

**EPA's Review of Revisions to Illinois' Water Quality Standards:
Water Quality Standards Variance for Chloride Applicable to the Chicago Area
Waterway System and Lower Des Plaines River
Under Section 303(c) of the Clean Water Act
WQSTS # IL2019-1441**

Date: May 12, 2022

I. Executive Summary

On February 9, 2022, the U.S. Environmental Protection Agency received a request from the Illinois Environmental Protection Agency (IEPA) for approval of a variance from the chloride criteria in Illinois' water quality standards (WQS) that protect aquatic life. On March 15, 2022, EPA received a letter from the Illinois Attorney General's Office certifying that the variance had been duly adopted in accordance with Illinois law. The variance applies to the Chicago Area Waterway System (CAWS), Lower Des Plaines River (LDPR) and select tributaries of the LDPR and reflects Illinois' determination that it is infeasible for those water bodies to attain Illinois' chloride WQS because the application of road salt in the watershed for deicing purposes is a human caused condition that prevents attainment of the aquatic life uses and cannot be remedied within the term of the variance. The variance establishes a variance-based interim chloride criterion of 280 mg/L, as a five-year seasonal average, for the identified segments of the CAWS and LDPR and requires dischargers that contribute chloride to the identified water bodies to implement a pollutant minimization program (PMP) to identify and minimize sources of chloride to the water bodies.

As discussed in Section III of this document, EPA determined that the variance is consistent with the relevant requirements of the Clean Water Act (CWA) and federal regulations at 40 CFR Part 131 and therefore approves Illinois' WQS variance for chloride. Consistent with the requirements of the Endangered Species Act (ESA), EPA evaluated the potential impacts of its approval of the variance on federally protected species and designated critical habitat and determined that consultation with the U.S. Fish and Wildlife Service (FWS) is necessary. As discussed in Section IV of this document, EPA developed a biological evaluation (BE) that evaluates potential effects of its approval and FWS concurred with EPA's evaluation through a letter dated May 5, 2022. Last, consistent with the "EPA Policy on Consultation and Coordination with Indian Tribes," EPA evaluated whether approval of the variance may affect the interests of federally recognized tribes. EPA concluded that approval of the variance will not impact tribal interests and that, therefore, tribal consultation is unnecessary.

II. Description of Illinois' Action

II.A. Background

Salt pollution is a widespread water quality problem in urbanized areas, especially in areas with cold climates. Multiple studies have found elevated concentrations of chloride (one component

of salt) in urban areas throughout the U.S., particularly those in high snowfall areas.¹ For example, U.S. Geological Survey monitoring data at 13 northern metropolitan areas indicated that 12 of the 13 areas had at least one monitoring location where chloride concentrations would be expected to adversely affect biological communities. Corsi et al. (2010) at 7380-7381.

Elevated levels of salts can have significant impacts to aquatic communities. Various species of aquatic insects,² mussels,³ invertebrates⁴ and plants⁵ have been shown to be sensitive to chloride salts. Elevated concentrations of chloride have been linked with lower abundance and diversity of aquatic biota and can affect nutrient and energy flows.⁶

While chloride may be introduced into the environment through a variety of sources, the application of road salt for deicing purposes is a widespread source of chloride to surface waters in urban areas, as exhibited by the fact that chloride concentrations are typically greatest in urban areas during winter months.⁷ Addressing road salt contamination is challenging. Numerous entities (public and private) typically conduct deicing activities in urban areas and salt is spread throughout the entire watershed during winter weather events. For example, in developing a total maximum daily load for the Twin Cities Metropolitan Area, Minnesota Pollution Control Agency determined that a chloride management plan would need to include 186 cities and townships, seven counties, as well as numerous colleges, universities, private industries, commercial property owners, school districts and private homeowners. Minnesota Pollution Control Agency, *Twin Cities Metropolitan Area Total Maximum Daily Load Study* (February 2016) at 35. Additionally, the resources and capacities of each of these entities can vary, creating barriers to the implementation of best management practices (BMPs) in parts of the watershed. M. Stone, et al., *Assessing the Efficacy of Current Road Salt Management Programs* (July 2010) at 147. Consequently, road salt reduction strategies will likely be most effective when implemented across the watershed and when the activities of all salt spreading entities are coordinated.

¹ E.g., see: S.R. Corsi, et al., “A fresh look at road salt: Aquatic toxicity and water-quality impacts on local, regional, and national scales,” *Environmental Science and Technology* 44:7376-7382 (2010); S.R. Corsi, et al., “River chloride trends in snow-affected urban watersheds: Increasing concentrations outpace urban growth rate and are common among all seasons,” *Science of the Total Environment* 508:488-497 (2015); W.R. Kelly, et al., *The Sources, Distribution, and Trends of Chloride in the Waters of Illinois*, Illinois State Water Survey Bulletin B-74 (2012); and J.F. Coles, et al., *Effects of Urban Development on Stream Ecosystems in Nine Metropolitan Areas Across the United States*, U.S. Geological Survey Circular 1373 (2012).

² D.J. Soucek and A. Dickinson, “Assessment of acute and full life-cycle toxicity of major ions to *Centroptilum triangulifer* using a laboratory cultured diet,” in *Society of Environmental Toxicology and Chemistry North America 34th Annual Meeting, 17-21 November 2013, Nashville, Tennessee* (2013).

³ E.g., N. Wang, et al., “Acute sensitivity of a broad range of freshwater mussels to chemicals with different modes of toxic action,” *Environmental Toxicology and Chemistry*, 36(3):786-796 (2017).

⁴ D.R. Mount, et al., “The acute toxicity of major ion salts to *Ceriodaphnia dubia*: I. Influence of background water chemistry,” *Environmental Toxicology and Chemistry*, 35(12):3039-3057 (2016).

⁵ W.T. Haller, et al., “Effects of salinity on growth of several aquatic macrophytes,” *Ecology*, 55:891-894 (1974).

⁶ S.E.G. Findlay and V.R. Kelly, “Emerging indirect and long-term road salt effects on ecosystems,” *Annals of the New York Academy of Sciences*, 1223:58-68 (2011); A.J. Timpano, et al., “Benthic macroinvertebrate community response to salinization in headwater streams in Appalachia USA over multiple years,” *Biological Indicators* 91:645-656 (2018); W.D. Hintz and R.A. Relyea, “A review of the species, community, and ecosystem impacts of road salt salinization in fresh waters,” *Freshwater Biology*, 64:1081-1097 (2019).

⁷ E.g., as seen in the documents cited in Footnote 1.

II.B. Water Quality in the CAWS and LDPR

The CAWS and LDPR are a series of waterways that flow through the Chicago area. The CAWS and LDPR underwent substantial hydrologic alterations in the 1800s and early 1900s to reverse the flow of the CAWS (to prevent contamination of Lake Michigan), widen and channelize several existing segments, and construct new canals where no waterways had previously existed. Additionally, the watershed of the CAWS and LDPR is heavily urbanized and biological communities have been historically limited by water quality contaminants introduced into the waters through urban storm water runoff, combined sewer overflows (CSOs), and discharges of treated wastewater effluent.

In the last 50 years, water quality has significantly improved in the CAWS and LDPR, leading to associated improvements to biological communities in those waters.⁸ Surveys of the biological communities and physical habitat of the CAWS and LDPR conducted in the 2000s indicated that while poor habitat caused by historical physical modifications still prevent most of the CAWS and LDPR from supporting full and diverse biological communities consistent with Illinois' General Use, the biological communities in the CAWS and LDPR had significantly improved since the waterbodies had last been evaluated in the 1970s. *See Lower Des Plaines River Use Attainability Analysis* (2003) and *Chicago Area Waterway System Use Attainability Analysis* (2007). To reflect these improvements, Illinois updated the applicable WQS for the CAWS and LDPR in 2015 to establish new use designations and water quality criteria intended to protect the improved biological communities.

Although many of the water quality issues that historically limited biological communities in the CAWS and LDPR have improved, elevated chloride concentrations continue to be a concern. Monitoring data indicate that much of the CAWS and LDPR and many of their associated tributaries frequently exceed the applicable state chloride criteria in winter months (December through April) during and after snow events. *Joint Submittal in Support of Petition for Chloride Time-Limited Water Quality Standard⁹ for the Defined Chicago Area Waterway System/Des Plaines River Watershed* (July 24, 2018, hereafter referred to as the "Joint Submittal") at 1.3 and 2.1-2.4, appendices 1-3, 7-16. These exceedances have been measured at monitoring locations throughout the CAWS and LDPR, indicating that chloride loading is a water quality issue throughout the watershed. The seasonality and timing of the exceedances indicate that they are caused by the application of road salt for deicing purposes. Additionally, estimates of chloride sources have identified road salt as the greatest source of chloride in the Chicago area. Based on estimates from Kelly et al. (2010) and Kelly et al. (2012), approximately 353,000 metric tons of road salt are applied each year in the Chicago area on average.

⁸ E.g., see A. Happel and D. Gallagher, "Chicago's fish assemblage over ~30 years – more fish and more native species," *Urban Ecosystems*, 24(2): 311-325 (2021) and T.B. Pluth, et al., "Long-term trends show improvements in water quality in the Chicago Metropolitan Region with investment in wastewater infrastructure, deep tunnels, and reservoirs," *Water Resources Research* 57(6) (2021).

⁹ "Time-limited water quality standard" (TLWQS) is Illinois' term for water quality standards variances, as defined by 40 CFR § 131.3(o).

There are more than 60,000 lane miles of roads in the Chicago area and hundreds of public and private entities conduct salting or deicing activities. *See Kelly et al. (2012)*. Consequently, road salt in the Chicago area cannot be effectively addressed without the participation and coordination of numerous entities throughout the watershed.

II.C. Development of Illinois' Variance

As discussed above, Illinois updated the applicable WQS for the CAWS and LDPR in 2015. During Illinois' rulemaking process for those revisions, several stakeholders expressed concern that the CAWS and LDPR did not currently meet the updated chloride criteria due to seasonal road salt loading, as discussed above. In response, IEPA convened a workgroup that included the Metropolitan Water Reclamation District of Greater Chicago (MWRD), several stormwater permittees and environmental groups to develop a proposal to address chloride, potentially through a WQS variance. As one of the participants with the most resources and a presence throughout the watersheds, MWRD helped lead and coordinate the workgroup in developing the proposal.

Because the elevated chloride levels in the CAWS and LDPR were determined to be caused by the application of road salt for deicing purposes, the workgroup evaluated the available options to address road salt contamination. The petitioners summarized these evaluations in the Joint Submittal, submitted to the IPCB. IEPA considered the information in the Joint Submittal, conducted additional evaluations, and summarized its conclusions in the April 5, 2019 *Illinois EPA's Recommendation* (hereafter referred to as "IEPA's Recommendation").

After being applied to roads and walking surfaces, road salt may enter surface waters either directly through runoff or as part of permitted discharges after entering storm sewer or combined sewer collection systems. Therefore, the workgroup identified the following potential options to prevent or substantially reduce the seasonal road salt loading to the CAWS and LDPR: (1) stop or significantly reduce the application of road salt within the watershed, (2) substitute alternative (non-chloride) deicers for road salt, and (3) install additional wastewater treatment technology to attempt to remove chloride from wastewater, prior to discharge, at wastewater treatment plants in the watershed.

As discussed in the Joint Submittal, the application of road salt "is driven largely by the need to maintain safe roadway conditions for travelers and safe walking surfaces for pedestrians." Joint Submittal at 3.2. The petitioners evaluated the available data on accidents, fatalities and injuries and determined that "[t]here are numerous studies that document the substantial (and obvious) impact of snow in causing slippery roads, as well as the beneficial impact of salt application as a mitigating measure." Joint Submittal at 3.4. Consequently, IEPA concluded that "an immediate, substantial reduction or cessation of road salting, while technically feasible, is not a viable option because of the increased risk of loss of human life due to icy and snow-covered roads." IEPA Recommendation at 7. This conclusion is consistent with other evaluations, which have concluded that ending the use of deicing salts is not currently feasible.¹⁰

¹⁰ E.g., see W.D. Hintz, et al., "Road salts, human safety, and the rising salinity of our fresh waters," *Frontiers in Ecology and the Environment* (2021).

Although the petitioners and IEPA concluded that an immediate, substantial reduction in road salting is not feasible, the petitioners and IEPA identified several BMPs that could potentially reduce the amount of road salt used while still maintaining public safety. However, the petitioners and IEPA determined that the amount of reduction achievable through implementation of the BMPs is uncertain and it may take time for the reductions to be observed. Therefore, IEPA concluded that, while implementation of BMPs is a feasible option for reducing road salt in the watershed, it is unclear whether full implementation of those BMPs would result in the CAWS and LDPR attaining the chloride criteria and it would take time to implement the BMPs.

To determine whether road salt could be replaced with non-chloride deicers, the petitioners also evaluated information about alternative deicing options from the *Chloride Free Snow and Ice Control Material* (December 2014) and the *Twin Cities Metropolitan Area Chloride Management Plan* (February 2016). While the petitioners identified several potential non-chloride deicers, all of the identified alternatives either were not effective at maintaining public safety or contributed to other water quality problems (e.g., low dissolved oxygen). Based on the information from the Joint Submittal, the Illinois Pollution Control Board (IPCB) concluded that “other available anti-icing ... technologies would cause more environmental damage than the chloride loading at issue.” IPCB, Opinion and Order of the Board (November 4, 2021) (hereafter referred to as the “Board Order”) at 21. This is consistent with other studies that have identified potential impacts on aquatic communities from road salt alternatives.¹¹

Finally, because road salt may enter surface waters as part of permitted discharges after entering storm sewer or combined sewer collection systems, the petitioners considered potential wastewater treatment technologies to attempt to remove chloride from wastewater, prior to discharge, at the wastewater treatment plants. As discussed in the Joint Submittal, the workgroup determined that the only treatment technology capable of removing chlorides from wastewater prior to discharge is reverse osmosis (i.e., membrane filtration). However, reverse osmosis functions by transferring chloride from wastewater into a concentrated brine that requires disposal. As discussed in IEPA’s Recommendation, IEPA evaluated potential options for disposal of the brine that would be produced if reverse osmosis was installed at all publicly owned treatment works in the watershed. Given the large volume of brine that would be produced, IEPA determined that the brine would need to be discharged into either a large body of water or injected into groundwater. IEPA was unable to identify any surface waters with sufficient capacity to accept the brine without causing an exceedance of the chloride criteria. Additionally, since many area communities use deep wells as their public water source, IEPA determined that injection of the brine into groundwater would not be feasible because it would jeopardize those public drinking water supplies. Therefore, IEPA concluded that “[t]here are no suitable locations in or around the Chicago area to dispose of the highly concentrated brine.” IEPA Recommendation at 8-9. Additionally, even if suitable locations for brine disposal could be identified, IEPA determined that, since not all road salt enters sewer systems, reverse osmosis would not address all sources of road salt to the CAWS and LDPR and would not address the environmental harm caused by road salt prior to entering sewer systems (e.g.,

¹¹ E.g., see M.S. Schuler, et al., “How common road salts and organic additives alter freshwater food webs: In search of safer alternatives,” *Journal of Applied Ecology*, 54:1353-1361 (2017).

damage to terrestrial vegetation). IEPA Recommendation at 7. Consequently, IEPA concluded that installation of additional wastewater treatment technology could not be used to address the seasonal salt loading.

In summary, the petitioners and IEPA concluded that the only option to reduce seasonal road salt loading to the CAWS and LDPR that is currently feasible is to implement BMPs to reduce road salt usage while maintaining public safety, but that it will take time to implement the BMPs throughout the watershed and the amount of reduction achievable is uncertain. Consequently, the petitioners and IEPA concluded that it is currently infeasible to reduce road salt usage in the CAWS and LDPR watersheds to the extent necessary for the CAWS and LDPR to attain the chloride criteria and, thus, a WQS variance is appropriate. The IPCB agreed and granted a WQS variance for the CAWS and LDPR through the November 4, 2021 Board Order. In response to questions from stakeholders, the IPCB subsequently amended the variance through an Opinion and Order issued on January 6, 2022 (hereafter referred to as the “Amended Board Order”) to clarify the effective date of the variance and some of the variance requirements.¹²

II.D. The Variance’s Requirements

As discussed above in Section II.C, Illinois determined that the only currently feasible option to reduce the introduction of road salt to the CAWS and LDPR is through the implementation of BMPs throughout the watershed. Additionally, as discussed in Section II.B, deicing activities in the CAWS and LDPR watersheds are implemented by hundreds of public and private entities with varying technical and financial capabilities. Consequently, to ensure that loadings of road salt to the CAWS and LDPR are minimized to the maximum extent possible, the variance establishes a PMP containing BMPs that chloride-contributing dischargers in the watersheds must implement and a novel chloride workgroup structure to coordinate, facilitate and evaluate the implementation of required BMPs by chloride-contributing dischargers.

Table 3 of the variance establishes a PMP that contains all of the BMPs identified by the petitioners and IEPA and additional BMPs proposed by commenters. The list of BMPs in Table 3 is based on information from other road salt reduction programs developed in the northern U.S. and Canada provided in the Joint Submittal, IEPA’s Recommendation and public comments and reflects the current technical knowledge about how to reduce road salt usage while maintaining public safety. The BMPs are specific to different activities (e.g., road salt application, road salt storage), and Table 3 requires chloride-contributing dischargers to implement the BMPs for all of the classes to which they belong. Table 4 of the variance specifies the schedule by which the dischargers must implement the PMPs, as required by Section 2 of the variance. As required by Section 3.A of the variance, each chloride-contributing discharger must incorporate the PMP in Table 3 of the variance into a discharger-specific PMP

¹² References to “the variance” in this document refer to the variance requirements and conditions established in the Amended Board Order. As discussed in the text, the variance requirements and conditions in the Amended Board Order are not substantively different from those in the November 4, 2021 Board Order but include a few small edits to clarify the effective date and when certain activities must occur. Illinois submitted the Amended Board Order to EPA for review under Section 303(c) of the CWA and that is the WQS variance that EPA reviewed.

and implement that PMP “to reduce chlorides into the CAWS and LDPR to the greatest extent achievable.”

As discussed above, the entities conducting deicing activities have varying technical and financial capabilities and, thus, while the variance requires all chloride-contributing dischargers to implement the BMPs in Table 3, not all of the dischargers will be able to implement the BMPs to the same extent. In recognition of this fact and the fact that, as discussed in Section II.A above, road salt reduction strategies must be implemented across the watershed to be effective, the variance also establishes a novel chloride workgroup structure to facilitate, evaluate and coordinate the activities of the individual chloride-contributing dischargers.

As required by Section 4.A of the variance, all dischargers with a national pollutant discharge elimination system (NPDES) permit that are currently expected or known to contribute chloride to the CAWS and LDPR must either participate in one of two watershed chloride workgroups or, if they choose not to participate in a workgroup, comply with the permit limits and conditions necessary to attain the underlying chloride criteria. For dischargers that choose not to participate in a chloride workgroup, the requirement to comply with permit limits necessary to attain the underlying chloride criteria ensures that the dischargers install necessary treatment technology to ensure that they reduce chlorides in their discharges down to the low levels necessary to attain the underlying chloride criteria in the listed waters. For dischargers that participate in a chloride workgroup, Section 4.A of the variance specifies that the chloride workgroups’ main goals are “working toward reducing chloride in the receiving stream.”¹³

Under the variance, each discharger is responsible for ensuring that their workgroup implements a number of measures to ensure that BMPs are implemented to the fullest extent possible within the CAWS and LDPR watershed and updated to reflect the current science. As required by the variance, dischargers are responsible for ensuring that their chloride workgroup compiles information from each discharger and develops watershed-wide reports that identify impediments faced by any discharger that prevent them from implementing BMPs; identify possible solutions to those impediments; and identify any financial, technical, or other assistance the workgroup may be able to provide an individual discharger to overcome those impediments. In this way, the chloride workgroup can identify opportunities for dischargers with more resources to provide assistance to dischargers experiencing challenges. Additionally, the variance requires that the dischargers ensure that their chloride workgroup assesses whether there has been adequate participation in the chloride workgroup by all dischargers, thereby ensuring public accountability and enforceability if any dischargers do not participate to the same extent as other dischargers. Section 7.D of the variance directs IEPA to incorporate the requirements of the variance into dischargers’ NPDES permits. Additionally, the workgroups are open to the public and non-governmental organizations, providing additional accountability.

To ensure that the chloride workgroups have the information to make the necessary analyses, the variance requires each discharger to submit an annual report to their chloride workgroup and

¹³ Illinois’ variance does not specify the required structure for the chloride workgroups. However, currently the CAWS workgroup is coordinated by MWRD (*See* <https://mwrdr.org/go-easy-salt-spreading-lightly-protects-water-quality-0>) and the LDPR workgroup is coordinated by the Lower Des Plaines Watershed Group (*See* <https://ldpwatersheds.org/about-us/lower-des-plaines-watershed-group/our-work/chloride-tlwqs/>).

IEPA that includes specific information listed in Section 3.B, including a list of the BMPs being used and to what extent (Section 3.B.i), and an analysis of the effectiveness and environmental impact of the BMPs and any hinderances or any unexpected achievements or setbacks (Section 3.B.ii). The reports must be made publicly available. To ensure that instream chloride monitoring data is available for these evaluations, Section 3.C of the variance requires the Metropolitan Water Reclamation District of Greater Chicago to collect hourly conductivity data at nine monitoring stations and weekly or monthly chloride samples at 15 monitoring stations.

Additionally, to ensure that the BMP list in Table 3 is updated based on new information and, thus, that the dischargers are continually implementing the BMPs expected to achieve the greatest chloride reductions, the variance requires that dischargers ensure that their chloride workgroup identifies in each status report any new BMPs, treatment technologies, and salt alternatives to reduce chloride loading to the environment. Section 6.C of the variance requires each chloride workgroup to use the annual reports and status reports to recommend modifications to the BMP list in Table 3 and recommend any new or innovative technology that could improve water quality and submit those recommendations to the IPCB prior to each five-year reevaluation that the IPCB is required to perform as described below in sections III.A.5 and III.A.7 of this document.

To ensure that BMPs are implemented throughout the watershed, sections 4.E and F of the variance require that the dischargers ensure that their chloride workgroup prepares outreach and educational materials to create awareness about the environmental impacts of chlorides and identify nonpoint source categories to prioritize for education and outreach efforts beginning in year seven of the variance term.

Lastly, Section 7.D of the Board's Order directs IEPA to incorporate the requirements of the variance into dischargers' national pollutant discharge elimination system (NPDES) permits. Consequently, all of the requirements summarized above, including the obligations that apply to all dischargers for implementing BMPs, participating in a chloride workgroup and ensuring that their chloride workgroup implements the various requirements required by the variance will become enforceable NPDES permit requirements.

III. EPA Review of Illinois' Action

WQS requirements of CWA sections 101(a)(2) and 303(c)(2) are implemented through federal WQS regulations contained in 40 CFR Part 131, including 40 CFR § 131.21, which requires EPA to review and approve or disapprove state-adopted WQS. In making this decision, EPA must consider the factors set forth at 40 CFR § 131.5(a). EPA reviews each of these criteria below. Because the variance does not modify the underlying designated water uses for the CAWS and LDPR, Illinois' water quality criteria, Illinois' existing antidegradation policy or its implementation, or affect Illinois' compliance schedule provision, the WQS requirements in 40 CFR §§ 131.5(a)(1) - (3) and (5) are not relevant in considering whether to approve Illinois' adopted WQS.

III.A. Whether the variance is consistent with 40 CFR § 131.14. (40 CFR § 131.5(a)(4))

40 CFR § 131.14 specifies requirements that states must fulfill to obtain EPA approval of variances to WQS. As described below, the variance meets all relevant requirements of 40 CFR § 131.14.

III.A.1. Whether the variance identifies the pollutant and the water body to which it applies and the permittee subject to the variance, and that the variance only applies to the specified permittee and water body. (40 CFR §§ 131.14(a)(1) & (b)(1)(i))

The introductory text of the variance specifies that the variance applies to the waterways listed in Table 1 of the variance. Amended Board Order at 3. Table 1 of the variance lists the following waterbody segments:

- Upper North Shore Channel from the Wilmette Pumping Station to the North Side Water Reclamation Plant,
- Lower North Shore Channel from the North Side Water Reclamation Plant to the confluence with the North Branch of the Chicago River,
- North Branch of the Chicago River,
- Chicago River from Lake Michigan to the confluence with the North Branch of the Chicago River and the South Branch of the Chicago River,
- South Branch of the Chicago River,
- Chicago Sanitary and Ship Canal,
- Cal-Sag Channel,
- Grand Calumet River,
- Lake Calumet,
- Lake Calumet Connecting Channel,
- Calumet River from Lake Michigan to its confluence with the Grand Calumet River and the Little Calumet River,
- Little Calumet River from its confluence with the Calumet River and Grand Calumet River to its confluence with the Cal-Sag Channel,
- Des Plaines River from the Kankakee River to the I-55 bridge,
- Des Plaines River from the I-55 bridge to the Brandon Road Lock and Dam,
- Des Plaines River from the Brandon Road Lock and Dam to the confluence with the Chicago Sanitary and Ship Canal,
- Des Plaines River from the confluence with the Chicago Sanitary and Ship Canal to the Will County line,
- Hickory Creek,
- Union Ditch,
- Spring Creek,
- Marley Creek, and
- East Branch of Marley Creek.

As specified in the variance, the variance only applies to chloride and the 21 waterbody segments listed in Table 1 of the variance (hereafter referred to as “the listed waters”). Because

this variance is not a discharger specific variance but rather a water body-specific variance, EPA's regulation at 40 CFR 131.14(b)(1)(i) does not require the variance to identify the specific permittees subject to the variance. Therefore, the variance is consistent with the requirements of 40 CFR §§ 131.14(a)(1) and (b)(1)(i).

III.A.2. Whether the State retained, in its standards, the underlying designated use and criterion addressed by the WQS variance. (40 CFR § 131.14(a)(2))

Illinois' WQS provide that all waters of the state are designated for "General Use" unless a specific use designation has been otherwise established. *See* 35 Ill. Admin. Code 303.201. No specific use designation had been established for eight of the segments listed in Table 1 of the variance and, thus, the use designation for those eight segments is General Use. Illinois' WQS specifically designate ten of the CAWS segments with Illinois' CAWS Aquatic Life Use A, two of the CAWS and LDPR segments with Illinois' CAWS and Brandon Pool Aquatic Life Use B, and designate one LDPR segment with Illinois' Upper Dresden Island Pool Aquatic Life Use. *See* 35 Ill. Admin. Code 303.230, 235 and 240. 35 Ill. Admin. Code 302.208(g) specifies the water quality criteria for chloride that apply to General Use waters. 35 Ill. Admin. Code 302.407(g)(3) specifies the water quality criteria for chloride that apply to Illinois' CAWS Aquatic Life Use A, CAWS and Brandon Pool Aquatic Life Use B, and Upper Dresden Island Pool Aquatic Life Use. Additionally, 35 Ill. Admin. Code 303.449 specifies the water quality criteria for chloride that apply to the Chicago Sanitary and Ship Canal.

The variance does not modify the underlying designated uses at 35 IAC 303.201, 230, 235 and 240 for any of the listed waters. Additionally, the variance does not modify the water quality criteria at 35 Ill. Admin. Code 302.208(g), 203.407(g)(3) and 303.449 that apply to those designated uses. Because Illinois has retained in its WQS the underlying aquatic life uses, as well as the related criteria, the variance is consistent with the requirements of 40 CFR § 131.14(a)(2).

III.A.3. Whether the designated use and criterion addressed by the WQS variance can be achieved by implementing technology-based effluent limits required under sections 301(b) and 306 of the Act. (40 CFR § 131.14(a)(4))

Road salt applied to roads and walkways for deicing purposes may enter surface waters both directly through runoff and as part of permitted discharges after entering storm sewer or combined sewer collection systems. Illinois' aquatic life criteria for chloride are more stringent than any federal effluent guideline or any other technology-based limits required for stormwater or municipal wastewater facilities under sections 301(b) and 306 of the CWA. Therefore, the variance is consistent with the requirements of 40 CFR § 131.14(a)(4).

III.A.4. Whether the variance includes the requirements that apply throughout the term of the WQS variance that represent the HAC of the waterbody segment applicable throughout the term of the WQS variance.... (40 CFR § 131.14(b)(1)(ii))

40 CFR § 131.14(b)(1)(ii)(B) provides that a state must specify the highest attainable condition (HAC) for a water body-specific variance as a quantifiable expression that is one of the following:

- (1) The highest attainable interim use and interim criterion; or
- (2) If no additional feasible pollutant control technology can be identified, the interim use and criterion that reflect the greatest pollutant reduction achievable within the pollutant control technologies installed at the time the State adopts the WQS variance, and the adoption and implementation of a Pollutant Minimization Program (PMP).

As discussed in Section III.A.9 below, Illinois demonstrated that the application of road salt in the watershed for deicing purposes is a human caused condition that prevents attainment of the aquatic life uses. Additionally, Illinois evaluated the available options to reduce road salt usage in the CAWS and LDPR watersheds or remove chloride from wastewater prior to discharge and demonstrated that the only currently feasible means to reduce the introduction of road salt to the CAWS and LDPR while maintaining public safety is through the implementation of BMPs. EPA agrees with these demonstrations.

As part of its evaluation, Illinois considered whether any pollutant control technologies could be installed to reduce chloride in the CAWS and LDPR. As discussed in Section II.C above, Illinois demonstrated, and EPA agrees, that the only potential wastewater treatment technologies to remove chloride (i.e., reverse osmosis) are infeasible. As discussed in IEPA's recommendation, even if reverse osmosis was only installed at some publicly owned treatment works in the watershed so as to reduce, but not completely remedy, the discharge of chloride from wastewater treatment plants, Illinois demonstrated, and EPA agrees, that reverse osmosis would not remove the chloride from the watershed but would only transfer the chloride from one location to another. By contrast, BMPs to reduce the amount of salt applied during winter snow events would reduce the amount of salt applied to roadways and walking surfaces in the first place and, thus, are capable of reducing the application of road salt in the watershed. Additionally, Illinois determined, and EPA agrees, that BMPs would have the additional benefit of reducing road salt that enters surface waters directly through runoff and would reduce environmental damage to terrestrial and groundwater resources caused by road salt (e.g., damage to terrestrial plants). IEPA Recommendation at 7. Therefore, Illinois concluded that "the reverse osmosis option, assuming it is even technically and financially feasible, would not result in a reduction of salt usage and the associated environmental impacts" and selected the implementation of BMPs as "the option that will result in the optimal environmental outcome." IEPA Recommendation at 7 and 9. EPA agrees with Illinois' conclusion.

In summary, there is no additional feasible pollutant control technology that could be implemented and reducing the chloride sources (i.e., road salt) through the implementation of BMPs would minimize the total chloride release to the environment and, would best, represent the HAC. Consequently, Illinois expressed the HAC for the variance period as "the ... interim

use and criterion that reflect the greatest pollutant reduction achievable with the pollutant control technologies installed at the time the State adopts the WQS variance, and the adoption and implementation of a Pollutant Minimization Program,” consistent with 40 CFR § 131.14(b)(1)(ii)(B)(2) and as described in more detail below.

As discussed above and in Section III.A.9, the basis of the variance is that the application of road salt in the watershed for deicing purposes is a human caused condition that prevents attainment of the aquatic life uses. Therefore, Illinois set the interim criterion to protect the aquatic life use that the listed waters can feasibly attain (i.e., the interim use): aquatic life seasonally affected by road salt. Consistent with that basis, Illinois set the interim criterion based on the current seasonal (December through April) chloride concentrations in the CAWS and LDPR, which would reflect ambient conditions under current road salting practices (i.e., the interim criterion and use that reflect the greatest pollutant reduction achievable with the pollutant control technologies installed at the time, per 40 CFR § 131.14(b)(1)(ii)(B)(2)). Because the monitoring data indicate that the listed waters are able to comply with the State’s chloride criteria during non-winter months, Section 5.A of the variance requires that that the interim use and criterion only apply from December through April of each year. Amended Board Order at 11. The underlying chloride criteria will apply from May through November of each year, although the PMP will be implemented year-round.

Based on monitoring data included in the Joint Submittal, the seasonal chloride concentration in the CAWS averaged 289 mg/L between 2012 and 2017 at the most downstream sampling point on the CAWS (Lockport, on the Chicago Sanitary and Ship Canal). While fewer data were available from the LDPR, the available data indicated that seasonal chloride concentrations were similar to those in the CAWS. Joint Submittal at 8.1-8.2 and appendices 55 and 56. Consequently, Illinois concluded that 289 mg/L reflects the ambient chloride concentration in the CAWS and LDPR based on current pollutant control technologies and road salting practices. Joint Submittal at 8.1.

Additionally, Illinois decided to adjust the interim criterion to account for projected reductions in chloride loading due to the implementation of BMPs required under the variance. The Joint Submittal evaluated several studies of road salt reduction programs and determined that road salt BMPs typically result in a 10-25% reduction in salt loadings. However, the studies also indicated that these reductions may take time to achieve and, thus, projected that BMPs are likely to result in a 3-7% reduction in the first five years of the variance. Joint Submittal at 8.2. Based on the information provided in the Joint Submittal, Illinois adjusted the current ambient seasonal chloride concentrations in the CAWS and LDPR (289 mg/L) downward by 3%, resulting in a seasonal average concentration of 280 mg/L and established that as the interim criterion for the first five years of the variance. IEPA Recommendation at 11. The result of Illinois’ adjustment is that the interim criterion of the variance is more stringent than the ambient chloride concentrations in the CAWS and LDPR based on currently installed pollutant control technologies and road salting practices, consistent with 40 CFR § 131.14(b)(1)(ii)(B)(2). After the first five years of the variance, the interim criterion may change based on the results of reevaluations conducted every five years. As discussed in Section III.A.5 below, Section 6 of the variance requires Illinois to reevaluate the interim criterion every five years and, if any reevaluation identifies a more stringent HAC, then that HAC becomes the applicable interim

criterion. Consequently, the interim criterion after the first five years of the variance will either continue to be 280 mg/L, as a seasonal average, or, if the reevaluation determines that it is feasible for the listed waters to achieve a lower seasonal average concentration, a more stringent interim criterion.

To ensure that sources of road salt to the listed waters are minimized to the maximum extent possible, consistent with 40 CFR § 131.14(b)(1)(ii)(B)(2), the variance HAC also includes a PMP with requirements for chloride-contributing dischargers in the watershed to implement BMPs and a process to evaluate and update those BMPs based on monitoring, reporting and analysis.

Dischargers currently expected or known to contribute chloride to the listed waters are identified in Table 2 of the variance. As discussed in Section II.D above, the variance specifies that the interim requirements for each discharger identified in Table 2 are to meet the interim criterion and to implement the PMP contained in Table 3 of the variance as part of a discharger-specific PMP. As specified in Table 4 of the variance, each discharger must submit its discharger-specific PMP to IEPA within six months of the variance effective date and must begin implementing the BMPs contained in Table 3 of the variance and its discharger-specific PMP within one year of the variance effective date. As required by Section I.C.v of the variance, each discharger-specific PMP must contain all of the BMPs listed in Table 3 of the variance for their discharger type.

The variance also establishes a novel chloride workgroup structure that requires each discharger to participate in one of two watershed chloride workgroups and ensure that each member of the workgroup implements a number of measures to coordinate and evaluate the implementation of BMPs by chloride-contributing dischargers, facilitates updates to the list of BMPs in Table 3, and conducts outreach to identify nonpoint sources of chloride and creates awareness about the environmental impacts of chlorides. As established in Section 4 of the variance, the variance requirements related to the chloride workgroups ensure that the chloride workgroups can identify opportunities for dischargers with more resources to provide assistance to dischargers experiencing challenges and that the workgroups are conducting outreach to nonpoint sources, so that BMPs are implemented throughout the watersheds to the fullest extent possible. Additionally, the variance requirements in Section 4 of the variance ensure that the BMP list in Table 3 is updated based on new information and, thus, that the dischargers are continually implementing the BMPs expected to achieve the greatest chloride reductions. Section 7.D of the variance directs IEPA to incorporate the requirements of the variance into dischargers' NPDES permits. Consequently, all of the requirements summarized above, including the obligations that apply to all dischargers for implementing BMPs, participating in the chloride workgroups and ensuring that the chloride workgroups implement the various requirements required by the variance will become enforceable NPDES permit requirements, consistent with 40 CFR § 131.14(c).

For dischargers not included in Table 2 of the variance, Section 1.B requires that those dischargers comply with the permit limits and conditions necessary to comply with the underlying chloride criteria, thereby ensuring that these dischargers do not cause or contribute to exceedances of the underlying chloride criteria in the listed waters. The dischargers subject to

these requirements are expected to be dischargers that do not belong to one of the chloride-contributing categories established in Table 3 of the variance or dischargers that otherwise believe that they meet the underlying WQS. Since these dischargers can achieve lower chloride concentrations than the dischargers listed in Table 2, either because they do not apply or capture deicing salts or because they have alternate means of reducing salt in their effluent, the variance applies requirements to ensure that these facilities maintain their attainable chloride concentrations (i.e., levels consistent with the underlying criteria).

Section 1.C of the variance allows additional dischargers that are not currently listed in Table 2 to request the BMP-based requirements rather than the limits and conditions based on the underlying chloride criteria, provided that the dischargers satisfy certain conditions. Specifically, as required by sections 1.C.i through viii of the variance, the discharger must belong to one of the classes of dischargers identified in the variance and be located in the CAWS and LDPR watershed. Additionally, the discharger must implement a discharger-specific PMP that includes all required BMPs from Table 3. The variance requires that the discharger implement the required BMPs from Table 3 within 12 months of receiving the BMP-based requirements. As discussed in the Board Order, the conditions are intended to ensure that all dischargers implement BMPs along the same schedule and to require that dischargers that are not currently listed in Table 2 of the variance are held to the same expectations and schedule as the dischargers in Table 2. Board Order at 54-55. Lastly, to ensure that the application of BMP-based requirements to new dischargers do not result in a lowering of the currently achieved water quality, the variance requires that, if the discharger is a significant new source of chloride, the discharger must offset their additional loading before it may receive the BMP-based requirements in its permit instead of the limits and conditions based on the underlying chloride criteria.

EPA has reviewed Illinois' submission and concludes that the State's expression of the applicable HAC as described above and how it will assign the HAC to different discharges that discharge to the listed waters satisfies the requirements of 40 CFR § 131.14(b)(1)(ii).

III.A.5. Whether the variance includes a statement providing that the requirements are either the HAC identified at the time of variance adoption, or the HAC later identified during any reevaluation, whichever is more stringent. (40 CFR § 131.14(b)(1)(iii))

Section 7.B. requires that a reevaluation of the HAC must be submitted to the Board and subsequently to EPA six months before the end of each five-year period of the variance. Section 6 of the variance describes the requirements associated with five-year reevaluations of the variance during the 15-year variance term. Sections 6.A through C require that dischargers ensure that their chloride workgroup submits a proposed reevaluation to the IPCB six months before the end of each five-year period (i.e., in years four and nine of the variance) that assesses the HAC using all existing and readily available information, evaluates whether the chloride sampling plan needs to be expanded or modified, and evaluates the effectiveness of the required BMPs and provide recommendations for any BMPs and new or innovative technology that could improve water quality if implemented. Section 6.D requires the IPCB to make the chloride workgroup's proposed reevaluation available to the public and solicit information from the public about additional BMPs and new or innovative technologies that could improve water

quality if implemented. Section 6.E of the variance requires the IPCB to identify and incorporate updates to the BMPs in Table 3 “needed to achieve the greatest chloride reduction achievable for the whole watershed” based on the information provided in the proposed reevaluation and the public. Section 6.F of the variance provides that, “[a]s required by 35 Ill. Adm. Code 104.580(e)(1), if any re-evaluation yields a more stringent HAC, that HAC becomes the applicable interim TLWQS for the remaining duration of the TLWQS.” Therefore, the variance is consistent with the requirements of 40 CFR § 131.14(b)(1)(iii).

III.A.6. Whether the variance includes the term of the WQS variance, and whether the term of the WQS variance is only as long as necessary to achieve the HAC, consistent with the demonstration provided in paragraph (b)(2) of this section. (40 CFR § 131.14(b)(1)(iv))

Section 7.A of the variance specifies that “[t]his TLWQS will be effective upon the approval of the USEPA and the TLWQS expires 15 years after the date of USEPA approval.” Since the State determined that source reduction measures are the most effective means of reducing sources of chloride to the listed waters, the variance ensures that the HAC is achieved by establishing an interim criterion, which reflects the current ambient chloride concentrations with an incremental reduction in road salt usage as result of implementing BMPs, and requiring implementation of an iterative process to implement, evaluate and update BMPs throughout the 15-year variance term, as discussed in Section III.A.4 above. As discussed in the preamble to EPA’s 2015 Water Quality Standards Regulatory Revisions, the term of WQS variances must reflect “the time needed to plan activities, implement activities, or evaluate the outcome of activities.” 80 Fed. Reg. 51038.

In setting the term of the variance, Illinois considered data from the Joint Submittal about the time needed to implement road salt BMPs from other BMP-based road salt reduction programs developed and implemented in the northern U.S. and Canada. The available studies indicated that local factors (e.g., public deicing expectations, local road and weather conditions, and current salting practices) affect the implementation of road salt BMPs and, thus, BMP plans must be reevaluated and optimized over time before road salt BMPs can achieve their full effectiveness. See CDM, *DuPage River Salt Creek Workgroup Chloride Usage Education and Reduction Program Study* (August 2007) (included as Appendix 25 to the Joint Submittal); Transportation Association of Canada, *Successes in Road Salt Management: Case Studies* (April 2013) (included as Appendix 24 to the Joint Submittal); New Hampshire Department of Environmental Management, *Chloride Reduction Implementation Plan for Dinsmore Brook Watershed* (February 2011) (included as Appendix 26 to the Joint Submittal). As part of this reevaluation process, entities may determine that they need to make capital purchases (e.g., new salt spreader trucks, plow blades) to optimize their implementation of the road salt BMPs. New Hampshire Department of Environmental Management, *Chloride Reduction Implementation Plan for Dinsmore Brook Watershed* (February 2011) at 23-31. Consequently, all of the case studies cited in the Joint Submittal identified regular reevaluations of BMPs as a critical component of BMP implementation and indicated that implementation of road salt BMPs is a long-term undertaking. For example, in the *Chloride Reduction Implementation Plan for Dinsmore Brook Watershed* (February 2011), the New Hampshire Department of Environmental Services estimated that it would take at least 10 years for full chloride load reductions from road salt BMPs to be achieved due to the time required to reevaluate and

optimize road salt application practices. Chloride Reduction Implementation Plan for Dinsmore Brook Watershed at 60.

Additionally, as discussed in Section III.A.4 above, the variance includes requirements to monitor the listed waters and evaluate the effectiveness of the BMPs in Table 3 and, thus, Illinois also considered data from the studies cited in the Joint Submittal about the time needed to evaluate the outcomes of BMP implementation. The available studies indicated that it typically takes several years to quantify and evaluate the effectiveness of BMP implementation due to the lag time between implementation and effect and due to the variability of weather conditions. For example, in a review of the effectiveness of Canada's *Code of Practice for the Environmental Management of Road Salts* by the University of Waterloo and the National Water Research Institute, salt applicators reported that it was "[d]ifficult to measure effectiveness given the variability of winter." Stone, M. et al., *Assessing the Efficacy of Current Road Salt Management Programs* (July 26, 2010) (included as Appendix 28 to the Joint Submittal) at 17. As a result, many of the studies cited in the Joint Submittal determined that several years of monitoring would be required to evaluate the effectiveness of BMP implementation. For example, the New Hampshire Department of Environmental Services determined that chloride concentrations would need to be monitored over 10 years and averaged to evaluate the effectiveness of road salt BMPs given the variability in weather. New Hampshire Department of Environmental Management, *Chloride Reduction Implementation Plan for Dinsmore Brook Watershed* (February 2011) at 60.

In summary, the available studies cited in the Joint Submittal indicated that it will take at least 10 years for dischargers to optimize their BMP implementation and it will take several years after that to evaluate the outcomes of BMP implementation. Additionally, Illinois determined that, since road salt is applied throughout the watershed by many different types of entities (public and private), it will take time for the chloride workgroups to conduct outreach with all salt applicators and nonpoint sources within the watersheds and for those applicators and nonpoint sources to implement and optimize their BMPs. IEPA Recommendation at 25. Therefore, Illinois concluded that "15 years is the minimum necessary term to implement and adequately measure the chloride reducing effect of the BMPs, the individual PMPs, and the adjusted practices resulting from the re-evaluation process." Board Order at 45. As discussed in Section III.A.4 above, the variance includes requirements for the dischargers to reevaluate and update their PMPs, identify capital purchases that may be needed, and conduct outreach with nonpoint sources.

The BMPs required under the variance are expected to result in greater chloride reductions and an improved HAC for as long as they are implemented (in this case, 15 years). Additionally, the variance requires that the IPCB "identify all additional BMPs and new or innovative technologies that are achievable for any discharger in the category" and update the BMP lists in Table 3 with any such BMPs or technologies, thereby ensuring that the variance requirements reflect the latest information regarding chloride reduction strategies throughout the variance term. Additionally, the variance requires the chloride workgroups to conduct education and outreach activities to nonpoint source categories, which is expected to result in more BMPs being implemented by more entities, thereby achieving reductions of road salt among a greater portion of the total chloride load within the watersheds as the variance progresses.

EPA has reviewed Illinois' information as described above pertaining to the term of the variance and concludes that the term is consistent with the requirements of 40 CFR § 131.14(b)(1)(iv).

III.A.7. Whether, for a WQS variance with a term greater than five years, the variance includes a specified frequency to reevaluate the HAC ... and a provision specifying how the State intends to obtain public input on the reevaluation. (40 CFR § 131.14(b)(1)(v))

Section 6.A of the variance specifies that, “[b]y the deadlines listed in Table 4, each discharger must ensure that their [chloride workgroup] submits a proposed re-evaluation under 35 Ill. Adm. Code 104.0580, which assesses the HAC using all existing and readily available information.” Table 4 requires that each discharger ensure that their chloride workgroup submits a proposed reevaluation consistent with the Board Order four and a half and nine and a half years after the effective date of the variance. Section 6.D of the variance requires the IPCB to “make the information submitted in Section (6)(C) available to the public and provide an opportunity for any person to submit information about additional BMPs and new or innovative technologies that could improve water quality if implemented.” Section 7.B of the variance requires that each reevaluation of the HAC must be subsequently submitted to EPA. Therefore, EPA concludes that the term of the variance is consistent with the requirements of 40 CFR § 131.14(b)(1)(v).

III.A.8. Whether the variance includes a provision that the WQS variance will no longer be the applicable WQS for purposes of the Act if the State does not conduct a reevaluation consistent with the frequency specified in the WQS variance or the results are not submitted to EPA as required by (b)(1)(v) of this section. (40 CFR § 131.14(b)(1)(vi))

Section 7.D of the variance specifies that “[t]he TLWQS will no longer be the applicable WQS for purposes of the Clean Water Act if the Petitioners do not conduct a re-evaluation consistent with the frequency specified in paragraph 7(B) or the results are not submitted to USEPA as required by this paragraph.” Therefore, EPA concludes that the variance is consistent with the requirements of 40 CFR § 131.14(b)(1)(vi).

III.A.9. Whether the supporting documentation includes a demonstration of the need for a WQS variance and that attaining the designated use and criterion is not feasible throughout the term of the variance because: (1) one of the factors listed in §131.10(g) is met, or (2) actions necessary to facilitate restoration preclude attainment. (40 CFR § 131.14(b)(2)(i)(A))

As described below, the supporting documentation provided by the State included a demonstration of the need for a WQS variance because road salt entering the listed waters after application for deicing purposes is a human caused condition that prevents attainment of the aquatic life uses and cannot be remedied within the term of the variance, consistent with 40 CFR § 131.10(g)(3), and is therefore infeasible.

As discussed in Section II.B above, the petitioners submitted monitoring data from the CAWS and LDPR collected between January 2006 and April 2017 to Illinois demonstrating that the

listed waters frequently exceeded the applicable chloride criteria in winter months (December through April) during and after snow events. Joint Submittal at 1.3, 2.1-2.4 and appendices 1-3, 7-16. Based on the seasonality and timing of the exceedances indicated by the data in the Joint Petition, Illinois concluded that “the human-caused condition of seasonal salt loading to reduce ice accumulation necessary to maintain public safety prevents attainment of the chloride WQS in the CAWS and LDPR watersheds.” Board Order at 21.

As discussed in Section II.C above, the petitioners and IEPA evaluated potential options to prevent the seasonal road salt loading to the CAWS and LDPR and demonstrated that it is currently infeasible to reduce road salt usage in the CAWS and LDPR watersheds to the extent necessary for the CAWS and LDPR to attain the chloride criteria. Specifically, the petitioners and IEPA submitted information to the IPCB in the Joint Submittal and IEPA’s Recommendation demonstrating that (1) an immediate, substantial reduction or cessation of road salt usage is infeasible because of the increased risk to human life; (2) an incremental reduction in road salt usage through the implementation of BMPs is technically feasible but is uncertain to result in the listed waters attaining the chloride criteria and it would take time to implement the BMPs; (3) substitution of alternative (non-chloride) deicers for road salt is infeasible because all known alternative deicers are currently not effective at maintaining public safety and/or would cause other water quality problems; and (4) installation of potential wastewater treatment technologies to remove chloride (i.e., reverse osmosis) is infeasible installing additional treatment technologies at wastewater treatment plants would not address all sources of road salt to the listed waters (e.g., road salt that enters surface waters directly through runoff) and all potential disposal locations for the brine would transfer the chloride to another resource where it would have environmental or health effects rather than removing it from the watersheds.

Illinois submitted the supporting documentation summarized above to EPA. EPA reviewed the supporting information submitted by Illinois, including the Joint Submittal, the studies cited in the Joint Submittal, IEPA’s Recommendation and the Board Order and agrees with the State’s conclusions. EPA concludes that the State demonstrated the need for a WQS variance because the application of road salt for deicing purposes is a human caused condition that prevents attainment of the aquatic life uses and cannot be remedied within the term of the variance, consistent with 40 CFR § 131.10(g)(3). Consequently, the variance is consistent with the requirements of 40 CFR § 131.14(b)(2)(i)(A). As discussed in Section III.A.4 of this document, the variance contains the conditions necessary to result in the greatest chloride reductions achievable during the term of the variance.

III.A.10. Whether, for a WQS variance to a non-101(a)(2) use, the State submitted documentation justifying how its consideration of the use and value of the water for those uses listed in §131.10(a) appropriately supports the WQS variance and term. (40 CFR § 131.14(b)(2)(i)(B))

Not applicable. The variance does not apply to any non-101(a)(2) use.

III.A.11. Whether the supporting documentation includes a demonstration that the term of the WQS variance is only as long as necessary to achieve the HAC. Such documentation must justify the term of the WQS variance by describing the pollutant control activities to achieve the HAC. (40 CFR § 131.14(b)(2)(ii))

As described in Section III.A.6., EPA concluded that the supporting documentation demonstrates that the term of the variance is as long as necessary to achieve the HAC through compliance with the interim criterion for chloride, which reflects the expected ambient concentration after an incremental reduction in road salt due to BMP implementation, and the implementation of BMPs to reduce the application of road salt for deicing purposes that can enter the listed waters. Activities included in the PMP plan are described in Section III.A.4. Consequently, the variance is consistent with 40 CFR § 131.14(b)(2)(ii).

III.A.12. Whether, for a WQS variance that applies to a water body or waterbody segment, that variance includes: (A) identification of any best management practices for nonpoint source controls that could be implemented to make progress towards attaining the underlying designated use and criterion, and (B) any subsequent WQS variance must include documentation of the best management practice implementation and the water quality progress achieved. (40 CFR § 131.14(b)(2)(iii))

Table 3 of the variance includes a list of BMPs to reduce or eliminate the application of road salt for deicing and prevent road salt from entering waterways. Section 2 of the variance requires all dischargers covered by the variance to implement PMPs “to reduce chlorides into the CAWS and LDPR to the greatest extent achievable using all of the BMPs currently identified in Table 3 and BMPs specified by the Board following any re-evaluation.” Although the BMPs identified in Table 3 will be implemented by dischargers (i.e., point sources), the BMPs are intended to minimize the use and release of road salt generally and, thus, will also reduce road salt entering waters directly (i.e., nonpoint sources). Additionally, Section 4.E of the variance requires that each discharger ensure that their chloride workgroup prepares:

outreach and educational materials to create awareness about the environmental impacts of chlorides. Each discharger must ensure that their CWG share these materials with other users of road salt in their local area. Outreach and education materials may include various forms of social media, incentives for chloride reduction, support for community-based training of commercial road salt spreaders, training for residents and other entities that apply road salt, and funding or other support to implement chloride BMPs in communities where new equipment is not affordable.

Starting in year seven of the variance term, the variance requires the dischargers and chloride workgroups to identify nonpoint source categories and implement education and outreach efforts for the identified nonpoint sources.

Therefore, EPA concludes that the variance identifies best management practices for nonpoint source controls that could be implemented to make progress toward attaining the underlying designated use and criterion, consistent with the requirements of 40 CFR § 131.14(b)(2)(iii).

III.B. Whether the State has followed applicable legal procedures for revising or adopting standards. (40 CFR § 131.5(a)(6))

In a letter dated March 15, 2022 and received by EPA on the same day, Stephen J. Sylvester of Illinois' Office of the Attorney General certified that the variance was duly adopted and is enforceable in accordance with Illinois state law.

In adopting the variance, the State also provided opportunities for public input consistent with federal requirements at 40 CFR § 131.20(b) and 40 CFR Part 25. On November 14, 2019, the IPCB issued a Hearing Office Order announcing that it would hold a public hearing on the variance on February 18, 2020, with an allowance for the hearing to continue on February 19 and 20, 2020, if needed. On December 17, 2019, the IPCB provided public notice of the scheduled hearing through a Notice of Hearing on the IPCB's website. The IPCB held a public hearing to discuss the proposed variance on February 18, 2020 and accepted public comments on the variance through March 17, 2020. Nine participants provided comments at the February 18, 2020 public hearing and the IPCB received comments from Chicago Salt Company; CITGO; IEPA; Illinois Environmental Regulatory Group; IMTT Illinois, LLC; the City of Palos Heights; River Advocates; and EPA.

As described above, the IPCB held a public hearing that was publicized more than 45 days period to the date of the hearing. The IPCB prepared a transcript of the hearing and met other requirements for public hearings specified at 40 CFR § 25.5. As discussed in the Board Order, the IPCB considered and responded to the public comments before granting the variance. IPCB proposed amendments to the variance in response to some of the comments. Consequently, EPA concludes that the State satisfied the public participation requirements of 40 CFR § 131.20(b) and 40 CFR § 25.5.

Because Illinois followed its legal procedures for adopting a variance and met federal public participation requirements regarding the revision of WQS, EPA concludes that the variance is consistent with the requirements of 40 CFR § 131.5(a)(6).

III.C. Whether the State standards which do not include the uses specified in section 101(a)(2) of the Act are based on appropriate technical and scientific data and analyses. (40 CFR § 131.5(a)(7))

Although (as described above in Section III.A.2.) the State is retaining its underlying designated uses and criteria for waters impacted by the variance. However, for the period of time that the variance is in effect, the State's standards effectively do not include all of the uses specified in Section 101(a)(2) of the Act. As described above in Section III.A., the variance is based on appropriate technical and scientific data and analysis. Consequently, the variance is consistent with the requirements of 40 CFR § 131.5(a)(7).

III.D. Whether the State submission meets the requirements included in §131.6 of this part and, for Great Lakes States or Great Lakes Tribes (as defined in 40 CFR § 132.2) to conform to section 118 of the Act, the requirements of 40 CFR 132. (40 CFR § 131.5(a)(8))

40 CFR § 131.6 identifies the minimum requirements of a WQS submission that EPA must consider. As described below, IEPA's submittal meets all the relevant requirements of 40 CFR § 131.6.

III.D.1. Minimum requirements for WQS submission (40 CFR § 131.6)

III.D.1.a. 40 CFR §§ 131.6(a), (c), (d) and (f) are not relevant in considering whether to approve the variance.

40 CFR §§ 131.6(a), (c), (d), and (f) are not relevant in considering whether to approve the variance because the variance does not remove the underlying designated water uses, criteria, antidegradation policies, antidegradation implementation procedures or compliance schedule provisions within the State's WQS.

III.D.1.b. Whether the State submitted methods used and analyses conducted to support the variance. (40 CFR § 131.6(b))

The State submitted the following documents that describe the methods used and analyses conducted to support the variance:

- Illinois Attorney General Office's certification of proper issuance of the time limited water quality standard for chloride, dated March 15, 2022;
- Transmittal letter from Sanjay K. Sofat, IEPA, to Debra Shore, EPA, dated February 9, 2022;
- Petition for Variance from Village of Homewood, filed with the IPCB on July 20, 2015;
- Opinion and Order of the Board, consolidating separate chloride variance petitions, dated December 17, 2015;
- Illinois EPA's Response to the Variance Petition, filed with the IPCB on March 16, 2017;
- Order of the Board, requiring petitioners to file an amended petition, dated April 12, 2017;
- Joint Submittal in Support of Petition for Chloride Time-Limited Water Quality Standard for the Defined Chicago Area Waterway System/Des Plaines River Watershed, filed with the IPCB on July 24, 2018;
- Order of the Board, finding that the Joint Submittal is in substantial compliance and ordering that a public hearing on the chloride variance be held, dated December 20, 2018;
- Illinois EPA's Recommendation, filed with the IPCB on April 5, 2019;
- MWRD Response to Recommendation of Illinois Environmental Protection Agency, filed with the IPCB on April 19, 2019;
- Transcript of public hearing held February 18, 2020;
- Post-hearing brief of MWRD, filed with the IPCB on April 20, 2020;

- Letter from David Pfeifer, EPA, to Sanjay Sofat, IEPA, providing feedback on the chloride variance, dated June 20, 2020;
- IEPA's Response to Post Hearing Comments, filed with the IPCB on August 21, 2020;
- Post-hearing reply brief of MWRD, filed with the IPCB on August 21, 2020;
- Opinion and Order of the Board granting the chloride variance, dated November 4, 2021;
- Email from Elizabeth S. Harvey, Swanson, Martin & Bell, LLP, to Mark Kaminski, IPCB, Re: questions about the new TLWQS, dated November 18, 2021; and
- Opinion and Order of the Board clarifying the November 2021 Board Order, dated January 6, 2022.

In addition, IEPA's letter submitting the State's variance to EPA stated that it was also submitting the documents contained in IPCB's online docket for the chloride variance, which included:

- Notice of Hearing for the February 18, 2020 public hearing, dated December 17, 2019;
- Certifications that the Notice of Hearing was published in the State Journal Register and Herald-News on December 19, 2019 and published in the Chicago Tribune on December 20, 2019;
- Public comments received by the IPCB;
- Exhibits submitted at the public hearing;
- Testimonies filed with the IPCB prior to the February 18, 2020 public hearing;
- Board questions for IEPA and the petitioners, dated July 24, 2019; and
- Responses to Board questions from IEPA and the petitioners.

Consequently, the State satisfied the requirements of 40 CFR § 131.6(b).

III.D.1.c. Whether the State submitted a certification by the State Attorney General or other appropriate legal authority that the variance was duly adopted pursuant to State law. (40 CFR § 131.6(e))

Illinois' Office of Attorney General certified the rules in a letter from Stephen J. Sylvester, Illinois' Office of the Attorney General, to Debra Shore, EPA, dated March 15, 2022. Consequently, the State satisfied the requirements of 40 CFR § 131.6(e).

III.D.2. Requirements of 40 CFR Part 132

The requirements of 40 CFR Part 132 are not applicable with respect to this action because the water bodies addressed by today's action are not part of the Great Lakes System.

III.E. Conclusion

For the reasons described above, the variance is consistent with the requirements of 40 CFR § 131.5, the CWA, and 40 CFR Part 131. Consistent with 40 CFR § 131.5(b), EPA approves the WQS variance adopted by the State.

IV. ESA Requirements

Consistent with Section 7 of the ESA and federal regulations at 50 CFR Part 402, EPA is required to consult with FWS on any action taken by EPA that may affect federally listed threatened or endangered species or designated critical habitat. Actions are considered to have the potential to affect listed species if listed species are present in the action area.

According to the FWS Information for Planning Consultation website (accessed January 18, 2022, <https://ecos.fws.gov/ipac/>), the listed threatened or endangered species in Cook, DuPage and Will counties, Illinois that could possibly be in the action area include northern long-eared bat, piping plover, rufa red knot, eastern massasauga, Hine's emerald dragonfly, monarch butterfly, rusty patched bumblebee, eastern prairie fringed orchid, lakeside daisy, leafy-prairie clover, prairie bush-clover and sheepsnose mussel. There is no critical habitat in Cook, DuPage or Will counties in the potential action area of the variance.

Based on a review of the available information for these species, EPA has concluded that approval of Illinois' chloride variance for the CAWS and LDPR will have no effect on piping plover, eastern massasauga, Hine's emerald dragonfly, monarch butterfly, rusty patched bumblebee, lakeside daisy, leafy-prairie clover, prairie bush-clover and sheepsnose mussel. Additionally, EPA has determined that the variance will have no effect on critical habitat. However, based on the potential presence of aquatic, aquatic-dependent, and/or wetland species in the action area, EPA concluded that consultation under Section 7 of the ESA is required. EPA drafted a BE of the effects of the adopted rules on listed species in Cook and Will counties and concluded that its approval of the adopted rules may affect, but is not likely to adversely affect, the northern long-eared bat, rufa red knot and eastern prairie fringed orchid. EPA has completed consultation with FWS and received concurrence on its evaluation through a letter from FWS dated May 5, 2022.

V. Tribal Consultation Requirements

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." EPA reviewed the locations of tribal lands in and around Steuben County and concluded that no tribal lands were located within the action area. Therefore, consultation is not necessary as tribal interests are not affected by EPA's action on the variance.