), with a few exceptions. The Rock River valley in Rockford has higher Cl^- concentrations (generally > 50 mg/L), reflecting greater urbanization and heavier amounts of snow and thus road salt runoff. Chloride concentrations also are higher in the American Bottoms area across the Mississippi River from St. Louis, again reflecting the large degree of urbanization. In areas where there are no aquifers, primarily the southern half of Illinois, large-diameter dug and bored wells are used. These wells are vulnerable to surface contamination. Chloride concentrations in these areas vary widely, probably reflecting the local land use activities that impact the wells.

An important control on Cl^- concentrations in Quaternary aquifers is depth. In general, the shallower the aquifer, the more vulnerable it is to surface-derived contamination. Figure 22 shows Cl^- concentrations for wells 50 feet or less. In contrast, Figure 23 shows Cl^- concentrations for wells greater than 250 feet. Figure 24 shows a box-and-whisker diagram of Cl^- concentrations as a function of depth. Results from ANOVA testing indicated that Cl^- concentrations in each depth range were significantly greater than all deeper groups.

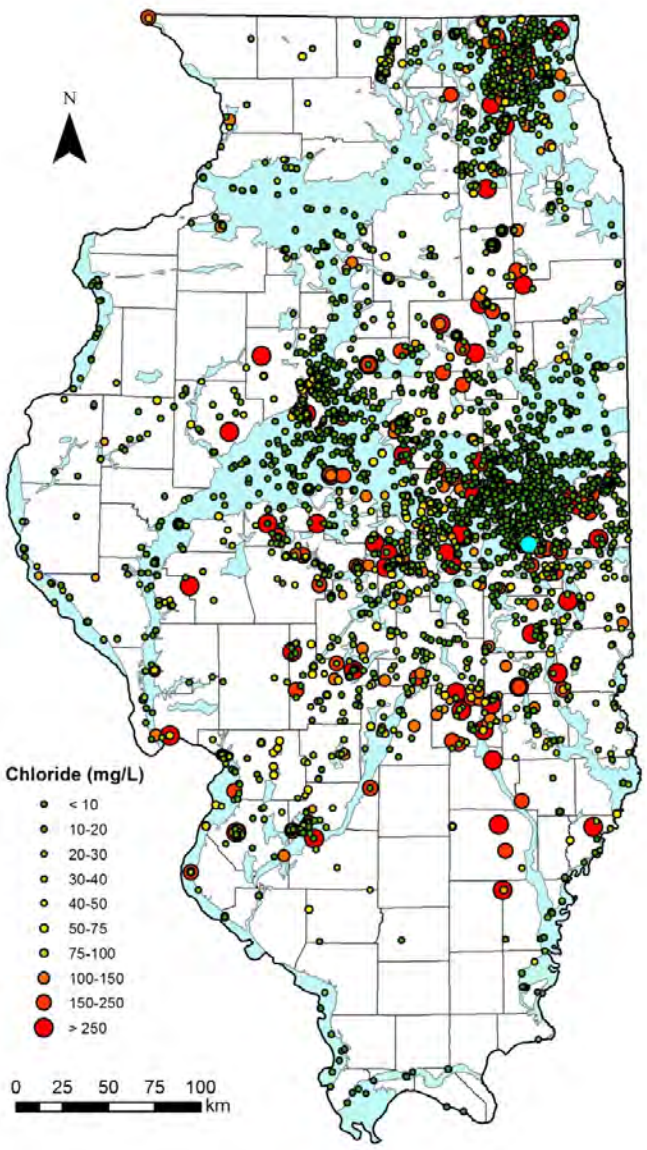

Figure 19. Chloride concentrations in wells open to Quaternary sand-and-gravel aquifers. Locations of significant Quaternary sand-and-gravel aquifers indicated by light blue.

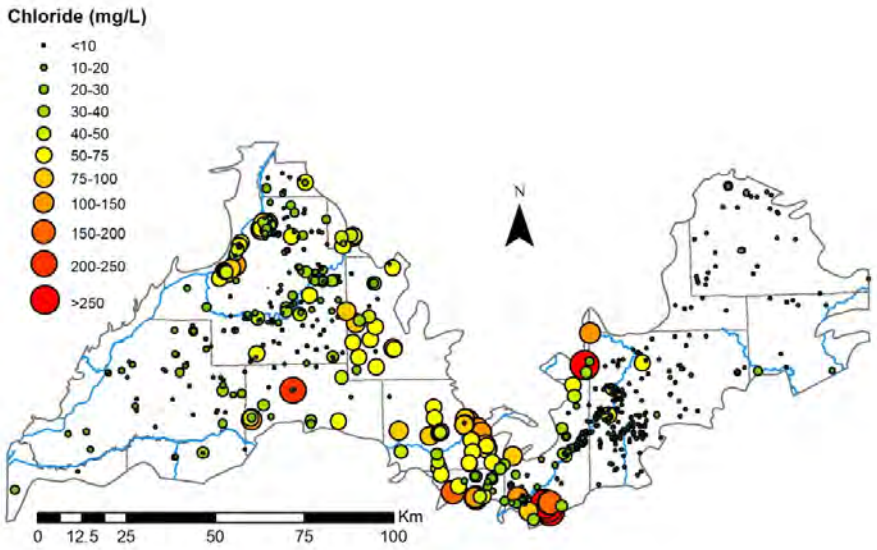

Figure 20. Chloride concentrations in the Mahomet Aquifer

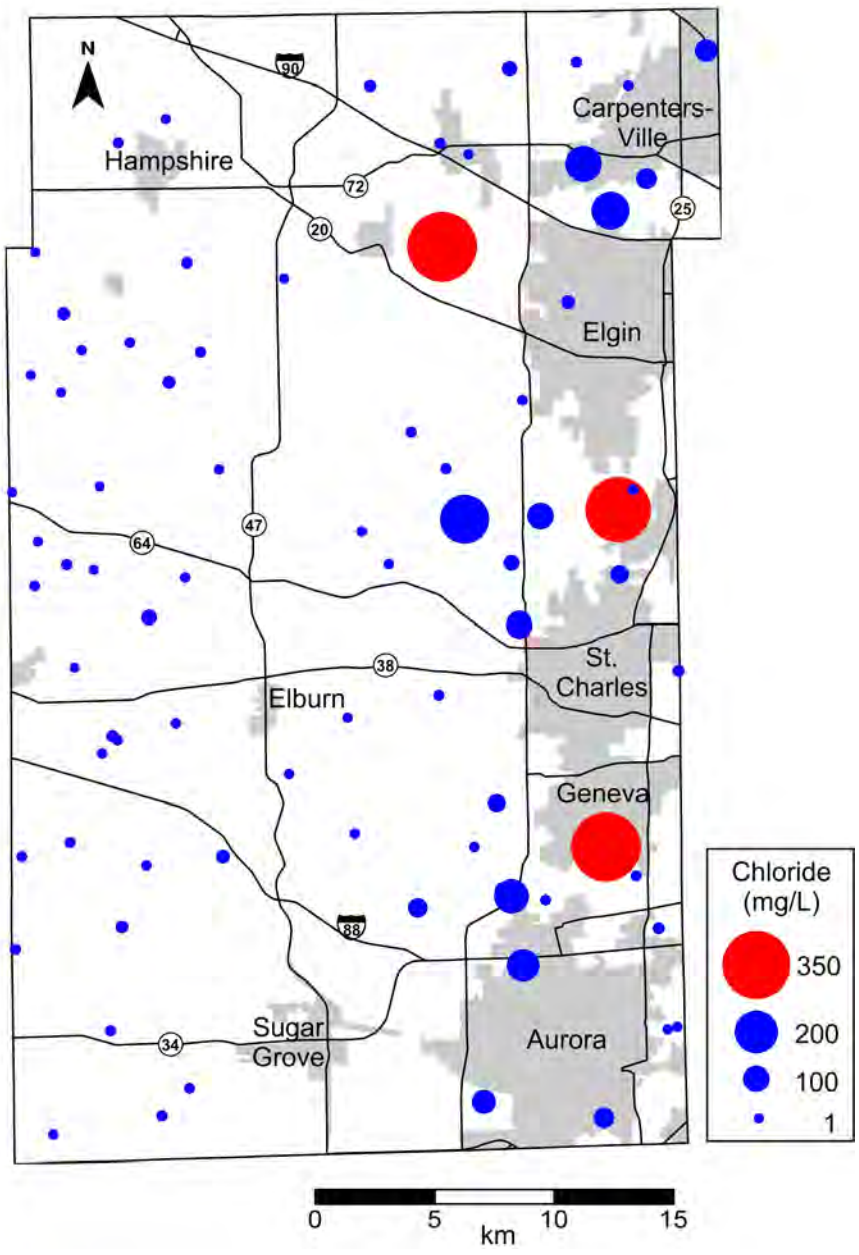

Figure 21. Chloride concentrations in samples collected from shallow wells (< 250 feet) in Kane County in 2003. Size of circle represents Cl^- concentration, with red circles indicating values > 250 mg/L. Gray areas represent municipalities. Major roads shown. Figure from Kelly, 2005.

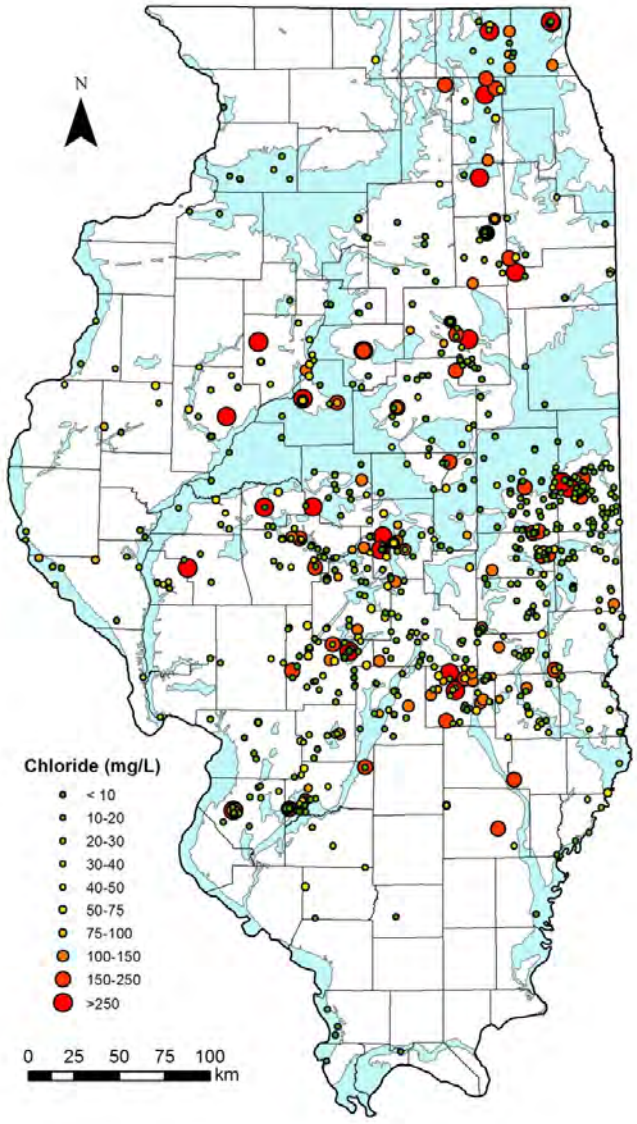

Figure 22. Chloride concentrations in wells 50 feet deep or less open to Quaternary sand-and-gravel aquifers. Locations of significant Quaternary sand-and-gravel aquifers indicated by light blue.

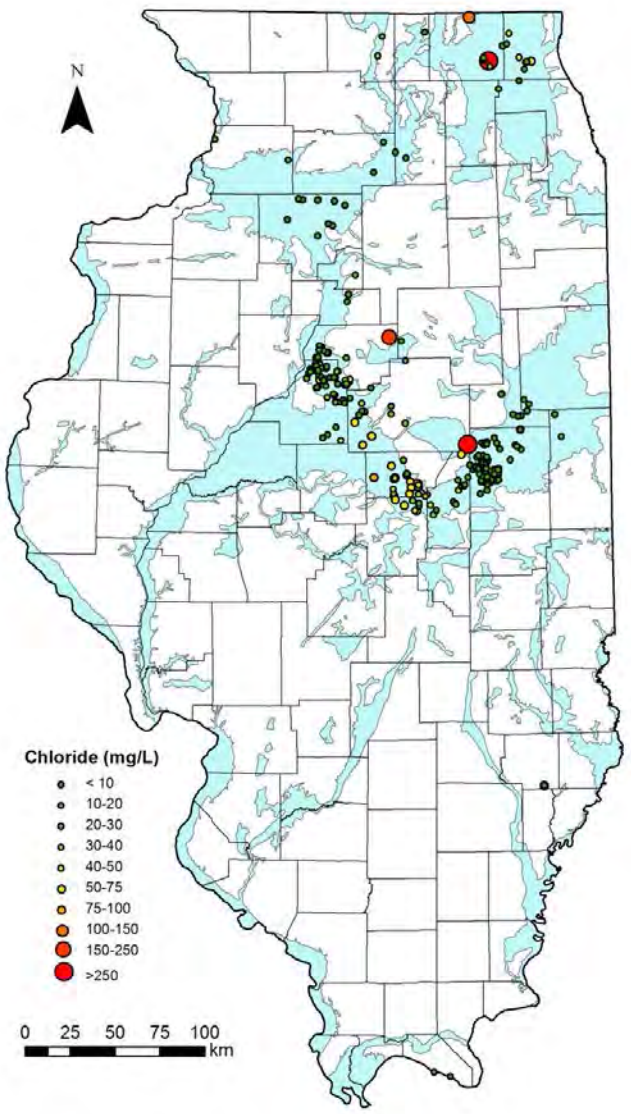

Figure 23. Chloride concentrations in wells equal to or greater than 250 feet open to Quaternary sand-and-gravel aquifers. Locations of significant Quaternary sand-and-gravel aquifers indicated by light blue.

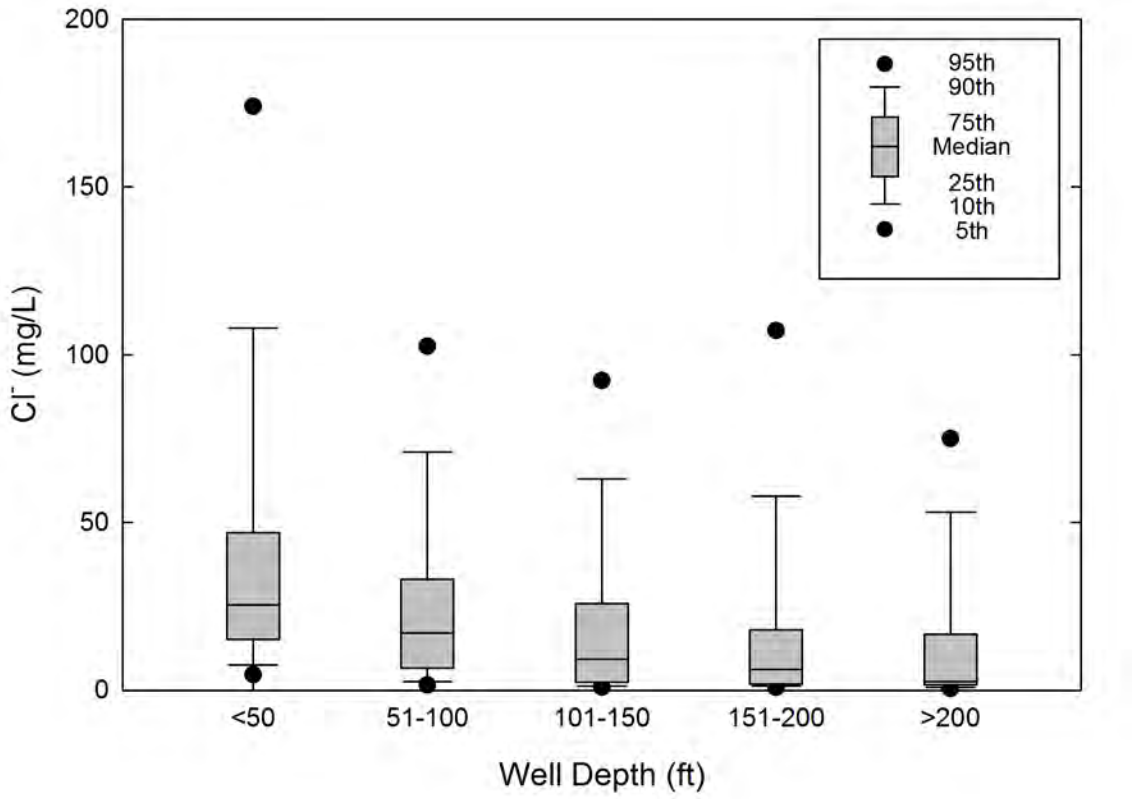

Figure 24. Box-and-whisker diagram for Cl^- concentrations in Quaternary aquifers in Illinois as a function of well depth. Concentrations are significantly greater for each depth group compared to all deeper groups.

Bedrock Aquifers

Bedrock aquifers in Illinois are found in the northern third of the state and along the Mississippi River (Figure 18). Aquifers in the upper bedrock unit are used in the southern two-thirds of Illinois. Chloride concentrations vary widely (Figures 25 and 26), and primarily appear to be a function of depth, i.e., the deeper the well, the higher the concentration (Figure 27). Very high concentrations are likely primarily due to natural sources, i.e., recharge from brines; Pennsylvanian formations are the primary oil producing units in Illinois. Some of these wells may also be exhibiting contamination from leaky brine holding ponds commonly associated with oil drilling activities (Hensel and McKenna, 1989). In the sinkhole plain of southwestern Illinois (Monroe, Randolph, and St. Clair Counties), Mississippian limestones exhibit karst features (sinkholes, caves). These aquifers are extremely vulnerable to surface contamination, but Cl^- is not an important contaminant in this primarily rural region.

Devonian and Silurian Age aquifers are important aquifers in Illinois, heavily used in northeastern and northwestern Illinois (Figure 26). They are primarily of carbonate lithology, the most productive being fractured dolomites. The heaviest use of these aquifers is in the Chicago

region, in DuPage, northern Will, southern and western Cook, and western Lake Counties. These bedrock units dip towards the south, and Cl^- concentrations are significantly greater in areas where the Devonian-Silurian aquifers are deeper (Figures 26 and 27). In northeastern Illinois, the tops of the bedrock aquifers are often in contact with sand and gravel glacial units. Wells are often screened in this interval due to its large hydraulic conductivity. These Silurian bedrock aquifers also show the increasing trend in Cl^- concentrations seen in the sand and gravel aquifers due to road salt runoff (Kelly, 2008). More than half of public supply wells finished in these aquifers tested by Kelly (2008) have statistically significant increasing trends in Cl^- concentrations.

The oldest aquifers in Illinois are found in the northern third of the state and are Cambrian and Ordovician aged. These aquifers are primarily sandstones and are heavily used in the northern part of Illinois, especially centered around Joliet and Aurora south and west of Chicago, respectively. In general, the salinity of water in the Cambrian-Ordovician aquifers is lowest in north-central and northwestern Illinois where the Ancell Aquifer outcrops at the surface and recharge is occurring (Figure 28). Salinity generally increases to the east and south in the direction of flow and stratigraphic dip. Below a latitude of about 40° the water in these aquifers is unpotable due to high TDS levels. Chloride concentrations tend to increase with well depth (Figure 29).

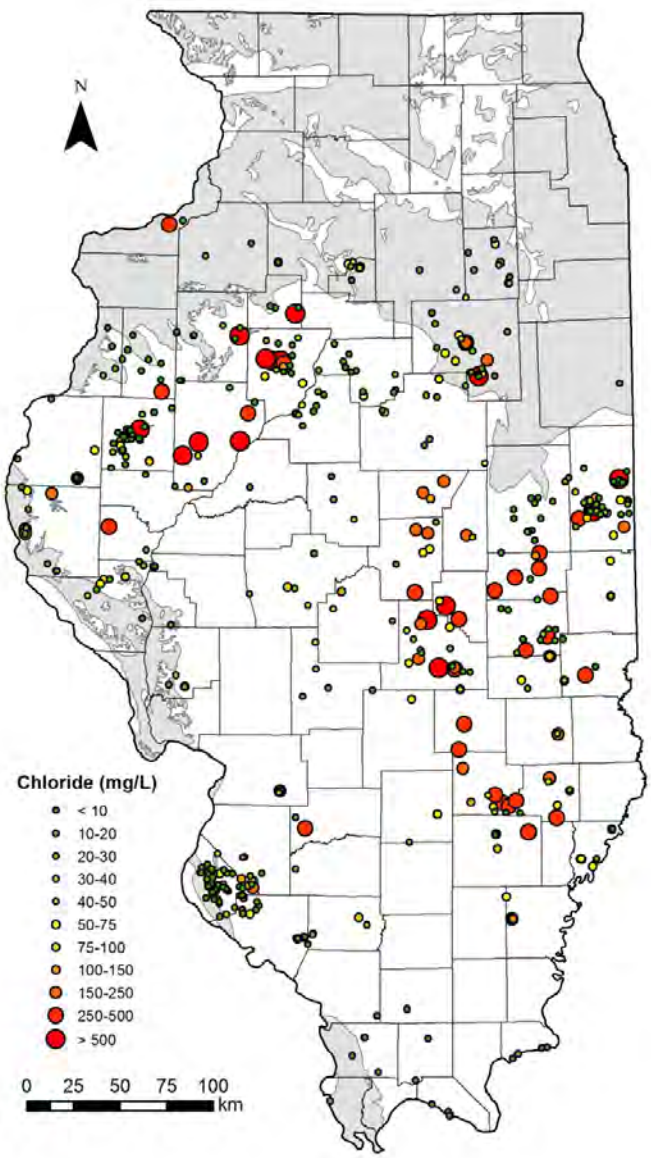

Figure 25. Chloride concentrations in wells open to upper bedrock aquifers (Pennsylvanian-Mississippian). Extent of Silurian-Pennsylvanian aquifers indicated by gray.

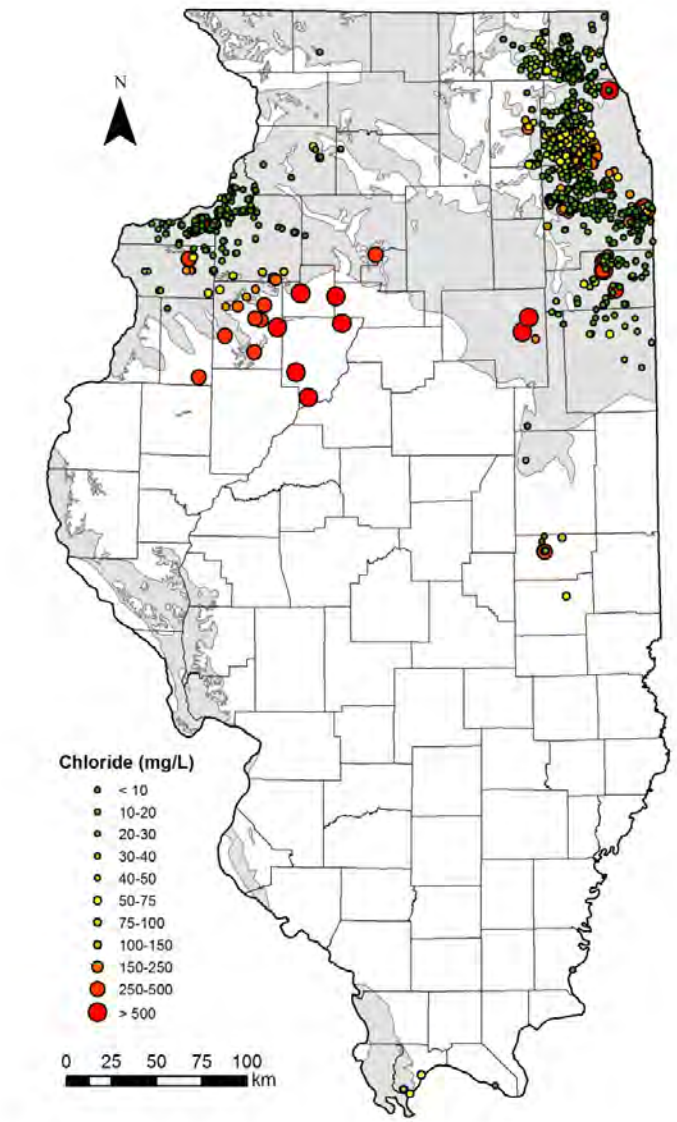

Figure 26. Chloride concentrations in wells open to Devonian-Silurian bedrock aquifers. Extent of Silurian-Pennsylvanian aquifers indicated by gray.

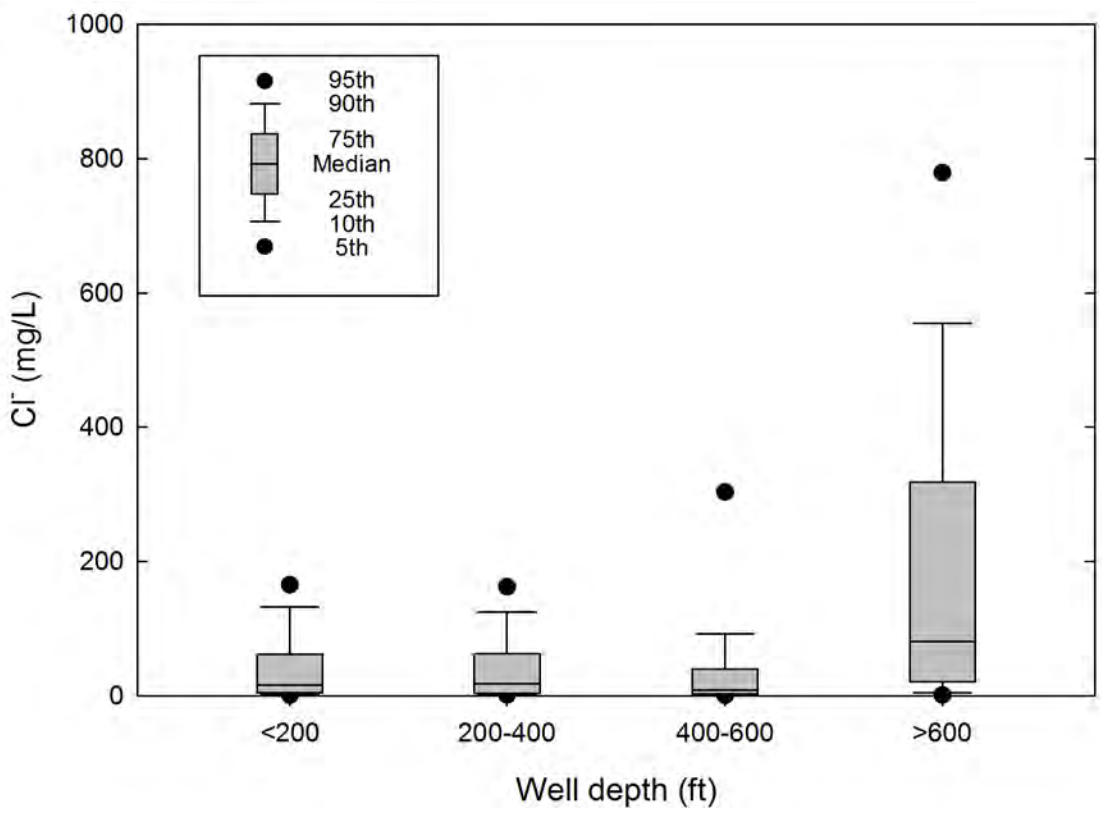

Figure 27. Chloride concentrations as a function of depth for wells completed in Silurian-Devonian bedrock aquifers. The deepest group has significantly greater concentrations than all three shallower groups (ANOVA on ranks).

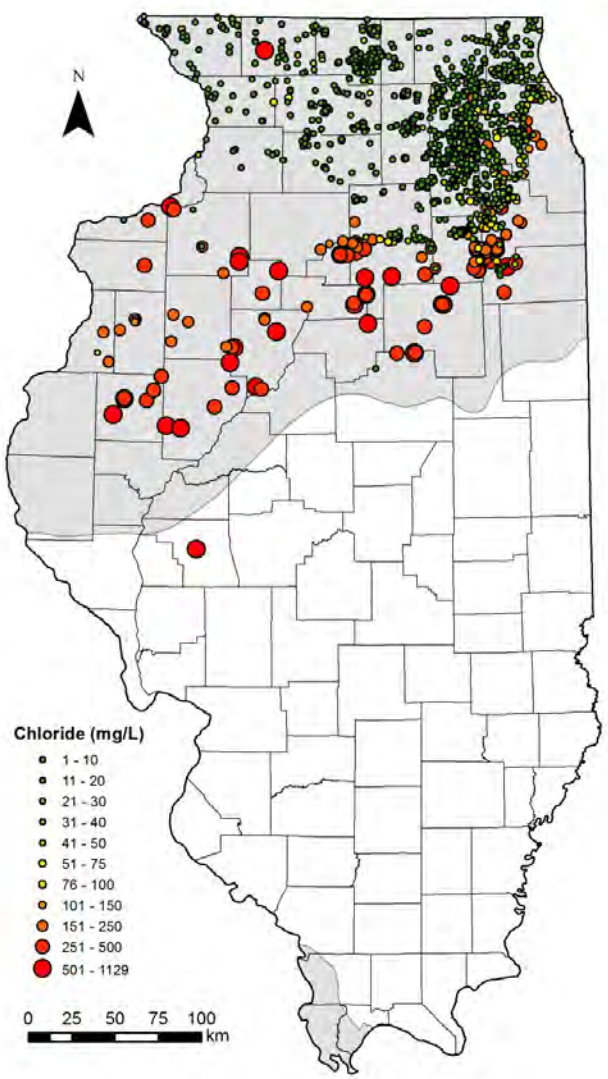

Figure 28. Chloride concentrations in wells open to Cambrian-Ordovician aquifers. Extent of Cambrian-Ordovician aquifers indicated by gray.

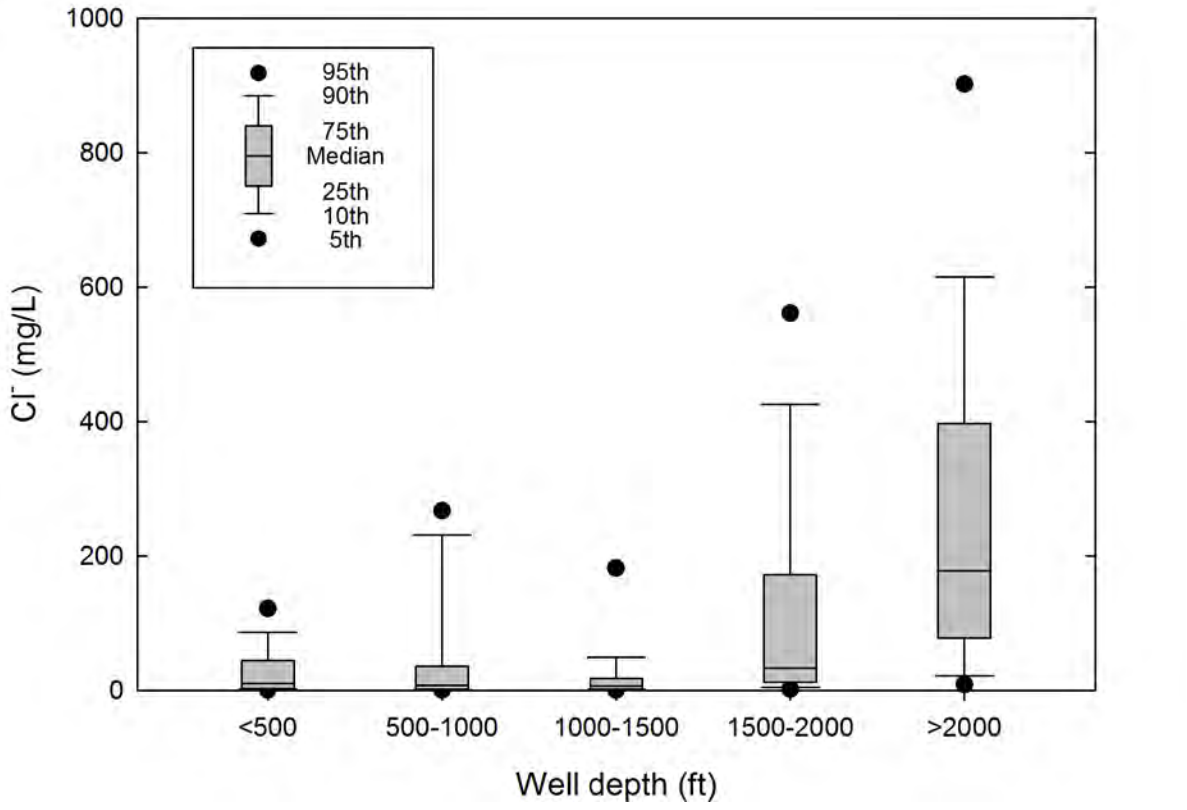

Figure 29. Chloride concentrations as a function of depth for wells completed in Cambrian-Ordovician bedrock aquifers. The two deepest groups have significantly greater concentrations than all three shallower groups (ANOVA on ranks).

Saline Springs

Panno et al. (2010) reported that there are about 30 saline springs throughout the Illinois Basin (most of which are in Illinois) that are coincident with geologic structures within and at the margins of the basin (Figure 2). Saline springs in Illinois have been identified by others (i.e., Bartow et al., 1909; Willman and Payne 1941; Panno et al., 1994, 2006, 2011). Discharge of saline groundwater may be found along the LaSalle Anticlinorium in the form of shallow wells, salt marshes, and springs at Starved Rock, Matheson, and Kickapoo Creek State Parks, and as bedrock seeps into the Mahomet aquifer in east central Illinois (Panno et al., 1994, 2006). Similar saline springs are found in southern Illinois along the Rough Creek-Shawneetown Fault Zone near Equality, and many of these sites are historic in that they were used by Native Americans and early settlers as a source of salt for meat preservation and other uses (Panno et al., 2006, 2010). Chloride concentrations in these springs can range from several hundred to greater than 30,000 mg/L in the case of the Vermilion Salines in Kickapoo Creek State Park (Panno et al., ISGS, unpublished data). The sources of these saline springs range from Cambrian- to Pennsylvanian-age formations (Panno et al., 2010).

Trend Analysis

Shallow aquifers in northeastern Illinois have been heavily impacted by human activities, with the most obvious sign being increasing Cl^- concentrations. Kelly (2008) showed that Cl^- concentrations in shallow groundwater in the Chicago region have been increasing since the 1960s. Over half of the shallow (< 200 ft; 60 m) public supply wells evaluated (N = 239) had statistically significant increasing trends in Cl^- concentrations, and there did not appear to be a leveling off of trends for the most recent samples (1990–2005).

Chloride concentrations have been increasing in shallow aquifers since the 1950s–1960s (Figure 30). The median Cl^- concentration steadily increased from 6 mg/L prior to 1950 to nearly 20 mg/L in samples from 1990 to 2005, and each time period had significantly greater concentrations than the previous time period except for the 1990–2005 group compared to the 1980s. The spread in concentrations has also been increasing, indicating spatial variability in sources of Cl^- contamination. Chloride had greater concentrations in the shallower (< 100 ft) wells than the deeper (100–200 ft) ones for all date groupings (Figure 31). These differences were statistically significant at most time periods for Cl^-. Concentration trends were generally the same for both the shallower and deeper wells. There were increasing trends for Cl^- concentrations for both shallower and deeper wells, with the median concentration increasing from 8 to 36 mg/L in the shallower wells and from 5 to 17 mg/L in the deeper wells from prior to 1950s–1960s to 1990–2005.

For individual counties, the greatest temporal changes for Cl^- were generally found in the western counties, DuPage, Kane, McHenry, and, to a lesser extent, Will County to the south (Figure 31) (Kelly, 2008). In DuPage County, the median values of all major ions tended to increase, especially Cl^-, which increased from 4 mg/L prior to 1950 to 101 mg/L in the 1990s and later, an increase of more than 2500 percent. Chloride in Cook County was highest in the 1990–2005 data group, but there was little change in the previous groups. No significant change occurred in Cl^- concentrations in Lake County during the entire time span.

Kelly (2008) reported there were significant temporal increases in Cl^- concentrations for the majority of the municipal wells tested (55 percent), and significant positive slope values were calculated for 57 percent of the wells (Figure 32). Chloride trends varied spatially; Lake and Cook Counties had relatively low percentages of wells with increasing Cl^- trends (39 to 45 percent) and slope values, while DuPage, Kane, and McHenry Counties had much higher percentages of wells with positive trends (55 to 71 percent) and slope values. Almost half (112 of 239) of the individual public supply wells tested had at least one sample collected between 1990 and 2005. The same trends for Cl^- were observed for the wells with the most recent data compared to the entire group of wells, suggesting that there has not been a leveling off in Cl^- concentrations in the 1990s or later (Kelly, 2008).

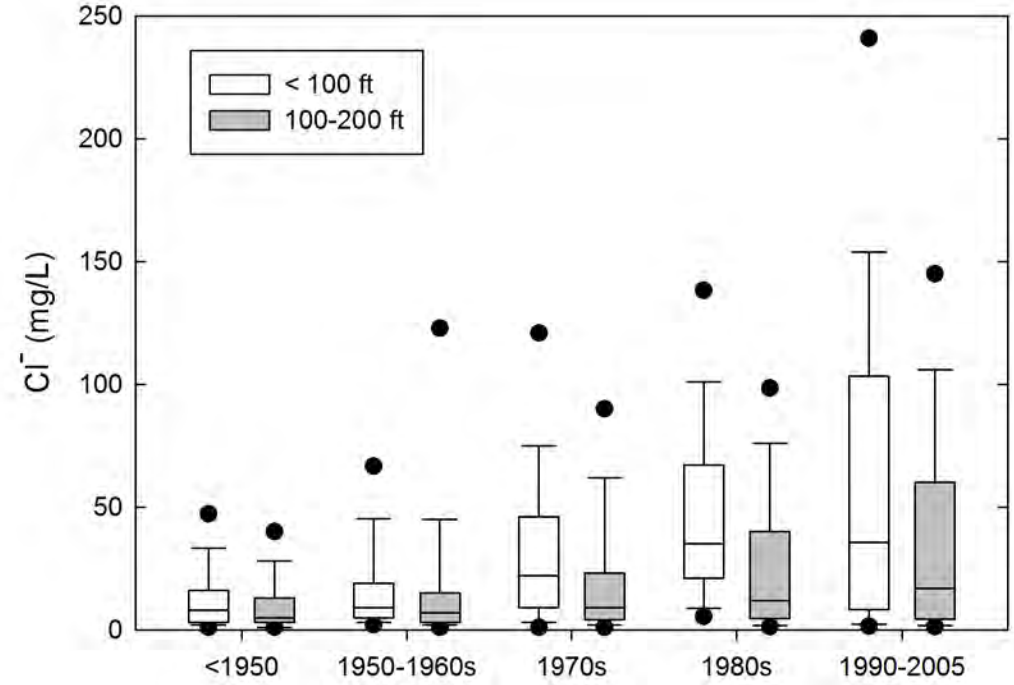

Figure 30. Box plots of Cl^- concentrations in shallow aquifers in the Chicago region. Circles show 5th and 95th percentile data. Figure from Kelly (2008).

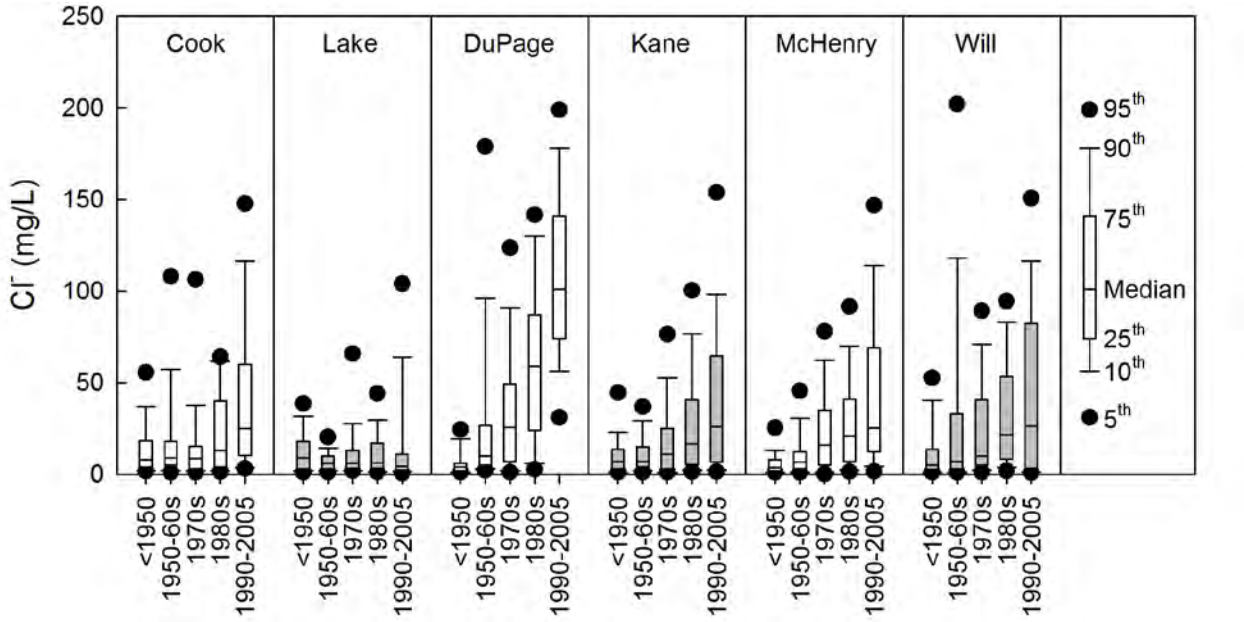

Figure 31. Box plots of Cl^- concentrations in shallow aquifers in the Chicago region by county. Figure from Kelly, 2008.

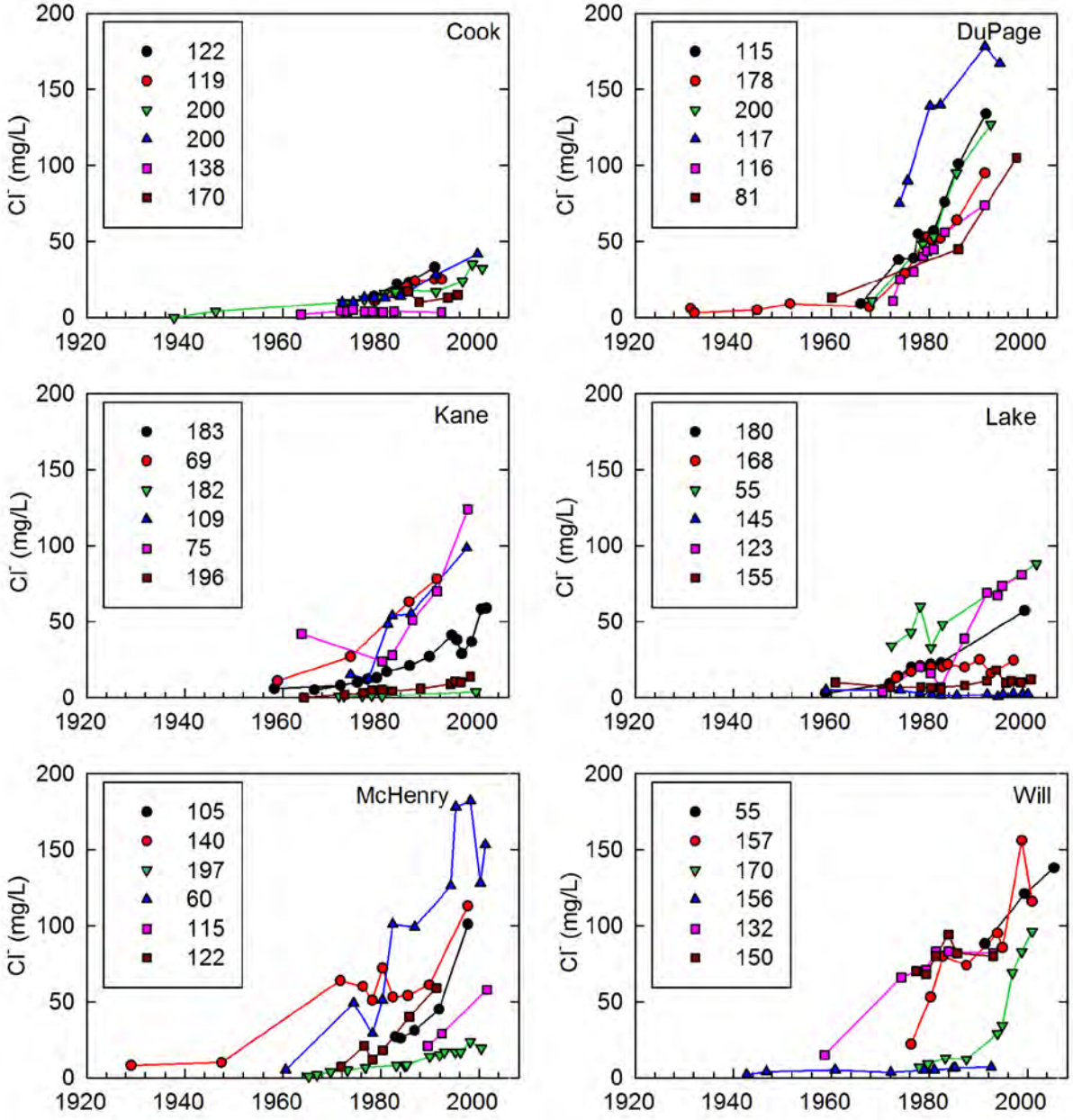

Figure 32. Chloride concentrations as a function of time for selected public supply wells in the Chicago region. Well depths (feet) in legends. Figure from Kelly, 2008.

Wetlands

Wetlands are defined as lands that transition between terrestrial and aquatic systems where the water table is usually at or near the surface or the land is covered by shallow water (U.S. Fish and Wildlife, 2011). Wetland substrates can be either predominantly undrained hydric soils or nonsoils that are saturated or covered by shallow water at some time during the growing season. Wetland types found in Illinois include marshes, swamps, bogs, and fens (USEPA, 2011b). Water quality in wetlands should generally reflect their source water, whether it is shallow groundwater or surface runoff, but land use activities adjacent to wetlands can strongly influence concentrations of Cl^- and other aqueous species within the wetlands.

There have been few published studies that include water quality data, and specifically Cl^-, for wetlands in Illinois. There are some published data for fens and bogs in northeastern Illinois. Fens are essentially springs that receive a very hard Ca-HCO_3-type groundwater, while bogs receive surface water from more dilute runoff. Both types of wetlands are common in northeastern Illinois. Fens at Sterne's Woods State Natural Area near Crystal Lake and South Elgin Fen near South Elgin were found to be contaminated with road salt and septic effluent (Panno et al., 1999, 2006). One part of a fen at Sterne's Woods that was reported to be in near pristine condition had Cl^- concentrations between 8.8 and 44 mg/L. Two other fens affected by septic effluent and road salt had Cl^- concentrations as high as 339 mg/L and 283 mg/L, respectively. Septic effluent and road salt discharged into South Elgin Fen increased the Cl^- concentration to 116 mg/L (Panno et al., 2005). In cases where septic effluent discharged into fens, the diverse fen-wetland vegetation was replaced by a more salt-tolerant monoculture of cattails (*Typhaangustifolia*). Panno et al. (1999) reported that fen vegetation diversity was profoundly reduced when Cl^- concentrations exceeded 45 mg/L. Road salt runoff has reduced plant diversity in wetlands of northern Illinois, where very high Cl^- concentrations have produced wetlands that can only support cattails and other halophilic vegetation (e.g., *Phragmitesaustralis*).

Discussion and Conclusions

Prior to major settlements in Illinois, Cl^- concentrations in most shallow groundwater and rivers and streams were very low, probably < 10 mg/L, and in many cases much lower. The exceptions were areas where natural brines in Paleozoic sedimentary rocks discharged at or near the land surface. There were numerous saline springs that were exploited by Native Americans and early settlers for making salt. There are numerous streams and rivers in Illinois with names such as Salt Creek or Saline Branch, named because of the discharge of saline water in or near these streams.

Once Illinois became settled as the population grew, contamination of water began. Chloride was not an important component of contamination sources in the 19th century, with the possible exception of livestock waste. It wasn't until around the middle of the 20th century that the important sources of Cl^- contamination, i.e., water conditioning salt, KCl fertilizer, and road deicers, began to be used in large amounts in Illinois. Since that time, there has been an increase

in Cl^- concentrations in many water bodies in Illinois, and there does not yet appear to be any slackening in its increase in groundwater or surface waters (Kelly, 2008; Kelly et al., in press).

One of the most likely results of increasing Cl^- concentrations in surface waters is degradation of aquatic biota. We are unaware of any systematic studies of the effects of elevated levels of Cl^- on aquatic biota in the Chicago area, but it seems certain that there would be negative effects. Corsi et al. (2010) reported that seven of 13 streams in the Milwaukee, WI, area exhibited toxicity to water fleas (*Ceriodaphniadubia*) and fathead minnows (*Pimephalespromelas*) due to road salt runoff. They measured very high Cl^- concentrations in some of the streams (commonly > 1,000 mg/L and up to 7,730 mg/L).While these are higher than typically found in stations monitored in Chicago, some of the smaller streams occasionally had Cl^- concentrations > 1,000 mg/L, and smaller streams that are unmonitored undoubtedly experience even higher concentrations.

Chicago, many of its suburbs, and many other cities in Illinois have combined sewer systems, with storm water runoff being collected and treated at WWTPs. A large percentage of road salt runoff in the most urban parts of the Chicago region thus does not enter shallow groundwater but is diverted to streams and rivers in discharge from WWTPs. The rapid transfer of saline snow melt to streams and rivers in Chicago produces very high Cl^- concentrations in the winter. However, some road salt runoff ends up in the soil zone and shallow groundwater, and this could represent a relatively long-term source of Cl^- and other ions to surface water.

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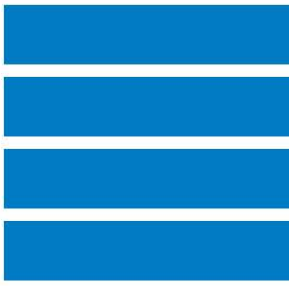

Exhibit 2

BEFORE THE ILLINOIS POLLUTION CONTROL BOARD

IN THE MATTER OF:	)	
	)	
WATER QUALITY STANDARDS AND	)	
EFFLUENT LIMITATIONS FOR THE	)	R08-09 (Subdocket D)
CHICAGO AREA WATERWAY SYSTEM	)	(Rulemaking – Water)
AND THE LOWER DES PLAINES RIVER:	)	
PROPOSED AMENDMENTS TO 35 Ill.	)	
Adm. Code Parts 301, 302, 303 and 304	)	
	)	

COMMENTS OF THE ILLINOIS ENVIRONMENTAL PROTECTION AGENCY ON THE ILLINOIS POLLUTION CONTROL BOARD'S SUBDOCKET D FIRST NOTICE OPINION

The Illinois Environmental Protection Agency ("Illinois EPA" or "Agency"), by and through its attorneys, hereby submits its Comments on the First Notice Opinion issued by the Illinois Pollution Control Board ("Board") on September 18, 2014. In support thereof, the Illinois EPA states as follows:

I. Procedural History

On October 26, 2007, the Agency filed a rulemaking proposal to update the designated uses and accompanying water quality standards and effluent limitations for the waters currently designated for Secondary Contact and Indigenous Aquatic Life Use which includes most waters in the Chicago Area Waterway System ("CAWS") and Lower Des Plaines River. The Board docketed this proposal as R08-09. On March 18, 2010, the Board issued an Order dividing R08-09 into four separate subdockets. Subdocket D addresses the water quality standards for the waterways at issue is this rulemaking.

On September 18, 2014, the Board issued a First Notice Opinion and Order in Subdocket D. The Board's Opinion proceeded with most of the water quality standards

proposed by Illinois EPA with two exceptions, water quality standards for chlorides and temperature. The Board instead proposed: (1) that the 500 mg/L chloride standard must be adapted for the CSSC from December 1 until April 30th. Additionally, the Board proposes for the CSSC a numeric standard of 620 mg/L as a chronic water quality standard and 990 mg/L as an acute water quality standard for chloride from December 1 until April 30; and (2) The Board finds the temperature water quality standards proposed by IEPA and others are not appropriate. Therefore, the Board is proposing the General Use temperature standard for all the waterways in this proceeding. The Board also declined to proceed with mixing zones for chlorides or with site-specific relief for discharges.

The Board's First Notice Proposal was published in Volume 38, Issue 40 of the Illinois Register on October 3, 2014.

II. Summary of Illinois EPA's First Notice Comments in Subdocket D

These comments provide Illinois EPA's response to the Board's First Notice Opinion and Order issued on September 18, 2014. The Illinois EPA is in agreement with the non-controversial issues identified by the Board in its First Notice Opinion and Order and asks the Board to proceed to First Notice with respect to the water quality standards proposed by the Agency. Therefore, the Illinois EPA supports the Board moving to Second Notice on those non-controversial issues identified in the First Notice Opinion and Order.

The Illinois EPA has identified eleven issues to address from the Board's First Notice Opinion and Order. The Agency will discuss each issue in detail below.

A. Bubbly Creek

In the Board's First Notice Opinion and Order the Board held that they would not propose the deletion of the Indigenous Aquatic Life standards and would instead propose language that establishes those standards for Bubbly Creek and include those standards with the standards proposed for ALU A, ALU B, and UDIP ALU water. (Opinion, P. 176). The Board does raise the concern that Bubbly Creek would be subject to an "anytime" dissolved oxygen standard of 4.0 mg/L, which appears to be more protective than the "anytime" dissolved oxygen standard of 3.5 mg/L applicable to CAWS ALU A, ALU B, and UDIP waters. (Id.) Therefore, the Board seeks comments on whether the proposed dissolved oxygen standard for Bubbly Creek need to be changed to reflect the "anytime" standard applicable to remaining portions of the CAWS and LDPR. (Id.)

The Illinois EPA recommends the Board proceed to Second Notice with the water quality standards originally proposed by the Agency in 2007. If the Board does not agree with that approach, the Illinois EPA would suggest that Bubbly Creek retain its current water quality standard, until issues are addressed and resolved in Subdocket E. Additionally, the "anytime" dissolved oxygen standard of 3.5 mg/L is only a portion of the criteria that makes the dissolved oxygen standard protective.

B. Total Ammonia Nitrogen

The Illinois EPA is reconfirming its commitment to address the 2013 national criteria document for ammonia on a state-wide basis. The 2013 national criteria document for ammonia is much more stringent than the current ammonia regulations. Most existing facilities will not be able to meet the 2013 national criteria ammonia limits with their

existing facilities and may require expensive upgrades to the treatment facilities. The Illinois EPA believes that all stakeholders in the state should be involved in the implementation of the 2013 ammonia criteria. On October 29 and 30, 2014, interested national stakeholders (USEPA, State regulators, industry, municipal dischargers, etc.) met, in Washington D.C., to discuss the issues with implementing the 2013 ammonia criteria. These implementation issues need to be addressed before the Illinois EPA proposes the adoption of the ammonia criteria in a state-wide rulemaking.

C. Copper

The 2007 Update of Ambient Water Quality Criteria for Copper is a site-specific derivation of the Copper criteria. From the USEPA fact sheet for the *2007 Update of Ambient Water Quality Criteria for Copper*, "The biotic ligand model (BLM) requires ten input parameters to calculate a freshwater copper criterion (a saltwater BLM is not yet available): temperature, pH, dissolved organic carbon (DOC), calcium, magnesium, sodium, potassium, sulfate, chloride, and alkalinity." Neither the Metropolitan Water Reclamation District of Greater Chicago (MWRDGC) nor the Illinois EPA currently collect dissolved organic carbon (DOC) data.

BLM-based criteria can be more stringent than the current hardness-based copper criteria and in certain cases the current hardness-based copper criteria may be overly stringent for particular water bodies. USEPA expects that application of this model will result in more appropriate criteria and eliminate the need for costly, time-consuming site-specific modifications using the water effect ratio. If a discharger believes that the hardness-based copper criteria is too stringent, that discharger could use the water effect ratio for support of a site-specific water quality standard.

The BLM methodology has not been used state-wide for setting water quality standards. For permitting purposes, the Illinois EPA has used the hardness based criteria extensively. The Agency uses the 25th percentile hardness at the representative ambient water quality monitoring network station to determine the appropriate NPDES limits. There are no implementation procedures or guidelines to indicate what data should be used to develop permit limits. If the Illinois EPA used 75th percentile on all ten parameters, the resulting permit limit may be too stringent. If the average of all ten parameters were used, the resulting permit limit may not be stringent enough. These implementation issues need to be addressed before the Illinois EPA proposes the adoption of the Copper criteria in a state-wide rulemaking.

D. Selenium

The most recent Selenium national criteria document is much more stringent than the proposed Selenium water quality standard. The Illinois EPA is concerned about the science behind the Selenium national criteria document. USEPA is re-evaluating the most recent national criteria document for Selenium.

According to USEPA's website, "EPA released in May 2014 a draft updated national recommended aquatic life criterion for the pollutant selenium. The public was able to provide scientific views on the draft document until July 28, 2014. The draft document is an update to EPA's 1999 chronic aquatic life criterion for selenium and reflects the latest scientific information, which indicates that selenium toxicity to aquatic life is primarily driven by organisms consuming selenium-contaminated food rather than by direct exposure to selenium dissolved in water. The external peer review draft criterion has four parts, including two fish tissue-based and two water column-based

elements. EPA recommends that states and tribes adopt all four elements of the selenium criterion into water quality standards."

When the draft Selenium national criteria becomes final, the Illinois EPA can start the process of adopting the national criteria on a state-wide basis.

E. Chlorides

The Board proposed in its First Notice Opinion, a year-round single –value of 500 mg/L chloride water quality standard for the waters in the CAWS and Lower Des Plaines River. (Opinion, P. 184-185) The Board also proposed that during the winter months for the CSSC the proposal put forth by CITGO, which would be a chloride water quality standard of 991 mg/L for the acute standard and 624 mg/L for the chronic standard. The winter months are defined as December 1 through April 30th. (Opinion, P. 185).

The Agency appreciates the Board attempt to address the issue of a chloride water quality standard for these waters. However, the Agency does not support the action taken by the Board in its First Notice Opinion and Order. The approach taken by the Board only helps CITGO and fails to address the widespread problem that result by the adoption of the proposal by the Board. The Agency supports the 500 mg/L water quality standard for the non-winter months, but by just allowing the CSSC to have the water quality standard proposed by CITGO in the winter months does not address the problem the State of Illinois and dischargers are facing with deicing issues. There will still be wide spread non-compliance if water quality standard for chlorides proposed in the First Notice Opinion and Order is adopted by the Board. (See, Attachment 1).

As previously argued, CITGO indicated they had some discussions with USEPA, but it still unclear if the proposal by CITGO would be approved by USEPA pursuant to

Section 303 of the Clean Water Act. USEPA has stated their concerns with the method used by CITGO with respect their recalculations. Illinois EPA again stresses that it would be premature at this point for the Board to propose CITGO's chloride water quality standards for Second Notice knowing outstanding issues still exists.

Also, as previously argued, Illinois EPA has reviewed the CITGO proposal and cannot support the proposed standards. Specifically, the Agency does not support the removal of *Ceriodaphina dubia* from the chloride criteria dataset, and believes the removal of this species results in a criteria that may not be protective of other resident species. CITGO has indicated they have not found *Ceriodaphnia dubia* in this section of the Chicago Sanitary and Ship Canal during winter months. However, few studies have sought out to verify the presence of *Ceriodaphnia dubia* in these waters during winter months. The Agency does not believe that the minimal effort expended on winter collection, has sufficiently determined that this species is wholly absent from these waters during winter months. Furthermore, even if *Ceriodaphnia dubia* are in fact absent from these waters, the Agency is concerned that other organisms closely related to this species may be present and may exhibit similar sensitivity to chloride exposure. *Ceriodaphnia dubia* is a common test organism in aquatic toxicology that has nationally standardized culture procedures, test conditions, and reporting requirements. It is nationally recognized as a surrogate species for other planktonic crustaceans that have not undergone the same standardization of culturing and testing procedures. Given the limited research on the winter residency of *Ceriodaphnia dubia* in these waters, and the suitability of this species as a surrogate for other planktonic crustaceans, the Agency believes that the elimination of this species from the chloride dataset is not appropriate.

Since the last time Illinois EPA filed comments with the Board more action has been taken with respect to tackling the issue of chlorides due to deicing in this watershed. The Agency is proposing a chloride variance approach[1] that would define non-winter months as May 1st-Novemmber 30th and during the non-winter months that chloride water quality standard would be 500 mg/L. As for the winter months, they would be defined as December 1st through April 30th and during this time frame the approach is to have no water quality standard in place because the focus would be on applying BMPs to point sources and non-point sources to achieve the highest attainable stream quality. Under this approach, the NPDES dischargers would be given a load limit based on past loadings. Also, the work group would work on an approvable variance should one be sought.

Over the summer Illinois EPA met with MWRDGC and the City of Chicago. The Agency presented a variance approach and the Agency's views as to a water quality standard for non-winter months and the use of BMPs during the winter months. The Agency also provided an outline of what would be involved in establishing a workgroup to focus on chlorides reductions during winter deicing events using BMPs. (See, Attachment 2, Agency's presented outline). MWRDGC has agreed to facilitate getting the working group started and Illinois EPA is committed in getting the workgroup off the ground and working towards proposing a waterbody specific variance to address chlorides. There has also been interest expressed by IDOT, The Illinois Tollway, and IERG in participating in the workgroup going forward. There has been three phone conference calls with MWRDGC, with the last one being held on October 21, 2014, to work on details of the upcoming kick off meeting and who should be invited to

[1] This approach has been developed after numerous conversations with USEPA.

participate in the workgroup. It is anticipated that the kickoff meeting for the workgroup will be held in January 2015.

The workgroup will be discussing a waterbody specific variance. This would involve identifying the pollutant, permittee(s) and the waterbody or waterbody segments to which the variance would apply. The demonstration would be focusing on the factors found in 131.10(g), with primary focus being on 131.10(g) (3), human caused conditions, or 131.10(g)(6), which focuses on social and economic impacts. The Agency is anticipating a long-term variance option with a possibility of renewal. The renewal is not automatic and requires documentation to show what steps have been made over the life of the variance and why more time is needed. The workgroup would be working on what documentation would be needed to support a variance renewal after the expiration of the variance period. The Agency is following the proposed rules found in Volume 78, Number 171, pages 54531-54546 of the Federal Register for the variance concept and approval. (See, Attachment 3, Federal Register, September 4, 2013).

The Agency argues the best approach would be for the Board to allow for another subdocket to be opened to address the chloride issue and allow time for the workgroup to work through the concepts outlined by the Agency. Once this is completed, the Agency and the workgroup participants will come back to the Board with a proposal for chlorides and a variance. The Agency would commit to filing statuses with Board to show what progress is being with the workgroup and how close the parties maybe to filing a proposal. While the workgroup is working on the variance concept, the question becomes what standard should be in place while the group is

working. The Agency suggests that if the Board were to grant a new subdocket for chlorides, the current TDS standard should stay in effect until the work group comes forward with a proposal for the Board to consider. The Agency had previously proposed that TDS be eliminated once a chloride standard was adopted. However, since the Agency is asking that a subdocket be opened and no action be taken with respect a chloride water quality standard, a TDS standard should stay in effect while the work group works towards a proposal for the Board.

Therefore, the Agency again requests the Board to delay any action with respect to a chloride water quality standard, as the Agency works with the workgroup and USEPA on a winter concept that would utilize best management practices for point sources and non-point sources and to work on an approvable waterbody specific variance.

However, if the Board decides to move forward with the chloride standard of 500 mg/L, the Agency would recommend a delayed effective date of 2 years. The TDS standard of 1500 mg/L should continue during the time the chloride standard is not effective.

F. Compliance Mechanism and Best Management Practice for Chlorides

The Board in its First Notice Opinion and Order proposed revisions to Part 309 of the Illinois Administrative Code. The revision would be found in Section 309.141 and would allow for best management practices with respect to chlorides. (Opinion P. 204).

The Agency does not oppose the proposal by the Board when you look at it from a big picture concept. However, the Agency would argue it should not be limited to chlorides. The Agency suggests writing the new the section non-specific to be

consistent with the federal rule and to allow the Agency the ability to use BMPs in other situations beyond chlorides. With that being said, the Agency would still argue that adding Section 309.141 does not solve the problem with respect to deicing. High chlorides will still remain and water bodies will still be impaired. Therefore, a variance still needs to be used as a means to address the chloride issue facing these waterways. (See, Section E above).

G. Mixing Zone Amendments

The Board decided not to propose CITGO's mixing zone proposal, but encouraged comments on the issue. (Opinion, P. 200). The Agency still opposes amendments to the mixing zone regulations. CITGO admitted they have had no conversation with USPEA or the Agency with respect to the proposal. See, December Hearing Transcript, P. 180. The Agency agrees with USEPA's comments filed in April 2014, that CITGO's proposal, which would allow for the chronic standard criteria to be exceeded outside the mixing zone, would not be protective of the applicable aquatic life use designations. Therefore, the Agency asks that the amendments to the mixing zone regulations not be proposed in the Board's Second Notice.

H. Temperature

In the Board's First Notice Opinion and Order the Board declined to move forward with the Agency's, the Environmental Groups or Midwest Gen's thermal water quality standard proposal and instead adopted the General Use temperature standards for all three aquatic life use designations in the CAWS and LDPR. (See, First Notice Opinion and Order, P. 204).

The Agency appreciates the time the Board took to carefully review all the proposals, but would again reiterate the arguments made in the Agency's Post Hearing comments and ask that Board reconsider and adopt the temperature standards proposed by the Agency. (See, Agency's Post Hearing Comments, P. 11-18).

If the Board declines to adopt the temperature standards proposed by the Agency and goes forward with the General Use standards for these waters, the Board should adopt the protections found in the regulations at 35 Ill. Adm. Code 302.211 (b-d) and not just the maximum thermal requirements and excursion hours at 302.211 (e). This will ensure that there are no abnormal temperature changes other than those caused by natural conditions, the normal daily and seasonal temperature fluctuations shall be maintained, and the maximum temperature rise above natural temperatures shall not exceed 2.8 ^{o}C (5 ^{o}F).

I. Excursion Hours

The Agency supports the Board's decision to keep the excursion hours that are currently in the General Use water quality standards. The Agency would like to point out on page 212 of the Board's Opinion, it incorrectly states that "Section 302.211 allows an increase of up to 2.8 ^{o}F to occur for 1% of the hours in a 12-month period." Section 302.211(e) allows an increase of up to 1.7 ^{o}C (3 ^{o}F) to occur for 1% of the hours in a 12 month period. This is stated correctly in the proposed rules. (See, P. 234 of the First Notice Opinion and Order).

J. Mercury

The Illinois EPA supports the Board's proposed water quality standard for mercury. For the reasons below, the Agency does not support the adoption of the 2001 mercury human health criteria.

Illinois EPA has proposed a human health water quality standard of 12 ng/L, which is equivalent to EPA's 1984 ambient water quality criterion for mercury. However, the most recent Mercury national criteria document is the 2001 mercury human health criteria. The 2001 mercury human health criteria is a fish tissue-based methyl-mercury criteria of 0.3 mg/kg. In order to convert a fish tissue-based methyl-mercury water quality standard to a water column mercury concentration, fish tissue data and low-level ambient mercury data must be available. The fish tissue data and low-level ambient mercury data is used to determine a conversion factor. The Agency and MWRDGC have collected mercury fish tissue data; however, the MWRDGC nor the Illinois EPA currently collect low-level Mercury data in these waters. A site-specific conversion factor, to convert the fish tissue criteria to a water column number, cannot be completed at this time since there is no low-level Mercury ambient data over the time period of fish tissue data.

The Illinois EPA does not believe that the use of a bioaccumulation model would be appropriate for these waters. These waters are not typical natural streams. The vast majority of these streams are straight-walled deep-draft channels. The Illinois EPA along with the stakeholder group tried to determine a system that had similar habitat that could provide a reference site. However, it was determined that no reference site

could be used since there was no sites with similar habitat which would have similar biology.

USEPA has issued Final Implementation Guidance that has a draft national bioaccumulation factors (BAFs). The Illinois EPA does not believe that using nationally derived BAFs from waters that meet the CWA goals (or from waters that have uses that meet the CWA goals) are appropriate for these waters. As the Board is aware, the vast majority of waters in this rulemaking do not meet the CWA goals.

For this proceeding, CITGO collected a limited amount of low-level Mercury data in the intake, which is on the Chicago Sanitary and Ship Canal. This data indicated that the annual average was 9.59 ng/L, which would meet the proposed mercury water quality standard of 12.0 ng/L.

III. Comments on the Draft Regulatory Language

Illinois EPA has reviewed the draft regulatory language proposed by the Board in its First Notice Opinion and Order. The Agency recommends the following revisions before proceeding to Second Notices:

A) In the table of contents, Radium 226 and 228 (302.307) is correct on the Board's website, so it is unclear why there is a strikeout for 302.307.

B) In Section 302.101(d), there should be a reference to 303.449, if the Board decides to keep this provision.

C) In Section 302.407(e), the formula for Cadmium, Chromium (trivalent), Copper, Lead, Nickle, Zinc and Silver should be consistent with the formula listed for Fluoride. The Fluoride formula is the current and correct form of the formula.

D) In Section 302.407(X), the (T + 273.16) should be formatted correctly and therefore, (T + 273.16) goes under 2729.92.

E) In Section 302.408(c), if the Board choses to keep this provision, the citation to 303.230, should be 303.235.

F) In Section 302.408(d), if the Board decides to keep the provision, the citation to 303.325, should be 303.340.

G) In Section 302.408, if the Board were to adopt the General Use Standards for temperature, then the tables in (c), (d), and (e) could be consolidated or the Board could just reference the General Use Standards and omit the tables.

H) In Section 302.408(e), if the Board were to adopt the table format, there is a box that has nothing in it and therefore it should be deleted.

I) In Section 302.408(e), if the Board choses to keep this language, the reference to 303.237, should be changed to 303.230.

J) In Section 302.410, “toxic to aquatic life” should be stricken since the regulations also protect for human health.

K) In Section 302.412(b), the references to 303.220 should be changed to 303.230.

L) In Section 302.412(c)(2)(A), the reference should be changed from subsection (e) to subsection (f).

M) In Section 302.412(c)(2)(B), the reference to subsection (e), should be changed to subsection (f).

N) In Section 302.412(d)(2), the reference should be changed from subsection (d) to subsection (e).

O) In Section 302.412(d)(3), the reference should be changed from subsection (d) to subsection (e).

P) Fluoride is misspelled in the table found in Section 302.407(e).

Q) Proposed change to language found in 302.401 is needed to clarify that the standard for the Chicago River is still the General Use water quality standard. The Agency would suggest the following:

Section 302.401 Scope and Applicability

b) Subpart D also contains the Chicago Area Waterway System and Lower Des Plaines River water quality standards. Except for the Chicago River, these standards must be met only by waters specifically designated in Part 303. The Subpart B general use and Subpart C public and food processing water supply standards of this Part do not apply to waters described in 35 Ill. Adm. Code 303.204 as the Chicago Area Waterway System or Lower Des Plaines River and listed in 35 Ill. Adm. Code 303.220 through 303.240, except that waters designated as Primary Contact Recreation Waters in 35 Ill. Adm. Code 303.220 must meet the numeric water quality standard for bacteria applicable to protected waters in 35 Ill. Adm. Code 302.209. The Chicago River must meet the General Use standards including the numeric water quality standard for fecal coliform bacteria applicable to protected waters in 35 Ill. Adm. Code 302.209.

R) The Agency also suggests the title the Agency originally proposed for Section 302.410 be titled “Other Toxic Substances”. This would be in agreement with the General Use Standards 302.210 and would recognize that these are intended to protect aquatic life, wildlife, and human health.

S) The language in Section 303.204 and describing the standards for waters listed in 303 limits the description to aquatic life, but the applicable standards

in Subpart D includes aquatic life, wildlife and human health criteria. Therefore, the Agency recommends the Board ensure that aquatic life, wildlife and human health criteria at Section 302.401 and 302.402.

T) After reviewing the proposed language for 302.410, the Agency recommends the Board keep the old language as it pertains to Bubbly Creek, but adopt an entirely new sentence or sentences with regards to protection of CAWS/LDPR segments that more closely mirrors the language found at 302.210. The current language is not clear as to the level of protection afforded to Bubbly Creek and it is limited to standards at 302.407 when now there are numeric standards found in Sections 302.407-302.412. Therefore, the Agency suggests the following:

> Section 302.410 Other toxic substances:
>
> Any substance or combination of substances toxic to aquatic life not listed in Section 302.407 shall not exceed one half of the 96-hour median tolerance limit (96-hour TLm) for native fish or essential fish food organisms <u>in the South Fork of the South Branch of the Chicago River (Bubbly Creek). All other Chicago Area Waterway System and Lower Des Plaines River waters as designated in Part 303 shall be free from any substances or combination of substances in concentrations toxic or harmful to human health, or to animal, plant or aquatic life. Individual chemical substances or parameters for which numeric standards are specified in this Subpart are not subject to this Section.</u>

IV. Conclusion

The Agency appreciates the opportunity to comment on the Board's First Notice Opinion and Order and the time and effort invested by the Board in addressing the issues covered in Subdocket D. The Agency is full support of the aspects of the Board's First Notice Order that are not addressed in detail in these comments and looks forward to the conclusion of this rulemaking docket.

WHEREFORE, the Illinois EPA respectfully requests the Illinois Pollution Control Board proceed to Second Notice and Final Adoption of Subdocket D consistent with the comments submitted above and to grant the opening of another subdocket to allow for the development of a chloride water quality standard and water body specific variance proposal.

Respectfully submitted,

By:/s/Stefanie N. Diers
Stefanie N. Diers
Assistant Counsel
Division of Legal Counsel

Date: November 21, 2014

Illinois Environmental Protection Agency
1021 North Grand Avenue East
P.O. Box 19276
Springfield, Illinois 62794-9276

ATTACHMENT 1

Chloride
percentage above 500 mg/L
Jan. 2001 through Dec. 2012 (Dec. – March)

- North Shore Channel – 8%
- North Br. Chicago River – 13%
- South Br. Chicago River – 4.4%
- S. Fk. S. Br. Chicago River – 4%
- CSSC - 6%
- Cal-Sag - 2.6%
- Little Calumet River – 2.3%
- Des Plaines River – 6% (2001 data only)
- Grand Calumet and Calumet Rivers – 0 above 500 mg/L

ATTACHMENT 2

Chloride Variance Outline

I. Waterbody specific variance

-2 types of variances
-waterbody specific variance

-discharger specific variance

-Components of a waterbody specific variance

-identify the pollutant(s), permittee(s), and/or the waterbody or waterbody segments to which the variance applies

-requirements of the waterbody specific variance?

-the request must specify (a) the highest attainable interim use and interim numeric criterion or (b) an interim numeric effluent condition that reflects the highest attainable condition for a specific permittee(s) during the term of the variance

Demonstration for Seeking Waterbody Specific Variance

-The state must justify the need for the variance. A demonstration that attaining the designated use and criterion is not feasible during the term of the WQS variance because one of the factors in 131.10(g). 10(g)(3) and (g)(6) are relevant factors to consider in a variance request.

-what is needed for 131.10(g)(3)(human caused condition)

-documentation and burden of proof

-monitoring data to determine the current ambient conditions; this is the first hurdle to get past; multiple excursions and by a substantial margin

-maps showing the geographical extent of the problem

-engineering studies and literature of the relevant remediation alternatives or BMPs that could be implemented and documentation that none of the alternatives or practices, if implemented, would result in attaining the designated use and criteria within variance timeframe;

-description, with supporting information from the scientific literature, of the environmental impacts associated with the

remedial alternatives and an analysis of what could be done in an environmentally safe manner

~~-modeling data~~ data/info showing the associated pollutant reductions achievable within the timeframe of the variance compared to reductions needed to achieve the designated use and criteria

-what is needed for 131.10(g)(6)(social & economic impact)

-documentation and burden of proof

-social impact analysis

-use of economic interim guidance 1995, if necessary

<u>10 year term with option to renew is a possibility, but not automatic</u>

-for a renewal, USEPA will look at:

(1) whether conditions have changed such that the designated use and criterion are now attainable;
(2) whether new or additional information has become available to indicate that the designated use and criterion are not attainable in the future (data or information that supports a use change/refinement; or
(3) whether feasible progress is being made toward the designated use and criterion and that additional time is needed to make further progress (will the variance need to renewed?)

-must provide documentation of the steps taken to meet the requirement of the previous variance and it will not be renewed if the applicant did not comply with the conditions of the original variance

-must provide documentation as to whether and to what extent cost-effective and reasonable BMPs have been implemented to address the pollutant(s) subject to the variance and the water quality progress achieved during the variance period; alternative treatments or any changes in their NPDES treatment technologies

-what is needed to measure progress and success (monitoring?)

-how effective are the BMPs

-must have an expiration date not to exceed 10 years, however it could be renewed if a case is made why one would need additional time.

II. UAA+ Chloride Variance:

-What is the watershed? = UAA +?

Applicable to for the non-winters months

-how do we define non-winter months?

-May 1 through November 30

-basis for non-winter months?

-standard 500 mg/L

-basis for the standard?

Applicable to winter months

-how do we define winter months?

-December 1- April 30

-basis for winter months?

-Interim water quality standard

-no standard because focus would be on applying BMPs to point sources and non-point sources to achieve highest attainable stream quality

-basis for applying BMPs instead of having water quality standard?

-quantify existing loading

-quantify existing BMP usage

BMPS's list

-Point sources
-Non-point sources
-Salt piles (storage and handling)
-Do a load limit in NPDES permits in addition to BMPs?

Establish a work group

-Responsible for:

-who will lead the work group? (set up like DuPage and Fox)
-identification of effective BMPs for point/non-point sources.
-who is responsible for instituting and tracking of the BMPs
-what BMPs stay until variance in no longer needed
-achieving goals of the BMPs
-drafting regulatory language
-sub-groups may be needed (what would the elements be?)
-time frames established for accomplishing tasks
-reporting requirements for group and individual sources
-accountability (Yearly Reporting Requirements)
-what is needed from group?
-what is needed from individual sources?

Requirements for participating in the variance

-identified by the work group
-participation and implementation

-compliance with the permit

Based on the proposed rules located in Volume 78, Number 171, pages 54531 – 54546 of the Federal Register.

ATTACHMENT 3

PDF of the Federal Register September 4, 2013

FEDERAL REGISTER

Vol. 78 Wednesday,
No. 171 September 4, 2013

Part II

Environmental Protection Agency

40 CFR Part 131
Water Quality Standards Regulatory Clarifications; Proposed Rule

ENVIRONMENTAL PROTECTION AGENCY

40 CFR Part 131

[EPA–HQ–OW–2010–0606; FRL–9839–7]

RIN 2040–AF 16

Water Quality Standards Regulatory Clarifications

AGENCY: Environmental Protection Agency (EPA).

ACTION: Proposed rule.

SUMMARY: The Environmental Protection Agency (EPA) is proposing changes to the federal water quality standards (WQS) regulation which helps implement the Clean Water Act. The changes will improve the regulation's effectiveness in restoring and maintaining the chemical, physical, and biological integrity of the nation's waters. The EPA is seeking comments from interested parties on these proposed revisions. The core of the current regulation has been in place since 1983; since then, a number of issues have been raised by states, tribes, or stakeholders or identified by the EPA in the implementation process that will benefit from clarification and greater specificity. The proposed rule addresses the following key program areas: Administrator's determinations that new or revised WQS are necessary, designated uses, triennial reviews, antidegradation, variances to WQS, and compliance schedule authorizing provisions.

DATES: Comments must be received on or before December 3, 2013.

ADDRESSES: Submit your comments, identified by Docket identification (ID) No. EPA–HQ–OW–2010–0606, by one of the following methods:

- *Federal eRulemaking Portal: http://www.regulations.gov.* Follow the online instructions for submitting comments.
- *Email: ow-docket@epa.gov.*
- *Mail:* Water Docket, Environmental Protection Agency, Mail Code 2822T, 1200 Pennsylvania Ave. NW., Washington, DC 20460. Attention: Docket ID No. EPA–HQ–OW–2010–0606.
- *Hand Delivery:* EPA Docket Center, EPA West Room 3334, 1301 Constitution Ave. NW., Washington, DC 20004, Attention: Docket ID No. EPA–HQ–OW–2010–0606. Such deliveries are only accepted during the Docket Center's normal hours of operation. Special arrangements should be made for deliveries of boxed information by calling 202–566–2426.

Instructions: Direct your comments to Docket ID No. EPA–HQ–OW–2010–0606. The EPA's policy is that all comments received will be included in the public docket without change and may be made available online at *http://www.regulations.gov,* including any personal information provided, unless the comment includes information claimed to be Confidential Business Information (CBI) or other information whose disclosure is restricted by statute. Do not submit information that you consider to be CBI or otherwise protected through *http://www.regulations.gov* or email. The *http://www.regulations.gov* Web site is an ''anonymous access'' system, which means the EPA will not know your identity or contact information unless you provide it in the body of your comment. If you send an email comment directly to the EPA without going through *www.regulations.gov* your email address will be automatically captured and included as part of the comment that is placed in the public docket and made available on the Internet. If you submit an electronic comment, the EPA recommends that you include your name and other contact information in the body of your comment and with any disc you submit. If the EPA cannot read your comment due to technical difficulties and cannot contact you for clarification, the EPA may not be able to consider your comment. Electronic files should avoid the use of special characters, any form of encryption, and be free of any defects or viruses. For additional information about the EPA's public docket visit the Docket Center homepage at *http://www.epa.gov/epahome/dockets.htm.*

Docket: All documents in the docket are listed in the *http://www.regulations.gov* index. Although listed in the index, some information is not publicly available (e.g., CBI or other information whose disclosure is restricted by statute). Certain other materials, such as copyrighted material, will be publicly available only in hard copy. Publicly available docket materials are available either electronically in *http://www.regulations.gov* or in hard copy at the Office of Water Docket Center, EPA/DC, EPA West, Room 3334, 1301 Constitution Ave. NW., Washington, DC. The Public Reading Room is open from 8:30 a.m. to 4:30 p.m., Monday through Friday, excluding legal holidays. The telephone number for the Public Reading Room is (202) 566–1744; the telephone number for the Office of Water Docket Center is (202) 566–2426.

FOR FURTHER INFORMATION CONTACT: Janita Aguirre, Standards and Health Protection Division, Office of Science and Technology (4305T), Environmental Protection Agency, 1200 Pennsylvania Avenue NW., Washington, DC 20460; telephone number: 202–566–1860; fax number: 202–566–0409; email address: *WQSRegulatoryClarifications@epa.gov.*

SUPPLEMENTARY INFORMATION: This supplementary information section is organized as follows:

Table of Contents

I. General Information

A. Does this action apply to me?

State and tribal governments responsible for administering or overseeing water quality programs may be directly affected by this rulemaking, as states and authorized tribes[1] may

[1] Hereafter referred to as ''states and authorized tribes'' or ''states and tribes.'' ''State'' in the Clean

need to consider and implement new provisions, or revise existing provisions, in their water quality standards (WQS or standards). Entities such as industrial dischargers or publicly owned treatment works that discharge pollutants to waters of the United States may be indirectly affected by this rulemaking because WQS may be used in determining permit limits under the National Pollutant Discharge Elimination System (NPDES) or in implementing other Clean Water Act (CWA or the Act) regulatory programs. Citizens concerned with water quality and WQS implementation may also be interested in this rulemaking, although they might not be directly impacted. Categories and entities that may potentially be affected include the following:

Category	Examples of potentially affected entities
States and Tribes	States and authorized tribes (tribes eligible to administer WQS under the CWA).
Industry	Industries discharging pollutants to waters of the United States.
Municipalities	Publicly owned treatment works or other facilities discharging pollutants to waters of the United States.

This table is not intended to be exhaustive, but rather provides a guide for entities that may be directly or indirectly affected by this action. It lists the types of entities of which the EPA is aware could be potentially affected by this action. Other types of entities not listed in the table might be affected through implementation of WQS that are revised as a result of this rule. If you have questions regarding the applicability of this action to a particular entity, consult the person listed in the preceding **FOR FURTHER INFORMATION CONTACT** section.

B. What should I consider as I prepare my comments for the EPA?

1. Resubmitting Relevant Comments From 2010 Stakeholder and Public Listening Sessions

From August through December 2010, the EPA held multiple listening sessions with stakeholders and the public, as well as consultation sessions with states, tribes, and representatives of state and local elected officials, concerning the general directions of this proposed rule. The EPA considered the views and comments received from these sessions in developing this proposal. The proposal published today has evolved substantially from the materials the EPA shared at that time. If you submitted comments in response to any of those sessions and wish for these comments to be considered during the public comment period for this proposed rulemaking, you must resubmit such comments to the EPA in accordance with the instructions outlined in this document.

2. Submitting Confidential Business Information (CBI)

Do not submit this information to the EPA through *http://www.regulations.gov* or email. Clearly mark the part or all of the information that you claim to be CBI. For CBI information in a disc that you mail to the EPA, mark the outside of the disc as CBI and then identify electronically within the disc the specific information that is claimed as CBI. In addition to one complete version of the comment that includes information claimed as CBI, a copy of the comment that does not contain the information claimed as CBI must be submitted for inclusion in the public docket. Information so marked will not be disclosed except in accordance with procedures set forth in 40 Code of Federal Regulations (CFR) part 2.

3. Tips for Preparing Your Comments

When submitting comments, remember to:

- Identify the rulemaking by docket number and other identifying information (subject heading, **Federal Register** date and page number).
- Follow directions. The agency may ask you to respond to specific questions or organize comments by referencing a CFR part or section number.
- Submit any and all comments on any portion of the rulemaking that you wish to be considered.
- Explain why you agree or disagree, suggest alternatives, and substitute language for your requested changes.
- Describe any assumptions and provide any technical information and/or data that you used.
- If you provide an estimate of potential costs or burdens, explain how you arrived at your estimate in sufficient detail to allow for it to be reproduced.
- Provide specific examples to illustrate your concerns, and suggest alternatives.
- Explain your views as clearly as possible.
- Make sure to submit your comments by the comment period deadline identified.

II. Background

A. What is the statutory and regulatory history of the WQS regulation and program?

The CWA—initially enacted as the Federal Water Pollution Control Act Amendments of 1972 (Pub. L. 92–500) and subsequent amendments—establishes the basic structure in place today for regulating pollutant discharges into the waters of the United States. In the Act, Congress established the national objective to ''restore and maintain the chemical, physical, and biological integrity of the Nation's waters,'' and to achieve ''wherever attainable, an interim goal of water quality which provides for the protection and propagation of fish, shellfish, and wildlife and for recreation in and on the water'' (sections 101(a) and 101(a)(2)).

The CWA establishes the basis for the current WQS regulation and program. Section 301 of the Act provides that ''the discharge of any pollutant by any person shall be unlawful'' except in compliance with specific requirements of Title III and IV of the Act, including industrial and municipal effluent limitations specified under section 304 and ''any more stringent limitation, including those necessary to meet WQS, treatment standards or schedule of compliance established pursuant to any State law or regulation.'' Section 303(c) of the Act addresses the development of state and authorized tribal WQS and provides for the following:

(1) WQS shall consist of designated uses and water quality criteria based upon such uses;

(2) States and authorized tribes shall establish WQS considering the following possible uses for their waters—propagation of fish, shellfish and wildlife, recreational purposes, public water supply, agricultural and

Water Act and this document refers to a state, the District of Columbia, the Commonwealth of Puerto Rico, the Virgin Islands, Guam, American Samoa, and the Commonwealth of the Northern Mariana Islands.

industrial water supplies, navigation, and other uses;

(3) State and tribal standards must protect public health or welfare, enhance the quality of water, and serve the purposes of the Act;

(4) States and tribes must review their standards at least once every 3 years; and

(5) The EPA is required to review any new or revised state and tribal standards, and is also required to promulgate federal standards where the EPA finds that new or revised state or tribal standards are not consistent with applicable requirements of the Act or in situations where the Administrator determines that federal standards are necessary to meet the requirements of the Act.

The EPA established the core of the current WQS regulation in a final rule issued in 1983.[2] This rule strengthened previous provisions that had been in place since 1977 and moved them to a new 40 CFR part 131 (54 FR 51400, November 8, 1983). The resulting regulation describes how the WQS envisioned in the CWA are to be administered. It clarifies the content of standards and establishes more detailed provisions for implementing the provisions of the Act. The following are examples of how the regulation has interpreted and implemented the CWA provisions regarding standards:

- Establishes procedures to recognize the importance of designating beneficial uses to achieve the CWA section 101(a)(2) interim goal with regard to protecting aquatic life and recreational uses, and to provide states and tribes the option of establishing sub-categories of uses, such as cold water and warm water aquatic life designations (§ 131.10).
- Provides detail concerning the adoption of numeric water quality criteria, including authorizing the modification of the EPA's national recommended criteria to reflect site-specific conditions, the use of criteria methodologies different from the EPA's recommendations so long as they are scientifically defensible, and the use of narrative criteria where numeric criteria cannot be derived or to supplement numeric criteria (§ 131.11).
- Incorporates and clarifies the Act's emphasis on the importance of preserving existing uses and identifying and preserving high quality and outstanding resource waters through longstanding antidegradation provisions. These provisions are designed to protect existing uses and the level of water quality necessary to support these uses; to protect high quality waters and provide a transparent analytic process for states and tribes to determine whether limited degradation of such waters is appropriate and necessary (§ 131.12).

In support of the 1983 regulation, the EPA has issued a number of guidance documents, such as the ''Water Quality Standards Handbook'' (WQS Handbook),[3] that have provided guidance on the interpretation and implementation of the WQS regulation, and on scientific and technical analyses that are used in making decisions that would impact WQS. The EPA also developed the ''Technical Support Document for Water Quality-Based Toxics Control'' [4] (TSD) that provided additional guidance for implementing state and tribal WQS.

The part 131 regulation has been modified twice since 1983. First, in 1991 the EPA added §§ 131.7 and 131.8 regarding tribes, pursuant to section 518 of the CWA (56 FR 64893, December 12, 1991). Section 518, which was enacted in 1987, included provisions extending the ability to participate in the WQS program to Indian tribes. Second, in 2000 the EPA promulgated § 131.21(c), commonly known as the ''Alaska Rule,'' to clarify that new and revised standards adopted by states and tribes and submitted to the EPA after May 30, 2000 become applicable standards for CWA purposes only when approved by the EPA (65 FR 24641, April 27, 2000).

B. How has the public provided EPA input on the national WQS Program in the past?

The EPA received comments, data, and information from over 6,000 commenters in developing ''Final Water Quality Guidance for the Great Lakes System'' in 1995 (60 FR 15366, March 23, 1995). The final Guidance represented more than six years of intensive, cooperative efforts that included participation by the eight Great Lakes states, the EPA, and other Federal agencies in open dialogue with citizens, local governments, municipalities, academia, the environmental community, and industries located in the Great Lakes ecosystem. This process entailed a thorough review and analysis of the federal water quality program and opportunities for greater clarity, focus, and improved implementation. The final Guidance is codified in 40 CFR part 132 and helps establish consistent, enforceable, and long-term protections from all types of pollutants, with short-term emphasis on the types of bio-accumulative contaminants that accumulate in the food web and pose a threat to the Great Lakes System. While not all provisions of the Final Guidance may be necessary or appropriate for the national Water Quality Standards Program, the EPA considered the input received from the public through the development of the Final Guidance during the preparation of this proposed rule.

In 1998, the EPA issued an Advance Notice of Proposed Rulemaking (ANPRM) to discuss and invite comment on over 130 aspects of the federal WQS regulation and program, with a goal of identifying specific changes that might strengthen water quality protection and restoration, facilitate watershed management initiatives, and incorporate evolving water quality criteria and assessment science into state and tribal WQS programs. (63 FR 36742, July 7, 1998). In response, the EPA received over 3,200 specific written comments from over 150 comment letters. The EPA also held three public meetings during the 180-day comment period where additional comments were received and discussed.

Although the EPA chose not to move forward with a rulemaking after the ANRPM, as a result of the input received, the EPA identified a number of high priority issue areas for which the Agency has developed guidance, provided technical assistance and continued further discussion and dialogue to assure more effective program implementation. For example, many ANPRM commenters expressed the need for additional assistance on establishing designated uses of water bodies and the process to follow when making designated uses more or less protective. In order to receive input from a broad set of stakeholders on these topics, the EPA held a follow-up national symposium on designated uses on June 3–4, 2002 in Washington, DC. Approximately 200 interested citizens, government officials, and regulated parties attended this open meeting, which included presentations from a variety of stakeholders and an expert panel representing different

[2] In this preamble, the EPA uses the term ''water quality standards regulation'' to mean subparts A, B, and C of part 131. These three subparts, comprising §§ 131.1 through 131.22, contain general provisions, requirements for establishing standards, and procedures for review and revision of standards, respectively. Part 131 also includes a subpart D that contains the text of WQS the EPA has promulgated to replace or augment state and tribal standards.

[3] First edition, December 1983; second edition, EPA 823–B–94–005a, August 1994.

[4] First edition, EPA 440/4–85–032, September 1985; revised edition, EPA 505/2–90–001, March 1991.

viewpoints.[5] In addition, the EPA held four co-regulator workshops between February 2005 and April 2006 with state, interstate, and tribal partners, and gathered further input and feedback on the establishment, adjustment, and implementation of designated uses.[6]

C. Why is the EPA proposing changes to the Federal WQS regulation?

The core requirements of the current WQS regulation have been in place for over 30 years. These requirements have provided a strong foundation for water quality-based controls, including water quality assessments, impaired waters lists, and total maximum daily loads (TMDLs) under CWA section 303(d), as well as for water quality-based effluent limits (WQBELs) in NPDES discharge permits under CWA section 402. As with the development and operation of any program, however, a number of policy and technical issues have recurred over the past 30 years in individual standards reviews, stakeholder comments, and litigation that the EPA believes would be addressed and resolved more efficiently by clarifying, updating and revising the federal WQS regulation to assure greater public transparency, better stakeholder information, and more effective implementation.

From 2008 through 2010, the EPA held ongoing discussions with state and tribal partners and other stakeholders. These discussions addressed a wide-range of issues, from which a subset has been identified as significant areas of continuing concern. In 2010, the EPA held listening sessions with the public, states and tribes to obtain feedback on this subset of issues. The agenda, background material, list of participants and the public transcripts may be viewed at *http://water.epa.gov/lawsregs/lawsguidance/wqs_listening.cfm#records*. Section III of the EPA's proposal describes the key areas the EPA has chosen to address based on input received and the EPA's proposed regulatory approaches. The EPA believes that states, tribes, other stakeholders, and the public will benefit from clarification in these key areas to better understand and make proper use of available CWA tools and flexibilities, while maintaining open and transparent public participation. Clear regulatory requirements and improved implementation will provide a more transparent and well-defined pathway for restoring and maintaining the biological, chemical, and physical integrity of the nation's waters. The changes the EPA is proposing today add or modify specific regulatory provisions to address key areas described below.

[5] Proceedings from the national symposium on designated uses can be found at *http://water.epa.gov/scitech/swguidance/standards/uses/symposium_index.cfm*.

[6] A summary of the co-regulator workshops and a link to the use attainability analysis (UAA) case studies can be found at *http://water.epa.gov/scitech/swguidance/standards/uses/uaa/info.cfm*.

III. Program Areas for Proposed Regulatory Clarifications

A. Introduction

As discussed in section II.C, the EPA has had ongoing dialogue with states, tribes and stakeholders on key issues that are central to assuring effective implementation of the WQS program. As part of this process, the Agency has considered several fundamental questions in evaluating opportunities to improve implementation of the WQS program including which recurring implementation issues would benefit most from a regulatory clarification or update, whether there are emerging issues that could be more effectively addressed through regulatory revisions, whether the regulation continues to have the appropriate balance of consistency and flexibility for states and tribes, and whether the resulting program effectively facilitates public participation in standards decisions.

As a result of this evaluation and consideration of continuing input from states, tribes and stakeholders, the EPA is proposing changes to key program areas of its WQS regulation at 40 CFR part 131 that the Agency believes will result in improved regulatory clarity and more effective program implementation, and lead to environmental improvements in water quality. This proposed rulemaking requests comment on regulatory revisions in the following six key issue areas: (1) Administrator's determination that new or revised WQS are necessary, (2) designated uses, (3) triennial reviews, (4) antidegradation, (5) WQS variances, and (6) compliance schedule authorizing provisions.

B. Administrator's Determinations That New or Revised WQS Are Necessary

1. The EPA Proposal

The EPA is proposing to amend paragraph (b) of § 131.22 to add a requirement that an Administrator's determination must be signed by the Administrator or his or her duly authorized delegate, and must include a statement that the document is a determination for purposes of section 303(c)(4)(B) of the Act.

2. Background and Rationale for Revision

Section 303(c)(4)(B) of the CWA provides the EPA Administrator with authority to determine that a new or revised WQS is necessary to meet the CWA requirements, typically in those situations where a state or tribe fails or is unable to act in a manner consistent with the CWA. Such a determination is made at the Administrator's discretion, after evaluating all relevant factors. An Administrator's determination triggers the requirement for the EPA to promptly prepare and publish proposed regulations setting forth a revised or new WQS for the waters of the United States involved, and for the EPA to promulgate such WQS unless the state or tribe adopts and the EPA approves such WQS before the EPA promulgation.

The EPA is concerned that the process whereby the Administrator determines that new or revised standards are necessary is not always clearly understood or interpreted by the public and stakeholders. In some instances, this lack of understanding has led to a mistaken conclusion that the EPA has made a CWA 303(c)(4)(B) determination when, in fact, the EPA did not make nor intend to make a determination. For example, Agency memoranda or documents articulating areas where states' WQS may need improvements have sometimes been construed or alleged by stakeholders to be official Administrator determinations that obligate the EPA to propose and promulgate federal WQS for such states. In order to ensure effective implementation of the national WQS program, to provide direct, clear, and transparent feedback on state and tribal actions, and to maintain an open and constructive dialogue with states, tribes and stakeholders on important water quality issues, it is essential that the EPA have the ability to provide feedback, and states and tribes have the opportunity to consider and evaluate the Agency's views, without fear of litigation triggering a duty on the part of the EPA to propose and promulgate WQS before either a state, tribe or the Agency believes such a course is appropriate or necessary.

The EPA believes that this revision would establish a more transparent process for the Administrator to announce any determination made under section 303(c)(4)(B) of the Act. Such a revision will allow the EPA to effectively provide direct and specific written recommendations to states and tribes on areas where WQS improvements should be considered,

without the possibility that such recommendations will be construed as a determination that obligates the EPA to propose and promulgate new or revised standards.

The public's ability under Section 553(e) of the Administrative Procedure Act (5 U.S.C. 553(e)) to petition the EPA to issue, amend, or repeal a rule, would not be affected by this proposed revision.

The EPA invites comments on the proposed amendment to paragraph (b) of § 131.22. The EPA also invites comment on any other options it should consider or on the interpretations expressed in this section.

C. Designated Uses

1. The EPA Proposal

First, the EPA is proposing to amend paragraph (g) at § 131.10 to provide that where a state or tribe adopts new or revised water quality standards based on a use attainability analysis (UAA), it must adopt the highest attainable use (HAU). States and tribes must also adopt criteria, as specified in § 131.11(a), to protect that use. The EPA is also proposing to add a definition of HAU at § 131.3(m). Specifically, the EPA is proposing to define HAU as ''the aquatic life, wildlife, and/or recreation use that is both closest to the uses specified in section 101(a)(2) of the Act and attainable, as determined using best available data and information through a use attainability analysis defined in § 131.3(g).''

Second, the EPA is making appropriate edits to § 131.10(g) to be clear that the factors listed in § 131.10(g) must be used when a UAA is required by § 131.10(j), and is restructuring § 131.10(k) to clearly articulate when a UAA is not required.

2. Background

Designated uses communicate a state's or tribe's environmental management objectives for its waters and drive on-the-ground water quality decision-making and improvements. To establish appropriate WQS, states and tribes define the water quality goals of a water body first by designating the use(s) and second by setting criteria that protect those uses. WQS are the foundation for other CWA requirements applicable to a water body, such as WQBELs for point source dischargers, as well as assessment of waters and establishment of TMDLs for waters not meeting applicable WQS. Designated uses play such an important role in the effective implementation of the CWA. The EPA believes it is essential to provide clear and concise regulatory requirements for states and tribes to follow (1) when adopting a use specified in section 101(a)(2) or sub-categories of such uses for a water body for the first time, or (2) when removing or revising a currently adopted use specified in section 101(a)(2) of the Act, or a sub-category of such a use. This is particularly important in light of recurring input and questions on this issue and the potential for conflicting interpretations and inconsistent case-by-case WQS program implementation.

Under section 303 (33 U.S.C. 1313) of the CWA, states and authorized tribes are required to develop WQS for waters of the United States within their state. WQS shall include designated use or uses to be made of the water and criteria to protect those uses. Such standards shall be established taking into consideration the use and value of waters for public water supplies, propagation of fish and wildlife, recreation, agricultural uses, industrial uses, navigation and other purposes (CWA 303(c)(2)(A)). Designated uses are defined at 40 CFR 131.3(f) as the ''uses specified in water quality standards for each water body or segment whether or not they are being attained.'' A ''use'' is a particular function of, or activity in, a particular water body that requires a specific level of water quality.

Section 101(a)(2) of the CWA establishes the national goal that ''wherever attainable, an interim goal of water quality which provides for the protection and propagation of fish, shellfish, and wildlife and provides for recreation in and on the water'' be achieved by July 1, 1983. CWA section 303(c)(2)(A) requires state and tribal WQS to ''protect the public health or welfare, enhance the quality of the water and serve the purposes of this [Act].'' The WQS regulation at 40 CFR part 131 interprets and implements these provisions through requirements that WQS protect the uses specified in section 101(a)(2) of the Act unless those uses are shown to be unattainable, effectively creating a rebuttable presumption of attainability.[7] Thus, it has been the EPA's interpretation that the uses specified in section 101(a)(2) of the Act are presumed attainable unless a state or tribe affirmatively demonstrates through a UAA[8] that 101(a)(2) uses are not attainable as provided by one of six regulatory factors at § 131.10(g).[9]

The current WQS regulation at 40 CFR 131.10 requires states and tribes to specify appropriate uses to be achieved and protected; requires that WQS ensure attainment and maintenance of WQS of downstream waters; allows for sub-categories of uses (e.g., to differentiate between cold water and warm water fisheries) and seasonal uses; describes when uses are attainable; lists six factors of which at least one must be satisfied to justify removal of uses specified in Section 101(a)(2) that are not existing uses; prohibits removal of existing uses; requires states and authorized tribes to revise WQS to reflect uses that are presently being attained but not designated; and establishes when a state or tribe is or is not required to conduct a UAA. States and tribes have flexibility when managing their designated uses consistent with the CWA and implementing regulation.

More specifically, the current WQS regulation requires a UAA when designating uses that do not include the uses specified in section 101(a)(2) of the CWA, when removing a designated use specified in section 101(a)(2) of the Act, or when adopting sub-categories of such uses that require less stringent criteria. The phrase ''uses specified in section 101(a)(2) of the Act'' refers to uses that provide for the protection and propagation of fish (including aquatic invertebrates), shellfish, and wildlife, and recreation in and on the water, as well as for the protection of human health when consuming fish, shellfish, and other aquatic life.[10] ''Sub-category of a use specified in section 101(a)(2) of the Act'' refers to any use that reflects the subdivision of uses specified in section 101(a)(2) of the Act into smaller, more homogenous groups of waters with the intent of reducing variability within the group. 40 CFR 131.10(c) provides that states and authorized tribes may adopt sub-categories of a use and set the appropriate criteria to reflect varying needs of such sub-categories of uses. States and tribes have broad discretion to determine the appropriate level of specificity to use in identifying and defining designated uses, and nothing in this proposal is intended to narrow that discretion. However, the EPA has found that the clearer, more accurate, and

[7] *See* 40 CFR 131.2; 131.5(a)(4); 131.6(a),(f); 131.10(g), (j), (k).

[8] *See* 40 CFR 131.3(g). A UAA is a structured scientific assessment of the factors affecting the attainment of the use that may include physical, chemical, biological, and economic factors as described in § 131.10(g).

[9] EPA's ''rebuttable presumption'' that the uses specified in CWA section 101(a)(2) are presumed attainable, unless demonstrated to be unattainable through a UAA, has been upheld in *Idaho Mining Association v. Browner,* 90 F. Supp. 2d 1078 (D. Idaho 2000).

[10] *http://water.epa.gov/scitech/swguidance/standards/upload/2000_10_31_standards_shellfish.pdf.*

refined the designated uses are in describing the state's or tribe's objective for a water body, the more effective those use designations can be in driving the management actions necessary to restore and protect water quality.[11]

The current regulation at § 131.10(g) and (h)(1) provides that states and tribes may not remove a designated use if it would also remove an existing use unless a use requiring more stringent criteria is added. Existing uses are ''those uses actually attained in the water body on or after November 28, 1975, whether or not they are included in the water quality standards.'' Existing uses are known to be ''attained'' when both the use *and* the water quality necessary to support the use has been achieved.[12] The EPA recognizes, however, that all the necessary data may not be available. Where data may be limited, inconclusive, or not available, states and tribes have discretion to determine whether an existing use has been attained, based on either the use or the water quality. It is important to note that the prohibition on removing an existing use is not intended to apply to a situation where the state or tribe wishes to remove a use where removal would result in improving the condition of a water body. The intent of the regulation is to further the objective in CWA section 101(a) to ''restore and maintain the chemical, physical, and biological integrity'' of the nation's waters, not to prevent actions that make the water body more like its minimally impacted condition. For example, if a warm water fishery exists behind a dam, the existing use provision would not prevent the state from removing that dam because doing so would likely restore the natural cold water aquatic ecosystem.

3. Rationale for Revision

Adoption of Highest Attainable Use

As discussed above, states and tribes have flexibility to designate and revise uses in accordance with the provisions of § 131.10 which implements the requirement in 303(c)(2)(A) that standards shall be set to serve the purposes of the Act as set forth in Section) 101(a)(2) and 303(c)(2)(A). However, the EPA believes that it may be appropriate to provide greater clarity in the regulations implementing this requirement. For example, as part of the UAA process, a state or tribe may be able to demonstrate that a use supporting a particular class of aquatic life is not attainable. However, if some less sensitive aquatic organisms are able to survive at the site under current or attainable future conditions, the goals of the CWA are not served by simply removing the aquatic life use designation and applicable criteria without determining whether there is some alternate 101(a)(2) use or subcategory of such a use that is feasible to attain. The UAA process can be used to identify the highest aquatic life use that is attainable (i.e., highest attainable use). Under this proposal, the state or tribe would be required to designate that highest attainable use. However, as noted above, states and tribes have broad discretion to determine the appropriate level of specificity to use in identifying and defining designated uses, and nothing in this proposal is intended to narrow that discretion. To further clarify this in rule text, the proposal would add the following language to 131.10(g): ''To meet this requirement, States may, at their discretion, utilize their current use categories or subcategories, develop new use categories or subcategories, or adopt another use which may include a location-specific use.'' Thus, while a state or tribe may wish to establish a new or revised use category or subcategory to meet the proposed HAU requirement, the state or tribe could also comply with this requirement by adopting the highest attainable use from its currently established use categories or subcategories or by adopting a location-specific use, or another defensible approach.

The EPA's current regulation at 40 CFR 131.6(a) requires that each state's or tribe's water quality standards submitted to the EPA for review must include ''use designations consistent with the provisions of sections 101(a)(2) and 303(c)(2) of the Act.'' Sections 131.10(g) and 131.10(j) implement the CWA by authorizing a state or tribe to designate uses that do not include the uses specified in section 101(a)(2) or to remove protection for a use specified in section 101(a)(2) (or subcategory of such a use) only through a UAA. If the state or tribe demonstrates through a UAA that a 101(a)(2) use, or a subcategory of such a use, is not attainable, then in order to comply with this regulatory requirement, the state or tribe will need to adopt use designations that continue to serve the 101(a)(2) goal by protecting the highest attainable use unless the state or tribe has shown that no use specified in section 101(a)(2) is attainable.

This proposal is intended to clearly articulate a requirement to adopt the HAU in the EPA's regulation. HAU is defined in this proposal as ''the aquatic life, wildlife, and/or recreation use that is both closest to the uses specified in section 101(a)(2) of the Act and attainable, as determined using best available data and information through a use attainability analysis defined in § 131.3(g).'' With this definition, the EPA recognizes and affirms the primary role accorded to states and tribes under the CWA in establishing categories of designated uses and assigning those uses to specific water bodies within their jurisdiction. The EPA intends for states and tribes to use their existing use classification scheme to meet the HAU requirement whenever the state or tribe determines that it is appropriate to do so. The EPA is not requiring states and tribes to revise their use categorization scheme by developing new use categories or subcategories, although states and tribes are encouraged to develop them if they find it practical and appropriate to do so. While the EPA believes that there is often value in specifying more narrowly targeted aquatic life uses (e.g., warm water or cold water fishery), the EPA also recognizes that it may not be practical for states or tribes to adopt fine gradations of aquatic life uses in many cases. The proposed rule would thus not affect a state or tribe's discretion to determine the appropriate level of specificity in establishing designated uses.

When adopting the HAU, states and tribes must also adopt criteria to protect that use, as specified in § 131.11(a). Requiring the HAU to be adopted as an essential part of the UAA process is important to adequately implement both CWA sections 101(a)(2) and 303(c)(2)(A). Where uses specified in section 101(a)(2) are unattainable, it is important that states and tribes still strive to attain uses that continue to serve the purposes of the Act and also enhance the quality of the water.

In determining the HAU to adopt in place of an unattainable aquatic life, wildlife, and/or recreation use, states and tribes should use the same regulatory factors (at 40 CFR 131.10(g)) and data analysis that were used to evaluate attainability. When conducting this review and soliciting input from the public, states and tribes should consider not only what is currently attained, but also what is attainable in the future after achievable gains in water quality are

[11] EPA notes that a use may meet the description of a ''sub-category of a use specified in section 101(a)(2) of the Act,'' but not provide an equal level of protection as a use specified in section 101(a)(2) of the Act. If a state wishes to designate such a sub-category, a UAA would be required, consistent with § 131.10(j).

[12] *See http://water.epa.gov/scitech/swguidance/standards/upload/Smithee-existing-uses-2008-09-23.pdf.*

realized. Such a prospective analysis may involve the following:

- Identifying the current and expected condition for a water body;
- Evaluating the effectiveness of best management practices (BMPs) and associated water quality improvements;
- Examining the efficacy of treatment technology from engineering studies; and
- Using water quality models, loading calculations, and other predictive tools.

Once a state or tribe has determined the HAU, there are several different approaches it may wish to consider for articulating the designated use in the relevant water quality standards regulations. The EPA's intent is for a state or tribe to have the flexibility to choose its preferred approach for articulating the HAU in regulation. The EPA provides the following example approaches, but does not intend states and tribes to be limited to only these approaches. The EPA invites comments on other approaches or examples that states and tribes could use when articulating the HAU, or examples of scenarios where the following approaches may not be appropriate. The EPA emphasizes that states and tribes are not required to develop new use categories or subcategories to meet the HAU requirement.

1. Use a refined designated use structure that is already adopted into state or tribal regulation: Where a state or tribe already has a refined designated use structure adopted into state regulations, they could consider adopting the ''next best'' attainable use that already exists in the use structure as the HAU. For example, consider a state with the following four aquatic life uses: exceptional, high, modified, and limited aquatic life use—each with associated dissolved oxygen criteria that protect the use. The state determines through a UAA (based on a factor at § 131.10(g)) that a particular stream cannot attain the designated ''high aquatic life use'' and associated dissolved oxygen criterion due to a low head dam and resulting impoundment. Because the dam cannot be removed or operated in such a way as to attain the dissolved oxygen criteria needed to protect the expected biological community at the site, the state adopts the ''modified aquatic life use'' and dissolved oxygen criterion to protect the revised use. The UAA documents that the ''modified aquatic life use'' reflects the HAU despite the disturbed condition of the water body.

2. Revise the current designated use structure to include more refined uses and/or sub-categories of uses: Some states or authorized tribes may not have a refined designated use structure adopted into their state or tribal regulations, but rather have a general use category expressed as a ''general aquatic life use,'' ''fish and wildlife use,'' ''recreation use,'' and so on. If a state or tribe finds that its only option upon determining that such a general use category is not attainable is to remove it altogether, a state or tribe may wish to consider revising its current designated use framework to include more refined uses and/or sub-categories, and adopt criteria to protect those uses.

For example, a state or tribe may be able to adequately demonstrate (consistent with 40 CFR 131.10(g)(2)) that natural conditions or water levels preclude the attainment of a use and associated water quality criteria. The state or tribe may document that it is infeasible to attain an aquatic life use associated with fish because the water is naturally intermittent. However, intermittent streams provide essential habitat for different types of aquatic life (e.g., aquatic invertebrates). Such an aquatic life use is likely attainable if not already attained. Therefore, in this scenario the state or tribe may wish to adopt a refined ''intermittent aquatic life use'' and criteria to protect that use in its statewide designated use framework because such a use category reflects the naturally expected aquatic life use for intermittent streams that could be applied to multiple streams in the state.

As another example, some states have chosen to refine their use categories to reflect the various biological communities that might be expected in a water body. If a state is interested in revising its current designated use structure, it may wish to define its uses based on the composition and structure of the aquatic life expected for each use with associated biological and dissolved oxygen criteria adopted into regulation. Incorporating such refinements into designated uses allows the state to tailor its use designations to reflect the actual biological community expected.

3. Designate a location-specific use and adopt criteria to protect that use: A state or tribe may determine that a use is unattainable for one particular parameter (e.g., altered pH due to highly mineralized geology, or a combined sewer overflow (CSO)-impacted use) or suite of parameters in a specific location. In such situations, the state or tribe may choose to adopt a use that more accurately reflects the location-specific expectations, such as a ''pH limited aquatic life use,'' a ''habitat limited aquatic life use,'' or a ''minerals limited aquatic life use.'' The state or tribe would then adopt a new set of criteria to protect that use, but could adopt all the same criteria levels as were protective of the original use, except for the parameter or parameters limiting the location-specific use. Such an approach would not require a state or tribe to add the location-specific use in its framework, but it could do so if later if it finds that other waters will fall into the same category.

The concept of HAU should not to be confused with ''site-specific criteria.'' A site-specific criterion is designed to protect the current unchanged designated use, but the criterion value may be different from the statewide or otherwise applicable criterion because it is tailored to account for site-specific conditions that may cause a given chemical concentration to have a different effect on one site than on another. By contrast, the criterion supporting a newly established highest attainable use is designed to protect the revised use associated with a different aquatic community expected in the water body.

In addition to this proposal requiring states and tribes to adopt the HAU, the EPA recommends that states and tribes consider the HAU during a triennial review. If new information becomes available during a triennial review to indicate that a use higher than what is currently designated is attainable, states and tribes should revise their WQS to reflect the HAU. As with the HAU requirement, states and tribes are not required to revise their currently established use categories during triennial review to allow for more refined designation of higher uses, though they may wish to consider doing so.

Revisions To Clarify When a UAA Is and Is Not Required

The EPA's proposal also revises § 131.10(g) to clarify that the factors at § 131.10(g) are only required to be considered when § 131.10(j) requires a UAA. The current language in § 131.10(g) is ambiguous on this point and thus has led to confusion as to whether § 131.10(g) applies to all use revisions or only those actions addressed in § 131.10(j). The EPA's 1998 ANPRM stated that the EPA's position, at the time, was that a UAA is not limited to actions addressed in § 131.10(j). However, the EPA has implemented the CWA to focus on uses specified in § 101(a)(2) and now believes that the better interpretation of its regulations is that the factors in 131.10(g) are only required to be considered when a state or tribe is demonstrating that a use specified in § 101(a)(2) or a subcategory of such a use is not attainable through a UAA.

The EPA's interpretation is supported by § 131.10(j), that explains when a UAA is required, and § 131.3(g) that defines a UAA as ''a structured scientific assessment of the factors affecting the attainment of the use which may include physical, chemical, biological, and economic factors as described in § 131.10(g).'' When §§ 131.3(g), 131.10(g) and (j) are read together, it is clear that the factors at § 131.10(g) are only required to be considered when the state or tribe must do a UAA under § 131.10(j). This proposal adds language to §§ 131.10(g) and 131.10(j) to clarify the relationship between these two provisions and the intent of these provisions to implement CWA sections 101(a)(2) and 303(c)(2)(A). For all other designated uses, this proposal uses the term ''uses not specified in section 101(a)(2)'' to refer to uses discussed in section 303(c)(2)(A) but not included in section 101(a)(2). Section 303(c)(2)(A) and the EPA's regulation at § 131.10(a) requires the state or authorized tribe to take into consideration the ''use and value'' of water for public water supplies, propagation of fish and wildlife, recreational purposes, agricultural, industrial and other purposes, and also taking into consideration their use and value for navigation. The UAA demonstration satisfies this requirement for uses specified in 101(a)(2). And while states and authorized tribes are not required by regulation to conduct a UAA using factors at § 131.10(g) when designating and removing a use not specified in 101(a)(2), the EPA recognizes that UAAs may provide valuable information to a state or authorized tribe when deciding how to manage their waters and demonstrate consideration of a water's ''use and value.''

Finally, the EPA is proposing to clarify § 131.10(k) to state when a UAA is *not* required. Specifically, § 131.10(k) is revised to articulate that a UAA is not required when a state or authorized tribe designates or has designated uses specified in section 101(a)(2) of the Act for a water body for the first time, removes a designated use that is not specified in section 101(a)(2) of the Act, or adopts a subcategory that requires criteria as stringent as the previously applicable criteria. The current structure of 131.10(j)(2) and 131.10(k) could result in situations where a UAA is not required by 131.10(k) but is required by 131.10(j)(2) thus leading to confusion. The EPA intends to eliminate this confusion by restructuring 131.10(k) as proposed.

The EPA invites comments on the proposed addition of 40 CFR 131.3(m), and the proposed amendments to § 131.10(g), § 131.10(j) and § 131.10(k). The EPA also invites comment on any other options it should consider or on the interpretations expressed in this section.

D. Requirements of Triennial Reviews

1. The EPA Proposal

The EPA is proposing to amend the triennial review requirements of paragraph (a) of § 131.20 to clarify that a state or tribe shall re-examine its water quality criteria during its triennial review to determine if any criteria should be revised in light of any new or updated CWA section 304(a) criteria recommendations to assure that designated uses continue to be protected.

2. Rationale for Revision

Sections 303(a) through (c) of the CWA require that states and tribes adopt WQS applicable to their interstate and intrastate waters and that the EPA review and approve or disapprove these standards based on whether they are consistent with the Act. Section 303(c)(1) further requires states and tribes to hold public hearings at least once every 3 years for the purpose of reviewing applicable WQS and, as appropriate, modifying and adopting standards. The state or tribe decides whether and how to modify or adopt its WQS; however, any new or revised standards shall be submitted to the EPA for review and approval or disapproval.

The EPA adopted regulations in 1983 implementing these provisions at 40 CFR 131.20. This regulation requires that states and tribes hold a public hearing to review applicable WQS at least once every 3 years (i.e., a ''triennial review'') and, as appropriate, modify and adopt standards. Public hearings on WQS provide an essential opportunity for stakeholders and the general public to participate in the WQS-setting process to provide input and raise issues to appropriate officials. In addition, the regulation requires states and tribes to consider whether any new information has become available that indicates if uses specified in CWA section 101(a)(2) that were previously unattainable are now attainable. 40 CFR 131.20(c) provides that the results of these reviews be submitted to the EPA (see also § 131.6(f)).

Stakeholders have expressed concern that states and tribes may retain criteria in their WQS that are no longer protective of designated uses for multiple triennial review cycles, despite the availability of new or updated EPA CWA section 304(a) criteria recommendations. While states and tribes are not required to use EPA's 304(a) criteria recommendations, the EPA agrees that it is important for states and tribes to consider any new or updated 304(a) criteria as part of their triennial review, in order to ensure that state or tribal water quality criteria reflect current science and protect applicable designated uses. In this regard, 40 CFR 131.20(a) requires that any waterbody segment with WQS that does not include the uses specified in CWA section 101(a)(2) be re-examined and updated if new information becomes available to indicate that previously unattainable CWA section 101(a)(2) uses are now attainable. However, because 40 CFR 131.20(a) does not include a parallel statement regarding criteria that support these uses, states and tribes may not re-evaluate their existing criteria to ensure that the criteria continue to be protective of the designated uses when new or updated 304(a) criteria recommendations become available. As a result, the EPA is proposing to include an explicit reference to 304(a) recommended criteria at 131.20(a), to ensure that new or updated 304(a) criteria are considered during triennial review.

The EPA invites comments on the proposed amendments to paragraph (a) of § 131.20. The EPA also invites comment on any other options it should consider or on the interpretations expressed in this section.

E. Antidegradation Implementation

The EPA is proposing to amend several provisions of § 131.12 related to implementing the antidegradation requirements. These include (1) clarifying the options available to states and tribes when identifying Tier 2 high quality waters, (2) clarifying that states and tribes must conduct an alternatives analysis in order to support state and tribal decision-making on whether to authorize limited degradation of high quality water, and (3) specifying that states and tribes must develop and make available to the public implementation methods for their antidegradation policies. The EPA is also proposing to add language to § 131.5(a) describing the EPA's authority to review and approve or disapprove state-adopted or tribal-adopted antidegradation policies. The language at § 131.5(a) will further specify that if a state or tribe has chosen to formally adopt implementation methods as water quality standards, the EPA would review whether those implementation methods are consistent with 131.12.

Background

Section 101(a) of the CWA emphasizes the prevention of water pollution and expressly includes the objective ''to restore and *maintain* the chemical, physical and biological integrity of the Nation's waters (33 U.S.C. 1251) (emphasis added). The antidegradation requirements that the EPA incorporated by regulation in 1983 into 40 CFR 131.12 implement the maintenance aspect of CWA section 101(a) and are an essential component of the overall WQS program. Although designated uses and criteria are the primary tools states and tribes use to achieve the CWA 101(a) goals, antidegradation complements these by providing a framework for maintaining existing uses, for protecting waters that are either attaining or are of a higher quality than necessary to support the CWA 101(a)(2) goals, and for protecting state/tribal identified Outstanding National Resource Waters (ONRWs). Antidegradation plays a critical role in allowing states and tribes to maintain and protect the valuable resource of high quality water by ensuring that decisions to allow a lowering of high quality water are made in a transparent public manner and are based on a sound technical record.

In the Water Quality Act of 1987, Congress expressly affirmed the principle of antidegradation that is reflected in section 101 of the Act. In those amendments to the CWA, Congress incorporated a reference to antidegradation policies in section 303(d)(4)(B) of the Act (33 U.S.C. 1313(d)(4)(B)): ''Standard Attained—For waters identified under paragraph (1)(A) where the quality of such waters equals or exceeds levels necessary to protect the designated use for such waters or otherwise required by applicable WQS, any effluent limitation based on a total maximum daily load or other waste load allocation established under this section, or any WQS established under this section, or any permitting standard may be revised only if such revision is subject to and consistent with the antidegradation policy established under this section'' (emphasis added). This provision not only confirms that an antidegradation policy is an integral part of the CWA, but also explains the relationship of the antidegradation policy to other CWA regulatory programs.[13] Antidegradation reviews are applicable to revisions to effluent limitations based on a TMDL, wasteload allocation, or water quality standard, but they are not required for revisions to a TMDL, wasteload allocation, or water quality standard.[14]

High quality waters provide support for aquatic life and recreation and support unique and significant ecologies and species habitat. These attributes confer a special degree of resiliency and resistance to adverse effects, particularly as the nation's waters face an increasing degree of stress from anthropogenic influences. Therefore, maintenance and protection of high quality waters has never been more important.

Protection of waters that meet or exceed levels necessary to support the CWA uses is central to supporting both economic and community growth and sustainability. Such waters contribute to our public health, aquatic ecosystems, drinking water supplies, and to the welfare of families and communities. The health and growth of tourism, recreation, fishing, and businesses and the jobs they create rely on a sustainable source of clean water. Degradation of water quality may result in increasing public health risks, declining aquatic communities and ecological diversity, and increasing treatment costs that must be borne by ratepayers and local governments. Maintenance of waters that exceed levels necessary to support the CWA uses can sometimes save time and economic resources for a community in the long-term. Using an antidegradation program to prevent the degradation of a water body may be more cost-effective and efficient than long-term restoration efforts. In addition, maintaining a water body in its initial high quality condition helps ensure the preservation of unique attributes that may ultimately be impossible to fully restore in a number of situations.

Currently, 40 CFR 131.12 requires states and tribes to adopt an antidegradation policy and identify implementation methods for that policy. The state's or tribe's policy must provide protection for all existing uses, hereafter referred to as ''Tier 1'' protection (40 CFR 131.12(a)(1)). The policy must also require the maintenance and protection of high quality (''Tier 2'') waters unless the state or authorized tribe finds that ''allowing lower water quality is necessary'' to accommodate ''important economic or social development in the area in which the waters are located,'' a process hereby referred to as ''Tier 2 review'' (40 CFR 131.12(a)(2)). Additionally, the policy must provide for the maintenance and protection of water quality in ONRWs, identified by the state or tribe, hereinafter referred to as ''Tier 3'' waters (40 CFR 131.12(a)(3)). This proposal focuses on different aspects of state and tribal implementation methods to ensure effective and transparent implementation of Tier 2 high quality water antidegradation protection provisions.

In this regard, the EPA indicated in its 1998 ANPRM that ''on a national scale, antidegradation is not being used as effectively as it could be,'' a concern that continues today and is echoed by stakeholders who have identified antidegradation as an underused component of water quality protection. Although the federal antidegradation regulation is intended to help states and tribes protect and maintain high quality waters, the number of waters that are identified as impaired continues to grow. The benefits of high quality waters may be jeopardized if states and tribes do not consider the long-term consequences of lowering water quality or evaluate the alternatives that might be available to reduce the need to accommodate increased pollution.

While the EPA has issued guidance in the past to help facilitate state and tribal implementation of the regulatory antidegradation provisions, the EPA received substantial feedback from stakeholders that existing CWA antidegradation regulatory provisions and related guidance have not been fully successful in ensuring consistent and effective implementation of Tier 2 high quality water protections. Moreover, states have recognized the limits of national guidance in the area of CWA implementation. Most recently on March 30, 2011, the Environmental Council of the States published a resolution entitled ''Objection to U.S. Environmental Protection Agency's Imposition of Interim Guidance, Interim Rules, Draft Policy and Reinterpretation Policy'' in which it states that the ''EPA should minimize the use of interim guidance, interim rules, draft policy and reinterpretation policy and eliminate the practice of directing its regional or national program managers to require compliance by states with the same in the implementation of delegated programs.'' For these and the other reasons discussed above, the EPA is, therefore, revising its regulation to update the requirements for transparent and effective state and tribal antidegradation implementation.

[13] *PUD No. 1 of Jefferson County v. Washington Department of Ecology,* 511 U.S. 700, 705 (1994) (''A 1987 amendment to the Clean Water Act makes clear that section 303 also contains an 'antidegradation policy . . .'").

[14] *Native Village of Point Hope* v. *U.S. Envtl. Prot. Agency,* No. 3:11–cv–00200–TMB, slip op. at 24–25 (D. Alaska Sept. 14, 2012).

1. The EPA Proposal—Part 1: Identification of High Quality Waters

The EPA is proposing to add paragraph (b)(1) to § 131.12 to provide that high quality waters may be identified on a parameter-by-parameter basis or on a water body-by-water body basis, as long as the state or tribal implementation methods ensure that waters are not excluded from Tier 2 protection solely because not all of the uses specified in CWA section 101(a)(2) are attained. The EPA's established view is that either method of identifying high quality waters is acceptable, but is proposing today to codify that flexibility for states and tribes into regulation. By ''the uses specified in CWA section 101(a)(2)'' the EPA means the uses and functions encompassed within the CWA section 101(a)(2), such as aquatic life support, wildlife support, consumption of aquatic life, and recreation.

The nationally applicable water quality standards regulation at § 131.12 describes high quality waters as those where the quality of the waters exceed levels necessary to support the propagation of fish, shellfish, and wildlife and recreation in and on the water (i.e., the CWA goals articulated in section 101(a)(2)). States typically use one of two approaches to identify high quality waters. While the EPA specified in the ''Water Quality Guidance for the Great Lakes System'' that high quality waters subject to 40 CFR part 132 must be identified using a parameter-by-parameter approach, the WQS regulation applicable to all states and tribes (at 40 CFR part 131) does not currently specify how a state or tribe must identify its high quality waters for purposes of the antidegradation requirements. States and tribes using a parameter-by-parameter approach identify which waters are of high quality for purposes of a Tier 2 review at the time the activity that would lower water quality is proposed. Under this approach, when an activity is proposed that would potentially lower water quality in any high quality water, the state or tribe would determine for which parameters the water quality is better than applicable criteria developed to support the CWA 101(a)(2) uses. Each parameter for which water quality would be lowered by the permitted activity is considered independently and, once a parameter is determined to exist at a level that is better than applicable criteria, the state or tribe would conduct a Tier 2 review for that parameter. In contrast, states and tribes using a water body-by-water body approach typically identify high quality waters in advance on a list by weighing a variety of factors to classify a water body's overall quality. If an activity is proposed that would potentially lower water quality, the state would first determine if that water body is on its Tier 2 list, and thus eligible for Tier 2 review.

The EPA has found, however, that it is currently possible for high quality waters to be identified on a water body-by-water body basis in a manner that the EPA believes may be contrary to the intent of the antidegradation provisions. In some cases, states or tribes have implemented antidegradation such that, where a water body is listed on the CWA section 303(d) list based on one or more parameters affecting only one of the CWA 101(a)(2) uses, the state or tribe automatically considers the water no longer high quality. As a result, the state or tribe would no longer conduct Tier 2 reviews before allowing a lowering of water quality for any parameter. However, individual Section 303(d) listings can be a potentially poor indicator of the overall quality of a surface water because, although one or more of the uses specified in 101(a)(2) is listed as impaired, one or more other uses specified in 101(a)(2) might still be attained and the water quality may be higher than necessary to support such use(s). Such a means of identifying high quality waters would categorically deny Tier 2 protection to a water body that is still of high quality with respect to other uses specified in CWA 101(a)(2).

If a water body can be excluded from Tier 2 protection solely because one of the uses specified in 101(a)(2) is not being attained, without a holistic evaluation of the water body, it is possible that a large number of state and tribal waters would never be subject to Tier 2 review for any parameter. Yet those waters may in fact be high quality waters relative to other unimpaired uses. Thus, such water bodies could be degraded further without a public participation process. For example, mercury is widely prevalent in U.S. waters and is known to bioaccumulate in fish tissue, thus affecting the water body's ability to support protection and propagation of aquatic life. A recent statistically based EPA sampling survey found predator species fish tissue in 49 percent of the sampled population of lakes in the conterminous United States with surface areas greater than or equal to 1 hectare exceeded the EPA's recommended 0.3 ppm tissue-based mercury criterion (''National Study of Chemical Residues in Lake Fish Tissue,'' EPA 823–R–09–006). If all states and tribes used an approach for identifying high quality water whereby any impairment rendered the water body ineligible for Tier 2 protection, almost half of the lakes would automatically be excluded from Tier 2 high quality water protection. The EPA's view is that this approach would not be consistent with the objectives of the CWA and the intent of the antidegradation regulation.

The EPA recognizes that there may be multiple ways for a state or tribe to develop a water body-based approach for identifying high quality waters consistent with the goals of the CWA and the antidegradation regulation. The EPA understands that in some cases, § 131.12(a)(2) has been interpreted to mean that if any one of the uses reflecting CWA 101(a)(2) goals is not supported, that the water body as a whole cannot be considered high quality. The regulatory language, however, is derived from the language in CWA 101(a)(2) that specifies it is a national goal to achieve water quality that provides for ''the protection and propagation of fish, shellfish, and wildlife and provides for recreation in and on the water.'' The intent of this CWA statement is to strive towards all of the uses specified in the provision and not to stop striving towards all of the uses simply because one of them is not being achieved. The EPA's proposal and interpretation of 40 CFR 131.12(a)(2) is consistent with the intent of the CWA.

Rather than excluding a water body from Tier 2 protection solely because not all of the uses specified in CWA section 101(a)(2) are attained, the EPA would expect the state or tribe to consider a combination of chemical, biological, and physical characteristics in identifying high quality waters. In other words, the EPA would expect the state or tribe to use all the relevant available data to conduct an overall holistic assessment of these characteristics in order to determine whether a water body would receive Tier 2 protection. Some of the factors a state or tribe may consider include, but are not limited to, existing aquatic life uses including aquatic assemblages, habitat, hydrology, geomorphic processes, and landscape condition; existing recreational uses and recreational significance; and the overall value and significance of the water body from an ecological and public-use perspective. Numerous tools, such as biological, habitat, hydrologic, geomorphic, and landscape assessments or the environmental impact statement rating system, could be useful to states and tribes in making and supporting these judgments.

For purposes of better understanding this proposal, consider the following examples.

• *Water Body A has aquatic life and recreational designated uses and is listed as impaired for methylmercury and bacteria, pursuant to CWA section 303(d).* Under this proposed rule, a state or tribe using a water body-by-water body approach could exclude Water Body A from its Tier 2 list because the state or tribe could show that high levels of methylmercury prevent the attainment of protection and propagation of fish, shellfish and wildlife, *and* that high levels of bacteria prevent attainment of recreation in and on the water.

• *Water Body B has aquatic life and recreational designated uses and is listed pursuant to CWA section 303(d) as impaired for methylmercury, but not for bacteria or any other pollutant necessary to protect recreation.* Under a water body-by-water body approach, the proposed rule would prohibit the state or tribe from excluding Water Body B from its Tier 2 list solely because the water body cannot attain protection and propagation of aquatic life due to methylmercury. Water Body B is still attaining recreation in and on the water as specified in section 101(a)(2) of the Act.

The EPA invites comments on the proposed addition of paragraph (b)(1) to § 131.12. Additionally, the EPA is considering whether to specify how a state or tribe determines for which parameters Tier 2 review must be conducted depending on the approach used to identify high quality waters. The EPA requests comment on whether, once a high quality water is identified, the Tier 2 review process for that water body should differ depending on the approach used to identify it as high quality. As the EPA has explained before in the ANPRM and in the ''Water Quality Guidance for the Great Lakes System'' (40 CFR part 132), for high quality waters identified through the parameter-by-parameter approach, states and tribes conduct Tier 2 reviews for all parameters for which the water quality has been identified as better than the applicable criteria developed to support the CWA 101(a)(2) uses. Each parameter for which water quality would be lowered by the permitted activity is considered independently and, once a parameter is determined to exist at a level that is better than applicable criteria developed to support the CWA 101(a)(2) uses, the state or tribe would conduct a Tier 2 review for that parameter.

The EPA has made a variety of different statements about how Tier 2 reviews are conducted once the water body is identified as Tier 2 using a water body-by-water body approach.[15] [16] Thus, for the water body-by-water body approach the EPA could specify that Tier 2 reviews must be conducted for all parameters for which the water quality has been identified as better than the applicable criteria developed to support the CWA 101(a)(2) uses.

Alternatively, the EPA could specify that for waters identified as high quality on a water body-by-water body basis, Tier 2 reviews are only required for parameters associated with the 101(a)(2) uses currently being supported. For example, in Water Body B above, a Tier 2 review would only be required for each parameter that is better than the applicable criteria to protect recreation. And, a Tier 2 review would not be required for any parameter only associated with the aquatic life use (i.e., and not also associated with the recreation use).

The EPA could also specify that states and tribes have discretion on how to conduct the Tier 2 reviews. The EPA also invites comments on any other options it should consider or on the interpretations expressed in this section.

2. The EPA Proposal—Part 2: Alternatives Analysis

The EPA is proposing to add paragraph (b)(2) to 40 CFR 131.12 to ensure that states and tribes will only make a finding that lowering water quality is necessary, as required in § 131.12(a)(2), after conducting an alternatives analysis that evaluates a range of non-degrading and minimally degrading practicable alternatives that have the potential to prevent or minimize the degradation associated with the proposed activity. This proposal also provides that if a state or tribe can identify any practicable alternatives, the state or tribe must choose one of those alternatives to implement when authorizing a lowering of high water quality.

Section 131.12(a)(2) also provides that high quality water shall be maintained and protected unless the state or tribe finds (after satisfaction of public participation and intergovernmental coordination requirements) that ''allowing lower water quality is necessary to accommodate important economic or social development in the area in which the waters are located'' (40 CFR 131.12(a)(2)). As discussed previously, this process is called a Tier 2 review. Tier 2 review calls for the state or tribe to investigate two questions: (1) Whether allowing lower water quality is necessary to accomplish the proposed activity, typically by examining alternative ways of accomplishing the activity through an alternatives analysis; and (2) whether the proposed activity that will result in lower water quality will accommodate important economic or social development, through a socio-economic analysis. States and tribes may determine the order in which to complete the two aspects of the finding. In addition, states have discretion to decide there is no need to answer the second question if the answer to the first question is ''no.'' For example, a state or tribe may choose to first ask whether lowering of water quality is necessary to accomplish the proposed activity, and if the answer is ''no,'' decide at that point not to investigate whether the proposed activity will accommodate important economic or social development. While this finding is a state or tribal responsibility, the EPA recognizes that states and tribes may establish processes requiring the entity responsible for conducting the proposed activity to provide information or conduct the necessary evaluations.

Although the existing regulation implies that the state or tribe must have a means of evaluating whether a lowering of water quality is necessary to accomplish the proposed activity, currently there is no explicit requirement to conduct an alternatives analysis. Even if a state or tribe conducts an alternatives analysis, the regulation does not specify that, where there is a practicable alternative, the state or tribe must select an alternative for implementation. For these purposes, the term ''practicable'' means that the alternatives considered must be available for the proposed activity, technologically possible, able to be done or put into practice successfully at the site in question, and economically viable. This lack of specificity can result in situations where a state or tribe does not evaluate less-degrading or non-degrading alternatives to the proposed activity, and thus lacks a reasoned basis for determining if the proposed lowering of water quality is necessary to accomplish the proposed activity, or not. The EPA's view is that this lack of specificity can lead to state or tribal decisions to lower water quality without appropriately making a finding that a

[15] See ''EPA Region VIII Guidance: Antidegradation Implementation; Requirements, Options, and EPA Recommendations Pertaining to State/Tribal Antidegradation Programs,'' August, 1883, page 14, *http://water.epa.gov/scitech/swguidance/standards/adeg/upload/Region8_ch2_pg5-20.pdf.*

[16] See ''Proposed Water Quality Standards for Kentucky,'' November 2002, page 68977, *http://www.epa.gov/fedrgstr/EPA-WATER/2002/November/Day-14/w28922.htm.*

lowering is necessary, contrary to section 131.12(a)(2).

This issue was considered carefully as part of the development of updated water quality requirements for the Great Lakes states in 1995. The regulation at 40 CFR part 132, Appendix E, addresses it by requiring that any entity seeking to degrade high water quality must submit an antidegradation demonstration for consideration by the state. This demonstration includes an analysis identifying any cost-effective pollution prevention alternatives and techniques, as well as an analysis identifying alternative or enhanced treatment techniques (and their relative costs) that are available to the entity and that would eliminate or significantly reduce the extent to which the increased loading results in a lowering of water quality. States and tribes should tailor the level of detail and documentation in antidegradation reviews to the specific circumstances encountered. The state or tribe then uses that information to determine whether or not the lowering of water quality is necessary.

Under the approach proposed today, the state or tribe would conduct its alternatives analysis by considering a range of non-degrading and minimally degrading practicable alternatives to the proposed activity. Similar to the alternatives analysis provided for in 40 CFR part 132, this evaluation would include a consideration of any non-degrading or minimally degrading cost-effective pollution prevention alternatives and enhanced treatment techniques, but would not be limited to those. For example, alternatives could include no discharge, pollution prevention measures, process changes, reduction in the scale of the project, advanced or different treatment technologies, water recycling and reuse, land application, seasonal or controlled discharge options avoiding critical water quality periods, and alternative discharge locations, if such measures were practicable.

Once the state or tribe has identified a range of practicable alternatives, the state or tribe would evaluate the alternatives in terms of the extent of degradation that would result. By initially considering practicable alternatives that represent a range from non-degrading to minimally degrading as opposed to simply identifying the single least degrading alternative, the state or tribe then has a basis to make the required finding, considering the implications and technological and economic practicability of the alternatives more holistically, and considering any impacts beyond the direct effects on water quality, such as cross-media impacts (e.g., impacts on land due to land application of pollutants found in water). This will allow the state or tribe to determine whether the lowering of water quality is necessary to accommodate important economic or social development per Part 131.12(a)(2). As reflected in the Great Lakes System regulation at Part 132, the EPA believes states and tribes should tailor the level of detail and documentation of alternatives analyses in antidegradation reviews to the significance and magnitude of the particular circumstances encountered.

The EPA invites comment on the proposed addition of paragraph (b)(2) to § 131.12. The EPA also invites comment on any other options it should consider or on the interpretations expressed in this section.

3. The EPA Proposal—Part 3: Developing and Making Available to the Public Antidegradation Implementation Methods

The EPA is proposing to add paragraph (b) to 40 CFR 131.12 to specify that states and tribes must develop and make available to the public antidegradation implementation methods to improve program implementation, ensure consistency with the CWA, and provide transparency as to applicable state and tribal antidegradation review requirements. The EPA is also making changes to language in § 131.5(a) describing the EPA's authority to review and approve or disapprove state-adopted or tribal-adopted antidegradation policies. The language in § 131.5(a) further specifies that if a state or tribe has chosen to formally adopt implementation methods as water quality standards, the EPA would review whether those implementation methods are consistent with § 131.12. In addition to the proposed requirements included in this proposal, the EPA is considering and requesting comment on whether the EPA should include a requirement that antidegradation implementation methods be adopted as WQS and thus subject to the EPA's review and approval or disapproval. Alternatively, the EPA is considering and requesting comment on whether the EPA should specify that states and tribes may, but are not required to, adopt antidegradation implementation methods as WQS.

Currently there is confusion whether the existing regulations require states and tribes to adopt antidegradation implementation methods as WQS. Stakeholders have raised concerns that some states and tribes have not developed or made publically available antidegradation implementation methods, despite the fact that the regulation requiring this was established in 1983. Specifically, they are concerned that the absence of such methods reduces transparency in the implementation of states' and tribes' policies, and potentially limits the ability to ensure protection of existing uses, high quality waters, and ONRWs to the full extent required by the regulation. The CWA at section 101(e) specifically states that ''public participation in the development, revision, and enforcement of any regulations, standard, effluent limitation, plan, or program established . . . under this Act shall be provided for, encouraged, and assisted. . . .'' The EPA encourages states and tribes to provide a robust and transparent process for developing and making available to the public their antidegradation implementation methods and for implementing those methods in specific cases.

Section 501(a) of the CWA (33 U.S.C. 1361(a)) authorizes the EPA Administrator to ''prescribe such regulations as are necessary to carry out [her] functions under this Act.'' The CWA, under section 303(c), also specifies that the EPA Administrator must review and approve new or revised WQS after determining they are consistent with applicable requirements under the CWA. The EPA believes that antidegradation implementation methods are an important component of implementing antidegradation policies. Thus, the EPA is considering and requesting comment on whether the EPA should include a requirement that implementation methods be formally adopted as WQS and thus subject to the EPA's review and approval or disapproval. Formal adoption of implementation methods as WQS, along with EPA review under section 303(c) of the Act, would help ensure the consistent and effective implementation of the state or tribe's antidegradation provisions so that waters will be maintained and protected in accordance with the objectives of the Act.[17] At the same time, the EPA acknowledges the primary role of states and tribes in establishing and implementing water quality standards. The EPA is thus alternatively considering and requesting comment on whether to specify in rule that states and tribes may, but are not required to, adopt antidegradation implementation methods as WQS subject to EPA approval. In this case,

[17] As of 2013, the EPA is aware of 25 states that have adopted antidegradation implementation methods entirely into rule.

states and tribes must develop antidegradation implementation methods, and must make them available to the public, but they would not be subject to EPA review and approval or disapproval unless the state or tribe chose to formally adopt them as WQS.

Additionally, antidegradation is an essential part of WQS and state and tribal approaches to implementing antidegradation requirements may have direct implications for NPDES permits, as well as other federal permits and licenses for activities that affect water quality. The EPA believes that this may be an additional reason why the regulations should require states and tribes to formally adopt, after providing an opportunity for public involvement, and obtain EPA approval for antidegradation implementation methods. Lastly, state and tribal antidegradation programs that have antidegradation implementation methods adopted into regulations are more transparent to stakeholders and the public, as well as provide greater clarity to regulated industry.

The ''Water Quality Guidance for the Great Lakes System'' (40 CFR part 132) provides that an acceptable antidegradation policy and implementation methods are required elements of a state's or tribe's WQS program for waters of the Great Lakes system. That regulation requires that Great Lakes states and tribes adopt provisions into their policy and implementation methods that are consistent with a list of specifications, including details on how high quality waters are to be identified and on the components of antidegradation Tier 2 reviews.

Consistent with this ''Water Quality Guidance for the Great Lakes System'' requirement and for the reasons explained, the EPA is considering and seeking comments on a revision to the antidegradation regulation at 40 CFR 131.12 that would require states and tribes to adopt antidegradation implementation methods in order to improve program implementation, ensure consistency with CWA, and provide transparency as to applicable state or tribal antidegradation review requirements. If the EPA were to finalize such a requirement, the EPA would expect that a state or tribe's adopted implementation methods would describe how the state or tribe intended to implement each aspect of its policy, consistent with § 131.12(a), as well as how antidegradation decisions would be documented. This would provide sufficient information so that the public and the EPA would understand the extent to which activities affecting water quality are being authorized consistent with the state's or tribe's antidegradation policy and other CWA requirements.

The EPA invites comments on the proposed addition of paragraph (b) to § 131.12. As previously mentioned, there is confusion whether the existing regulations require states and tribes to adopt antidegradation implementation methods as WQS. The EPA requests comment on whether the EPA should require, as part of Section 131.12(b), that implementation methods be adopted as WQS and thus subject to the EPA's review and approval or disapproval. If the EPA makes adoption of implementation methods a requirement, the EPA is also considering corresponding revisions to sections 131.5(a) and 131.6(d). Specifically, the EPA requests comment on whether a corresponding revision should be made to section 131.6(d) to clarify that implementation methods are one of the minimum requirements for a water quality standards submission. Alternatively, the EPA is requesting comment on whether the EPA should explicitly specify in regulation that states and tribes are not required to adopt antidegradation implementation method as WQS. Finally, the EPA invites comments on any other options it should consider or on the interpretations expressed in this section.

4. Minimum Elements of an Antidegradation Implementation Method

The EPA's basis for taking approval or disapproval action on a state's or a tribe's antidegradation policy is whether the policy is consistent with the CWA and the water quality standards regulations at 40 CFR § 131.12. While the current regulations do not require states or tribes to adopt antidegradation implementation methods as water quality standards, if a state or tribe chooses to do so, the EPA would review a state's or tribe's implementation methods on the basis of ensuring that the methods do not undermine the state's or tribe's own antidegradation policy. This proposed revised antidegradation regulation continues to provide for a wide range of state and tribal approaches to antidegradation. States and tribes have considerable discretion in how they address each of the elements of antidegradation implementation specified in the regulation. To facilitate development of implementation methods, the EPA is providing in this preamble a list of the areas states' and tribes' implementation methods would need to address, at a minimum, to be consistent with the WQS regulation. This list is based on requirements currently found in the federal antidegradation regulation, as well as proposed requirements found in this action. Again, how states and tribes address each of these areas in their methods is within their discretion, as long as it does not undermine their antidegradation policy or is otherwise inconsistent with the Act or EPA's regulations.

a. Scope and applicability: the state or tribe should describe the scope and applicability of their antidegradation policy.

b. Existing uses protection: the state or tribe will ensure the maintenance and protection of all existing uses and the water quality necessary to protect the existing uses.

c. High quality water protection

i. Identification of high quality water: the state or tribe will identify high quality waters on a parameter-by-parameter basis or a water body-by-water body basis, as long as the state's or tribe's implementation methods ensure that waters are not excluded from Tier 2 protection solely because not all of the uses specified in CWA section 101(a)(2) are attained.

ii. Alternatives analysis and social/economic analysis: the state or tribe will determine whether the lowering of water quality that would result from a proposed activity is necessary to accommodate important economic or social development in the area in which the waters are located through an alternatives analysis and a social and/or economic analysis.

iii. Public participation and intergovernmental coordination: the state or tribe will ensure full satisfaction of the public participation and intergovernmental coordination provisions of the state's or tribe's continuing planning process in any finding that will allow lower water quality.

iv. Requirements for point and nonpoint sources: the state or tribe will ensure that there shall be achieved the highest statutory and regulatory requirements for all new and existing point sources and all cost-effective and reasonable best management practices for nonpoint source control when allowing a lowering of water quality.

d. ONRW protection: the state or tribe will ensure the maintenance and protection of water quality for waters identified as ONRWs.

e. Thermal Discharges: The state or tribe will ensure consistency with Section 316 of the Act in cases that involve potential water quality impairment associated with thermal discharges.

5. How does this proposal affect states or authorized Tribes for which the EPA has promulgated antidegradation implementation methods?

The revised WQS regulation will apply to all states, authorized tribes, and territories, regardless of whether or not the EPA has previously promulgated an antidegradation policy or implementation methods for the state or tribe. Therefore, any previously promulgated antidegradation policies or implementation methods may require revision to meet the new requirements of Section 131.12.

F. WQS Variances

1. Background

The EPA has encouraged states and tribes to utilize WQS variances [18] (hereafter referred to as ''variances''), where appropriate, as an important WQS tool that provides states and tribes time to make progress towards attaining a designated use and criteria. The EPA has offered input and support for variances through Office of General Counsel legal decisions,[19] guidance, memoranda, and approval actions for many years. These documents specifically explain the EPA's interpretation that variances may be granted if the state or authorized tribe demonstrates that the variance meets the same requirements as a permanent [20] designated use change, even though the WQS regulation lacks explicit provisions on the issue. As a result, the EPA has heard from states, tribes, and stakeholders that there is confusion, inconsistency, and mixed interpretations about how, when, and where variances may be used appropriately (e.g., with regard to nutrients and implementation of numeric nutrient criteria). In particular, the EPA has found that this WQS tool is underutilized. For example, since tracking WQS variance submittals in 2004, four EPA Regions have never received a WQS variance submittal. However, the EPA has found that where states and tribes and their stakeholders have more specificity in regulation regarding variances, such as those states and tribes covered by the ''Water Quality Guidance for the Great Lakes System'' (i.e., Great Lakes Initiative) rulemaking at 40 CFR part 132, they are successfully adopting and submitting WQS variances. This proposed rule is intended to provide this specificity nationally.

The CWA specifies a national goal at Section 101(a) to restore and maintain the chemical, physical and biological integrity of the Nation's waters and an interim goal in Section 101(a)(2) that, ''wherever attainable,'' water quality provide for the protection and propagation of fish, shellfish, and wildlife and provides for recreation in and on the water. In implementing the CWA, the regulation at 40 CFR 131.10 establishes provisions relating to the management of designated uses. In 1977, an Office of General Counsel legal decision considered the practice of temporarily downgrading the WQS as it applies to a specific discharger rather than permanently downgrading an entire water body or waterbody segment(s) and determined that such a practice is acceptable under the EPA's existing regulations as long as the variance is adopted consistent with the substantive and procedural requirements for permanently downgrading a designated use. In other words, a state or tribe may change the standard in a more targeted way rather than remove the standard all together. The EPA further explained that it would be appropriate to grant a variance based on any of the six factors for removing a designated use as listed in § 131.10(g).[21]

The state practice described in the Office of General Counsel legal decision became known as adopting a ''variance'' to WQS. Specifically, a variance is a time-limited designated use and criterion that is targeted to a specific pollutant(s), source(s), and/or water body or waterbody segment(s) that reflects the highest attainable condition during the specified time period. Variances are different from changes to the designated use and associated criteria in that they are intended as a mechanism to provide time for states, authorized tribes and stakeholders to implement adaptive management approaches that will improve water quality where the designated use and criterion currently in place are not being met, but still retain the designated use as a long term goal. Variances are limited in scope and are an environmentally preferable tool over a designated use change because variances retain designated use protection for all pollutants as they apply to all sources with the exception of those specified in the variance. Even the discharger who is given a variance for one particular constituent is required to meet the applicable criteria for all other constituents. The variance is given for a limited time period and the discharger must either meet the WQS upon the expiration of this time period or the state or tribe must adopt a new variance or re-justify the current variance subject to EPA review and approval. Thus, when properly applied, a variance can lead to improved water quality over time, and in some cases, full attainment of designated uses due to advances in treatment technologies, control practices, or other changes in circumstances, thereby furthering the objectives of the CWA.

Presently, the nationally applicable WQS regulation only mentions variances in 40 CFR 131.13. This provision indicates that variance policies are general policies affecting the application and implementation of WQS, and that states and tribes may include variances policies in their state and tribal standards, at their discretion. The EPA provided variance procedure requirements when it promulgated WQS for Kansas (§ 131.34(c)), Puerto Rico (§ 131.40(c)), and the Great Lakes System (40 CFR part 132, Appendix F, Procedure 2). However, the nationally applicable regulation does not explicitly address questions such as when a variance can be granted, how a variance must be justified, what is required during the term of the variance, or for how long a variance can be granted. The EPA's established position has been that variances, as time-limited and narrow use revisions, are appropriate WQS tools that must go through public review and require the EPA's review and approval.[22] This position is supported by the EPA's practice regarding variances.[23] Today, we recognize a more direct link to the CWA Section 101(a)

[18] The EPA distinguishes WQS variances, as described in today's proposed rulemaking, from variances as described in the EPA's permitting regulation at §§ 122.2 and 125.3.

[19] The EPA's memoranda discussing variances are available on the EPA's Web site at *http://water.epa.gov/scitech/swguidance/waterquality/standards/handbook/chapter05.cfm#section3.*

[20] ''Permanent'' is used here and throughout this section to contrast between the time-limited nature of variances and designated use changes in accordance with 40 CFR 131.10 that require a revision to a State's water quality standards to reverse. In accordance with 40 CFR 131.20, waters that ''do not include the uses specified in section 101(a)(2) of the Act shall be re-examined every 3 years to determine if new information has become available. If such new information indicates that the uses specified in section 101(a)(2) of the Act are attainable, the State shall revise its standards accordingly.''

[21] Variances in Water Quality Standards, March 15, 1985, Memo from Edwin L. Johnson, Director of the Office of Water Regulations and Standards, to the Regional Water Division Directors and the Advanced Notice of Proposed Rulemaking at 63 FR 36759.

[22] The EPA addressed variances in its Kansas and Puerto Rico promulgations and part 132 Great Lakes Water Quality Guidance regulations (Published March 23, 1995, *http://www.ecfr.gov/cgi-bin/text-idx?c=ecfr&SID=105020ee867fe139a8d0965b23bf7557&rgn=div5&view=text&node=40:23.0.1.1.19&idno=40*).

[23] The EPA's WQS Handbook, 1994: *http://water.epa.gov/scitech/swguidance/standards/handbook/chapter05.cfm#section3*

goal of ''restore and maintain'' for variances. WQS variances are consistent with the ''restore'' aspect of the goal since variances are intended to allow incremental environmental progress in achieving designated uses. As described in detail in section III.F.2, the EPA is proposing a set of variance provisions that are in many ways parallel to the regulations in 131.10, but are tailored to better fit the circumstances where variances will allow for environmental progress toward achieving the goals of the CWA. The EPA notes that its understanding and past practice allows for variances whether or not those uses are specified in Section 101(a)(2), however, the demonstration may differ.

States and tribes have expressed that variances are useful in a number of circumstances where the state or tribe has demonstrated that the designated use and criterion are not attainable today (or for a limited period of time), but may be attainable in the longer term. Examples include when:

- Attaining the designated use and criterion is not feasible under the current conditions (e.g., attainment of numeric nutrient criteria would result in substantial and widespread social and economic impact) but could be feasible should circumstances change (e.g., development of less expensive pollution control technology or a change in local economic conditions); or
- The state or tribe does not know whether the designated use and criterion can be attained, but feasible progress toward attaining the designated use and criterion can still be made by implementing known controls and tracking environmental improvements (e.g., complex use attainability challenges involving legacy pollutants).

There are a variety of tools available to states, tribes and dischargers that can provide time to meet regulatory requirements; however, the most common regulatory tools considered are variances and permit compliance schedules. Which tool is appropriate depends upon the circumstances. Variances can be appropriate to address situations where it is known that the designated use and criterion are unattainable today (or for a limited period of time) but feasible progress could be made toward attaining the designated use and criterion. A permit compliance schedule, on the other hand, may be appropriate when the use is attainable, but the permittee needs additional time to modify or upgrade treatment facilities in order to meet its WQBEL such that a schedule and resulting milestones will lead to compliance ''as soon as possible'' with the WQBEL based on the currently applicable WQS. (See CWA section 507(17) for a definition of ''Schedules of compliance'' and 40 CFR 122.47).

The EPA is proposing and soliciting comment on revisions to the WQS regulation that will provide more specificity and clearer requirements on the development and use of variances. Such revisions will establish requirements to help improve water quality by allowing states and tribes time to work with stakeholders to address any challenges and uncertainties associated with attaining the designated use and the associated criterion. These revisions will also provide assurance that further feasible progress toward the designated use and criterion will be made during the variance period.

The EPA's proposed regulatory provisions for variances at § 131.14 address the following key topic areas: (1) Applicability, (2) submission requirements, (3) implementing variances, (4) how to renew a variance, and (5) conforming changes to §§ 131.34 and 131.40. A discussion of this proposal and the rationale for each proposed regulatory provision follows.

2. Rationale and the EPA Proposal

a. Part 1—Applicability of Variances

i. The Scope of a Variance

To provide clarity, promote consistency, and avoid conflicting interpretations of WQS variances, the EPA is proposing a new regulatory definition for WQS variance at § 131.14. A water quality standards variance (WQS variance) is a time-limited use and criterion for a specified pollutant(s), permittee(s), and/or water body or waterbody segment(s) that reflect the highest attainable condition during the specified time period. Variances are WQS subject to EPA review and approval or disapproval and must be consistent with § 131.14. As WQS, variances are subject to § 131.20(a) and thus must be reviewed on a triennial basis. States and tribes continue to have broad discretion on the structure of their triennial reviews and can decide whether and how to modify or adopt WQS as a result of a triennial review. The EPA is also proposing to specify at § 131.14(a)(1) that all other applicable water quality standards not specifically addressed by the variance remain applicable.

Typically, states find variances that apply to a specific pollutant(s) and discharger(s) to be most useful. If a state believes that the designated use and criterion is unattainable for a period of time because the discharger cannot meet its WQBEL, the state may grant a discharger-specific variance so long as the variance is consistent with the CWA and implementing regulation.

Similarly, if a state or tribe believes that the designated use and criterion is unattainable as it applies to multiple permittees because they are all experiencing challenges in meeting their WQBELs for the same pollutant for the same reason, regardless of whether or not they are located on the same water body, a state or tribe may streamline its variance process by granting one variance that applies to all these dischargers (i.e., a multiple discharger variance) so long as the variance is consistent with the CWA and implementing regulations. The EPA recognized the utility of a multiple discharger variance and its distinction from an individual discharger variance in the ''Water Quality Guidance for the Great Lakes System: Supplementary Information Document'' (SID; EPA–820–B–95–001; March 1995). The EPA provided further clarification regarding multiple discharger variances in the ''Water Quality Standards for the State of Florida's Lakes and Flowing Waters; Final Rule'' (75 FR 75790, December 6, 2010). More recently in March 2013, the EPA provided a set of frequently asked questions to assist states and tribes in developing credible rationales for multiple discharger variances. [24]

Where a state or tribe can demonstrate that the designated use and criterion currently in place for a specific pollutant is not attainable immediately (or for a limited period of time) for an entire water body, the state or tribe may adopt a waterbody variance as an alternative to a designated use change for the water body so long as the variance is consistent with the CWA and implementing regulation. In such an instance, the variance applies to the water body itself, rather than to any specific source or sources. A waterbody variance provides time for the state or tribe to work with both point and nonpoint sources to determine and implement adaptive management approaches on a waterbody/watershed scale to achieve pollutant reductions and strive toward attaining the water body's designated use and associated criteria.

States and tribes retain discretion as to whether, when, and where to adopt variances. However, consistent with the

[24] *Discharger-specific Variances on a Broader Scale: Developing Credible Rationales for Variances that Apply to Multiple Dischargers,* EPA–820–F–13–012, March 2013 (*http://water.epa.gov/scitech/swguidance/standards/upload/Discharger-specific-Variances-on-a-Broader-Scale-Developing-Credible-Rationales-for-Variances-that-Apply-to-Multiple-Dischargers-Frequently-Asked-Questions.pdf*).

EPA's current position, should a state or tribe choose to grant a variance, it is subject to the EPA's review and approval or disapproval—regardless of the scope of the variance.

The EPA invites comment on its proposal and on any other options it should consider or on the interpretations expressed in this section. The EPA also invites comment on the applicability of variances to individual dischargers, multiple dischargers and to entire water bodies.

ii. An EPA Approved Variance Is Only Applicable for CWA Section 402 Permitting Purposes and in Issuing Certifications Under Section 401 of the Act

The proposed WQS regulation at 40 CFR 131.14(a)(2) would specify that where a state or authorized tribe adopts a variance, the state or tribal regulations must continue to reflect the underlying designated use and criterion unless the state or tribe adopts and the EPA approves a revision to the designated use and criterion as consistent with § 131.10 or § 131.11. The interim requirements specified in the variance apply only for CWA section 402 permitting purposes and in issuing certifications under section 401 of the Act for the pollutant(s), permittee(s) and/or water body or waterbody segment(s) covered by the variance.

To date, the EPA's available guidance has characterized variances as temporary changes to the designated use; however, such a characterization might imply that the variance replaces the designated use while the variance is in effect. This has led to conflicting interpretations of how variances affect the implementation of WQS through CWA programs, such as NPDES permits and the CWA 303(d) requirements.

The CWA and implementing regulation direct the states to add waters that are not attaining *any* applicable WQS to their 303(d) impaired waters list. Specifically, CWA section 303(d)(1)(A) states that ''each state shall identify those waters within its boundaries for which the effluent limitations required by section 301(b)(1)(A) and section 301(b)(1)(B) of this title are not stringent enough to implement *any* water quality standards applicable to such waters''(emphasis added). Stakeholders have expressed concern that if the interim requirements do not replace the designated use and criterion, there will effectively be two WQS applicable for purposes of implementing the CWA section 303(d) program where a variance has been approved. However, the interim requirements *do not replace* the designated use and criteria for the water body as a whole. Discharger-specific variances affect the development of WQBELs for the discharger(s) specified in the variance; they do not affect the designated use and criterion that apply to the rest of the water body. In addition, variances are time-limited and intended as a tool to facilitate water quality improvements, not to revise the long term goals for a water body. Therefore, any implementation of CWA section 303(d) must continue to be based on the underlying designated uses and criteria for the water body rather than the interim requirements.

By requiring state and tribal regulations to maintain the underlying designated use and criterion where a variance is approved, the proposed regulation will ensure it is clear that the interim requirements associated with a variance do not replace the designated use and criterion. This will, in turn, facilitate a consistent interpretation regarding how variances affect the implementation of WQS through the various CWA programs and how variances are to be used to support feasible progress toward attaining the underlying designated use and criteria.

The EPA invites comment on its proposal and on any other options it should consider or on the interpretations expressed in this section.

iii. Relationship to Technology-Based Requirements in CWA Sections 301(b) and 306

The EPA is proposing to add paragraph (a)(3) to 40 CFR 131.14 to specify that a variance shall not be granted if the designated use and criterion can be achieved by implementing technology-based effluent limits required under sections 301(b) and 306 of the Act.

As with designated use changes, variances are not permissible if the WQS can be attained by implementing technology-based effluent limits required under section 301(b) and 306 of the Act. Section 301(b)(1)(A), (B), and section 306 of the Act provide for technology-based requirements through effluent limitations guidelines and new source performance standards. These technology-based requirements represent the minimum level of control that must be imposed in a permit (40 CFR 125.3). Because variances are allowed only where the designated use and criterion are demonstrated to be unattainable during the term of the variance, it would not be appropriate to use a variance if the designated use and criterion can be attained by implementing the technology-based requirements of the Act.

The EPA invites comment on its proposal and on any other options it should consider or on the interpretations expressed in this section.

b. Part 2—Submission Requirements

This section describes the relevant information that a state or authorized tribe must submit to the EPA when requesting the EPA's review and approval of a variance.

i. Components of a Variance

1. Identifying Information—Pollutant(s), Permittee(s), Location

The EPA is proposing to add paragraph (b)(1)(i) at 40 CFR 131.14 requiring states and authorized tribes to identify, in the variance, the pollutant(s), the permittee(s), and/or the water body or waterbody segment(s) to which the variance applies.

This proposed regulatory revision will require all variances to specify for what, to whom, and/or where the variance applies, which will help ensure full transparency and public participation on the applicability and scope of the variance. This will alleviate any inconsistencies in the way states and tribes have articulated where, when and how the variance applies.

The EPA invites comment on its proposal and on any other options it should consider or on the interpretations expressed in this section.

2. Numeric Interim Requirements That Apply During a Variance

The EPA is proposing to add paragraph (b)(1)(ii) at 40 CFR 131.14 to require that a variance must specify (1) the highest attainable interim use and numeric criterion that will apply during the term of the variance or (2) an interim numeric effluent condition that reflects the highest attainable condition for a specific permittee(s) during the term of the variance. Neither (1) nor (2) shall result in any lowering of the currently attained water quality, unless a time-limited lowering of water quality is necessary during the term of a variance for restoration activities, consistent with § 131.14(b)(2)(ii).

As variances have been implemented to date, some states and tribes have not identified in the variance the interim requirements that shall apply for permitting purposes during the term of the variance. Specifying the interim requirements to be met during the variance will provide the legal basis for permit writers to develop permit limits that derive from and comply with a WQS, as required by the permitting regulations at 40 CFR 122.44(d)(vii)(A).

As discussed in Section III.C, the EPA is proposing a requirement that a state

or tribe adopts the highest attainable use closest to the 101(a)(2) goals when it has demonstrated that the use specified in CWA section 101(a)(2) or a subcategory of such a use is not attainable based on a UAA. The EPA is proposing that a similar requirement apply to variances such that if states or tribes can demonstrate that a use specified in section 101(a)(2) or subcategory of such a use is not attainable for the variance period, then the state or tribe must adopt a variance reflecting the highest attainable condition during the term of the variance. Such a requirement ensures that feasible progress will be made towards the designated use and the criterion to protect that use during the period of the variance.

Requiring that states and tribes establish interim requirements that apply for purposes of CWA section 402 permitting and in issuing certifications under section 401 of the Act, and that such requirements reflect the highest attainable condition during the variance, creates a framework for variances to provide states and tribes with time to implement adaptive management approaches that drive progress towards meeting the designated use and criterion in a transparent and accountable manner—a key environmental benefit of a variance. This is consistent with previous EPA statements in the EPA's WQS Handbook and 1998 ANPRM that discuss the EPA's position regarding the progress to be made during the term of the variance towards attaining the designated use and criterion.[25]

A state's or tribe's determination or identification of the highest attainable interim use need not be complex. A state or tribe could simply include the phrase ''variance affected'' or ''variance modified'' to the current use description or the state or tribe could describe the interim use by identifying the parameter included in the variance, such as ''pH-limited'' use as a way to provide transparency. States and tribes may find it appropriate to adopt such ''variance modified'' uses as the highest attainable interim use, rather than adopting an alternate use from the state or tribe's current use classification system, as they might be more likely to do if they were making a permanent change to a designated use. To determine the numeric criterion that protects the highest attainable interim use, a state or tribe shall determine the condition that is both feasible to attain and closest to the protection afforded by the designated use and criteria. A state's or tribe's determination of the highest attainable condition and numeric interim requirements to apply during a waterbody variance should include consideration and evaluation of pollutant reductions from all contributing sources. This could include an evaluation of the point source controls, pollutant minimization plans and NPS pollutant reductions that could be achieved in the water body.

Rather than identifying the highest attainable interim use and interim numeric criterion, a state or tribe may choose to specify in its variance that the applicable interim water quality standard shall be defined by a numeric effluent condition that reflects the highest attainable condition for a specific permittee(s) during the term of the variance. Adopting a numeric effluent condition that reflects the highest attainable condition is reasonable because the resulting instream concentration reflects the highest attainable interim use and interim criterion and, therefore, the interim numeric effluent condition is acting as a surrogate for the interim use and interim criterion. If current effluent quality represents the highest attainable condition for a specific permittee(s), then this would become the interim requirement during the term of the variance. In situations where a variance addresses a pollutant(s) for which no feasible wastewater treatment option can be identified, an interim numeric water quality-based effluent condition reflecting the levels currently achievable and a requirement to develop and implement a Pollutant Minimization Program (PMP) [26] together would constitute the highest attainable effluent condition.

The EPA invites comment on its proposal and on any other options it should consider or on the interpretations expressed in this section.

3. Expiration Date

The EPA is proposing to add paragraph (b)(1)(iii) at 40 CFR 131.14 to require that all variances must include an expiration date and that variances must be as short as possible but expire no later than 10 years after the date the state or tribe adopts the variance, consistent with § 131.14(b)(2).

Variances are time-limited; therefore, in order to promote consistency and clarity and to ensure that variances are truly time-limited, the EPA is proposing that all variances include an explicit expiration date. Such expiration date must be consistent with the demonstration that a variance is needed for a specified period of time based on one of the factors identified in proposed § 131.14(b)(2), must be as short as possible, and cannot exceed 10 years. Establishing an expiration date will ensure that the conditions of a variance will be thoroughly re-evaluated and subject to a public review on a regular and predictable basis to determine (1) whether conditions have changed such that the designated use and criterion are now attainable; (2) whether new or additional information has become available to indicate that the designated use and criterion are not attainable in the future (i.e., data or information supports a use change/refinement); or (3) whether feasible progress is being made toward the designated use and criterion and that additional time is needed to make further progress (i.e., whether a variance may be renewed).

The EPA believes that up to 10 years is a reasonable duration for a variance, as it represents two 5-year NPDES permit terms and provides adequate opportunity to implement measures to make feasible progress. A maximum of 10 years is also sufficient to reflect changing circumstances, such as the availability of new economic information or affordable treatment technology that may impact whether or not a variance is still warranted.

The EPA invites comment on its proposal and on any other options it should consider or on the interpretations expressed in this section.

ii. Demonstrating the Need for a Variance—Supporting Documentation

The EPA is proposing to add paragraph (b)(2) at 40 CFR 131.14 to specify that in order to document that a variance is needed for uses specified in section 101(a)(2) or sub-categories of such uses, the state or tribe must demonstrate that attaining the designated use and criterion is not feasible during the term of the variance because of one of the factors listed in § 131.10(g) or because actions necessary to facilitate restoration through dam removal or other significant wetland or stream reconfiguration activities preclude attainment of the designated use and criterion while the actions are being implemented.

[25] The EPA's 1994 WQS Handbook stated that ''EPA has approved state adopted variances in the past and will continue to do so if …reasonable progress is being made toward meeting the standards.'' The EPA's 1998 ANPRM indicated that the EPA was considering revising its regulations to include a requirement that before a variance may be granted the applicant must include documentation that ''…reasonable progress will be made toward meeting the underlying or original standard.'' The EPA did not propose a revised regulation at that time.

[26] A PMP is a structured process to reduce loadings of a pollutant by identifying, preventing and reducing loadings, improving processes and improving wastewater treatment.

The regulation at 40 CFR 131.10(g) identifies six factors that may be used to demonstrate, through a UAA, when a use specified in section 101(a)(2) of the Act, or a subcategory of such a use, is unattainable. The EPA's current position (and its longstanding practice) is that one of these same § 131.10(g) ''attainability'' factors must be used by states and tribes to justify why and for how long a variance is necessary for uses specified in section 101(a)(2) or sub-categories of such uses. In developing this proposed regulation, the EPA considered other situations where a variance may be appropriate and the EPA concluded that the current § 131.10(g) factors do not accommodate situations where a variance may be necessary to facilitate short-term efforts to restore the natural physical features (i.e., natural geomorphology) of a system. Specifically, this is meant to address the situation when a time-limited exceedance of a criterion might be expected while efforts for dam removal or significant wetlands or stream reconfiguration/restoration efforts are underway to facilitate restoration of the natural physical features of a water body. The proposed new factor is intended only to cover the length of time necessary to remove the dam or the length of time in which stream restoration activities are actively on-going. Although such a variance might not directly impact a NPDES permittee, it may be necessary to allow states and tribes to certify that any federal license or permit that may result in the discharge of pollutants in state/tribal jurisdiction will still meet their state/tribal WQS, under CWA section 401.

In determining whether or not to grant a variance for uses specified in section 101(a)(2) and sub-categories of such uses (and subsequently submit such a variance to the EPA for review and approval), the state or tribe must consider and evaluate whether the available information supports a conclusion that the designated use and criteria are not feasible to attain during the variance period based on one of the factors listed in § 131.14(b)(2).

A factor that has been commonly used to demonstrate the need for a discharger specific variance is § 131.10(g)(6), which provides that a state or tribe may remove a designated use if ''[c]ontrols more stringent than those required by sections 301(b) and 306 of the Act would result in substantial and widespread economic and social impact.'' The Interim Economic Guidance for Water Quality Standards, published March 1995 (see *http://water.epa.gov/scitech/swguidance/standards/economics/*) provides guidance on the types of information that a state or tribe should consider evaluating and include in its record to support a variance based on § 131.10(g)(6).[27]

The state's or tribe's record for granting a variance based on ''Human caused conditions or sources of pollution prevent the attainment of the use and cannot be remedied or would cause more environmental damage to correct than to leave in place'' [28] may include, but not be limited to, consideration and evaluation of the following types of available information:

- Monitoring data to determine the current ambient conditions.
- Data/maps showing the geographical extent of the problem.
- Engineering studies and literature of the relevant remediation alternatives and best management practices that could be implemented and documentation that none of the alternatives or practices, if implemented, would result in attaining the designated use and criteria within the variance timeframe.
- Description, with supporting information from the scientific literature, of the environmental impacts associated with the remedial alternatives and an analysis of what could be done in an environmentally safe manner. Such an analysis would facilitate a determination of whether the human caused condition or source of pollution would cause more environmental harm to remedy than to leave in place.
- Modeling data showing the associated pollutant reductions achievable within the timeframe of the variance compared to reductions needed to achieve the designated use and criteria.

A variance should be a transparent mechanism that allows a state, tribe or discharger a defined period of time to conduct any necessary studies so long as the state or tribe demonstrates the need for the variance in accordance with the regulations and the state or tribe retains the applicable criteria for all other pollutants. The EPA commonly receives questions about whether permit compliance schedules can be used for this purpose. Permit compliance schedules may only be used in situations where time is needed for a permittee to come into compliance with the WQBEL in the permit, not to provide time to address uncertainty regarding the appropriateness or attainability of the WQS.

The EPA invites comment on its proposal and on any other options it should consider or on the interpretations expressed in this section.

iii. Identifying and Documenting the Controls for Other Sources Related to the Pollutant(s) and Location(s) Specified in a Waterbody Variance That Could Be Implemented

The EPA is proposing to add paragraph (b)(3) at § 131.14 to specify that, in addition to the other requirements under 131.14(b), for a waterbody variance (one not limited to a specific discharger or dischargers), a state or tribe must include an *identification and documentation* of any cost-effective and reasonable BMPs for nonpoint sources related to the pollutant(s) and location(s) specified in the variance that could be implemented water body wide to make progress towards attaining the designated use and criterion. A state or tribe must provide public notice and comment for any such documentation.

Because other sources of pollution (e.g., nonpoint sources) can have a significant bearing on whether the designated use and associated criterion for the entire water body are attainable, it is essential for states and tribes to consider and provide information to the public regarding the impact that controlling other sources through application of cost-effective and reasonable BMPs could have on water quality before granting a waterbody variance. Doing so could inform the state's or tribe's assessment of what interim actions may be needed to make feasible progress towards attaining the designated use and criterion related to the pollutant(s) and location(s) specified in the variance, as well as what the highest attainable interim designated use and criterion may be and for how long they may be needed.

A similar requirement is set out in the WQS regulation at § 131.10(d) and (h)(2) which specifies that a use is deemed attainable and cannot be removed if it can be achieved by the imposition of/implementing effluent limits required under sections 301(b) and 306 of the Act as well as cost-effective and reasonable best management practices for nonpoint source control. The EPA's current position is that before removing a designated use states and tribes must first evaluate the impact that point and nonpoint source controls might have on water quality. When conducting such an evaluation, states and tribes should consider the impacts from

[27] The § 131.10(g)(6) analysis would include costs of point source controls and the impacts on the surrounding community.

[28] As specified in § 131.10(g)(3) and cross-referenced in § 131.14(b)(2)(i).

implementing any [29] cost-effective and reasonable BMPs for nonpoint source controls water body wide. In situations where it can be demonstrated that a use is precluded by non-anthropogenic stressors (e.g., high levels of a naturally occurring metal in a surface water body), the EPA does not expect states and tribes to evaluate nonpoint source controls, as controlling nonpoint sources would not lead to attainment.

The EPA's proposed requirement for waterbody variances differs from those applicable to designated uses because variances are time-limited and targeted serving as a tool to facilitate progress toward the designated use and criterion. It is unnecessary to require states and tribes to demonstrate that the designated use and criteria are unattainable even if cost effective and reasonable BMPs were implemented, as is required when revising a designated use, because variances do not ''permanently'' downgrade the designated use but establish a regulatory mechanism by which feasible progress will be made during the term of the variance. Instead, a requirement to identify and document cost-effective and reasonable BMPs for other sources will assist states and tribes in identifying the actions they may need to implement to meet their interim requirements as well as to make feasible progress towards attaining the designated use and criterion.

The EPA invites comment on its proposal and on any other options it should consider or on the interpretations expressed in this section.

c. Part 3—Implementing Variances

The EPA is proposing to add paragraph (c) at 40 CFR 131.14 specifying that variances serve as the basis of a WQBEL included in a NPDES permit for the period the variance is in effect. Any activities required to implement the variance shall be included as conditions of the NPDES permit for the permittee(s) subject to the variance.

When variances are adopted and approved, they serve as the basis of a WQBEL included in a NPDES permit during the variance period. However, any specific actions that will be necessary for the discharger to implement the variance and make such feasible progress are typically at the discretion of the permitting authority. Therefore, in § 131.14(c), the EPA is proposing regulatory language similar to § 131.34(c) and § 131.40(c) linking the requirements of variances to the NPDES permitting process, specifically 40 CFR 122.44(d)(1)(viii)(A) that requires the permitting authority to establish limitations that derive from and comply with the applicable WQS. The EPA believes the proposed regulatory requirement will ensure proper accountability when implementing variances. The proposed provision reflects the provisions in the ''Water Quality Guidance for the Great Lakes System'' (40 CFR part 132, Appendix F, Procedure 2).

The EPA invites comment on its proposal and on any other options it should consider or on the interpretations expressed in this section.

d. Part 4—How To Renew a Variance

The EPA is proposing to add paragraph (d) at 40 CFR 131.14 to specify that to obtain the EPA's approval of a variance renewal, the state or tribe must meet the requirements of § 131.14 and provide appropriate documentation of the steps taken to meet the requirements of the previous variance. Renewal of the variance may be disapproved if the applicant did not comply with the conditions of the original variance, or otherwise does not meet the requirements of this section. For renewal of a waterbody variance, the state or tribe must also include documentation of whether and to what extent cost-effective and reasonable BMPs have been implemented to address the pollutant(s) subject to the variance and the water quality progress achieved during the variance period.

Although the EPA is proposing to establish a maximum single variance term of no more than 10 years, it recognizes that there may be circumstances in which a renewal of a variance is both necessary and appropriate. As the EPA's 1998 ANPRM articulates, variances are WQS and should be continued or extended only where the initial conditions for granting the variance still apply.[30] If a variance term will expire and the applicant complied with the conditions of the original variance (e.g., feasible progress has been made), but the designated use and criterion remain unattainable, then renewal of a variance may be an appropriate option for the state or tribe to consider.

The EPA is providing an additional requirement for waterbody variances because both point and nonpoint sources are contributing to the water quality challenges. The state or tribe must document whether and to what extent BMPs have been implemented and the water quality progress achieved during the variance period.

This proposed regulation explicitly provides that the EPA may disapprove a renewal of the variance if the applicant did not comply with the conditions of the original variance, or otherwise does not meet the requirements of § 131.14. The EPA recognizes that circumstances out of the permittee, state's or tribe's control may impact the ability to meet the specific conditions and requirements of the variance, even if all required actions to implement the variance were completed. The proposed regulatory language allows the EPA to consider these factors when determining whether to grant a WQS variance renewal. If the EPA disapproves the variance renewal, then the state or tribe must implement its water quality program to meet the applicable designated use and associated criteria or conduct a UAA to justify a revision to the designated use and associated criteria.

The EPA invites comment on its proposal and on any other options it should consider or on the interpretations expressed in this section.

e. Part 5—Variances for the EPA-Promulgated Designated Uses

The EPA is proposing to delete detailed variance procedures promulgated by the EPA in 40 CFR 131.34(c) and 131.40(c) and replace them with language specifying that the appropriate Regional Administrators may grant variances from the EPA-promulgated regulations for Kansas and Puerto Rico consistent with this proposed requirements at § 131.14.

The EPA promulgated variance procedures that the Regional Administrator could use to grant variances from the specific WQS the EPA promulgated for Kansas and Puerto Rico in § 131.34 and 131.40. This proposal reflects the most efficient and transparent approach to ensure that variances granted by the Regional Administrator for the federally promulgated standards in Kansas and Puerto Rico meet the same requirements as the rest of the United States once the EPA finalizes the nationally applicable revisions to 40 CFR part 131.

The EPA invites comment on its proposal and on any other options it should consider or on the interpretations expressed in this section.

G. Provisions Authorizing the Use of Permit-Based Compliance Schedule

1. The EPA Proposal

The EPA is proposing to add a new regulatory provision at § 131.15 to be consistent with the decision of the EPA Administrator in *In the Matter of Star-*

[29] i.e., not just those that may already be required by state regulations.

[30] 63 FR 36759.

Kist Caribe, Inc. (1990 WL 324290 (EPA), 1990 EPA App. LEXIS 45, 3 EAD 172 (April 16, 1990)). This provision would clarify that a permitting authority may only issue compliance schedules for WQBELs in NPDES permits if the state or tribe has authorized issuance of such compliance schedules pursuant to state or tribal law in its water quality standards or implementing regulations. Any such compliance schedule authorizing provision is a WQS subject to the EPA's review and approval. The proposed provision would also clarify that individual compliance schedules issued pursuant to such authorizing provisions are not themselves WQS but must be consistent with CWA section 502(17), the state's or tribe's EPA-approved compliance schedule authorizing provision, and the requirements of 40 CFR 122.2 and 122.47.

2. Rationale for Revision

CWA section 502(17) defines ''schedule of compliance'' to mean ''a schedule of remedial measures including an enforceable sequence of actions or operations leading to compliance with an effluent limitation, other limitation, prohibition, or standard.'' The EPA's NPDES regulation at 40 CFR 122.2 defines a schedule of compliance as ''a schedule of remedial measures included in a 'permit,' including an enforceable sequence of interim requirements . . . leading to compliance with the CWA and regulations.'' Section 301(b)(1)(C) of the Act specifies that there shall be achieved ''. . . not later than July 1, 1977, any more stringent limitation, including those necessary to meet WQS, treatment standards, or schedules of compliance, established pursuant to any State law or regulations (under authority preserved by section 1370 of this title) or any other Federal law or regulation, or required to implement any applicable water quality standard established pursuant to this chapter.''

In, *In the Matter of Star-Kist Caribe, Inc.,* the EPA Administrator (in an appeal of an EPA-issued NPDES permit) interpreted CWA 301(b)(1)(C) to mean that (1) after July 1, 1977, permits must require immediate compliance with (i.e., may not contain compliance schedules for) effluent limitations based on WQS adopted before July 1, 1977, and (2) permit compliance schedules are allowed for effluent limitations based on WQS adopted after that date *only* if the state or tribe has clearly indicated in its WQS or implementing regulations that it intends to allow them (i.e., the state's or tribe's WQS or implementing regulations must contain a provision authorizing the use of permit-based compliance schedules). The latter requirement ensures that a permit including such a compliance schedule still meets WQS pursuant to CWA section 301(b)(1)(C).

The EPA's current WQS regulation is silent regarding compliance schedules and compliance schedule authorizing provisions. As a result, despite *Star-Kist,* the EPA is concerned that state/tribal permitting authorities may be including compliance schedules in permits, thus delaying compliance with a WQS-based WQBEL, even though the state/tribe may not have authorized the use of such compliance schedules in its WQS or implementing regulations.

Consistent with the *Star-Kist* decision, a state or tribe has the discretion to include a compliance schedule authorizing provision in its WQS or implementing regulations. Such a provision may also be codified in a state or tribe's NPDES regulations. However, regardless of where it appears, a compliance schedule authorizing provision adopted pursuant to state or tribal law is considered a WQS subject to the EPA's approval under CWA section 303(c)(3). Although a compliance schedule authorizing provision does not describe the desired condition or level of protection of a water body in exactly the same way as a designated use or water quality criteria, it expresses the state's or tribe's intent to allow a delay in meeting the desired condition. Compliance schedule authorizing provisions allow the permitting authority to provide a permittee additional time to comply with a WQBEL that derives from and complies with the applicable WQS beyond the date of permit issuance, which is the date upon which a permittee is otherwise required to comply with its WQBEL. In addition, as articulated in the *Star-Kist* decision, states and tribes may only allow this delay if the applicable WQS is new or revised, after July 1, 1977.

When states and tribes authorize the use of compliance schedules in their WQS or implementing regulations, they ensure that WQBELs subject to appropriately issued compliance schedules are ''fully consistent with, and therefore 'meet,' the requirements of the State or tribal water quality standard, as contemplated by [CWA] 301(b)(1)(C).'' *Star-Kist* at 175. Once approved pursuant to CWA 303(c)(3), the compliance schedule authorizing provision itself becomes part of the applicable WQS; therefore, any delay in compliance with a WQBEL pursuant to that permit compliance schedule would be consistent with state/tribal WQS. A compliance schedule, as defined by section 502(17) of the Act, that is granted pursuant to a state's or tribe's approved compliance schedule authorizing provision is, on the other hand, a permitting tool and is not itself considered a WQS. The EPA has implemented section 502(17) of the Act in the context of the NPDES permitting program at 40 CFR 122.2 and 122.47. Any compliance schedule, itself, must be consistent with these provisions.

The EPA invites comments on the proposed addition of § 131.15. The EPA also invites comment on any other options it should consider or on the interpretations expressed in this section.

H. Other Changes

1. The EPA Proposal

In the course of developing this proposal, the EPA identified several spelling mistakes, grammatical errors and/or inconsistencies, and incorrect citations in 40 CFR part 131, as well as the need for various conforming edits (e.g., provisions that need to be re-numbered or re-lettered based on a regulatory addition or deletion outlined in this proposal). The EPA is proposing the following changes:

- § 131.2: Change ''. . . necessary to protect the uses'' to ''. . . that protect the designated uses'' (consistency with terminology in § 131.11).
- § 131.3(h): Change ''technology-bases'' to ''technology-based'' (spelling mistake).
- § 131.3(j): Delete ''the Trust Territory of the Pacific Islands.'' [31] Insert the word ''the'' in front of ''water quality standards program'' (grammatical clarification).
- § 131.5(a)(1): Change ''. . . has adopted water uses'' to ''. . . has adopted designated water uses'' (grammatical clarification).
- § 131.5(a)(2): Insert ''. . . based on sound scientific rationale'' (consistency with language in § 131.11).
- § 131.10(j): Insert ''and § 131.10(g)'' before the word ''whenever'' (consistency with proposed revisions to § 131.10(g)).
- § 131.10(j)(2): Insert '', to remove a subcategory of such a use,'' after the first instance of ''. . . specified in section 101(a)(2) of the Act'' (legal clarification that a UAA is also required when removing a subcategory of a use specified in section 101(a)(2) of the Act without adopting another use in its place).

[31] ''The Trust Territory of the Pacific Islands'' became the ''Commonwealth of the Northern Mariana Islands'' in 1986 via Presidential Proclamation. See *http://www.presidency.ucsb.edu/ws/index.php?pid=36688#axzz1XrK7AXLN.*

• § 131.11(a)(2): Change reference from ''40 CFR part 35'' to ''40 CFR part 130'' to reflect the correct citation.

• § 131.11(b): Italicize ''Form of criteria'' (consistency with formatting in § 131.11(a)).

• § 131.12(a)(2): Insert ''the protection and'' into the phrase ''propagation of fish, shellfish and wildlife'' to be consistent with CWA 101(a)(2) and the rest of the WQS regulation at part 131. Change ''assure'' to ''ensure'' (grammatical clarification).

• § 131.20(b): Change ''hold a public hearing'' to ''hold public hearings'' and add ''or revising'' after ''reviewing'' (consistency with CWA 303(c) and § 131.20(a)). Insert ''EPA's'' in front of ''public participation regulation'' (clarification that 40 CFR part 25 is the EPA's regulation). Delete the phrase ''EPA's water quality management regulation (40 CFR 130.3(b)(6))'' (nonexistent citation).

The EPA invites comments on the proposed amendments described above. The EPA also invites comment on any other options it should consider or on the interpretations expressed in this section.

IV. When does this action take effect?

Comments on this proposed rulemaking must be received on or before December 3, 2013. Should this proposed rulemaking be finalized, the effective date will likely be 60 days after date of publication of the final rule in the **Federal Register**. For judicial review purposes, the effective date will likely be 60 days after date of publication of the final rule in the **Federal Register**.

The EPA is proposing to require states and tribes to meet the requirements of the final rule on the effective date of the final rule. The EPA's expectation is that, where a new or revised requirement necessitates a change to state or tribal WQS, such changes will occur within the next triennial review that the state or tribe initiates after the EPA's publication of the final rule.

The EPA invites comments on the proposed effective dates. The EPA also invites comment on any other options it should consider or on the interpretations expressed in this section.

V. Economic Impacts on State and Tribal WQS Programs

The EPA evaluated the potential incremental administrative burdens and costs that may be associated with this proposal. Incremental burden and costs are those above and beyond the burden and costs associated with implementation of current WQS regulations. Because this proposal will not establish any requirements directly applicable to regulated entities, the focus of the EPA's economic analysis is to estimate the potential administrative burden and costs to state, tribal, and territorial governments, and the EPA. The EPA's economic analysis is documented in *Economic Analysis for the Water Quality Standards Regulatory Clarifications (Proposed Rule)* and can be found in the docket for this proposal.

The EPA assessed the potential incremental burden and costs associated with this proposed regulation revisions by first identifying those elements of the proposed revisions that may impose incremental burdens and costs. The EPA estimated the incremental number of labor hours potentially required by states and tribes to comply with those elements of the proposed regulations, and then estimated the costs associated with those additional labor hours. The EPA identified four areas where incremental burdens and costs may be anticipated: (1) One-time burden and costs associated with state and tribal rulemaking activities because states and tribes may need to adopt new or revised provisions into their WQS, (2) annual costs associated with designating uses because identifying the highest attainable use when performing a UAA may require additional labor hours, (3) annual costs associated with antidegradation implementation including reviewing a greater number and more complex antidegradation requests, and (4) annual costs associated with additional development and documentation of variance requests. In addition to the proposed requirements included in this proposal, the EPA is considering and requesting comment on whether the EPA should include a requirement that antidegradation implementation methods be formally adopted as WQS and thus subject to the EPA's review and approval or disapproval. Incremental burden and costs were estimated for all 50 states, the District of Columbia, 5 territories, and the 39 Indian tribes authorized to administer a WQS program with WQS approved by the EPA.

Estimates of the incremental administrative burden and costs to state and tribal governments associated with this proposal without the requirement to adopt antidegradation implementation methods as WQS are summarized in the following table:

SUMMARY OF INCREMENTAL ADMINISTRATIVE BURDEN AND COSTS TO STATE AND TRIBAL GOVERNMENTS ASSOCIATED WITH THIS PROPOSAL WITHOUT THE REQUIREMENT TO ADOPT ANTIDEGRADATION IMPLEMENTATION METHODS AS WQS

Provision	One-time			Recurring	
	Burden (hours)	Cost (2013$ millions)	Annualized cost (2013$ millions/year) [1]	Burden (hours/year)	Cost (2013$ millions/year)
Rulemaking Activities	9,500–47,500	$0.46–$2.28	$0.03–$0.15	—	—
Designated Uses	—	—	—	240–1,200	$0.01–$0.06
Antidegradation [2]	—	—	—	97,070–145,605	$4.61–$7.04
Variances	—	—	—	4,620–5,310	$0.22–$0.26
National Total	9,500–47,500	$0.46–$2.28	$0.03–$0.15	101,930–152,115	$4.84–$7.36

'—' = not applicable.

[1] Although the EPA expects these one-time costs to occur once over a 3 year period, they are annualized here at 3% discount rate over 20 years for comparative purposes.

[2] Includes annual costs associated with reviewing a greater number and more complex antidegradation requests.

Estimates of the incremental administrative burden and costs to the EPA associated with this proposal without the requirement to adopt antidegradation implementation methods as WQS are summarized in the following table:

SUMMARY OF POTENTIAL INCREMENTAL ADMINISTRATIVE BURDEN AND COSTS TO THE EPA ASSOCIATED WITH THIS PROPOSAL WITHOUT THE REQUIREMENT TO ADOPT ANTIDEGRADATION IMPLEMENTATION METHODS AS WQS

One-time					Recurring			
Costs to states and tribes (2013$ million)	Costs to the agency [1] (2013$ million)	Annualized cost to the agency [2] (2013$ million per year)	Burden		Costs to states and tribes (2013$ million per year)	Costs to the agency [1] (2013$ million per year)	Burden	
			Hours [3]	FTEs [4]			Hours per year [3]	FTEs per year [4]
$0.46–$2.28	$0.09–$0.46	$0.01–$0.03	1,200–6,040	0.58–2.9	$4.84–$7.36	$0.97–$1.47	12,810–19,470	6.16–9.36

[1] Assuming that the incremental costs to the EPA are equal to 20% of the costs to states and tribes.
[2] Although the EPA expects these one-time costs to occur once over a 3 year period, they are annualized here at 3% discount rate over 20 years for comparative purposes.
[3] Total costs to the Agency divided by hourly wage rate (including overhead and benefits) of $75.55 per hour.
[4] Burden hours to the Agency divided by hours worked by full-time equivalent (FTE) employees per year (2,080 hours per year).

A summary of the combined estimated costs to all potentially affect states, tribes, and the EPA without the requirement to adopt antidegradation implementation methods as WQS are summarized in the following table:

SUMMARY OF POTENTIAL INCREMENTAL ADMINISTRATIVE BURDENS AND COSTS ASSOCIATED WITH THE PROPOSED RULE TO STATES, TRIBES, AND THE EPA WITHOUT THE REQUIREMENT TO ADOPT ANTIDEGRADATION IMPLEMENTATION METHODS AS WQS

Entities	One-time			Recurring	
	Burden (hours)	Cost (2013$ millions)	Annualized cost [1] (2013$ million/ year)	Burden (hours/year)	Cost (2013 $millions/year)
States and tribes	9,500–47,500	$0.46–$2.28	$0.03–$0.15	101,930–152,115	$4.84–$7.36
Agency	1,200–6,040	$0.09–$0.46	$0.01–$0.03	12,810–19,470	$0.97–$1.47
Total	10,700–53,540	$0.55–$2.74	$0.04–$0.18	114,740–171,585	$5.81–$8.83

[1] Although the EPA expects these one-time costs to occur once over a 3 year period, they are annualized here at 3% discount rate over 20 years for comparative purposes.

To estimate the total annual cost of this proposal without the requirement to adopt antidegradation implementation methods as WQS which include both one-time costs and recurring costs, the EPA annualized the one-time costs over a period of 20 years. Using a 20-year annualization period and a discount rate of three percent, total annual costs for this proposal without the requirement to adopt antidegradation implementation methods as WQS are estimated to range from $5.84 million ($0.04 million + $5.81 million) to $9.01 million ($0.18 million + $8.83 million) per year.

In addition to the proposed requirements included in this proposal, the EPA is considering and requesting comment on whether the EPA should include a requirement that antidegradation implementation methods be formally adopted as WQS and thus subject to the EPA's review and approval or disapproval. This additional requirement would require affected entities to develop or revise antidegradation implementation methods, and adopt the implementation methods in WQS, resulting in one-time (nonrecurring) burden and costs. Estimates of the incremental administrative burden and costs to state and tribal governments associated with this proposal including the requirement to adopt antidegradation implementation methods into WQS are summarized in the following table:

SUMMARY OF INCREMENTAL ADMINISTRATIVE BURDEN AND COSTS TO STATE AND TRIBAL GOVERNMENTS ASSOCIATED WITH THIS PROPOSAL WITH THE REQUIREMENT TO ADOPT ANTIDEGRADATION IMPLEMENTATION METHODS AS WQS

Provision	One-time			Recurring	
	Burden (hours)	Cost (2013$ millions)	Annualized cost [1] (2013$ millions/ year)	Burden (hours/year)	Cost (2013$ millions/year)
Rulemaking Activities	9,500–47,500	$0.46–$2.28	$0.03–$0.15	—	—
Designated Uses	—	—	—	240–1,200	$0.01–$0.06
Antidegradation	33,600–67,200	1.61–3.23	0.11–0.22	97,070–145,605	4.61–7.04
Variances	—	—	—	4,620–5,310	0.22–0.26
National Total	43,100–114,700	2.07–5.51	0.14–0.37	101,930–152,115	4.84–7.36

'—' = not applicable.
[1] Although the EPA expects these one-time costs to occur once over a 3 year period, they are annualized here at 3% discount rate over 20 years for comparative purposes.

Estimates of the incremental administrative burden and costs to the EPA associated with this proposal including the requirement to adopt antidegradation implementation

methods into WQS are summarized in the following table:

SUMMARY OF POTENTIAL INCREMENTAL ADMINISTRATIVE BURDEN AND COSTS TO THE EPA ASSOCIATED WITH THIS PROPOSAL WITH THE REQUIREMENT TO ADOPT ANTIDEGRADATION IMPLEMENTATION METHODS AS WQS

One-time					Recurring			
Costs to states and tribes (2013$ million)	Costs to the agency [1] (2013$ million)	Annualized cost to the agency [2] (2013$ million per year)	Burden		Costs to states and tribes (2013$ million per year)	Costs to the agency [1] (2013$ million per year)	Burden	
			Hours [3]	FTEs [4]			Hours per year [3]	FTEs per year [4]
$2.07–$5.51	$0.41–$1.10	$0.03–$0.07	5,480–14,570	2.63–7.01	$4.84–$7.36	$0.97–$1.47	12,810–19,470	6.16–9.36

[1] Assuming that the incremental costs to the EPA are equal to 20% of the costs to states and tribes.
[2] Although the EPA expects these one-time costs to occur once over a 3 year period, they are annualized here at 3% discount rate over 20 years for comparative purposes.
[3] Total costs to the Agency divided by hourly wage rate (including overhead and benefits) of $75.55 per hour.
[4] Burden hours to the Agency divided by hours worked by full-time equivalent (FTE) employees per year (2,080 hours per year).

A summary of the combined estimated costs of this proposal to all potentially affect states, tribes, and the EPA including the requirement to adopt antidegradation implementation methods into WQS are summarized in the following table.

SUMMARY OF POTENTIAL INCREMENTAL ADMINISTRATIVE BURDENS AND COSTS ASSOCIATED WITH THE PROPOSED RULE TO STATES, TRIBES, AND THE EPA WITH THE REQUIREMENT TO ADOPT ANTIDEGRADATION IMPLEMENTATION METHODS AS WQS

Entities	One-time			Recurring	
	Burden (hours)	Cost (2013$ millions)	Annualized cost [1] (2013$ millions/year)	Burden (hours/year)	Cost (2013 $millions/year)
States and tribes	43,100–114,700	$2.07–$5.51	$0.14–$0.37	101,930–152,115	$4.84–$7.36
Agency	5,480–14,570	$0.41–$1.10	$0.03–$0.07	12,810–19,470	$0.97–$1.47
Total	48,580–129,270	$2.48–$6.61	$0.17–$0.44	114,740–171,585	$5.81–$8.83

[1] Although the EPA expects these one-time costs to occur once over a 3 year period, they are annualized here at 3% discount rate over 20 years for comparative purposes.

To estimate the total annual cost of this proposal including the requirement to adopt antidegradation implementation methods as WQS which include both one-time costs and recurring costs, the EPA annualized the one-time costs over a period of 20 years. Using a 20-year annualization period and a discount rate of three percent, total annual costs for this proposal with the requirement to adopt antidegradation implementation methods as WQS are estimated to range from $5.98 million ($0.17 million + $5.81 million) to $9.27 million ($0.44 million + $8.83 million) per year.

In addition to estimating potential burden and costs, the EPA also evaluated the potential benefits associated with this proposal. States, tribes, stakeholders, and the public will benefit from the proposed clarifications of the WQS regulations by ensuring better utilization of available WQS tools that allow states and tribes the flexibility to implement their WQS in an efficient manner while providing transparency and open public participation. Although associated with potential administrative burden and costs in some areas, this proposal has the potential to partially offset these costs by reducing regulatory uncertainty and consequently increasing overall program efficiency. Furthermore, more efficient and effective implementation of state and tribal WQS has the potential to provide a variety of economic benefits associated with cleaner water including the availability of clean, safe, and affordable drinking water, water of adequate quality for agricultural and industrial use, and water quality that supports the commercial fishing industry and higher property values. Nonmarket benefits of this proposal include the protection and improvement of public health and greater recreational opportunities. The EPA acknowledges that achievement of any benefits associated with cleaner water would involve additional control measures, and thus costs to regulated entities and non-point sources, that have not been included in the economic analyses for this proposed rule. The EPA has not attempted to quantify either the costs of such control measures that might ultimately be required as a result of this rule, or the benefits they would provide. Complete details on how the EPA evaluated burden, costs, and benefits are documented in *Economic Analysis for the Water Quality Standards Regulatory Clarifications (Proposed Rule)* included in the docket for this proposal.

The EPA invites comments on its economic analysis. Specifically, the EPA invites comments on the accuracy of the burden and costs estimates presented in this proposal, and any actual state or tribal data that may help to refine these estimates. This proposal does not establish any requirements directly applicable to regulated point sources or nonpoint sources of pollution, although the EPA recognizes that these sources could potentially incur costs as a result of changes to WQS adopted by states and tribes as a result of this rule (states and tribes could also adopt new or revised WQS independent of this proposed rule). However, unlike some other EPA WQS rules for which an economic analysis was prepared, this proposal does not lend itself to identification of readily predictable outcomes regarding changes to state water quality standards that might result. Likewise, the EPA could

not predict requirements that could ultimately be imposed on NPDES permittees and nonpoint sources. Thus, the EPA has not analyzed potential costs or cost savings associated with any consequences of revised state or tribal WQS. Nonetheless, the EPA is interested in the potential implications of this proposal for regulated entities and non-point sources and on whether and how it should incorporate such costs in its economic analysis of the rule.

VI. Statutory and Executive Order Reviews

A. Executive Order 12866: Regulatory Planning and Review and Executive Order 13563: Improving Regulation and Regulatory Review

Under Executive Order (E.O.) 12866 (58 FR 51735, October 4, 1993), this action is a ''significant regulatory action.'' Accordingly, the EPA submitted this action to the Office of Management and Budget (OMB) for review under E.O.s 12866 and 13563 (76 FR 3821, January 21, 2011) and any changes made in response to OMB recommendations have been documented in the docket for this action.

In addition, the EPA prepared an analysis of the potential costs and benefits associated with this action. This analysis is contained in ''Economic Analysis for the Proposed Revisions to Water Quality Standards Regulatory Revisions.'' A copy of the analysis is available in the docket for this action and the analysis is briefly summarized in Section V of the preamble.

B. Paperwork Reduction Act

The information collection requirements in this proposed rule have been submitted for approval to the Office of Management and Budget (OMB) under the Paperwork Reduction Act, 44 U.S.C. 3501 et seq. The Information Collection Request (ICR) document prepared by the EPA has been assigned EPA ICR number 2449.01.

The EPA is proposing the WQS Regulatory Clarifications Rule to improve the regulation's effectiveness in helping restore and maintain the chemical, physical, and biological integrity of the nation's waters. The core of the current regulation has been in place since 1983; since then, a number of issues have been raised by stakeholders or identified by the EPA in the implementation process that will benefit from clarification and greater specificity. The proposed rule addresses the following key program areas: (1) Administrator's determinations that new or revised WQS are necessary, (2) designated uses, (3) triennial reviews, (4) antidegradation, (5) variances to WQS, and (5) compliance schedule authorizing provisions. In addition to the proposed requirements included in this proposal, the EPA is considering and requesting comment on whether the EPA should require that antidegradation implementation methods be adopted as WQS and thus subject to the EPA's review and approval or disapproval. This mandatory information collection will ensure the EPA has the needed information to review standards and make approvals or disapprovals in accordance with provisions in the proposed Water Quality Standards Regulatory Clarifications Rule. Under the Clean Water Act (CWA), the EPA is responsible for reviewing and approving or disapproving new and revised WQS submitted by states and tribes. The EPA will use the information required by this proposed rule to carry out its responsibility under the CWA. In reviewing state and tribal standards submissions, the EPA considers whether submissions are consistent with the WQS regulation at part 131. The WQS Regulatory Clarifications Rule will add new requirements to part 131. If the information collection activities in the WQS Regulatory Clarifications Rule are not carried out, specific improvements in the implementation of the WQS program will not take place. In some cases, implementation and control steps such as total maximum daily loads and National Pollutant Discharge Elimination System permits may not be as protective as necessary under the CWA.

Burden is defined at 5 CFR 1320.3(b). The EPA expects that the proposed rule will lead to incremental burden hours and labor costs in the following areas: rulemaking activities, designated uses, antidegradation, and variances to WQS. The EPA estimates the cost of labor from data on state government hourly wage rates (data are not available for tribes). The labor categories chosen as applicable to WQS regulatory revision efforts are Environmental Scientist, Department Manager, Environmental Engineer, and Economist. Given the 2012 labor rates for these categories, inflated to March 2013 dollars using the Bureau of Labor Statistics (BLS) Employment Cost Index for professional and related state and local government workers (116.0/115.0 = 1.01), and accounting for benefits using the BLS Employer Cost for Employee Compensation for state and local professional government workers (32.7% of total compensation is attributable to benefits), the EPA calculated an average hourly wage rate of $48.

The EPA estimates the incremental number of labor hours using historical information and data, and the historical knowledge and best professional judgment of EPA personnel with experience administering the WQS program. A total of 95 governmental entities are potentially affected by the proposed rule: 50 states, the District of Columbia, 6 territories, and 39 tribes that have authority to administer WQS programs. Rulemaking activities result in one-time (nonrecurring) burden and costs. Note that these one-time activities will occur over an initial three-year period. The proposed rule will also require affected entities to undertake the following activities each year: conduct use attainability analyses to determine the highest attainable use, review alternative analyses in antidegradation requests, review additional antidegradation requests for high quality waters, comply with new submission requirements for variances, and review additional variance renewal applications. Given the EPA's estimates of the number and frequency of labor hours associated with each of the proposed provisions, the total one-time incremental burden (during each of the first three years) associated with the proposed rule without requiring adoption of antidegradation implementation methods as WQS ranges from 9,500 hours to 47,500 hours, while the annual incremental burden ranges from 101,930 hours to 152,115 hours. Given an hourly wage rate of $48, these labor hours lead to total one-time costs (incurred during each of the first three years) of approximately $0.46 million to $2.28 million and annual costs of $4.84 million to $7.36 million. These incremental burden and costs are associated with a total of 32 one-time responses per year during the initial three-year period for rulemaking activities. In addition, the number of annual responses is 1,405 responses.

In addition to the proposed requirements included in this proposal, the EPA is considering and requesting comment on whether the EPA should include a requirement that antidegradation implementation methods be formally adopted as WQS and thus subject to the EPA's review and approval or disapproval. This additional requirement would require affected entities to develop or revise antidegradation implementation methods, and adopt antidegradation implementation methods as WQS resulting in one-time (nonrecurring) burden and costs. Including this

additional requirement, the total one-time incremental burden (during each of the first three years) associated with the proposed rule ranges from 43,100 hours to 114,700 hours, while the annual incremental burden remains the same ranging from 101,930 hours to 152,115 hours. Given an hourly wage rate of $48, these labor hours lead to total one-time costs (incurred during each of the first three years) of approximately $2.07 to $5.51 million and annual costs of $4.84 to $7.36 million. These incremental burden and costs are associated with a total of 32 one-time responses per year during the initial three-year period for rulemaking activities. In addition, the number of annual responses is 1,405 responses.

An agency may not conduct or sponsor, and a person is not required to respond to, a collection of information unless it displays a currently valid OMB control number. The OMB control numbers for EPA's regulations in 40 CFR are listed in 40 CFR part 9.

To comment on the Agency's need for this information, the accuracy of the provided burden estimates, and any suggested methods for minimizing respondent burden, the EPA has established a public docket for this rule, which includes this ICR, under Docket ID number EPA–HQ–OW–2010–0606. Submit any comments related to the ICR to the EPA and OMB. See ADDRESSES section at the beginning of this notice for where to submit comments to the EPA. Send comments to OMB at the Office of Information and Regulatory Affairs, Office of Management and Budget, 725 17th Street NW., Washington, DC 20503, Attention: Desk Office for EPA. Since OMB is required to make a decision concerning the ICR between 30 and 60 days after September 4, 2013, a comment to OMB is best assured of having its full effect if OMB receives it by October 4, 2013. The final rule will respond to any OMB or public comments on the information collection requirements contained in this proposal.

C. Regulatory Flexibility Act

The Regulatory Flexibility Act (RFA) generally requires an agency to prepare a regulatory flexibility analysis of any rule subject to notice and comment rulemaking requirements under the Administrative Procedure Act or any other statute unless the agency certifies that the rule will not have a significant economic impact on a substantial number of small entities. Small entities include small businesses, small organizations, and small governmental jurisdictions.

For purposes of assessing the impacts of this rule on small entities, small entity is defined as (1) a small business as defined by the Small Business Administration's (SBA) regulations at 13 CFR 121.201; (2) a small governmental jurisdiction that is a government of a city, county, town, school district or special district with a population of less than 50,000; and (3) a small organization that is any not-for-profit enterprise which is independently owned and operated and is not dominant in its field.

After considering the economic impacts of this proposed rule on small entities, I certify that this action will not have a significant economic impact on a substantial number of small entities. This proposed rule will not impose any requirements on small entities.

State and tribal governments responsible for administering or overseeing water quality programs may be directly affected by this rulemaking, as states and tribes may need to consider and implement new provisions, or revise existing provisions, in their WQS. Small entities, such as small businesses or small governmental jurisdictions, are not directly regulated by this rule. The EPA continues to be interested in the potential impacts of the proposed rule on small entities and welcomes comments on issues related to such impacts.

D. Unfunded Mandates Reform Act

This rule does not contain a Federal mandate that may result in expenditures of $100 million or more for state, local, and tribal governments, in the aggregate, or for the private sector in any one year. The EPA estimates total annual costs to states and tribes to range from $4,840,000 to $7,360,000. Thus, this rule is not subject to the requirements of sections 202 or 205 of the Unfunded Mandates Reform Act of 1995 (UMRA).

This rule is also not subject to the requirements of section 203 of UMRA because it contains no regulatory requirements that might significantly or uniquely affect small governments.

E. Executive Order 13132 (Federalism)

Under section 6(b) of E.O. 13132, the EPA may not issue an action that has federalism implications, that imposes substantial direct compliance costs, and that is not required by statute, unless the Federal government provides the funds necessary to pay the direct compliance costs incurred by state and local governments, or the EPA consults with state and local officials early in the process of developing the proposed action. In addition, under section 6(c) of E.O. 13132, the EPA may not issue an action that has federalism implications and that preempts state law, unless the Agency consults with state and local officials early in the process of developing the proposed action.

The EPA has concluded that the action does not have federalism implications. The EPA is proposing changes to provide clarity and transparency in the WQS regulation that may require state and local officials to reevaluate or revise their standards. However, it will not impose substantial direct compliance costs on state or local governments, nor will it preempt state law. Thus, the requirements of sections 6(b) and 6(c) of the E.O. do not apply to this action.

Consistent with the EPA's policy, the EPA nonetheless consulted with state and local officials early in the process of developing the proposed action to allow them to provide meaningful and timely input into its development. In August and September 2010, the EPA consulted with representatives from states and intergovernmental associations to hear their views on the proposed regulatory changes. Participants expressed concern that the proposed changes may impose a resource burden on state and local governments, as well as infringe on states' flexibility in the areas of antidegradation and designated uses. The EPA's view is that such changes would generally codify the EPA's current practice and provide clear expectations to state and local regulators. Participants urged the EPA to ensure that states with satisfactory regulations in these areas are not unduly burdened by the proposed changes.

Keeping with the spirit of E.O. 13132, and consistent with the EPA's policy to promote communications between the EPA and state and local governments, the EPA specifically solicits comment on this proposed action from state and local officials. In particular, the EPA requests comment on any provision in this proposed rule that state officials believe would impose an undue burden on state water quality standards programs.

F. Executive Order 13175

Subject to the E.O. 13175 (65 FR 67249, November 9, 2000), the EPA may not issue a regulation that has tribal implications, that imposes substantial direct compliance costs, and that is not required by statute, unless the federal government provides the funds necessary to pay the direct compliance costs incurred by tribal governments, or the EPA consults with tribal officials early in the process of developing the proposed regulation and develops a tribal summary impact statement.

The EPA has concluded that this action may have tribal implications. However, it will neither impose substantial direct compliance costs on tribal governments, nor preempt tribal law. To date, 48 Indian tribes have been approved for treatment in a manner similar to a state (TAS) for CWA sections 303 and 401. Of the 48 tribes, 39 have federally approved WQS in their respective jurisdictions. All of these authorized tribes are subject to this proposed rule. However, this rule might impact other tribes as well because federal, state or authorized tribal standards may apply to waters adjacent to the tribal waters. The EPA consulted with tribal officials early in the process of developing this regulation to allow them to provide meaningful and timely input into its development. In August 2010, the EPA held a tribes-only consultation session to hear their views and answer questions of all interested tribes on the targeted areas the EPA is considering for regulatory revision. Tribes expressed the need for additional guidance and assistance in implementing the proposed rulemaking, specifically for development of antidegradation implementation methods and determination of the highest attainable use. The EPA has considered the burden to states and tribes in developing this proposal and, when possible, has chosen to provide sufficient direction and flexibility to allow tribes to spend resources addressing other aspects of their WQS programs. The EPA also intends to release updated guidance in a new edition of the WQS Handbook. The EPA specifically solicits additional comment on this proposed action from tribal officials.

G. Executive Order 13045: Protection of Children From Environmental Health Risks and Safety Risks

This action is not subject to E.O. 13045 (62 FR 19885, April 23, 1997) because it is not economically significant as defined in E.O. 12866, and because the Agency does not believe the environmental health or safety risks addressed by this action present a disproportionate risk to children.

H. Executive Order 13211: Actions Concerning Regulations That Significantly Affect Energy Supply, Distribution, or Use

This action is not a ''significant energy action'' as defined in E.O. 13211 (66 FR 28355, May 22, 2001), because it is not likely to have a significant adverse effect on the supply, distribution, or use of energy.

I. National Technology Transfer and Advancement Act

Section 12(d) of the National Technology Transfer and Advancement Act of 1995 (NTTAA), Pub. L. 104–113, 12(d) (15 U.S.C. 272 note) directs the EPA to use voluntary consensus standards in its regulatory activities unless to do so would be inconsistent with applicable law or otherwise impractical. Voluntary consensus standards are technical standards (e.g., materials specifications, test methods, sampling procedures, and business practices) that are developed or adopted by voluntary consensus standards bodies. NTTAA directs the EPA to provide Congress, through OMB, explanations when the Agency decides not to use available and applicable voluntary consensus standards.

This proposed rulemaking does not involve technical standards. Therefore, the EPA is not considering the use of any voluntary consensus standards.

J. Executive Order 12898: Federal Actions To Address Environmental Justice in Minority Populations and Low-Income Populations

E.O. 12898 (59 FR 7629, February 16,1994) establishes federal executive policy on environmental justice. Its main provision directs federal agencies, to the greatest extent practicable and permitted by law, to make environmental justice part of their mission by identifying and addressing, as appropriate, disproportionately high and adverse human health or environmental effects of their programs, policies, and activities on minority populations and low-income populations in the United States.

The EPA has determined that this proposed rule will not have disproportionately high and adverse human health or environmental effects on minority or low-income populations because it does not adversely affect the level of protection provided to human health or the environment. This proposed rulemaking does not directly establish water quality standards for a state or tribe. In addition, this proposed rulemaking is national in scope, and therefore is not specific to a particular geographic area(s).

List of Subjects in 40 CFR Part 131

Environmental protection, Indians—lands, Intergovernmental relations, Reporting and recordkeeping requirements, Water pollution control.

Dated: August 20, 2013.

Gina McCarthy,

Administrator.

For the reasons stated in the preamble, the EPA proposes to amend 40 CFR part 131 as follows:

PART 131—WATER QUALITY STANDARDS

■ 1. The authority citation for part 131 continues to read as follows:

Authority: 33 U.S.C. 1251 *et seq.*

Subpart A—General Provisions

■ 2. Amend § 131.2 by revising the first sentence to read as follows:

§ 131.2 Purpose.

A water quality standard defines the water quality goals of a water body, or portion thereof, by designating the use or uses to be made of the water and by setting criteria that protect the designated uses. * * *

■ 3. Amend § 131.3 by revising paragraphs (h) and (j), and adding paragraph (m) to read as follows:

§ 131.3 Definitions.

* * * * *

(h) *Water quality limited segment* means any segment where it is known that water quality does not meet applicable water quality standards, and/or is not expected to meet applicable water quality standards, even after the application of the technology-based effluent limitations required by sections 301(b) and 306 of the Act.

* * * * *

(j) *States* include: The 50 States, the District of Columbia, Guam, the Commonwealth of Puerto Rico, Virgin Islands, American Samoa, the Commonwealth of the Northern Mariana Islands, and Indian Tribes that EPA determines to be eligible for purposes of the water quality standards program.

* * * * *

(m) *Highest attainable use* is the aquatic life, wildlife, and/or recreation use that is both closest to the uses specified in section 101(a)(2) of the Act and attainable, as determined using best available data and information through a use attainability analysis defined in § 131.3(g).

■ 4. Amend § 131.5 by:

■ a. Revising paragraphs (a)(1) and (a)(2);

■ b. Redesignating paragraphs (a)(3) through (a)(5) as (a)(4) through (a)(6) and adding a new paragraph (a)(3); and

■ c. Revising paragraph (b).

The revisions and additions read as follows:

§ 131.5 EPA Authority.

(a) * * *

(1) Whether the State has adopted designated water uses which are consistent with the requirements of the Clean Water Act;

(2) Whether the State has adopted criteria that protect the designated water uses based on sound scientific rationale;

(3) Whether the State has adopted an antidegradation policy consistent with § 131.12(a), and if the State has chosen to adopt implementation methods, whether those implementation methods are consistent with § 131.12;

* * * * *

(b) If EPA determines that the State's or Tribe's water quality standards are consistent with the factors listed in paragraphs (a)(1) through (a)(6) of this section, EPA approves the standards. EPA must disapprove the State's or Tribe's water quality standards and promulgate Federal standards under section 303(c)(4), and for Great Lakes States or Great Lakes Tribes under section 118(c)(2)(C) of the Act, if State or Tribal adopted standards are not consistent with the factors listed in paragraphs (a)(1) through (a)(6) of this section. EPA may also promulgate a new or revised standard when necessary to meet the requirements of the Act.

* * * * *

Subpart B—Establishment of Water Quality Standards

■ 5. Amend § 131.10 by revising paragraph (g) introductory text and paragraphs (j), and (k) to read as follows:

§ 131.10 Designation of uses.

* * * * *

(g) Pursuant to § 131.10(j), States may designate or remove a use or a sub-category of a use as long as the action does *not* remove protection for an existing use, and the State can demonstrate that attaining the use is not feasible because of one of the six factors in this paragraph. If a State adopts new or revised water quality standards based on a use attainability analysis, the State shall also adopt the highest attainable use and the criteria to protect that use. To meet this requirement, States may, at their discretion, utilize their current use categories or subcategories, develop new use categories or subcategories, or adopt another use which may include a location-specific use.

* * * * *

(j) A State must conduct a use attainability analysis as described in § 131.3(g), and § 131.10(g), whenever:

(1) The State designates or has designated uses for a water body for the first time that do not include the uses specified in section 101(a)(2) of the Act, or

(2) The State wishes to remove a designated use that is specified in section 101(a)(2) of the Act, to remove a sub-category of such a use, or to designate a sub-category of such a use which requires criteria less stringent than previously applicable.

(k) A State is not required to conduct a use attainability analysis whenever:

(1) The State designates or has designated uses for a water body for the first time that include the uses specified in section 101(a)(2) of the Act, or

(2) The State wishes to remove a designated use that is not specified in section 101(a)(2) of the Act, or designate a sub-category of a use specified in section 101(a)(2) of the Act which requires criteria at least as stringent as previously applicable.

■ 6. Amend § 131.11 by revising paragraphs (a)(2) and (b) introductory text to read as follows:

§ 131.11 Criteria.

(a) * * *

(2)*Toxic Pollutants.* States must review water quality data and information on discharges to identify specific water bodies where toxic pollutants may be adversely affecting water quality or the attainment of the designated water use or where the levels of toxic pollutants are at a level to warrant concern and must adopt criteria for such toxic pollutants applicable to the water body sufficient to protect the designated use. Where a State adopts narrative criteria for toxic pollutants to protect designated uses, the State must provide information identifying the method by which the State intends to regulate point source discharges of toxic pollutants on water quality limited segments based on such narrative criteria. Such information may be included as part of the standards or may be included in documents generated by the State in response to the Water Quality Planning and Management Regulations (40 CFR part 130).

(b) *Form of criteria:* In establishing criteria, States should:

* * * * *

■ 7. Amend § 131.12 by revising the section heading and paragraphs (a) introductory text and (a)(2), and adding paragraph (b) to read as follows:

§ 131.12 Antidegradation Policy and Implementation Methods.

(a) The State shall develop and adopt a statewide antidegradation policy. The antidegradation policy shall, at a minimum, be consistent with the following:

* * * * *

(2) Where the quality of the waters exceed levels necessary to support the protection and propagation of fish, shellfish, and wildlife and recreation in and on the water, that quality shall be maintained and protected unless the State finds, after full satisfaction of the intergovernmental coordination and public participation provisions of the State's continuing planning process, that allowing lower water quality is necessary to accommodate important economic or social development in the area in which the waters are located. In allowing such degradation or lower water quality, the State shall ensure water quality adequate to protect existing uses fully. Further, the state shall ensure that there shall be achieved the highest statutory and regulatory requirements for all new and existing point sources and all cost-effective and reasonable best management practices for nonpoint source control.

* * * * *

(b) The State shall develop and make available to the public statewide methods for implementing the antidegradation policy adopted pursuant to paragraph (a) of this section. A State's antidegradation implementation methods shall be designed to achieve antidegradation protection consistent with paragraph (a) of this section. Such methods must ensure that:

(1) High quality waters are identified on a parameter-by-parameter basis or on a water body-by-water body basis at the State's discretion, but must not exclude any water body from high quality water protection solely because not all of the uses specified in CWA section 101(a)(2) are attained; and

(2) The State will only make a finding that lowering high water quality is necessary, pursuant to paragraph (a)(2) of this section, after conducting an alternatives analysis that evaluates a range of non-degrading and minimally degrading practicable alternatives that have the potential to prevent or minimize the degradation associated with the proposed activity. If the State can identify any-practicable alternatives, the State must choose one of those alternatives to implement when authorizing a lowering of high water quality.

■ 8. Add § 131.14 to subpart B to read as follows:

§ 131.14 Water quality standards variances.

States may, at their discretion, grant variances subject to the provisions of this section and public participation requirements at § 131.20(b). A water quality standards variance (WQS

variance) is a time-limited designated use and criterion for a specified pollutant(s), permittee(s), and/or water body or waterbody segment(s) that reflect the highest attainable condition during the specified time period. WQS variances are water quality standards subject to EPA review and approval or disapproval and must be consistent with this section. Any such WQS variances adopted after *[effective date of the final rule]* must be consistent with this regulatory section.

(a) *Applicability:*

(1) All applicable WQS not specifically addressed by the WQS variance remain applicable.

(2)(i) Where a state adopts a WQS variance, the State regulations must continue to reflect the underlying designated use and criterion unless the State adopts and EPA approves a revision to the underlying designated use and criterion consistent with § 131.10 or § 131.11.

(ii) The interim requirements specified in the WQS variance are in effect during the term of the WQS variance and apply for CWA section 402 permitting purposes and in issuing certifications under section 401 of the Act for the permittee(s), pollutant(s), and/or water body or waterbody segment(s) covered by the WQS variance. For these limited purposes, the interim requirements will be the standards applicable for purposes of the CWA under 40 CFR 131.21(c)–(e).

(3) A WQS variance shall not be granted if the designated use and criterion addressed by the proposed WQS variance can be achieved by implementing technology-based effluent limits required under sections 301(b) and 306 of the Act.

(b) *Submission Requirements:*

(1) A WQS variance must specify the following:

(i) Identifying information: A WQS variance must identify the pollutant(s), permittee(s), and/or the water body or waterbody segment(s) to which the WQS variance applies.

(ii) WQS that apply during a variance for CWA section 402 permitting purposes and in issuing certifications under section 401 of the Act: A WQS variance must specify:

(A) The highest attainable interim use and interim numeric criterion, or

(B) An interim numeric effluent condition that reflects the highest attainable condition for a specific permittee(s) during the term of the variance. Neither (A) nor (B) of this paragraph shall result in any lowering of the currently attained water quality unless a time-limited lowering of water quality is necessary during the term of a variance for restoration activities, consistent with paragraph (b)(2)(ii) of this section.

(iii) Date the WQS variance will expire: States must include an expiration date for all WQS variances, consistent with paragraph (b)(2) of this section. WQS variances must be as short as possible but expire no later than 10 years after state adoption.

(2) The State must submit a demonstration justifying the need for a WQS variance. For a WQS variance to a use specified in section 101(a)(2) of the Act or a sub-category of such a use, the State must submit a demonstration that attaining the designated use and criterion is not feasible during the term of the WQS variance because:

(i) One of the factors listed in § 131.10(g) applies, or

(ii) Actions necessary to facilitate restoration through dam removal or other significant wetland or stream reconfiguration activities preclude attainment of the designated use and criterion while the actions are being implemented.

(3) For a waterbody variance, the state must identify and document any cost-effective and reasonable best management practices for nonpoint source controls related to the pollutant(s) and location(s) specified in the WQS variance that could be implemented to make progress towards attaining the designated use and criterion. A State must provide public notice and comment for any such documentation.

(c) *Implementing variances in NPDES permits:* Consistent with paragraph (a)(2)(ii) of this section, a WQS variance serves as the basis of a water quality-based effluent limit included in a NPDES permit for the period the variance is in effect. Any limitations required to implement the WQS variance shall be included as conditions of the NPDES permit for the permittee(s) subject to the WQS variance.

(d) *WQS variance renewals:* EPA may approve a WQS variance renewal if the State meets the requirements of this section and provides documentation of the actions taken to meet the requirements of the previous WQS variance. For a waterbody WQS variance renewal, the state must also provide documentation of whether and to what extent BMPs have been implemented to address the pollutant(s) subject to the WQS variance and the water quality progress achieved during the WQS variance period. Renewal of a WQS variance may be disapproved if the applicant did not comply with the conditions of the original WQS variance, or otherwise does not meet the requirements of this section.

■ 9. Add § 131.15 to subpart B to read as follows:

§ 131.15 Compliance schedule authorizing provisions.

A State may, at its discretion and consistent with state law, authorize schedules of compliance for water quality-based effluent limits (WQBELs) in NPDES permits by including a compliance schedule authorizing provision in its water quality standards or implementing regulations. Any such provision is a water quality standard subject to EPA review and approval and must be consistent with sections 502(17) and 301(b)(1)(C) of the Act. Individual compliance schedules issued pursuant to such authorizing provisions are not themselves water quality standards. Individual compliance schedules must be consistent with CWA section 502(17), the state's EPA-approved compliance schedule authorizing provision, and the requirements of §§ 122.2 and 122.47.

Subpart C—Procedures for Review and Revision of Water Quality Standards

■ 10. Amend § 131.20 by revising paragraphs (a) and (b) to read as follows:

§ 131.20 State review and revision of water quality standards.

(a) *State Review.* The State shall from time to time, but at least once every 3 years, hold public hearings for the purpose of reviewing applicable water quality standards and, as appropriate, modifying and adopting standards; in particular, any water body segment with water quality standards that do not include the uses specified in section 101(a)(2) of the Act shall be re-examined every 3 years to determine if any new information has become available. If such new information indicates that the uses specified in section 101(a)(2) of the Act are attainable, the State shall revise its standards accordingly. Similarly, a State shall re-examine its water quality criteria to determine if any criteria should be revised in light of any new or updated CWA section 304(a) criteria recommendations to assure that designated uses continue to be protected. Procedures States establish for identifying and reviewing water bodies for review should be incorporated into their Continuing Planning Process.

(b) *Public Participation.* The State shall hold public hearings for the purpose of reviewing or revising water quality standards, in accordance with provisions of State law and EPA's public participation regulation (40 CFR part 25). The proposed water quality

standards revision and supporting analyses shall be made available to the public prior to the hearing.

* * * * *

■ 11. Amend § 131.22 by revising paragraph (b) to read as follows:

§ 131.22 EPA promulgation of water quality standards.

* * * * *

(b) The Administrator may also propose and promulgate a regulation, applicable to one or more States, setting forth a new or revised standard upon determining such a standard is necessary to meet the requirements of the Act. To constitute an Administrator's determination, such determination must:

(1) Be signed by the Administrator or his or her duly authorized delegate, and

(2) Contain a statement that the document constitutes an Administrator's determination under section 303(c)(4)(B) of the Act.

* * * * *

Subpart D—Federally Promulgated Water Quality Standards

■ 12. Amend § 131.34 by revising paragraph (c) to read as follows:

§ 131.34 Kansas.

* * * * *

(c) *Water quality standard variances.* The Regional Administrator, EPA Region 7, is authorized to grant variances from the water quality standards in paragraphs (a) and (b) of this section where the requirements of § 131.14 are met.

■ 13. Amend § 131.40 by revising paragraph (c) to read as follows:

§ 131.40 Puerto Rico.

* * * * *

(c) *Water quality standard variances.* The Regional Administrator, EPA Region 2, is authorized to grant variances from the water quality standards in paragraphs (a) and (b) of this section where the requirements of § 131.14 are met.

[FR Doc. 2013–21140 Filed 9–3–13; 8:45 am]

BILLING CODE 6560–50–P

Exhibit 3

BEFORE THE ILLINOIS POLLUTION CONTROL BOARD

IN THE MATTER OF:	)	
	)	
WATER QUALITY STANDARDS AND	)	
EFFLUENT LIMITATIONS FOR THE	)	R08-09
CHICAGO AREA WATERWAY SYSTEM	)	(Rulemaking – Water)
AND THE LOWER DES PLAINES RIVER:	)	
PROPOSED AMENDMENTS TO 35 Ill.	)	
Adm. Code Parts 301, 302, 303 and 304	)	
	)	

PREFILED TESTIMONY OF SCOTT TWAIT

My name is Scott Twait and I am an Environmental Protection Engineer in the Water Quality Standards Section in the Illinois EPA's Bureau of Water. I have held that position since October 1996. I received a Bachelor's degree in Civil Engineering from the University of Illinois in 1992. As a member of the Water Quality Standards staff, I have participated in the internal development of rulemaking proposals and Agency responses to site-specific rulemaking proposals and petitions for adjusted standards and variances. These include serving as the lead technical reviewer for the Effingham and Exxon-Mobil site-specific rulemakings, the Belleville Combined Sewer Overflow and Borden Chemical Adjusted Standards, and the CITGO and Ameren CIPS - Grand Tower Variances.

My involvement in the use attainability analysis process that has led to this rulemaking began with serving as lead technical staff on the Lower Des Plaines River Use Attainability Analysis. I have been involved in a technical review of each of the numeric water quality standards applicable to the Secondary Contact and Indigenous Aquatic Life waters and the recommendations to update and upgrade them as contained in the Agency's proposal. In particular, I was involved in interpreting the

information and recommendations provided to the Agency with regard to the thermal water quality standards by U.S. EPA's contractor, Chris Yoder of the Center of Applied Bioassessment and Biocriteria at the Midwest Biodiversity Institute, and translating those recommendations into the numeric temperature water quality standard proposal before the Board.

The focus of my testimony is the decisions Illinois EPA made in formulating its proposal to the Board for the set of comprehensive numeric water quality standards necessary to protect the designated aquatic life and recreational uses being established for the Lower Des Plaines River and Chicago Area Waterway System. After selection of recommended aquatic life and recreational uses, which is described in Rob Sulski's Pre-filed Testimony, the Agency reviewed the latest available criteria documents and literature to get the most current science on numerical standards necessary for individual parameters to protect the proposed uses. In most cases that proved to be U.S. EPA's national criteria document or information supporting a recent upgrade to an Illinois General Use standard. This type of information was significantly lacking for two very important parameters — temperature and bacteria. My testimony will address the efforts the Agency undertook to address these informational gaps.

In most cases, identical numeric water quality standards are necessary to protect all of the proposed aquatic life use designations. The exceptions to this are temperature, dissolved oxygen and ammonia. I will be discussing two of these exceptions – temperature and ammonia – in my testimony. In general, the Agency attempted to use the most current criteria available when proposing water quality standards for the various toxic parameters. This was accomplished with all parameters

except cadmium, copper and chloride which will be explained in further detail in my testimony. The Agency is also proposing water quality standards for sulfate and chloride that are based on the proposal currently before the Board in R07-09. Like the Agency's proposal in R07-09, the proposal in this rulemaking also includes the elimination of a numeric water quality standard for Total Dissolved Solids. My testimony will provide details regarding the basis for the Agency's current proposal to the Board for an updated temperature water quality standard for the three aquatic life use designations being recommended for these waters. Finally, I will also discuss the recommendations being made by the Agency with regard to numeric bacteria standards for the protection of the recreational use designations of these waters.

Numeric Water Quality Standards for Toxic Parameters and Metals

There are a number of water quality standards where the most recent U.S. EPA National Criteria Document was found to be the same as or consistent with the current water quality standard on the books for the General Use designation. The proposal before the Board in this rulemaking contains water quality standards for the following contaminants in order to protect aquatic life use designations in the CAWS and Lower Des Plaines River that are based on both the U.S. EPA National Criteria Document and the General Use Standard: pH, Chromium (total hexavalent), Cyanide and Total Residual Chlorine. Ammonia is also based on both of these documents with two variations which I will explain in more detail.

With regard to pH, the Agency has proposed updating the current standard of 6.0 to 9.0 to conform to the current General Use standard of 6.5 to 9.0 which is also consistent with the most recent federal criteria document. It is expected that this

standard will be attained at most times and in most areas of the CAWS and Lower Des Plaines River, though data from the Metropolitan Water Reclamation District of Greater Chicago (or MWRDGC) indicates there may be occasional pH violations below 6.5. The federal criterion states that a pH range of 6.0 to 6.5 will be unlikely to be harmful to fish unless the free carbon dioxide present is in excess of 100 parts per million. At the Agency's request, MWRDGC derived the free carbon dioxide concentrations. In cases where pH was between 6.0 and 6.5, the free carbon dioxide level was greater than 100 parts per million approximately 64 percent of the time. Therefore, the Agency concluded a pH standard below 6.5 could not be supported for these waters at this time.

With regard to ammonia, the water quality standard contained in the Agency's proposal to the Board is based on the most recent national criteria document. The ammonia proposal is also the same as the General Use water quality standards with two exceptions. The first exception is that the seasonal ammonia standard protecting the early life stage period is not applicable to those waters not being designated for the protection of early life stages. The waters that do not protect for early life stages are the Chicago Area Waterway System and Brandon Pool Aquatic Life Use B waters. The second exception is that the following sentence from 35 Illinois Administrative Code Section 302.212(e) is not proposed for inclusion in the CAWS and Lower Des Plaines River standards "In addition, during any other period when early life stages are present, and where the water quality standard does not provide adequate protection for these organisms, the water body must meet the Early Life Stage Present water quality standard." This sentence was inserted in the General Use water quality standards to provide a heightened level of conservatism or an additional safety factor to the General

Use water quality standards to address any unknown organisms that may be found to spawn extremely early or extremely late in the year. Illinois EPA is confident this language is not necessary to protect the aquatic life uses designated for these waters. Chicago Area Waterway Aquatic Life Use A Waters, Chicago Area Waterway and Brandon Pool Aquatic Life Use B Waters and the Upper Dresden Island Pool Aquatic Life Use Waters will be fully protected by the adoption of the ammonia water quality standards proposed by the Agency.

When reviewing the available water quality criteria information, the Agency found that the existing General Use standards for several parameters where either more up-to-date than the current National Criteria Document or there was no available National Criteria Document. In those situations the Agency chose to propose that the Board adopt the General Use water quality standard for the CAWS and Lower Des Plaines River aquatic life uses. These parameters are lead, benzene, ethylbenzene, toluene, xylene, nickel, zinc, mercury (human health standard), benzene (human health standard) and iron. On page 70 of the Statement of Reasons, the Agency indicated that U.S. EPA approval for benzene, ethylbenzene, toluene, xylene, nickel (dissolved) and Zinc (dissolved) was pending. U.S. EPA formally approved the General Use water quality standards for these six parameters in a letter dated July 25, 2007. This approval letter is included as Attachment 1 to my pre-filed testimony.

In several cases, the Illinois EPA found that a U.S. EPA National Criteria Document was available that was more current from what is currently adopted for General Use waters. Where possible, the Agency attempted to use this updated criteria for the Lower Des Plaines River and CAWS waters. These parameters are arsenic,

chromium (trivalent), silver and the aquatic life standard for mercury. The Agency has proposed to adopt the National Criteria Document recommendations for these numeric water quality standards, because they represent the most up-to-date information available on the impacts of these metals on aquatic life.

Cadmium

The proposed Cadmium water quality standard is the same as the General Use water quality standard. U.S. EPA's most recent National Criteria Document for cadmium was finalized in 2001. The Agency considered basing the acute and chronic cadmium water quality standards on the recalculation procedure from the 2001 National Criteria Document by removing cold water species and species not native to Illinois. Based on stream data provided by MWRDGC, it appeared to the Agency that the chronic criteria would be periodically exceeded in these waters. This discovery led the Agency to investigate the potential cause of these exceedances.

MWRDGC collects cadmium data once per month at twenty-six stream locations. The Agency reviewed the data and noted that periodic exceedances of the national criteria would occur mostly in the summer months and that cadmium was usually not detectable in the winter months when barge traffic was minimal. Contaminated sediment is scoured and resuspended by barge traffic. Photos showing the plume from sediment scoured and resuspended in the waterway are attached to the Statement of Reasons as Attachment CC. The Agency reviewed the stream data where there was not a known point source of cadmium and concluded that the exceedances of the chronic criteria were most likely the result of contaminated sediment, but could not rule out point sources that were not quantified, such as CSOs. Based on an analysis of the

data, the Agency believes that a legacy of contaminated sediment prevents full attainment of the Clean Water Act aquatic life use in these waters and is the primary reason that the chronic national criterion cannot be met in the segments of the CAWS. The Agency concluded that the General Use dissolved cadmium water quality standards would fully protect the aquatic life uses that have been defined for the Lower Des Plaines River and the Chicago Area Waterway System.

Copper

The acute and chronic copper water quality standards in this proposal are based on the recalculation procedure established in the 1995 National Criteria Document removing cold water species and species not native to Illinois. The northern squawfish and chiselmouth are only found in the western states and viable populations of Coho salmon, sockeye salmon, cutthroat trout, Chinook salmon, rainbow trout, Atlantic salmon and brook trout are not found in Illinois outside of Lake Michigan. The proposed water quality standards for these waters are also being updated to include a translator from total copper to dissolved copper.

On February 22, 2007, U.S. EPA finalized a national criterion update for copper. Illinois EPA has not chosen to incorporate the 2007 criterion because it is based on a Biotic Ligand Model. This new methodology is quite complex and requires the ability to measure the presence of additional parameters that would impact copper's toxicity such as dissolved organics. This new methodology would be a significant departure from the way copper water quality standards have been used in the past. Illinois EPA will continue to evaluate whether this model is useful for General Use waters and the waters

impacted by this proposal and will consider updating or supplementing the copper standards as appropriate.

On page 72 of the Statement of Reasons we state that: "Based on the compliance of the Agency samples and the closeness to compliance of the MWRDGC data, the Agency recommends that the water quality standard be set at the existing General Use standard." This statement is erroneous since the Agency is proposing to use a recalculation based on the National Criteria Document, which is more up-to-date than the General Use water quality standard.

Chloride, Sulfate and Total Dissolved Solids

Currently, there are no sulfate or chloride ambient water quality standards applicable to the CAWS and Lower Des Plaines River. The Agency proposed changes to the General Use water quality standards for sulfate and total dissolved solids (or TDS) in docket R07-09 which was filed with the Board on October 23, 2006. The proposal in this rulemaking to address sulfate, chloride and TDS in the CAWS and the Lower Des Plaines River is patterned after the proposal currently before the Board in R07-09. It was also developed prior to a First Notice Opinion by the Board in that proceeding. There are currently no applicable national criteria for sulfate.

While the proposed sulfate water quality standard in this rulemaking is based primarily on the proposal in R07-09, it does not include the limit of 2,000 mg/L for protection of livestock watering since this is not a designated use of the CAWS or Lower Des Plaines River. In addition, the Agency's proposal does not include provisions for instances when hardness is less than 100 mg/L or chloride is less than 5 mg/L since

these conditions do not exist in the CAWS or Lower Des Plaines River. Monitoring data collected by MWRDGC was used to support this conclusion.

There is currently no chloride standard applicable to the Secondary Contact and Indigenous Aquatic Life Uses segments of the CAWS and Lower Des Plaines River. The proposed chloride water quality standard is exactly the same as the current General Use water quality standard of 500 mg/L. The General Use chloride standard has not been updated since the original adoption. U.S. EPA's National Criteria Document recommends a Criterion Maximum Concentration of 860 mg/L and a Criterion Chronic Concentration of 230 mg/L. Illinois EPA is proposing to maintain the General Use water quality standard in these waters as a single value of 500 mg/L. This is the value that has been used by scientists in evaluating the toxicity of sulfate. It would be inconsistent with the results of that research to convert to the federal methodology which contains an acute value that is less restrictive than the Illinois EPA's General Use standard and a chronic value that may be more restrictive than the Agency's General Use standard. The Illinois EPA expects that there will be violations of the chloride standard during the winter months when road salting takes place to address winter weather events and the safety of Illinois motorists. This problem is not unique to the CAWS and Lower Des Plaines River and the Illinois EPA plans to continue to work with state and local government entities to mitigate the potential harm to aquatic life from these practices.

Sulfate and chloride are the key toxic components of dissolved solids. As a result of the improvements to the sulfate water quality standard the Agency also proposed elimination of the total dissolved solids standard in R07-09. Illinois EPA is

proposing elimination of a TDS standard for the Lower Des Plaines River and CAWS as well. In addition to TDS, the Agency is proposing elimination of the barium, fluoride, manganese, oil/fats/grease, and phenols water quality standards as unnecessary, inappropriate or outdated. These are explained in more detail in the Agency's Statement of Reasons.

Temperature

Due to extreme difference of opinion in the temperature discussions and the lack of an updated national criteria document, Illinois EPA decided to take advantage of an undertaking by the Ohio River Valley Water Sanitary Commission (or ORSANCO) to update their methodology and data for derivation of temperature criteria. Through funding from U.S. EPA, an independent national temperature expert was retained to develop temperature criteria options to protect the aquatic life uses for the Lower Des Plaines River. The proposed temperature water quality standards utilized methods contained in the report by Midwest Biodiversity Institute and Center for Applied Bioassessment and Biocriteria titled *Temperature Criteria Options for the Lower Des Plaines River*. The authors are Chris O. Yoder and Edward T. Rankin. A version of that report dated October 11, 2005 is included as Attachment GG to the Agency's Statement of Reasons. A final version with non-substantive corrections dated November 23, 2005 is being submitted as Attachment 2 to the pre-filed testimony of Chris Yoder. A transcription error effecting Table 3 of the November 2005 report is corrected in Attachment HH to the Agency's Statement of Reasons. The Agency used the conclusions and options presented in this report to develop temperature standards for the CAWS and Lower Des Plaines River.

The methodology contained in Chris Yoder's report relies on use of a Representative Aquatic Species list, referred to as an RAS list. The methodology uses the RAS list to develop summer daily maximum and period average thermal criteria. The MBI report had three main categories of RAS lists with some subcategories: General Use, Modified Use, and Secondary Contact/Indigenous Aquatic Life Use with 49, 27, and 8 species RAS lists respectively. The categories are modeled after existing aquatic life uses in Illinois and Ohio's modified use, but should not be interpreted as being equivalent to existing Illinois and Ohio designated use labels. The Agency applied the RAS lists developed by Chris Yoder for the Lower Des Plaines River to the aquatic life use designations developed by the Agency for the CAWS and Lower Des Plaines River.

The Agency determined that the Chicago Area Waterway System and Brandon Pool Aquatic Life Use B waters listed in 35 Illinois Administrative Code 303.235 of the proposal should use the option of the 8 species RAS list (Secondary Contact/ Indigenous Aquatic Life) to determine the summer daily maximum and period average. This decision was made based on the aquatic life and habitat in the affected stream reaches. It is believed that those eight species are representative of the species that would be found in water capable of maintaining aquatic life populations predominated by individuals of tolerant types that are adaptive to the unique physical conditions, flow patterns and operational controls designed to maintain navigational use, flood control and drainage functions in deep-draft, steep-walled shipping channels.

Based on the fact that white sucker was present in certain waters, the Agency determined the Chicago Area Waterway System Aquatic Life Use A waters listed in 35

Illinois Administrative Code 303.230 of the rulemaking proposal should use the option of the 8 species RAS list plus white sucker to determine the summer daily maximum and period average. This decision was made based on the aquatic life and habitat in the affected stream reaches. It is believed that those nine species are representative of the species that would be found in water capable of maintaining aquatic life populations predominated by individuals of tolerant or intermediately tolerant types that are adaptive to the unique physical conditions, flow patterns, and operational controls necessary to maintain navigational use, flood control, and drainage functions of this waterway system.

The Des Plaines River between the Brandon Road Lock and Dam and the I-55 bridge has incrementally more diverse aquatic life and higher quality habitat than the rest of the CAWS and Lower Des Plaines River. For this reason, the Agency determined it was appropriate to use the option of the 27 species RAS list (Modified Use) to determine the summer daily maximum and period average for the Upper Dresden Island Pool waters. The Agency was asked to look at the feasibility of including the stonecat madtom to the 27 species RAS list by staff of U.S. EPA Region V. However, Illinois EPA biologists concluded that typical habitat for stonecat madtoms is higher-gradient creeks and rivers with moderate to swift currents and gravelly to rocky substrates. It is reasonable to not expect stonecats in Lower Des Plaines River, which does not have much of their typical habitat. Based on these recommendations from the Agency biologists, I determined not to rely on the stonecat madtom when working with the Fish Temperature Model to develop the proposed temperature water quality standards.

Criteria for non-summer periods are derived to maintain seasonal norms and cycles of increasing and decreasing temperatures. Seasonal ambient temperature data were analyzed from eight locations in the CAWS and Lower Des Plaines River for the period 1998 through 2004. The data from these stations can by found in Appendix B of Chris Yoder's report which is included as Attachment 2 to his pre-filed testimony. The monitoring location at Route 83 on the Chicago Sanitary and Ship Canal was used as the "background" location because it was not directly influenced by cooling water or Lake Michigan and was believed to be representative of "background" temperatures. Because the source water of the CAWS is composed of the MWRDGC wastewater treatment plant effluents, the temperatures of these waters can be expected to exceed other measures of background or ambient temperature at certain times of the year. Consequently, the Agency decided to use the effluent temperature from MWRDGC's North Side, Calumet and Stickney facilities as the background temperature instead of using temperatures at the Route 83 Chicago Sanitary and Ship Canal station during periods of the non-summer months when the effluent temperature was higher than the background temperature. These periods were January, February, October 1-15, November and December. For the non-summer periods of September 16-30, October 16-31, March, April, May and June 1-15, the Agency used temperature values from the Route 83 Chicago Sanitary and Ship Canal station in setting the period averages because the ambient values were higher than the effluent data values. The effluent data used was submitted to the Agency by MWRDGC on May 22, 2007 and is included as Attachment W to the Agency's Statement of Reasons. Had the Agency not made this alteration to the recommendations Chris Yoder's temperature report in developing

our water quality standards, the water quality standards for the three aquatic life use designations proposed for the CAWS and Lower Des Plaines River would have been lower than the MWRDGC effluents and would have required installation of cooling towers or other treatment technology to reduce the temperature of these effluents.

The Agency used the 75th percentile of the temperatures from the MWRDGC effluent and Route 83 Chicago Sanitary and Ship Canal station data as the period average to ensure that the seasonal norms are preserved in the system. The daily maximum of the summer months was preserved for the entire year to ensure that no acute lethal temperatures are present, rather than using the 98th percentile of ambient temperature values for the non-summer months or some other statistical method as suggested by Chris Yoder. This decision was made because the daily maximum is designed to protect acute (or lethal) impacts, while the chronic (or sub-lethal) impacts are protected through the period average. The Illinois EPA believes that seasonal norms are preserved with the period average as opposed to the daily maximum.

The proposed thermal water quality standards are more stringent than the current Secondary Contact and Indigenous Aquatic Life water quality standards for all months. The proposed thermal water quality standards are also more stringent than the current General Use standards for the months April through November, especially when considering the period average. During the remaining months, the proposed standards are approximately equivalent to the existing General Use standards. The proposed thermal water quality standards are more stringent than the current Adjusted Standard for temperature applicable at Interstate-55 for all of the months, especially when considering the period average.

Because fish can tolerate short-term elevations in temperature, the current water quality standards in Illinois allow for a certain amount of excursions before there is an exceedance of the standard. The excursions under the current General Use and Secondary Contact and Indigenous Aquatic Life Standards are limited both in their degree and frequency. The Agency is proposing to allow excursions from the daily maximum criteria to occur two percent of the time. This is between the one percent for General Use and five percent for the existing Secondary Contact and Indigenous Aquatic Life Standards. Currently, the excursion hours allowed under Midwest Generation's thermal adjusted standard at the Interstate-55 bridge also allow two percent excursion hours. The Agency is also proposing to limit the allowable excursions of the daily maximum up to 2° Celsius (or 3.6° Fahrenheit). This is between the 1.7° C (or 3° F) excursion allowance for the General Use standard and 3.8° C (or 7° F) for the existing Secondary Contact and Indigenous Aquatic Life Standards.

Developing the Agency's proposal to the Board for thermal water quality standards was one of the most challenging aspects of the rule development process and there will likely be additional information developed in the Record of this proceeding that the Board will have to consider in making a final decision.

Bacteria

In the case of bacteria, the Agency concluded there were no reliable criteria available on which to base water quality standards to protect the types of recreational uses designated in the CAWS and Lower Des Plaines River. Older federal criteria documents are viewed with skepticism among the scientific community. U.S. EPA has undertaken a multi-year initiative centered on an epidemiological survey to develop new

criteria. They have publicly stated their desire to have new criteria available for states to use within five years. The federal effort is focused exclusively on primary contact recreation areas such as public beaches. MWRDGC has commissioned the University of Illinois School of Public Health to perform an epidemiologic study in the Chicago area to look at a spectrum of recreational activity generally characterized as secondary contact. The Agency agrees with MWRDGC that such an approach is more closely representative of actual exposure conditions likely associated with recreational activity within the various segments of the CAWS. While the Agency is proposing that the Board adopt specific recreational use designations applicable within the CAWS and Lower Des Plaines River; we are recommending deferral of adopting any numeric bacterial water quality standard until sound information is available to support such a standard. As a precautionary measure to protect our recreating public, however, we are proposing to require wastewater treatment facilities discharging into any segments listed as Incidental Contract Recreation and Non-Contact Recreation to employ disinfection practices after a reasonable compliance period.

I will be happy to answer any questions from the Board and the public on the development of the temperature water quality standard, the other toxic and metals numeric water quality standards and the bacteria water quality standard recommendation.

By: Scott Twait

Scott Twait

Date: 20 Dec. 2007

Illinois Environmental Protection Agency
1021 North Grand Avenue East
P.O. Box 19276
Springfield, Illinois 62794-9276

ATTACHMENT 1

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

JUL 25 2007

REPLY TO THE ATTENTION OF:
WQ-16J

Marcia T. Willhite, Chief
Bureau of Water
Illinois Environmental Protection Agency
PO Box 19276
Springfield, Illinois 62794-9276

Dear Ms. Willhite:

On February 13, 2004, the Illinois Environmental Protection Agency (Illinois EPA) submitted amendments for revised water quality standards to the United States Environmental Protection Agency (U.S. EPA) for review and approval under Section 303(c) of the Clean Water Act (CWA). The proposed amendments are at 35 Ill. Adm. Code 302.105, Antidegradation; 302.208, Numeric Standards for Chemical Constituents; 302.504, Chemical Constituents (Lake Michigan Basin Water Quality Standards); and 302.575 (Procedures for Deriving Tier 1 Water Quality Criteria and Values in the Lake Michigan Basin to Protect Wildlife). U.S. EPA also reviewed proposed amendments at 35 Ill. Adm. Code 301.267, 301.313, 301.413, 309.141, and 309.157 that were pertinent to water quality standards.

Consistent with Section 303(c) of the CWA and Federal regulations at 40 CFR 131.21, U.S. EPA is required to review and approve, or disapprove, new or revised State water quality standards. U.S. EPA has reviewed the new and revised water quality standards identified above and the information submitted by Illinois EPA in support of these amendments and hereby approves all of the new and revised standards identified above pursuant to Section 303(c) of the CWA and Federal regulations at 40 CFR 131.21.

Illinois EPA's submittal includes proposed aquatic life criteria for BETX chemicals (benzene, ethylbenzene, toluene, and xylenes). Illinois EPA's criteria were derived using a significant amount of data from static, unmeasured toxicity tests that apparently were not reviewed to confirm that the reported concentrations of the toxicants were actually the concentrations to which the test organisms were exposed. Because BETX chemicals are highly volatile, data from static, unmeasured toxicity tests are likely to overestimate the exposure and consequently, the LC50 for the species being tested because of volatilization of the toxicant during the test. Incorporation of this data into the criterion can lead to a value that is not protective of aquatic life because the LC50 for the species represented by static, unmeasured data might be significantly lower, possibly even among the four, most-sensitive species LC50s that determine the magnitude of the criterion. For this reason, U.S. EPA's, "Guidelines for Deriving National Aquatic Life Criteria for the Protection of Aquatic Life and their Uses" (U.S. EPA, 1985), cautions against accepting static, unmeasured tests unless the individual studies are thoroughly reviewed to ensure the reported toxicant concentration is an accurate estimate of the exposure of the test

organisms. In the absence of other data demonstrating that the proposed criteria protect aquatic life uses, U.S. EPA would have disapproved Illinois EPA's proposed criteria for the BETX chemicals. However, after consulting extensively with U.S. EPA Headquarters and the Office of Research and Development, we determined that, in the case of BETX chemicals, published predictive models exist (Di Toro *et al.*, "Technical Basis for Narcotic Chemicals and Polycyclic Aromatic Hydrocarbon Criteria," 2000; ASTER (Assessment Tools for the Evaluation of Risk), U.S. EPA) that provide an additional line of evidence to confirm that Illinois' proposed BETX criteria are adequately protective of aquatic life uses in Illinois surface waters. By approving these criteria, U.S. EPA is not endorsing Illinois EPA's use of unreviewed static, unmeasured data in deriving BETX criteria. The use of static, unmeasured data is not appropriate for chemicals that may volatilize substantially during the course of the toxicity test, without careful review of each study to ensure an accurate estimate of the LC50.

Consistent with Section 7 of the Endangered Species Act (ESA) and Federal Regulations at 50 CFR Part 402, U.S. EPA is required to consult with the United States Fish and Wildlife Service (U.S. FWS) on any action that may affect Federally-listed threatened and endangered species. Pursuant to the "Memorandum of Agreement Between the Environmental Protection Agency, Fish and Wildlife Service and National Marine Fisheries Service Regarding Enhanced Coordination Under the Clean Water Act and Endangered Species Act" (the MOA) governing consultation with U.S. FWS, the approval of new and revised State water quality criteria under Section 303 of the CWA is an action requiring consultation. To date, U.S. EPA has initiated, but not completed, consultation with U.S. FWS on the revised rules approved above. U.S. EPA has determined that this approval action does not violate Section 7(d) of the ESA, which prohibits irreversible or irretrievable commitments of resources that have the effect of foreclosing the formulation or implementation of reasonable and prudent alternatives, and has included in the record the basis for the conclusion that there are not impacts of concern during the interim period until the consultation is completed.

If you or your staff has any questions regarding this approval, please have them contact Brian Thompson of my staff. Mr. Thompson may be reached at (312) 353-6066.

Very truly yours,

Linda Holst

Linda Holst, Acting Director
Water Division

cc: Robert Mosher, Illinois EPA
Michael Coffee, U.S. FWS, Rock Island ES Field Office

ILLINOIS ENVIRONMENTAL PROTECTION AGENCY

1021 NORTH GRAND AVENUE EAST, P.O. BOX 19276, SPRINGFIELD, ILLINOIS 62794-9276 • (217) 782-2829

BRUCE RAUNER, GOVERNOR LISA BONNETT, DIRECTOR

217/782-0610

May 8, 2015

RECEIVED
MAY 11 2015
BY M Wantz

ExxonMobil Oil Corporation
Post Office Box 874
Joliet, Illinois 60434

Re: ExxonMobil Oil Corporation
NPDES Permit No. IL0002861
Final Permit

Gentlemen:

Attached is the final NPDES Permit for your discharge. The Permit as issued covers discharge limitations, monitoring, and reporting requirements. Failure to meet any portion of the Permit could result in civil and/or criminal penalties. The Illinois Environmental Protection Agency is ready and willing to assist you in interpreting any of the conditions of the Permit as they relate specifically to your discharge. The following changes have been made since the public notice of this permit:

1. Sample type for phenols and cyanide at outfall 001 has been changed to a grab sample.

2. WET testing required in Special Condition 13 is now also listed on page 4 of the permit.

3. Special Condition 3 has been modified to note that temperature samples shall be taken prior to mixing with the receiving stream.

4. In Special Condition 17.G, the word "discharge" has been removed from the end of the first sentence.

5. In Special Condition 17.H.2 and 17.I, corrective actions noted in observations and inspections shall take place within one week of confirmation unless otherwise specified by the Agency.

6. Special Condition 2 has been modified to explain the temperature limits for the combined outfall.

The Agency has begun a program allowing the submittal of electronic Discharge Monitoring Reports (NetDMRs) instead of paper Discharge Monitoring Reports (DMRs). If you are interested in NetDMRs, more information can be found on the Agency website, http://www.epa.state.il.us/water/net-dmr/index.html. If your facility is not registered in the NetDMR program, a supply of preprinted paper DMR Forms for your facility will be sent to you prior to the initiation of DMR reporting under the reissued permit. Additional information and instructions will accompany the preprinted DMRs upon their arrival.

The attached Permit is effective as of the date indicated on the first page of the Permit. Until the effective date of any re-issued Permit, the limitations and conditions of the previously-issued Permit remain in full effect. You have the right to appeal any condition of the Permit to the Illinois Pollution Control Board within a 35 day period following the issuance date.

Should you have questions concerning the Permit, please contact Mark E. Liska at 217/782-0610.

Sincerely,

Alan Keller, P.E.
Manager, Permit Section
Division of Water Pollution Control

SAK:MEL:14102301.docx

Attachment: Final Permit

cc: Records
Compliance Assurance Section
Des Plaines Region
USEPA
CMAP

NPDES Permit IL0002861

Illinois Environmental Protection Agency

Division of Water Pollution Control

1021 North Grand Avenue East

P.O. Box 19276

Springfield, Illinois 62794-9276

NATIONAL POLLUTANT DISCHARGE ELIMINATION SYSTEM

Reissued (NPDES) Permit

Expiration Date: April 30, 2020

Issue Date: May 8, 2015
Effective Date: May 8, 2015

Name and Address of Permittee:

ExxonMobil Oil Corporation
Post Office Box 874
Joliet, Illinois 60434

Facility Name and Address:

ExxonMobil Oil Corporation
25915 S.E. Frontage Road
Channahon, Illinois 60410
(Will County)

Discharge Number and Name:	Receiving Waters
001 -- Treated Process, Sanitary and Storm Water	Des Plaines River
002 -- Non-Contact Cooling Water, Boiler Blowdown, Zeolite Water Softening Regeneration Streams (Brine, Slow and Fast Rinses), Condensate, Potable Water, Fire Water, and Overflow of Excess River/well Water from Utility Makeup Water Systems	Des Plaines River
003 -- Storm Water Runoff and Hydrostatic Test Water from Tankage Area and Coke Storage Area, Well Test Water, and Emergency Once-Through Cooling Water	Des Plaines River
A01 -- Purge Treatment Unit Wastewater - Wet Gas Scrubber Wastewater	Internal Outfall
A03 -- Hydrostatic Test Water	Internal Outfall
004 -- Storm Water Runoff from Wharf Area	Des Plaines River
005 -- Storm Water Runoff from Wharf Area	Des Plaines River
006 -- Storm Water Runoff from Northeast Secondary Drainage Area	Jackson Creek tributary to Des Plaines River
007 -- Storm Water Runoff from East Secondary Drainage Area	Jackson Creek tributary to Des Plaines River
008 -- Storm Water Runoff from Interceptor Basin Overflow	Des Plaines River
009 -- Storm Water Runoff from North Secondary Drainage Area	Des Plaines River
010 -- Storm Water Runoff from Northeast Secondary Drainage Area	Des Plaines River

In compliance with the provisions of the Illinois Environmental Protection Act, Title 35 of Ill. Adm. Code, Subtitle C and/or Subtitle D, Chapter 1, and the Clean Water Act (CWA), the above-named permittee is hereby authorized to discharge at the above location to the above-named receiving stream in accordance with the standard conditions and attachments herein.

Permittee is not authorized to discharge after the above expiration date. In order to receive authorization to discharge beyond the expiration date, the permittee shall submit the proper application as required by the Illinois Environmental Protection Agency (IEPA) not later than 180 days prior to the expiration date.

Alan Keller, P.E.
Manager, Permit Section
Division of Water Pollution Control

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NPDES Permit IL0002861

Effluent Limitations and Monitoring

PARAMETER	LOAD LIMITS lbs/day 30 DAY AVG.	LOAD LIMITS lbs/day DAILY MAX.	CONCENTRATION LIMITS mg/l 30 DAY AVG.	CONCENTRATION LIMITS mg/l DAILY MAX.	SAMPLE FREQUENCY	SAMPLE TYPE

1. From the effective date of this permit until the expiration date, the effluent of the following discharge(s) shall be monitored and limited at all times as follows:

Outfall(s): 001**** - Treated Process, Sanitary, and Storm Water (DAF = 4.32 MGD, DMF = 5.04 MGD)

Flow (MGD)	See Special Condition 20				Daily	Continuous
pH	See Special Condition 1				1/Week	Grab
BOD_5	584	1,435	20	40	2/Month	24 hr Composite
Total Suspended Solids	730	1,793	25	50	2/Week	24 hr Composite
COD***	14,164	27,295			2/Month	24 hr Composite
Oils, Fats and Grease	438	1,076	15	30	1/Week	24 hr Composite*
Phenols	8.2	27	0.3	0.6	1/Month	Grab
Chromium (Total)	9.7**	28**	1.0	2.0	2/Month	24 hr Composite
Chromium (Hexavalent)	0.78**	1.8**	0.1	0.2	2/Month	24 hr Composite
Sulfide	11	24			1/Month	24 hr Composite
NH_3-N	108	252	3.0	6.0	2/Week	24 hr Composite
Cyanide	2.9	7.2	0.1	0.2	1/Month	Grab
Fluoride	438	1,076	15	30	1/Month	24 hr Composite

*See Special Condition 4.
**See Special Conditions 10, and 28.
***See Special Conditions 10.
****See Special Conditions 7, 13, and 19.

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Effluent Limitations and Monitoring

PARAMETER	LOAD LIMITS lbs/day 30 DAY AVG.	LOAD LIMITS lbs/day DAILY MAX.	CONCENTRATION LIMITS mg/l 30 DAY AVG.	CONCENTRATION LIMITS mg/l DAILY MAX.	SAMPLE FREQUENCY	SAMPLE TYPE

1. From the effective date of this permit until the expiration date, the effluent of the following discharge(s) shall be monitored and limited at all times as follows:

Outfall(s): 002* - Non-Contact Cooling Water and Boiler Blowdown (Discharge = 10.476 MGD)

Flow (MGD)	See Special Condition 20		Daily	Continuous
pH	See Special Condition 1		1/Week	Grab
TOC	See Special Condition 5	'5' Net	1/Month	24 hr Composite

* See Special Condition 8.

Outfall: 003** Storm Water Runoff (Intermittent Discharge)
Hydrostatic Test Water from Tankage Area and Coke Storage Area (Intermittent Discharge)
Well Test Water (Intermittent Discharge)

			If Discharge Occurs	
Flow (MGD)	See Special Condition 20		Daily	Continuous
pH*	See Special Condition 1		2/Month*	Grab
Oil & Grease*		15	2/Month*	Grab
TOC*		110	2/Month*	Grab

*The discharge must be sampled daily in the subsequent 48 hours of discharge after the West Storm Basin receives flow from the coke sedimentation basin. See Special Conditions 21 and 22.
**See Special Conditions 19, 21, 22, and 23.

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Effluent Limitations and Monitoring

PARAMETER	LOAD LIMITS lbs/day 30 DAY AVG.	LOAD LIMITS lbs/day DAILY MAX.	CONCENTRATION LIMITS mg/l 30 DAY AVG.	CONCENTRATION LIMITS mg/l DAILY MAX.	SAMPLE FREQUENCY	SAMPLE TYPE
1. From the effective date of this permit until the expiration date, the effluent of the following discharge(s) shall be monitored and limited at all times as follows:						
Outfall: A03*** - Hydrostatic Test Water through Outfall 003 (Intermittent Discharge)						
Flow (MGD)	See Special Condition 20				1/Event*	Estimate
pH	See Special Condition 1				1/Event*	Grab
Total Suspended Solids			15	30	1/Event*	Grab
Oil & Grease			15	30	1/Event*	Grab
Iron (Total)			2	4	1/Event*	Grab
Benzene			--	0.05	1/Event*	Grab
Total BETX**			--	0.75	1/Event*	Grab
Phenols			0.3	0.6	1/Event*	Grab

*Monitor each event prior to discharging to Outfall 003. An event is defined as the hydrostatic test water discharge associated from a tank, piping, or pipeline integrity testing activity.
**See Special Condition 24.
***See Special Conditions 25, 26 and 27.

Combined Outfalls 001, 002, and 003					
WET	See Special Condition 13		1/Year		
Temperature	See Special Conditions 2, 3 and 6		Daily	Continuous	
Total Dissolved Solids	385,000		2/Month*	24 hr Composite	
Total Residual Chlorine	See Special Conditions 18 and 31	0.05	1/Event	Grab	
Phosphorus (Total)		Monitor Only	1/Month	24 hr Composite	
Nitrogen (Total)		Monitor Only	1/Month	24 hr Composite	
Mercury**		Monitor Only	1/Month	Grab	
Sulfate		Monitor Only	1/Month	24 hr Composite	
Chloride		Monitor Only	1/Month	24 hr Composite	

* Sampling shall take place only during the months of November through April. No sampling is required during the remaining months.
**Mercury must be monitored using USEPA method 1631E using the heated digestion option in Section 11.1.1.2. Prior to analysis for mercury, digest the sample using the option in 1631E of heating samples at 50°C for 6 hours in a bromine chloride (BrCl) solution in closed vessels.

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Effluent Limitations and Monitoring

PARAMETER	LOAD LIMITS lbs/day 30 DAY AVG.	LOAD LIMITS lbs/day DAILY MAX.	CONCENTRATION LIMITS mg/l 30 DAY AVG.	CONCENTRATION LIMITS mg/l DAILY MAX.	SAMPLE FREQUENCY	SAMPLE TYPE

1. From the effective date of this permit until the expiration date, the effluent of the following discharge(s) shall be monitored and limited at all times as follows:

Outfall: A01 - Purge Treatment Unit Wastewater - contains Wet Gas Scrubber Wastewater

Temperature		90^0 F*	Daily	Continuous

* Temperature on internal outfall A01 from the purge treatment unit shall be monitored, reported, and limited to 90^0 F only when the combined outfall 001, 002, and 003 daily average temperature exceeds 90^0 F.

Outfalls: 004* and 005* - Storm Water Runoff from Wharf Area (Intermittent Discharge)
008* - Storm Water Runoff from Interceptor Basin Overflow - (Intermittent Discharge)

			If Discharge Occurs	
Flow (MGD)	See Special Condition 20		Daily	Estimate
pH	See Special Condition 1		2/Month	Grab
Oil & Grease		15	2/Month	Grab
TOC		110	2/Month	Grab

*See Special Conditions 9 and 19 for BAT/BCT rules.

Outfalls: 006** - Storm Water Runoff from Northeast Secondary Drainage Area (Intermittent Discharge)

007** - Storm Water Runoff from East Secondary Drainage Area (Intermittent Discharge)

009** - Storm Water Runoff from North Secondary Drainage Area (Intermittent Discharge)

010** - Storm Water Runoff from Northeast Secondary Drainage Area (Intermittent Discharge)

**See Special Conditions 9 and 17 for SWPPP.

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Special Conditions

SPECIAL CONDITION 1. The pH shall be in the range 6.0 to 9.0 standard units and shall be reported as a daily minimum and a daily maximum.

SPECIAL CONDITION 2. The receiving waters are designated as Secondary Contact and Indigenous Aquatic Life Waters by 35 Ill. Adm. Code 302.408. These waters shall meet the following standard:

Temperatures shall not exceed 93°F (34°C) more than 5% of the time, or 100°F (37.8°C) at any time at the edge of the allowed mixing which is defined by 35 Ill. Adm. Code 302.102.

A thermal model was submitted in 2003 to demonstrate that the discharge would meet the Secondary Contact and Indigenous Aquatic Life standards and a thermal model was submitted in 2014 to demonstrate that the discharge would meet the General Use standards downstream of the I-55 bridge. The thermal models demonstrated that there is no reasonable potential to exceed the water quality standards with allowed mixing in the receiving stream. The maximum effluent temperature at the time of the study was 123°F. The monthly average flow ranged from 2.81 MGD to 12.78 MGD since the outfall has a stormwater component. If the refinery is modified in a way that would change the basis upon which the thermal models in 2003 and 2014 were calculated so that the studies would no longer represent the discharge, the permittee must submit a new thermal model to the Agency with their modification application.

The permittee shall monitor the effluent on a continuous basis and report the monthly maximum temperature on the DMR form.

SPECIAL CONDITION 3. Temperature shall be measured at a point downstream of where outfalls 001, 002 and 003 are combined but prior to mixing with the receiving stream and reported as a daily maximum.

SPECIAL CONDITION 4. The composites for oil, fats, and greases shall consist of sample aliquots of approximately equal volume, a minimum of 100 milliliters, collected at regular time intervals over a 24-hour period (3 aliquots total). A single sample formed by combining all the aliquots, and the solvent rinse of the container, would then be analyzed. The results of the single analysis is then reported for oil, fats, and grease.

SPECIAL CONDITION 5. Permittee shall monitor influent and effluent TOC. Net TOC discharged shall not exceed 5 mg/l. Negative net TOC values shall be reported as zero.

SPECIAL CONDITION 6. Samples taken in compliance with the effluent monitoring requirements for outfall 001, 002 and 003 shall be taken at a point representative of discharge but prior to mixing with each of the other streams.

SPECIAL CONDITION 7. For the purpose of this permit, the discharge from outfall 001 is limited solely to treated process, utility, service, hydrostatic test, well water, sanitary, and storm water free from any other wastewater.

SPECIAL CONDITION 8. For the purpose of this permit, the discharge from outfall 002 is limited to non-contact cooling water, softener regeneration stream, boiler blowdown, condensate, potable water, fire water, and overflow of excess river/well water from utility makeup water system, free from process and other wastewater discharges. In the event that the permittee shall require the use of water treatment additives other than those generic categories or chemical groupings previously approved by this Agency for use with softener regeneration stream, boiler blowdown, or non-contact cooling water that would be discharged to outfall 002, the permittee must notify this Agency in writing in accordance with the Standard Conditions -- Attachment H, number (8).

SPECIAL CONDITION 9. For the purpose of this permit, the discharge from outfalls 004, 005, 006, 007, 008, 009, and 010 are limited to storm water, including construction activities, groundwater seepage, condensate, well water, and fire water, free from process and other wastewater discharges.

SPECIAL CONDITION 10. The discharge credit, if necessary, for contaminated storm water from non-process and process area storm water runoff, as applied to discharge 001, shall be as follows:

Additional storm water credit for the following parameters shall be based on the quantity of storm flow taken through process treatment.

Pounds Per 1000 gallons of storm water flow*

Parameter	Average	Maximum
COD	1.5	3.0
Chromium (Total)**	.0018	005
Chromium (Hexavalent)**	.00023	.00052

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Dry Weather Flow: The average flow from the wastewater treatment facility for the last three consecutive zero precipitation days. Previously collected storm water which is sent to process treatment during this period shall not be included in this computation.

*Storm Water Flows: The storm water runoff treated in the wastewater treatment facility is that portion of flow greater than the dry weather flow. Measurement of previously collected contaminated storm water from tank dikes may also be used in computing storm water credit.

In computing monthly average permit limits to include storm water credit, the mass credit calculated above shall be averaged along with process mass limits over the 30 day period. Explanatory calculations and flow data shall be submitted together with Discharge Monitoring Reports.

**The permittee shall not exceed the following load limits (lbs/day) from outfall 001 at any time:

Parameter	Average	Maximum
Chromium (Total)	32.94	80.56
Chromium (Hexavalent)	3.29	8.06

SPECIAL CONDITION 11. The Permittee shall record monitoring results on Discharge Monitoring Report (DMR) Forms using one such form for each outfall each month.

In the event that an outfall does not discharge during a monthly reporting period, the DMR Form shall be submitted with no discharge indicated.

The Permittee may choose to submit electronic DMRs (NetDMRs) instead of mailing paper DMRs to the IEPA. More information, including registration information for the NetDMR program, can be obtained on the IEPA website, http://www.epa.state.il.us/water/net-dmr/index.html.

The completed Discharge Monitoring Report forms shall be submitted to IEPA no later than the 15th day (or following business day) of the following month, unless otherwise specified by the permitting authority.

Permittees not using NetDMRs shall mail Discharge Monitoring Reports with an original signature to the IEPA at the following address:

Illinois Environmental Protection Agency
Division of Water Pollution Control
1021 North Grand Avenue East
Post Office Box 19276
Springfield, Illinois 62794-9276

Attention: Compliance Assurance Section, Mail Code # 19

SPECIAL CONDITION 12. If an applicable effluent standard or limitation is promulgated under Sections 301(b)(2)(C) and (D), 304(b)(2), and 307(a)(2) of the Clean Water Act and that effluent standard or limitation is more stringent than any effluent limitation in the permit or controls a pollutant not limited in the NPDES Permit, the Agency shall revise or modify the permit, after public notice and opportunity for hearing, in accordance with the more stringent standard or prohibition. In addition to newly promulgated effluent standards or limitations, if new information is received by this Agency that was not available at the time of permit issuance and would have justified the application of different permit conditions at the time of issuance, the Agency shall revise or modify the permit, after public notice and opportunity for hearing, to address the new information.

SPECIAL CONDITION 13. The Permittee shall conduct biomonitoring using effluent collected at a point downstream of where Outfalls 001, 002, and 003 are combined but prior to entry into the receiving water.

Biomonitoring

1. Acute Toxicity - Standard definitive acute toxicity tests shall be run on at least two trophic levels of aquatic species (fish, invertebrate) representative of the aquatic community of the receiving stream. Testing must be consistent with Methods for Measuring the Acute Toxicity of Effluents and Receiving Waters to Freshwater and Marine Organisms (Fifth Ed.) EPA/821-R-02-012. Unless substitute tests are pre-approved; the following tests are required:

   a. Fish - 96 hour static LC_{50} Bioassay using fathead minnows (Pimephales promelas).

   b. Invertebrate 48-hour static LC_{50} Bioassay using *Ceriodaphnia*.

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Special Conditions

2. Test Requirements - The above test shall be conducted annually using 24-hour composite samples unless otherwise authorized by the IEPA. Effluent samples must be analyzed for ammonia, chloride, and TDS, given that these parameters may be associated with acute toxicity.

3. Reporting - Results shall be reported according to EPA/821-R-02-012, Section 12, Report Preparation, and shall be submitted to IEPA, Bureau of Water, Compliance Assurance Section within one week of receipt from the laboratory. Results from ammonia, chloride, TDS analyses, as well as any other parameter believed to contribute to effluent toxicity, must be included in the bioassay report.

4. Toxicity – Should a bioassay result in acute toxicity to ≥50% of test organisms and the effluent is found to contain non-toxic amounts of ammonia, chloride, and TDS, the IEPA may require, upon notification, six (6) additional rounds of monthly testing on the affected organism(s) to be initiated within 30 days of the toxic bioassay. Results shall be submitted to IEPA within one (1) week of becoming available to the Permittee.

5. Toxicity Identification and Reduction Evaluation - Should any of the additional bioassays result in toxicity to ≥50% of organisms and the effluent is found to contain non-toxic amounts of ammonia, chloride, and TDS, the Permittee must contact the IEPA within one (1) day of the results becoming available to the Permittee and begin the toxicity identification evaluation process in accordance with Methods for Aquatic Toxicity Identification Evaluations, EPA/600/6-91/003. The IEPA may also require, upon notification, that the Permittee prepare a plan for toxicity reduction evaluation to be developed in accordance with Toxicity Reduction Evaluation Guidance for Municipal Wastewater Treatment Plants, EPA/833B-99/002, which shall include an evaluation to determine which chemicals have a potential for being discharged in the plant wastewater, a monitoring program to determine their presence or absence and to identify other compounds which are not being removed by treatment, and other measures as appropriate. The Permittee shall submit to the IEPA its plan for toxicity reduction evaluation within ninety (90) days following notification by the IEPA. The Permittee shall implement the plan within ninety (90) days or other such date as contained in a notification letter received from the IEPA.

The IEPA may modify this Permit during its term to incorporate additional requirements or limitations based on the results of the biomonitoring. In addition, after review of the monitoring results, the IEPA may modify this Permit to include numerical limitations for specific toxic pollutants. Modifications under this condition shall follow public notice and opportunity for hearing.

SPECIAL CONDITION 14. The Bypass and Upset provisions in 40 CFR 122.41(m) and 40 CFR 122.41(n) are applicable to this permit.

SPECIAL CONDITION 15. The use and operation of the wastewater treatment facilities shall be under the supervision of a certified Class K operator.

SPECIAL CONDITION 16. For the duration of this permit, the permittee shall submit to the Agency an annual summary report of the quantities of sludge produced by the wastewater treatment facility and disposed of, in units of dry tons or gallons (average total percent solids) by different disposal methods including but not limited to application on farmland, application on reclamation land, landfilling, public distribution, dedicated land disposal, sod farms, storage lagoons or any other specified disposal method. Said reports shall be submitted to the Agency by January 31 of each year.

The annual report for sludge shall be reported on the form titled "Sludge Management Reports" to the following address:

Illinois Environmental Protection Agency
Division of Water Pollution Control
Compliance Assurance Section
1021 North Grand Avenue East
Post Office Box 19276
Springfield, Illinois 62794-9276

SPECIAL CONDITION 17.

STORM WATER POLLUTION PREVENTION PLAN (SWPPP)

A. A storm water pollution prevention plan shall be maintained by the permittee for the storm water associated with industrial activity at this facility discharge from outfalls 006, 007, 009, and 010. The plan shall identify potential sources of pollution which may be expected to affect the quality of storm water discharges associated with the industrial activity at the facility. In addition, the plan shall describe and ensure the implementation of practices which are to be used to reduce the pollutants in storm water discharges

Special Conditions

associated with industrial activity at the facility and to assure compliance with the terms and conditions of this permit. The permittee shall modify the plan if substantive changes are made or occur affecting compliance with this condition.

1. Waters not classified as impaired pursuant to Section 303(d) of the Clean Water Act.

   Unless otherwise specified by federal regulation, the storm water pollution prevention plan shall be designed for a storm event equal to or greater than a 10-year 24-hour rainfall event.

2. Waters classified as impaired pursuant to Section 303(d) of the Clean Water Act

   For any site which discharges directly to an impaired water identified in the Agency's 303(d) listing, and if any parameter in the subject discharge has been identified as the cause of impairment, the storm water pollution prevention plan shall be designed for a storm event equal to or greater than a 10-year 24-hour rainfall event. If required by federal regulations, the storm water pollution prevention plan shall adhere to a more restrictive design criteria.

B. The operator or owner of the facility shall make a copy of the plan available to the Agency at any reasonable time upon request.

   Facilities which discharge to a municipal separate storm sewer system shall also make a copy available to the operator of the municipal system at any reasonable time upon request.

C. The permittee may be notified by the Agency at any time that the plan does not meet the requirements of this condition. After such notification, the permittee shall make changes to the plan and shall submit a written certification that the requested changes have been made. Unless otherwise provided, the permittee shall have 30 days after such notification to make the changes.

D. The discharger shall amend the plan whenever there is a change in construction, operation, or maintenance which may affect the discharge of significant quantities of pollutants to the waters of the State or if a facility inspection required by paragraph H of this condition indicates that an amendment is needed. The plan should also be amended if the discharger is in violation of any conditions of this permit, or has not achieved the general objective of controlling pollutants in storm water discharges. Amendments to the plan shall be made within 30 days of any proposed construction or operational changes at the facility, and shall be provided to the Agency for review upon request.

E. The plan shall provide a description of potential sources which may be expected to add significant quantities of pollutants to storm water discharges, or which may result in non-storm water discharges from storm water outfalls at the facility. The plan shall include, at a minimum, the following items:

   1. A topographic map extending one-quarter mile beyond the property boundaries of the facility, showing: the facility, surface water bodies, wells (including injection wells), seepage pits, infiltration ponds, and the discharge points where the facility's storm water discharges to a municipal storm drain system or other water body. The requirements of this paragraph may be included on the site map if appropriate. Any map or portion of map may be withheld for security reasons.

   2. A site map showing:

      i. The storm water conveyance and discharge structures;

      ii. An outline of the storm water drainage areas for each storm water discharge point;

      iii. Paved areas and buildings;

      iv. Areas used for outdoor manufacturing, storage, or disposal of significant materials, including activities that generate significant quantities of dust or particulates.

      v. Location of existing storm water structural control measures (dikes, coverings, detention facilities, etc.);

      vi. Surface water locations and/or municipal storm drain locations

      vii. Areas of existing and potential soil erosion;

      viii. Vehicle service areas;

      ix. Material loading, unloading, and access areas.

      x. Areas under items iv and ix above may be withheld from the site for security reasons.

   3. A narrative description of the following:

Special Conditions

i. The nature of the industrial activities conducted at the site, including a description of significant materials that are treated, stored or disposed of in a manner to allow exposure to storm water;

ii. Materials, equipment, and vehicle management practices employed to minimize contact of significant materials with storm water discharges;

iii. Existing structural and non-structural control measures to reduce pollutants in storm water discharges;

iv. Industrial storm water discharge treatment facilities;

v. Methods of onsite storage and disposal of significant materials.

4. A list of the types of pollutants that have a reasonable potential to be present in storm water discharges in significant quantities. Also provide a list of any pollutant that is listed as impaired in the most recent 303(d) report.

5. An estimate of the size of the facility in acres or square feet, and the percent of the facility that has impervious areas such as pavement or buildings.

6. A summary of existing sampling data describing pollutants in storm water discharges.

F. The plan shall describe the storm water management controls which will be implemented by the facility. The appropriate controls shall reflect identified existing and potential sources of pollutants at the facility. The description of the storm water management controls shall include:

1. Storm Water Pollution Prevention Personnel - Identification by job titles of the individuals who are responsible for developing, implementing, and revising the plan.

2. Preventive Maintenance - Procedures for inspection and maintenance of storm water conveyance system devices such as oil/water separators, catch basins, etc., and inspection and testing of plant equipment and systems that could fail and result in discharges of pollutants to storm water.

3. Good Housekeeping - Good housekeeping requires the maintenance of clean, orderly facility areas that discharge storm water. Material handling areas shall be inspected and cleaned to reduce the potential for pollutants to enter the storm water conveyance system.

4. Spill Prevention and Response - Identification of areas where significant materials can spill into or otherwise enter the storm water conveyance systems and their accompanying drainage points. Specific material handling procedures, storage requirements, spill clean up equipment and procedures should be identified, as appropriate. Internal notification procedures for spills of significant materials should be established.

5. Storm Water Management Practices - Storm water management practices are practices other than those which control the source of pollutants. They include measures such as installing oil and grit separators, diverting storm water into retention basins, etc. Based on assessment of the potential of various sources to contribute pollutants, measures to remove pollutants from storm water discharge shall be implemented. In developing the plan, the following management practices shall be considered:

i. Containment - Storage within berms or other secondary containment devices to prevent leaks and spills from entering storm water runoff. To the maximum extent practicable storm water discharged from any area where material handling equipment or activities, raw material, intermediate products, final products, waste materials, by-products, or industrial machinery are exposed to storm water should not enter vegetated areas or surface waters or infiltrate into the soil unless adequate treatment is provided.

ii. Oil & Grease Separation - Oil/water separators, booms, skimmers or other methods to minimize oil contaminated storm water discharges.

iii. Debris & Sediment Control - Screens, booms, sediment ponds or other methods to reduce debris and sediment in storm water discharges.

iv. Waste Chemical Disposal - Waste chemicals such as antifreeze, degreasers and used oils shall be recycled or disposed of in an approved manner and in a way which prevents them from entering storm water discharges.

v. Storm Water Diversion - Storm water diversion away from materials manufacturing, storage and other areas of potential storm water contamination. Minimize the quantity of storm water entering areas where material handling equipment of activities, raw material, intermediate products, final products, waste materials, by-products, or industrial machinery are

exposed to storm water using green infrastructure techniques where practicable in the areas outside the exposure area, and otherwise divert storm water away from exposure area.

vi. Covered Storage or Manufacturing Areas - Covered fueling operations, materials manufacturing and storage areas to prevent contact with storm water.

6. Sediment and Erosion Prevention - The plan shall identify areas which due to topography, activities, or other factors, have a high potential for significant soil erosion. The plan shall describe measures to limit erosion.

7. Employee Training - Employee training programs shall inform personnel at all levels of responsibility of the components and goals of the storm water pollution control plan. Training should address topics such as spill response, good housekeeping and material management practices. The plan shall identify periodic dates for such training.

8. Inspection Procedures - Qualified plant personnel shall be identified to inspect designated equipment and plant areas. A tracking or follow-up procedure shall be used to ensure appropriate response has been taken in response to an inspection. Inspections and maintenance activities shall be documented and recorded.

G. Non-Storm Water Discharge - The plan shall include a certification that the discharge has been tested or evaluated for the presence of non-storm water. The certification shall include a description of any test for the presence of non-storm water discharges, the methods used, the dates of the testing, and any onsite drainage points that were observed during the testing. Any facility that is unable to provide this certification must describe the procedure of any test conducted for the presence of non-storm water discharges, the test results, potential sources of non-storm water discharges to the storm sewer, and why adequate tests for such storm sewers were not feasible.

H. Quarterly Visual Observation of Discharges - The requirements and procedures of quarterly visual observations are applicable to all outfalls covered by this condition.

1. You must perform and document a quarterly visual observation of a storm water discharge associated with industrial activity from each outfall. The visual observation must be made during daylight hours. If no storm event resulted in runoff during daylight hours from the facility during a monitoring quarter, you are excused from the visual observations requirement for that quarter, provided you document in your records that no runoff occurred. You must sign and certify the document.

2. Your visual observation must be made on samples collected as soon as practical after a discharge begins. The sampler will record the time of sampling and when the rainfall event began. When monitoring for a discharge from snow melt, the sampler will record when the air temperature exceeded freezing. All samples must be collected from a storm event discharge that is greater than 0.1 inch in magnitude and that occurs at least 72 hours from the previously measureable (greater than 0.1 inch rainfall) storm event. The observation must document: color, odor, clarity, floating solids, settled solids, suspended solids, foam, oil sheen, and other obvious indicators of storm water pollution. If visual observations indicate any unnatural color, odor, turbidity, floatable material, oil sheen or other indicators of storm water pollution, the permittee shall obtain a sample and monitor for the parameter or the list of pollutants in Part E.4. The permittee shall take corrective action to address the pollutant(s) within one week of confirmation of a pollutant discharge unless otherwise specified by the Agency.

3. You must maintain your visual observation reports onsite with the SWPPP. The report must include the observation date and time, inspection personnel, nature of the discharge (i.e., runoff or snow melt), visual quality of the storm water discharge (including observations of color, odor, floating solids, settled solids, suspended solids, foam, oil sheen, and other obvious indicators of storm water pollution), and probable sources of any observed storm water contamination.

4. You may exercise a waiver of the visual observation requirement at a facility that is inactive or unstaffed, as long as there are no industrial materials or activities exposed to storm water. If you exercise this waiver, you must maintain a certification with your SWPPP stating that the site is inactive and unstaffed, and that there are no industrial materials or activities exposed to storm water.

5. Representative Outfalls - If your facility has two or more outfalls that you believe discharge substantially identical effluents, based on similarities of the industrial activities, significant materials, size of drainage areas, and storm water management practices occurring within the drainage areas of the outfalls, you may conduct visual observations of the discharge at just one of the outfalls and report that the results also apply to the substantially identical outfall(s).

6. The visual observation documentation shall be made available to the Agency and general public upon written request.

I. The permittee shall conduct an annual facility inspection to verify that all elements of the plan, including the site map, potential pollutant sources, and structural and non-structural controls to reduce pollutants in industrial storm water discharges are accurate. Observations that require a response shall be corrected by the permittee within 1 week unless otherwise specified by the Agency. The appropriate response to the observation shall be retained as part of the plan. Records documenting significant observations

made during the site inspection shall be submitted to the Agency in accordance with the reporting requirements of this permit.

J. This plan should briefly describe the appropriate elements of other program requirements, including Spill Prevention Control and Countermeasures (SPCC) plans required under Section 311 of the CWA and the regulations promulgated thereunder, and Best Management Programs under 40 CFR 125.100.

K. The plan is considered a report that shall be available to the public at any reasonable time upon request.

L. The plan shall include the signature and title of the person responsible for preparation of the plan and include the date of initial preparation and each amendment thereto.

M. Facilities which discharge storm water associated with industrial activity to municipal separate storm sewers may also be subject to additional requirement imposed by the operator of the municipal system

Construction Authorization

Authorization is hereby granted to construct treatment works and related equipment that may be required by the Storm Water Pollution Prevention Plan developed pursuant to this permit.

This Authorization is issued subject to the following condition(s).

N. If any statement or representation is found to be incorrect, this authorization may be revoked and the permittee there upon waives all rights thereunder.

O. The issuance of this authorization (a) does not release the permittee from any liability for damage to persons or property caused by or resulting from the installation, maintenance or operation of the proposed facilities; (b) does not take into consideration the structural stability of any units or part of this project; and (c) does not release the permittee from compliance with other applicable statutes of the State of Illinois, or other applicable local law, regulations or ordinances.

P. Plans and specifications of all treatment equipment being included as part of the stormwater management practice shall be included in the SWPPP.

Q. Construction activities which result from treatment equipment installation, including clearing, grading and excavation activities which result in the disturbance of one acre or more of land area, are not covered by this authorization. The permittee shall contact the IEPA regarding the required permit(s).

REPORTING

R. The facility shall submit an electronic copy of the annual inspection report to the Illinois Environmental Protection Agency. The report shall include results of the annual facility inspection which is required by Part I of this condition. The report shall also include documentation of any event (spill, treatment unit malfunction, etc.) which would require an inspection, results of the inspection, and any subsequent corrective maintenance activity. The report shall be completed and signed by the authorized facility employee(s) who conducted the inspection(s). The annual inspection report is considered a public document that shall be available at any reasonable time upon request.

S. The annual report shall be due August 1.

T. If the facility performs inspections more frequently than required by this permit, the results shall be included as additional information in the annual report.

U. The permittee shall retain the annual inspection report on file at least 3 years. This period may be extended by request of the Illinois Environmental Protection Agency at any time.

Annual inspection reports shall be submitted to the following email and office addresses: epa.npdes.inspection@illinois.gov

Illinois Environmental Protection Agency
Bureau of Water
Compliance Assurance Section
Annual Inspection Report
1021 North Grand Avenue East
Post Office Box 19276
Springfield, Illinois 62794-9276

V. The permittee shall notify any regulated small municipal separate storm sewer owner (MS4 Community) that they maintain coverage

under an individual NPDES permit. The permittee shall submit any SWPPP or any annual inspection to the MS4 community upon request by the MS4 community.

SPECIAL CONDITION 18.

ZEBRA MUSSEL CONTROL PROGRAM FOR OUTFALL 002

The following control program is authorized by this permit, in accordance with the conditions and limitations below.

A. Chlorination/Dechlorination

1. Chlorine or chlorine compounds may be applied on an intermittent or continuous basis.

2. The discharge of Outfall 002 shall be dechlorinated.

3. The discharge limit of the combined flows as monitored under A.6 of this Special Condition shall not exceed 0.05 mg/l total residual chlorine as a daily maximum.

4. Dechlorination chemical(s) shall be applied at a rate sufficient to provide complete dechlorination; excess application should be avoided to the extent practicable. The dechlorination system shall be interlocked or otherwise controlled to operate whenever chlorination is occurring.

5. For continuous chlorination programs, or intermittent chlorination more frequent than once per week, shall be monitored on a weekly basis for total residual chlorine. For intermittent chlorination once per week or less frequently, each chlorine application shall be monitored. Monitoring shall be by a grab sample at the time of maximum chlorine application.

6. Monitoring for total residual chlorine shall be done at a point downstream where outfalls 001, 002 and 003 are combined but prior to entry into the receiving waters.

B. All samples for total residual chlorine shall be analyzed by an applicable method contained in 40 CFR 136, equivalent in accuracy to low-level amperometric titration. Any analytical variability of the method used shall be considered when determining the accuracy and precision of the results obtained.

SPECIAL CONDITION 19. The Agency has determined that the effluent limitations in this permit constitute BAT/BCT for storm water which is treated in the existing treatment facilities (Outfalls 001, 003, 004, 005 and 008) for purposes of this permit reissuance, and no pollution prevention plan will be required for such storm water. In addition to the chemical specific monitoring required elsewhere in this permit, the permittee shall conduct an annual inspection of the facility site to identify areas contributing to a storm water discharge associated with industrial activity, and determine whether any facility modifications have occurred which result in previously-treated storm water discharges no longer receiving treatment. If any such discharges are identified the permittee shall request a modification of this permit within 30 days after the inspection. Records of the annual inspection shall be retained by the permittee for the term of this permit and be made available to the Agency on request.

SPECIAL CONDITION 20. Flow shall be reported from outfalls 001, 002, and 003 as a monthly average and daily maximum. Flows shall be reported from outfalls A03, 004, 005, and 008 as a monthly average. All flows shall be reported in million gallons per day on the DMR form.

When continuous flow measurement is required, the measurements will be collected at the sample point location or at an equivalent representative flow location. During periods of maintenance of flow monitoring equipment and/or periods of malfunctioning flow monitoring equipment, a combination of upstream flow meters and/or engineering estimates may be used to calculate an estimate of flow representative of the discharge at effected outfalls. If the use of calculated (estimated) flows is necessary, the Permittee shall indicate on the monthly DMR dates for which calculated (estimated) flows were used.

Special Conditions

SPECIAL CONDITION 21. Runoff from the coke storage area may overflow into outfall 003 when its flow exceeds the design capacity of the coke storage area containment system in the event of a failure or malfunction of the sump pump system. Intentional diversion of some or all of the coke storage area runoff to outfall 003 is allowed only when needed during heavy rains to prevent overflow of oily wastewater at the wastewater treatment plant, provided that no permit discharge limits are exceeded at outfall 003.

SPECIAL CONDITION 22. The Permittee shall indicate on the monthly DMR's the date(s) in which the of coke storage area runoff flowed to outfall 003. The permit may be modified as a result of these analyses to include more frequent sampling for the required parameters, and include sampling requirements for additional parameters along with the appropriate sampling frequencies. Modifications under this Special Condition shall follow public notice and opportunity for hearing.

SPECIAL CONDITION 23. For the purpose of this permit, outfall 003 is limited to stormwater associated with refinery operations and construction activities, utility water, fire water (main flushing, hydrant testing, relief valves, and emergency once-through cooling water), service (river) water, condensate, groundwater seepage, well water, and hydrostatic test water, free from other wastewater discharges.

SPECIAL CONDITION 24. For the purpose of this permit, total BETX is defined as the arithmetic sum of Benzene, Ethylbenzene, Toluene, and Xylene(s). Xylenes shall include ortho-, meta-, and para-xylenes. Xylene shall be analyzed using EPA method 602 or 624, or any other method with prior approval by IEPA. When calculating the arithmetic sum with a mix of data points above and below the Method Detection Level (MDL), the data points below the MDL shall be treated as zero.

SPECIAL CONDITION 25. The Permittee shall notify the IEPA Des Plaines Regional Office at (847-294-4000) at least 24 hours prior to commencing any discharge of hydrostatic test water from tanks that formerly contained petroleum products to Outfall 003 (see Attachment H). This notification shall include:

A. Total volume of water to be discharged and estimated average discharge flow rate for the event. The permittee shall calculate the flow for each discharge event by dividing the total discharge volume by the number of days over which the discharge is expected to occur. This flow shall be reported as the daily maximum flow.

B. The piping, pipeline or tank(s) from which water to be discharged originates.
C. Most recent product(s) stored in the piping, pipeline or tank(s).
D. Analytical results of wastewater for outfall A03 parameters prior to discharge. The monitoring location shall be established for each discharge event and be located where representative samples of the piping, pipeline or tank (s) contents can be obtained prior to discharge. For parameters for which both monthly average and daily maximum limits are specified, the permittee may take multiple samples of the discharge event to demonstrate compliance with the monthly average limit.

Upon notification, discharge from outfall A03 may commence if wastewater analysis meets effluent limits. If wastewater analysis does not meet permitted effluent limits, the water shall be routed to outfall 001 or treatment will be required before discharge to outfall 003. Construction of permanent treatment facilities which may be necessary to meet the requirements of this permit may not be started until a construction permit is issued by the Agency. This does not include the use of temporary portable treatment facilities.

This analysis shall be included on discharge monitoring reports.

SPECIAL CONDITION 26. Prior to performing any hydrostatic testing subject to Special Condition 25, the permittee shall empty the piping, pipeline, or tank(s) of any product and clean the piping, pipeline, or tank(s).

SPECIAL CONDITION 27. The monitoring/reporting requirements and limitations for the Benzene and total BETX parameters are applicable when the discharges result from hydrostatic testing of piping, pipeline, or tank(s) that had contained products that contain the BETX parameters and are subject to Special Condition 25.

SPECIAL CONDITION 28. On any day when monitoring is required, if the analysis for Total Chromium indicates levels less than the discharge limitations for Hexavalent Chromium, then the analysis for Hexavalent Chromium will not be required (compliance with the discharge limitations for Hexavalent Chromium will be demonstrated for that monitoring event by the results for Total Chromium). If, during any monitoring event, the results for Total Chromium indicate levels greater than the discharge limitations for Hexavalent Chromium, then the analysis for Hexavalent Chromium shall be required using the same sample which was analyzed for Total Chromium. If it is not possible to perform the analysis for Hexavalent Chromium using the same sample which was analyzed for Total Chromium, then another sample shall be immediately collected and analyzed for both Total and Hexavalent Chromium.

SPECIAL CONDITION 29. The Permittee shall monitor and report concentrations (in mg/l) of the following listed parameters twice per year in the months of January and July at the combined outfall. The sample shall be a 24-hour effluent composite except as otherwise specifically provided below and the results shall be submitted on the monthly DMR's to IEPA. The parameters to be sampled are:

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STORET CODE	PARAMETER	Minimum detection limit
01002	Arsenic	0.001 mg/l
01007	Barium	0.5 mg/l
01027	Cadmium	0.003 mg/l
01042	Copper	0.005 mg/l
00718	Cyanide (grab) (weak acid dissociable)	5.0 ug/l
00720	Cyanide (grab not to exceed 24 hours) (total)	5.0 ug/l
01045	Iron (total)	0.5 mg/l
01046	Iron (Dissolved)	0.5 mg/l
01051	Lead	0.05 mg/l
01055	Manganese	0.5 mg/l
01067	Nickel	0.005 mg/l
01147	Selenium	0.075 mg/l
01077	Silver (total)	0.003 mg/l
01087	Vanadium	0.008 mg/l
01092	Zinc	0.50 mg/>

Unless otherwise indicated, concentrations refer to the total amount of the constituent present in all phases, whether solid, suspended or dissolved, elemental or combined, including all oxidation states.

SPECIAL CONDITION 30. Total Residual Chlorine shall be monitored, reported, and limited to 0.05 mg/l whenever well test water is discharged through outfall 003 and when chlorine is used in the well testing activity. Monitoring should be performed a minimum of one time per well test event. An event is defined as the well test water discharge associated from a well water testing activity.

SPECIAL CONDITION 31. Appropriate use of diversions designed as part of the wastewater treatment system to manage flows in the primary section of the wastewater treatment plant do not constitute a bypass provided that the water is routed through the biological treatment plant, treated, and discharged in accordance with permit discharge limitations.

SPECIAL CONDITION 32. Cooling Water Intake Structure. Based on available information, the Agency has determined that the operation of the cooling water intake structure meets the equivalent of Best Technology Available (BTA) in accordance with the Best Professional Judgment provisions of 40 CFR 125.3 and 40 CFR 125.90(b), based on information available at the time of permit reissuance.

However, the Permittee shall comply with the requirements of the Cooling Water Intake Structure Existing Facilities Rule as found at 40 CFR 122 and 125. Any application materials and submissions required for compliance with the Existing Facilities Rule, shall be submitted to the Agency no later than 4 years from the effective date of this permit.

If for any reason, the Cooling Water Intake Structure Existing Facilities Rule is stayed or remanded by the courts, the Permittee shall comply with the requirements below. The information required below is necessary to further evaluate cooling water intake structure operations based on the most up to date information.

A. The permittee shall submit the following information/studies within 4 years of the effective date of the permit:

1. Source Water Physical Data to include:

   a. A narrative description and scaled drawings showing the physical configuration of all source water bodies used by the facility including aerial dimensions, depths, salinity and temperature regimes;

   b. Identification and characterization of the source waterbody's hydrological and geomorphological features, as well as the methods used to conduct any physical studies to determine the intake's area of influence and the results of such studies; and

   c. Location maps.

2. Source Waterbody Flow Information

   The permittee shall provide the annual mean flow of the waterbody, any supporting documentation and engineering calculations to support the analysis of whether the design intake flow is greater than five percent of the mean annual flow of the river or stream

for purposes of determining applicable performance standards. Representative historical data (from a period of time up to 10 years) shall be used, if available.

3. Taxonomic identification of all life stages of fish and shellfish and any species protected under Federal, State, or Tribal law (including threatened or endangered species) that are in the vicinity of the cooling water intake structure(s) and are susceptible to impingement and entrainment;

4. A characterization of all life stages of fish and shellfish, and any species protected under Federal, or State law, including a description of the abundance and temporal and spatial characteristics in the vicinity of the cooling water intake structure(s). These can include historical data that are representative of the current operation of the facility and of biological conditions at the site.

B. The permittee shall comply with the following requirements:

1. At all times properly operate and maintain the intake equipment as demonstrated in the application material supporting the BTA determination.

2. Inform IEPA of any proposed changes to the cooling water intake structure or proposed changes to operations at the facility that affect impingement mortality and/or entrainment.

3. Debris collected on intake screens is prohibited from being discharged back to the canal. Debris does not include living fish or other living aquatic organisms.

C. All required reports shall be submitted to the Industrial Unit, Permit Section and Compliance Assurance Section at the address in Special Condition 11.

This special condition does not relieve the permittee of the responsibility of complying with any other laws, regulations, or judicial orders issued pursuant to Section 316(b) of the Clean Water Act.

Attachment H

Standard Conditions

Definitions

Act means the Illinois Environmental Protection Act, 415 ILCS 5 as Amended.

Agency means the Illinois Environmental Protection Agency.

Board means the Illinois Pollution Control Board.

Clean Water Act (formerly referred to as the Federal Water Pollution Control Act) means Pub. L 92-500, as amended. 33 U.S.C. 1251 et seq.

NPDES (National Pollutant Discharge Elimination System) means the national program for issuing, modifying, revoking and reissuing, terminating, monitoring and enforcing permits, and imposing and enforcing pretreatment requirements, under Sections 307, 402, 318 and 405 of the Clean Water Act.

USEPA means the United States Environmental Protection Agency.

Daily Discharge means the discharge of a pollutant measured during a calendar day or any 24-hour period that reasonably represents the calendar day for purposes of sampling. For pollutants with limitations expressed in units of mass, the "daily discharge" is calculated as the total mass of the pollutant discharged over the day. For pollutants with limitations expressed in other units of measurements, the "daily discharge" is calculated as the average measurement of the pollutant over the day.

Maximum Daily Discharge Limitation (daily maximum) means the highest allowable daily discharge.

Average Monthly Discharge Limitation (30 day average) means the highest allowable average of daily discharges over a calendar month, calculated as the sum of all daily discharges measured during a calendar month divided by the number of daily discharges measured during that month.

Average Weekly Discharge Limitation (7 day average) means the highest allowable average of daily discharges over a calendar week, calculated as the sum of all daily discharges measured during a calendar week divided by the number of daily discharges measured during that week.

Best Management Practices (BMPs) means schedules of activities, prohibitions of practices, maintenance procedures, and other management practices to prevent or reduce the pollution of waters of the State. BMPs also include treatment requirements, operating procedures, and practices to control plant site runoff, spillage or leaks, sludge or waste disposal, or drainage from raw material storage.

Aliquot means a sample of specified volume used to make up a total composite sample.

Grab Sample means an individual sample of at least 100 milliliters collected at a randomly-selected time over a period not exceeding 15 minutes.

24-Hour Composite Sample means a combination of at least 8 sample aliquots of at least 100 milliliters, collected at periodic intervals during the operating hours of a facility over a 24-hour period.

8-Hour Composite Sample means a combination of at least 3 sample aliquots of at least 100 milliliters, collected at periodic intervals during the operating hours of a facility over an 8-hour period.

Flow Proportional Composite Sample means a combination of sample aliquots of at least 100 milliliters collected at periodic intervals such that either the time interval between each aliquot or the volume of each aliquot is proportional to either the stream flow at the time of sampling or the total stream flow since the collection of the previous aliquot.

(1) **Duty to comply.** The permittee must comply with all conditions of this permit. Any permit noncompliance constitutes a violation of the Act and is grounds for enforcement action, permit termination, revocation and reissuance, modification, or for denial of a permit renewal application. The permittee shall comply with effluent standards or prohibitions established under Section 307(a) of the Clean Water Act for toxic pollutants within the time provided in the regulations that establish these standards or prohibitions, even if the permit has not yet been modified to incorporate the requirements.

(2) **Duty to reapply.** If the permittee wishes to continue an activity regulated by this permit after the expiration date of this permit, the permittee must apply for and obtain a new permit. If the permittee submits a proper application as required by the Agency no later than 180 days prior to the expiration date, this permit shall continue in full force and effect until the final Agency decision on the application has been made.

(3) **Need to halt or reduce activity not a defense.** It shall not be a defense for a permittee in an enforcement action that it would have been necessary to halt or reduce the permitted activity in order to maintain compliance with the conditions of this permit.

(4) **Duty to mitigate.** The permittee shall take all reasonable steps to minimize or prevent any discharge in violation of this permit which has a reasonable likelihood of adversely affecting human health or the environment.

(5) **Proper operation and maintenance.** The permittee shall at all times properly operate and maintain all facilities and systems of treatment and control (and related appurtenances) which are installed or used by the permittee to achieve compliance with conditions of this permit. Proper operation and maintenance includes effective performance, adequate funding, adequate operator staffing and training, and adequate laboratory and process controls, including appropriate quality assurance procedures. This provision requires the operation of back-up, or auxiliary facilities, or similar systems only when necessary to achieve compliance with the conditions of the permit.

(6) **Permit actions.** This permit may be modified, revoked and reissued, or terminated for cause by the Agency pursuant to 40 CFR 122.62 and 40 CFR 122.63. The filing of a request by the permittee for a permit modification, revocation and reissuance, or termination, or a notification of planned changes or anticipated noncompliance, does not stay any permit condition.

(7) **Property rights.** This permit does not convey any property rights of any sort, or any exclusive privilege.

(8) **Duty to provide information.** The permittee shall furnish to the Agency within a reasonable time, any information which the Agency may request to determine whether cause exists for modifying, revoking and reissuing, or terminating this permit, or to determine compliance with the permit. The permittee shall also furnish to the Agency upon request, copies of records required to be kept by this permit.

(9) **Inspection and entry.** The permittee shall allow an authorized representative of the Agency or USEPA (including an authorized contractor acting as a representative of the Agency or USEPA), upon the presentation of credentials and other documents as may be required by law, to:

(a) Enter upon the permittee's premises where a regulated facility or activity is located or conducted, or where records must be kept under the conditions of this permit;

(b) Have access to and copy, at reasonable times, any records that must be kept under the conditions of this permit;

(c) Inspect at reasonable times any facilities, equipment (including monitoring and control equipment), practices, or operations regulated or required under this permit; and

(d) Sample or monitor at reasonable times, for the purpose of assuring permit compliance, or as otherwise authorized by the Act, any substances or parameters at any location.

(10) **Monitoring and records.**

(a) Samples and measurements taken for the purpose of monitoring shall be representative of the monitored activity.

(b) The permittee shall retain records of all monitoring information, including all calibration and maintenance records, and all original strip chart recordings for continuous monitoring instrumentation, copies of all reports required by this permit, and records of all data used to complete the application for this permit, for a period of at least 3 years from the date of this permit, measurement, report or application. Records related to the permittee's sewage sludge use and disposal activities shall be retained for a period of at least five years (or longer as required by 40 CFR Part 503). This period may be extended by request of the Agency or USEPA at any time.

(c) Records of monitoring information shall include:

(1) The date, exact place, and time of sampling or measurements;

(2) The individual(s) who performed the sampling or measurements;

(3) The date(s) analyses were performed;

(4) The individual(s) who performed the analyses;

(5) The analytical techniques or methods used; and

(6) The results of such analyses.

(d) Monitoring must be conducted according to test procedures approved under 40 CFR Part 136, unless other test procedures have been specified in this permit. Where no test procedure under 40 CFR Part 136 has been approved, the permittee must submit to the Agency a test method for approval. The permittee shall calibrate and perform maintenance procedures on all monitoring and analytical instrumentation at intervals to ensure accuracy of measurements.

(11) **Signatory requirement.** All applications, reports or information submitted to the Agency shall be signed and certified.

(a) **Application.** All permit applications shall be signed as follows:

(1) For a corporation: by a principal executive officer of at least the level of vice president or a person or position having overall responsibility for environmental matters for the corporation:

(2) For a partnership or sole proprietorship: by a general partner or the proprietor, respectively; or

(3) For a municipality, State, Federal, or other public agency: by either a principal executive officer or ranking elected official.

(b) **Reports.** All reports required by permits, or other information requested by the Agency shall be signed by a person described in paragraph (a) or by a duly authorized representative of that person. A person is a duly authorized representative only if:

(1) The authorization is made in writing by a person described in paragraph (a); and

(2) The authorization specifies either an individual or a position responsible for the overall operation of the facility, from which the discharge originates, such as a plant manager, superintendent or person of equivalent responsibility; and

(3) The written authorization is submitted to the Agency.

(c) **Changes of Authorization.** If an authorization under (b) is no longer accurate because a different individual or position has responsibility for the overall operation of the facility, a new authorization satisfying the requirements of (b) must be submitted to the Agency prior to or together with any reports, information, or applications to be signed by an authorized representative.

(d) **Certification.** Any person signing a document under paragraph (a) or (b) of this section shall make the following certification:

I certify under penalty of law that this document and all attachments were prepared under my direction or supervision in accordance with a system designed to assure that qualified personnel properly gather and evaluate the information submitted. Based on my inquiry of the person or persons who manage the system, or those persons directly responsible for gathering the information, the information submitted is, to the best of my knowledge and belief, true, accurate, and complete. I am aware that there are significant penalties for submitting false information, including the possibility of fine and imprisonment for knowing violations.

(12) **Reporting requirements.**

(a) **Planned changes.** The permittee shall give notice to the Agency as soon as possible of any planned physical alterations or additions to the permitted facility.
Notice is required when:

(1) The alteration or addition to a permitted facility may meet one of the criteria for determining whether a facility is a new source pursuant to 40 CFR 122.29 (b); or

(2) The alteration or addition could significantly change the nature or increase the quantity of pollutants discharged. This notification applies to pollutants which are subject neither to effluent limitations in the permit, nor to notification requirements pursuant to 40 CFR 122.42 (a)(1).

(3) The alteration or addition results in a significant change in the permittee's sludge use or disposal practices, and such alteration, addition, or change may justify the application of permit conditions that are different from or absent in the existing permit, including notification of additional use or disposal sites not reported during the permit application process or not reported pursuant to an approved land application plan.

(b) **Anticipated noncompliance.** The permittee shall give advance notice to the Agency of any planned changes in the permitted facility or activity which may result in noncompliance with permit requirements.

(c) **Transfers.** This permit is not transferable to any person except after notice to the Agency.

(d) **Compliance schedules.** Reports of compliance or noncompliance with, or any progress reports on, interim and final requirements contained in any compliance schedule of this permit shall be submitted no later than 14 days following each schedule date.

(e) **Monitoring reports.** Monitoring results shall be reported at the intervals specified elsewhere in this permit.

(1) Monitoring results must be reported on a Discharge Monitoring Report (DMR).
(2) If the permittee monitors any pollutant more frequently than required by the permit, using test procedures approved under 40 CFR 136 or as specified in the permit, the results of this monitoring shall be included in the calculation and reporting of the data submitted in the DMR.
(3) Calculations for all limitations which require averaging of measurements shall utilize an arithmetic mean unless otherwise specified by the Agency in the permit.

(f) **Twenty-four hour reporting.** The permittee shall report any noncompliance which may endanger health or the environment. Any information shall be provided orally within 24-hours from the time the permittee becomes aware of the circumstances. A written submission shall also be provided within 5 days of the time the permittee becomes aware of the circumstances. The written submission shall contain a description of the noncompliance and its cause; the period of noncompliance, including exact dates and time; and if the noncompliance has not been corrected, the anticipated time it is expected to continue; and steps taken or planned to reduce, eliminate, and prevent reoccurrence of the noncompliance. The following shall be included as information which must be reported within 24-hours:
(1) Any unanticipated bypass which exceeds any effluent limitation in the permit.
(2) Any upset which exceeds any effluent limitation in the permit.
(3) Violation of a maximum daily discharge limitation for any of the pollutants listed by the Agency in the permit or any pollutant which may endanger health or the environment.
The Agency may waive the written report on a case-by-case basis if the oral report has been received within 24-hours.

(g) **Other noncompliance.** The permittee shall report all instances of noncompliance not reported under paragraphs (12) (d), (e), or (f), at the time monitoring reports are submitted. The reports shall contain the information listed in paragraph (12) (f).

(h) **Other information.** Where the permittee becomes aware that it failed to submit any relevant facts in a permit application, or submitted incorrect information in a permit application, or in any report to the Agency, it shall promptly submit such facts or information.

(13) **Bypass.**
(a) Definitions.
(1) Bypass means the intentional diversion of waste streams from any portion of a treatment facility.
(2) Severe property damage means substantial physical damage to property, damage to the treatment facilities which causes them to become inoperable, or substantial and permanent loss of natural resources which can reasonably be expected to occur in the absence of a bypass. Severe property damage does not mean economic loss caused by delays in production.
(b) Bypass not exceeding limitations. The permittee may allow any bypass to occur which does not cause effluent limitations to be exceeded, but only if it also is for essential maintenance to assure efficient operation. These bypasses are not subject to the provisions of paragraphs (13)(c) and (13)(d).
(c) Notice.
(1) Anticipated bypass. If the permittee knows in advance of the need for a bypass, it shall submit prior notice, if possible at least ten days before the date of the bypass.
(2) Unanticipated bypass. The permittee shall submit notice of an unanticipated bypass as required in paragraph (12)(f) (24-hour notice).
(d) Prohibition of bypass.
(1) Bypass is prohibited, and the Agency may take enforcement action against a permittee for bypass, unless:
(i) Bypass was unavoidable to prevent loss of life, personal injury, or severe property damage;
(ii) There were no feasible alternatives to the bypass, such as the use of auxiliary treatment facilities, retention of untreated wastes, or maintenance during normal periods of equipment downtime. This condition is not satisfied if adequate back-up equipment should have been installed in the exercise of reasonable engineering judgment to prevent a bypass which occurred during normal periods of equipment downtime or preventive maintenance; and
(iii) The permittee submitted notices as required under paragraph (13)(c).
(2) The Agency may approve an anticipated bypass, after considering its adverse effects, if the Agency determines that it will meet the three conditions listed above in paragraph (13)(d)(1).

(14) **Upset.**
(a) Definition. Upset means an exceptional incident in which there is unintentional and temporary noncompliance with technology based permit effluent limitations because of factors beyond the reasonable control of the permittee. An upset does not include noncompliance to the extent caused by operational error, improperly designed treatment facilities, inadequate treatment facilities, lack of preventive maintenance, or careless or improper operation.
(b) Effect of an upset. An upset constitutes an affirmative defense to an action brought for noncompliance with such technology based permit effluent limitations if the requirements of paragraph (14)(c) are met. No determination made during administrative review of claims that noncompliance was caused by upset, and before an action for noncompliance, is final administrative action subject to judicial review.
(c) Conditions necessary for a demonstration of upset. A permittee who wishes to establish the affirmative defense of upset shall demonstrate, through properly signed, contemporaneous operating logs, or other relevant evidence that:
(1) An upset occurred and that the permittee can identify the cause(s) of the upset;
(2) The permitted facility was at the time being properly operated; and
(3) The permittee submitted notice of the upset as required in paragraph (12)(f)(2) (24-hour notice).
(4) The permittee complied with any remedial measures required under paragraph (4).
(d) Burden of proof. In any enforcement proceeding the permittee seeking to establish the occurrence of an upset has the burden of proof.

(15) **Transfer of permits.** Permits may be transferred by modification or automatic transfer as described below:
  (a) Transfers by modification. Except as provided in paragraph (b), a permit may be transferred by the permittee to a new owner or operator only if the permit has been modified or revoked and reissued pursuant to 40 CFR 122.62 (b) (2), or a minor modification made pursuant to 40 CFR 122.63 (d), to identify the new permittee and incorporate such other requirements as may be necessary under the Clean Water Act.
  (b) Automatic transfers. As an alternative to transfers under paragraph (a), any NPDES permit may be automatically transferred to a new permittee if:
    (1) The current permittee notifies the Agency at least 30 days in advance of the proposed transfer date;
    (2) The notice includes a written agreement between the existing and new permittees containing a specified date for transfer of permit responsibility, coverage and liability between the existing and new permittees; and
    (3) The Agency does not notify the existing permittee and the proposed new permittee of its intent to modify or revoke and reissue the permit. If this notice is not received, the transfer is effective on the date specified in the agreement.

(16) All manufacturing, commercial, mining, and silvicultural dischargers must notify the Agency as soon as they know or have reason to believe:
  (a) That any activity has occurred or will occur which would result in the discharge of any toxic pollutant identified under Section 307 of the Clean Water Act which is not limited in the permit, if that discharge will exceed the highest of the following notification levels:
    (1) One hundred micrograms per liter (100 ug/l);
    (2) Two hundred micrograms per liter (200 ug/l) for acrolein and acrylonitrile; five hundred micrograms per liter (500 ug/l) for 2,4-dinitrophenol and for 2-methyl-4,6 dinitrophenol; and one milligram per liter (1 mg/l) for antimony.
    (3) Five (5) times the maximum concentration value reported for that pollutant in the NPDES permit application; or
    (4) The level established by the Agency in this permit.
  (b) That they have begun or expect to begin to use or manufacture as an intermediate or final product or byproduct any toxic pollutant which was not reported in the NPDES permit application.

(17) All Publicly Owned Treatment Works (POTWs) must provide adequate notice to the Agency of the following:
  (a) Any new introduction of pollutants into that POTW from an indirect discharge which would be subject to Sections 301 or 306 of the Clean Water Act if it were directly discharging those pollutants; and
  (b) Any substantial change in the volume or character of pollutants being introduced into that POTW by a source introducing pollutants into the POTW at the time of issuance of the permit.
  (c) For purposes of this paragraph, adequate notice shall include information on (i) the quality and quantity of effluent introduced into the POTW, and (ii) any anticipated impact of the change on the quantity or quality of effluent to be discharged from the POTW.

(18) If the permit is issued to a publicly owned or publicly regulated treatment works, the permittee shall require any industrial user of such treatment works to comply with federal requirements concerning:
  (a) User charges pursuant to Section 204 (b) of the Clean Water Act, and applicable regulations appearing in 40 CFR 35;
  (b) Toxic pollutant effluent standards and pretreatment standards pursuant to Section 307 of the Clean Water Act; and
  (c) Inspection, monitoring and entry pursuant to Section 308 of the Clean Water Act.

(19) If an applicable standard or limitation is promulgated under Section 301(b)(2)(C) and (D), 304(b)(2), or 307(a)(2) and that effluent standard or limitation is more stringent than any effluent limitation in the permit, or controls a pollutant not limited in the permit, the permit shall be promptly modified or revoked, and reissued to conform to that effluent standard or limitation.

(20) Any authorization to construct issued to the permittee pursuant to 35 Ill. Adm. Code 309.154 is hereby incorporated by reference as a condition of this permit.

(21) The permittee shall not make any false statement, representation or certification in any application, record, report, plan or other document submitted to the Agency or the USEPA, or required to be maintained under this permit.

(22) The Clean Water Act provides that any person who violates a permit condition implementing Sections 301, 302, 306, 307, 308, 318, or 405 of the Clean Water Act is subject to a civil penalty not to exceed $25,000 per day of such violation. Any person who willfully or negligently violates permit conditions implementing Sections 301, 302, 306, 307, 308, 318 or 405 of the Clean Water Act is subject to a fine of not less than $2,500 nor more than $25,000 per day of violation, or by imprisonment for not more than one year, or both.
Additional penalties for violating these sections of the Clean Water Act are identified in 40 CFR 122.41 (a)(2) and (3).

(23) The Clean Water Act provides that any person who falsifies, tampers with, or knowingly renders inaccurate any monitoring device or method required to be maintained under this permit shall, upon conviction, be punished by a fine of not more than $10,000, or by imprisonment for not more than 2 years, or both. If a conviction of a person is for a violation committed after a first conviction of such person under this paragraph, punishment is a fine of not more than $20,000 per day of violation, or by imprisonment of not more than 4 years, or both.

(24) The Clean Water Act provides that any person who knowingly makes any false statement, representation, or certification in any record or other document submitted or required to be maintained under this permit, including monitoring reports or reports of compliance or non-compliance shall, upon conviction, be punished by a fine of not more than $10,000 per violation, or by imprisonment for not more than 6 months per violation, or by both.

(25) Collected screening, slurries, sludges, and other solids shall be disposed of in such a manner as to prevent entry of those wastes (or runoff from the wastes) into waters of the State. The proper authorization for such disposal shall be obtained from the Agency and is incorporated as part hereof by reference.

(26) In case of conflict between these standard conditions and any other condition(s) included in this permit, the other condition(s) shall govern.

(27) The permittee shall comply with, in addition to the requirements of the permit, all applicable provisions of 35 Ill. Adm. Code, Subtitle C, Subtitle D, Subtitle E, and all applicable orders of the Board or any court with jurisdiction.

(28) The provisions of this permit are severable, and if any provision of this permit, or the application of any provision of this permit is held invalid, the remaining provisions of this permit shall continue in full force and effect.

(Rev. 7-9-2010 bah)

WASHINGTON, D.C. 20460

OFFICE OF
WATER

MAR 15 1985

MEMORANDUM

SUBJECT: Variances in Water Quality Standards

TO: Water Division Directors

Numerous questions have been raised regarding the granting of variances to water quality standards. The Preamble to the water quality standards regulations discusses limiting the granting of a variance that"... based on a demonstration that meeting the standard would cause substantial and widespread economic and social impact, the same test as if the State were changing a use..."

A interpretation by our Office of General Counsel, provides a better determination on what factors can be considered in allowing variances from water quality standards. The OGC interpretation is that any of the factors recognized in the regulation for justifying a stream use downgrade, not just the substantial and widespread economic and social impact test, may be used to support a variance.

Our previous interpretation was somewhat illogical as it allowed more opportunity for a permanent change in standards then it did for a temporary, short-term change which could be granted by a variance. Under Section 510 of the Clean Water Act, States have the right to establish more stringent standards than suggested by EPA. Therefore, as long as any temporary water quality standards modification conforms to the requirements established in Section 131.10 (g) of the regulation for downgrading uses, such an approach is acceptable as it would lead to only a temporary change to a water quality standard rather than a downgrade, and thus would be more stringent than the Federal requirements.

This interpretation dies not change the regulation which provides that States may have general policies affecting the application and implementation of standards. It does affect the discussion of variances contained in the Preamble to the regulation and the guidance included in the WQS Handbook, page 1-9. No other aspect of the variance policy and guidance is altered by this new interpretation. this memorandum should be kept as part of your permanent file for interpreting water quality standards.

Overall, we expect the impact of this change to be minimal as the discussion of variances appears to far outweigh its actual affects on the program. Often the confusion surrounding variances obscures the fact that what is really being discussed are specialized permit conditions, scheduling adjustments, site-specific criteria, or actual downgrading actions.

Edwin L. Johnson, Director
Office of Water Regulations
and Standards (WH-551)

cc: Bill Whittington
Peter Perez
Cathy Winer
Net Notzen

Water Quality Standards Handbook - Chapter 5: General Policies (40 CFR 131.13)

EPA-820-B-14-004
September 2014

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Introduction

As specified in 40 CFR 131.13, states and authorized tribes may, at their discretion, adopt certain policies into their water quality standards (WQS) that generally affect how their WQS are applied or implemented. Examples of such general policies include those affecting mixing zones, critical low flows, and WQS variances. [1/] As the regulation indicates, states and tribes are not required to adopt general policies. However, if a state or tribe chooses to adopt a general policy, such policies are subject to EPA review and approval or disapproval under Section 303(c) of the Clean Water Act (CWA) if they constitute new or revised WQS (see Chapter 1 of this Handbook). This chapter provides an overview of three types of general WQS policies. In particular, Section 5.1 of this chapter discusses mixing zones, Section 5.2 discusses critical low flows, and Section 5.3 discusses variances.

5.1 Mixing Zones

A mixing zone is a limited area or volume of water where initial dilution of a discharge takes place and where certain numeric water quality criteria may be exceeded. The CWA does not require that all criteria be met at the exact point where pollutants are discharged into a receiving water prior to the mixing of such pollutants with the receiving water. Sometimes it is possible to expose aquatic organisms to a pollutant concentration above a criterion for a short duration within a limited, clearly defined area of a waterbody while still maintaining the designated use of the waterbody as a whole. Where this is the case, a state or authorized tribe may find it appropriate to allow ambient concentrations of a pollutant above the criterion in small areas near point-source outfalls (i.e., mixing zones).

Mixing zones do not constitute new state or tribal criteria or changes to the state- or tribe-adopted and EPA-approved criteria. Therefore, the narrative and/or numeric criteria for the waterbody are still the applicable criteria within the boundaries of the mixing zone. A mixing zone simply authorizes an applicable criterion to be exceeded within a defined area of the waterbody while still protecting the designated use of the waterbody as a whole. Since 1983, the guidance in this Handbook has described mixing zones as areas where criteria may be exceeded rather than areas where criteria do not apply.

By authorizing a mixing zone, states and tribes allow some portion of the waterbody to mix with and dilute particular wastewater discharges before evaluating whether the waterbody as a whole is meeting its criteria. In addition to the WQS regulation at 40 CFR 131.13 described above, the use of dilution is supported by the National Pollutant Discharge Elimination System (NPDES) permitting regulation at 40 CFR 122.44(d)(1)(ii), which requires the permitting authority to consider, where appropriate, "the dilution of the effluent in the receiving water" when determining whether a discharge causes, has the reasonable potential to cause, or contributes to an instream excursion above a criterion. Depending on the state or tribal WQS and implementation policies, a consideration of dilution could be expressed in the form of a

dilution allowance or a mixing zone. A dilution allowance typically is expressed as the flow or portion of the flow of a river or stream and is typically applied in flowing waters where rapid and complete mixing occurs. A mixing zone is typically applied in any waterbody type in which incomplete mixing occurs. For more information, see Chapter 6 of the *NPDES Permit Writers' Manual* (2010).

While mixing zones serve to dilute concentrations of pollutants in effluent discharges, they also allow increases in the mass loading of the pollutant to the waterbody (more so than would occur if no mixing zone were allowed). Therefore, if not applied appropriately, a mixing zone could adversely affect mobile species passing through the mixing zone as well as less mobile species (e.g., benthic communities) in the immediate vicinity of the discharge. Because of these and other factors, mixing zones should be applied carefully so that they do not result in impairment of the designated use of the waterbody as a whole or impede progress toward the CWA goals of restoring and maintaining the physical, chemical, and biological integrity of the Nation's waters. Keeping this in mind, a state or tribe has the discretion to choose whether to authorize mixing zones and adopt a mixing zone policy. However, as described below, if a state or tribe chooses to adopt a mixing zone policy, such a policy is generally considered a new or revised WQS that must be adopted into state or tribal law and approved by the EPA before it is effective for CWA purposes.

An important note is that "mixing zone" is used in multiple ways. A *mixing zone policy* is a legally binding state or tribal policy that is adopted into WQS and describes the general characteristics of and requirements associated with mixing zones without taking into account site-specific information. The EPA generally views such mixing zone polices as constituting new or revised WQS that require EPA review and approval or disapproval under Section 303(c) of the CWA. Consistent with the four-part test described in *What is a New or Revised Water Quality Standard Under CWA Section 303(c)? Frequently Asked Questions* (2012) and Chapter 1 of this Handbook, a state or tribal mixing zone policy is a legally binding provision that is adopted into state or tribal law (part one), and it addresses the criteria component of WQS (part two). Additionally, a mixing zone policy expresses a desired condition in the waterbody to allow flexibility in meeting the applicable criteria within certain areas of the waterbody (part three), and if it is a new provision or revises an existing policy (part four), it clearly meets the requirements to be a new or revised WQS.

On the other hand, an *individual, site-specific mixing zone* is authorized for a particular point-source discharge in accordance with a state or tribal mixing zone policy and accounts for the site-specific characteristics of a particular discharge and receiving water. An individual mixing zone is defined and implemented through the NPDES permitting process. The EPA does not view individual mixing zones as constituting new or revised WQS requiring EPA review under Section 303(c). Like a mixing zone policy, an individual mixing zone is a legally binding provision that is established pursuant to state or tribal law (part one), and it addresses the criteria component of WQS (part two). However, unlike a mixing zone policy, an individual mixing zone does not express or establish a desired condition in the waterbody (part three). Instead, the individual mixing zone is used to establish appropriate water quality-based effluent limits (WQBELs) for a specific discharger's NPDES permit. An individual mixing zone also does not establish a new provision or revise an existing provision (part four). Rather, it implements a WQS (i.e., the state or tribal mixing zone policy) for a specific discharger using site-specific information.

Additionally, any time an effluent is discharged into a receiving water, there will be a zone of *actual or physical mixing* in which the discharge and receiving water naturally mix regardless of whether a mixing zone, in the regulatory sense, has been authorized. Such actual mixing is described using field studies and a water quality model and is used in establishing an individual, site-specific mixing zone for a particular discharge.

The authorization of mixing zones under incompletely mixed discharge and receiving water situations pre-dates the CWA. The EPA's current mixing zone guidance, contained in this Handbook, the *Technical Support Document for Water Quality-based Toxics Control* (TSD) (1991), and the *NPDES Permit Writers' Manual* (2010), evolved from previous guidance from the EPA and its predecessor agencies on the use of mixing zones as a regulatory tool to address the incomplete mixing of wastewater discharges in receiving waters. This Handbook describes the EPA's recommendations for state and tribal mixing zone policies. The other two documents listed above describe the technical and permitting aspects of defining individual, site-specific mixing zones for point-source discharges during the NPDES permitting process. Additional information on mixing zones can also be found in the EPA's *Compilation of EPA Mixing Zone Documents* (2006) and *Advanced Notice of Proposed Rulemaking for Water Quality Standards* (1998).

5.1.1 Recommended Contents of State and Tribal Mixing Zone Policies

The EPA recommends that states and authorized tribes adopt, at a minimum, a definitive statement into their WQS specifying whether the state or tribe intends to authorize mixing zones. Consistent with the discussion above, where a mixing zone is authorized, water quality criteria are met at the edge of the mixing zone during critical low-flow conditions (which are described in Section 5.2 of this chapter) so that the designated use of the waterbody as a whole is protected. If a state or tribe chooses to adopt a mixing zone policy, such a policy should ensure the following:

- Mixing zones do not impair the designated use of the waterbody as a whole.

- Pollutant concentrations within the mixing zone are not lethal to organisms passing through the mixing zone. 2/
- Pollutant concentrations within the mixing zone do not cause significant human health risks considering likely pathways of exposure.
- Mixing zones do not endanger critical areas such as breeding or spawning grounds, habitat for threatened or endangered species, areas with sensitive biota, shellfish beds, fisheries, drinking water intakes and sources, or recreational areas.

Because pollutant concentrations may exceed numeric criteria within mixing zones, these elevated concentrations could adversely affect the productivity of the waterbody and have unanticipated ecological consequences. Therefore, the EPA recommends that the use of mixing zones in the development of WQBELs in NPDES permits be carefully evaluated and appropriately limited on a case-by-case basis in light of the overarching requirement to protect the designated use of the waterbody as a whole pursuant to 40 CFR 131.10.

Due to potential additive or synergistic effects of certain pollutants that could result in the designated use of the waterbody as a whole not being protected, state and tribal mixing zone policies should specify, and permitting authorities should ensure, that mixing zones do not overlap. Additionally, the EPA recommends that permitting authorities evaluate the cumulative effects of multiple mixing zones within the same waterbody. The EPA has developed a holistic approach to determine whether a mixing zone is appropriate based on such cumulative effects considering all of the impacts to the designated uses of the waterbody (see *Allocated Impact Zones for Areas of Non-Compliance* (1995)). If the total area affected by elevated concentrations within all mixing zones combined is small compared to the total area of the waterbody in which the mixing zones are located, then mixing zones are likely to have little effect on the designated use of the waterbody as a whole, provided that they do not impinge on unique or critical habitats. As understanding of pollutant impacts on ecological systems evolves, states and tribes may find specific cases in which no mixing zone is appropriate.

States and tribes that choose to adopt mixing zone policies should describe the general procedures for defining and implementing mixing zones in terms of location, maximum size, shape, outfall design, and in zone water quality, at a minimum. Such policies should be sufficiently detailed to support regulatory actions, issuance of permits, and determination of best management practices for nonpoint sources.

The EPA recommends that specific characteristics of an individual mixing zone for a specific discharger be defined on a case by case basis using the state or tribal mixing zone policy. This site-specific assessment would ideally take into consideration the physical, chemical, and biological characteristics of the discharge (including the type of pollutant discharged) and receiving waterbody; the life history and behavior of organisms in the receiving waterbody; and the designated uses of the waterbody.

Location

States and authorized tribes should restrict the potential locations of mixing zones as a way to protect stationary benthic organisms and human health from the potential adverse effects of elevated pollutant levels. In addition, states and tribes should prohibit mixing zones where they may endanger biologically important and other critical areas that the state, tribe, or federal government has identified. These include breeding and spawning grounds, habitat for threatened or endangered species, areas with sensitive biota, shellfish beds, fisheries, drinking water intakes and sources, and recreational areas.

Pollutant concentrations above the chronic aquatic life water quality criterion may prevent sensitive taxa from living and reproducing successfully within the mixing zone. In this regard, benthic and territorial organisms may be of greatest concern in protecting aquatic life within a mixing zone. The higher the pollutant concentrations occurring within the mixing zone, the more taxa are likely to be adversely affected, thereby affecting the structure and function of the ecological community and, potentially, the designated use of the waterbody as a whole.

For protection of human health, states and tribes should restrict mixing zones such that they do not result in significant human health risks when evaluated using reasonable assumptions about exposure pathways. For example, where drinking water contaminants are a concern, the mixing zones should not encroach on drinking water intakes and sources. Where fish tissue residues are a concern (either because of measured or predicted residues), mixing zones should not result in significant human health risks to average and sensitive subpopulations of consumers of fish and shellfish after considering exposure duration of the affected aquatic organisms in the mixing zone and the patterns of fisheries use in the area. Where waters are designated for primary contact recreation, mixing zones for bacteria should not result in significant human health risks to people recreating in such waters. In all cases, it is critical that the designated use of the waterbody as a whole is protected.

Size

In order to protect the designated uses of the waterbody as a whole, pollutant concentrations within any mixing zone should not be lethal to mobile, migrating, and drifting organisms in the waterbody or cause significant human health risks considering likely pathways of exposure. One means of achieving these objectives is to limit the size of the mixing zone.

Most states and authorized tribes allow mixing zones as a matter of policy but also specify general spatial dimensions that limit their size. States and tribes have developed various methods of defining the maximum allowable size of mixing zones for various types of waters. State and tribal policies dealing with streams and rivers often limit mixing zone widths, cross sectional areas, and/or flow volumes and allow lengths to be determined on a case by case basis. For lakes, estuaries, and coastal waters, dimensions are usually specified by surface area, width, cross sectional area, and/or volume. The EPA recommends that states and tribes use methods that result in quantitative measures sufficient for permitting authorities to develop WQBELs in a transparent and straightforward manner.

If a mixing zone is authorized for a specific discharge, the permitting authority then defines the actual size of an individual, site-specific mixing zone for the specific discharge on a case-by-case basis using the general size restrictions in the state or tribal mixing zone policy. The area or volume of an individual mixing zone or group of mixing zones should be as small as practicable so that it does not interfere with the designated uses or with the established community of aquatic life in the segment for which the uses are designated.

In general, where a state or tribe has both acute and chronic aquatic life water quality criteria as well as human health criteria for the same pollutant, states and tribes may establish independent mixing zone size specifications that apply to each criteria type. For aquatic life criteria, there may be up to two types of mixing zones: one for the acute criterion and one for the chronic criterion (see Figure 5.1).

In the zone immediately surrounding the outfall, both the acute and the chronic criteria may be exceeded, but the acute criterion is met at the edge of this zone, which is often referred to as the acute mixing zone or the zone of initial dilution. The acute mixing zone is sized to prevent lethality to passing organisms in order to protect the designated use of the waterbody as a whole.

In the next mixing zone, which is often called the chronic mixing zone, the chronic criterion may be exceeded, but the acute criterion is met. The chronic criterion is met at the edge of the chronic mixing zone. The chronic mixing zone is sized to protect the designated use of the waterbody as a whole.

Where the state or tribe also has human health criteria for the pollutant of concern, the human health mixing zone is sized to prevent significant human risks in order to protect the designated use of the waterbody as a whole.

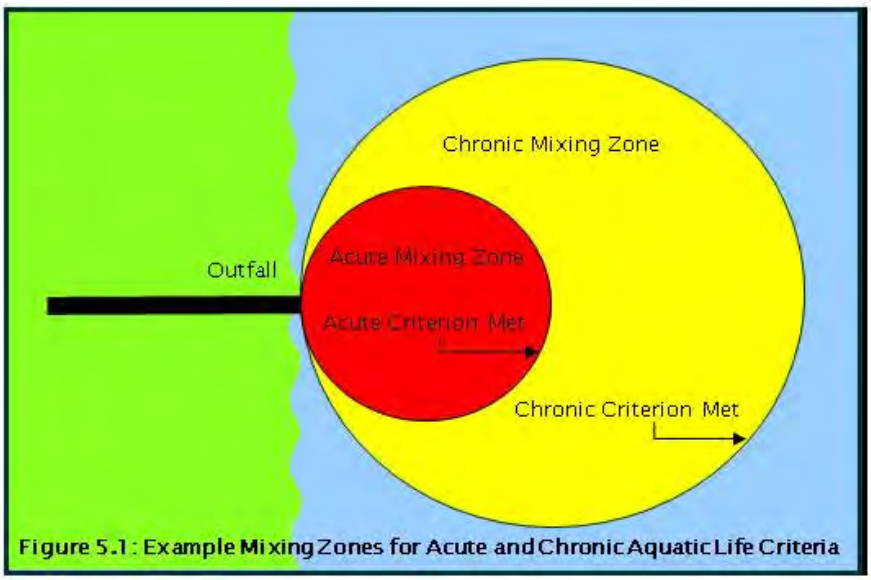

Figure 5.1: Example Mixing Zones for Acute and Chronic Aquatic Life Criteria

For a particular pollutant found in a particular discharge, the magnitude, duration, frequency, and any authorized mixing zone associated with each of the criteria types (i.e., human health and acute and chronic aquatic life) will determine which criterion most limits the allowable discharge. In all cases, the permitting authority should evaluate the

size of the site-specific mixing zone to determine its effect on the designated use of the waterbody as a whole. Section 2.2.2 of the TSD (1991) contains information for determining whether a mixing zone's size is appropriate.

State and tribal mixing zone policies should identify zones of passage within waterbodies that contain migrating, free-swimming, or drifting organisms. Zones of passage are continuous water routes of such volume, area, and quality as to allow the passage of free swimming and drifting organisms without significant adverse effects on their populations. Many species migrate for spawning and other purposes. Not only do migrating species (e.g., anadromous and catadromous species) need to be able to reach suitable spawning areas, their young (and in some cases the adults) require a safe return route to their growing and living areas. Elevated pollutant concentrations within a mixing zone can create barriers that hinder or prevent safe migration. Therefore, mixing zones should be sized and located appropriately within the waterbody to provide a continuous zone of passage that protects migrating, free-swimming, and drifting organisms.

Shape

The waterbody type, outfall design, and characteristics of the discharge will determine the shape of a mixing zone. The shape should be a simple configuration that is easy to locate in a waterbody and that avoids impingement on biologically important areas. In lakes, a circle with a specified radius is generally preferable, but other shapes may be appropriate in the case of unusual site requirements.

"Shore hugging" plumes should be avoided in all waterbodies. Shore areas are often the most biologically productive and sensitive areas of a waterbody, and they are often used for recreation. Shore-hugging plumes generally do not mix as well with receiving waters and, thus, do not dilute as well as mixing zones with other shapes that do not hug shorelines. Because shore-hugging plumes tend to keep unmixed water over the benthic area or in the recreational area, they are more likely to adversely affect the designated uses of the waterbody.

Outfall Design

Because outfall design affects the amount of initial mixing that occurs, state and tribal mixing zone policies should instruct dischargers to utilize the best practicable engineering design of the outfall to maximize initial mixing. Sometimes, modifying the design of the diffuser, the location of the outfall, or other outfall design characteristics can reduce significant adverse impacts to the waterbody because different design characteristics have different effects on mixing. Many different factors affect how well the outfall design allows the discharge to mix with the receiving water including the following:

- The height of the outfall with respect to the surface and bottom of the waterbody.
- The distance of the end of the pipe to the nearest bank (i.e., whether the outfall is in the middle of the waterbody or close to one side).
- The angle of the discharge.
- The type of diffuser that is used (i.e., single-port or multi-port diffuser).

Section 4.4.1 of the TSD (1991) describes recommendations for outfall design in more detail.

In-zone Water Quality

States and authorized tribes should ensure that a minimum level of water quality is maintained within a mixing zone. Mixing zones should attain the "free from" narrative water quality criteria that are applicable to all waters in a state or reservation. For example, the EPA recommends that mixing zones be free from the following:

- Materials in concentrations that will cause acutely toxic conditions to aquatic life. [3/]
- Materials in concentrations that settle to form objectionable deposits.
- Floating debris, oil, scum, and other material in concentrations that form nuisances.
- Substances in concentrations that produce objectionable color, odor, taste, or turbidity.
- Substances in concentrations that produce undesirable aquatic life or result in a dominance of nuisance species.

5.1.2 Situations in Which Mixing Zones May Not Be Appropriate

As discussed above, states and authorized tribes are not required to allow mixing zones. Even if a state or tribe chooses to allow mixing zones generally, it may also choose to define in its policy circumstances under which mixing zones are prohibited (e.g., for particular pollutants and/or waterbodies). Likewise, where the state or tribe generally allows mixing zones, the permitting authority may decide that a mixing zone is not appropriate for a particular discharge on a site-specific basis. [4/] States and tribes should conclude that mixing zones are not appropriate in the following situations:

- Where they may impair the designated use of the waterbody as a whole.
- Where they contain pollutant concentrations that may be lethal to passing organisms.
- Where they contain pollutant concentrations that may cause significant human health risks considering likely pathways of exposure.
- Where they may endanger critical areas such as breeding and spawning grounds, habitat for threatened or endangered species, areas with sensitive biota, shellfish beds, fisheries, drinking water intakes and sources, and recreational areas.

Additionally, states and tribes should carefully consider whether mixing zones are appropriate where a discharge contains bioaccumulative, pathogenic, persistent, carcinogenic, mutagenic, or teratogenic pollutants or where a discharge containing toxic pollutants may attract aquatic life.

Bioaccumlative pollutants are one example of a pollutant for which mixing zones may not be appropriate because they may cause significant human health risks such that the designated use of the waterbody as a whole may not be protected. [5/] Therefore, the EPA recommends that state and tribal mixing zone policies do not allow mixing zones for discharges of bioaccumulative pollutants. The EPA adopted this approach in 2000 when it amended its 1995 *Final Water Quality Guidance for the Great Lakes System* at 40 CFR Part 132 to phase out mixing zones for existing discharges of bioaccumulative pollutants within the Great Lakes Basin and ban such mixing zones for new discharges within the Basin.

Because fish tissue contamination tends to be a far-field problem affecting entire or downstream waterbodies rather than a near-field problem being confined to the area within a mixing zone, a state or tribe may find it appropriate to restrict or eliminate mixing zones for bioaccumulative pollutants in certain situations such as the following:

- Where mixing zones may encroach on areas often used for fish harvesting, particularly for stationary species such as shellfish.
- Where there are uncertainties in the protectiveness of the water quality criteria or the assimilative capacity of the waterbody.

Chapter 3 of this Handbook and Chapter 5 of *Methodology for Deriving Ambient Water Quality Criteria for the Protection of Human Health* (2000) provide additional information about bioaccumulation, and Section 4.3.4 of the TSD (1991) discusses preventing bioaccumulation problems for human health in calculating WQBELs.

Another example of a pollutant for which a mixing zone may not be appropriate is bacteria. Because bacteria mixing zones may cause significant human health risks and endanger critical areas (e.g., recreational areas), the EPA recommends that state and tribal mixing zone policies do not allow mixing zones for bacteria in waters designated for primary contact recreation. The presumption in a river or stream segment designated for primary contact recreation is that primary contact recreation can safely occur throughout the segment and, therefore, that bacteria levels will not exceed criteria throughout the segment. Epidemiological studies have demonstrated that illness rates are higher when the criteria are exceeded compared to when those criteria are not exceeded (see Sections 3.2 and 3.3 of the EPA's *Recreational Water Quality Criteria* (2012)). Therefore, people recreating in or through a bacteria mixing zone (where bacteria levels may be elevated above the criteria levels) may be exposed to greater risk of gastrointestinal illness than would otherwise be allowed by the state or tribal criteria for protection of the recreation use. Given this presumption, states and tribes should carefully evaluate whether authorizing a mixing zone that results in elevated levels of bacteria in a river or stream designated for primary contact recreation will adversely affect the designated use. If so, then states and tribes should not authorize such mixing zones because they could result in a significant human health risk.

A third example of a situation in which the EPA recommends that states and tribes prohibit a mixing zone is when an effluent is known to attract biota. In such cases, a continuous zone of passage around the mixing area will not protect aquatic life. Although most toxic pollutants elicit a neutral or avoidance response, there are some situations in which aquatic life are attracted to a toxic discharge and, therefore, can potentially incur significant exposure. For example, temperature can be an attractive force and may counter an avoidance response to a particular pollutant. Therefore, the organisms would tend to stay in the mixing zone rather than passing through or around it. Innate behavior such as migration may also counter an avoidance response and cause fish to incur significant exposure.

5.1.3 Mixing Zones for the Discharge of Dredged or Fill Material

In conjunction with the Department of the Army, the EPA has developed guidelines at 40 CFR Part 230 for evaluating discharges of dredged or fill material into navigable waters, which include provisions at 40 CFR 230.11(f) for determining the acceptability of mixing zones for such material. Discharges of dredged or fill material are generally temporary and result in short term disruption to the waterbody rather than constituting a continuous discharge with long-term disruption beyond the fill area. In authorizing and establishing mixing zones for dredge and fill activities,

the state or authorized tribe's primary consideration should be achieving and protecting the designated uses of the waterbody pursuant to 40 CFR 131.10. As such, states and tribes should evaluate the particular pollutants involved for their effects on the designated use. Technical guidance for determining the potential for contaminant-related impacts associated with the discharge of dredged material can be found in *Evaluation of Dredged Material Proposed for Discharge in Waters of the U.S. - Testing Manual: Inland Testing Manual* (1998).

5.1.4 Mixing Zones for Aquaculture Projects

Under Section 318 of the CWA, permitting authorities may allow discharges of certain pollutants associated with approved aquaculture projects. Consistent with 40 CFR 122.25, an aquaculture project is a defined, managed water area into which certain pollutants are discharged for the maintenance or production of harvestable freshwater, estuarine, or marine plants or animals. The EPA's regulations at 40 CFR 125.11 provide that aquaculture project approval must not result in the enlargement of a pre-existing mixing zone beyond the area designated for the original discharge and that the designated project area (which is also defined at 40 CFR 122.25) must not include a portion of a waterbody large enough to expose a substantial portion of the indigenous biota to the conditions within the designated project area. For example, a designated project area should not include the entire width of a stream because all of the indigenous organisms might be exposed to pollutant discharges that would exceed WQS. The areas designated for approved aquaculture projects should be treated in the same manner as other mixing zones.

5.2 Critical Low Flows for Water Quality Criteria Implementation

Pursuant to 40 CFR 131.11(a), states and authorized tribes must adopt those water quality criteria that protect designated uses. To ensure that adopted criteria are protective of the designated uses, states and tribes generally establish critical low-flow values to support implementation of the applicable criteria through such programs as NPDES permitting.

Critical low-flow conditions present special challenges to the integrity of the aquatic community and the protection of human health. Dilution is one of the primary mechanisms by which the concentrations of contaminants in effluent discharges are reduced following their introduction into a receiving water. Low flows in the receiving water typically aggravate the effects of effluent discharges because, during a low-flow event, there is less water available for dilution, resulting in higher instream concentrations of pollutants. Therefore, the allowable dilution (which may be only a portion of the critical low flow depending on the state or tribal WQS and implementation procedures) for purposes of determining the need for and establishing WQBELs in NPDES permits should ensure protection of the applicable criteria at the calculated critical low-flow value.

The EPA has historically encouraged states and tribes to specify directly within their WQS which calculated critical low-flow values should be used to determine the available dilution for the purposes of determining the need for and establishing WQBELs. Such critical low-flow values have historically been reviewed and approved or disapproved by the EPA as new or revised WQS under Section 303(c) of the CWA. Likewise, revisions to those critical low-flow values would generally constitute new or revised WQS subject to EPA review and approval or disapproval (see Chapter 1 of this Handbook and *What is a New or Revised Water Quality Standard Under CWA Section 303(c)? Frequently Asked Questions* (2012)).

Most states and tribes generally follow the guidance in the TSD (1991) when adopting critical low-flow values for criteria implementation. The EPA recommends that states and tribes adopt the critical low-flow values for use in steady-state analyses so that criteria are implemented appropriately. If criteria are implemented using inappropriate critical low-flow values (i.e., calculated values that are too high), the resulting control of toxic pollutants may not be fully protective because the resulting ambient concentrations could exceed criteria when such low flows occur. In the case of aquatic life, more frequent excursions than are allowable (e.g., more than once in three years) could result in unacceptable effects on aquatic organisms and designated uses if the appropriate value is not used in the calculations.

In addition to steady-state models, the TSD recommends the use of three dynamic models to perform wasteload allocations. Because dynamic wasteload models do not generally use specific steady-state critical low-flow values but accomplish the same effect by factoring in the probability of occurrence of stream flows based on the historical flow record, this Handbook discusses only steady-state conditions.

In Appendix D of the TSD and *Technical Guidance Manual for Performing Wasteload Allocations, Book VI: Design Conditions - Chapter 1: Stream Design Flow for Steady-State Modeling* (1986), the EPA describes and recommends two methods for calculating acceptable critical low-flow values: the traditional hydrologically based method developed by the United States Geological Survey (USGS) and a biologically based method developed by the EPA.[6/] The hydrologically based critical low-flow value is determined statistically using probability and extreme values, while the biologically based critical low flow is determined empirically using the specific duration and frequency associated with the

criterion.

Additionally, the two documents listed above describe the flow values that the EPA recommends for implementing acute and chronic criteria using both methods. Table 5.1 below summarizes these recommendations.

Table 5.1: EPA-recommended Critical Low Flows for Aquatic Life and Human Health Criteria

Criteria	Hydrologically Based Flow	Biologically Based Flow
Acute Aquatic Life	1Q10	1B3
Chronic Aquatic Life	7Q10	4B3
Human Health	Harmonic mean	

Using the hydrologically based method, 1Q10 represents the lowest one-day average flow event expected to occur once every ten years, on average, and 7Q10 represents the lowest seven-consecutive-day average flow event expected to occur once every ten years, on average. Using the biologically based method, 1B3 represents the lowest one-day average flow event expected to occur once every three years, on average, and 4B3 represents the lowest four-consecutive-day average flow event expected to occur once every three years, on average.

States and tribes may designate other critical low-flow values to implement the applicable criteria, provided they are scientifically justified. The EPA has also recommended critical low-flow values that differ from the above recommendations for specific pollutants such 30Q5, 30Q10, and 30B3 for implementing chronic criteria for ammonia.

The EPA does not view the fact that many streams within a state or tribe have no flow at 7Q10 as adequate justification for designating alternative flows. Note that, when a criterion specifies a four day average concentration that should not be exceeded more than once every three years, this condition should not be interpreted as implying that a 4Q3 low flow is appropriate for use as the hydrologically based critical low-flow value for assessing impacts on the receiving water.

The EPA recommends the harmonic mean flow for implementing human health criteria. The concept of a harmonic mean is a standard statistical data analysis technique. The EPA's model for human health effects assumes that such effects occur because of a long-term exposure to low concentrations of a toxic pollutant (e.g., two liters of water per day for seventy years). The harmonic mean flow allows for estimating the concentration of toxic pollutant contained in those two liters of water per day when the daily variation in the flow rate is high. Therefore, the EPA recommends use of the harmonic mean flow in computing critical low flows for human health criteria rather than using other averaging techniques.

In addition to the documents listed above, see the EPA's *Flow 101* webpage and *Advanced Notice of Proposed Rulemaking for Water Quality Standards* (1998) for additional information on critical low flows.

The EPA notes that the USGS has documented that, in some areas of the United States, there have been changes to the critical low flows in freshwater rivers and streams or increased duration and frequency of low flow occurrence. The source of the reductions may often be anthropogenic in origin such as over-pumping of groundwater, hydrologic alteration including impoundments, or surface water withdrawals. Some of these reductions may persist long enough to cause changes to the critical low-flow values. In addition, prolonged droughts have resulted in a reduction of the low-flow minimums released on regulated rivers or revisions to drought control manuals to allow for further reductions of the low-flow values. During prolonged droughts, there may also be a trend towards increased pumping of groundwater, which may, in turn, lead to a reduction of surface water flows. New water intakes may also permanently change a waterbody's critical low flow.

The following documents provide additional information on changing flow patterns:

- The USGS's *National Water Census - Streamflow* webpage.
- The USGS's *Groundwater Depletion in the United States (1900-2008)* (2013).
- The USGS's *Alteration of Streamflow Magnitudes and Potential Ecological Consequences: a Multiregional Assessment* (2011).
- The EPA's *Report on the Environment - Fresh Surface Water* webpage.

It may be prudent for states and tribes to review and revise, as appropriate, their critical low-flow values during the triennial review process to account for changes to historical flow patterns. Also, NPDES permitting authorities should be aware that these altered historical flow patterns in rivers and streams may render historical flow records less accurate in predicting current and future critical flows. Where appropriate, permitting authorities should consider alternate approaches to establishing critical low-flow conditions that account for these climatic and anthropogenic changes when conducting reasonable potential analyses and in establishing protective WQBELs (see *NPDES Permit Writers' Manual: Inclusion of Climate Change Considerations*).

5.3 Variances from Water Quality Standards

A WQS variance is a time-limited designated use and water quality criterion for a specific pollutant(s) or water quality parameter(s) that reflect the highest attainable condition during the term of the WQS variance. A WQS variance may apply to an NPDES-permitted discharger or waterbody/waterbody segment(s). The regulation at 40 CFR 131.13 provides that states and authorized tribes may adopt into their WQS general variance policies that describe how they intend to apply and implement variances. Although such variance policies require EPA review and approval, states and tribes are not required to adopt variance policies in order to adopt individual variances. Nevertheless, as opposed to individual mixing zones (discussed in Section 5.1 of this chapter), the individual variances themselves must be adopted into WQS (or other legally binding state or tribal requirements) and approved by the EPA before they can be effective for CWA purposes.

Although the legal authority to adopt a WQS variance is the same as a revision to a designated use, the purpose of a variance is different from that of a designated use revision (described in Chapter 2 of this Handbook). A variance is intended to serve as a mechanism to provide time for states, tribes, and stakeholders to implement actions to improve water quality over an identified period of time when and where the designated use currently in place is not being met. When utilizing a variance, the state or tribe retains the designated use that is currently in place as a long-term goal. As first articulated in 1977 in *Decision of the General Counsel on Matters of Law Pursuant to 40 CFR Section 125.36(m). No. 58*, a state or tribe may adopt a WQS variance if the state or tribe can satisfy the same substantive and procedural requirements as a designated use removal, which are described in 40 CFR 131.10(g).

A variance is also different from a permit compliance schedule. While both tools can provide time to meet regulatory requirements, which tool is appropriate depends upon the circumstances. Variances can be appropriate to address situations where it is known that the designated use and criterion are unattainable today (or for a limited period of time), but feasible progress could be made toward attaining the designated use and criterion. A permit compliance schedule, on the other hand, may be appropriate when the designated use is attainable, but the discharger needs additional time to modify or upgrade treatment facilities in order to meet its WQBEL such that a schedule and resulting milestones will lead to compliance "as soon as possible" with the WQBEL based on the currently applicable WQS. See CWA Section 502(17) for a definition of "schedules of compliance" and 40 CFR 122.47.

A variance may be appropriate where a state or tribe determines that the designated use cannot be attained for a period of time because the discharger cannot immediately meet a WQBEL, which is written to meet a particular WQS, or a waterbody/waterbody segment cannot immediately meet the criteria to protect the designated use. Under such circumstances, the variance provides a targeted, time-limited revision to the WQS that reflects the highest attainable condition. These new time-limited WQS then serve as the basis for pollution control requirements during the term of the variance. For WQS variances that apply to aquatic life, wildlife, and recreational uses (i.e., the Section 101(a)(2) uses), this means that attainment of the designated use is infeasible under at least one of the six factors at 131.10(g) for at least the term of the variance.

The practical effect of the variance is an NPDES permit containing a WQBEL that complies with a less stringent criterion than would otherwise be in effect in the absence of the variance. However, the underlying designated use and criteria remain in effect for Section 303(d) listing and total maximum daily load development regardless of whether the variance is for a single discharger, multiple dischargers, or a waterbody/waterbody segment. At the end of the variance term, the discharger's WQBEL must ensure compliance with the underlying designated use and criterion or the state or tribe must obtain a new variance. To obtain a new variance, the state or tribe must again demonstrate that the designated use is not attainable at the point of discharge and again submit the variance to the EPA for review and approval or disapproval.

In many cases, a WQS variance is an environmentally useful tool because a variance exists only for a defined term and retains designated use protection for all pollutants and sources, with the sole exception of those specified in the variance. Even the discharger with a variance for a particular pollutant is required to meet applicable criteria for all other pollutants. Thus, a variance can result in water quality improvements over time and, in some cases, full attainment of designated uses by maintaining existing water quality protections while allowing time for advances in treatment technologies, control practices, or other changes in circumstances.

States and tribes typically adopt a WQS variance for an individual discharger for a specific pollutant in a specific waterbody. However, where multiple dischargers have similar attainment challenges, a state or tribe may streamline its variance process by adopting a multiple-discharger WQS variance. Such a variance applies to several dischargers but may be supported by a single technical rationale justifying the need for the variance. The EPA has previously published information on both individual- and multiple-discharger variances at 40 CFR Part 132. For additional information on variances, also see *Discharger-Specific Variances on a Broader Scale: Developing Credible Rationales for Variances that*

Apply to Multiple Dischargers (2013).

[1/] Throughout this document, the term "states" means the fifty states, the District of Columbia, the Commonwealth of Puerto Rico, the Virgin Islands, Guam, American Samoa, and the Commonwealth of the Northern Mariana Islands. The term "authorized tribe" or "tribe" means an Indian tribe authorized for treatment in a manner similar to a state under CWA Section 518 for purposes of Section 303(c) WQS.

[2/] Lethality is a function of the magnitude of a pollutant concentration and the duration an organism is exposed to that concentration. Section 4.3.3 of the TSD (1991) describes various methods for preventing lethality to organisms passing through a mixing zone.

[3/] Acutely toxic conditions are those that are lethal to aquatic organisms that may pass through the mixing zone. The underlying assumption for allowing a mixing zone is that pollutant concentrations in excess of acute and chronic criteria, but below acutely toxic concentrations, may exist in small areas without causing adverse effects to the designated use of the waterbody as a whole.

[4/] The 1996 memorandum *EPA Guidance on Application of State Mixing Zone Policies in EPA-issued NPDES Permits* describes the circumstances under which the EPA may include a mixing zone in an NPDES permit when the EPA is the permitting authority.

[5/] However, note that some chemicals of relatively low toxicity such as zinc will bioconcentrate in fish without harmful effects resulting from human consumption.

[6/] In some EPA documents such as those cited, critical low flow is also called "design flow" or "stream design flow." These terms are different from a facility or effluent design flow.

Exhibit 7

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

MAR 15 2013

John M. Kim, Director
Illinois Environmental Protection Agency
1021 North Grand Avenue East
P.O. Box 19276
Springfield, Illinois 62794-9276

Dear Mr. Kim:

On November 15, 2012, the Illinois Environmental Protection Agency (Illinois EPA) transmitted a variance, issued by the Illinois Pollution Control Board (IPCB or the Board) to CITGO Petroleum Corporation and PDV Midwest Refining, L.L.C., for review and approval by the U.S. Environmental Protection Agency in accordance with section 303(c) of the Clean Water Act (CWA). IPCB granted the variance from the total dissolved solids (TDS) criterion in Illinois' water quality standards at 35 Ill. Adm. Code 302.407 for protection of Illinois' indigenous aquatic life designated use for the Chicago Sanitary and Ship Canal (CSSC), a segment of the Chicago Area Waterway System. As described below, EPA disapproves the variance.

IPCB granted the variance in accordance with a state statute that allows the Board to grant regulatory relief when "compliance with any rule or regulation, requirement or order of the Board would impose an arbitrary or unreasonable hardship." The variance effectively removed for a time-limited period the indigenous aquatic life use and removed the TDS criterion necessary to protect that use for that period of time.

The CWA and federal regulations do not allow states to remove designated uses or modify criteria simply because a state believes that such standards "would impose an arbitrary or unreasonable hardship." Instead, under EPA's regulations, a state can only remove a designated use specified in section 101(a)(2) of the CWA, or a subcategory thereof, if, among other things, the state demonstrates that it is not feasible to attain the designated use for one of the reasons specified at 40 CFR 131.10(g). Similarly, states can only modify criteria necessary to protect designated uses if the state provides an adequate scientific rationale demonstrating that the revised criteria protect designated uses.

While Illinois EPA asserts that the variance is justified as a time-limited removal of the indigenous aquatic life designated use, Illinois did not provide appropriate technical and scientific data and analyses to support such a use removal as required by 40 CFR 131.5(a)(4).

Specifically, Illinois did not provide appropriate technical and scientific data and analyses demonstrating that the indigenous aquatic life designated use was not attainable for any of the reasons specified at 40 CFR 131.10(g), and so Illinois did not submit "[u]se designations consistent with the provisions of sections 101(a)(2) and 303(c)(2) of the Act" as required by 40 CFR 131.6(a). Consequently, EPA disapproves Illinois' effective time-limited removal of the indigenous aquatic life designated use based upon EPA's conclusion that it was not based upon appropriate technical and scientific data and analyses as required by 40 CFR 131.5(a)(1), 131.5(a)(4), 131.5(a)(5) and 40 CFR 131.10. Furthermore, to the extent that the variance modified Illinois' criteria for protection of the indigenous aquatic life designated use by effectively eliminating the applicable TDS criterion, EPA disapproves the modification in accordance with 40 CFR 131.5(a)(2) and (5) because no adequate scientific rationale demonstrating that removal of the TDS criterion would be protective of the indigenous aquatic life designated use has been provided as required by 40 CFR 131.6(b), (c) and (f) and 131.11(a). The enclosed document, entitled "Basis for EPA's Disapproval of IPCB Decision Granting Variance to CITGO Petroleum Corp. and PDV Midwest Refining, L.L.C.," more fully sets forth the basis for EPA's decision.

To address this disapproval, Illinois needs to take action so that the indigenous aquatic life designated use and the TDS criterion to protect that use at 35 Ill. Adm. Code 302.407 are fully effective under Illinois law with respect to the CSSC, including with respect to discharges into the CSSC from the oil refinery owned by CITGO Petroleum Corporation and PDV Midwest Refining L.L.C.

The impact of today's disapproval is that, for CWA purposes, the indigenous aquatic life designated use and the TDS criterion to protect that use at 35 Ill. Adm. 302.407 apply to the CSSC, including with respect to discharges into the CSSC from the oil refinery owned by CITGO Petroleum Corporation and PDV Midwest Refining, L.L.C., notwithstanding IPCB's variance decision. The use and criterion will apply for CWA purposes until EPA approves a change, deletion, or addition to the water quality standards for the segments impacted by today's disapprovals, or promulgates standards for those segments. *See* 40 CFR 131.21(e).

If Illinois wants to take the effects of deicing activities in the Chicago area into account in the water quality standards for the CSSC, Illinois could attempt to do so as part of IPCB's proceedings pertaining to aquatic life use designations and criteria for the Chicago Area Waterway System in IPCB Subdocket Nos. R2008-09(C) and (D). Specifically, Illinois could perform a structured, scientific assessment of the attainability of aquatic life uses, taking into account deicing activities, and of the criteria necessary to protect aquatic life uses, and revise water quality standards accordingly. Illinois could submit any such revisions to EPA for approval, along with the methods used, analyses conducted, scientific rationale and other information demonstrating the appropriateness under federal law of any revised aquatic life designated use for the CSSC and any new or revised criteria for the protection of the revised aquatic life designated use that differ from those specified at 35 Ill. Adm. Code 302.407.

If you have any questions regarding this matter, please contact me or your staff may contact Linda Holst, Chief, Water Quality Branch, at (312) 886-6758.

Sincerely,

Susan Hedman
Regional Administrator

Enclosure

cc: Marcia Willhite, Illinois EPA
John Therriault, Illinois Pollution Control Board, Clerk's Office

Basis for EPA's Disapproval of Illinois Pollution Control Board's Decision Granting a Variance to CITGO Petroleum Corp. and PDV Midwest Refining, L.L.C."

Date: MAR 15 2013

I. Introduction

On November 15, 2012, the Illinois Environmental Protection Agency (Illinois EPA) submitted a request for the U.S. Environmental Protection Agency to approve in accordance with section 303(c) of the Clean Water Act (CWA), a revision to water quality standards for the Chicago Sanitary and Ship Canal (CSSC). Specifically, Illinois EPA requested that EPA approve an Illinois Pollution Control Board (IPCB) decision granting a "variance" to CITGO Petroleum Corporation and PDV Midwest Refining, L.L.C., from the total dissolved solids (TDS) criterion in Illinois' water quality standards at 35 Ill. Adm. Code 302.407 for protection of Illinois' designated use for aquatic life in the CSSC. *See CITGO Petroleum Corporation and PDV Midwest Refining, L.L.C v. IEPA*, PCB 12-94 (October 18, 2012) (hereinafter "*CITGO Variance Decision*") *available at* http://www.ipcb.state.il.us/documents/dsweb/Get/Document-77765. The IPCB granted the variance in accordance with a state statute that allows IPCB to grant regulatory relief when "compliance with any rule or regulation, requirement or order of the Board would impose an arbitrary or unreasonable hardship." 415 ILCS 5/35(a); *see also CITGO Variance Decision* at 20.

II. Legal Background

A. Designated Uses and Water Quality Criteria

Section 101(a)(2) of the CWA states the national interim goal of achieving by July 1, 1983, "water quality which provides for the protection and propagation of fish, shellfish, and wildlife and provides for recreation in and on the water" (hereafter collectively referred to as "the uses specified in section 101(a)(2)"), wherever attainable. Section 303 of the CWA requires states to adopt water quality standards for waters of the United States within their respective jurisdictions. Section 303(c) of the CWA requires, among other things, that state water quality standards include the designated use or uses to be made of the waters and water quality criteria based upon such uses. Section 303(c)(2)(A) of the CWA requires that water quality standards "protect the public health or welfare, enhance the quality of water and serve the purposes" of the CWA. The EPA's regulations at 40 CFR 131.2 explain that:

> "Serve the purposes of the Act" (as defined in sections 101(a)(2) and 303(c) of the Act) means that water quality standards should, wherever attainable, provide water quality for the protection and propagation of fish, shellfish and wildlife and for recreation in and on the water and take into consideration their use and value of [*sic*] public water supplies, propagation of fish, shellfish, and wildlife, recreation in and on the water, and agricultural, industrial, and other purposes including navigation.

EPA's regulations at 40 CFR Part 131 interpret and implement sections 101(a)(2) and 303(c)(2)(A) of the CWA through a requirement that water quality standards include the uses specified in section 101(a)(2) of the CWA, unless those uses have been shown to be unattainable, in which case a state can adopt subcategories of the uses specified in section 101(a)(2) which require less stringent criteria. *See* 40 CFR 131.5(a)(4), 131.6(a), and 131.10(j), and 131.20(a); *see also Idaho Mining Association v. Browner*, 90 F.Supp. 2d 1078, 1092 (D. Id. 2000); 68 Fed. Reg. 40428, 40430-31 (July 27, 2003). 40 CFR 131.10(g) provides that, once a state designates the uses specified in section 101(a)(2) of the CWA or subcategories thereof for a specific water body, the state can only remove the designated use if, among other things, "the [s]tate can demonstrate that attaining the designated use is not feasible [for at least one of the six reasons set forth at 40 CFR 131.10(g)]."

When a state adopts designated uses that include the uses specified in section 101(a)(2) of the CWA or subcategories thereof, the state must also adopt "water quality criteria that protect the designated use." 40 CFR 131.11(a). "Such criteria must be based on sound scientific rationale and must contain sufficient parameters or constituents to protect the designated use." *Id.* Unlike with designated uses, nothing in the CWA or EPA's regulations allows states to relax or modify criteria, based on concepts of attainability, to levels that are not protective of the designated use. Instead, if criteria are not attainable, the CWA and EPA's regulations allow states to (1) remove the current designated use after demonstrating, among other things, that attaining the current designated use is not feasible for one of the 40 CFR 131.10(g) reasons, and replace it with a subcategory of use and, then, (2) adopt new, potentially less stringent, criteria necessary to protect the new designated use.

B. Variances

EPA has long recognized that, where a state satisfies all of the requirements in 40 CFR Part 131 for removing designated uses (or subcategories of uses), including demonstrating that it is not feasible to attain the designated use for one of the reasons specified at 40 CFR 131.10(g), EPA could also approve a state decision to limit the applicability of the use removal to only a single discharger, while continuing to apply the previous use designation and criteria to other dischargers. Such a state decision, which is often referred to as a "variance," can be approved as being consistent with the requirements of the CWA and 40 CFR Part 131. This is because the state's action in limiting the applicability of an otherwise approvable use removal to a single discharger and to a single pollutant is environmentally preferable and would be more stringent than a full use removal; and states have the right to establish more stringent standards under section 510 of the CWA. *See* 58 FR 20802, 20921-22 (April 16, 1993).

C. Water Quality Standard Submission Requirements and EPA Review Authority

40 CFR 131.6 provides that states must submit, among other things, the following to the EPA for review when they adopt new or revised designated uses and criteria:

> (a) Use designations consistent with the provisions or section 101(a)(2) and 303(c)(2) of the Act.

(b) Methods used and analyses conducted to support water quality standards revisions.
(c) Water quality criteria to protect the designated uses.
. . . .
(f) General information which will aid the Agency in determining the adequacy of the scientific basis of the standards which do not include the uses specified in section 101(a)(2) of the Act as well as information on general policies applicable to State standards which may affect their application and implementation.

40 CFR 131.5(a) provides that, in reviewing new or revised use designations and criteria, the EPA must determine, among other things:

(1) Whether the State has adopted water uses which are consistent with the requirements of the Clean Water Act;
(2) Whether the State has adopted criteria that protect the designated uses;
. . . .
(4) Whether the State standards which do not include the uses specified in section 101(a)(2) of the Act are based upon appropriate technical and scientific data and analyses, and
(5) Whether the State submission meets the requirements included in §131.6 of this part.

40 CFR 131.21(c)(2) provides that new or revised water quality standards that are adopted by states do not become applicable water quality standards for purposes of the CWA until after they have been submitted to and approved by EPA in accordance with section 303(c) of the CWA.

III. Illinois' Water Quality Standards for the CSSC

A. Illinois' Adoption and EPA's Approval of Indigenous Aquatic Life Designated Use and Criteria for the CSSC

As noted above, EPA's regulations at 40 CFR Part 131 interpret and implement sections 101(a)(2) and 303(c)(2)(A) of the CWA through a requirement that water quality standards include the uses specified in section 101(a)(2) of the CWA, unless those uses have been shown to be unattainable for one of the reasons set forth at 40 CFR 131.10(g). When consistent with the requirements of 40 CFR 131.10(g), a state can adopt subcategories of the uses specified in section 101(a)(2) which require less stringent criteria. In 1974, Illinois demonstrated that providing for protection and propagation of fish – *i.e.,* one of the uses specified in section 101(a)(2) of the CWA – was not attainable for several waters in the Chicago area, and so Illinois adopted a subcategory of aquatic life use, referred to as "indigenous aquatic life" that it applied to the CSSC. *See* 35 Ill. Adm. Code 302 Subpart D. Waters designated as indigenous aquatic life waters are supposed to be capable of supporting an indigenous aquatic life limited only by the physical configuration of the body of water, characteristics and origin of the water and the presence of contaminants in amounts that do not exceed the water quality standards listed in Subpart D. 35 Ill. Adm. Code 302.402. Illinois also adopted criteria to protect the indigenous aquatic life designated use, including the total dissolved solids (TDS) criterion of 1,500

milligrams per liter (mg/L) set forth at 35 Ill. Adm. Code 302.407. The indigenous aquatic life use and associated criteria applicable to the CSSC were approved previously by EPA[1]

B. Variances Pertaining to the CITGO Petroleum Corporation and PDV Midwest Refining, L.L.C. oil refinery in Lemont, Illinois

The IPCB first granted to CITGO Petroleum Corporation and PDV Midwest Refining, L.L.C. a variance from the TDS criterion on April 21, 2005. *See CITGO Variance Decision* at 3. The variance effectively eliminated the applicability of the TDS criterion of 1,500 mg/L for purposes of deriving a water quality based effluent limit (WQBEL) for TDS in CITGO's National Pollutant Discharge Elimination System permit. The IPCB extended the variance on May 15, 2008, *id.*, and again on October 18, 2012, *id.* at 20. Illinois did not submit either the IPCB's original 2005 variance decision or 2008 extension decision to EPA for review and approval under section 303(c) of the CWA. Consequently, the original 2005 variance and the 2008 extension have never been applicable water quality standards for purposes of the CWA. *See* 40 CFR 131.21(c)(2). On November 15, 2012, Illinois EPA submitted IPCB's October 18, 2012, variance decision to EPA for approval in accordance with section 303(c) of the CWA.

The basis for the variance decision in each instance was IPCB's conclusion that compliance with a WQBEL derived from the TDS criterion "would impose an arbitrary or unreasonable hardship." The variance effectively removed for a time-limited period the indigenous aquatic life designated use and removed the TDS criterion necessary to protect that use for that period of time. Despite statements by Illinois EPA and IPCB that the variances are consistent with federal law (*see* CITGO variance at 17), nothing in the CWA or EPA's water quality standards regulations allows states to remove designated uses or modify criteria on this "hardship" basis alone. Instead, as described above, water quality standards can be revised where it can be demonstrated that it is not feasible to attain a designated use for one of the reasons specified at 40 CFR 131.10(g) (and other requirements are also met); or where criteria are revised based on sound scientific rationale and are protective of applicable designated uses in accordance with 40 CRF 131.6(c) and 131.11(a). As described below, there is no indication in IPCB's 2005, 2008 or 2012 decisions that, in granting and extending the variance, IPCB ever evaluated the feasibility of attaining the indigenous aquatic life use designation in the CSSC utilizing any of the factors in 40 CFR 131.10(g). There also is no indication in IPCB's decisions that removal of the TDS criterion is based upon a sound scientific rationale demonstrating that the indigenous aquatic life designated use would be protected.

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[1] EPA first approved the indigenous aquatic life use applied to the CSSC in 1974 and the adoption of the applicable TDS standard in 1979. In 2011, Illinois revised aspects of its water quality standards pertaining to the Chicago Area Waterway System to update certain designated recreational uses. The revisions also impacted some aspects of the indigenous aquatic life designated use and criteria. On May 16, 2012, EPA approved portions of those revisions and disapproved others. Illinois' 2011 revisions, and EPA's May 16, 2012, action, did not result in any substantive change to either the indigenous aquatic life designated use for the CSSC or the criteria for protection of that use at 35 Ill. Adm. Code 302.407. *See* EPA's May 16, 2012, letter and supporting documents, *available at* http://www.epa.gov/region5/chicagoriver.

IV. EPA's Action on Illinois' Revised Water Quality Standard for the CSSC

A. "Arbitary and Unreasonable Hardship"

EPA cannot approve the IPCB's decision granting the variance as a change to water quality standards solely because the state believes that such standards "would impose an arbitrary or unreasonable hardship." Instead, EPA evaluated Illinois EPA's November 15, 2012 submission to determine whether the change to the standards is consistent with the CWA and federal regulations regarding time-limited use removals (often referred to as "variances to water quality standards") and water quality criteria[2].

B. Time-Limited Use Removal

Illinois EPA, in its November 15, 2012, submission to EPA, asserts that IPCB's variance decision can be justified under 40 CFR 131.10(g)(3) and (g)(6) as a time-limited use removal. Each of these assertions is evaluated below.

1. 40 CFR 131.10(g)(3)

40 CFR 131.10(g)(3) provides that designated uses can be removed "if the [s]tate can demonstrate that attaining the designated use is not feasible because . . . [h]uman caused conditions or sources of pollution prevent the attainment of the use and cannot be remedied or would cause more environmental damage to correct than to leave in place."

As a threshold matter, to justify removing a designated use under 40 CFR 131.10(g)(3), a state must identify with some specificity the "human caused conditions or sources of pollution [that] prevent the attainment of the use." While the record before IPCB is replete with generalized assertions that winter de-icing activities using road salt and other compounds cause TDS levels in the CSSC to exceed the TDS criterion, there is nothing in the state record that adequately identifies with any specificity where these activities are taking place, what entities are responsible for these activities, and what amount of the total TDS load into the CSSC each entity is responsible for.[3] In addition, it is unclear from the record and IEPA's November 15, 2012,

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[2] EPA also evaluated Illinois EPA's subsequent submission of more detailed references to documents and information Illinois EPA believed to be relevant to the review of the CITGO variance (email from S. Sofat to L. Holst, dated 2/4/13).

[3] Specifically, a state should develop and evaluate information on the amount of loadings of the pollutant at issue from each source (including any point source that is the subject of a variance request) relative to the other sources and also relative to the total loadings to the water body. Here, although there was testimony in the state administrative record that, during snowmelt, the oil refinery effluent makes up between 0.6 to 1% of the total TDS load in the CSSC (Huff 2005 testimony at 35-36), there is no similar information in the record on the other specific sources of TDS. Information on the relative loadings from each source is important in evaluating potential remedial measures.

submission to EPA whether, and to what extent, the state believes that TDS discharges from the oil refinery are one of the "sources" that prevent attainment of the designated use. In sum, Illinois has not adequately identified the "human caused conditions or sources of pollution [that] prevent the attainment of the use."

Once a state identifies with specificity the "human caused conditions or sources of pollution [that] prevent the attainment of the use," then, to justify removing a designated use under 40 CFR 131.10(g)(3), the state must also demonstrate either that the conditions or sources "cannot be remedied" or that implementation of the remedy "would cause more environmental damage to correct than to leave in place." One way that states can make such a demonstration would be to present information on the cost and technical feasibility of a reasonable range of potential remedial measures that could be implemented so that those "conditions or sources of pollution" no longer prevent the attainment of the use. The state must then demonstrate either that it is not feasible to implement such remedial measures (thereby demonstrating that the "human caused conditions or sources of pollution cannot be remedied") or that implementation of such remedial measures would "cause more environmental damage to correct than to leave in place." Here, the state administrative record only includes information regarding the cost, technical feasibility and environmental impacts of remedial measures for one of the sources of pollution – the oil refinery – into the CSSC. The state has not identified – much less evaluated the costs, technical feasibility and environmental impact of – remedial measures for the other sources that the state asserts prevent attainment of the use: *i.e.*, the sources responsible for winter de-icing activities.[4] Nor has Illinois demonstrated in any other way that the "human caused conditions or sources of pollution" cannot be remedied or that implementation of such a remedy "would cause more environmental damage to correct than to leave in place."

Because Illinois has not provided sufficient information identifying the "human caused conditions or sources of pollution prevent[ing] attainment of the use," and has not provided sufficient information demonstrating that such human caused conditions or sources of pollution "cannot be remedied or would cause more environmental damage to correct than to leave in place," Illinois has not demonstrated that attaining the designated indigenous aquatic life use is not feasible under 40 CFR 131.10(g)(3).

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[4] CITGO appended testimony to its variance request that was presented in a separate rulemaking effort before IPCB in IPCB Docket No. R2008-09(C) regarding the attainability of proposed revisions to the aquatic life use designation and associated chloride criteria that IPCB is considering adopting for the CSSC. Specifically, CITGO appended testimony that "[a]ttainment of chloride criteria [being considered as being necessary to protect the revised aquatic life use designation being considered by IPCB] requires a 50% reduction of deicing salt use," and that attainable reduction goals could be up to 30%, citing one municipality. However, no such information or analysis is given for the TDS, the pollutant at issue here.

2. 40 CFR 131.10(g)(6)

In regards to 40 CFR 131.10(g)(6), Illinois did provide limited information regarding the costs of one alternative for reducing TDS discharges from the oil refinery using evaporation technology. However, there is nothing in the record providing an evaluation or a demonstration of how implementation of this control or any other controls more stringent than those required by sections 301(b) and 306 of the CWA to control TDS would result in "substantial and widespread economic and social impact." Consequently, Illinois has not adequately demonstrated "that attaining the designated [indigenous aquatic life] use is not feasible because . . . [c]ontrols more stringent than those required by sections 301(b) and 306 of the [CWA] would result in substantial and widespread economic and social impact." 40 CFR 131.10(g)(6).

C. Criteria Revision

Illinois EPA also notes in its November 15, 2012, submission that (1) IPCB removed the TDS criterion for Illinois General Use waters in 2008 and (2) Illinois is considering removing the TDS criterion applicable to the CSSC in the context of adopting revised aquatic life use designations and associated criteria in the Chicago Area Waterway System proceedings, in IPCB Docket No. R2008-09.[5] However, Illinois EPA has not asserted, and the IPCB's orders do not suggest, that IPCB's variance decision can be justified as a revision to the criteria for protection of the indigenous aquatic life designated use for the CSSC. Even if Illinois EPA had made such an assertion, IPCB's variance decision would not be approvable as a modification to criteria. This is because, as described below, the administrative record for the variance decision lacks sufficient scientific rationale as required by 40 CFR 131.6(b), (c) and (f) and 131.11(a) as to why removal of the TDS criterion would be protective of the current indigenous aquatic life use.

The scientific rationale as to why IPCB's removal of the TDS criterion was protective of the aquatic life uses in General Use waters is that (1) chlorides and sulfates are constituents of TDS; (2) IPCB adopted chloride and sulfate criteria for the General Use waters, and so (3) there is no longer any need to include the TDS criterion as a surrogate parameter for chlorides and sulfates. *See* IPCB's First Opinion and Order in "Triennial Review of Sulfate and Total Dissolved Solids Water Quality Standards," Docket No. R07-09 (September 20, 2007), at 26, *available at* http://www.ipcb.state.il.us/documents/dsweb/Get/Document-58772. Ilinois EPA's proposal to not include TDS criterion for any aquatic life use designations that are ultimately adopted for the Chicago Area Waterway System relies on the same scientific rationale. *See* IEPA's Statement of Reasons at 78-79, filed by IEPA on October 26, 2007, in IPCB Docket No. R2008-09, *available at* http://www.ipcb.state.il.us/documents/dsweb/Get/Document-59147. IPCB's variance decision does not include adoption of chloride and sulfate criteria and so is not supported by either the scientific rationale underlying removal of the TDS criterion from the General Use water quality

[5] Illinois EPA's proposal to remove the TDS criterion can be found in IPCB's Docket No. R2008-09. After IEPA initiated those proceedings, Docket No. R2008-09 was broken into four subdockets. Subdocket No. R2008-09(C) pertains to aquatic life use designations for the Chicago Area Water System, including the CSSC. Subdocket No. R2008-09(D) pertains to criteria necessary to protect any revised aquatic life designations.

standards or Illinois EPA's rationale to remove the TDS criterion from future aquatic life use designations for the Chicago Area Waterway System.

There is opinion evidence in the state administrative record from 2005 indicating that incremental increases in TDS levels in the CSSC resulting from operation of an air pollution control wet gas scrubber at the refinery would have no impact on the receiving stream. *See* PCB 05-85 Opinion and Order, April 25, 2005 at 13. The basis for that opinion appears to be evidence presented by the petitioners that (1) even with the incremental TDS increases, the TDS levels outside of the mixing zone in the CSSC during most times of the year would still be substantially below the 1,500 mg/l TDS criterion, and (2) in the rare instances where deicing activities cause TDS levels in the CSSC to exceed 1,500 mg/l at the refinery's discharge point, the incremental increases in the in-stream TDS levels are so small that there is no further adverse impact beyond any adverse impacts resulting from the fact that the TDS levels already exceed 1,500 mg/l. However, nothing in that testimony addresses the question of whether there is a sound scientific rationale for removing the TDS criterion when chloride and sulfate criteria do not replace the existing TDS criterion.

D. Summary of EPA's action to disapprove the CITGO variance

IPCB's variance effectively removed for a time-limited period the indigenous aquatic life designated use and effectively removed the TDS criterion necessary to protect that use for that period of time. EPA disapproves Illinois' variance based upon EPA's conclusion that it was not based upon appropriate technical and scientific data and analyses as required by 40 CFR 131.5(a)(1), 131.5(a)(4), 131.5(a)(5) and 40 CFR 131.10. Furthermore, to the extent that the variance modified Illinois' criteria for protection of the indigenous aquatic life designated use by effectively eliminating the applicable TDS criterion, EPA disapproves the modification in accordance with 40 CFR 131.5(a)(2) and (5) because no adequate scientific rationale demonstrating that removal of the TDS criterion would be protective of the indigenous aquatic life designated use has been provided as required by 40 CFR 131.6(b), (c) and (f) and 131.11(a).

E. Effect of EPA's Action on Endangered and Threatened Species

EPA is disapproving the IPCB's variance decision as explained in this document. This disapproval does not cause any change to Illinois' federally-applicable water quality standards under the CWA. Because there is no change to the State's federally-applicable water quality standards, there is no effect on listed species or their designated habitat. Therefore, Endangered Species Act consultation is not required.

F. Tribal Consultation

On May 4, 2011, EPA issued the "EPA Policy on Consultation and Coordination with Indian Tribes" to address Executive Order 13175, "Consultation and Coordination with Indian Tribal Governments." The EPA Tribal Consultation Policy states that "EPA's policy is to consult on a government-to-government basis with federally recognized tribes when EPA actions and decisions may affect tribal interests."

There are no federally recognized tribes located in the vicinity of the CITGO Petroleum Corporation and PDV Midwest Refining, L.L.C. discharge or downstream within the action area. Therefore, EPA is not engaging in tribal consultation for this action.

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

MAR 2 1 2014

REPLY TO THE ATTENTION OF:
WQ-16J

Marcia T. Willhite, Chief
Bureau of Water
Illinois Environmental Protection Agency
P.O. Box 19276
Springfield, Illinois 62794-9276

Dear Ms. Willhite:

The Illinois Environmental Protection Agency (IEPA) forwarded to the U.S. Environmental Protection Agency the variance application submitted by the Sanitary District of Decatur (SDD) to the Illinois Pollution Control Board (IPCB) in IPCB Docket No. 2014-11. IEPA requested that EPA review and comment on the application. This letter provides those comments.

SDD's variance application discusses EPA's March 15, 2013, letter that disapproved Illinois' request for approval of a variance for CITGO Petroleum Corp. under section 303(c) of the Clean Water Act (CWA). EPA explained in the March 15, 2013, letter that, under the CWA and EPA's implementing regulations, a variance can only be approved by EPA as a revision to water quality standards in accordance with section 303(c) of the CWA if, among other things, the state can demonstrate that the designated use for the water body at issue is not attainable for at least one of the reasons specified at 40 CFR 131.10(g). As explained in the Federal Register notice of EPA's recently proposed revisions to EPA's water quality standards regulations that is cited in SDD's variance application, this has been EPA's longstanding interpretation of the CWA and EPA's implementing regulations, which EPA has consistently applied since 1977. *See* 78 Fed. Reg. 54518, 54531 (Sept. 4, 2013). This continues to be EPA's interpretation and nothing in the Federal Register notice or in EPA's proposed revisions to its water quality regulations changes that longstanding interpretation.

Thus, for a variance to be approvable by EPA under the section 303(c) of the CWA and EPA's implementing regulations, Illinois will be required to affirmatively demonstrate that it is not feasible to attain the General Use designation for the Sangamon River for one of the reasons specified at 40 CFR 131.10(g). We urge the IEPA and the IPCB to carefully evaluate SDD's variance request to determine whether this threshold has been met. In doing so, IEPA and IPCB should consider whether all alternatives for reducing the discharge of nickel into the Sangamon River have been evaluated and demonstrated to be infeasible; including, but not limited to, all alternatives for treating discharges from SDD's wastewater treatment plant, all alternatives for reducing nickel in the wastewater from the Archer Daniels Midland (ADM) facility before it enters SDD's sewer system such as treatment alternatives and process changes, and all alternatives for eliminating ADM's discharges into SDD's sewer system such as piping ADM's

discharges away from the sewer system to another receiving stream location where there might be more available dilution than currently exists in the portion of the Sangamon River into which SDD discharges. In addition, IEPA and IPCB should recognize that, as explained in EPA's March 15, 2013, letter disapproving the CITGO variance, the feasibility threshold in 131.10(g) is different from the "arbitrary and unreasonable hardship" threshold set forth at 415 ILCS5/35(a).

We hope that these comments are useful as IEPA and IPCB evaluate whether SDD's variance application is consistent with federal requirements. If you have any questions about these comments, please contact Linda Holst at 312-886-6758 or holst.linda@epa.gov or Robie Anson, at 312-886-1502 or anson.robie@epa.gov of my staff.

Sincerely,

Tinka G. Hyde
Director, Water Division

cc: Tim Kluge, Sanitary District of Decatur

Exhibit 9

BEFORE THE ILLINOIS POLLUTION CONTROL BOARD

EXXONMOBIL OIL CORPORATION	)	
	)	
Petitioner,	)	
	)	
v.	)	PCB _____
	)	(Variance – Water)
ILLINOIS ENVIRONMENTAL PROTECTION AGENCY,	)	
	)	
	)	
Respondent.	)	

AFFIDAVIT OF MEENA M. NAINAN

I, Meena M. Nainan, being first duly sworn on oath, depose and state as follows:

1. I am currently employed as the Safety, Security, Health and Environmental Manager for ExxonMobil Oil Corporation ("ExxonMobil") in Joliet, Illinois, a position which I have held since May 1, 2012.

2. I participated in the preparation of the Petition for Variance, to the extent it discusses ExxonMobil.

3. I have read the Petition for Variance, and based upon my personal knowledge and belief, the facts stated therein with regard to ExxonMobil are true and correct.

FURTHER AFFIANT SAYETH NOT.

Meena M. Nainan

Subscribed and sworn to before me
this 20 day of July 2015.

Notary Public

DEBORAH ROBINSON
OFFICIAL SEAL
Notary Public - State of Illinois
My Commission Expires
May 09, 2019