BEFORE THE POLLUTION CONTROL BOARD
OF THE STATE OF ILLINOIS

IN THE MATTER OF:	)	
	)	
CITGO PETROLEUM CORPORATION and PDV MIDWEST REFINING, L.L.C.,	)	
	)	PCB_____
Petitioners,	)	(Variance - Water)
	)	
v.	)	
	)	
ILLINOIS ENVIRONMENTAL PROTECTION AGENCY,	)	
	)	
Respondent.	)	

NOTICE OF FILING

To:

John Therriault, Clerk of the Board Illinois Pollution Control Board 100 West Randolph, Suite 11-500 Chicago, IL 60601	John J. Kim, Interim Director Illinois Environmental Protection Agency 1021 N. Grand Avenue East, P.O. Box 19274 Springfield, IL 62794-9274
Sara Terranova; Stephanie Diers, Office of Chief Legal Counsel Illinois Environmental Protection Agency 1021 N. Grand Avenue East P.O. Box 19274 Springfield, IL 62794-9274	

Please take notice that on July 10, 2013, we filed electronically with the Office of the Clerk of the Illinois Pollution Control Board the attached **Petition for Modification of Variance to Include Additional Conditions for Protection of Aquatic Life Uses**, a copy of which is served upon you.

CITGO PETROLEUM CORPORATION and
PDV MIDWEST REFINING, L.L.C.

By: _____
One of Its Attorneys

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CITGO PETROLEUM CORPORATION and PDV MIDWEST REFINING, L.L.C.,	)	
Petitioners,	)	PCB_____ (Variance - Water)
v.	)	
ILLINOIS ENVIRONMENTAL PROTECTION AGENCY,	)	
Respondent.	)	

PETITION FOR MODIFICATION OF VARIANCE TO INCLUDE ADDITIONAL CONDITIONS FOR PROTECTION OF AQUATIC LIFE USES

Petitioners PDV Midwest Refining, L.L.C. ("PDVMR") and CITGO Petroleum Corporation (collectively the "Lemont Refinery") request that the Illinois Pollution Control Board ("Board") modify the variance issued in PCB 12-94 ("Recent Variance") by adding a condition for the protection of aquatic life uses in the Lower Ship Canal ("Added Condition"). Petitioners additionally request that the Board affirm and re-adopt the requirements from the prior Order, which required the Lemont Refinery to undertake certain actions as contained in the existing variance that authorizes discharges of Total Dissolved Solids. *See* Exhibit 1 (PCB 12-94, October 18, 2012 Opinion and Order). PDVMR is the owner of the Lemont Refinery and CITGO Petroleum Corporation is the operator of this refinery. This Petition is brought pursuant to Section 35 of the Act, 415 ILCS 5/35, and Part 104 of Chapter 35 of the Illinois Administrative Code, 35 IAC § 104.100 *et seq*. In support of this Petition, the Lemont Refinery states as follows:

PRIOR PROCEEDINGS

1. The Lemont Refinery first sought a variance from the Board's water quality standards for TDS in November, 2004. This request was the result of an agreement that the Lemont Refinery reached with USEPA, the State of Illinois and other states, to reduce emissions as embodied in a Consent Decree. Under that Consent Decree, the Lemont Refinery installed a Wet Gas Scrubber in the Fluid Catalytic Converter Unit ("FCCU"), which resulted in a purge stream with dissolved solids and sulfates that is discharged through the Refinery's process water outfall #0001. The IEPA (hereafter "Agency") advised during its review of the water permit application, that because of elevated TDS levels in the Ship Canal that a variance would be required for it to issue the construction permit for the Wet Gas Scrubber. The Board initially granted the requested relief in an opinion and order in PCB 05-85 entered April 21, 2005 (the "First Variance"), attached as Exhibit 2.[1]

2. After the First Variance was granted new data and changes in applicable regulations downstream of the refinery created the need for the Lemont Refinery to seek certain changes to the variance conditions that the Board imposed in the First Variance. Accordingly, the Lemont Refinery filed an Amended Petition and the Agency filed its Recommendation, with certain conditions to reflect the changed circumstances. The Board subsequently granted the variance (the "Second Variance") in an opinion an order in PCB 08-33 entered May 15, 2008, attached as Exhibit 3.

3. Several material facts changed since the Second Variance was granted, however, the basic environmental situation remains the same. Although the Second Variance anticipated

the removal of the TDS standard in a pending rulemaking proceeding before the Board, that has yet to be resolved. Exhibit 3 at p.14 (*citing In The Matter of: Water Quality Standards and Effluent Limitations for the Chicago Area Waterway System (CAWS) and the Lower Des Plaines River: Proposed Amendments to 35 Ill. Adm. Code 301, 302, 303 and 304*, R08-09 (hereinafter, "R08-09"). Notably, R08-09 is still pending. The Board, therefore, issued a further opinion and order on October 18, 2012, in PCB 12-94. Exhibit 1. The Recent Variance ultimately led to this Motion for an Added Condition to protect aquatic uses in the Lower Ship Canal.

4. At about the same time as the Second Variance was proceeding, the Board increased the water quality standard for total dissolved solids ("TDS") for another refinery owned by the ExxonMobil Corporation. Specifically, the TDS water quality standard ranged from the ExxonMobil Outfall in the Des Plaines River to its confluence with the Kankakee River. *See Revisions to Water Quality Standards for Total Dissolved Solids in the Lower Des Plaines River ExxonMobil Oil Corporation*, R06-24 (Site-Specific Rulemaking - Water), February 15, 2007 opinion and order attached as Exhibit 4. The Board also eliminated the water quality standard for TDS in General Use waters. *See Triennial Review of Sulfate and Total Dissolved Solids Water Quality Standards*, R07-09, (Rulemaking - Water), September 4, 2008 opinion and order attached as Exhibit 5. This created an odd situation of there being a water quality standard for TDS in the Chicago Sanitary & Ship Canal ("CSSC"), but no TDS standard at all in the general use waters downstream. The USEPA has approved both Board actions with respect to TDS. *See e.g.* Exhibit 6 (EPA April 24, 2006 approval letter and EPA's Rationale for Approval, March 18, 2009).

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[1] The Lemont Refinery is contemporaneously filing a Motion to include the Record from the PCB 05-85, PCB 08-33, and PCB 12-94 proceedings as part of this matter.

5. The Lemont Refinery filed a petition for the Recent Variance in order to extend the Second Variance, pursuant to 35 Ill. Admin. Code 104.210. Pursuant to the requirement in the Second Variance and corresponding schedule, the Lemont Refinery undertook certain required activities and now proposes that the variance amendment requested here build upon that work by making the revisions outlined below to the Recent Variance Order ("Accepted Order"). Notably, the Agency issued a favorable Recommendation with respect to the Recent Variance, and the only change the Agency sought was to add sampling for chlorides. *See* IEPA's Recommendations in PCB 12-94 record. The Lemont Refinery agreed to the Agency's request. *See* March 1, 2012 Hearing Officer Order in PCB 12-94 record. The Board subsequently granted the requested variance with the conditions agreed to by the Parties. Exhibit 1.

6. After the Board granted the Recent Variance, the Agency sent the Board's Order in PCB 12-94 to the USEPA for review. The Agency never explained to the Lemont Refinery why it chose to submit this variance to USEPA as opposed to any of the other variances. Indeed, it appears that this was the first time that the Agency had taken such an action regarding a water quality variance. The Agency also failed to advise the Lemont Refinery that USEPA had the Recent Variance under review. Nor was the Lemont Refinery given an opportunity to participate in any discussions with USEPA or the Agency regarding USEPA's review of this variance. Importantly, the Lemont Refinery only first learned of this review when the Agency provided USEPA's March 15, 2013 decision. USEPA letter and decision, March 15, 2013, attached as Exhibit 7. Even then it took a fairly significant effort in the form of multiple requests to the Agency to find out what exactly was submitted to USEPA as part of the record. The Lemont Refinery has since determined that, for whatever reason, the Agency did not submit to USEPA the very information that USEPA was seeking, particularly the extensive information that had

been developed by IEPA and submitted to the Board in the UAA CAWS rulemaking proceeding, R08-09, Docket C.

7. The USEPA rejected the variance. This decision appears to be predominantly based on the grounds of the meager record before it, which apparantly did not include the aquatic life use information presented in R08-09, Docket C. The principal statements of USEPA in rejecting the variance are found in the following statements:

> "The variance effectively removed for a time limited period the indigenous aquatic use and removed the TDS criterion necessary to protect that use of that period of time."
>
> "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)..."
>
> Exhibit 7, USEPA letter at p. 1-2.

8. While USEPA was deliberating about the Recent Variance, the Board issued its Opinion and Order on First Notice in Docket C of R08-09. *In The Matter of: Water Quality Standards and Effluent Limitations for the Chicago Area Waterway System (CAWS) and the Lower Des Plaines River: Proposed Amendments to 35 Ill. Adm. Code 301, 302, 303 and 304*, R08-9 (Subdocket C Rulemaking - Water) Opinion and Order (February 21, 2013). As the Board knows, that docket addresses the appropriate aquatic life uses for the receiving stream. In that Opinion, the Board found that the entire CSSC should be designated as "Aquatic Use B." *Id.* at 196-197. The Board made detailed findings and review of the record, particularly with respect to the very factors that USEPA found lacking in its review. The Board found that this segment of the CAWS met at least 3 of the criteria in 40 CFR 131.10(g) to justify that the CSSC was not able to attain the fishable/swimmable goals of the Clean Water Act. *Id.* (finding that the CSSC

met Factors 3, 4 and 5 of 40 CFR 131.10(g)). This Opinion was apparently never sent to USEPA in the context of the Recent Variance, nor did the Agency forward the memoranda that the Lemont Refinery and Agency filed before the Board, both of which supported the applicability of these three factors to the CSSC. The Board's Opinion on First Notice in Docket C lays out the justification for the CSSC being categorized appropriately as"Use B" water. *Id.*

9. Further, based on the prior rulings of the Board, both in the R08-09 Docket C proceeding and in the proceeding where the Board granted the ExxonMobil refinery a site specific TDS standard of 1686 mg/L, the Lemont Refinery now proposes to add the following condition to the Recent Variance Order issued in PCB 12-94.

> 12. During the Term of this Variance, the discharge from Outfall 001 of the Lemont Refinery outside the mixing zone shall not cause an exceedance of a TDS standard of 1686 mg/L and a sulfate standard of 1,371 mg/L.

(the "Added Condition"). All of the other conditions that the Lemont Refinery recommends be included in the variance are listed in the Accepted Order in PCB 12-94. *See* Exhibit 1 at p. 20-23. Specifically, the Lemont Refinery proposes to include all of the conditions in the Accepted Order with the addition of the water quality conditions for TDS and sulfates as appearing in the Added Condition stated above. *See* Exhibit 8 (Proposed Order).

10. The Lemont Refinery has collected the data as required by Paragraphs 3, 4, and 5 of the Order in PCB 08-33, and PCB 12-94. That information, which relates to TDS, is included in the records and Petitions for the prior variances. The information on TDS and chlorides as required by the Recent Variance is included in Exhibit 9.

11. The Lemont Refinery has also collected TDS information in an effort to address the requirements of paragraph 6, in particular: "To the extent there is a correlation between

effluent TDS concentration and any exceedence of an applicable water quality standard for TDS, petitioners must determine the time period that the water from the Fluid Catalytic Converter Unit (FCCU) wet gas scrubber bleed may require additional management or treatment, including holding, treatment, or alternative disposal." This information confirms the modeling done before the first variance was filed and the relative quantity of sulfates and TDS in the discharge. As further discussed below, this information demonstrates that the water from the FCCU unit is a minor contributor to the normal TDS levels in the Ship Canal, and an even smaller contributor to the increased TDS levels in the Ship Canal during periods of snow-melt.

BACKGROUND ON REFINERY

12. Information on this topic is included in the prior variances and Board orders and is incorporated by reference.

EXISTING WATER QUALITY

13. The Lemont Refinery discharges into the Ship Canal, upstream of the Lockport Lock & Dam, immediately above the "electric fish barrier," and within the safety zone established by the Coast Guard. Below the dam, the Canal merges with the Des Plaines River, passes through Joliet, and 11 miles downstream of Joliet passes beneath the I-55 Bridge. Until the I-55 Bridge, the receiving waters are designated as Secondary Contract waters; below the I-55 Bridge, the Des Plaines River is designated as General Use water, the General Use waters begin 18.5 miles below the Lemont Refinery's outfall. The Board has proposed a very similar use classification in R08-09 Docket C and the Lemont Refinery has supported that proposed Opinion and Order with respect to the CSSC. With respect to the water quality standards to be adopted in Docket D in R08-09, we note the TDS standards are as follows:

	General Use	Exxon-Mobil[2]	Secondary Contact
Total Dissolved Solids (TDS) mg/L	Removed in R07-09	1,686	1,500

Other information on the water quality conditions is included in the prior Petitions for Variance. However, the Lemont Refinery calls to the Board's attention that the series of variances began because of the elevated sulfates from the Wet Gas Scrubber, and not due to elevated chlorides. When this series of variances began, it was only TDS as caused by sulfates that led to the initial variance request. Chlorides are not associated with the Wet Gas Scrubber Project.

REGULATORY CONSTRAINTS

14. The following assertions are identical to the Recent Variance. Note that none of these items listed here were cited by the USEPA in its objection to the variance in PCB 12-94. *See* Exhibit 7.

15. There are no specific Illinois effluent limits on sulfates or TDS. Therefore, to the extent there are water quality impacts, effluent limits would be based on Water Quality Based Effluent Limits ("WQBELs") after mixing.

16. Mixing Zone - Under Illinois regulations, the maximum allowable mixing zone is 25 percent of the stream flow. Water quality standards must be achieved at the edge of the mixing zone. Using the Lemont Refinery's actual discharge loadings from Outfall 001, which the WGS discharge is part of, and 25 percent of the Canal's low flow yields the following incremental increases in concentrations at the edge of the mixing zone:

[2] Limit applies during winter months from point of discharge to confluence of lower Des Plaines River with Kankakee River.

	Projected Increase in WQ at Edge of Mixing Zone
Sulfate, mg/L	83
TDS, mg/L	116

17. Categorical Limits - U.S. EPA has promulgated categorical limits on various industries, including the petroleum refining industry. These regulations found in 40 CFR 419, do not include specific effluent limits on sulfates or TDS. The Board has previously found that the Lemont Refinery's wastewater treatment system goes beyond Best Available Technology ("BAT") requirements.

18. Impaired Waterways - Section 303(d) of the Clean Water Act requires states to identify impaired waterways and the causes of impairment and then develop what is essentially a waste load allocation for addressing the impairment. Illinois prepared its list of impaired waterways in 1998 and 738 segments were identified. Illinois also developed a priority list for addressing these 738 segments. According to IEPA's *Illinois Water Quality Report 2010*, the entire stretch of the Canal and the downstream Des Plaines River both are listed as impaired waterways, for a variety of reasons. However, none of the reasons listed are for TDS. The Illinois State Water Survey report entitled "The Sources, Distribution, and Trends of Chloride in the Waters of Illinois", published in 2012, suggests the principal sources of TDS and chlorides into the Ship Canal are upstream of the intake for the Lemont Refinery. *See* Exhibit 10 (excerpts from report).

19. The Lemont Refinery has conducted the water quality sampling for TDS as required by the variances from 2005. These data continue to show elevated TDS and chloride levels during periods of snow-melt conditions. The TDS and chloride results of the sampling

upstream of the Refinery are included in Exhibit 9. The TDS levels recorded in the Ship Canal – a high in 2008 of 4,468 mg/L; a high in 2010 of 2,047 mg/L, and three results in 2011 of over 2,900 mg/L – continue to show the effect of urban runoff from snow-melt. By comparison, the combined increase in TDS levels from the ExxonMobil FCCU project with the Lemont Refinery FCCU project is quite small—the maximum additional TDS levels at the I-55 bridge was projected to be 72 mg/L. That projection is consistent with the recent sampling data collected by the Refinery. By comparison, the TDS and chloride data in the Ship Canal upstream of the Refinery has much greater influence and variation. In the Ship Canal, the maximum level for each parameter during snow melt conditions is 2 to 4 times the average. Compared to the 72 mg/L TDS level from the WGS attributed to less toxic sulfates, the TDS increase due to more toxic chlorides to the Ship Canal during snow melt is greater than 1,000 mg/L and has been over 25,00 mg/L greater. Thus the variability in TDS due to run-off varies during snow melt between 12 to 30 times the contribution to water quality from the WGS discharge. Further, the maximum TDS levels in December, 2007 at the I-55 Bridge were the same as recorded before the WGS discharges began. Thus, the contribution from the WGS, the activity that lead to the Initial Variance request, has nothing to do with the exceedances of the TDS standard in the Ship Canal. *See* Petition at p. 13 in PCB 12-94 record.

20. Elevated TDS levels documented by the Lemont Refinery were observed over a nearly three-week-long stretch during February 2008 at the I-55 Bridge. The length of time and the volume of water required are greater than assumed when the Lemont Refinery put together its compliance plan for the variance in PCB 05-85. At the time of the 2005 variance, the available data on TDS levels in the Chicago Sanitary & Ship Canal and at the I-55 Bridge were those data being collected by the Metropolitan Water Reclamation District of Greater Chicago

("MWRDGC"). Based on the data available when the first variance was requested, the Lemont Refinery did not expect the duration of elevated TDS levels to last for such a long period of time. It is also believed that the TDS regulations would be eliminated, and hence that measures such as wastewater storage would not be required. However, the data collected pursuant to the First Variance for the Refinery indicate that elevated TDS levels could still extend over a three week period due to prolonged snowmelt conditions.

21. Of course, the length of time for the elevated TDS levels has a dramatic effect on planning any corrective measures. The Lemont Refinery's average permitted discharge is 5.79 MGD. The quantity of tankage needed to store that volume of wastewater would be substantial (perhaps 100 million gallons for a 20-day period, assuming this period of time is a worst case scenario). These circumstances are further support for adoption of a dynamic and flexible mechanism, such as a "Best Management Practices" approach to minimize TDS discharges into the Ship Canal. The Lemont Refinery submits that any corrective measures will need to be flexible and that some sort of a Best Management Practices plan should be a key element of any final measures. And of course, the Board has yet to either delete the TDS standard or to adopt some other requirement, such as the Agency-proposed sulfate and chloride water quality standards.

22. The uses of the receiving stream, the Lower Ship Canal and the Regulated Navigation Zone just upstream of the Black Safety Zone, are for tolerant species ("Use B" as proposed by the Board in R08-09 Docket C) and presently as Indigenous Aquatic Life. Using either nomenclature, the aquatic habitat in this segment is "very poor". *See In The Matter of: Water Quality Standards and Effluent Limitations for the Chicago Area Waterway System (CAWS) and the Lower Des Plaines River: Proposed Amendments to 35 Ill. Adm. Code 301, 302,*

303 and 304, R08-9 (Subdocket C Rulemaking - Water) Opinion and Order, at p. 26. Exhibit 11 hereto shows that the proposed interim TDS water quality standard of 1686 is very protective of this use and this aquatic habitat. The basis for the proposed sulfate standard is included in Exhibit 12, and is also protective of this use and aquatic habitat.

23. USEPA had also asked about other sources of TDS to the Ship Canal. *See* Exhibit 7, Basis for EPA's Disapproval at p. 5. The aforementioned Illinois State Water Survey report identifies non-point source run-off and the discharges of the MWRDGC as the principal sources of chlorides. By comparison, as shown by Exhibit 13, the Lemont Refinery contributes 0.25 percent of the chloride loadings during snow melt periods when chlorides in the Ship Canal are above 500 mg/l. *Id.* at Table 3 (Ship and Sanitary Canal "Average").

24. The Agency did not dispute these immediately preceding assertions in the Recent Variance. *See* IEPA's Recommendations in PCB 12-94 record.

25. Moreover, the USEPA's objection can be addressed by including a limit on TDS because the USEPA expressly complained that "[t]he variance effectively removed for a time limited period the indigenous aquatic use and removed the TDS criterion necessary to protect that use of that period of time" and that "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)..." Exhibit 7, USEPA letter at p. 1-2.

26. The Lemont Refinery proposes the Added Conditions as noted above to address these perceived deficiencies in the Recent Variance. The TDS limit of 1686 mg/L was previously approved by the Board in R06-24 and applied to both Secondary Contact and General

Use waters. As such, it is clearly protective of aquatic species in the Lower Ship Canal which can be defined as "tolerant" and suitable for "Aquatic Life Use B". This is confirmed by Exhibit 11. In addition, the Added Condition includes a limitation on sulfates in the Ship Canal which is based on the Sulfate standard for General use waters. Since sulfates are the pollutant added by the Wet Gas Scrubber and the material that led to these variances, we believe it is much more appropriate as an added condition than TDS.

27. Based on the foregoing, the Lemont Refinery submits that the relief here requested is consistent with the effluent standards and areawide planning criteria under the Clean Water Act. Moreover, these are conditions during the term of this variance. We fully expect the Board to move forward and adopt appropriate water quality standards in Docket D of R08-09.

ARBITRARY AND UNREASONABLE HARDSHIP

28. The prior variances and Board Orders clearly establish the existence of an arbitrary and unreasonable hardship. Those records are incorporated here.

29. While the USEPA may have an aversion to economic considerations, the record now also shows that the limits in the Added Condition would be clearly protective of an Aquatic Life Use B in the Lower Ship Canal. Thus the Added Condition is satisfactory even without regard to the showing of hardship, which notably is required for a variance under Illinois law and is an important factor for the Board to recognize.

30. Additionally, although this was not at issue in the USEPA's variance review, the Lemont Refinery remains willing to continue to pursue the affirmative measures identified in the Recent Variance Order. The Lemont Refinery submits that a TDS water quality management plan be required by the variance conditions proposed herein. This plan should take the form of a

Best Management Practices Plan to address TDS and snow-melt run-off conditions. The flexibility of such a plan would fit the episodic nature of the water quality conditions. Moreover, BMPs are being used in other river basins to address snow melt run-off and would be appropriate for this matter. It is readily acknowledged that highway de-icing practices are the key contributor to exceedences in the TDS water quality standard. Highway de-icing will preclude achievement of any chloride water quality standard adopted on the Ship Canal. These measures are cost-effective and provide relief for point source dischargers from conditions created by non-point sources. This same Best Management Practices approach proposed herein could be adopted to allow for relief during snow melt run-off, requiring point sources discharges to adopt BMPs so that any contribution to the chlorides/TDS would be minimized.

REQUEST FOR HEARING

31. The Lemont Refinery hereby requests a hearing on this Petition.

CONCLUSION

32. The hardship to the Lemont Refinery of compliance with respect to this matter is unquestioned. That hardship has been extensivly documented in the prior variances and is incorporated here by reference. It is also clear that this Variance, with the Added Conditions as included in the Recommended Conditions, is protective of the uses of the Lower Ship Canal and the Regulated Navigation Zone and the aquatic life and habitat. It therefore is consistent with federal law and the UAA proceedings ongoing before the Board. In conclusion, the Lemont Refinery requests that the Board grant this Variance Petition for Modification of Variance to include Additional Conditions for Protection of Aquatic Life Uses, for the same period of time as included in Order in PCB 12-94.

WHEREFORE, the Lemont Refinery requests that this Petition be granted.

CITGO PETROLEUM CORPORATION and
PDV MIDWEST REFINING, L.L.C.

By: _____
One of Its Attorneys

Dated: July 10, 2013

Jeffrey C. Fort
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13261107

CERTIFICATE OF SERVICE

The undersigned, an attorney, certifies that I have served upon the individuals named on the attached Notice of Filing true and correct copies of the **Petition for Modification of Variance to Include Additional Conditions for Protection of Aquatic Life Uses** by First Class Mail, postage prepaid, on July 10, 2013.

EXHIBIT 1

ILLINOIS POLLUTION CONTROL BOARD
October 18, 2012

CITGO PETROLEUM CORPORATION and PDV MIDWEST REFINING, L.L.C.,	)	
Petitioners,	)	
v.	)	PCB 12-94
	)	(Variance – Water)
ILLINOIS ENVIRONMENTAL PROTECTION AGENCY,	)	
Respondent.	)	

OPINION AND ORDER OF THE BOARD (by C.K. Zalewski):

On December 20, 2011, CITGO Petroleum Corporation (CITGO) and PDV Midwest Refining, L.L.C. (PDVMR) (collectively, petitioners) filed a petition for a five-year extension of the variance granted in CITGO Petroleum Corporation and PDV Midwest Refining, L.L.C. v. IEPA, PCB 08-33 (May 15, 2008). The PCB 08-33 variance granted relief, through May 15, 2013, from water quality standards for total dissolved solids (TDS) at 35 Ill. Adm. Code 302.208(g), and 302.407. Petitioners seek continued relief for discharges from the oil refinery in Lemont (Lemont Refinery), which CITGO operates and PDVMR owns. The Lemont Refinery discharges into the Chicago Sanitary and Ship (S & S) Canal, which is tributary to the Des Plaines River.

The Illinois Environmental Protection Agency (IEPA or Agency) recommends that the Board grant the variance extension, but only from 35 Ill. Adm. Code 302.407, stating that relief from Section 302.208(g) is no longer necessary. The Agency recommends that the variance be granted subject to conditions, including an additional condition not proposed by petitioners. Petitioners have waived hearing, and no request for a hearing or objection to the variance extension has been filed.

The Board grants the requested five-year variance extension, subject to conditions similar to those suggested and agreed to by the parties. This variance order modifies and extends certain conditions of the variance in PCB 08-33, issued May 15, 2008.

The Board finds that petitioners have demonstrated that denial of the requested variance would impose an arbitrary or unreasonable hardship. As explained below, the levels of TDS in petitioners' effluent in excess of the Board's standards are a byproduct of air pollution control equipment petitioners were required to install and use under a Consent Decree with the United States Environmental Protection Agency (USEPA), the State of Illinois, and several other states. As the Board and the parties here agree, the variance extension is necessary in part since the removal of the TDS standard from Board rules anticipated in the PCB 08-33 variance extension is still pending in R08-9(C) and (D). *See* Water Quality Standards and Effluent Limitations for

the Chicago Area waterway System (CAWS) and the Lower Des Plaines River: Proposed Amendments to 35 Ill. Adm. Code 301, 302, 303, and 304, R08-9.

In addition, the Board finds that the requested variance extension is not inconsistent with federal law and may be issued without any significant impact on public health or the environment. Finding relief from 35 Ill. Adm. Code 302.208(g) no longer applicable, the Board therefore grants petitioners the requested five-year variance extension, but only from 35 Ill. Adm. Code 302.407, subject to the conditions set forth in the order following this opinion.

In this opinion, the Board first describes the legal framework for variances, followed by a general description of the PCB 05-85 and PCB 08-33 proceedings. Next, the Board sets forth the procedural history of PCB 12-94. The Board then provides background on petitioners' facility, the Consent Decree, the air pollution control equipment, the S & S Canal and the Des Plaines River, and water sampling results. Next, the Board sets forth the TDS water quality standards from which petitioners seek continued relief. The Board then discusses the requested variance extension and IEPA's recommendation, including the proposed compliance plan. Lastly, the Board makes its findings on hardship, environmental impact, consistency with federal law, and conditions for the variance extension.

LEGAL FRAMEWORK

A "variance is a temporary exemption from any specified rule, regulation, requirement or order of the Board." *See* 35 Ill. Adm. Code 104.200(a)(1). Under Title IX of the Environmental Protection Act (Act) (415 ILCS 5/35-38 (2010)), the Board is responsible for granting variances when a petitioner demonstrates that immediate compliance with the Board regulation would impose an "arbitrary or unreasonable hardship" on petitioner. *See* 415 ILCS 5/35(a) (2010); *see also* 415 ILCS 5/37(a) (2010) (burden of proof is on petitioner). The Board may grant a variance, however, only to the extent consistent with applicable federal law. *See* 415 ILCS 5/35(a) (2010). Further, the Board may issue a variance with or without conditions, and for only up to five years. *See* 415 ILCS 5/36(a) (2010). The Board may extend a variance from year to year if petitioner shows that it has made satisfactory progress toward compliance with the regulations from which it received the variance relief. *See* 415 ILCS 5/36(b) (2010). The Board may grant variance extensions for longer than a year. *See* The Ensign-Bickford Company v. IEPA, PCB 00-24 (Nov. 18, 1999); Village of North Aurora v. IEPA, PCB 95-42 (Apr. 20, 1995); City of Springfield v. IEPA, PCB 93-135 (Dec. 16, 1993); Dept. of the Army v. IEPA, PCB 92-107 (Oct. 1, 1992).

The Act requires IEPA to provide public notice of a variance petition, including notice by publication in a newspaper of general circulation in the county where petitioner's facility is located. *See* 415 ILCS 5/37(a) (2010); 35 Ill. Adm. Code 104.214. The Board will hold a hearing on the variance petition (1) if petitioner requests a hearing, (2) if IEPA or any other person files a written objection to the variance within 21 days after the newspaper notice publication, together with a written request for hearing, or (3) if the Board, in its discretion, concludes that a hearing would be advisable. *See* 415 ILCS 5/37(a) (2010); 35 Ill. Adm. Code 104.224, 104.234.

The Act requires IEPA to appear at hearings on variance petitions (415 ILCS 5/4(f) (2010)) and to investigate each variance petition and "make a recommendation to the Board as to the disposition of the petition." 415 ILCS 5/37(a) (2010); 35 Ill. Adm. Code 104.216. In a variance proceeding then, the burden is on the petitioner to prove that immediate compliance with Board regulations would cause an arbitrary or unreasonable hardship that outweighs public interest in compliance with the regulations. *See* Willowbrook Motel v. PCB, 135 Ill. App. 3d 343, 349-50, 481 N.E.2d 1032, 1036-1037 (1st Dist. 1985).

BACKGROUND ON PCB 05-85 and PCB 08-33

The instant petition for a variance extension concerns petitioners' oil refinery in Lemont, Will County, which CITGO operates and PDVMR owns. The original variance was issued by the Board in CITGO Petroleum Corp. and PDV Midwest Refining, L.L.C. v. IEPA, PCB 05-85 (Apr. 21, 2005). The first variance extension was issued by the Board in CITGO Petroleum Corp. and PDV Midwest Refining, L.L.C. v. IEPA, PCB 08-33 (May 15, 2008).

In PCB 05-85, the Board granted CITGO and PDVMR a variance from the general use water quality standard for TDS of 1,000 milligrams per liter (mg/L) (35 Ill. Adm. Code 302.208(g)) and the secondary contact and indigenous aquatic life water quality standard for TDS of 1,500 mg/L (35 Ill. Adm. Code 302.407). By the terms of the Board's order, the variance relief lasted through December 15, 2009, and was subject to various conditions. Before granting the variance, the Board found that petitioners proved that compliance with the TDS water quality standards would impose an arbitrary or unreasonable hardship on petitioners, and that the requested variance was not inconsistent with federal law and could be issued without any significant impact on public health or the environment.

The PCB 05-85 variance allowed petitioners greater amounts of TDS in their wastewater discharge to the S & S Canal, which leads to the Des Plaines River. The Board found the higher levels of TDS in petitioners' effluent are a byproduct of the air pollution control equipment that petitioners had to install and use under a Consent Decree with USEPA and the states of Illinois, Louisiana, New Jersey, and Georgia. IEPA recommended that the Board grant the variance requested in PCB 05-85, which the Board did by order of April 21, 2005.

In PCB 08-33, the Board issued CITGO and PDVMR an extension, continuing to allow petitioners greater amounts of TDS in their wastewater discharge to the S & S Canal, because of regulatory developments since the original PCB 05-85 variance was granted in 2005. Specifically, two pending rulemakings proposed eliminating the TDS water quality standards for general use and secondary contact waters, including the S & S Canal and Des Plaines River. *See* R07-9[1] and R08-9[2]. IEPA recommended granting the extension. On May 15, 2008, the Board

[1] Triennial Review of Sulfate and Total Dissolved Solids Water Quality Standards: Proposed Amendments to 35 Ill. Adm. Code 302.102(b)(6), 302.102(b)(8), 302.102(b)(10), 302.208(g), 309.103(c)(3), 405.109(b)(2)(A), 409.109(b)(2)(B), 406.100(d); Repealer of 35 Ill. Adm. Code 406.203 and Part 407; and Proposed New 35 Ill. Adm. Code 302.208(h), R07-9 (R07-9 Triennial Review).

issued the variance extension in PCB 08-33, with relief extending through May 15, 2013 and subject to conditions similar to those of PCB 05-85.

PROCEDURAL HISTORY OF PCB 12-94

Petition

Petitioners filed their petition for variance extension on December 20, 2011, waiving hearing.[3] Included in the petition was a motion to incorporate by reference the record in PCB 08-33. Ext. Pet. at 2 and Exh. A. The Board grants that motion. See 35 Ill. Adm. Code 101.306.

On January 19, 2012, the Board issued an order accepting the petition without making a determination on the informational sufficiency or merits of the petition. On April 3, 2012, petitioners filed a response to a Hearing Officer Order issued March 5, 2012 directing petitioners to address issues outlined in the order.[4]

IEPA Notice and Recommendation

On January 3, 2012, IEPA filed a motion for extension of time to publish notice of the petition for variance extension in PCB 12-94. On January 11, 2012, petitioners filed a response to IEPA's motion, stating no objection. The Board granted IEPA's motion by order of January 19, 2012. On January 25, 2012, IEPA filed proof that the notice was published in the *South DuPage Reporter/Progress* on January 11, 2012.

On February 17, 2012, IEPA filed a recommendation that the Board grant the requested variance extension, subject to an additional condition to the proposed compliance plan as set forth in the recommendation.[5] IEPA did not receive any written comments, objections, or requests for a hearing. Ext. Agency Rec. at 2, 6, 8.

BACKGROUND

Overview

PDVMR owns and CITGO operates the Lemont Refinery, which is located at 135th Street and New Avenue in Lemont, Will County. Ext. Pet. at 1, 4. Petitioners entered into a

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[2] 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 301, 302, 303 and 304, R08-9 (R08-9).

[3] The Board cites the petition for variance extension as "Ext. Pet. at _."

[4] The Board cites the petitioners' April 4, 2012, response to the March 5, 2012 hearing officer order as "Pet. Resp. to HOO at __."

[5] The Board cites IEPA's February 17, 2012 recommendation as "Ext. Agency Rec. at _."

Consent Decree with USEPA and the states of Illinois, Louisiana, New Jersey, and Georgia to resolve alleged air quality violations at three refineries owned or operated by CITGO and related entities. The Consent Decree was entered on January 27, 2005, in the United States District Court for the Southern District of Texas, Case No. H-04-3883. Ext. Pet. at 1, PCB 08-33 slip op. at 5-6 (May 15, 2008).

Under the Consent Decree, petitioners installed a wet gas scrubber (WGS) in the fluid catalytic converter unit (FCCU) to reduce sulfur dioxide (SO_2) air emissions at the Lemont Refinery. The resulting purge stream from the wet gas scrubber contains dissolved solids and sulfates, which are discharged into the Refinery's wastewater treatment system and contribute additional levels of TDS to the facility's treated wastewater. Ext. Pet. at 1-2, PCB 08-33 slip op. at 7-8, 18 (May 15, 2008). The Lemont Refinery discharges its treated wastewater to the S & S Canal, which flows into the Des Plaines River. PCB 08-33 slip op. at 3, 6, 8 (May 15, 2008).

During the original PCB 05-85 proceeding, petitioners stated that in order to obtain a construction permit for a purge treatment unit to treat the wastewater from the wet gas scrubber, IEPA required a modified National Pollutant Discharge Elimination System (NPDES) permit because of occasional water quality violations for TDS due to "snow melt runoff, carrying road salt and similar compounds into streams." PCB 08-33 slip op. at 6. With the potential impact of the Refinery's increased TDS discharge in the S & S Canal and downstream in the Des Plaines River at the Interstate 55 (I-55) bridge, petitioners maintained that a variance was needed. Without a variance, petitioners stated that IEPA could not issue the modified NPDES permit. *Id.*

Soon after the consent decree was lodged, petitioners filed their original petition for variance in PCB 05-85 on November 8, 2004. PCB 08-33 slip op. at 6-7 (May 15, 2008). On April 21, 2005, the Board granted the PCB 05-85 variance, subject to conditions, with relief through December 15, 2009. Because of pending rulemakings proposing to eliminate the TDS water quality standards in the receiving waters, petitioners filed a petition for extension of variance on November 14, 2007, and an amended petition on January 22, 2008 in PCB 08-33. On May 15, 2008, the Board granted the PCB 08-33 variance extension, subject to conditions, extending relief through May 15, 2013.

Since the PCB 08-33 variance extension was granted, the Board has completed the R07-9 rulemaking and eliminated the TDS water quality in general use waters effective September 8, 2008. Petitioners state that the proposed elimination of the TDS water quality standard for the S & S Canal in pending rulemaking R08-9 Subdockets C and D "are being held in abeyance pending submission of a proposed resolution by various parties". Ext. Pet. at 3-4. Petitioners note, "[t]here is no firm prediction when action may be taken" in R08-9. Ext. Pet. at 4. Petitioners state, "[t]his leaves the odd situation of there being a water quality standard for TDS in the [S & S Canal], but no TDS standard at all in the general use waters downstream." Ext. Pet. at 3.

Although the petitioners requested the Board exempt its discharge from the TDS water quality standard under R07-9, the Board instead suggested petitioners seek to extend the dates of the variance conditions, which lead to the prior variance extension in PCB 08-33. Ext. Pet. at 3. Later, petitioners requested in R08-9 that the Board proceed with a separate docket for the

affected segment of the S & S Canal, but the Board declined to do so. Therefore, petitioners filed the petition to extend the prior variance extension. Ext. Pet. at 3-4.

The Lemont Refinery

The Lemont Refinery was built during the period 1967 through 1970, and became operational in late fall 1969. Ext. Pet. at 8. Approximately 25 different products are made at the Lemont Refinery, including gasolines, turbine fuels, diesel fuels, furnace oils, petroleum coke, and various specialty naphthas that can be manufactured into intermediate products, such as antifreeze, dacron, detergent, industrial alcohols, plastics, and synthetic rubber. Ext. Pet. at 8. Ninety percent of the Lemont Refinery's output goes toward making gasolines, diesel fuels, home heating oils, and turbine fuels for use in Illinois and throughout the Midwest. Ext. Pet. at 8. As of the time of the petition's filing, the Lemont Refinery produces 168,626 barrels daily on average and employs approximately 530 people. Ext. Pet. at 8.

The Lemont Refinery draws water from the S & S Canal, and discharges into the S & S Canal upstream of the Lockport Lock & Dam. Ext. Pet. at 8, 10. According to petitioners, the Refinery takes approximately 5.0 million gallons of water daily from the S & S Canal and discharges approximately 4.5 million gallons to the S & S Canal—the difference constituting cooling tower evaporation and steam losses. Ext. Pet. at 8. The wastewater effluent contains dissolved solids derived from crude oil compounds that are removed at the Refinery, as well as concentrating the TDS present in the S & S Canal intake water from the evaporation cooling. Ext. Pet. at 8.

The Lemont Refinery operates under an NPDES permit (No. IL0001589), which was issued by IEPA. The NPDES permit includes Outfall 001 at the Refinery at river mile 296.5 on the S & S Canal (latitude 41°38'58" and longitude 88°03'31"). The NPDES permit was re-issued and modified by IEPA on June 22, 2007. Ext. Pet. at 8, Exh. D; Agency Rec. at 7. The permit does not have effluent limits on TDS, but does reflect the possibility of actions by the Board regarding the Refinery. Ext. Pet. at 8-9. The NPDES permit contains Special Condition 18, which provides:

> The permittee was granted a variance from the water quality standard for Total Dissolved Solids (TDS) for the discharge at outfall 001 in accordance with Illinois Pollution Control Board Order PCB 05-85. The permittee shall commence its study of downstream TDS concentrations in accordance with the schedule contained in this order. This permit may be modified to include any final limitations or monitoring requirements which may be necessary based on the results of the study, or future Illinois Pollution Control Board actions with result to Total Dissolved Solids water quality standards. This variance expires on December 15, 2009. Ext. Pet., Exh. D at 11.

The NPDES permit expired on July 31, 2011, and petitioners filed an application for renewal, which IEPA received on December 17, 2012. Ext. Pet. at 9, Agency Rec. at 7. As of the filing date of the petition, IEPA was reviewing the renewal permit application. Ext. Agency Rec. at 7.

The Lemont Refinery includes a physical/chemical and biological wastewater treatment plant, which performs primary, secondary, and tertiary treatment on the generated wastewater before it is discharged to the S & S Canal. Ext. Pet. at 9. The Refinery has invested $45 million over the last ten years to upgrade the wastewater treatment system, including a purge treatment unit in 2007 for the purge water discharged from the wet gas scrubber discharge, discussed below, and 4,000,000 gallons of tankage for pretreatment to enhance solids removal before the wastewater treatment plant[6]. Ext. Pet. at 10, Pet. Resp. to HOO at 2.

Wet Gas Scrubber

Under the Consent Decree, petitioners installed a wet gas scrubber (WGS) in the fluid catalytic converter unit (FCCU) at the Lemont Refinery. The WGS is designed to remove SO_2 in air emissions from the FCCU. In October 2007, the WGS began operating. Ext. Pet. at 11, PCB 08-33 slip op. at 7-8 (May 15, 2008).

Petitioners state that the SO_2 is "ultimately converted to sodium sulfate salts which are contained in a purge stream." Ext. Am. Pet. at 11. Petitioner presented testimony at the PCB 05-85 hearing that the WGS discharge would "contain significant sodium sulfate, which essentially is the source of the TDS subject to the variance request." PCB 08-33 slip op. at 8 (May 15, 2008). The purge stream is discharged to a purge treatment unit and then to the Lemont Refinery's wastewater treatment system. Ext. Pet. at 1-2.

As the WGS was being constructed, petitioners estimated the daily average discharge of TDS from the WGS to be 215,000 pounds per day and the daily maximum would be 304,000 pounds per day. Based on actual data from 2008 through 2010, petitioners found that the quantity of TDS being discharged now due to the WGS is about half of what was previously predicted. Before the WGS was operational, TDS in the Refinery outfall averaged 2,644 mg/L or 106,065 pounds per day. Since the WGS began operating, the TDS in the Refinery outfall has averaged 4,829 mg/L or 200,515 pounds per day. Overall, the WGS loading has been on the order of 94,450 pounds per day. Pet. Resp. to HOO at 3-4, Exh. J.

S & S Canal and Des Plaines River

Below the Lockport Lock & Dam, the S & S Canal merges with the Des Plaines River, passes through Joliet, and 11 miles downstream of Joliet passes beneath the I-55 bridge. The Chicago Area Waterway System and the Lower Des Plaines River Waters are designated to protect for various recreational uses. *See* 35 Ill. Adm. Code 303.204, 303.220, and 303.224. For the general use portion of the Des Plaines River, petitioners note that the TDS water quality standard was repealed under R07-09. Ext. Pet. at 3. Petitioners modified their request for the variance extension to include only the TDS water quality standards applicable to the recreational use waters of the S & S Canal and Des Plaines River. Pet. Resp. to HOO at 1.

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[6] Petitioner notes that the 4,000,000 gallons of tankage was not intended to satisfy any of the compliance plan conditions of the PCB 08-33 order. Petitioner clarifies that the tankage is used as a solids/water separator and has no capacity for holding additional flow during periods of elevated TDS in the S & S Canal. Pet. Resp. to HOO at 2.

Petitioners state, and IEPA does not dispute, that neither the S & S Canal nor the downstream Des Plaines River has been listed by IEPA as impaired for TDS. Ext. Pet. at 13.

TDS and Chloride Data

Petitioners represent that they have conducted the TDS water quality sampling required by the conditions of the current and previous variances in PCB 08-33 and PCB 05-85. Ext. Pet. at 13. Samples were collected of the water intake upstream of the Lemont Refinery in the S & S Canal (Ext. Pet. Exh. B, C) and at the plant outfall (Ext. Pet. Resp. to HOO, Exh. I, K). Petitioners note, and IEPA agreed, that the monitoring and sampling requirement to collect downstream samples from the Des Plaines River near the I-55 bridge in condition 3 of PCB 08-33 should no longer be applicable. Since the TDS water quality standard was eliminated for general use waters, petitioners state that IEPA agreed that monitoring at that location could be discontinued. Ext. Pet. at 7.

Petitioners reported TDS data from the water intake samples collected upstream in the S & S Canal during the winter periods from April 3, 2007 through April 25, 2011. During this time period, TDS levels in the influent averaged from 772 mg/l in 2007 to 1,058 mg/L in 2011, with annual maximums appearing in December 2007 (2,045 mg/l), April 2008 (4,468 mg/l), November 2009 (1,883 mg/l), March 2010 (1,494 mg/l), and April 2011 (3,139 mg/l). Ext. Pet. Exh. B.

Petitioners also provided TDS data from the outfall before and after the wet gas scrubber began discharging for the time period from April 2007 to September 2010. Pet. Resp. to HOO Exh. I. Before the wet gas scrubber began operating, the TDS in the Refinery outfall averaged 2,644 mg/l or 106,065 pounds per day. Since the wet gas scrubber began discharging, the TDS in the Refinery outfall has averaged 4,829 mg/L or 200,515 pounds per day. Overall, the wet gas scrubber loading has been on the order of 94,450 pounds per day. Pet. Resp. to HOO at 3-4, Exh. J. Petitioners note that this loading is about half of the 215,000 pounds per day design average that was predicted in the original variance petition. Pet. Resp. to HOO at 4.

Based on actual discharge concentrations and flow, petitioners report the following incremental increases in sulfate and TDS levels in the receiving waters:

	S & S Canal at edge of mixing zone*	S & S Canal after complete mixing	DesPlaines River @I-55 Bridge after complete mixing
Sulfate (mg/l)	81	21	18
TDS (mg/l)	113	29	25

* Based on 25 percent of S & S Canal low flow

Ext. Pet. at 12, Pet. Resp. to HOO Exh. J.

Petitioners also reported chloride data at the plant intake from the S & S Canal and the plant outfall. For the period of January 10, 2005 to April 29, 2011, chloride levels in the influent

averaged from 211 mg/l in 2006 to 347 mg/L in 2011, with annual maximums appearing in January 2005 (835 mg/l), February 2006 (484 mg/l), December 2007 (998 mg/l), February 2008 (896 mg/l), March 2009 (881 mg/l), November 2010 (870 mg/l), and February 2011 (1099 mg/l). Chloride levels at the plant outfall for the period of July 25, 2011 to February 27, 2012 ranged from 130 mg/L in July 2011 to 1,000 mg/L in February 2012. Ext. Pet. Exh. C, Ext. Pet. Exh. G at Exh. C, Pet. Resp. to HOO Exh. K.

Petitioners note that the upstream sampling data "continue to show episodic elevated chloride and TDS levels that are associated with snow melt run-off conditions." Ext. Pet. at 13. Based on data taken during February 2008, petitioners also found that elevated TDS levels could persist over a three-week period when snow melt conditions are prolonged. Ext. Pet. at 14. When TDS levels are elevated in the receiving stream, Huff explained during the R08-9(C) proceedings, "the Lemont Refinery loses its mixing zone for chlorides (and sulfates)..." Ext. Pet., Exh. G at 5; *see also id* at 7 ("Section 302.102(b)(9) prohibits mixing zones for constituents where the water quality standard is already violated in the receiving stream."). Petitioners indicated this constitutes another reason for this variance request. Pet. Resp. to HOO at 4.

APPLICABLE REGULATIONS

Petitioners seek a variance from TDS water quality standards at 35 Ill. Adm. Code 302.407. Part 302 sets forth water quality standards applicable throughout the State as designated in 35 Ill. Adm. Code 303. *See* 35 Ill. Adm. Code 302.101(a).

Subpart D of Part 302, which contains Section 302.407, sets forth the secondary contact and indigenous aquatic life water quality standards. *See* 35 Ill. Adm. Code 302.201(d). Section 302.407 provides a TDS standard of 1,500 mg/L. Petitioners seek variance relief from this standard regarding the S & S Canal. The S & S Canal is designated among Illinois' secondary contact and indigenous aquatic life waters, as is the Des Plaines River "from its confluence with the Chicago Sanitary and Shipping Canal to the Interstate 55 bridge." *See* 35 Ill. Adm. Code 303.441(a), (i). The provision from which petitioners seek relief, Section 302.407, reads in pertinent part:

Section 302.407 Chemical Constituents

Concentrations of other chemical constituents shall not exceed the following standards:

CONSTITUENTS	STORET NUMBER	CONCENTRATION (mg/L)
***		
Total Dissolved Solids	70300	1500

35 Ill. Adm. Code 302.407.

In a recent site-specific rulemaking R06-24[7], the Board adopted site-specific TDS water quality standards for portions of the Des Plaines River at 35 Ill. Adm. Code 303.445. For the segment of the Des Plaines River currently designated as Secondary Contact and Indigenous Aquatic Life Use waters downstream of the S & S Canal, the TDS water quality standard is 1,686 mg/L. However, Petitioners do not seek relief from this provision, which became effective on February 27, 2007. Section 303.445 reads:

Section 303.445 Total Dissolved Solids Water Quality Standard for the Lower Des Plaines River

a) Beginning November 1 and continuing through April 30 of each year, the total dissolved solids (TDS) water quality standard for Secondary Contact and Indigenous Aquatic Life Use waters in 35 Ill. Adm. Code 302.407 does not apply to the portion of the Des Plaines River from the ExxonMobil refinery wastewater treatment plant discharge point located at Interstate 55 and Arsenal Road (said point being located in Will County, T34N, R9E, S15, Latitude: 41°, 25', 20" North, Longitude: 88°, 11', 20" West) and continuing to the Interstate 55 bridge. TDS levels in these waters must instead meet a water quality standard for TDS (STORET Number 70300) of 1,686 mg/L.

b) Beginning November 1 and continuing through April 30 of each year, the TDS water quality standard for General Use Waters in 35 Ill. Adm. Code 302.208 does not apply to the Des Plaines River from the Interstate 55 bridge to the confluence of the Des Plaines River with the Kankakee River. TDS levels in these waters must instead meet a water quality standard for TDS (STORET Number 70300) of 1,686 mg/L. 35 Ill. Adm. Code 303.445.

[7] Revisions to Water Quality Standards for Total Dissolved Solids in the Lower Des Plaines River for ExxonMobil Oil Corporation: Proposed 35 Ill. Adm. Code 303.445, R06-24.

The Des Plaines River from the Interstate 55 bridge downstream is designated among Illinois' general use waters. Currently, there is no TDS water quality standard for general use waters. The previous TDS water quality standard for general use waters was repealed under the rulemaking in R07-9, effective September 8, 2008. *See* R07-9.

VARIANCE PETITION

Petitioners request the Board to extend the PCB 08-33 variance relief for five years, as well as modify the conditions and a number of internal dates within the conditions of the variance, noting relief from Section 302.208(g) is no longer relevant and should be removed. Petitioners have waived hearing. Ext. Pet. at 19, Pet. Resp. to HOO at 1. The petition is supported by the affidavit of Brigitte Postel, who has worked at the Lemont Refinery as Environmental Engineer, Water Coordinator since October 2003. Ext. Pet. Exh. H.

Petitioners represent that they have "undertaken the activities required by the prior variance as required by the prior schedule" and have collected data as required by conditions 3, 4, 5, and 6 of the Order in PCB 08-33. (Ext. Pet. at 4, 7.) In particular, condition 6 requires petitioners to identify any relationship between TDS in the effluent and the receiving streams and to determine a time period that the WGS purge stream would require additional management, treatment or disposal. In an effort to address the requirements of condition 6, petitioners evaluated the TDS information and confirmed results of the modeling done before the first variance was filed. Petitioners state, "[t]his information demonstrates that water from the FCCU unit is a minor contributor to the normal TDS levels in the Ship Canal..." Ext. Pet. at 7.

In light of the data collected and the regulatory developments discussed below, petitioners seek to extend the dates of the current variance "to avoid unnecessary activities." Ext. Pet. at 6. Specifically, petitioners state, "[i]n the next few months, CITGO would be required to undertake various substantive design and other measures which may either not be necessary, or different requirements may be created that are not now expected." Ext. Pet. at 6.

Regulatory Developments Since the 2008 Variance

According to petitioners, since the variance extension was granted in May 2008, "several other material facts have changed" that warrant the extension mostly as a result of two rulemaking: R07-9 Triennial Review and R08-9 CAWS/LDPR. Ext. Pet. at 2.

R07-9 Triennial Review. As noted above, the Board repealed the water quality standard for TDS in general use waters in Section 302.208(g) under rulemaking R07-9, effective September 8, 2008. Ext. Pet. at 3. Since then, petitioners and IEPA have agreed that the monitoring and sampling requirement to collect downstream samples from the Des Plaines River near the I-55 Bridge in Condition 3 of PCB 08-33 was no longer applicable. Ext. Pet. at 7. Additionally, petitioners and IEPA agree that a variance extension from Section 302.208(g) is no longer relevant or necessary. Pet. Resp. to HOO at 1, Agency Rec. at 6.

Petitioners note that, "[t]his leaves the odd situation of there being a water quality standard for TDS in the [S & S Canal], but no TDS standard at all in the general use waters

downstream." Ext. Pet. at 3. Petitioners explain that CITGO participated in the R07-9 proceedings, requesting the Board exempt its discharge from meeting the TDS water quality standard, but the Board declined to do so. At first notice in R07-9, the Board stated:

> While the Board declines to eliminate TDS standard for secondary contact waters, the Board recognizes that CITGO may face some hardship if TDS standard for secondary contact waters is not resolved in a timely manner. Specifically, CITGO may have to expend funds on designing wastewater storage system for wastewater from refinery's wet gas scrubber in order to comply with CITGO's variance conditions [PCB 05-85]. In this regard, the Board believes that CITGO has a number of options CITGO can pursue to avoid undertaking any exercise that may be unnecessary in the future, including seeking an extension of the current variance with amended conditions. R07-9 Triennial Review, slip op. at 30 (Sept. 20, 2007).

R08-9 CAWS/LDPR. At the time the variance extension in PCB 08-33 was issued, petitioners anticipated the removal of the TDS standard for the Canal in a pending rulemaking captioned: 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 301, 302, 303 and 304, R08-9. Ext. Pet. at 2. To date, R08-9 (Subdockets C and D) are still pending, and "are being held in abeyance pending submission of a proposed resolution by various parties". Ext. Pet. at 3-4.

Petitioners' Proposed Variance Extension Language

Petitioners state, "CITGO has undertaken the activities required by the prior variance as required by the prior schedule, and would propose that the requested variance build upon the prior variance..." Ext. Pet. a 5. Petitioners proposed revisions reflecting an adjusted timeline that would allow petitioners "to avoid unnecessary activities." Ext. Pet. at 6. Specifically, petitioners propose the following revisions to the Board's May 15, 2008 order as shown by strike-through and underlining:

> The Board grants CITGO and PDVMR a variance from the TDS water quality standards of 35 Ill. Admin. Code ~~302.208(g) and~~ 302.407, subject to the following conditions:
>
> 1. The duration of the variance relief from the identified TDS water quality standards is from ~~May 15,2008~~ [date of Board order] through ~~May 15, 2009~~[8] [5 years after the date of Board order]. This variance modifies and extends certain conditions of the variance in PCB ~~05-95, entered April 21, 2005.~~08-33, entered May 15, 2008.
>
> 2. This variance applies only to petitioners' Lemont Refinery at 135th Street and New Avenue in Lemont, Will County, regarding elevated TDS levels in the effluent of Outfall 001 due to operation of the wet gas scrubber

[8] Date is May 15, 2013 per May 15, 2008 Board Order in PCB 08-33.

under the Consent Decree entered January 26, 2005[9], in the United States District Court for the Southern District of Texas, Case No. H-04-3833.

~~3. Unless and until the United States Environmental Protection Agency (USEPA) approves the elimination of the general use water quality standard for TDS, petitioners must monitor and collect samples from the Des Plaines River near the I-55 bridge three times per week, during the winter months (December 1 to March 30), and analyze for TDS. Petitioners must submit the TDS sample results monthly to the Illinois Environmental Protection Agency (IEPA).~~

3. Unless and until USEPA approves the elimination of the TDS water quality standard for the Chicago Sanitary and Ship Canal (S & S Canal), petitioners must monitor their water intake from the S & S Canal two times per week, during the winter months (December 1 to March 30) for TDS. Petitioners must submit the TDS sample results monthly to IEPA.

4. Unless and until USEPA approves the elimination of the TDS water quality standard for the S & S Canal, petitioners must monitor TDS in the effluent from Outfall 001 two times per week, during winter months (December 1 to March 30). Petitioners must submit the TDS sample results monthly to IEPA.

5. Unless and until USEPA approves the elimination of the TDS water quality standard for the S & S Canal, petitioners must diligently attempt to identify any relationship between the TDS levels in the effluent from Outfall 001, and the water quality samples required to be collected pursuant to paragraphs 3, and ~~4, and 5~~ of this order. ~~To the extent there is a correlation between effluent TDS concentration and any exceedence of an applicable water quality standard for TDS, petitioners must determine the time period that the water from the Fluid Catalytic Converter Unit (FCCU) wet gas scrubber bleed may require additional management or treatment, including holding, treatment, or alternative disposal.~~

6. Unless USEPA has approved the elimination of the TDS water quality standard for the S & S Canal, by ~~45~~ 50 months from the date of the Board order, petitioners must prepare a TDS water quality management plan to identify and minimize its contributions of TDS to the Ship Canal utilizing Best Management Practices~~to address any contribution from the FCCU wet gas scrubber bleed as determined by the analyses performed pursuant to paragraph 6 of this order~~. Elements to be considered in developing this plan ~~must~~ may include a system to retain, treat, or dispose of the FCCU wet gas scrubber bleed or any other approach to eliminate wet gas scrubber bleed from Outfall 001 during periods when applicable TDS water quality standards are exceeded. Other options to be considered may

[9] The Consent Decree was entered January 27, 2005. PCB 05-85, Exh. 1, February 17, 2005.

include holding tanks~~, deep well disposal, crystallization, and any other technology or management strategy identified~~ and de-icing and softening practices at the Lemont Refinery.

7. Unless USEPA has approved the elimination of the TDS water quality standard for the S & S Canal, by ~~46~~ 51 months from the date of the Board order, petitioners must design the TDS water quality management plan/Best Management Plan for the conditions identified in paragraphs 5 and 6 ~~7~~ of this order and submit the plan to IEPA.

8. Unless USEPA has approved the elimination of the TDS water quality standard for the S & S Canal, by ~~48~~ 52 months from the date of the Board order, petitioners must submit to IEPA a wastewater construction permit application for any elements of the TDS water quality management plan/Best Management Plan for which permits or amended permits are required.

9. Unless USEPA has approved the elimination of the TDS water quality standard for the S & S Canal, by ~~54~~ 57 months from the date of the Board order, petitioners must begin construction as needed for an FCCU wet gas scrubber bleed control system and/or implement the TDS water quality management plan/Best Management Plan.

10. Unless USEPA has approved the elimination of the TDS water quality standard for the S & S Canal, by 60 months from the date of the Board order, petitioners must operate any equipment required to be constructed by the TDS water quality management plan/Best Management Plan as needed so as to not cause or contribute to any exceedences of applicable water quality standards ~~due to the operation of the wet gas scrubber identified in paragraph 2 of this order~~.

Ext. Pet. at 4-5, Pet. Resp. to HOO at 1.

These amendments, according to petitioners, will provide a five-year variance that "will really only provide three years of relief by moving the prior schedule back three years." Ext. Am. Pet. at 6. Moreover, petitioners state that:

> [I]f the Board removes the existing water quality standard for TDS in the [S & S Canal], this variance will become moot according to its terms, and not require further action by the Board. Ext. Pet. at 6.

Arbitrary or Unreasonable Hardship

In considering a variance request, the Board is required by Section 35(a) of the Act to determine whether the petitioner has presented adequate proof that it would suffer an arbitrary or unreasonable hardship if required to immediately comply with the Board's regulation at issue. *See* 415 ILCS 5/35(a) (2010).

Petitioners state that their request for variance extension is necessitated by the Consent Decree, which was lodged by USEPA to "substantially reduce emissions of sulfur dioxide [SO_2], nitrogen oxides [NO_X] and Particulate Matter [PM]." Ext. Pet. at 15. Petitioners agreed to the reductions and have invested over $140 million at the Lemont Refinery, "most of which costs are for the very wet gas scrubber which generates the TDS" at issue in the variance extension request. Ext. Pet. at 15.

Petitioners maintain that their contribution of TDS is "readily within the assimilative capacity of the waterway," and that there is no TDS water quality violation in the S & S Canal "except in association with snow melt conditions." Ext. Pet. at 15. Moreover, the TDS water quality standards are proposed to be removed in R08-9 for the S & S Canal. Ext. Pet. at 15.

Examined Alternatives

Petitioners investigated methods to avoid discharging the TDS contributions from the WGS into the existing wastewater treatment system, including holding tanks, deep well disposal, electrodialysis, biological sulfate reduction, reverse osmosis, and evaporation. Ext. Pet. at 16. Deep well disposal of the scrubber effluent was rejected by IEPA as an option, according to petitioners, because it would constitute a Class I injection well. Petitioners explain that such wells are not "permittable" in northeastern Illinois because no cap rock exists over the depth to which disposal wells are drilled. Ext. Pet. at 16.

In addition to deep well disposal, petitioners investigated several removal technologies. Petitioners explain that electrodialysis has not been applied in the chemical or refinery industries on this scale; biological sulfate reduction will not reduce the overall TDS concentration because it merely replaces the sulfate ions with carbonate ions; and reverse osmosis concentration is limited because scaling problems would develop given the high concentration of sodium sulfate. Ext. Pet. at 16.

Petitioners also evaluated evaporation, finding it to be the only other potentially available option, but noted that such a massive system has, to their knowledge, never before been constructed. Petitioners describe the evaporation approach as energy intensive, contributing to an increase in carbon dioxide emissions to the atmosphere. According to petitioners, the most energy efficient form of evaporation would be a falling film evaporator with mechanical vapor recompression followed by a crystallizer, centrifuge, and dryer. Petitioners estimated the capital cost in 2011 dollars on the order of $8,400,000 with costs of operation and depreciation of $1,200,000 per year, 40 percent of which would be energy costs. Ext. Pet. at 16-17. Overall, petitioners found no technologies for the removal of TDS that were both proven and cost-effective. Ext. Pet. at 17.

Under conditions 6 and 7 of the prior variance extension, petitioners were required to "determine the time period that the water from the FCCU wet gas scrubber may require additional management or treatment, including holding, treatment, or alternative disposal" and to "prepare a TDS water quality management plan . . . to retain, treat, or dispose of the FCCU wet gas scrubber bleed . . . during periods when applicable TDS water quality standards are

exceeded." Ext. Pet. at 5, PCB 08-33 slip op. at 25. Based on data taken during February 2008, petitioners found that elevated TDS levels could persist over a three-week period when snow melt conditions are prolonged. With a design average permitted discharge of 5.79 million gallons per day (MGD) of wastewater, petitioners calculated the volume of holding tankage would be near 100 million gallons for a 20-day period. Ext. Pet. at 14.

Petitioners suggested instead that a more flexible approach be used to minimize TDS discharges into the S & S canal in the form of "Best Management Practices". Ext. Pet. at 14-15. Petitioners explain that the flexibility of a plan using Best Management Practices would better fit the episodic nature of water quality conditions and practices being used in other river basins to address snow melt run-off. Ext. Pet. at 19. Petitioners proposed replacing references in the variance conditions to deep well disposal and crystallization with options that would consider "de-icing and softening practices at the Lemont Refinery." Ext. Pet. at 5.

Additionally, petitioners cite to activities directed by the Army Corps of Engineers related to preventing Asian Carp from reaching Lake Michigan that "have a substantial impact on aquatic life and the uses of the [S&S Canal] adjacent to and downstream of the Refinery." Ext. Pet. at 17-18.

Petitioners conclude that requiring control of the increased wastewater discharge would impose on them an arbitrary and unreasonable hardship:

> CITGO is not the cause of any current water quality standard exceedance; upstream conditions in the Ship Canal from snow melt conditions exceed the existing TDS standard, and the Agency has asked the Board to remove that standard as well. Further, CITGO is investing substantial monies in the Refinery to substantially reduce air emissions and substantially reducing the overall environmental releases from the Refinery, and the wastewater discharge involved is relatively modest. Ext. Pet. at 18.

Environmental Impact

When deciding to grant or deny a variance petition, the Board is required to balance the petitioner's hardship in complying with Board regulations against the impact that the requested variance will have on the environment. *See* Monsanto Co. v. PCB, 67 Ill. 2d 276, 292, 367 N.E.2d 684, 691 (1977). Petitioner must establish that the hardship it would face from denial of its variance request would outweigh any injury to the public or the environment from granting the relief, and "[o]nly if the hardship outweighs the injury does the evidence rise to the level of an arbitrary or unreasonable hardship." Marathon Oil Co. v. IEPA, 242 Ill. App. 3d 200, 206, 610 N.E. 2d 789, 793 (5th Dist. 1993).

Petitioners state that "there is no benefit to the public or the environment by compelling such compliance" with the existing TDS water quality standards. Ext. Pet. at 20. In the original proceeding, testimony was presented that, because TDS is composed of a variety of anions and cations, "there are no 'toxicity' values that can be applied to the generic TDS parameter." PCB 08-33 slip op. at 21-22 (May 15, 2008). Petitioners state, and IEPA does not dispute, that neither

the S & S Canal nor the downstream Des Plaines River has been listed by IEPA as impaired for TDS. Ext. Pet. at 13. Huff also testified that "sodium sulfate, at the proposed levels discharged, will not impact the aquatic community in the Chicago Sanitary and Ship Canal or in the Des Plaines River" and that there is "no adverse effect on aquatic life due to TDS and sulfate levels." PCB 08-33 slip op. at 22 (May 15, 2008).

On the other hand, petitioners have invested $140 million in the Lemont Refinery under the Consent Decree and projected reductions in "SO2 emissions by 15,300 tons/year, NO_X emissions by 1,100 tons/year, and PM emissions by 92 tons/year." Ext. Pet. at 15.

Furthermore, petitioners emphasize that, since the previous variance extension was granted, the Board has eliminated the TDS water quality standard for general use waters in R07-9. Petitioners report that the Board is considering IEPA's proposal to eliminate the TDS water quality standard for the S & S Canal in R08-9. Ext. Pet. at 2-3.

Consistency with Federal Law

Under Section 35 of the Act (415 ILCS 5/35 (2010)), the Board may grant a variance only to the extent that doing so is consistent with applicable provisions of federal law. In PCB 05-85 and PCB 08-33, IEPA concluded that granting the requested variance would not be inconsistent with the Clean Water Act or any other federal standard. PCB 08-33 slip op. at 22 (May 15, 2008). In this proceeding for an extension of the variance relief, petitioners maintain that they have again satisfied this requirement. Ext. Pet. at 15.

Agency Recommendation

IEPA recommends that the Board grant petitioners' requested variance extension for five years from the date of the Board's order, subject to a modification and an additional condition set forth in IEPA's recommendation. Ext. Agency Rec. at 6.

IEPA suggests striking the petitioners' suggested variance language seeking relief from 302.208(g), which IEPA states is unnecessary since the TDS water quality standard applicable to general use waters was removed by the Board in 2008. Ext. Agency Rec. at 6, 8. The additional condition IEPA suggests that the Board add to the compliance plan would require petitioners to "provide chloride data for their effluent to ensure that any future chloride water standard can be met." Ext. Agency Rec. at 6.

Regarding issues of both environmental impact and arbitrary or unreasonable hardship, IEPA states, "the underlying facts in this proceeding are identical to those considered by the Board in PCB 08-33 and PCB 05-85." IEPA thus maintains that the Board's previous findings regarding environmental impact and hardship are still applicable to this case. Ext. Agency Rec. at 4-6.

DISCUSSION

The Act authorizes the Board to grant variances, "beyond the limitations prescribed in this Act, whenever it is found, upon presentation of adequate proof, that compliance with any

rule or regulation . . . would impose an arbitrary or unreasonable hardship." 415 ILCS 5/35(a). Petitioners are requesting an extension of a 2008 variance issued by the Board in PCB 08-33 where the Board granted a variance from two of the Board's water quality standards for TDS (35 Ill. Adm. Code 302.208(g), 302.407). Ex. Pet. at 4. The petitioners request a variance for 5 years from the date of the Board order. Ex. Pet. at 4.

To obtain a variance, petitioners must establish that the hardship from denying the variance from Sections 302.208(g) and 302.407 "outweighs any injury to the public or the environment" from granting the variance. Marathon Oil Co. v. IEPA, 242 Ill. App. 3d 200, 206, 610 N.E.2d 789, 793 (5th Dist. 1993). If petitioners only show that compliance will be difficult, "that proof alone is an insufficient basis" for granting the variance. *Id.* Thus, "only if the hardship outweighs the injury does the evidence rise to the level of an arbitrary or unreasonable hardship." *Id.*

The Board finds, as it did in PCB 08-33 and PCB 05-85, that the Petitioners have established that the hardship they would experience outweighs any injury to the public or the environment from granting the relief. As discussed below, the Board additionally finds that petitioners have adequately addressed any potential alternatives; and that granting petitioners' variance is consistent with federal law. In so finding, the Board of course notes that the IEPA does not dispute petitioners' proof as outlined below.

Petitioners investigated methods to avoid discharging the TDS contributions from the wet gas scrubber into the existing wastewater treatment system, including holding tanks, deep well disposal, electrodialysis, biological sulfate reduction, reverse osmosis, and evaporation. Ext. Pet. at 16. The Board takes note of the petitioners' progress toward compliance, including reporting the TDS results of samples relating to the chlorides upstream of the Refinery, the correlation between effluent TDS concentration and any exceedence of an applicable water quality standard for TDS, and the contribution with the water from the FCCU unit to normal TDS in the Ship Canal. Ext. Pet. at 7.

With regard to environmental impact, petitioners explain that the Refinery "has only a modest theoretical impact on the Ship Canal," during stream low flow conditions, and taking into account loading from outfall 001 (which includes the WGS contribution). Ext. Pet. at 11. The sulfate and TDS levels in the waterways after complete mixing based on actual discharge concentrations and flow would increase only as follows: 18 mg/L sulfate and 25 mg/L TDS at the Des Plaines River at the I-55 Bridge and 21 mg/L sulfate and 29 mg/L TDS at the S & S Canal. *Id.* at 12. Notably, petitioners contend that their investment of over $140 million at the Refinery pursuant to the 2003 Consent Decree is projected to reduce SO_2 emissions by 15,300 tons/year, NO_x emissions by 1,100 tons/year, and PM emissions by 92 tons/year. *Id.* at 15.

Conditions

The Board grants petitioners' requested extension of variance from 35 Ill. Adm. Code 302.407, subject to the conditions proposed by petitioners, and modified by IEPA and the Board. Section 36(a) of the Act (415 ILCS 5/36(a) (2010)) provides that "[i]n granting a variance the Board may impose such conditions as the policies of this Act may require." The conditions are

those set forth as a compliance plan in the petition, modified by IEPA's recommendation, supplemented by petitioners in their response to the hearing officer order, and further modified by the Board.

IEPA proposed striking the petitioners' suggested variance language seeking relief from Section 302.208(g) as unnecessary since the Board repealed the TDS water quality standard for general use waters in R09-7, effective September 8, 2008. Agency Rec. at 6. Petitioners agreed that relief from Section 302.208(g) was no longer relevant and should be removed. Pet. Resp. to HOO at 1. The Board will therefore consider the petitioners' request for a variance only from Section 302.407.

IEPA also recommended adding a condition to "provide chloride data for [petitioners] effluent to ensure that any future chloride water standard can be met." Ext. Agency Rec. at 6. Although IEPA only requested adding a requirement for chloride data in the effluent, the petitioners responded by suggesting that chlorides be added to TDS as parameters to be monitored and reported for both conditions 3 and 4. Pet. Resp. to HOO at 5. The Board notes that condition 3 relates to the intake, while condition 4 relates to the effluent.

To that end, the Board finds sampling the influent would be prudent for the sake of comparison in quantifying the petitioners' incremental impact on the receiving stream. As indicated by the data provided, the petitioners have already been monitoring chloride in their influent and effluent, so the Board will modify the conditions to reflect the petitioners' current ongoing efforts. Therefore, the Board will add a requirement for chloride data in the influent and effluent under conditions 3 and 4. The Board will also include chloride with TDS under proposed condition 5 such that:

> petitioners must diligently attempt to identify any relationship between the TDS and chloride levels in the effluent from Outfall 001, and the water quality samples required to be collected pursuant to paragraphs 3 and 4 of this order.

Additionally, to address the possible increase of TDS above levels presented in the petition due to any increased production at the Lemont Refinery, petitioners propose the following condition be added to the terms of the variance extension:

> 11. Petitioners shall assess, on an annual basis, the quantity of TDS incrementally being added to the wet gas scrubber. If the amount of incremental TDS exceeds, or threatens to exceed, 215,000 pounds as a daily average on an annual basis, then petitioners shall either reduce its incremental TDS discharge to below 215,000 pounds on a daily average or submit a request for another variance with appropriate conditions. Pet. Resp. to HOO at 6.

In addition, Section 36(b) of the Act provides that if the Board grants a variance, the Board must do so "upon the condition that the person who receives such variance shall make such periodic progress reports as the Board shall specify." 415 ILCS 5/36(b) (2010). Under the proposed condition 7 of the variance extension, by 51 months from the date of today's order,

unless USEPA has approved elimination of the TDS standard for the S & S canal, petitioners must design a TDS water quality management plan/Best Management Practices Plan to identify and minimize its contributions of TDS to the S & S Canal. Condition 7 also requires that petitioners submit the plan to IEPA.

If the Board's decision does not effectuate the intent of the parties, or if any condition imposed by the Board is objectionable, petitioners may decline to execute the certificate of acceptance set forth below, and either or both parties may file a motion to reconsider. *See* 35 Ill. Adm. Code 101.520, 101.902, 104.240, 104.248.

CONCLUSION

The Board finds that petitioners will incur an arbitrary or unreasonable hardship absent grant of this extension of variance relief from the TDS secondary contact and indigenous aquatic life water quality standards of 35 Ill. Adm. Code 302.407. The Board finds that issuance of the variance extension is not inconsistent with federal law and will not significantly impact public health or the environment. Finding relief from 35 Ill. Adm. Code 302.208(g) no longer applicable, the Board therefore grants petitioners the requested five year variance extension, but only from 35 Ill. Adm. Code 302.407, subject to the conditions set forth this order. As requested by petitioners, this variance begins today.

This opinion constitutes the Board's findings of fact and conclusions of law.

ORDER

The Board grants CITGO Petroleum Corporation and PDV Midwest Refining, L.L.C. (petitioners) a variance from the Total Dissolved Solids (TDS) water quality standards of 35 Ill. Adm. Code 302.407, subject to the following conditions:

1. The duration of the variance relief from the identified TDS water quality standards is five years, from October 18, 2012 through October 18, 2017. This variance modifies and extends certain conditions of the variance in PCB 08-33, issued May 15, 2008.

2. This variance applies only to petitioners' Lemont Refinery at 135th Street and New Avenue in Lemont, Will County, regarding TDS concentrations in the effluent of Outfall 001 due to operation of the wet gas scrubber under the Consent Decree entered January 27, 2005, in the United States District Court for the Southern District of Texas, Case No. H-04-3833.

3. Unless and until the United States Environmental Protection Agency (USEPA) approves the elimination of the TDS water quality standard for the Chicago Sanitary and Ship Canal (S & S Canal), petitioners must monitor their water intake from the S & S Canal two times per week, during the winter months (December 1 to March 30) for TDS and chlorides. Petitioners must submit the TDS and chloride sample results monthly to the Illinois Environmental Protection Agency (IEPA).

4. Unless and until USEPA approves the elimination of the TDS water quality standard for the S & S Canal, petitioners must monitor TDS and chlorides in the effluent from Outfall 001 two times per week, during winter months (December 1 to March 30). Petitioners must submit the TDS and chloride sample results monthly to IEPA.

5. Unless and until USEPA approves the elimination of the TDS water quality standard for the S & S Canal, petitioners must diligently attempt to identify any relationship between the TDS and chloride levels in the effluent from Outfall 001, and the water quality samples required to be collected pursuant to paragraphs 3 and 4 of this order.

6. Unless USEPA has approved the elimination of the TDS water quality standard for the S & S Canal, by 50 months from the date of the Board order, petitioners must prepare a TDS water quality management plan to identify and minimize its contributions of TDS to the Ship Canal utilizing Best Management Practices. Elements to be considered in developing this plan may include a system to retain, treat, or dispose of the FCCU wet gas scrubber bleed or any other approach to eliminate wet gas scrubber bleed from Outfall 001 during periods when applicable TDS water quality standards are exceeded. Options to be considered may include holding tanks and de-icing and softening practices at the Lemont Refinery.

7. Unless USEPA has approved the elimination of the TDS water quality standard for the S & S Canal, by 51 months from the date of the Board order, petitioners must design the TDS water quality management plan/Best Management Plan for the conditions identified in paragraphs 5 and 6 of this order and submit the plan to IEPA.

8. Unless USEPA has approved the elimination of the TDS water quality standard for the S & S Canal, by 52 months from the date of the Board order, petitioners must submit to IEPA a wastewater construction permit application for any elements of the TDS water quality management plan/Best Management Plan for which permits or amended permits are required.

9. Unless USEPA has approved the elimination of the TDS water quality standard for the S & S Canal, by 57 months from the date of the Board order, petitioners must begin construction as needed for an FCCU wet gas scrubber bleed control system and/or implement the TDS water quality management plan/Best Management Plan.

10. Unless USEPA has approved the elimination of the TDS water quality standard for the S & S Canal, by 60 months from the date of the Board order, petitioners must operate any equipment required to be constructed by the TDS water quality management plan/Best Management Plan as

needed so as to not cause or contribute to any exceedences of applicable water quality standards.

11. Petitioners shall assess, on an annual basis, the quantity of TDS incrementally being added to the wet gas scrubber. If the amount of incremental TDS exceeds, or threatens to exceed, 215,000 pounds as a daily average on an annual basis, then petitioners shall expeditiously either reduce their incremental TDS discharge to below 215,000 pounds on a daily average or submit a variance request for another variance with appropriate conditions.

IT IS SO ORDERED.

If petitioners choose to accept this variance extension, they must, within 45 days after the date of this opinion and order, file with the Board and serve on IEPA a certificate of acceptance and agreement to be bound by all the terms and conditions of the granted variance. "A variance and its conditions are not binding upon the petitioner until the executed certificate is filed with the Board and served on the Agency. Failure to timely file the executed certificate with the Board and serve the Agency renders the variance void." 35 Ill. Adm. Code 104.240. The form of the certificate follows:

CERTIFICATE OF ACCEPTANCE

I (We), CITGO/PDV Midwest Refining, having read the opinion and order of the Illinois Pollution Control Board in docket PCB 12-94, dated October 18, 2012, understand and accept the opinion and order, realizing that this acceptance renders all terms and conditions of the variance set forth in that order binding and enforceable.

Petitioners: CITGO PETROLEUM CORPORATION

PDV MIDWEST REFINING, L.L.C.,

By: Yvonne Jeanneret
Authorized Agent

Title: Environmental Manager, Lemont Refinery

Date: Nov. 2, 2012

Section 41(a) of the Environmental Protection Act provides that final Board orders may be appealed directly to the Illinois Appellate Court within 35 days after the Board serves the order. 415 ILCS 5/41(a) (2010); *see also* 35 Ill. Adm. Code 101.300(d)(2), 101.906, 102.706. Illinois Supreme Court Rule 335 establishes filing requirements that apply when the Illinois Appellate Court, by statute, directly reviews administrative orders. 172 Ill. 2d R. 335. The Board's procedural rules provide that motions for the Board to reconsider or modify its final orders may be filed with the Board within 35 days after the order is received. 35 Ill. Adm. Code 101.520; *see also* 35 Ill. Adm. Code 101.902, 102.700, 102.702.

I, John T. Therriault, Assistant Clerk of the Illinois Pollution Control Board, certify that the Board adopted the above opinion and order on October 18, 2012, by a vote of 4-0.

John T. Therriault

John T. Therriault, Assistant Clerk
Illinois Pollution Control Board

EXHIBIT 2

ILLINOIS POLLUTION CONTROL BOARD
April 21, 2005

CITGO PETROLEUM CORPORATION and PDV MIDWEST REFINING, L.L.C.,	)	
Petitioners,	)	
v.	)	PCB 05-85 (Variance – Water)
ILLINOIS ENVIRONMENTAL PROTECTION AGENCY,	)	
Respondent.	)	

JEFFREY C. FORT AND LETISSA CARVER REID OF SONNENSCHEIN, NATH & ROSENTHAL, L.L.P., APPEARED ON BEHALF OF PETITIONERS; and

JAMES A. DAY, DARIN E. LECRONE, AND SCOTT A. TWAIT APPEARED ON BEHALF OF RESPONDENT.

OPINION AND ORDER OF THE BOARD (by A.S. Moore):

For their oil refinery in Lemont, Will County, CITGO Petroleum Corporation (CITGO) and PDV Midwest Refining, L.L.C. (PDVMR) (collectively, petitioners) seek a variance from two of the Board's water quality standards (35 Ill. Adm. Code 302.208(g), 302.407) for Total Dissolved Solids (TDS). The refinery, called the "Lemont Refinery," is operated by CITGO and owned by PDVMR.

The requested variance would last for approximately five years and allow petitioners greater amounts of TDS in their wastewater discharge to the Chicago Sanitary and Ship Canal (S & S Canal), which leads to the Des Plaines River. The higher levels of TDS in petitioners' effluent will come from air pollution control equipment that petitioners must install and use under a Consent Decree with the United States Environmental Protection Agency (USEPA), the State of Illinois, and several other states. The Illinois Environmental Protection Agency (Agency) recommends that the Board grant the requested variance, subject to conditions.

For the reasons set forth in this opinion, the Board finds that petitioners have proven that compliance with the TDS water quality standards at issue would impose an arbitrary or unreasonable hardship on petitioners. In addition, the Board finds that the requested variance is not inconsistent with federal law and may be issued without any significant impact on public health or the environment. The Board therefore grants petitioners the requested variance, subject to the conditions set forth in the order following this opinion. The variance relief begins today and lasts through December 15, 2009.

In this opinion, the Board first describes the legal framework for variances, followed by the procedural history of this case. The Board then provides background on petitioners' facility, the Consent Decree, the S & S Canal and the Des Plaines River, and the air pollution control equipment to be installed and the expected impacts from the resulting wastewater discharge. Next, the Board sets forth the TDS water quality standards from which petitioners seek relief: the general use water quality standard and the secondary contact water quality standard. The Board then discusses the requested variance, including petitioners' proposed compliance plan and the Agency's recommendation. Lastly, the Board makes its findings on hardship, environmental impact, consistency with federal law, and conditions for the variance.

LEGAL FRAMEWORK

A "variance is a temporary exemption from any specified rule, regulation, requirement or order of the Board." *See* 35 Ill. Adm. Code 104.200(a)(1). Under Title IX of the Environmental Protection Act (Act), 415 ILCS 5/35-38 (2002), the Board is responsible for granting variances when a petitioner demonstrates that immediate compliance with the Board regulation would impose an "arbitrary or unreasonable hardship" on petitioner. *See* 415 ILCS 5/35(a) (2002).

The Board may grant a variance, however, only to the extent consistent with applicable federal law. *See* 415 ILCS 5/35(a) (2002). Further, the Board may issue a variance with or without conditions, and for only up to five years. *See* 415 ILCS 5/36(a) (2002). The Board may extend a variance from year to year if petitioner shows that it has made satisfactory progress toward compliance with the regulations from which it received the variance relief. *See* 415 ILCS 5/36(b) (2002).

Specifically, as it relates to petitioners' request for a TDS water quality variance, the Act provides:

> To the extent consistent with applicable provisions of the Federal Water Pollution Control Act . . . and regulations pursuant thereto . . . :
>
> The Board may grant individual variances beyond the limitations prescribed in this Act, whenever it is found, upon presentation of adequate proof, that compliance with any rule or regulation, requirement or order of the Board would impose an arbitrary or unreasonable hardship. 415 ILCS 5/35(a) (2002); *see also* 35 Ill. Adm. Code 104.200, 104.208, 104.238.
>
> In granting a variance the Board may impose such conditions as the policies of this Act may require.
> ***
> [A]ny variance granted pursuant to the provisions of this Section shall be granted for such period of time, not exceeding five years, as shall be specified by the Board at the time of the grant of such variance, and upon the condition that the person who receives such variance shall make such periodic progress reports as the Board shall specify. 415 ILCS 5/36(a), (b) (2002); *see also* 35 Ill. Adm. Code 104.200, 104.210, 104.242, 104.244.

The Act requires the Agency to provide public notice of a variance petition, including notice by publication in a newspaper of general circulation in the county where petitioner's facility is located. *See* 415 ILCS 5/37(a) (2002); 35 Ill. Adm. Code 104.214. The Board will hold a hearing on the variance petition if petitioner requests a hearing, if the Agency or any other person files a written objection to the variance being granted within 21 days after the newspaper notice, or if the Board, in its discretion, concludes that a hearing would be advisable. *See* 415 ILCS 5/37(a) (2002); 35 Ill. Adm. Code 104.224, 104.234.

The Act requires the Agency to appear at hearings on variance petitions (415 ILCS 5/4(f) (2002)) and to investigate each variance petition and "make a recommendation to the Board as to the disposition of the petition" (415 ILCS 5/37(a) (2002); 35 Ill. Adm. Code 104.216). At hearing, the "burden of proof shall be on the petitioner." 415 ILCS 5/37(a) (2002); *see also* 35 Ill. Adm. Code 104.200(a)(1), 104.238(a). In a variance proceeding then, the burden is on the petitioner to prove that immediate compliance with Board regulations would cause an arbitrary or unreasonable hardship that outweighs public interest in compliance with the regulations. *See* Willowbrook Motel v. PCB, 135 Ill. App. 3d 343, 349-50, 481 N.E.2d 1032, 1036-1037 (1st Dist. 1985).

PROCEDURAL HISTORY

Petitioners filed their petition for variance on November 8, 2004, requesting a hearing. On November 18, 2004, the Board accepted the petition for hearing. On February 7, 2005, the Agency filed its recommendation on the variance petition, which included proof of publication of the variance petition notice on November 26, 2004, in the *Lemont Reporter/Metropolitan*.[1] This initial recommendation of the Agency was that the Board should deny the requested variance.

On February 17, 2005, petitioners filed the prefiled testimony of two witnesses: Claude Harmon and James Huff. Petitioners included 15 exhibits associated with the prefiled testimony. Harmon has been with CITGO as the Environmental Manager of the Lemont Refinery since 1994, and has been in the environmental field for 30 years. *See* Hearing Transcript at 17-18. Huff is a registered Professional Engineer and Vice President of Huff & Huff, Inc., an environmental consulting firm. Over the last 25 years, Huff has been involved in over 30 environmental impact studies associated with wastewater discharge impacts on receiving streams, including surveys of the S & S Canal and the Des Plaines River. Huff has worked with the Lemont Refinery for the past 22 years on various wastewater issues. Huff was retained by petitioners to assist in evaluating alternatives for the wastewater stream to be generated by the new air pollution control equipment, identifying associated water quality impacts, preparing related permit applications, and providing technical support on the variance petition. *See* Hearing Transcript at 29-32; Hearing Exhibit 8.

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[1] The Board cites the variance petition as "Pet. at _." The Board cites the Agency's February 7, 2005 recommendation as "Agency Rec. at _."

Hearing Officer Bradley Halloran conducted the hearing on the variance petition in Chicago on February 24, 2005. At hearing, the prefiled testimony of Harmon and Huff was entered into the record as if read, and petitioners' 15 exhibits were offered and admitted into the record, all without objection.[2] The Agency offered no testimony or exhibits at hearing. Counsel for the Agency stated on the record at the close of hearing that with petitioners' submission of testimony and exhibits, the Agency was prepared to support petitioners' request for variance. Tr. at 47-48.

The parties agreed to file their post-hearing briefs simultaneously. Petitioners filed their opening brief on March 14, 2005. The Agency filed its opening brief on March 15, 2005, in which the Agency recommended that the Board grant petitioners the requested variance. The parties waived their opportunity to file response briefs.[3]

BACKGROUND

Overview

As noted, PDVMR owns and CITGO operates the Lemont Refinery, which is located at 135th Street and New Avenue in Lemont, Will County. Exh. 4 at 1; Exh. 11 at 1; Tr. at 13. Petitioners entered into a Consent Decree with USEPA and the States of Illinois, Louisiana, New Jersey, and Georgia to resolve alleged air quality violations at three refineries owned or operated by CITGO and related entities. Exh. 1; Exh. 4 at 1; Exh. 6 at 1; Tr. at 7, 20. The Consent Decree was entered on January 26, 2005, in the United States District Court for the Southern District of Texas, Case No. H-04-3883. Exh. 1 at 165; Tr. at 20; Pet. Br. at 2.

According to petitioners, under the Consent Decree, petitioners must reduce air emissions at the Lemont Refinery, a process that will contribute additional levels of TDS to the facility's treated wastewater. Tr. at 24; Exh. 4 at 1; Pet. Br. at 2. Petitioners maintain that, to comply with the Consent Decree, they must construct certain equipment and obtain air and water construction and operating permits from the Agency. Exh. 4 at 1; Exh. 3 (construction permit drawings). Petitioners state that they face significant stipulated penalties if they fail to comply with the Consent Decree schedule. Tr. at 10, 21; Exh. 2 (schedule); Pet. Br. at 4. Harmon testified that petitioners will be undertaking a "major construction project extending approximately 20 months." Tr. at 20-21; *see also* Pet. Br. at 2; Exh. 2.

The Lemont Refinery discharges its treated wastewater to the S & S Canal. Exh. 4 at 2. In December 2004, petitioners submitted to the Agency a construction permit application to install new wastewater treatment equipment—that application is still pending before the Agency. Agency Rec. at 8; Exh. 5 (application for wastewater construction permit); Tr. at 21-22.

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[2] The Board cites the hearing transcript as "Tr. at _" and the hearing exhibits as "Exh. _ at _." The variance petition was admitted as a hearing exhibit, and is cited as either "Pet. at _" or "Exh. 4 at _."

[3] The Board cites petitioners' brief as "Pet. Br. at _" and the Agency's brief as "Agency Br. at _."

According to Harmon, the Agency advised petitioners that it cannot issue a wastewater construction permit because of occasional water quality violations for TDS. Tr. at 22; Exh. 4 at 2; Exh. 5; Pet. Br. at 2, Exh. B.

Specifically, Harmon testified that "two critical issues" raised by the Agency "pose challenges for the consent decree schedule." Tr. at 22; Pet. Br. at 2. First, the Agency will not grant the construction permit without also issuing a modified National Pollutant Discharge Elimination System (NPDES) permit. Second, because there has been an exceedence of the TDS standard in the past "in association with snow melt runoff, carrying road salt and similar compounds into streams," the Agency could not issue an NPDES permit for this project unless petitioners obtained a variance from the Board. Tr. at 22; Pet. Br. at 2-3. Huff likewise testified that "the Agency position that the addition of this wastewater stream would contribute to the existing TDS violations that periodically occur due to salt runoff from highway deicing activities leads to this variance request." Tr. at 40.

Petitioners maintain that the variance is needed because, with increased TDS discharge, there is a potential impact both in the S & S Canal and downstream at the Interstate 55 (I-55) Bridge over the Des Plaines River. Exh. 4 at 2; Tr. at 24. Petitioners state that their variance petition was filed soon after the Consent Decree was lodged. Pet. Br. at 3.

The Lemont Refinery

The Lemont Refinery was built during the period 1967 through 1970, and became operational in late fall 1969. Exh. 4 at 2. Approximately 25 different products are made at the Lemont Refinery, including gasolines, turbine fuels, diesel fuels, furnace oils, petroleum coke and various specialty napthas that can be manufactured into intermediate products such as antifreeze, Dacron, detergent, industrial alcohols, plastics, and synthetic rubber. *Id.* Ninety percent of the Lemont Refinery's output goes toward making gasolines, diesel fuels, home heating oils, and turbine fuels for use throughout the Midwest. *Id.* Currently, the Lemont Refinery produces 168,626 barrels daily on average and employs approximately 530 people. *Id.*

The Lemont Refinery draws water from the S & S Canal, and discharges into the Canal upstream of the Lockport Lock & Dam. Exh. 4 at 2, 5. According to petitioners, the Refinery takes approximately 4.0 million gallons of water daily from the Canal, and discharges approximately 3.8 million gallons to the Canal—the difference constituting cooling tower evaporation and steam losses. *Id.* at 2-3. The wastewater effluent contains dissolved solids derived from crude oil compounds that are removed at the Refinery, as well as concentrating the TDS present in the Canal intake water from the evaporation cooling. *Id.* at 3.

The Lemont Refinery operates under an NPDES permit (No. IL0001589), which was issued by the Agency and became effective September 1, 1994. Exh. 4 at 3; Exh 12 (existing NPDES permit); Agency Rec. at 8. Petitioners timely submitted a renewal application for the NPDES permit, so the permit continues in full force and effect during the Agency's review of the renewal application, which is still pending. Exh. 4 at 3; Agency Rec. at 8. The NPDES permit includes Outfall 001 at river mile 296.5 on the S & S Canal (latitude 41°38'58" and longitude 88°03'31"). The current NPDES permit does not have effluent limits on TDS. Exh. 4 at 3. In

August 2004, petitioners submitted to the Agency an application to modify their NPDES permit—that application is also still under review by the Agency. Agency Rec. at 8; Exh. 11 (NPDES permit modification application).

The Lemont Refinery includes a physical/chemical and biological wastewater treatment plant, which performs primary, secondary, and tertiary treatment on the generated wastewater before it is discharged to the S & S Canal. Exh. 4 at 3-4. Besides the discharge that is the subject of this variance petition, no specific projects are currently being developed that would increase the production rate of the amount of TDS discharged. Tr. at 22-23.

S & S Canal and Des Plaines River

Below the Lockport Lock & Dam, the S & S Canal merges with the Des Plaines River, passes through Joliet, and 11 miles downstream of Joliet passes beneath the I-55 Bridge. Exh. 4 at 5; Exh. 6 at 1. Upstream of the I-55 Bridge, the waters are designated as secondary contact waters. Downstream of the I-55 Bridge, the Des Plaines River is a general use water. The general use waters begin 18.5 miles downstream of petitioners' outfall. Tr. at 33; Exh. 4 at 5; Exh. 6 at 1.

According to Huff, from 1998 to 2005, petitioners weekly sampled for TDS in their water intake from the S & S Canal, collected upstream of the Lemont Refinery's wastewater discharge. Tr. at 33-34; Exh. 6 at 3; Exh. 9. From 1998 to 2002, the mean TDS ranged from a low of 541 milligrams per liter (mg/L) in 1998 to a high of 629 mg/L in 2001. Huff testified that the maximum TDS result (and the only exceedence of the 1,500 mg/L secondary contact TDS standard from 1998 to 2005 recorded by petitioners at the water intake) was 1,636 mg/L on March 8, 2002. Tr. at 34; Exh. 6, Table 1; Exh. 9.

The Metrolpolitan Water Reclamation District of Greater Chicago (MWRDGC) also had a weekly sampling program in 2001 and 2002. Tr. at 34; Exh. 6 at 3. The MWRDGC data is contained in Huff's report entitled *Impact of CITGO's Proposed Discharge on Water Quality* (December 2004), which was entered into the record at hearing as Exhibit 6. Tr. at 34. At the first MWRDGC sampling site downstream of the Lemont Refinery, at Lockport, the average TDS for January 2001 through July 2002 was 626 mg/L—petitioners' average since 2001 was 599 mg/L. Exh. 6 at 3, 8-9. At the I-55 Bridge, MWRDGC measured a mean TDS since 2001 of 705 mg/L. *Id.*

Huff testified that at the Lockport Lock & Dam, downstream of the Lemont Refinery outfall, the MWRDGC recorded one TDS exceedence (1,595 mg/L), on January 4, 2001, adding that the Lemont Refinery recorded 1,408 mg/L TDS the next day. Tr. at 34. At the sampling station at Jefferson Street in Joliet, which is the next MWRDGC station downstream from the Lockport Lock & Dam, the MWRDGC recorded one TDS exceedence (1,535 mg/L), on February 24, 2000. *Id.* Further downstream at the Empress casino, one TDS exceedence (1,867 mg/L) was recorded, also on February 24, 2000. *Id.* At the I-55 Bridge, where the general use water quality standard begins, the 1,000 mg/L TDS standard was exceeded on March 16, 2000 (1,902 mg/L), on January 25, 2001 (1,194 mg/L), on February 1, 2001 (1,075 mg/L), and on February 8, 2001 (1,139 mg/L). *Id.* at 34-35. The last three exceedences occurred over three

consecutive sampling events, which Huff testified implies that the "TDS excursion was persistent for at least 15 days." *Id.* at 35.

According to Huff, there is a "strong correlation between the upstream TDS readings and the downstream TDS readings," which "is to be expected as TDS is considered a 'conservative' pollutant; that is, there is little or no reduction due to chemical or biological processes." Tr. at 36. Huff added that "the preponderance of flow at the I-55 Bridge originates from the Chicago area, so there [are] limited dilutional effects until further downstream." *Id.*

Huff testified that a "review of all the TDS data (Exhibits 6 and 9) reveals that all of the elevated TDS readings occur in the winter, and are attributable to snowmelt runoff carrying salt runoff from highway deicing activities." Tr. at 35. Huff's report likewise concluded:

> The source of the elevated TDS in the waterway is from highway de-icing runoff. The significant tons of road salt that is applied in the drainage basin causes these TDS exceedances, independent of other activities. Exh. 6 at 5.

Because of deicing and snow melt run-off, petitioners maintain that the TDS violations would occur with or without petitioners' current or future contribution of TDS. Exh. 4 at 6, 8; Tr. at 8.

Wet Gas Scrubber

Under the Consent Decree, petitioners will install a wet gas scrubber, along with substantial support equipment and controls, at the Lemont Refinery. The wet gas scrubber is designed to reduce sulfur dioxide (SO_2) in air emissions from the carbon monoxide boiler on the Fluid Catalytic Converter Unit (FCCU). Exh. 3; Exh. 4 at 5; Exh. 6 at 1; Tr. at 8, 20-21. It is expected that by July 2006, construction of the wet gas scrubber will be complete and the discharge will begin. Exh. 4 at 12.

Huff testified that the wet gas scrubber discharge "will contain significant sodium sulfate, which essentially is the source of the TDS subject to the variance request." Tr. at 33. Specifically, the wet gas scrubber process generates water purge, which contains particulate and SO_2. The purge stream will be removed from the wet gas scrubber to control TDS and Total Suspended Solids levels in the scrubber water. Exh. 6 at 1; Tr. at 33.

Purge water from the wet gas scrubber will then be treated to remove suspended solids and ammonia, and cooled to 90°F. Effluent from the purge treatment unit will contain approximately 94,000 mg/L TDS and will be discharged to the treated water basin of the Lemont Refinery's wastewater treatment system and discharged through Outfall 001, along with the existing process wastewater. Exh. 4 at 5; Exh. 6 at 1-2; Pet. Br., Exh. A at 2. The combined outfall will have a projected TDS level of 8,700 mg/L. Exh. 6 at 4.

The purge treatment unit's effluent is expected to add 274,000 gallons per day average flow to the Lemont Refinery's wastewater discharge, and 215,000 pounds per day of TDS. Exh. 6 at 1; Tr. at 21, 33, 38-39; *see also* Exh. 5, 11. Huff estimated that low-flow stream conditions (7-day, 10-year) in the S & S Canal at the Lemont Refinery would be 1,134 million gallons per

day (MGD) and in the Des Plaines River at the I-55 Bridge would be 1,260 MGD. Tr. at 38-39; Exh. 4 at 5; Exh. 6 at 3-4.

According to Huff's estimate, the incremental increase at low flow in TDS levels from the FCCU effluent would be 23 mg/L in the S & S Canal and 21 mg/L in the Des Plaines River at the I-55 Bridge. Exh. 6 at 4. Using the existing water quality data described above and adding this incremental amount, petitioners project the following TDS concentrations after mixing: 606 mg/L in the S & S Canal and 726 mg/L in the Des Plaines River at the I-55 Bridge. *Id.* Huff added that the maximum TDS reading of 1,902 mg/L in the Des Plaines River is the equivalent of 38,000,000 pounds per day of TDS, and "the Lemont Refinery's contribution would be on the order of 0.6 percent of the total loading." Tr. at 36.

APPLICABLE REGULATIONS

Petitioners seek a variance from TDS water quality standards at 35 Ill. Adm. Code 302.208(g) and 302.407. Part 302 sets forth water quality standards applicable throughout the State as designated in 35 Ill. Adm. Code 303. *See* 35 Ill. Adm. Code 302.101(a).

Subpart B of Part 302, which contains Section 302.208(g), sets forth general use water quality standards that must be met in waters of the State for which there is no specific designation. *See* 35 Ill. Adm. Code 302.101(b); *see also* 35 Ill. Adm. Code 303.201 ("general use waters"). Section 302.208(g) provides a general use water quality standard for TDS of 1,000 mg/L. Petitioners seek variance relief from this standard for the Des Plaines River. Section 302.208(g) reads in relevant part:

> Section 302.208 Numeric Standards for Chemical Constituents
>
> g) Concentrations of the following chemical constituents shall not be exceeded except in waters for which mixing is allowed pursuant to Section 302.102.

Constituent	Unit	STORET Number	Standard
Total Dissolved Solids	mg/L	70300	1000

35 Ill. Adm. Code 302.208(g).

Subpart D of Part 302, which contains Section 302.407, sets forth the secondary contact and indigenous aquatic life water quality standards. *See* 35 Ill. Adm. Code 302.201(d). Section 302.407 provides a TDS standard of 1,500 mg/L. Petitioners seek variance relief from this standard regarding the S & S Canal. The S & S Canal is designated among Illinois' secondary contact and indigenous aquatic life waters, as is the Des Plaines River "from its confluence with the Chicago Sanitary and Shipping Canal to the Interstate 55 bridge." *See* 35 Ill. Adm. Code

303.441(a), (i). The provision from which petitioners seek relief, Section 302.407, reads in pertinent part:

> Section 302.407 Chemical Constituents
>
> Concentrations of other chemical constituents shall not exceed the following standards:

CONSTITUENTS	STORET NUMBER	CONCENTRATION (mg/L)
Total Dissolved Solids	70300	1500

35 Ill. Adm. Code 302.407.

THE REQUESTED VARIANCE AND AGENCY RECOMMENDATION

In their petition, petitioners request a five-year variance from the TDS water quality standards of Sections 302.208(g) and 302.407. Pet. at 2, 13. Based on the petition, the Agency originally recommended that the Board deny the requested variance for two primary reasons. First, the Agency believed that petitioners "had not adequately supported [their] contention that a binding consent decree required the installation of air pollution control equipment that prompted the variance petition." Agency Br. at 2. Second, the Agency maintained that petitioners' compliance plan set forth in the petition was inadequate. *Id.*

The Agency now believes that petitioners have addressed these two alleged deficiencies. Agency Br. at 1-3. As for the Agency's former concern regarding the Consent Decree, the Agency states that "[w]ith the introduction of the executed consent decree into the record of this matter, CITGO has now resolved this deficiency." *Id.* at 2. As for the Agency's former concern regarding the petition's compliance plan, the Agency states that petitioners' Exhibit 7 consists of a "detailed compliance plan," which is the "product of a series of meetings and negotiations between CITGO representatives and Illinois EPA staff." *Id.* at 2-3. This "new compliance plan fully resolves the Illinois EPA's concerns." Agency Br. at 3; Tr. at 11-12. The Agency therefore now recommends that the Board grant the requested variance. Agency Br. at 1, 3.

Petitioners' new compliance plan in Exhibit 7 reads as follows:

DATE	TASK
October 1, 2006	Identify a location near the I-55 Bridge for collecting water samples and secure access.
November 1, 2006	Retain a contractor to collect TDS samples in the Des Plaines during snow melt conditions.

December 1, 2006	CITGO will collect TDS samples, three times per week during the winter months (December 1 to March 30). During the defined sampling period, CITGO will attempt to identify the relationship between TDS levels at the discharge versus TDS levels at the I-55 bridge, with the expectation that this information will assist CITGO in identifying the scope of the period that CITO would need to hold the discharge.
April 1, 2008	End water quality testing.
May 1, 2008	Size the required retention system for the wet gas scrubber bleed for the maximum number of days the TDS level at the I-55 Bridge remains above 1,000 mg/L.
June 1, 2008	Initiate design of the system to hold the FCC wet gas scrubber bleed for the maximum number of days required when the TDS exceeds 1,000 mg/L at the I-55 Bridge.
December 1, 2008	Submit a wastewater construction permit application.
March 1, 2009	Begin construction as needed on retention system for FCC wet gas scrubber bleed stream system.
December 1, 2009	Place FCC wet gas scrubber bleed stream system into operation, as needed. Monitor the Des Plaines River five days per week (excluding weekends and holidays) during the winter months (December 1 to March 30).
December 15, 2009	Achieve final compliance with 35 IAC 302.208(g) and 302.407.

Exh. 7.

Petitioners state that this "negotiated compliance plan," which was "completed to the satisfaction of IEPA," requires petitioners to collect TDS data from the Des Plaines River at the I-55 Bridge during winter months. Pet. Br. at 3. Huff testified that the proposed TDS data collection is "extensive." Tr. at 40. According to petitioners, this data "will provide information that the Agency might not otherwise have the funding to undertake and could lead to better

understanding of the snowmelt phenomenon and perhaps yield ideas on how to reduce that impact." Tr. at 12.

Harmon testified that after two seasons of TDS testing, the Lemont Refinery "will be able to size the required holding tank or basin for the wet gas scrubber discharge during periods of high salinity." Tr. at 25, 40-41; Pet. Br. at 3. According to Harmon, the retention system project would begin by March 1, 2009, and "would be completed by the winter season beginning December 1, 2009." Tr. at 25, 41; Pet. Br. at 3.

HARDSHIP

In considering a variance request, the Board is required by Section 35(a) of the Act to determine whether the petitioner has presented adequate proof that it would suffer an arbitrary or unreasonable hardship if required to immediately comply with the Board's regulation at issue. *See* 415 ILCS 5/35(a) (2002).

Petitioners state that their variance request is necessitated by the Consent Decree, to which the Agency is a party. Exh. 4 at 9. USEPA lodged the Consent Decree, explains petitioners, to "substantially reduce emissions of [SO_2], nitrogen oxides [NO_X] and Particulate Matter [PM]." *Id.* Petitioners will be investing over $120 million at the Lemont Refinery, "most of which costs are for the very wet gas scrubber which generates the TDS" at issue in the variance request. *Id.* Petitioners state that they are subject to "substantial penalties" if they do not meet the Consent Decree schedule. Pet. Br. at 4.

The wet gas scrubber will increase the amount of TDS in the Lemont Refinery's treated wastewater. Pet. Br. at 4; Exh. 6 at 1; Tr. at 21, 33, 38-39; *see also* Exh. 5, 11. Petitioners maintain that their contribution of TDS would be "readily within the assimilative capacity of the waterway," and that there is no TDS water quality violation "except in association with snow melt conditions." Exh. 4 at 9.

Petitioners investigated methods to avoid releasing the FCCU wastewater into the existing wastewater treatment system, including a managed release program with the use of a storm water basin for retention; deep well disposal; and installation of evaporation wastewater treatment technology. Petitioners maintain that none of these alternatives is practical. Exh. 4 at 10, 12-13; Pet. Br. at 4. Petitioners also investigated "sewering the discharge . . . to the [MWRDGC]," but the MWRDGC informed petitioners that it "did not have the capacity to handle the discharge." Tr. at 10. The Agency ultimately does not take issue with any of petitioners' conclusions regarding the viability of alternative technologies.

Further regarding the investigated alternatives, Harmon testified that the storm water basin at the Lemont Refinery is used to collect site storm water runoff and drainage from naturally existing waterways. Tr. at 25; Pet. Br. at 4. According to Harmon, because of residential developments near the northwest facility boundary, there has been a marked increase in storm water volume in the site's storm water basin. Tr. at 25; Pet. Br. at 4. Runoff from the developments feeds into naturally existing waterways that terminate within boundaries of the Lemont Refinery and ends up in the site's storm water basin. Tr. at 25; Pet. Br. at 4-5. Harmon

explained that a special condition in an Agency-issued "Groundwater Management Zone Approval Letter" requires that the basin's water level be maintained below 12'9". According to Harmon, it has been difficult to comply with this condition because of the additional volume of storm water runoff from the residential developments. Tr. at 26; Pet. Br. at 5. Under these circumstances, retaining the wet gas scrubber effluent in the storm water basin during periods of snowmelt and deicing is not viable, Harmon testified. Tr. at 26; Pet. Br. at 5. However, strategies to divert the residential runoff before it crosses the Lemont Refinery border are being pursued. Harmon testified that if such a diversion is implemented, the site's storm water basin may be able to retain wet gas scrubber effluent during snowmelt conditions. Tr. at 26.

Deep well disposal of the scrubber effluent, according to petitioners, is also not a viable alternative because it would constitute a Class I injection well, which wells "are not permittable in northeastern Illinois because no cap rock exists over the depth where disposal wells are drilled." Pet. Br. at 5. Huff testified that "Class I wells require injection beneath a cap rock that will prevent migration upwards into higher aquifers" and northeastern Illinois "does not have a cap rock above the Mount Simon formation used for disposal wells throughout the Midwest." Tr. at 39; *see also* Pet. Br. at 5; Exh. 4 at 10; Exh. 13.

Petitioners also state that technologies for removing sodium sulfate from a dilute aqueous stream are limited: electrodialysis has not been applied in the chemical or refinery industries on this scale; biological sulfate reduction will not reduce the overall TDS concentration by simply replacing the sulfate ions with carbonate ions; and reverse osmosis concentration is limited because scaling problems would develop given the high concentration of sodium sulfate. Exh. 4 at 10; Pet. Br. at 5.

Petitioners maintain that the only alternative technology potentially available would be evaporation, which they describe as an energy intensive approach that would result in increased carbon dioxide emissions. Pet. Br. at 5-6.; Exh. 4 at 10-11, Attachment A; Tr. at 40. According to petitioners, this alternative "would result in substantial adverse affects on the environment in the form of increased emissions to evaporate the wastewater." Exh. 4 at 13. Additionally, in 2004 dollars, the capital cost for applying a falling film evaporator with mechanical vapor recompression to this wastewater stream is approximately $7 million. Operating costs are estimated at $1 million per year, including depreciation. Exh. 4 at 11; Pet. Br. at 6; Exh. 14 (evaporation costs). Huff testified that over the years, TDS variance "requests consistently have found evaporation technology cost- and energy-prohibitive." Tr. at 40.

Petitioners are unaware of any such massive evaporation project being built or operated, and conclude that requiring it here for the wet gas scrubber discharge would impose on them an arbitrary and unreasonable hardship. This is especially so, according to petitioners, because: installation is not practical, particularly in light of the time schedule required by the Consent Decree; petitioners are not the cause of TDS exceedences; petitioners are investing substantial funds to reduce air emissions; and the TDS discharge at issue is "relatively modest." Exh. 4 at 12; Tr. at 35-36; Pet. Br. at 6.

Huff testified that TDS effluent limits are not proposed as a condition of the variance because "it is clear that the TDS water quality violations are due solely to salt runoff from

highway deicing activities." Tr. at 43. Huff added that "the Lemont Refinery will have no control over the TDS concentrations, so the only possibility to control the pounds per day discharged is by limiting the discharge rate." *Id.* at 45. Limiting the discharge rate would require the Refinery to hold treated effluent, and presumably cease all discharge if the Des Plaines River TDS is greater than 1,000 mg/L, according to Huff. *Id.* Huff testified that today there is no storage capacity at the Lemont Refinery to accomplish this:

> [T]hese [TDS water quality] violations appear to occur over 15 consecutive days, but less than 22 days. The Lemont Refinery will have to come up with in excess of 4,000,000 gallons of capacity to isolate the wet gas scrubber during these periods of elevated TDS levels at the I-55 Bridge. Currently, this excess capacity does not exist, and the actual number of days that would require holding wet gas scrubber water currently is poorly understood. The requested compliance time frame is for the collection of the necessary data to properly size this holding basin/tankage. *Id.* at 45-46.

ENVIRONMENTAL IMPACT

When deciding to grant or deny a variance petition, the Board is required to balance the petitioner's hardship in complying with Board regulations against the impact that the requested variance will have on the environment. Monsanto Co. v. PCB, 67 Ill. 2d 276, 292, 367 N.E.2d 684, 691 (1977). Petitioner must establish that the hardship it would face from denial of its variance request would outweigh any injury to the public or the environment from granting the relief, and "[o]nly if the hardship outweighs the injury does the evidence rise to the level of an arbitrary or unreasonable hardship." Marathon Oil. Co. v. EPA, 242 Ill. App. 3d 200, 206, 610 N.E. 2d 789, 793 (5th Dist. 1993).

Petitioners state that there would be no cognizable benefit to the public or the environment in making them comply with the existing TDS water quality standards. Pet. Br. at 7. Huff testified that because TDS is composed of a variety of anions and cations, "there are no 'toxicity' values that can be applied to the generic TDS parameter." Tr. at 36. Petitioners maintain that the Agency has been investigating whether having a TDS water quality standard is necessary, and that the Agency may soon propose eliminating TDS as a water quality parameter. Exh. 4 at 9. According to Huff, the Agency believes at this point that the "technical data supported elimination of the TDS water quality standard." Tr. at 37; Pet. Br. at 7; Exh. 10.

Petitioners state, and the Agency does not dispute, that neither the S & S Canal nor the downstream Des Plaines River has been listed by the Agency as impaired for TDS. Exh. 4 at 7, 10. Huff testified that "sodium sulfate, at the proposed levels discharged, will not impact the aquatic community in the Chicago Sanitary and Ship Canal or in the Des Plaines River" and that there is "no adverse effect on aquatic life due to TDS and sulfate levels." Tr. at 37-38. Petitioners maintain that there would be no "significant injury to the public or the environment" from the requested variance. Pet. Br. at 7; Tr. at 37-38.

On the other hand, according to petitioners, their over-$120 million investment in the Lemont Refinery under the Consent Decree is projected to "reduce SO_2 emissions by 15,300

tons/year, NO_X emissions by 1,100 tons/year, and PM emissions by 80 tons/year." Exh. 4 at 9; *see also* Exh. 1; Tr. at 20.

CONSISTENCY WITH FEDERAL LAW

Under Section 35 of the Act (415 ILCS 5/35 (2002)), the Board may grant a variance only to the extent that doing so is consistent with applicable provisions of federal law. In its original recommendation, the Agency stated that if petitioners filed with the Board the information shared informally with the Agency, then "granting the requested variance would not be inconsistent with the Clean Water Act or any other federal standard." Agency Rec. at 7. In its post-hearing brief recommending that the Board grant the requested variance, the Agency states that petitioners, at hearing, "offered all the documents and testimony it had previously discussed informally with the Illinois EPA." Agency Br. at 2.

BOARD FINDINGS AND CONDITIONS

The Board has balanced the hardship petitioners would face in immediately complying with the TDS water quality standards against the impact that granting the requested variance would have on the public and the environment, all as described in detail above. Based on this record, and considering the conditions to which the variance would be subject, the Board finds that petitioners have established that the hardship they would experience outweighs any injury to the public or the environment from granting the relief. The Board finds that petitioners have presented adequate proof that they would suffer an arbitrary or unreasonable hardship if required to comply immediately with the Board regulations at issue. The Board further finds that the requested variance is not inconsistent with federal law.

As provided in Section 36(a) of the Act (415 ILCS 5/36(a) (2002)), "[i]n granting a variance the Board may impose such conditions as the policies of this Act may require." With minor clarifying language changes, the Board will impose as conditions on the variance those conditions agreed to by petitioners and the Agency and set forth as petitioners' compliance plan in Exhibit 7. The Board will impose additional conditions, however, specifically regarding sampling the wastewater effluent for TDS and reporting TDS sampling results. After discussing those new additional conditions, the Board will discuss when the variance terminates.

Effluent

The Board will require petitioners to monitor the effluent of Outfall 001 for TDS as a condition of the variance. *See* Condition 4. The Board finds this condition necessary given that petitioners have agreed to attempt to identify any relationship between TDS levels in the effluent of Outfall 001 and TDS levels in the Des Plaines River at the I-55 Bridge. *See* Condition 5. This data may also help to verify that the incremental TDS impacts from the Lemont Refinery will be as petitioners estimated. Further, the information may aid petitioners in identifying the time period that may be needed to hold the FCCU wet gas scrubber bleed. *See* Condition 5.

The Board will require this TDS effluent sampling twice per week, which is consistent with petitioners' current NPDES permit sampling protocol for other parameters. *See* Exh. 12.

Also, to be in accordance with the agreed-upon winter time frame for TDS sampling in the Des Plaines River at the I-55 Bridge, the Board will require the TDS effluent sampling only during the winter months, *i.e.*, December through March. *See* Condition 3.

Reporting

Section 36(b) of the Act provides that if the Board grants a variance, the Board must do so "upon the condition that the person who receives such variance shall make such periodic progress reports as the Board shall specify." 415 ILCS 5/36(b) (2002). Accordingly, as a condition of the variance, the Board will require petitioners to submit their in-stream and effluent TDS sampling results to the Agency on a monthly basis. *See* Conditions 3 and 4.

Duration

The record appears to contain conflicting statements on the duration of variance relief that petitioners seek. The petition itself, filed in November 2004, requests a "Variance for a period of 5 years from the date of granting this Variance on the conditions proposed herein." Pet. at 13. The subsequently-filed compliance plan, however, requires petitioners to "[a]chieve final compliance with 35 IAC 302.208(g) and 302.407" by December 15, 2009. Exh. 7. As the Board is today, April 21, 2005, granting the variance, the difference in duration would be roughly four months. Those four months could be significant because they are winter months, *i.e.*, the deicing and snow-melt runoff season.

For several reasons, the Board uses the earlier date (*i.e.*, December 15, 2009) for expiration of the variance relief. First, the compliance plan was prepared *after* the petition. Second, at hearing, the parties agreed on the record to the conditions set forth in the compliance plan. Third, petitioners do not repeat in their post-hearing brief a request for a "5-year variance." Fourth, the compliance plan provides not merely a time frame, but a date-certain, December 15, 2009.

Most importantly, under the compliance plan agreed to by petitioners and the Agency, petitioners have committed to begin operating, as necessary, the FCCU wet gas scrubber bleed retention system on December 1, 2009. As proposed, if the Des Plaines River is experiencing TDS exceedences at the I-55 Bridge, the retention system would hold the FCCU wet gas scrubber bleed, *i.e.*, the effluent expected to elevate TDS levels in Outfall 001. In other words, once the retention system is operational, the primary reason proffered by petitioners for needing the variance is eliminated. As Huff testified: "The requested compliance time frame is for the collection of the necessary data to properly size this holding basin/tankage." Tr. at 45-46. Moreover, under the compliance plan, petitioners have committed to be in compliance by December 15, 2009, with the TDS water quality standards from which they seek relief. It is unclear on this record why then, after that date, petitioners would be entitled to relief from those very standards.

The Board notes that, as provided in the compliance plan, the Board is requiring petitioners to monitor TDS in the Des Plaines River during the 2009 and 2010 winter season. This will therefore include sampling *after* the variance relief from the TDS water quality

standards has expired. This is simply a condition of the variance relief, and is in no way inconsistent with petitioners avoiding being subject to the general rules from April 21, 2005 through December 15, 2009.

If the Board's decision on the expiration of the variance relief does not effectuate the intent of the parties, or if any condition imposed by the Board is objectionable, petitioners may decline to execute the certificate of acceptance set forth below, and either or both parties may file a motion to reconsider. *See* 35 Ill. Adm. Code 101.520, 101.902, 104.240, 104.248.

CONCLUSION

The Board finds that if this petition for a variance from the TDS general use and secondary contact water quality standards (35 Ill. Adm. Code 302.208(g) and 302.407) is not granted, petitioners will incur an arbitrary or unreasonable hardship. The Board finds that issuance of the variance is not inconsistent with federal law and will not significantly impact public health or the environment. Therefore, the Board grants the requested variance to petitioners, subject to the conditions set forth in this order. The variance relief begins today and runs through December 15, 2009.

This opinion constitutes the Board's findings of fact and conclusions of law.

ORDER

The Board grants CITGO and PDVMR a variance from the TDS water quality standards of 35 Ill. Adm. Code 302.208(g) and 302.407, subject to the following conditions:

1. The duration of the variance relief from the identified TDS water quality standards is from April 21, 2005 through December 15, 2009.

2. This variance applies only to petitioners' Lemont Refinery at 135th Street and New Avenue in Lemont, Will County, regarding elevated TDS levels in the effluent of Outfall 001 due to operation of the wet gas scrubber under the Consent Decree entered January 26, 2005, in the United States District Court for the Southern District of Texas, Case No. H-04-3883.

3. By October 1, 2006, petitioners must identify a location near the I-55 Bridge for collecting water samples from the Des Plaines River and secure access for the sampling. By November 1, 2006, petitioners must retain a contractor to collect TDS samples at that location. From December 1, 2006 through March 30, 2008, petitioners must collect TDS samples from the Des Plaines River three times per week during the winter months (December 1 to March 30). Petitioners must submit the TDS sample results monthly to the Agency.

4. From December 1, 2006 through March 30, 2008, the effluent of Outfall 001 must be monitored for TDS two times per week during the winter months (December 1

to March 30). Petitioners must submit the TDS sample results monthly to the Agency.

5. Petitioners must diligently attempt to identify any relationship between TDS levels in the effluent of Outfall 001 and TDS levels in the Des Plaines River at the I-55 Bridge. Petitioners must use any resulting relevant information to identify the time period that may be needed to hold the FCCU wet gas scrubber bleed.

6. By May 1, 2008, petitioners must begin to size the system needed to retain the FCCU wet gas scrubber bleed for the maximum number of days that the TDS level in the Des Plaines River at the I-55 Bridge exceeds 1,000 mg/L.

7. By June 1, 2008, petitioners must begin to design the system needed to retain the FCCU wet gas scrubber bleed for the maximum number of days that the TDS level in the Des Plaines River at the I-55 Bridge exceeds 1,000 mg/L.

8. By December 1, 2008, petitioners must submit to the Agency a wastewater construction permit application for the FCCU wet gas scrubber bleed retention system.

9. By March 1, 2009, petitioners must begin construction as needed on the FCCU wet gas scrubber bleed retention system.

10. By December 1, 2009, petitioners must operate the FCCU wet gas scrubber bleed retention system as needed. From December 1, 2009 through March 30, 2010, petitioners must collect TDS samples from the Des Plaines River at the I-55 Bridge five days per week (excluding weekends and holidays). Petitioners must submit the TDS sample results monthly to the Agency.

IT IS SO ORDERED.

If petitioners choose to accept this variance, they must, within 45 days after the date of this opinion and order, file with the Board and serve on the Agency a certificate of acceptance and agreement to be bound by all the terms and conditions of the granted variance. "A variance and its conditions are not binding upon the petitioner until the executed certificate is filed with the Board and served on the Agency. Failure to timely file the executed certificate with the Board and serve the Agency renders the variance void." 35 Ill. Adm. Code 104.240. The form of the certificate follows:

CERTIFICATE OF ACCEPTANCE

I (We), _____, having read the opinion and order of the Illinois Pollution Control Board in docket PCB 05-85, dated April 21, 2005, understand and accept the opinion and order, realizing that this acceptance renders all terms and conditions of the variance set forth in that order binding and enforceable.

Petitioner CITGO PETROLEUM CORPORATION

By: _____
Authorized Agent

Title: _____

Date: _____

Petitioner PDV MIDWEST REFINING, L.L.C.

By: _____
Authorized Agent

Title: _____

Date: _____

Section 41(a) of the Environmental Protection Act provides that final Board orders may be appealed directly to the Illinois Appellate Court within 35 days after the Board serves the order. 415 ILCS 5/41(a) (2002); see also 35 Ill. Adm. Code 101.300(d)(2), 101.906, 102.706. Illinois Supreme Court Rule 335 establishes filing requirements that apply when the Illinois Appellate Court, by statute, directly reviews administrative orders. 172 Ill. 2d R. 335. The Board's procedural rules provide that motions for the Board to reconsider or modify its final orders may be filed with the Board within 35 days after the order is received. 35 Ill. Adm. Code 101.520; see also 35 Ill. Adm. Code 101.902, 102.700, 102.702.

I, Dorothy M. Gunn, Clerk of the Illinois Pollution Control Board, certify that the Board adopted the above opinion and order on April 21, 2005, by a vote of 5-0.

Dorothy M. Gunn, Clerk
Illinois Pollution Control Board

EXHIBIT 3

ILLINOIS POLLUTION CONTROL BOARD
May 15, 2008

CITGO PETROLEUM CORPORATION and PDV MIDWEST REFINING, L.L.C.,	)	
Petitioners,	)	
v.	)	PCB 08-33
	)	(Variance – Water)
ILLINOIS ENVIRONMENTAL PROTECTION AGENCY,	)	
Respondent.	)	

OPINION AND ORDER OF THE BOARD (by T.E. Johnson):

On November 14, 2007, CITGO Petroleum Corporation (CITGO) and PDV Midwest Refining, L.L.C. (PDVMR) (petitioners) filed a petition to extend the variance issued by the Board in CITGO Petroleum Corporation and PDV Midwest Refining, L.L.C. v. IEPA, PCB 05-85 (Apr. 21, 2005). In PCB 05-85, the Board granted petitioners a variance from two of the Board's water quality standards for Total Dissolved Solids (TDS) (35 Ill. Adm. Code 302.208(g), 302.407). The temporary regulatory relief granted in 2005 applies to petitioners' oil refinery in Lemont (Lemont Refinery), which CITGO operates and PDVMR owns.

In this proceeding, PCB 08-33, respondent, the Illinois Environmental Protection Agency (IEPA), recommends that the Board grant the variance extension, subject to conditions proposed by IEPA. Petitioners have waived hearing, and no request for a hearing or objection to the variance extension has been filed. The Board finds that it may issue a final decision on the merits based on the current record, which by incorporation includes the record of PCB 05-85. The proposed variance extension would last for five years and continue to allow petitioners greater amounts of TDS in their wastewater discharge to the Chicago Sanitary and Ship Canal (S & S Canal), which leads to the Des Plaines River. The higher levels of TDS in petitioners' effluent come from air pollution control equipment that petitioners were required to install and use under a Consent Decree with the United States Environmental Protection Agency (USEPA), the State of Illinois, and several other states.

For the reasons set forth in this opinion, the Board finds that petitioners have proven that compliance with the TDS water quality standards at issue would impose an arbitrary or unreasonable hardship on petitioners. In addition, the Board finds that the requested variance extension is not inconsistent with federal law and may be issued without any significant impact on public health or the environment. The Board therefore grants petitioners the requested variance extension, subject to the conditions set forth in the order following this opinion. The variance relief begins today and lasts through May 15, 2013.

In this opinion, the Board first describes the legal framework for variances, followed by a general description of the PCB 05-85 proceeding. Next, the Board sets forth the procedural history of PCB 08-33. The Board then provides background on petitioners' facility, the Consent Decree, the air pollution control equipment, the S & S Canal and the Des Plaines River, and water sampling results. Next, the Board sets forth the TDS water quality standards from which petitioners seek continued relief: the TDS general use water quality standard and the TDS secondary contact water quality standard. The Board then discusses the requested variance extension and IEPA's recommendation, including the proposed compliance plans. Lastly, the Board makes its findings on hardship, environmental impact, consistency with federal law, and conditions for the variance extension.

LEGAL FRAMEWORK

A "variance is a temporary exemption from any specified rule, regulation, requirement or order of the Board." *See* 35 Ill. Adm. Code 104.200(a)(1). Under Title IX of the Environmental Protection Act (Act) (415 ILCS 5/35-38 (2006)), the Board is responsible for granting variances when a petitioner demonstrates that immediate compliance with the Board regulation would impose an "arbitrary or unreasonable hardship" on petitioner. *See* 415 ILCS 5/35(a) (2006).

The Board may grant a variance, however, only to the extent consistent with applicable federal law. *See* 415 ILCS 5/35(a) (2006). Further, the Board may issue a variance with or without conditions, and for only up to five years. *See* 415 ILCS 5/36(a) (2006). The Board may extend a variance from year to year if petitioner shows that it has made satisfactory progress toward compliance with the regulations from which it received the variance relief. *See* 415 ILCS 5/36(b) (2006). The Board has granted variance extensions for longer than a year. *See* The Ensign-Bickford Company v. IEPA, PCB 00-24 (Nov. 18, 1999); Village of North Aurora v. IEPA, PCB 95-42 (Apr. 20, 1995); City of Springfield v. IEPA, PCB 93-135 (Dec. 16, 1993); Dept. of the Army v. IEPA, PCB 92-107 (Oct. 1, 1992).

Specifically, as it relates to petitioners' request for a TDS water quality variance extension, the Act provides:

> To the extent consistent with applicable provisions of the Federal Water Pollution Control Act . . . and regulations pursuant thereto . . . :
>
> The Board may grant individual variances beyond the limitations prescribed in this Act, whenever it is found, upon presentation of adequate proof, that compliance with any rule or regulation, requirement or order of the Board would impose an arbitrary or unreasonable hardship. 415 ILCS 5/35(a) (2006); *see also* 35 Ill. Adm. Code 104.200, 104.208, 104.238.
>
> In granting a variance the Board may impose such conditions as the policies of this Act may require.
> * * *
> [A]ny variance granted pursuant to the provisions of this Section shall be granted for such period of time, not exceeding five years, as shall be specified by the

> Board at the time of the grant of such variance, and upon the condition that the person who receives such variance shall make such periodic progress reports as the Board shall specify. Such variance may be extended from year to year by affirmative action of the Board, but only if satisfactory progress has been shown. 415 ILCS 5/36(a), (b) (2006); *see also* 35 Ill. Adm. Code 104.200, 104.210, 104.242, 104.244.

The Act requires IEPA to provide public notice of a variance petition, including notice by publication in a newspaper of general circulation in the county where petitioner's facility is located. *See* 415 ILCS 5/37(a) (2006); 35 Ill. Adm. Code 104.214. The Board will hold a hearing on the variance petition (1) if petitioner requests a hearing, (2) if IEPA or any other person files a written objection to the variance within 21 days after the newspaper notice publication, together with a written request for hearing, or (3) if the Board, in its discretion, concludes that a hearing would be advisable. *See* 415 ILCS 5/37(a) (2006); 35 Ill. Adm. Code 104.224, 104.234.

The Act requires IEPA to appear at hearings on variance petitions (415 ILCS 5/4(f) (2006)) and to investigate each variance petition and "make a recommendation to the Board as to the disposition of the petition" (415 ILCS 5/37(a) (2006); 35 Ill. Adm. Code 104.216). The "burden of proof shall be on the petitioner." 415 ILCS 5/37(a) (2006); *see also* 35 Ill. Adm. Code 104.200(a)(1), 104.238(a). In a variance proceeding then, the burden is on the petitioner to prove that immediate compliance with Board regulations would cause an arbitrary or unreasonable hardship that outweighs public interest in compliance with the regulations. *See* Willowbrook Motel v. PCB, 135 Ill. App. 3d 343, 349-50, 481 N.E.2d 1032, 1036-1037 (1st Dist. 1985).

BACKGROUND ON PCB 05-85

In PCB 05-85, the Board granted CITGO and PDVMR a variance from the general use water quality standard for TDS of 1,000 milligrams per liter (mg/L) (35 Ill. Adm. Code 302.208(g)) and the secondary contact and indigenous aquatic life water quality standard for TDS of 1,500 mg/L (35 Ill. Adm. Code 302.407). By the terms of the Board's order, the variance relief lasts through December 15, 2009, and is subject to various conditions. Before granting the variance, the Board found that petitioners proved that compliance with the TDS water quality standards would impose an arbitrary or unreasonable hardship on petitioners, and that the requested variance is not inconsistent with federal law and may be issued without any significant impact on public health or the environment.

The variance allows petitioners greater amounts of TDS in their wastewater discharge to the S & S Canal, which leads to the Des Plaines River. The higher levels of TDS in petitioners' effluent come from air pollution control equipment that petitioners had to install and use under a Consent Decree with USEPA, Illinois, Louisiana, New Jersey, and Georgia. IEPA recommended that the Board grant the variance requested in PCB 05-85, which the Board did by order of April 21, 2005.

PROCEDURAL HISTORY OF PCB 08-33

Petition and Amended Petition

Petitioners filed their petition for variance extension on November 14, 2007, waiving hearing. On December 20, 2007, the Board issued an order identifying several informational deficiencies in the petition and directing petitioners to file an amended petition to provide the additional information. On January 22, 2008, petitioners filed an amended petition, setting forth only the changed portions of the original petition, as permitted by Board procedural rule. In a February 21, 2008 order, the Board found that with the amended petition, petitioners provided the information required by the Board's procedural rules for the contents of a petition for variance extension.[1]

Incorporation of PCB 05-85 Record

On January 22, 2008, petitioners filed a motion to incorporate the record of PCB 05-85 into this proceeding. On February 21, 2008, the Board granted the motion and directed the Clerk to place a copy of the PCB 05-85 record into the PCB 08-33 record. As the PCB 05-85 record forms a part of the PCB 08-33 record, the Board cites to the PCB 05-85 record throughout today's opinion and below provides an abbreviated procedural history of that case.

In PCB 08-85, petitioners filed their petition for variance on November 8, 2004, requesting a hearing. On February 7, 2005, IEPA filed its recommendation on the variance petition. This initial recommendation of IEPA was that the Board should deny the requested variance.[2]

Before hearing in PCB 05-85, petitioners filed the pre-filed testimony of two witnesses: Claude Harmon and James Huff. Petitioners included 15 exhibits associated with the pre-filed testimony. Harmon had been with CITGO as the Environmental Manager of the Lemont Refinery since 1994, and had been in the environmental field for 30 years. *See* Hearing Transcript at 17-18. Huff is a registered Professional Engineer and Vice President of Huff & Huff, Inc., an environmental consulting firm. At the time, Huff had been involved in over 30 environmental impact studies associated with wastewater discharge impacts on receiving streams over a 25-year period, including surveys of the S & S Canal and the Des Plaines River. Huff had worked with the Lemont Refinery for the past 22 years on various wastewater issues. Huff had been retained by petitioners to assist in evaluating alternatives for the wastewater stream to be generated by the new air pollution control equipment, identifying associated water quality impacts, preparing related permit applications, and providing technical support on the original variance petition. *See* Hearing Transcript at 29-32; Hearing Exhibit 8.

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[1] The Board cites the petition for variance extension as "Ext. Pet. at _" and the amended petition as "Ext. Am. Pet. at _."

[2] The Board cites the PCB 05-85 variance petition as "Pet. at _." The Board cites IEPA's February 7, 2005 recommendation in PCB 05-85 as "Agency Rec. at _."

Hearing Officer Bradley Halloran conducted the hearing on the PCB 05-85 variance petition in Chicago on February 24, 2005. At hearing, the pre-filed testimony of Harmon and Huff was entered into the record as if read, and petitioners' 15 exhibits were offered and admitted into the record, all without objection.[3] IEPA offered no testimony or exhibits at hearing. Counsel for IEPA stated on the record at the close of hearing that with petitioners' submission of testimony and exhibits, IEPA was prepared to support petitioners' request for variance. Tr. at 47-48. Petitioners filed their post-hearing brief on March 14, 2005. IEPA filed its post-hearing brief on March 15, 2005, in which IEPA recommended that the Board grant petitioners the requested variance.[4] As stated above, the Board granted the variance, subject to conditions, on April 21, 2005.

IEPA Notice and Recommendation

On December 26, 2007, IEPA filed a motion for extension of time to publish notice of the petition for variance extension in PCB 08-33. The Board granted IEPA's motion by order of January 10, 2008. On March 3, 2008, IEPA filed proof that the notice was published in the *Lemont Reporter/Metropolitan* on December 28, 2007, and February 1, 2008.

On March 10, 2008, IEPA filed a recommendation that the Board grant the requested variance extension, subject to the conditions of a compliance plan set forth in the recommendation.[5]

Statutory Decision Deadline

The 120-day statutory period for the Board to decide this case recommenced upon the filing of the amended petition for variance extension, making the decision deadline May 21, 2008. *See* 415 ILCS 5/38 (2006).

BACKGROUND

Overview

PDVMR owns and CITGO operates the Lemont Refinery, which is located at 135th Street and New Avenue in Lemont, Will County. Exh. 4 at 1; Exh. 11 at 1; Tr. at 13. Petitioners entered into a Consent Decree with USEPA and the States of Illinois, Louisiana, New Jersey, and Georgia to resolve alleged air quality violations at three refineries owned or operated by CITGO and related entities. Exh. 1; Exh. 4 at 1; Exh. 6 at 1; Tr. at 7, 20. The Consent Decree was

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[3] The Board cites the PCB 05-85 hearing transcript as "Tr. at _" and the hearing exhibits as "Exh. _ at _." The PCB 05-85 variance petition was admitted as a hearing exhibit, and is cited as either "Pet. at _" or "Exh. 4 at _."

[4] For the post-hearing briefs in PCB 05-85, the Board cites petitioners' brief as "Pet. Br. at _" and IEPA's brief as "Agency Br. at _."

[5] The Board cites IEPA's recommendation in PCB 08-33 as "Ext. Agency Rec. at _."

entered on January 25, 2003, in the United States District Court for the Southern District of Texas, Case No. H-04-3883. Ext. Agency Rec. at 5-6; Exh. 1 at 165; Tr. at 20; Pet. Br. at 2.

According to petitioners, under the Consent Decree, petitioners must reduce air emissions at the Lemont Refinery, a process that will contribute additional levels of TDS to the facility's treated wastewater. Tr. at 24; Exh. 4 at 1; Pet. Br. at 2. Petitioners maintain that, to comply with the Consent Decree, they must construct certain equipment and obtain air and water construction and operating permits from IEPA. Exh. 4 at 1; Exh. 3 (construction permit drawings). Petitioners state that they face significant stipulated penalties if they fail to comply with the Consent Decree schedule. Tr. at 10, 21; Exh. 2 (schedule); Pet. Br. at 4. Harmon testified in the prior proceeding that petitioners would be undertaking a "major construction project extending approximately 20 months." Tr. at 20-21; *see also* Pet. Br. at 2; Exh. 2.

The Lemont Refinery discharges its treated wastewater to the S & S Canal. Exh. 4 at 2. In December 2004, petitioners submitted to IEPA a construction permit application to install new wastewater treatment equipment. Agency Rec. at 8; Exh. 5 (application for wastewater construction permit); Tr. at 21-22. According to Harmon, IEPA advised petitioners that it could not issue a wastewater construction permit because of occasional water quality violations for TDS. Tr. at 22; Exh. 4 at 2; Exh. 5; Pet. Br. at 2, Exh. B.

Specifically, Harmon testified during the original proceeding that "two critical issues" raised by IEPA pose "challenges for the consent decree schedule." Tr. at 22; Pet. Br. at 2. First, IEPA would not grant the construction permit without also issuing a modified National Pollutant Discharge Elimination System (NPDES) permit. Second, because there had been an exceedence of the TDS standard in the past "in association with snow melt runoff, carrying road salt and similar compounds into streams," IEPA could not issue an NPDES permit for this project unless petitioners obtained a variance from the Board. Tr. at 22; Pet. Br. at 2-3. Huff likewise testified in the prior proceeding that "the Agency position that the addition of this wastewater stream would contribute to the existing TDS violations that periodically occur due to salt runoff from highway deicing activities leads to this variance request." Tr. at 40.

In PCB 05-85, petitioners maintained that the variance was needed because, with increased TDS discharge, there is a potential impact both in the S & S Canal and downstream at the Interstate 55 (I-55) bridge over the Des Plaines River. Exh. 4 at 2; Tr. at 24. Petitioners stated that their variance petition was filed soon after the Consent Decree was lodged. Pet. Br. at 3.

The Lemont Refinery

The Lemont Refinery was built during the period 1967 through 1970, and became operational in late fall 1969. Ext. Pet. at 4; Exh. 4 at 2. Approximately 25 different products are made at the Lemont Refinery, including gasolines, turbine fuels, diesel fuels, furnace oils, petroleum coke and various specialty napthas that can be manufactured into intermediate products such as antifreeze, dacron, detergent, industrial alcohols, plastics, and synthetic rubber. *Id.* Ninety percent of the Lemont Refinery's output goes toward making gasolines, diesel fuels, home heating oils, and turbine fuels for use in Illinois and throughout the Midwest. *Id.*

Currently, the Lemont Refinery produces 168,626 barrels daily on average and employs approximately 530 people. *Id.*

The Lemont Refinery draws water from the S & S Canal, and discharges into the Canal upstream of the Lockport Lock & Dam. Ext. Pet. at 4, 7; Exh. 4 at 2, 5. According to petitioners, the Refinery takes approximately 5.0 million gallons of water daily from the Canal, and discharges approximately 4.5 million gallons to the Canal—the difference constituting cooling tower evaporation and steam losses. Ext. Pet. at 4-5. The wastewater effluent contains dissolved solids derived from crude oil compounds that are removed at the Refinery, as well as concentrating the TDS present in the Canal intake water from the evaporation cooling. Ext. Pet. at 5; Exh. 4 at 3.

The Lemont Refinery operates under an NPDES permit (No. IL0001589), which was issued by IEPA. Ext. Pet. at 5, Exh. B; Ext. Agency Rec. at 8; Exh. 4 at 3; Exh 12; Agency Rec. at 8. The NPDES permit includes Outfall 001 at the Refinery at river mile 296.5 on the S & S Canal (latitude 41°38'58" and longitude 88°03'31"). Ext. Pet. at 5, Exh. B; Exh. 4 at 3. The NPDES permit was re-issued and modified by IEPA on June 22, 2007. Ext. Pet. at 5, Exh. B; Ext. Agency Rec. at 8. The permit does not have effluent limits on TDS, nor did the permit in effect at the time of the PCB 05-85 proceeding. Ext. Pet. at 5, Exh. B; Exh. 4 at 3. The NPDES permit contains a special condition 18, which provides:

> The permittee was granted a variance from the water quality standard for Total Dissolved Solids (TDS) for the discharge at outfall 001 in accordance with Illinois Pollution Control Board Order PCB 05-85. The permittee shall commence its study of downstream TDS concentrations in accordance with the schedule contained in this order. This permit may be modified to include any final limitations or monitoring requirements which may be necessary based on the results of the study, or future Illinois Pollution Control Board actions with result to Total Dissolved Solids water quality standards. This variance expires on December 15, 2009. Ext. Pet., Exh. B at 11.

The Lemont Refinery includes a physical/chemical and biological wastewater treatment plant, which performs primary, secondary, and tertiary treatment on the generated wastewater before it is discharged to the S & S Canal. Ext. Pet. at 5; Exh. 4 at 3-4. The Refinery has invested $45 million over the last ten years to upgrading the wastewater treatment system, including a purge treatment unit for scrubber discharge in 2007, discussed below. Ext. Pet. at 7.

Wet Gas Scrubber

Under the Consent Decree, petitioners installed a wet gas scrubber (WGS) in the Fluid Catalytic Converter Unit (FCCU) at the Lemont Refinery. Ext. Am. Pet. at 3. The wet gas scrubber is designed to reduce sulfur dioxide (SO_2) in air emissions from the FCCU. Ext. Am. Pet. at 3; Exh. 3; Exh. 4 at 5; Exh. 6 at 1; Tr. at 8, 20-21.

When the variance petition was filed in PCB 05-85, the Lemont Refinery projected that the wet gas scrubber would be complete and operational in August 2006. Ext. Am. Pet. at 3; Exh. 3; Exh. 4 at 12. However, according to petitioners:

> That schedule assumed that the Consent Decree [] schedule required the WGS to come on line either when a turnaround of the FCC unit was completed (then scheduled for later in 2006) or by December 2007. Further discussions resulted in the conclusion that December 2007 was the critical date under the Consent Decree. As a result, the schedule for the WGS as well as the increased discharge from the WGS to the Chicago Sanitary and Ship Canal were deferred. Ext. Am. Pet. at 3.

In October 2007, the wet gas scrubber began discharging. *Id.* The wet gas scrubber is "undergoing start up and optimization activities." *Id.*

Petitioners state that the SO_2 is "ultimately converted to sodium sulfate salts which are contained in a purge stream." Ext. Am. Pet. at 3. Huff had testified at the PCB 05-85 hearing that the wet gas scrubber discharge would "contain significant sodium sulfate, which essentially is the source of the TDS subject to the variance request." Tr. at 33. The purge stream is discharged to the Lemont Refinery's wastewater treatment system. The design specifications for the wet gas scrubber blowdown limit the exit temperature to 90°F before discharge to the basin. Ext. Am. Pet. at 3. "Other design features have been made to address nitrates and ammonia nitrogen levels and avoid the need for relief from any other regulation." *Id.*; *see also* Exh. 6 at 1; Tr. at 33. The preliminary estimates are that the wet gas scrubbing system would add 304,000 pounds per day of TDS to the Lemont Refinery's wastewater discharge, assuming all sodium salts. Petitioners are monitoring the discharge as "optimization continues for the new equipment." Ext. Am. Pet. at 3.

Estimated low-flow stream conditions (7-day, 10-year) are as follows: 1,134 million gallons per day (MGD) in the S & S Canal at the Lemont Refinery; and 1,260 MGD in the Des Plaines River at the I-55 bridge. Ext. Pet. at 7; Tr. at 38-39; Exh. 4 at 5; Exh. 6 at 3-4. At low flow, the incremental increase in TDS levels from the FCCU effluent after mixing is expected to be 32 mg/L in the S & S Canal and 29 mg/L in the Des Plaines River at the I-55 bridge. Ext. Pet. at 9. Petitioners state that "TDS probably would continue to exceed the existing water quality standard for the secondary contact waters to the I-55 Bridge during times of snow melt run-off." *Id.* Using the projected discharge loadings and 25% of the S & S Canal's low flow yields, petitioners estimate a 128 mg/L incremental increase in TDS water quality at the edge of the mixing zone. *Id.* at 9-10.

S & S Canal and Des Plaines River

Below the Lockport Lock & Dam, the S & S Canal merges with the Des Plaines River, passes through Joliet, and 11 miles downstream of Joliet passes beneath the I-55 bridge. Exh. 4 at 5; Exh. 6 at 1; Ext. Pet. at 7. Upstream of the I-55 bridge, the waters are designated as secondary contact waters. Downstream of the I-55 bridge, the Des Plaines River is a general use

water. The general use waters begin 18.5 miles downstream of petitioners' outfall. Tr. at 33; Exh. 4 at 5; Exh. 6 at 1; Ext. Pet. at 7.

TDS Data from the PCB 05-85 Proceeding

According to Huff, from 1998 to 2005, petitioners weekly sampled for TDS in their water intake from the S & S Canal, collected upstream of the Lemont Refinery's wastewater discharge. Tr. at 33-34; Exh. 6 at 3; Exh. 9. From 1998 to 2002, the mean TDS ranged from a low of 541 mg/L in 1998 to a high of 629 mg/L in 2001. Huff testified that the maximum TDS result (and the only exceedence of the 1,500 mg/L secondary contact TDS standard from 1998 to 2005 recorded by petitioners at the water intake) was 1,636 mg/L on March 8, 2002. Tr. at 34; Exh. 6, Table 1; Exh. 9.

The Metropolitan Water Reclamation District of Greater Chicago (MWRDGC) also had a weekly sampling program in 2001 and 2002. Tr. at 34; Exh. 6 at 3. The MWRDGC data is contained in Huff's report entitled *Impact of CITGO's Proposed Discharge on Water Quality* (December 2004), which was entered into the record at the PCB 05-85 hearing as Exhibit 6. Tr. at 34. At the first MWRDGC sampling site downstream of the Lemont Refinery, at Lockport, the average TDS for January 2001 through July 2002 was 626 mg/L. At the time of the PCB 05-85 proceeding, petitioners' average since 2001 was 599 mg/L and at the I-55 bridge, MWRDGC measured a mean TDS since 2001 of 705 mg/L. Exh. 6 at 3, 8-9.

Huff testified that at the Lockport Lock & Dam, downstream of the Lemont Refinery outfall, the MWRDGC recorded one TDS exceedence (1,595 mg/L), on January 4, 2001, adding that the Lemont Refinery recorded 1,408 mg/L TDS the next day. Tr. at 34. At the sampling station at Jefferson Street in Joliet, which is the next MWRDGC station downstream from the Lockport Lock & Dam, the MWRDGC recorded one TDS exceedence (1,535 mg/L), on February 24, 2000. *Id.* Further downstream at the Empress casino, one TDS exceedence (1,867 mg/L) was recorded, also on February 24, 2000. *Id.* At the I-55 bridge, where the general use water quality standard begins, the 1,000 mg/L TDS standard was exceeded on March 16, 2000 (1,902 mg/L), on January 25, 2001 (1,194 mg/L), on February 1, 2001 (1,075 mg/L), and on February 8, 2001 (1,139 mg/L). *Id.* at 34-35. The last three exceedences occurred over three consecutive sampling events, which Huff testified implies that the "TDS excursion was persistent for at least 15 days." *Id.* at 35.

According to Huff's testimony in the prior proceeding, there is a "strong correlation between the upstream TDS readings and the downstream TDS readings," which "is to be expected as TDS is considered a 'conservative' pollutant; that is, there is little or no reduction due to chemical or biological processes." Tr. at 36. Huff added that "the preponderance of flow at the I-55 Bridge originates from the Chicago area, so there [are] limited dilutional effects until further downstream." *Id.*

Huff testified at the PCB 05-85 hearing that a "review of all the TDS data (Exhibits 6 and 9) reveals that all of the elevated TDS readings occur in the winter, and are attributable to snowmelt runoff carrying salt runoff from highway deicing activities." Tr. at 35. Huff's report likewise concluded:

> The source of the elevated TDS in the waterway is from highway de-icing runoff. The significant tons of road salt that is applied in the drainage basin causes these TDS exceedances, independent of other activities. Exh. 6 at 5.

Because of deicing and snow melt run-off, petitioners maintained in PCB 05-85 that the TDS violations would occur with or without petitioners' current or future contribution of TDS. Exh. 4 at 6, 8; Tr. at 8. Petitioners stated that the compliance plan negotiated with IEPA for that proceeding would require petitioners to collect TDS data from the Des Plaines River at the I-55 bridge during winter months. Pet. Br. at 3. Huff testified that the proposed TDS data collection is "extensive." Tr. at 40. According to petitioners, this data would "provide information that the Agency might not otherwise have the funding to undertake and could lead to better understanding of the snowmelt phenomenon and perhaps yield ideas on how to reduce that impact." Tr. at 12.

Harmon testified in the original proceeding that after two seasons of TDS testing, the Lemont Refinery would "be able to size the required holding tank or basin for the wet gas scrubber discharge during periods of high salinity." Tr. at 25, 40-41; Pet. Br. at 3. According to Harmon, the retention system project would begin by March 1, 2009, and "would be completed by the winter season beginning December 1, 2009." Tr. at 25, 41; Pet. Br. at 3.

TDS Data Since the PCB 05-85 Proceeding

Petitioners represent that they have conducted the TDS water quality sampling required by the conditions of the current variance. Ext. Am. Pet. at 4. Those data "continue to show elevated TDS and chloride levels during periods of snow-melt conditions." *Id.* Samples were collected upstream of the Lemont Refinery in the S & S canal (Exh. C), at the I-55 bridge *before* the wet gas scrubber discharge began (Exh. D), and at the I-55 bridge *after* the wet gas scrubber discharge began (Exh. E). *Id.*

The two TDS results in the S & S Canal greater than 1,500 mg/L were from the Lemont Refinery water intake, *i.e.*, upstream of the Refinery discharge: 1,656 mg/L on January 29, 2007; and 1,520 mg/L on February 26, 2007. Ext. Pet. at 8, Exh. C. The highest recent TDS result at the I-55 bridge, *i.e.*, downstream of the Refinery discharge, was 1,300 mg/L, in samples collected on February 28, 2007 (before the WGS discharge began), and December 12, 17, 26, and 28, 2007 (after the WGS discharge began). Ext. Pet. at 8, Exh. D; Ext. Am. Pet. at 4, Exh. E.

Based on these data, petitioners conclude:

> there is no relationship between the discharges from the Refinery and the water quality conditions relating to TDS, either for the conditions upstream of the Refinery intake, or for the conditions at the I-55 Bridge. The recent data does not indicate an exceedance of the applicable water quality standards at the I-55 Bridge. The highest levels recently recorded was 1,300 ppm, below both the 1,500 mg/l standard for secondary contact waters upstream of the bridge and the 1,686 mg/l seasonal standard for general use waters downstream of the bridge. *Id.*

APPLICABLE REGULATIONS

Petitioners seek a variance from TDS water quality standards at 35 Ill. Adm. Code 302.208(g) and 302.407. Part 302 sets forth water quality standards applicable throughout the State as designated in 35 Ill. Adm. Code 303. *See* 35 Ill. Adm. Code 302.101(a).

Subpart B of Part 302, which contains Section 302.208(g), sets forth general use water quality standards that must be met in waters of the State for which there is no specific designation. *See* 35 Ill. Adm. Code 302.101(b); *see also* 35 Ill. Adm. Code 303.201 ("general use waters"). Section 302.208(g) provides a general use water quality standard for TDS of 1,000 mg/L. Petitioners seek variance relief from this standard for the Des Plaines River. Section 302.208(g) reads in relevant part:

> Section 302.208 Numeric Standards for Chemical Constituents
>
> g) Concentrations of the following chemical constituents shall not be exceeded except in waters for which mixing is allowed pursuant to Section 302.102.

Constituent	Unit	STORET Number	Standard
Total Dissolved Solids	mg/L	70300	1000

35 Ill. Adm. Code 302.208(g).

Subpart D of Part 302, which contains Section 302.407, sets forth the secondary contact and indigenous aquatic life water quality standards. *See* 35 Ill. Adm. Code 302.201(d). Section 302.407 provides a TDS standard of 1,500 mg/L. Petitioners seek variance relief from this standard regarding the S & S Canal. The S & S Canal is designated among Illinois' secondary contact and indigenous aquatic life waters, as is the Des Plaines River "from its confluence with the Chicago Sanitary and Shipping Canal to the Interstate 55 bridge." *See* 35 Ill. Adm. Code 303.441(a), (i). The provision from which petitioners seek relief, Section 302.407, reads in pertinent part:

> Section 302.407 Chemical Constituents
>
> Concentrations of other chemical constituents shall not exceed the following standards:

CONSTITUENTS	STORET NUMBER	CONCENTRATION (mg/L)
Total Dissolved Solids	70300	1500

35 Ill. Adm. Code 302.407.

In a recent site-specific rulemaking, discussed further below, the Board adopted site-specific TDS water quality standards at 35 Ill. Adm. Code 303.445:

> Section 303.445 Total Dissolved Solids Water Quality Standard for the Lower Des Plaines River
>
> a) Beginning November 1 and continuing through April 30 of each year, the total dissolved solids (TDS) water quality standard for Secondary Contact and Indigenous Aquatic Life Use waters in 35 Ill. Adm. Code 302.407 does not apply to the portion of the Des Plaines River from the ExxonMobil refinery wastewater treatment plant discharge point located at Interstate 55 and Arsenal Road (said point being located in Will County, T34N, R9E, S15, Latitude: 41°, 25', 20" North, Longitude: 88°, 11', 20" West) and continuing to the Interstate 55 bridge. TDS levels in these waters must instead meet a water quality standard for TDS (STORET Number 70300) of 1,686 mg/L.
>
> b) Beginning November 1 and continuing through April 30 of each year, the TDS water quality standard for General Use Waters in 35 Ill. Adm. Code 302.208 does not apply to the Des Plaines River from the Interstate 55 bridge to the confluence of the Des Plaines River with the Kankakee River. TDS levels in these waters must instead meet a water quality standard for TDS (STORET Number 70300) of 1,686 mg/L. 35 Ill. Adm. Code 303.445.

Petitioners do not seek relief from Section 303.445, which became effective on February 27, 2007.

DISCUSSION

The Requested Variance Extension

Petitioners now seek to extend the PCB 05-85 variance relief for five years, as well as modify a number of internal dates within the conditions of the variance. Petitioners have waived hearing. Ext. Pet. at 14. The petition and the amended petition are each supported by the

affidavit of Brigitte Postel, who has worked at the Lemont Refinery since October 2003 and held the position of Environmental Engineer, Water Coordinator.

Petitioners represent that they have "undertaken the activities required by the prior variance" (Ext. Pet. at 2) such that the "the conditions of the prior variance have been fully met" (Ext. Am. Pet. at 1-2, quoting 35 Ill. Adm. Code 104.210(d)(2)). In light of the data collected and the regulatory developments discussed below, petitioners seek to extend the dates of the current variance "to avoid unnecessary activities." Ext. Pet. at 4.

Regulatory Developments Since the 2005 Variance

According to petitioners, since the variance was granted in April 2005, "several material facts have changed" that warrant the extension. Ext. Pet. at 2.

R06-24 ExxonMobil Site-Specific. First, petitioners note the effect of the concluded site-specific rulemaking, Revisions to Water Quality Standards for Total Dissolved Solids in the Lower Des Plaines River for ExxonMobil Oil Corporation: Proposed 35 Ill. Adm. Code 303.445, R06-24 (R06-24 Site-Specific). Ext. Pet. at 2, 7. On February 15, 2007, the Board in R06-24 Site-Specific increased to 1,686 mg/L the TDS secondary contact and general use water quality standards for certain waters during the months of November through April of each year. Specifically, the site specific rule applies in the Des Plaines River from the ExxonMobil refinery wastewater treatment plant discharge point located at I-55 and Arsenal Road (downstream of the Lemont Refinery discharge) and continuing to the I-55 bridge, and in the Des Plaines River from the I-55 bridge to the confluence of the Des Plaines River with the Kankakee River. *See* R06-24 Site-Specific, slip op. at 8 (Feb. 15, 2007) (adding 35 Ill. Adm. Code 303.445).

According to petitioners, had this site-specific rule been in effect when petitioners filed for the original variance relief in 2004, "one of the two places where the TDS standard had been exceeded would not have been a violation." Ext. Pet. at 2. Further, petitioners note:

> Adding in the Exxon-Mobil increased discharge, in combination with the increased CITGO discharge, the maximum additional TDS levels at the I-55 bridge was projected to be 72 mg/l. *See* Petition, ¶26 in R06-24 (February 7, 2006). But the data shows that the maximum TDS levels in December 2007 were the same as recorded before the WGS discharge began. The difference between the observed sampling information for TDS and the applicable water quality standard today (even before the Board takes final action in R 07-09) is so large that it does not appear likely that the General Use water quality standard as adopted for the Des Plain[e]s River downstream of the I-55 Bridge in the proceeding initiated by ExxonMobil will be a relevant factor. Ext. Am. Pet. at 4.

R07-9 Triennial. Second, in a pending rulemaking, Triennial Review of Sulfate and Total Dissolved Solids Water Quality Standards: Proposed Amendments to 35 Ill. Adm. Code 302.102(b)(6), 302.102(b)(8), 302.102(b)(10), 302.208(g), 309.103(c)(3), 405.109(b)(2)(A), 409.109(b)(2)(B), 406.100(d); Repealer of 35 Ill. Adm. Code 406.203 and Part 407; and Proposed New 35 Ill. Adm. Code 302.208(h), R07-9 (R07-9 Triennial), the Board proposed first-

notice amendments on Sept. 20, 2007, that would eliminate the TDS general use water quality standard. Ext. Pet. at 2, 7. "Of course," continue petitioners, if the Board removes the TDS standard for all general use waters, "sampling at the I-55 Bridge will not be relevant." Ext. Am. Pet. at 4. On May 1, 2008, the Board issued an order in R07-9 Triennial proposing for public comment proposed second-notice amendments that retained the elimination of the TDS general use water quality standard. *See* R07-9 Triennial, slip op. at 22 (May 1, 2008).

Further, the Board stated at first notice in R07-9 Triennial:

> While the Board declines to eliminate TDS standard for secondary contact waters, the Board recognizes that CITGO may face some hardship if TDS standard for secondary contact waters is not resolved in a timely manner. Specifically, CITGO may have to expend funds on designing wastewater storage system for wastewater from refinery's wet gas scrubber in order to comply with CITGO's variance conditions [PCB 05-85]. In this regard, the Board believes that CITGO has a number of options CITGO can pursue to avoid undertaking any exercise that may be unnecessary in the future, including seeking an extension of the current variance with amended conditions. R07-9 Triennial, slip op. at 30 (Sept. 20, 2007).

R08-9 CAWS/LDPR. In another pending rulemaking, 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 301, 302, 303 and 304, R08-9, IEPA "has proposed to remove the TDS standard in the Canal." Pet. at 2. On April 24, 2008, the Board concluded its tenth day of hearing in R08-9, which has not been to first notice. Additional hearings are expected to be held in the summer and fall of 2008.

Petitioners' Proposed Variance Extension Language

Petitioners ask that "the focus be moved to the conditions in the Ship Canal upstream of the Refinery, where occasional exceedances of the existing TDS standard exist." Ext. Am. Pet. at 5. Specifically, petitioners propose the following revisions to the Board's April 21, 2005 order:

> The Board grants CITGO and PDVMR a variance from the TDS water quality standards of 35 Ill. Adm. Code 302.208(g) and 302.407, subject to the following conditions:
>
> 1. The duration of the variance relief from the identified TDS water quality standards is from ~~April 21, 2005~~ [date of Board order] through December 15, ~~2009~~ 2012. This variance modifies and extends certain conditions of the variance in PCB 05-85, entered April 21, 2005.
>
> 2. This variance applies only to petitioners' Lemont Refinery at 135th Street and New Avenue in Lemont, Will County, regarding elevated TDS levels in the effluent of Outfall 001 due to operation of the wet gas scrubber under the Consent

Decree entered January 26, 2005, in the United States District Court for the Southern District of Texas, Case No. H-04-3883.

3. ~~By October 1, 2006, p~~Petitioners must identify a location near the I-55 Bridge for collecting water samples from the Des Plaines River and secure access for the sampling. ~~By November 1, 2006, p~~Petitioners must retain a contractor to collect TDS samples at that location. ~~From December 1, 2006 through~~ Until March 30, 2008, petitioners must collect TDS samples from the Des Plaines River three times per week during the winter months (December 1 to March 30). Petitioners must submit the TDS sample results monthly to the Agency.

4. ~~From December 1, 2006 through~~ Until March 30, 2008, the effluent of Outfall 001 must be monitored for TDS two times per week during the winter months (December 1 to March 30). Petitioners must submit the TDS sample results monthly to the Agency.

5. Petitioners must diligently attempt to identify any relationship between TDS levels in the effluent of Outfall 001 and TDS levels in the Des Plaines River at the I-55 Bridge. Petitioners must use any resulting relevant information to identify the time period that may be needed to hold the FCCU [Fluid Catalytic Converter Unit] wet gas scrubber bleed.

6. By May 1, ~~2008~~ 2011, petitioners must begin to size the system needed to retain the FCCU wet gas scrubber bleed for the maximum number of days that the TDS level in the ~~Des Plaines River at the I-55 Bridge exceeds 1,000 mg/L~~ Chicago Sanitary and Ship Canal exceeds the applicable water quality standard for TDS.

7. By June 1, ~~2008~~ 2011, petitioners must begin to design the system needed to retain the FCCU wet gas scrubber bleed for the maximum number of days that the TDS level in the ~~Des Plaines River at the I-55 Bridge exceeds 1,000 mg/L~~ Chicago Sanitary and Ship Canal exceeds the applicable water quality standard for TDS.

8. By December 1, ~~2008~~ 2011, if needed to meet an applicable water quality standard for TDS, petitioners must submit to the Agency a wastewater construction permit application for the FCCU wet gas scrubber bleed retention system.

9. By March 1, ~~2009~~ 2012, if needed to meet an applicable water quality standard for TDS, petitioners must begin construction as needed on the FCCU wet gas scrubber bleed retention system.

10. By December 1, 2012, if needed to meet an applicable water quality standard for TDS, petitioners must operate the FCCU wet gas scrubber bleed retention system as needed. From December 1, ~~2009~~ 2012 through March 30, ~~2010~~ 2013, if such system is necessary, petitioners must collect TDS samples from the ~~Des Plaines~~

~~River at the I-55 Bridge~~ Chicago Sanitary and Ship Canal five days per week (excluding weekends and holidays). Petitioners must submit the TDS sample results monthly to the Agency. *See* Ext. Pet. at 3-4; *see also* CITGO Petroleum Corporation and PDV Midwest Refining, L.L.C. v. IEPA, PCB 05-85, slip op. at 16-17 (Apr. 21, 2005).

These amendments, according to petitioners, will provide a five-year variance that "has the effect of moving the prior schedule back 3 years." Ext. Am. Pet. at 2. Moreover, petitioners state that:

> If the Board removes the existing water quality standard for TDS in the Ship Canal, this variance will become moot according to its terms, and not require further action by the Board. Ext. Pet. at 4.

Agency Recommendation

IEPA recommends that the Board grant petitioners' requested variance extension for five years from the date of the Board's order, subject to compliance plan conditions set forth by IEPA in its recommendation. Ext. Agency Rec. at 1, 4, 8.

IEPA notes that petitioners' petition includes a proposed compliance plan. Ext. Agency Rec. at 5. However, since the petition was filed, IEPA and petitioners "have been in discussions regarding the nature of the relief." *Id.* It is "[b]ased on these discussions" that IEPA "proposes the following modifications to CITGO's compliance plan":

> The Board grants CITGO and PDVMR a variance from the TDS water quality standards of 35 Ill. Adm. Code 302.208(g) and 302.407, subject to the following conditions:
>
> 1. The duration of the variance relief from the identified TDS water quality standards is for five years from the date of the Board order. This variance modifies and extends the variance relief granted in PCB 05-85, entered April 21, 2005.
>
> 2. This variance applies only to Petitioner's Lemont Refinery at 135 th Street and New Avenue in Lemont, Will County, regarding TDS concentrations in the effluent of Outfall 001 due to operation of the wet gas scrubber under the Consent Order Decree entered January 25, 2003, in the United States District Court for the Southern District of Texas, Case No. H-04-3833.
>
> 3. Until the U.S. EPA approves the elimination of the General Use water standard for TDS, Petitioner will monitor and collect samples from the Des Plaines River near 1-55 Bridge three times per week, during the winter months (December 1 to March 30), and analyze for TDS. Petitioner must submit the TDS sample results monthly to the Agency.

4. Until the U.S. EPA approves the elimination of the TDS water quality standard for the Chicago Sanitary & Ship Canal, Petitioner will monitor its water intake from the Chicago Sanitary & Ship Canal two times per week, during the winter months (December 1 to March 30) for TDS. Petitioner must submit the TDS sample results monthly to the Agency.

5. Until the U.S. EPA approves the elimination of the TDS water quality standard for the Chicago Sanitary & Ship Canal, Petitioner must monitor TDS in the effluent from Outfall 001 two times per week, during winter months (December 1 to March 30). Petitioner must submit the TDS effluent sample results monthly to the Agency.

6. Until the U.S. EPA approves the elimination of the TDS water quality standard for the Chicago Sanitary & Ship Canal, Petitioner will diligently attempt to identify any relationship between the TDS levels in the effluent from Outfall 001, and the water quality samples required to be collected pursuant to paragraphs 3, 4, and 5 of this Order. To the extent there is a correlation between effluent TDS concentration and any exceedance of an applicable water quality standard for TDS, Petitioner shall determine the time period that the water from the FCCU wet gas scrubber bleed may require additional management or treatment, including but not limited to holding, treatment, or alternative disposal.

7. Unless the U.S. EPA has approved the elimination of the TDS water quality standard for the Chicago Sanitary & Ship Canal, by 45 months from the date of the Board order, Petitioner must prepare a TDS water quality management plan to address any contribution from the FCCU wet gas scrubber bleed as determined by the analyses performed pursuant to paragraph 6. Elements to be considered in developing this plan shall include a system to retain, treat, or dispose of the FCCU wet gas scrubber bleed or any other approach to eliminate wet gas scrubber bleed from Outfall 001 during periods when applicable TDS water quality standards are exceeded. Options to be considered may include holding tanks, deep well disposal, crystallization, and any other technology or management strategy identified.

8. Unless the U.S. EPA has approved the elimination of the TDS water quality standard for the Chicago Sanitary & Ship Canal, by 46 months from the date of the Board order, Petitioner must design the TDS water quality management plan for the conditions identified in paragraph 7.

9. Unless the U.S. EPA has approved the elimination of the TDS water quality standard for the Chicago Sanitary & Ship Canal, by 48 months from the date of the Board order, Petitioner must submit to the Agency a wastewater construction permit application for any elements of the TDS

water quality management plan for which permits or amended permits are required.

10. Unless the U.S. EPA has approved the elimination of the TDS water quality standard for the Chicago Sanitary & Ship Canal, by 54 months from the date of the Board order, Petitioner must begin construction as needed for an FCCU wet gas scrubber bleed control system and/or implement the TDS water quality management plan.

11. Unless the U.S. EPA has approved the elimination of the TDS water quality standard for the Chicago Sanitary & Ship Canal, by 60 months from the date of the Board order, Petitioner must operate any equipment required to be constructed by the TDS water quality management plan as needed so as to not cause or contribute to any exceedences of applicable water quality standards due to the operation of the wet gas scrubber identified in paragraph 2 of this Order. *Id.* at 5-7.

Hardship

In considering a variance request, the Board is required by Section 35(a) of the Act to determine whether the petitioner has presented adequate proof that it would suffer an arbitrary or unreasonable hardship if required to immediately comply with the Board's regulation at issue. *See* 415 ILCS 5/35(a) (2006).

Petitioners state that their request for variance extension is necessitated by the Consent Decree, to which IEPA is a party. Ext. Pet. at 11; Exh. 4 at 9. USEPA lodged the Consent Decree, explains petitioners, to "substantially reduce emissions of [SO_2], nitrogen oxides [NO_X] and Particulate Matter [PM]." *Id.* Petitioners agreed to the reductions and are investing over $140 million at the Lemont Refinery, "most of which costs are for the very wet gas scrubber which generates the TDS" at issue in the variance extension request. Ext. Pet. at 11. Petitioners state that they are subject to "substantial penalties" if they do not meet the Consent Decree schedule. Pet. Br. at 4.

At the time of the original variance request, petitioners stated that the wet gas scrubber would increase the amount of TDS in the Lemont Refinery's treated wastewater. Pet. Br. at 4; Exh. 6 at 1; Tr. at 21, 33, 38-39; *see also* Exh. 5, 11. Petitioners maintain that their contribution of TDS is "readily within the assimilative capacity of the waterway," and that there is no TDS water quality violation in the Canal "except in association with snow melt conditions." Ext. Pet. at 11-12; *see also* Exh. 4 at 9. Petitioners add:

> And since the adoption of the modified TDS standard in the Lower Des Plaines River, as requested by Exxon-Mobil, there is no longer a violation of the modified TDS standard for that General Use body of water. Ext. Pet. at 12.

Petitioners investigated methods to avoid releasing the FCCU wastewater into the existing wastewater treatment system, including a managed release program with the use of a

storm water basin for retention; deep well disposal; and installation of evaporation wastewater treatment technology. Petitioners maintain that none of these alternatives is practical. Ext. Pet. at 12-14; Exh. 4 at 10, 12-13; Pet. Br. at 4. Petitioners also investigated "sewering the discharge . . . to the [MWRDGC]," but the MWRDGC informed petitioners that it "did not have the capacity to handle the discharge." Tr. at 10. IEPA does not take issue with any of petitioners' conclusions regarding the viability of alternative technologies.

Further, regarding the investigated alternatives, Harmon testified at the PCB 05-85 hearing that the storm water basin at the Lemont Refinery is used to collect site storm water runoff and drainage from naturally existing waterways. Tr. at 25; Pet. Br. at 4. According to Harmon, because of residential developments near the northwest facility boundary, there was a marked increase in storm water volume in the site's storm water basin. Tr. at 25; Pet. Br. at 4. Runoff from the developments feeds into naturally existing waterways that terminate within boundaries of the Lemont Refinery and ends up in the site's storm water basin. Tr. at 25; Pet. Br. at 4-5. Harmon explained that a special condition in an Agency-issued "Groundwater Management Zone Approval Letter" requires that the basin's water level be maintained below 12'9". According to Harmon, it has been difficult to comply with this condition because of the additional volume of storm water runoff from the residential developments. Tr. at 26; Pet. Br. at 5.

Under these circumstances, retaining the wet gas scrubber effluent in the storm water basin during periods of snowmelt and deicing is not viable, Harmon testified. Tr. at 26; Pet. Br. at 5. However, strategies to divert the residential runoff before it crosses the Lemont Refinery border were being pursued. Harmon testified that if such a diversion is implemented, the site's storm water basin may be able to retain wet gas scrubber effluent during snowmelt conditions. Tr. at 26.

Deep well disposal of the scrubber effluent, according to petitioners, is also not a viable alternative because it would constitute a Class I injection well, which wells are not "permittable" in northeastern Illinois because no cap rock exists over the depth where disposal wells are drilled. Ext. Pet. at 12; Pet. Br. at 5. Huff testified that "Class I wells require injection beneath a cap rock that will prevent migration upwards into higher aquifers" and northeastern Illinois "does not have a cap rock above the Mount Simon formation used for disposal wells throughout the Midwest." Tr. at 39; *see also* Pet. Br. at 5; Exh. 4 at 10; Exh. 13.

Petitioners also state that technologies for removing sodium sulfate from a dilute aqueous stream are limited: electrodialysis has not been applied in the chemical or refinery industries on this scale; biological sulfate reduction will not reduce the overall TDS concentration by simply replacing the sulfate ions with carbonate ions; and reverse osmosis concentration is limited because scaling problems would develop given the high concentration of sodium sulfate. Ext. Pet. at 13; Exh. 4 at 10; Pet. Br. at 5.

Petitioners maintain that the only alternative technology potentially available would be evaporation, which they describe as an energy intensive approach that would result in increased carbon dioxide emissions to the atmosphere. Ext. Pet. at 13; Pet. Br. at 5-6.; Exh. 4 at 10-11, Attachment A; Tr. at 40. According to petitioners, this alternative "would result in substantial

adverse affects on the environment in the form of increased emissions to evaporate the wastewater." Exh. 4 at 13. Additionally, in 2004 dollars, the capital cost for applying a falling film evaporator with mechanical vapor recompression to this wastewater stream is approximately $7 million. Operating costs are estimated at $1 million per year, including depreciation. Ext. Pet. at 13; Exh. 4 at 11; Pet. Br. at 6; Exh. 14 (evaporation costs). Huff testified that over the years, TDS variance "requests consistently have found evaporation technology cost- and energy-prohibitive." Tr. at 40.

Petitioners are unaware of any such massive evaporation project being built or operated, and conclude that requiring it here for the wet gas scrubber discharge would impose on them an arbitrary and unreasonable hardship:

> CITGO is not the cause of any current water quality standard exceedance; upstream conditions in the Ship Canal from snow melt conditions exceed the existing TDS standard, and the Agency has asked the Board to remove that standard as well. Further, CITGO is investing substantial monies in the Refinery to substantially reduce air emissions and substantially reducing the overall environmental releases from the Refinery, and the wastewater discharge involved is relatively modest. Ext. Pet. at 14; *see also* Exh. 4 at 12; Tr. at 35-36; Pet. Br. at 6.

During the original proceeding, Huff testified that TDS effluent limits are not proposed as a condition of the variance because "it is clear that the TDS water quality violations are due solely to salt runoff from highway deicing activities." Tr. at 43. Huff added that "the Lemont Refinery will have no control over the TDS concentrations, so the only possibility to control the pounds per day discharged is by limiting the discharge rate." *Id.* at 45. Limiting the discharge rate would require the Refinery to hold treated effluent, and presumably cease all discharge if the Des Plaines River TDS is greater than 1,000 mg/L, according to Huff. *Id.* Huff testified that today there is no storage capacity at the Lemont Refinery to accomplish this:

> [T]hese [TDS water quality] violations appear to occur over 15 consecutive days, but less than 22 days. The Lemont Refinery will have to come up with in excess of 4,000,000 gallons of capacity to isolate the wet gas scrubber during these periods of elevated TDS levels at the I-55 Bridge. Currently, this excess capacity does not exist, and the actual number of days that would require holding wet gas scrubber water currently is poorly understood. The requested compliance time frame is for the collection of the necessary data to properly size this holding basin/tankage. *Id.* at 45-46.

After reviewing the data collected at the I-55 bridge since the issuance of the 2005 variance, petitioners concede that it appears "the extent of elevated TDS levels may be longer than previously thought -- the 2006-07 winter alone produced elevated TDS levels over a three week long stretch." Ext. Am. Pet. at 5, Exh. D. Though these levels continue to be "due to snowmelt conditions," the existing variance condition "assumes that storage could occur for a long enough time so that the Refinery could avoid discharging during these events." *Id.* It is now apparent, however, that the length of time and the volume of water required is greater than

anticipated when the PCB 05-85 compliance plan was proposed. *Id.* Based on the data available at the time of the prior proceeding, which was from MWRDGC, petitioners "did not expect the duration of elevated TDS levels to last for such a long period of time." *Id.*

Petitioners believe that the TDS standards will be eliminated and that measures such as wastewater storage will not be required. Ext. Am. Pet. at 5. As the Lemont Refinery's maximum permitted discharge is 5.79 MGD:

> the quantity of tankage needed to store that volume of wastewater would be substantial (perhaps 100 million gallons for a 20-day period, assuming this period of time is a worst case scenario). However, at the present time, CITGO is not asking for a change in the final compliance measures - should any such measures be required. If the continued monitoring of the Ship Canal (as suggested by this Petition) continues to indicate that elevated TDS levels last for a couple of weeks at a time, and if the Board does not remove the TDS standard in the Ship Canal, CITGO may seek further relief from the Board - including a change to the existing compliance plan. *Id.* at 5-6.

Complying with the schedule in the existing variance and the TDS water quality standard is "substantial and there is no benefit to the public or the environment by compelling such compliance," according to petitioners. Ext. Pet. at 14. Petitioners conclude:

> Indeed, there does not appear to be any practical compliance alternative at this time. Even if there is an alternative, such would result in substantial adverse affects on the environment in the form of increased emissions to evaporate the wastewater. *Id.*

IEPA maintains that as "all the underlying facts are identical to the ones that were considered by the Board in PCB 05-85," the Board's 2005 finding, that petitioners would suffer an arbitrary or unreasonable hardship if required to comply immediately with the regulations at issue, also applies in this case. Ext. Agency Rec. at 4-5.

Environmental Impact

When deciding to grant or deny a variance petition, the Board is required to balance the petitioner's hardship in complying with Board regulations against the impact that the requested variance will have on the environment. *See* Monsanto Co. v. PCB, 67 Ill. 2d 276, 292, 367 N.E.2d 684, 691 (1977). Petitioner must establish that the hardship it would face from denial of its variance request would outweigh any injury to the public or the environment from granting the relief, and "[o]nly if the hardship outweighs the injury does the evidence rise to the level of an arbitrary or unreasonable hardship." Marathon Oil. Co. v. EPA, 242 Ill. App. 3d 200, 206, 610 N.E. 2d 789, 793 (5th Dist. 1993).

Petitioners state that there would be no cognizable benefit to the public or the environment in making them comply with the existing TDS water quality standards. Pet. Br. at 7. Huff testified in the original proceeding that because TDS is composed of a variety of anions

and cations, "there are no 'toxicity' values that can be applied to the generic TDS parameter." Tr. at 36. Petitioners emphasize that the Board has proposed eliminating the TDS general use water quality standard in R07-9 Triennial. Ext. Pet. at 12; *see also* Exh. 4 at 9; Tr. at 37; Pet. Br. at 7; Exh. 10. Petitioners expect that the proposed rule for TDS in secondary contact waters would be "no more stringent than for the General Use waters" and that accordingly "there would be no reason to store wastewater before discharging." Ext. Pet. at 12. Moreover, add petitioners:

> with the change in the water quality standards downstream, the point to assess the water quality conditions now would be the Canal, rather than at the I-55 Bridge on the Lower Des Plaines River. *Id.*

Petitioners state, and IEPA does not dispute, that neither the S & S Canal nor the downstream Des Plaines River has been listed by IEPA as impaired for TDS. Ext. Pet. at 10; Exh. 4 at 7, 10. Huff testified that "sodium sulfate, at the proposed levels discharged, will not impact the aquatic community in the Chicago Sanitary and Ship Canal or in the Des Plaines River" and that there is "no adverse effect on aquatic life due to TDS and sulfate levels." Tr. at 37-38. Petitioners maintain that there would be no "significant injury to the public or the environment" from the requested variance. Pet. Br. at 7; Tr. at 37-38.

On the other hand, according to petitioners, their $140 million investment in the Lemont Refinery under the Consent Decree is projected to "reduce SO_2 emissions by 15,300 tons/year, NO_X emissions by 1,100 tons/year, and PM emissions by 92 tons/year." Ext. Pet. at 11, 14; *see also* Exh. 4 at 9; Exh. 1; Tr. at 20.

IEPA states that nothing has changed to alter the Board's finding from PCB 05-85 that the hardship petitioners would experience outweighs any injury to the public or the environment from granting the relief. Ext. Agency Rec. at 5.

Consistency with Federal Law

Under Section 35 of the Act (415 ILCS 5/35 (2006)), the Board may grant a variance only to the extent that doing so is consistent with applicable provisions of federal law. In PCB 05-85, IEPA concluded that granting the requested variance would not be inconsistent with the Clean Water Act or any other federal standard. Agency Rec. at 7; Agency Br. at 2. In this proceeding for an extension of the variance relief, IEPA maintains that petitioners have again satisfied this requirement. Ext. Agency Rec. at 7.

Board Findings and Conditions

The Board has balanced the hardship petitioners would face in immediately complying with the TDS water quality standards against the impact that granting the requested variance extension would have on the public and the environment, all as described in detail above. Based on this record, and considering the conditions to which the variance extension would be subject, the Board finds that petitioners have established that the hardship they would experience outweighs any injury to the public or the environment from granting the relief.

The Board finds that petitioners have presented adequate proof that they would suffer an arbitrary or unreasonable hardship if required to comply immediately with the Board regulations at issue. Additionally, the Board finds that petitioners have made satisfactory progress toward compliance, including reporting the TDS results of samples collected at the I-55 bridge. Ext. Pet. at 7-8, 10-11, Exh. D; Ext. Am. Pet. at 3-5, Exh. E. The Board further finds that the variance extension is not inconsistent with federal law.

The Board grants petitioner's requested extension of variance, subject to the IEPA-proposed conditions, as supplemented below. Section 36(a) of the Act (415 ILCS 5/36(a) (2006)) provides that "[i]n granting a variance the Board may impose such conditions as the policies of this Act may require." The conditions set forth as a compliance plan in IEPA's recommendation were proposed in response to petitioners' proposed compliance plan and were based on discussions between IEPA and petitioners. IEPA's proposed plan differs from petitioners' in several respects.

Petitioners' proposal calls for both the sampling in the Des Plaines River near the I-55 bridge and the monitoring of the Outfall 001 effluent to terminate on March 30, 2008. IEPA proposes, in contrast, that petitioners (1) continue this in-stream sampling until USEPA approves elimination of the TDS general use water quality standard, and (2) continue the effluent sampling until USEPA approves elimination of the TDS water quality standard for the S & S Canal. In addition, IEPA proposes that petitioners monitor their water intake from the Canal for TDS, which petitioners have done in the past (*see* Ext. Pet., Exh. C) but have not proposed as a variance condition. The Board finds these conditions appropriate. The wet gas scrubber is relatively new equipment. It only began discharging in October 2007 and is still undergoing start up and optimization activities. The additional condition for intake monitoring will help to provide a more complete data picture in assessing any impact from TDS levels in the effluent.

Additionally, unlike petitioners' plan, the IEPA-proposed conditions do not mandate that the future control measure must be a retention system. Under either compliance plan, activities to control FCCU wet gas scrubber bleed contributing to TDS water quality standard exceedences would not be required until several years into the term of the variance extension. As noted, the 2005 variance contemplated that data collected under its terms would shed light on the scope of any retention system eventually built. Based on the recent data collection, petitioners raise uncertainties about the practicality of the WGS bleed retention system's volume.

Under the conditions proposed by IEPA for the variance extension, more TDS data will be collected, as discussed above. That data must be considered to identify any correlation between effluent TDS concentration and water quality exceedences and, as needed, to determine the proper response with respect to the FCCU wet gas scrubber bleed. Under these circumstances, the Board declines to provide now that the control measure to be instituted in 2012-13, if any, must necessarily be the retention system. Rather, the Board finds that this record supports preserving greater flexibility for the consideration of control options that may be viable later. Unless USEPA has approved eliminating the TDS water quality standard for the S & S Canal, petitioners would remain subject to interim milestones concerning control measures and, by May 15, 2013, would have to "operate any equipment required to be constructed by the

TDS water quality management plan as needed so as to not cause or contribute to any exceedences of applicable water quality standards due to the operation of the wet gas scrubber."

Under the Board's procedural rules, petitioners could have filed a response to IEPA's recommendation, but did not. *See* 35 Ill. Adm. Code 104.220. The Board will impose on the variance extension those conditions proposed by IEPA, with minor clarifying language changes. In addition, Section 36(b) of the Act provides that if the Board grants a variance, the Board must do so "upon the condition that the person who receives such variance shall make such periodic progress reports as the Board shall specify." 415 ILCS 5/36(b) (2006). Under the IEPA-proposed condition 8 of the variance extension, by 46 months from the date of today's order, petitioners must design a TDS water quality management plan addressing any contribution of the FCCU wet gas scrubber bleed to any exceedence of an applicable TDS water quality standard. The Board will also require that petitioners submit the plan to IEPA.

If the Board's decision does not effectuate the intent of the parties, or if any condition imposed by the Board is objectionable, petitioners may decline to execute the certificate of acceptance set forth below, and either or both parties may file a motion to reconsider. *See* 35 Ill. Adm. Code 101.520, 101.902, 104.240, 104.248.

CONCLUSION

The Board finds that if this petition for an extension of variance relief from the TDS general use and secondary contact water quality standards (35 Ill. Adm. Code 302.208(g) and 302.407) is not granted, petitioners will incur an arbitrary or unreasonable hardship. The Board finds that issuance of the variance extension is not inconsistent with federal law and will not significantly impact public health or the environment. Therefore, the Board grants the requested variance extension to petitioners, subject to the conditions set forth in this order. The relief provided to petitioners today is an extension of the variance granted on April 21, 2005, in PCB 05-85. The variance extension begins today and lasts for five years.

This opinion constitutes the Board's findings of fact and conclusions of law.

ORDER

The Board grants CITGO Petroleum Corporation and PDV Midwest Refining, L.L.C. (petitioners) a variance from the Total Dissolved Solids (TDS) water quality standards of 35 Ill. Adm. Code 302.208(g) and 302.407, subject to the following conditions:

1. The duration of the variance relief from the identified TDS water quality standards is five years, from May 15, 2008 through May 15, 2013. This variance modifies and extends the variance relief granted in PCB 05-85, issued April 21, 2005.

2. This variance applies only to petitioners' Lemont Refinery at 135th Street and New Avenue in Lemont, Will County, regarding TDS concentrations in the effluent of Outfall 001 due to operation of the wet gas scrubber under the Consent

Order Decree entered January 25, 2003, in the United States District Court for the Southern District of Texas, Case No. H-04-3833.

3. Unless and until the United States Environmental Protection Agency (USEPA) approves the elimination of the general use water quality standard for TDS, petitioners must monitor and collect samples from the Des Plaines River near the I-55 bridge three times per week, during the winter months (December 1 to March 30), and analyze for TDS. Petitioners must submit the TDS sample results monthly to the Illinois Environmental Protection Agency (IEPA).

4. Unless and until USEPA approves the elimination of the TDS water quality standard for the Chicago Sanitary and Ship Canal (S & S Canal), petitioners must monitor their water intake from the S & S Canal two times per week, during the winter months (December 1 to March 30) for TDS. Petitioners must submit the TDS sample results monthly to IEPA.

5. Unless and until USEPA approves the elimination of the TDS water quality standard for the S & S Canal, petitioners must monitor TDS in the effluent from Outfall 001 two times per week, during winter months (December 1 to March 30). Petitioners must submit the TDS sample results monthly to IEPA.

6. Unless and until USEPA approves the elimination of the TDS water quality standard for the S & S Canal, petitioners must diligently attempt to identify any relationship between the TDS levels in the effluent from Outfall 001, and the water quality samples required to be collected pursuant to paragraphs 3, 4, and 5 of this order. To the extent there is a correlation between effluent TDS concentration and any exceedence of an applicable water quality standard for TDS, petitioners must determine the time period that the water from the Fluid Catalytic Converter Unit (FCCU) wet gas scrubber bleed may require additional management or treatment, including holding, treatment, or alternative disposal.

7. Unless USEPA has approved the elimination of the TDS water quality standard for the S & S Canal, by 45 months from the date of the Board order, petitioners must prepare a TDS water quality management plan to address any contribution from the FCCU wet gas scrubber bleed as determined by the analyses performed pursuant to paragraph 6 of this order. Elements to be considered in developing this plan must include a system to retain, treat, or dispose of the FCCU wet gas scrubber bleed or any other approach to eliminate wet gas scrubber bleed from Outfall 001 during periods when applicable TDS water quality standards are exceeded. Options to be considered may include holding tanks, deep well disposal, crystallization, and any other technology or management strategy identified.

8. Unless USEPA has approved the elimination of the TDS water quality standard for the S & S Canal, by 46 months from the date of the Board order, petitioners

must design the TDS water quality management plan for the conditions identified in paragraph 7 of this order and submit the plan to IEPA.

9. Unless USEPA has approved the elimination of the TDS water quality standard for the S & S Canal, by 48 months from the date of the Board order, petitioners must submit to IEPA a wastewater construction permit application for any elements of the TDS water quality management plan for which permits or amended permits are required.

10. Unless USEPA has approved the elimination of the TDS water quality standard for the S & S Canal, by 54 months from the date of the Board order, petitioners must begin construction as needed for an FCCU wet gas scrubber bleed control system and/or implement the TDS water quality management plan.

11. Unless USEPA has approved the elimination of the TDS water quality standard for the S & S Canal, by 60 months from the date of the Board order, petitioners must operate any equipment required to be constructed by the TDS water quality management plan as needed so as to not cause or contribute to any exceedences of applicable water quality standards due to the operation of the wet gas scrubber identified in paragraph 2 of this order.

IT IS SO ORDERED.

If petitioners choose to accept this variance extension, they must, within 45 days after the date of this opinion and order, file with the Board and serve on IEPA a certificate of acceptance and agreement to be bound by all the terms and conditions of the granted variance. "A variance and its conditions are not binding upon the petitioner until the executed certificate is filed with the Board and served on the Agency. Failure to timely file the executed certificate with the Board and serve the Agency renders the variance void." 35 Ill. Adm. Code 104.240. The form of the certificate follows:

CERTIFICATE OF ACCEPTANCE

I (We), _____, having read the opinion and order of the Illinois Pollution Control Board in docket PCB 08-33, dated May 15, 2008, understand and accept the opinion and order, realizing that this acceptance renders all terms and conditions of the variance set forth in that order binding and enforceable.

Petitioner CITGO PETROLEUM CORPORATION	**Petitioner PDV MIDWEST REFINING, L.L.C.**
By: _____ **Authorized Agent**	**By:** _____ **Authorized Agent**
Title: _____	**Title:** _____
Date: _____	**Date:** _____

Section 41(a) of the Environmental Protection Act provides that final Board orders may be appealed directly to the Illinois Appellate Court within 35 days after the Board serves the order. 415 ILCS 5/41(a) (2006); *see also* 35 Ill. Adm. Code 101.300(d)(2), 101.906, 102.706. Illinois Supreme Court Rule 335 establishes filing requirements that apply when the Illinois Appellate Court, by statute, directly reviews administrative orders. 172 Ill. 2d R. 335. The Board's procedural rules provide that motions for the Board to reconsider or modify its final orders may be filed with the Board within 35 days after the order is received. 35 Ill. Adm. Code 101.520; *see also* 35 Ill. Adm. Code 101.902, 102.700, 102.702.

I, John T. Therriault, Assistant Clerk of the Illinois Pollution Control Board, certify that the Board adopted the above opinion and order on May 15, 2008, by a vote of 4-0.

John T. Therriault

John T. Therriault, Assistant Clerk
Illinois Pollution Control Board

EXHIBIT 4

ILLINOIS POLLUTION CONTROL BOARD
February 15, 2007

IN THE MATTER OF:	)	
	)	
REVISIONS TO WATER QUALITY	)	R06-24
STANDARDS FOR TOTAL DISSOLVED	)	(Site-Specific Rulemaking - Water)
SOLIDS IN THE LOWER DES PLAINES	)	
RIVER EXXONMOBIL OIL	)	
CORPORATION: PROPOSED 35 ILL.	)	
ADM. CODE 303.445	)	

Adopted Rule. Final Order.

OPINION AND ORDER OF THE BOARD (by T.E. Johnson):

On February 7, 2006, ExxonMobil Oil Corporation's (ExxonMobil) filed a petition for rulemaking pursuant to Section 28 of the Environmental Protection Act (Act) (415 ILCS 28 (2004)) to change the water quality standards in a portion of the Des Plaines River, allowing ExxonMobil's Joliet Refinery (Joliet Refinery) to increase its discharge of total dissolved solids (TDS). A hearing was held on June 14, 2006.

By today's action the Board adopts the proposed amendments. The rules adopted here are substantively unchanged from those adopted in the Board's first-notice and second-notice opinion and order. On December 7, 2006, the Board proposed the rulemaking for second notice. The Board directed that the rule be submitted to the Joint Committee on Administrative Rules (JCAR) for second-notice review. The rulemaking was considered at the February 6, 2007 JCAR meeting, and JCAR issued a certification of no objection to the rule. The following opinion will explain the proposal background, summarize the procedural history, and discuss the economic reasonableness and technical feasibility of the rule.

BACKGROUND

In this part of the opinion, the Board first provides background on the proposed site-specific rule, the Joliet Refinery, and the consent decree ExxonMobil signed to reduce air pollution. The Board then reviews wastewater treatment at the Joliet Refinery.

Proposed Rule

ExxonMobil seeks a site-specific rule for a portion of the Des Plaines River that would apply in lieu of the Board's TDS water quality standards for general use waters (35 Ill. Adm. Code 302.208(g)) and secondary contact and indigenous aquatic life use waters (35 Ill. Adm. Code 302.407). *See* Pet. at 2. Under the proposed rule, the portion of the Des Plaines River that would be subject to the new standards runs from the Joliet refinery wastewater discharge point, located at Interstate55 (I-55) and Arsenal Road, to the confluence of the Des Plaines River with the Kankakee River. *Id.* at 3. The proposed site-specific rule would set a water quality standard

of 1,686 mg/L for TDS that would apply from November 1 through April 30, of each year. *Id.* at 3. ExxonMobil expects increases in its TDS discharges because it will be installing pollution control equipment to reduce air emissions in an effort to comply with a consent decree the company entered into with the United States Environmental Protection Agency (USEPA) and several states. *Id.* at 1.

Joliet Refinery

The ExxonMobil Joliet Refinery is located approximately 50 miles southwest of Chicago in Channahon Township, Will County, on 1,300 acres of land adjacent to I-55 at the Arsenal Road exit. *See* Pet. at 4. The Des Plaines River runs along the north end of the refinery's campus. *Id.* The Joliet Army Arsenal, which is being redeveloped as an industrial complex, is to the east of the facility and the Midewin National Tallgrass Prairie is to the south of the refinery. *Id.* at 4.

Operations began at the Joliet Refinery in 1972. *See* Pet. at 5. ExxonMobil currently employs 600 full-time employees and 150 contractor employees at the Joliet site. *Id.* at 4. The refinery is certified as a STAR worksite, which is a voluntary safety program of the United States Occupational Safety and Health Administration (OSHA). *Id.* at 5. The refinery operates 24-hours a day to produce approximately nine million gallons of gasoline and diesel fuel per day. *Id.* at 5. The facility has a processing capacity of 240,000 barrels or 10.1 million gallons per day. *Id.* In addition to gasoline, the facility produces liquefied petroleum gas, propylene, asphalt, sulfur, and petroleum coke. *Id.* at 5. The refinery draws approximately 10.2 million gallons of water per day from the Des Plaines River and two million gallons of water daily from wells and, in turn, the facility discharges 12.3 million gallons of wastewater per day into the Des Plaines River. *Id.* The refinery draws water from and discharges to the Des Plaines River at approximately 1,000 feet east of the I-55 Bridge. *Id.*

Consent Decree

ExxonMobil will be retrofitting the Joliet Refinery to reduce air emissions in an effort to comply with a consent decree it entered into with the USEPA and the States of Illinois, Louisiana and Montana. Pet. at 1. The consent decree was a settlement for ExxonMobil's alleged violations of the New Source Review Program. *See* PC 2 at 1. The United States District Court for the Northern District of Illinois entered the consent decree on December 13, 2005. *See* Pet. at 6. A copy of the consent decree was attached to ExxonMobil's petition. *See* Pet. Exh. 1.

The consent decree requires ExxonMobil to install wet-gas scrubbers (WGS) and a catalytic sulfur dioxide (SO_2) additive technology (DESOX). *See* Pet. at 6. These technologies are expected to significantly reduce emissions of several air pollutants from the refinery, including a 95% reduction in sulfur dioxide emissions and a 50% reduction in the emission of nitrous oxides. *Id.* at 6. The WGS will contribute additional sulfate and TDS to the wastewater effluent from the refinery. *Id.* at 6.

As an attachment to its petition, ExxonMobil submitted a document entitled, *Process Description Along with Simplified Process Flow Diagrams*, describing the DESOX and WGS processes. *See* Pet. Exh. 3. The DESOX process is expected to capture SO_2 before processing through the WGS, and therefore the DESOX will limit the total increase of TDS into the wastewater discharge. *Id.* at 1. The WGS is expected to cause increased TDS wastewater discharges from the refinery. In turn, this will impact the concentration of TDS in the receiving waters. *See* Pet. Exh. 6 at 1.

Waste Water Treatment at the Joliet Refinery

ExxonMobil operates its wastewater treatment plant under a National Pollutant Discharge Elimination System (NPDES) permit issued by the Agency. *See* Pet. at 7. ExxonMobil attached a copy of the modified NPDES permit to its petition. *See* Pet. Exh. 7. The permit does not contain effluent limits on TDS. *Id.,* Pet. at 7. The Joliet Refinery's wastewater treatment plant (WWTP) includes physical/chemical and biological wastewater treatment processes, and performs primary, secondary, and tertiary treatment of the wastewater generated by the refinery. *See* Pet. at 7. The WWTP began operations in 1972 and included:

> two pre-separator fumes for gross oil removal, two API separators for oil and total suspended solids removal, two activated sludge units that can be operated in both parallel and series, followed by the treated guard basin and aeration before discharge. *Id.*

The refinery has made a number of improvements to its wastewater treatment system over the years, including: the addition of a "large equalization basin/biological aerated lagoon, larger blowers on the activated sludge units, new internals in the secondary clarifier" and process changes in the refinery to reduce pollutant loadings on the treatment system. *Id.* at 7. The refinery also installed "facilities to reduce oil carryover from process units," implemented a "'No Oil to Sewer' program plant-wide," and installed "access points in the sewer system to allow increased cleanouts." *Id.* ExxonMobil attached a diagram of the refinery's current wastewater treatment system to its petition. *See* Pet. Exh. 5.

ExxonMobil plans to expend approximately $40,000,000 to meet total suspended solids limitations for its wastewater discharge. Pet. at 8. ExxonMobil plans to upgrade the current wastewater treatment plant in the following ways: upgrade the Sour Water Stripper for pH optimization, which Exxon expects will reduce ammonia by 50%, install "alternate piping to reroute [the fluid catalytic cracking unit (FCC)] feed tank water draws from the wastewater treatment plant to the light slop system," increase flow monitoring in the wastewater treatment plant and install "new internals in the dissolved air floatation unit." *Id.* at 8.

ExxonMobil is also evaluating three options for treatment of the purge stream from the WGS. *See* Exh. 3 at 5, Exh. 6 at 4. None of the options will alter the amount of TDS discharged to the receiving stream. *Id.*

PROCEDURAL HISTORY

On February 7, 2006, ExxonMobil filed a petition for a site-specific rule under Section 28 of the Act (415 ILCS 28 (2004)). On the same day, the Agency and ExxonMobil filed a joint motion asking the Board to expedite consideration of this petition and to waive the 200 signatures requirement.

On March 2, 2006, the Board granted the motion for expedited consideration. The Board adopted the proposed rule for purposes of first notice under the APA without comment on the merits of the proposal, and thus began a 45-day period during which any person could file a public comment with the Board. The first-notice rule was published in the *Illinois Register* on March 17, 2006, and notice of publication was received from the Office of the Secretary of State on March 16, 2006. The Board received public comments from the Agency on July 5, 2006, and from ExxonMobil on July 11, 2006 and March 15, 2006.

On May 9, 2006, the Board scheduled a hearing for June 14, 2006, a prehearing Telephonic Status Conference for June 7, 2006, and ordered participants to prefile testimony and exhibits by May 31, 2006. The Board received prefiled testimony from the Agency and ExxonMobil on May 31, 2006 and June 2, 2006, respectively. On May 31, 2006, the Board received ExxonMobil's response to the Board's questions. James Huff, a registered professional engineer, and Stacey K. Ford, an employee of ExxonMobil and New Source Review Consent Decree Coordinator, both prefiled testimony on behalf of ExxonMobil. *See* Pet. Pre-File Test. Mark Twait, an environmental engineer with the Agency, prefiled testimony on behalf of that Agency. *See* Resp. Pre-File Test. On June 14, 2006, Stacey Ford and James Huff testified on behalf of ExxonMobil, and Scott Twait and Robert Mosher testified on behalf of the Agency. *See* Tr. at 4. All of the witnesses testified in favor of the proposed rule. *Id.*

The transcripts of the June 14, 2006 hearings were received by the Board on June 21, 2006, and promptly placed in the Clerk's Office On Line (COOL) on the Board's Web site at www.ipcb.state.il.us. Many other documents from this rulemaking are available through COOL, including Board opinions and orders, hearing officer orders, and public comments.

As required by Section 27(b) of the Act (415 ILCS 5/27(b) (2004)), the Board requested an economic impact study (ECIS) from the Department of Commerce and Economic Opportunity (DCEO) on March 2, 2006. In that letter, the Board asked the DCEO to provide a decision as soon as possible. No response to the letter was received. Based on this non-response and the DCEO's past assertions that it does not have the financial resources to perform ECIS studies, the Board considers that the DCEO decided not to conduct a study 30 days after the letter was sent – April 3, 2006. The Board's letter and the documents consisting of the DCEO's response were available to the public for more than 20 days prior to the June 14, 2006 hearing. The Board received no comments at the hearing on the DCEO's decision not to conduct an ECIS.

As noted, the Board conducted a public hearing in Joliet on June 14, 2006, and received comments from the petitioner and the Agency. The Agency submitted testimony and comments supporting ExxonMobil's site-specific rule proposal.

In its second-notice opinion and order issued on December 7, 2006, the Board found that adoption of ExxonMobil's proposed site-specific rule was warranted, and proposed the rulemaking for second-notice review by the JCAR. The Board incorporated the non-substantive first-notice changes suggested by JCAR into the proposal.

JCAR considered the second-notice proposal at its February 6, 2007 meeting and determined that no objection would be made. JCAR suggested minor non-substantive changes, and issued a formal certification of no objection to the proposed rulemaking on February 6, 2007. The second-notice period ended on February 8, 2007, when the Board received notification from JCAR that no objection will be issued. *See* 5 ILCS 100/5-40(c) (2002); 35 Ill. Adm. Code 102.606. Other than the non-substantive comments suggested by JCAR, the Board received no comments during the second-notice period.

DISCUSSION

At first notice, the Board accepted the proposal for hearing, and adopted the proposed amendments for the purpose of first notice under the Administrative Procedures Act (APA) without commenting on the merits of the proposal.

In its second-notice opinion, the Board found that the proposed site-specific rule is technically feasible and economically reasonable and will not have an adverse economic impact on the People of Illinois. Specifically, the Board agreed with the participants that "economically or technically feasible" treatment options that would allow the Joliet Refinery to comply with current water quality standards for TDS in the receiving waters are not available. Further, the Board agreed with ExxonMobil and the Agency that increased concentration of TDS in the relevant segment of the Des Plaines River will not substantially or significantly adversely affect the environment. The Board found that the proposed rule would most likely end any exceedences of TDS water quality standard in this segment of the Des Plaines River, and therefore allow for a mixing zone for TDS.

In addition, the Board agreed with ExxonMobil and the Agency that the aquatic toxicity data for sulfate presented by the Agency support the petitioner's assertion that the proposed TDS water quality standard of 1,686 mg/L for the affected segment of the Des Plaines River is within the toxicity threshold and protective of aquatic life. Further, the Board agreed with the participants that this segment of the Des Plaines River's impairment status under Section 303(d) of the Clean Water Act would most likely not be affected by an increased limit for TDS. The Board was convinced by the participants' assertion that a higher limit for TDS in this segment of the Des Plaines River is appropriate.

Because the Board determined that the proposed increased concentration limit in the receiving water is not expected to cause substantially adverse environmental impacts, and since the Agency cannot issue a permit with an effluent limit for TDS under the current standard because of previous exceedences in the receiving water, the Board concluded that a site-specific rule is appropriate in this instance.

The Board found that the proposed rule will not adversely impact the other dischargers into the relevant segment of the Des Plaines River, and that threatened or endangered species will not be impacted by the proposed rule. The Board noted that the USEPA has found that Section 303(c) of the Clean Water Act and 40 C.F.R. 131.11 are not impediments to the adoption of the proposed site-specific rule.

As in the second-notice order, the Board notes that as proposed, the standards would appear in new Section 303.445. The Board made several clarifying changes to the Part 303 table of contents and source note in the second-notice order, none of which warrant discussion.

The Board did not receive any comments on the modification, and the same language is included in today's order. Further, the Board has received no additional comments discussing economic reasonableness and technical feasibility of the proposed rule. Based on the record before it, the Board sees no reason to re-consider the conclusions made in the second-notice order. As noted, the Board did receive non-substantive comments from JCAR. The Board has incorporated the suggested changes into the adopted proposal, and has made further non-substantive clarifying changes that are not summarized in this order.

CONCLUSION

Based on the record before it, the Board finds that adoption of ExxonMobil's proposed site-specific rule is warranted.

ORDER

The Board directs the Clerk to file the following adopted rule with the Secretary of State for publication in the *Illinois Register* for final notice and adoption in the *Illinois Administrative Code*.

TITLE 35: ENVIRONMENTAL PROTECTION
SUBTITLE C: WATER POLLUTION
CHAPTER I: POLLUTION CONTROL BOARD

PART 303
WATER USE DESIGNATIONS AND SITE-SPECIFIC WATER QUALITY STANDARDS

SUBPART A: GENERAL PROVISIONS

Section
303.100 Scope and Applicability
303.101 Multiple Designations
303.102 Rulemaking Required

SUBPART B: NONSPECIFIC WATER USE DESIGNATIONS

Section
303.200 Scope and Applicability

SUBPART C: SPECIFIC USE DESINGATIONS AND SITE SPECIFIC WATER QUALITY STANDARDS

SUBPART D: THERMAL DISCHARGES

AUTHORITY: Implementing Section 13 and authorized by Sections 11(b) and 27 of the Environmental Protection Act [415 ILCS 5/13, 11(b) and 27].

SOURCE: Filed with the Secretary of State January 1, 1978; amended at 2 Ill. Reg. 27, p. 221, effective July 5, 1978; amended at 3 Ill. Reg. 20, p. 95, effective May 17, 1979; amended at 5 Ill. Reg. 11592, effective October 19, 1981; codified at 6 Ill. Reg. 7818; amended at 6 Ill. Reg. 11161, effective September 7, 1982; amended at 7 Ill. Reg. 8111, effective June 23, 1983; amended in R87-27 at 12 Ill. Reg. 9917, effective May 27, 1988; amended in R87-2 at 13 Ill. Reg. 15649, effective September 22, 1989; amended in R87-36 at 14 Ill. Reg. 9460, effective May 31, 1990; amended in R86-14 at 14 Ill. Reg. 20724, effective December 18, 1990; amended in R89-14(C) at 16 Ill. Reg. 14684, effective September 10, 1992; amended in R92-17 at 18 Ill. Reg. 2981, effective February 14, 1994; amended in R91-23 at 18 Ill. Reg. 13457, effective August 19, 1994; amended in R93-13 at 19 Ill. Reg. 1310, effective January 30, 1995; amended in R95-14 at 20 Ill. Reg. 3534, effective February 8, 1996; amended in R97-25 at 22 Ill. Reg. 1403, effective December 24, 1997; amended in R01-13 at 26 Ill. Reg. 3517, effective February 22, 2002; amended in R03-11 at 28 Ill. Reg. 3071, effective February 4, 2004; amended in R06-24 at 31 Ill. Reg. _____, effective _____.

SUBPART C: SPECIFIC USE DESIGNATIONS AND SITE SPECIFIC WATER QUALITY STANDARDS

Section 303.445 Total Dissolved Solids Water Quality Standard for the Lower Des Plaines River

a) Beginning November 1 and continuing through April 30 of each year, the total dissolved solids (TDS) water quality standard for Secondary Contact and Indigenous Aquatic Life Use waters in 35 Ill. Adm. Code 302.407 does not apply to the portion of the Des Plaines River from the ExxonMobil refinery wastewater treatment plant discharge point located at Interstate 55 and Arsenal Road (said point being located in Will County, T34N, R9E, S15, Latitude: 41°, 25', 20" North, Longitude: 88°, 11', 20" West) and continuing to the Interstate 55 bridge. TDS levels in these waters must instead meet a water quality standard for TDS (STORET Number 70300) of 1,686 mg/L.

b) Beginning November 1 and continuing through April 30 of each year, the TDS water quality standard for General Use Waters in 35 Ill. Adm. Code 302.208 does not apply to the Des Plaines River from the Interstate 55 bridge to the confluence of the Des Plaines River with the Kankakee River. TDS levels in these waters must instead meet a water quality standard for TDS (STORET Number 70300) of 1,686 mg/L.

Source: Added at 31 Ill. Reg. _____, effective _____)

IT IS SO ORDERED.

Section 41(a) of the Environmental Protection Act provides that final Board orders may be appealed directly to the Illinois Appellate Court within 35 days after the Board serves the order. 415 ILCS 5/41(a) (2004); *see also* 35 Ill. Adm. Code 101.300(d)(2), 101.906, 102.706. Illinois Supreme Court Rule 335 establishes filing requirements that apply when the Illinois Appellate Court, by statute, directly reviews administrative orders. 172 Ill. 2d R. 335. The Board's procedural rules provide that motions for the Board to reconsider or modify its final orders may be filed with the Board within 35 days after the order is received. 35 Ill. Adm. Code 101.520; *see also* 35 Ill. Adm. Code 101.902, 102.700, 102.702.

I, Dorothy M. Gunn, Clerk of the Illinois Pollution control Board, certify that the Board adopted the above opinion and order on February 15, 2007, by a vote of 4-0.

Dorothy M. Gunn, Clerk
Illinois Pollution Control Board

EXHIBIT 5

ILLINOIS POLLUTION CONTROL BOARD
September 4, 2008

IN THE MATTER OF:	)	
	)	
TRIENNIAL REVIEW OF SULFATE AND TOTAL DISSOLVED SOLIDS WATER QUALITY STANDARDS: PROPOSED AMENDMENTS TO 35 ILL. ADM. CODE 302.102(b)(6), 302.102(b)(8), 302.102(b)(10), 302.208(g), 309.103(c)(3), 405.109(b)(2)(A), 405.109(b)(2)(B), 406.100(d); REPEALER OF 35 ILL. ADM. CODE 406.203, 406.209, and PART 407; and PROPOSED NEW 35 ILL. ADM. CODE 302.208(h)	)	R07-9 (Rulemaking - Water)

Adopted Rule. Final Order.

OPINION AND ORDER OF THE BOARD (by G.T. Girard):

The Illinois Environmental Protection Agency (IEPA) proposed rules to update existing general use water quality standards for sulfate and total dissolved solids (TDS) by amending or repealing certain sections and parts of 35 Ill. Adm. Code Parts 302, 309, 405, 406, and 407 of the Board's water and mine-related pollution rules. On September 20, 2007, the Board proposed, for first notice, the rule as proposed by IEPA with certain specific changes. Those changes included the addition of language reflecting current IEPA practice to the rules on mixing zones and the amendment of mixing zone regulations to allow mixing in certain small streams when adequate dilution is not available.

On June 19, 2008, the Board proposed for second notice the rule, amending the language from first notice. Specifically, the Board amended the rule by clarifying: 1) how the sulfate standard for waters where chloride concentrations are above 500 milligrams per liter (mg/L) and hardness is 500 mg/L or lower would be set and, 2) how much of the steam volume may be used for mixing when the dilution ration is less than 3:1.

Today the Board proceeds to final notice making only slight changes as suggested by the Joint Committee on Administrative Rules (JCAR). JCAR voted to issue a certificate of no objection on August 19, 2008.

The Board will briefly describe the procedural background and then summarize the rule. Next, the Board will discuss the reasons for proceeding to final notice.

PROCEDURAL BACKGROUND

On October 23, 2006, IEPA filed a proposal under the general rulemaking provisions of Section 27 of the Environmental Protection Act (Act) (415 ILCS 5/27 (2006)). The proposal included a 15-page Statement of Reasons (Reasons) and a bound 3-inch thick collection of supporting facts and exhibits. On November 16, 2006, the Board accepted the rulemaking for hearing.

On November 27, 2006, in accordance with Section 27(b) of the Act (415 ILCS 5/27(b) (2006)), the Board requested that the Department of Commerce and Economic Opportunity (DCEO) conduct an economic impact study for this rulemaking. To date, the Board has not received a response from DCEO.

The Board held two hearings in this proceeding before Hearing Officer Marie Tipsord. The first hearing was held on March 7, 2007, in Springfield and the second on April 23, 2007, in Chicago. At those hearings, the Board heard testimony from:

Robert Mosher, Brian Koch and Toby Frevert on behalf of IEPA;
James Huff and Brigitte Postel on behalf of CITGO Petroleum Corporation (CITGO);
Glynnis Collins on behalf of Prairie Rivers Network, Sierra Club and the Environmental Law and Policy Center (collectively Environmental Groups);
Phil Gonet and Jim Boswell on behalf of the Illinois Coal Association (ICA).

At the close of hearings, a June 7, 2007 deadline for public comments to be filed was set. The Board received a total of eight public comments[1] from the following:

IEPA (PC 2, PC 4);
ICA (PC 1, PC 3);
Illinois Association of Wastewater Agencies Water Quality Subcommittee (IAWA) (PC 5);
CITGO (PC 6)
Illinois Environmental Regulatory Group (IERG) (PC 7); and
Environmental Groups (PC 8).

On September 20, 2007, the Board adopted the rule for first notice. The proposed rule was published in the *Illinois Register* on October 5, 2007 (31 Ill. Reg. 13624 (Oct. 5, 2007)). On October 11, 2007, by hearing officer order, the Board extended the deadline for filing first-notice public comments to December 3, 2007. The Board has received the following public comments since the rule was adopted for first notice:

IERG (PC 9);
IEPA (PC 10, PC 11).

On May 1, 2008, the Board adopted a *proposed* second notice to allow for comment on changes to the first notice proposal proposed at second notice. The Board allowed comments to

[1] Public comments are cited as "PC _ at _."

be filed until June 2, 2008. On June 2, 2008, the Environmental Groups filed a comment (PC 13).

On June 19, 2008, the Board adopted the rule for second notice and filed the rule with JCAR. On August 19, 2008, JCAR voted a certificate of no objection to the rule.

SUMMARY OF THE RULE

IEPA's proposed rule set forth a sulfate standard for general use waters that varied from 500 milligrams per liter (mg/L) to 2,500 mg/L, depending on the associated chloride and hardness levels measured in the water. The sulfate standard in waters used for livestock watering had a maximum level of 2,000 mg/L. The proposal eliminated the total dissolved solids (TDS) water quality standard for general use waters. The proposal also amended the mixing zone regulations to allow for mixing in 7Q1.1 zero flow streams[2], and in streams with less than a 3:1 dilution ratio. Finally, the proposal deleted the provisions addressing separate sulfate and chloride water quality standards for discharges from mining operations. Discharges from mining operations would be subject to the general use water quality standards under the proposed regulations. The Board requested additional comment on several of the provisions proposed for first notice, particularly regarding the economic reasonableness of the proposal to delete a special sulfate water quality standard for coal mines.

In response to the comments, the Board made changes to Section 302.208(h)(3)(C) and Section 309.102(b)(8). Specifically, the Board amended Section 302.208(h)(3)(C) to establish a standard for sulfate where chlorides exceed 500 mg/L and hardness is at or below 500 mg/L, according to Section 303(c) of the Clean Water Act and federal regulations at 40 C.F.R. 131.10(j)(2). Section 309.102(b)(8) was amended to require an NPDES permit applicant seeking a mixing zone more than 50% of the volume flow in streams where the dilution ratio is less than 3:1 to demonstrate the provision of an adequate zone of passage.

DISCUSSION

Section 27 of the Act obligates IEPA to provide an economic analysis to the Board and requires the Board to determine that the rule is economically reasonable and technically feasible. 415 ILCS 5/27 (2006). Specifically, the Act requires a person filing a proposed rule with the Board to "describe, to the extent reasonably practicable, the universe of affected sources and facilities and the economic impact of the proposed rule." 415 ILCS 5/27(a) (2006). The Board finds that IEPA has described affected sources including "19 active coal mines in Illinois at the present time." PC 2 at 2. Further, IEPA has described the economic reasonableness of the proposed sulfate standards. Specifically, IEPA analyzed point sources (including mining operations) within three categories (PC 11 at 3) concluding that only a small number of existing mines would need to employ additional controls such as best management practices.

The Illinois Coal Association (ICA) submitted as Hearing Exhibit 2 a technical report, dated May 1, 2004 through April 30, 2005, on the economic impact for coal mines. No other

[2] Streams that have zero flow for at least seven consecutive days recurring on average in nine years out of ten.

group has provided specific cost estimates. ICA's report estimated that the total annualized cost (capital and operating) for all coal mines in Illinois for compliance with a 2000 mg/L sulfate standard would be $730 million over a ten-year period. Exhibit 2 at 11. For compliance with a 500 mg/L standard, the report estimated a total annualized cost of $7.5 billion over a ten-year period. *Id.*

The Board carefully reviewed ICA's report and the rest of the record, and found that the record supported proceeding to first notice with the proposed sulfate standard as amended by the Board. The Board concluded that ICA's economic analysis was based on an assumption that additional treatment would be required for coal mines to achieve compliance, but that the Board's proposed changes to mixing provisions would allow mixing as a means of compliance, thus significantly reducing the proposed rules' economic impact upon industrial dischargers and coal mines. *See* Triennial Review of Sulfate and Total Dissolved Solids Water Quality Standards: Proposed Amendments to 35 Ill. Adm. Code 302.102(b)(6), 302.102(b)(8), 302.102(b)(10), 302.208(g), 309.103(c)(3), 405.109(b)(2)(A), 405.109(b)(2)(B), 406.100(d); Repealer of 35 Ill. Adm. Code 406.203 and Part 407; and Proposed New 35 Ill. Adm. Code 302.206(h) (Triennial Review), R07-9, slip op. at 30-31 (Sept. 20, 2007) (first notice).

The Board notes that, in accordance with Section 27(b) of the Act (415 ILCS 5/27(b) (2006)), the Board conducted a public hearing on the economic impact of the proposed rules and notified the public at least 20 days before the hearing. 415 ILCS 5/27(b)(2) (2008). The Board requested that the Department of Commerce and Economic Opportunity conduct a study of the economic impact of the proposed rules. *Id.* at (b)(1).

No additional hearings were requested, and no participant besides the ICA has submitted any additional economic data regarding the economic reasonableness of the proposed sulfate standard. The Board again carefully reviewed the record and considered all evidence in the record regarding the economic reasonableness of the proposed rules including sulfate standards on mining operations, before proceeding to second notice. The Board found that the record supports proceeding to second notice with the rule including the sulfate standards as proposed by IEPA. Triennial Review of Sulfate and Total Dissolved Solids Water Quality Standards: Proposed Amendments to 35 Ill. Adm. Code 302.102(b)(6), 302.102(b)(8), 302.102(b)(10), 302.208(g), 309.103(c)(3), 405.109(b)(2)(A), 405.109(b)(2)(B), 406.100(d); Repealer of 35 Ill. Adm. Code 406.203 and Part 407; and Proposed New 35 Ill. Adm. Code 302.206(h) (Triennial Review), R07-9, slip op. at 30-31 (June 19, 2008) (second notice).

During the proposed second notice period, only one comment was received (PC 13) and the Board amended the rulemaking language to address those concerns before proceeding to second notice.

The Board therefore finds that the rule is technically feasible and economically reasonable. Further, the Board finds that the record supports proceeding to adoption with the rule as proposed at second notice making only the changes suggested by JCAR.

CONCLUSION

The Board finds that the record supports proceeding to final notice with IEPA's proposal as amended by the Board. The Board finds the record establishes that the rulemaking is technically feasible and economically reasonable. Therefore the Board will proceed with final adoption of this rule.

ORDER

The Board adopts the proposed amendments set forth below for final notice and directs the Clerk to cause the rules to be filed with the Secretary of State for publication in the *Illinois Register* for final adoption.

TITLE 35: ENVIRONMENTAL PROTECTION
SUBTITLE C: WATER POLLUTION
CHAPTER I: POLLUTION CONTROL BOARD

PART 302
WATER QUALITY STANDARDS

SUBPART A: GENERAL WATER QUALITY PROVISIONS

Section
302.100 Definitions
302.101 Scope and Applicability
302.102 Allowed Mixing, Mixing Zones and ZIDs
302.103 Stream Flows
302.104 Main River Temperatures
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SUBPART B: GENERAL USE WATER QUALITY STANDARDS

Section
302.201 Scope and Applicability
302.202 Purpose
302.203 Offensive Conditions
302.204 pH
302.205 Phosphorus
302.206 Dissolved Oxygen
302.207 Radioactivity
302.208 Numeric Standards for Chemical Constituents
302.209 Fecal Coliform
302.210 Other Toxic Substances
302.211 Temperature
302.212 Total Ammonia Nitrogen
302.213 Effluent Modified Waters (Ammonia)(Repealed)

SUBPART C: PUBLIC AND FOOD PROCESSING WATER SUPPLY STANDARDS

SUBPART D: SECONDARY CONTACT AND INDIGENOUS AQUATIC LIFE STANDARDS

SUBPART E: LAKE MICHIGAN BASIN WATER QUALITY STANDARDS

SUBPART F: PROCEDURES FOR DETERMINING WATER QUALITY CRITERIA

AUTHORITY: Implementing Section 13 and authorized by Sections 11(b) and 27 of the Environmental Protection Act [415 ILCS 5/13, 11(b), and 27]

SOURCE: Filed with the Secretary of State January 1, 1978; amended at 2 Ill. Reg. 44, p. 151, effective November 2, 1978; amended at 3 Ill. Reg. 20, p. 95, effective May 17, 1979; amended at 3 Ill. Reg. 25, p. 190, effective June 21, 1979; codified at 6 Ill. Reg. 7818; amended at 6 Ill. Reg. 11161, effective September 7, 1982; amended at 6 Ill. Reg. 13750, effective October 26, 1982; amended at 8 Ill. Reg. 1629, effective January 18, 1984; peremptory amendments at 10 Ill. Reg. 461, effective December 23, 1985; amended at R87-27 at 12 Ill. Reg. 9911, effective May 27, 1988; amended at R85-29 at 12 Ill. Reg. 12082, effective July 11, 1988; amended in R88-1 at 13 Ill. Reg. 5998, effective April 18, 1989; amended in R88-21(A) at 14 Ill. Reg. 2899, effective February 13, 1990; amended in R88-21(B) at 14 Ill. Reg. 11974, effective July 9, 1990; amended in R94-1(A) at 20 Ill. Reg. 7682, effective May 24, 1996; amended in R94-1(B) at 21 Ill. Reg. 370, effective December 23, 1996; expedited correction at 21 Ill. Reg. 6273, effective December 23, 1996; amended in R97-25 at 22 Ill. Reg. 1356, effective December 24, 1997; amended in R99-8 at 23 Ill. Reg. 11249, effective August 26, 1999; amended in R01-13 at 26 Ill. Reg. 3505, effective February 22, 2002; amended in R02-19 at 26 Ill. Reg. 16931, effective November 8, 2002; amended in R02-11 at 27 Ill. Reg. 166, effective December 20, 2002; amended in R04-21

at 30 Ill. Reg. 4919, effective March 1, 2006; amended in R04-25 at 32 Ill. Reg. 2254, effective January 28, 2008; amended in R07-9 at 32 Ill. Reg. _____, effective _____.

SUBPART A: GENERAL WATER QUALITY PROVISIONS

Section 302.102 Allowed Mixing, Mixing Zones and ZIDs

a) Whenever a water quality standard is more restrictive than its corresponding effluent standard, or where there is no corresponding effluent standard specified at 35 Ill. Adm. Code 304, an opportunity shall be allowed for compliance with 35 Ill. Adm. Code 304.105 by mixture of an effluent with its receiving waters, provided the discharger has made every effort to comply with the requirements of 35 Ill. Adm. Code 304.102.

b) The portion, volume and area of any receiving waters within which mixing is allowed pursuant to subsection (a) shall be limited by the following:

1) Mixing must be confined in an area or volume of the receiving water no larger than the area or volume which would result after incorporation of outfall design measures to attain optimal mixing efficiency of effluent and receiving waters. Such measures may include, but are not limited to, use of diffusers and engineered location and configuration of discharge points.

2) Mixing is not allowed in waters which include a tributary stream entrance if such mixing occludes the tributary mouth or otherwise restricts the movement of aquatic life into or out of the tributary.

3) Mixing is not allowed in water adjacent to bathing beaches, bank fishing areas, boat ramps or dockages or any other public access area.

4) Mixing is not allowed in waters containing mussel beds, endangered species habitat, fish spawning areas, areas of important aquatic life habitat, or any other natural features vital to the well being of aquatic life in such a manner that the maintenance of aquatic life in the body of water as a whole would be adversely affected.

5) Mixing is not allowed in waters which contain intake structures of public or food processing water supplies, points of withdrawal of water for irrigation, or watering areas accessed by wild or domestic animals.

6) Mixing must allow for a zone of passage for aquatic life in which water quality standards are met. However, a zone of passage is not required in receiving streams that have zero flow for at least seven consecutive days recurring on average in nine years out of ten.

7) The area and volume in which mixing occurs, alone or in combination with other areas and volumes of mixing, must not intersect any area of any body of water in such a manner that the maintenance of aquatic life in the body of water as a whole would be adversely affected.

8) The area and volume in which mixing occurs, alone or in combination with other areas and volumes of mixing must not contain more than 25% of the cross-sectional area or volume of flow of a stream except for those streams where the dilution ratio is less than 3:1. In streams where the dilution ratio is less than 3:1, the volume in which mixing occurs, alone or in combination with other volumes of mixing, must not contain more than 50 % of the volume flow unless an applicant for an NPDES permit demonstrates, pursuant subsection (d) of this section, that an adequate zone of passage is provided for pursuant to Section 302.102(b)(6). ~~Mixing is not allowed in receiving waters which have a zero minimum seven day low flow which occurs once in ten years~~.

9) No mixing is allowed where the water quality standard for the constituent in question is already violated in the receiving water.

10) No body of water may be used totally for mixing of single outfall or combination of outfalls, except as provided in Section 302.102(b)(6).

11) Single sources of effluents which have more than one outfall shall be limited to a total area and volume of mixing no larger than that allowable if a single outfall were used.

12) The area and volume in which mixing occurs must be as small as is practicable under the limitations prescribed in this subsection, and in no circumstances may the mixing encompass a surface area larger than 26 acres.

c) All water quality standards of this Part must be met at every point outside of the area and volume of the receiving water within which mixing is allowed. The acute toxicity standards of Sections 302.208 and 302.210 must be met within the area and volume within which mixing is allowed, except as provided in subsection (e).

d) Pursuant to the procedures of Section 39 of the Act and 35 Ill. Adm. Code 309, a person may apply to the Agency to include as a condition in an NPDES permit formal definition of the area and volume of the waters of the State within which mixing is allowed for the NPDES discharge in question. Such formally defined area and volume of allowed mixing shall constitute a "mixing zone" for the purposes of 35 Ill. Adm. Code: Subtitle C. Upon proof by the applicant that a proposed mixing zone conforms with the requirements of Section 39 of the Act, this Section and any additional limitations as may be imposed by the Clean Water

Act (CWA) (33 USC ~~U.S.C~~ 1251 et seq.), the Act or Board regulations, the Agency shall, pursuant to Section 39(b) of the Act, include within the NPDES permit a condition defining the mixing zone.

e) Pursuant to the procedures of Section 39 of the Act and 35 Ill. Adm. Code 309, a person may apply to the Agency to include as a condition in an NPDES permit a ZID as a component portion of a mixing zone. Such ZID shall, at a minimum, be limited to waters within which effluent dispersion is immediate and rapid. For the purposes of this subsection, "immediate" dispersion means an effluent's merging with receiving waters without delay in time after its discharge and within close proximity of the end of the discharge pipe, so as to minimize the length of exposure time of aquatic life to undiluted effluent, and "rapid" dispersion means an effluent's merging with receiving waters so as to minimize the length of exposure time of aquatic life to undiluted effluent. Upon proof by the applicant that a proposed ZID conforms with the requirements of Section 39 of the Act and this Section, the Agency shall, pursuant to Section 39(b) of the Act, include within the NPDES permit a condition defining the ZID.

f) Pursuant to Section 39 of the Act and 35 Ill. Adm. Code 309.103, an applicant for an NPDES permit shall submit data to allow the Agency to determine that the nature of any mixing zone or mixing zone in combination with a ZID conforms with the requirements of Section 39 of the Act and of this Section. A permittee may appeal Agency determinations concerning a mixing zone or ZID pursuant to the procedures of Section 40 of the Act and 35 Ill. Adm. Code 309.181.

g) Where a mixing zone is defined in an NPDES permit, the waters within that mixing zone, for the duration of that NPDES permit, shall constitute the sole waters within which mixing is allowed for the permitted discharge. It shall not be a defense in any action brought pursuant to 35 Ill. Adm. Code 304.105 that the area and volume of waters within which mixing may be allowed pursuant to subsection (b) is less restrictive than the area or volume or waters encompassed in the mixing zone.

h) Where a mixing zone is explicitly denied in a NPDES permit, no waters may be used for mixing by the discharge to which the NPDES permit applies, all other provisions of this Section notwithstanding.

i) Where an NPDES permit is silent on the matter of a mixing zone, or where no NPDES permit is in effect, the burden of proof shall be on the discharger to demonstrate compliance with this Section in any action brought pursuant to 35 Ill. Adm. Code 304.105.

(Source: Amended at 32 Ill. Reg. _____, effective _____)

SUBPART B: GENERAL USE WATER QUALITY STANDARDS

Section 302.208 Numeric Standards for Chemical Constituents

a) The acute standard (AS) for the chemical constituents listed in subsection (e) shall not be exceeded at any time except as provided in subsection (d).

b) The chronic standard (CS) for the chemical constituents listed in subsection (e) shall not be exceeded by the arithmetic average of at least four consecutive samples collected over any period of at least four days, except as provided in subsection (d). The samples used to demonstrate attainment or lack of attainment with a CS must be collected in a manner that assures an average representative of the sampling period. For the metals that have water quality based standards dependent upon hardness, the chronic water quality standard will be calculated according to subsection (e) using the hardness of the water body at the time the metals sample was collected. To calculate attainment status of chronic metals standards, the concentration of the metal in each sample is divided by the calculated water quality standard for the sample to determine a quotient. The water quality standard is attained if the mean of the sample quotients is less than or equal to one for the duration of the averaging period.

c) The human health standard (HHS) for the chemical constituents listed in subsection (f) shall not be exceeded when the stream flow is at or above the harmonic mean flow pursuant to Section 302.658 nor shall an annual average, based on at least eight samples, collected in a manner representative of the sampling period, exceed the HHS except as provided in subsection (d).

d) In waters where mixing is allowed pursuant to Section 302.102, the following apply:

1) The AS shall not be exceeded in any waters except for those waters for which the Agency has approved a zone of initial dilutions (ZID) pursuant to Section 302.102.

2) The CS shall not be exceeded outside of waters in which mixing is allowed pursuant to Section 302.102.

3) The HHS shall not be exceeded outside of waters in which mixing is allowed pursuant to Section 302.102.

e) Numeric Water Quality Standards for the Protection of Aquatic Organisms

Constituent	STORET Number	AS (µg/L)	CS (µg/L)
Arsenic (trivalent, dissolved)	22680	$360 \times 1.0^* = 360$	$190 \times 1.0^* = 190$

Cadmium (dissolved)	01025	~~exp~~ $e^{A+B\ln(H)} \times \left\{1.138672 - [(\ln H)(0.041838)]\right\}^{*}$, where $A = -2.198$ and $B = 1.128$	~~exp~~ $e^{A+B\ln(H)} \times \left\{1.101672 - [(\ln H)(0.041838)]\right\}^{*}$, where $A = -3.490$ and $B = 0.7852$
Chromium (hexavalent, total)	01032	16	11
Chromium (trivalent, dissolved)	80357	~~exp~~ $e^{A+B\ln(H)} \times 0.316^{*}$, where $A = 3.688$ and $B = 0.8190$	~~exp~~ $e^{A+B\ln(H)} \times 0.860^{*}$, where $A = 1.561$ and $B = 0.8190$
Copper (dissolved)	01040	~~exp~~ $e^{A+B\ln(H)} \times 0.960^{*}$, where $A = -1.464$ and $B = 0.9422$	~~exp~~ $e^{A+B\ln(H)} \times 0.960^{*}$, where $A = -1.465$ and $B = 0.8545$
Cyanide	00718	22	5.2
Lead (dissolved)	01049	~~exp~~ $e^{A+B\ln(H)} \times \left\{1.46203 - [(\ln H)(0.145712)]\right\}^{*}$, where $A = -1.301$ and $B = 0.1.273$	~~exp~~ $e^{A+B\ln(H)} \times \left\{1.46203 - [(\ln H)(0.145712)]\right\}^{*}$, where $A = -2.863$ and $B = 1.273$
Mercury (dissolved)	71890	$2.6 \times 0.85^{*} = 2.2$	$1.3 \times 0.85^{*} = 1.1$

Nickel (dissolved)	01065	~~exp~~ $e^{A+B\ln(H)} \times 0.998$ *, where $A = 0.5173$ and $B = 0.8460$	~~exp~~ $e^{A+B\ln(H)} \times 0.997$ *, where $A = -2.286$ and $B = 0.8460$
TRC	500600	19	11
Zinc (dissolved)	01090	~~exp~~ $e^{A+B\ln(H)} \times 0.978$ *, where $A = 0.9035$ and $B = 0.8473$	~~exp~~ $e^{A+B\ln(H)} \times 0.986$ *, where $A = -0.8165$ and $B = 0.8473$
Benzene	78124	*4200*	*860*
Ethyl-benzene	78113	*150*	*14*
Toluene	78131	*2000*	*600*
Xylene(s)	81551	*920*	*360*

where: µg/L = microgram per liter~~,~~
~~exp[x]~~ e^x = base of natural logarithms raised to the x- power~~,~~
$\ln(H)$ = natural logarithm of Hardness (STORET 00900)~~, and~~
* = conversion factor multiplier for dissolved metals

f) Numeric Water Quality Standard for the Protection of Human Health

Constituent	STORET Number	(µg/L)
Mercury	71900	0.012
Benzene	78124	310

where: µg/L = micrograms per liter

g) Concentrations of the following chemical constituents shall not be exceeded except in waters for which mixing is allowed pursuant to Section 302.102.

STORET

Constituent	Unit	Number	Standard
Barium (total)	mg/L	01007	5.0
Boron (total)	mg/L	01022	1.0
Chloride (total)	mg/L	00940	500
Fluoride	mg/L	00951	1.4
Iron (dissolved)	mg/L	01046	1.0
Manganese (total)	mg/L	01055	1.0
Phenols	mg/L	32730	0.1
Selenium (total)	mg/L	01147	1.0
Silver (total)	µg/L	01077	5.0
~~Sulfate~~	~~mg/L~~	~~00945~~	~~500~~
~~Total Dissolved Solids~~	~~mg/L~~	~~70300~~	~~1000~~

where: mg/L = milligram per liter and
µg/L = microgram per liter

h) The following concentrations for sulfate must not be exceeded except in receiving waters for which mixing is allowed pursuant to Section 302.102:

1) At any point where water is withdrawn or accessed for purposes of livestock watering, the average of sulfate concentrations must not exceed 2,000 mg/L when measured at a representative frequency over a 30 day period.

2) The results of the following equations provide sulfate water quality standards in mg/L for the specified ranges of hardness (in mg/L as $CaCO_3$) and chloride (in mg/L) and must be met at all times:

A) If the hardness concentration of receiving waters is greater than or equal to 100 mg/L but less than or equal to 500 mg/L, and if the chloride concentration of waters is greater than or equal to 25 mg/L but less than or equal to 500 mg/L, then:

$C = [1276.7 + 5.508 (\text{hardness}) - 1.457 (\text{chloride})] * 0.65$

where, C = sulfate concentration

B) If the hardness concentration of waters is greater than or equal to 100 mg/L but less than or equal to 500 mg/L, and if the chloride

concentration of waters is greater than or equal to 5 mg/L but less than 25 mg/L, then:

C = [-57.478 + 5.79 (hardness) + 54.163 (chloride)] * 0.65

where C = sulfate concentration

3) The following sulfate standards must be met at all times when hardness (in mg/L as $CaCO_3$) and chloride (in mg/L) concentrations other than specified in (h)(2) are present:

A) If the hardness concentration of waters is less than 100 mg/L or chloride concentration of waters is less than 5 mg/L, the sulfate standard is 500 mg/L.

B) If the hardness concentration of waters is greater than 500 mg/L and the chloride concentration of waters is 5 mg/L or greater, the sulfate standard is 2,000 mg/L.

C) If the combination of hardness and chloride concentrations of existing waters are not reflected in subsection (h)(3)(A) or (B), the sulfate standard may be determined in a site-specific rulemaking pursuant to section 303(c) of the Federal Water Pollution Control Act of 1972 (Clean Water Act), 33 USC 1313, and Federal Regulations at 40 CFR. 131.10(j)(2).

(Source: Amended at 32 Ill. Reg. _____, effective _____)

TITLE 35: ENVIRONMENTAL PROTECTION
SUBTITLE C: WATER POLLUTION
CHAPTER I: POLLUTION CONTROL BOARD

PART 309
PERMITS

SUBPART A: NPDES PERMITS

Section
309.101 Preamble
309.102 NPDES Permit Required
309.103 Application - General
309.104 Renewal
309.105 Authority to Deny NPDES Permits
309.106 Access to Facilities and Further Information
309.107 Distribution of Applications
309.108 Tentative Determination and Draft Permit
309.109 Public Notice

SUBPART B: OTHER PERMITS

AUTHORITY: Implementing Sections 13 and 13.3 and authorized by Section 27 of the Environmental Protection Act [415 ILCS 5/13, 13.3 and 27].

SOURCE: Adopted in R71-14, at 4 PCB 3, March 7, 1972; amended in R73-11, 12, at 14 PCB 661, December 5, 1974, at 16 PCB 511, April 24, 1975, and at 28 PCB 509, December 20, 1977; amended in R73-11, 12, at 29 PCB 477, at 2 Ill. Reg. 16, p. 20, effective April 20, 1978; amended in R79-13, at 39 PCB 263, at 4 Ill. Reg. 34, p. 159, effective August 7, 1980; amended in R77-12B, at 41 PCB 369, at 5 Ill. Reg. 6384, effective May 28, 1981; amended in R76-21, at 44 PCB 203, at 6 Ill. Reg. 563, effective December 24, 1981; codified at 6 Ill. Reg. 7818; amended in R82-5, 10, at 54 PCB 411, at 8 Ill. Reg. 1612, effective January 18, 1984; amended in R86-44 at 12 Ill. Reg. 2495, effective January 13, 1988; amended in R88-1 at 13 Ill. Reg. 5993, effective April 18, 1989; amended in R88-21(A) at 14 Ill. Reg. 2892, effective February 13, 1990; amended in R91-5 at 16 Ill. Reg. 7339, effective April 27, 1992; amended in R95-22 at 20 Ill. Reg. 5526, effective April 1, 1996; amended in R99-8 at 23 Ill. Reg. 11287, effective August 26, 1999; amended in R02-11 at 27 Ill. Reg. 202, effective December 20, 2002; amended in R03-19 at 28 Ill. Reg. 7310, effective May 7, 2004; amended in R07-9 at 32 Ill. Reg. _____, effective _____.

SUBPART A: NPDES PERMITS

Section 309.103 Application - General

a) Application Forms

1) An applicant for a National Pollution Discharge Elimination System (NPDES) Permit shall file an application, in accordance with Section 309.223 ~~hereof~~, on forms provided by the Illinois Environmental Protection Agency (Agency). Such forms shall comprise the NPDES application forms promulgated by the U.S. Environmental Protection Agency for the type of discharge for which an NPDES Permit is being sought and such additional information as the Agency may reasonably require in order to determine that the discharge or proposed discharge will be in compliance with applicable state and federal requirements.

2) In addition to the above application forms, the Agency may require the submission of plans and specifications for treatment works and summaries of design criteria.

3) Effluent toxicity monitoring

A) In addition to the above application forms, the Agency may require, pursuant to Section 39 of the Act, the installation, use, maintenance and reporting of results from monitoring equipment and methods, including biological monitoring. The Agency may require, pursuant to Section 39 of the Act, effluent toxicity testing to show compliance with 35 Ill. Adm. Code 302.621 and 302.630. If this toxicity testing shows the effluent to be toxic, the Agency may require pursuant to Section 39 of the Act further testing and identification of the toxicants ~~toxicant(s)~~ pursuant to 35 Ill. Adm. Code 302.210(a).

B) The following POTWs shall provide the results of valid whole effluent biological toxicity testing to the Agency:

i) All POTWs with design influent flows equal to or greater than one million gallons per day;

ii) All POTWs with approved pretreatment programs or POTWs required to develop a pretreatment program pursuant to 35 Ill. Adm. Code 310.Subpart E;

C) In addition to the POTWs listed in subsection (a)(3)(B), the Agency may require other POTWs to submit the result of toxicity tests with their permit applications, based on consideration of the following factors.

i) The variability of the pollutants or pollutant parameters in the POTW effluent (based on chemical-specific information, the type of treatment facility, and types of industrial contributors);

ii) The dilution of the effluent in the receiving water (ratio of effluent flow to receiving stream flow);

iii) Existing controls on point or nonpoint sources, including total maximum daily load calculations for the waterbody segment and the relative contribution of the POTW;

iv) Receiving stream characteristics, including possible or known water quality impairment, and whether the POTW discharges to a coastal water, one of the Great Lakes, or a water designated as an outstanding natural resource; or

v) Other considerations (including but not limited to the history of toxic impact and compliance problems at the POTW), which the Agency determines could cause or contribute to adverse water quality impacts.

D) The POTWs required under subsection ~~subsections~~ (a)(3)(B) or (a)(3)(C) to conduct toxicity testing shall use the methods prescribed at 35 Ill. Adm. Code 302.Subpart F. Such testing must have been conducted since the later of the last NPDES permit reissuance or permit modification pursuant to Section 309.182, 309.183 or 309.184 for any of the reasons listed at 40 CFR 122.62(a) (1994), as amended at 60 Fed. Reg. 33926 effective June 29, 1995, herein incorporated by reference (including no later amendments or editions).

4) All POTWs with approved pretreatment programs shall provide the following information to the Agency: a written technical evaluation of the need to revise local limits pursuant to 35 Ill. Adm. Code 310.210. BOARD NOTE: Subsections (a)(3)(B) through (a)(4) are derived from 40 CFR 122.21(j) (1994).

b) Animal Waste Facilities

An applicant for an NPDES Permit in connection with the operation of an animal waste facility shall complete, sign, and submit an NPDES application in accordance with the provisions of 35 Ill. Adm. Code: Subtitle E, Chapter I.

c) Mining Activities

1) If, as defined by 35 Ill. Adm. Code 402.101, mining activities are to be carried out on a facility for which an NPDES Permit is held or required, the applicant must submit a permit application as required by 35 Ill. Adm. Code 403.103, 403.104 and 405.104. If the facility will have a discharge

other than a mine discharge or non-point source mine discharge as defined by 35 Ill. Adm. Code 402.101, the applicant shall also submit an NPDES Permit application in accordance with Section 309.223 on forms supplied by the Agency.

2) As provided by 35 Ill. Adm. Code 403.101, except to the extent contradicted in 35 Ill. Adm. Code: Subtitle D, Chapter I, the rules contained in this Subpart apply only to 35 Ill. Adm. Code: Subtitle D, Chapter I NPDES Permits.

3) As provided by 35 Ill. Adm. Code 406.100, except to the extent provided in 35 Ill. Adm. Code: Subtitle D, Chapter I, the effluent ~~and water quality~~ standards of 35 Ill. Adm. Code ~~302, 303 and~~ 304 are inapplicable to mine discharges and non-point source mine discharges.

d) New Discharges

Any person whose discharge will begin after the effective date of this Subpart A or any person having an NPDES Permit issued by the U.S. Environmental Protection Agency for an existing discharge which will substantially change in nature, or increase in volume or frequency, must apply for an NPDES Permit either:

1) No later than 180 days in advance of the date on which such NPDES Permit will be required; or

2) In sufficient time prior to the anticipated commencement of the discharge to insure compliance with the requirements of Section 306 of the Clean Water Act (CWA) (33 USC ~~U.S.C.~~ 1251 et seq), or with any other applicable water quality standards and applicable effluent standards and limitations.

e) Signatures

An application submitted by a corporation shall be signed by a principal executive officer of at least the level of vice president, or his duly authorized representative, if such representative is responsible for the overall operation of the facility from which the discharge described in the application form originates. In the case of a partnership or a sole proprietorship, the application shall be signed by a general partner or the proprietor, respectively. In the case of a publicly owned facility, the application shall be signed by either the principal executive officer, ranking elected official, or other duly authorized employee.

(Source: Amended at 32 Ill. Reg. _____, effective _____)

TITLE 35: ENVIRONMENTAL PROTECTION
SUBTITLE D: MINE RELATED WATER POLLUTION
CHAPTER I: POLLUTION CONTROL BOARD

PART 405
STATE AND NPDES PERMITS

Section
405.100 Preamble
405.101 Special Conditions: Agency Guidance Document
405.102 Standard for Permit Issuance or Certification
405.103 Permit Modification When New Regulations are Adopted
405.104 Permit Applications
405.105 Surface Drainage Control
405.106 Refuse Disposal
405.107 Experimental Permits for Refuse Disposal
405.108 Permit for Use of Acid-producing Mine Refuse
405.109 Abandonment Plan
405.110 Cessation, Suspension or Abandonment
405.111 Emergency Procedures To Control Pollution
405.112 Mine Entrances
405.113 Permit Area
405.APPENDIX A References to Previous Rules

AUTHORITY: Implementing Sections 12 and 13 and authorized by Section 27 of the Environmental Protection Act [415 ILCS 5/12, 13, and 27 (2006)].

SOURCE: Adopted in R76-20, R77-10, 39 PCB 196, at 4 Ill. Reg. 34, p. 164, effective August 7, 1980; codified at 5 Ill. Reg. 8527; amended in R83-6A at 8 Ill. Reg. 13267, effective July 16, 1984; amended in R07-9 at 32 Ill. Reg. _____, effective _____.

Section 405.109 Abandonment Plan

a) A state or NPDES permit shall include an abandonment plan as a condition.

b) An abandonment plan shall be incorporated into the permit by reference if it:

1) Includes a time schedule establishing that the abandonment plan will be executed and completed within a reasonable time after abandonment considering any potential adverse impact on the environment pending completion of the plan and the amount of time required to carry out the steps in the plan; one year is assumed to be a reasonable time unless the operator demonstrates that a longer time is reasonable; and

2) Shows that the mine related facilities and mining activities will be abandoned so as not to cause a violation of the Act or this Chapter.;

~~A) If the plan includes a discharge which will remain after abandonment which will not meet the requirements of 35 Ill. Adm. Code 406.202, and if the permit included water quality based conditions under 35 Ill. Adm. Code 406.203 during active mining, the discharge shall be deemed to meet 35 Ill. Adm. Code 406.202 with respect to total dissolved solids, chloride, sulfate, iron and manganese if it will meet the requirements of 35 Ill. Adm. Code 406.106 and 406.203(e)(1) and (e)(2); or~~

~~B) If the plan includes impoundments which will remain after abandonment and which will not meet the water quality standards of 35 Ill. Adm. Code 302.204 or 302.208, with respect to total dissolved solids, chloride, sulfate, iron, manganese and pH, such fact shall not prevent approval of the plan if the impoundment will meet the requirements of 35 Ill. Adm. Code 406.106 and 406.203(e)(1) and (e)(2).~~

c) If the abandonment plan does not meet the standard of ~~paragraph~~ subsection (b) the Agency may either deny the permit or issue it with an abandonment plan modified by conditions subject to Section 405.101.

d) The time limit provided by ~~paragraph~~ subsection (b)(1) is inapplicable to abandonment plans for surface coal mines which are approved as reclamation plans under the Surface Coal Mining Land Conservation and Reclamation Act, [225 ILCS 720] ~~(Ill. Rev. Stat. 1983, ch. 96 1/2, par. 7902.03)~~.

e) Any abandonment plan constituting a substantial change from the permitted abandonment plan is a revised abandonment plan.

f) A permittee shall apply for a new or revised or supplemental NPDES or State ~~state~~ permit prior to implementation of a revised abandonment plan within the time limits provided by 35 Ill. Adm. Code 403.104(c).

~~g) An abandonment plan incorporated into a permit pursuant to showing under 35 Ill. Adm. Code 406.203 shall include conditions pursuant to 35 Ill. Adm. Code 406.203(e)(1) and (e)(2).~~

(Source: Amended at 32 Ill. Reg. _____, effective _____)

TITLE 35: ENVIRONMENTAL PROTECTION
SUBTITLE D: MINE RELATED WATER POLLUTION
CHAPTER I: POLLUTION CONTROL BOARD

PART 406

MINE WASTE EFFLUENT AND WATER QUALITY STANDARDS

SUBPART A: EFFLUENT STANDARDS

SUBPART B: WATER QUALITY STANDARDS

AUTHORITY: Implementing Sections 12 and 13 and authorized by Section 27 of the Environmental Protection Act [415 ILCS 5/12, 13 and 27].

SOURCE: Adopted in R76-20, R77-10, 39 PCB 196, at 4 Ill. Reg. 34, p. 164, effective August 7, 1980; codified at 5 Ill. Reg. 8527; emergency amendment in R83-6B at 7 Ill. Reg. 8386, effective July 5, 1983, for a maximum of 150 days; amended in R83-6B at 7 Ill. Reg. 14510, effective October 19, 1983; amended in R83-6A at 8 Ill. Reg. 13239, effective July 16, 1984; amended in R84-29 at 11 Ill. Reg. 12899, effective July 27, 1987; amended in R07-9 at 32 Ill. Reg. _____, effective _____.

SUBPART A: EFFLUENT STANDARDS

Section 406.100 Preamble

a) Part 406 applies to mine discharges and non-point source mine discharges as defined by Section 402.101.

b) Other discharges, including sanitary sewers, are regulated under Subtitle C, Chapter I: Water Pollution.

c) A facility which has another discharge will be subject to both Subtitle C and Subtitle D. Subtitle D governs mining activities, including mine discharges and non-point source mine discharges. Subtitle C governs other discharges.

d) Except to the extent provided in this Part 406, Part ~~Parts 302, 303 and~~ 304 of subtitle C is ~~are~~ inapplicable to mine discharges and non-point source mine discharges.

(Source: Amended at 32 Ill. Reg. _____, effective _____)

SUBPART B: WATER QUALITY STANDARDS

Section 406.203 TDS Related Permit Conditions (Repealed)

~~a) This Section sets forth procedures by which water quality-based permit conditions for total dissolved solids, chloride, sulfate, iron and manganese may be established by the Agency for coal mine discharges. These procedures apply instead of Section 406.202 whenever a permit applicant elects to proceed under this Section. A permittee must comply with water quality-based permit conditions for total dissolved solids, chloride, sulfate, iron and manganese established pursuant to this Section instead of Section 406.202. Public hearings may be required pursuant to 35 Ill. Adm. Code 309.115.~~

~~b) An applicant may elect to proceed under this Section by providing the required information as part of a new or renewed or supplemental state or NPDES permit application.~~

~~c) The Agency shall establish permit conditions under this Section if all of the following conditions are met:~~

~~1) The applicant proves to the Agency that the discharge will not cause an adverse effect on the environment in and around the receiving stream, by either:~~

~~A) Demonstrating that the discharge will contain a concentration less than or equal to 3500 mg/l sulfate and 1000 mg/l chloride; or,~~

~~B) Through actual stream studies.~~

~~2) The applicant proves to the Agency that the discharge will not adversely affect any public water supply; and~~

~~3) The applicant proves to the Agency that it is utilizing good mining practices designed to minimize discharge of total dissolved solids, chloride, sulfate iron and manganese.~~

~~d) The Agency may promulgate under 35 Ill. Adm. Code 405.101(c) a code of good mining practices consistent with the definition in Section 406.204. Compliance with the code of good mining practices shall be prima facie evidence that the applicant is utilizing good mining practices within the meaning of paragraph (c)(3).~~

~~e) Whenever the Agency issues a permit based on this Section, it shall include such conditions as may be necessary to ensure that:~~

~~1) There is no adverse effect on the environment in and around the receiving stream;~~

~~2) The discharge does not adversely affect any public water supply; and~~

~~3) The permittee utilizes good mining practices designed to minimize discharge of total dissolved solids, chloride, sulfate, iron and manganese.~~

~~f) Whenever the Agency issues a permit pursuant to this Section, if may include as a condition a requirement that the permittee submit to the Agency effluent data for total dissolved solids, chloride, sulfate, iron and manganese.~~

(Source: Repealed at 32 Ill. Reg. _____, effective _____)

Section 406.209 Expiration of Former Exemptions (Repealed)

~~a) Exemptions from the water quality standards granted prior to the effective date of Section 406.203 shall continue until any of the following events occurs:~~

~~1) Any State or NPDES permit for the facility expires, or is revoked, renewed or reissued;~~

~~2) Any State or NPDES permit for the facility is modified, unless the Agency expressly continues the exemption pending review pursuant to paragraph (b);~~

~~3) An application period set pursuant to paragraph (b) expires with no application having been received;~~

~~4) The Agency grants or denies a permit under Section 406.203; or~~

~~5) January 1, 1987, the final date for continuation of former exemptions.~~

~~b) The Agency may require applications for review pursuant to Section 406.203 by notifying individual permittees and setting a date for application not less than 15 months after the date notice is given.~~

~~c) If an appeal to the Board is filed, exemptions continue until the Board enters a final order disposing of the appeal.~~

(Source: Repealed at 32 Ill. Reg. _____, effective _____)

TITLE 35: ENVIRONMENTAL PROTECTION
SUBTITLE D: MINE RELATED WATER POLLUTION
CHAPTER I: POLLUTION CONTROL BOARD

PART 407
COMPLIANCE AND EFFECTIVE DATES (REPEALED)

Section
407.101 Effective Date
407.102 Applications from Holders of Outstanding Permits
407.103 Expiration of Outstanding Permits
407.104 Abandonment Plan for Existing Permits
APPENDIX A References to Previous Rules

AUTHORITY: Authorized by Section 27 and implementing Sections 12 and 13 and authorized by Section 27 of the Illinois Environmental Protection Act (Ill. Rev. Stat., ch. 111 1/2, pars. 1012, 1013 and 1027) unless otherwise noted.

SOURCE: Adopted at 4 Ill. Reg. 34, p. 164, effective August 7, 1980; codified at 5 Ill. Reg. 34, p. 8527, effective August 10, 1981; Repealed in R07-9 at 31 Ill. Reg. _____, effective _____.

Section 407.101 Effective Date

This Chapter is effective upon filing with the Secretary of State.

Section 407.102 Applications from Holders of Outstanding Permits

a) A holder of an outstanding operating permit under the old Chapter 4 may apply for a state or NPDES permit at any time.

b) The Agency may by notification require a holder of an outstanding operating permit to apply for a state or NPDES permit.

c) Notification shall contain a date, not less than 180 days after notification, by which date an application must be received by the Agency.

Section 407.103 Expiration of Outstanding Permits

Compliance with the provisions of this Chapter is required on the effective date except that immediate compliance with the permit requirement of Section 404.101 is not required of holders of outstanding permits for mines opened prior to the effective date of this Subtitle D, Chapter I. For such facilities, compliance with Section 404.101 is required upon expiration of the outstanding operating permit. Such permits shall expire upon the occurrence of any of the following conditions, whichever occurs first:

a) The lapse of three years after the effective date of this Chapter; or

b) The expiration of any NPDES permit held by the permittee for the facility; or

c) Issuance of a permit for the facility pursuant to Section 403.102 or Section 404.101; or

d) The lapse of an application period fixed pursuant to Section 407.102(c) if an application is not received by the date given in the notification.

Section 407.104 Abandonment Plan for Existing Permits

The requirement of a permit to abandon contained in Rule 502 of old Chapter 4, effective May 23, 1972 shall continue to apply to operators of mines opened prior to the effective date of this Subtitle D, Chapter I, until such time as such operator shall have been issued under this Subtitle D, Chapter I a valid permit containing an abandonment plan.

Section 407.APPENDIX A REFERENCES TO PREVIOUS RULES

The following table is provided to aid in referencing old Board rule numbers to section numbers pursuant to codification.

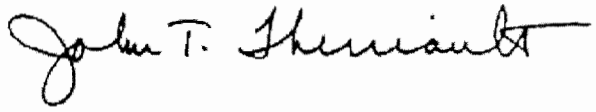
Chapter 4, Mine Related Pollution Part VII, Compliance and Effective Dates — 35 Ill. Admin. Code Part 407

Rule 701	Section 407.101
Rule 702	Section 407.102
Rule 703	Section 407.103
Rule 704	Section 407.104

Section 41(a) of the Environmental Protection Act provides that final Board orders may be appealed directly to the Illinois Appellate Court within 35 days after the Board serves the

order. 415 ILCS 5/41(a) (2006); *see also* 35 Ill. Adm. Code 101.300(d)(2), 101.906, 102.706. Illinois Supreme Court Rule 335 establishes filing requirements that apply when the Illinois Appellate Court, by statute, directly reviews administrative orders. 172 Ill. 2d R. 335. The Board's procedural rules provide that motions for the Board to reconsider or modify its final orders may be filed with the Board within 35 days after the order is received. 35 Ill. Adm. Code 101.520; *see also* 35 Ill. Adm. Code 101.902, 102.700, 102.702.

I, John T. Therriault, Assistant Clerk of the Illinois Pollution Control Board, certify that the Board adopted the above opinion and order on June 19, 2008, by a vote of 4-0.



John T. Therriault, Assistant Clerk
Illinois Pollution Control Board

EXHIBIT 6

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

APR 24 2006

REPLY TO THE ATTENTION OF:
WQ-16J

Mr. Robert Mosher
Water Quality Standards
Division of Water Pollution Control
Illinois Environmental Protection Agency
PO Box 19276
Springfield, IL 62794-9276

Dear Mr. Mosher:

Thank you for your January 24, 2006, letter to the United States Environmental Protection Agency (USEPA) regarding a proposed site-specific rule making to revise the total dissolved solids (TDS) standard for portions of the Lower Des Plaines River affected by the ExxonMobil Oil Refinery at Joliet, Illinois. In your letter, you requested that USEPA evaluate the information contained in the letter and provide a preliminary evaluation of whether or not the proposed site-specific rule making described in the letter would be consistent with the Clean Water Act (CWA) and Federal regulations if it were to be adopted by the Illinois Pollution Control Board (IPCB) and submitted to USEPA for review and approval.

For USEPA to further understand the proposed site-specific rule, a Petition for a Site-specific Rule water quality change was sent to Linda Holst from Tom Andryk, Assistant Counsel for Illinois Environmental Protection Agency (Illinois EPA) dated March 16, 2006. This was followed by a phone conversation on March 29, 2006, between Illinois EPA and USEPA and an email sent the same day explaining the recalculation procedure used to arrive at the proposed site-specific TDS standard (enclosed).

Summary of the proposed site-specific rule making

Under the conditions of a consent decree between USEPA and ExxonMobil, ExxonMobil is required to reduce its air emissions. To comply with the consent decree, Exxon Mobil intends to install wet gas scrubbers. As a result of the new air pollution controls, the concentrations of sodium sulfate in the wastewater discharge from the refinery will increase. ExxonMobil is seeking a site-specific standard change of the TDS standard for the Lower Des Plaines River from 1500 mg/L upstream of the I-55 bridge and 1000 mg/L downstream of the I-55 bridge to 1686 mg/L from the point of discharge to the confluence with the Kankakee River during the months of November to April. According to the letter, the applicable secondary contact and general use water quality standard cannot be met under winter low flow conditions because of high upstream TDS loads resulting from road salting. The letter indicates that even without the additional TDS loading from ExxonMobil due to the wet gas scrubber effluent, the highest observed ambient TDS concentration in the segment is 1595 mg/L; greater than either of the

Agency Ex F

applicable water quality standards. With the additional loading, the ambient concentrations under similar conditions are expected to be 1686 mg/L.

Based on all the documents, email and conversations that were provided to the USEPA, we understand that Illinois EPA is proposing a site-specific rule change based on a recalculation of the TDS standard based on new data and analyses conducted as part of Illinois' sulfate standard development effort. These data are used to demonstrate that the proposed site-specific standard for TDS is protective of uses given what is known about the toxicity of sulfates and the relationship between sulfate and chloride concentrations and TDS.

USEPA's preliminary review

USEPA understands that Illinois EPA will be submitting a proposed site-specific standard, based on the recalculation procedure, rule making to revise the TDS criterion for portions of the Lower Des Plaines River affected by the ExxonMobil Oil Refinery at Joliet, Illinois. Consistent with Section 303 of the CWA, USEPA will review Illinois' site-specific standard and either approve or disapprove at that time. However, USEPA has reviewed the information provided by Illinois EPA describing the technical basis for the proposed site-specific standard and determined that a site-specific standard derived consistent with the calculations provided in the email (enclosed) would be consistent with the requirements of Section 303(c) of the CWA and Federal regulations at 40 CFR 131.11 if it were to be adopted by the IPCB and submitted to USEPA consistent with Federal regulations at 40 CFR 131.6. This review is confined to the technical validity of the proposed standard only and does not constitute formal USEPA review and approval of new or revised water quality standards as required by Section 303(c)(3) of the CWA and Federal regulations at 40 CFR 131.21.

If you have any questions please feel free to contact Mari Nord at 312-886-3017 or Dave Pfeifer at 312-353-9024.

Very truly yours,

Linda Holst, Chief
Water Quality Branch

Enclosure

EPA'S RATIONALE FOR APPROVAL OF AMENDMENTS TO THE EXISTING ILLINOIS POLLUTION CONTROL BOARD REGULATION, 35 ILL. ADM. CODE 302.102, 302.208, 309.103, 405.109, 406.100, 406.203, and 407. REVISED WATER QUALITY CRITERIA FOR SULFATE AND TOTAL DISSOLVED SOLIDS. (WQSTS IL2008-274)

Date: MAR 1 8 2009

I. INTRODUCTION

On October 18, 2006, the Illinois Environmental Protection Agency (IEPA) proposed revisions to Illinois' water quality standards (WQS) for sulfate and total dissolved solids (TDS). EPA received the submittal on December 9, 2008. On January 21, 2009, EPA received a letter from the Illinois Attorney General's office certifying that the rulemaking met all State legal requirements. This certification completed the requirements of State WQS submissions as specified in 40 CFR 131.21 and section 303(c) of the Clean Water Act (CWA).

Documents submitted to EPA by IEPA included the following:

A. Action Letter from Marcia T. Willhite on December 9, 2008 which included:
   - Copies of the *Illinois Register* publications of the proposed and adopted regulations.
   - A copy of the Illinois EPA's Regulatory Proposal, dated October 18, 2006.
   - A copy of the Illinois Pollution Control Board's acceptance for hearing, first notice opinion, second first notice opinion, second notice opinion and adopting opinion in R07-009, which detail the rulemaking process and which responds to comments made during first notice.
   - A copy of the public notices for the hearings in R07-009.
   - Copies of the transcripts of the two hearings in R07-009.

B. Certification letter from The Illinois Attorney General's Office on January 21, 2009.

C. Copy of "Facts in Support of Changing Water Quality Standards for Sulfate, Total Dissolved Solids and Mixing Zones" along with Exhibits A through V received on February 1, 2007.

This review documents the basis for EPA's action on the components of Illinois' revised water rules.

A. EPA's review for consistency with the CWA and Federal Regulations

Water quality standards requirements of CWA sections 101(a)(2), 118, and 303(c)(2) are implemented through federal regulations at 40 CFR Part 131 and 40 CFR Part 132. Federal regulations at 40 CFR §131.21 require EPA to review and approve or disapprove new and revised water quality standards adopted by states and tribes. This authority has been delegated to the ten EPA Regional Administrators and, in Region 5, further delegated to the Director of the Water Division. In making this determination, EPA must consider the following requirements for 40 CFR §131.5:

- whether state-adopted uses are consistent with CWA requirements;
- whether the state has adopted criteria are protective of the adopted uses;
- whether the state has followed legal procedures for revising its standards;
- whether these standards are based on appropriate technical and scientific data and analyses;
- whether the state's submission includes certain basic elements as specified in 40CFR131.6, including use designations that are consistent with the provisions of Sections 101(a)(2) and 303(c)(2) of the CWA; and,
- whether, for water quality standards that apply within the Great Lakes basin, the state submission meets the requirements of 40 CFR Part 132.

B. EPA's consultation requirements under the Endangered Species Act

Consistent with section 7(a)(2) of the Endangered Species Act (ESA), 16 U.S.C. § 1536(a)(2), and federal regulations at 50 CFR Part 402, EPA is generally required to consult with the U.S. Fish and Wildlife Service (FWS) and/or the National Oceanic and Atmospheric Administration's Fisheries Service (for marine species), on EPA actions that may affect federally-listed threatened or endangered species or designated critical habitat (generally referred to as "listed species" in the remainder of this document). EPA's approval of new or revised State water quality standards under Section 303 of the CWA is generally an action requiring consultation where such approvals may affect listed species or designated critical habitat.

In a June 6, 2008 letter, EPA initiated informal consultation with the Rock Island Field Office of FWS. Consultation was not completed prior to EPA's statutory deadline for action on Illinois' revised water quality standards. EPA's approval of Illinois' revised water quality standards provisions identified below, is subject to the results of consultation under Section 7(a)(2) of the ESA. EPA will continue to work with FWS to complete consultation on EPA's approval of Illinois' revised water quality standards.

EPA believes that proceeding with approval of Illinois' revised water quality standards is consistent with section 7(d) of the ESA. EPA's approval decisions do not foreclose either formulation by FWS, or the implementation by EPA, of any alternatives that might be determined in the consultation to be needed to comply with section 7(a)(2). By approving the standards subject to the result of consultation under section 7(a)(2) of the ESA, EPA has explicitly stated that it retains its discretion to take appropriate action if the consultation identifies deficiencies in the standards requiring remedial action by EPA. EPA retains the full range of options available under section 303(c) of the CWA for ensuring the water quality standards are protective. EPA can, for example, work with Illinois to ensure that Illinois revises its standards as needed to ensure listed species protection, initiate rulemaking to promulgate federal standards to supersede Illinois' water quality standards or, in appropriate circumstances, change EPA's approval to disapproval. Moreover, EPA believes that approval of the State's water quality standards revisions summarized below will not result in any impacts of concern prior to the conclusion of consultation.

II. SUMMARY OF SUBMITTED RULE REVISIONS

A. Description of rule revisions

The changes to Illinois water rules consist of editorial and substantive changes to multiple rules. The changes are summarized below:

Title 35: Environmental Protection
Subtitle C: Water Pollution
Chapter I: Pollution Control Board
Part 302: Water Quality Standards

- Section 302.102 Allowed Mixing, Mixing Zones and ZIDs
  - Eliminates the requirement for a zone of passage in receiving streams that have zero flow for at least seven consecutive days recurring on average in nine years out of ten.
  - Allows for up to 50% of the volume of a stream to be used for mixing where the dilution ratio is less than 3:1 and eliminates the prohibition on mixing in streams with a zero minimum seven day low flow which occurs once in ten years.

- Section 302.208 Numeric Standards for Chemical Constituents
  - Illinois made editorial changes to the table of aquatic life criteria at 302.208 (e) consisting of replacing the term "exp" with the mathematical symbol "e."
  - Illinois struck the existing criteria for TDS and sulfate. These criteria are replaced by the new sulfate criterion at 302.208(h).

Part 309: Permits

- Section 309.103 Application – General
  - Illinois made editorial to Illinois' rules on NPDES permit applications

Subtitle D: Mine Related Water Pollution
Part 405: State and NPDES Permits

- Section 405.109 Abandonment Plan
  - Eliminates provisions allowing exemptions from water quality standards for dissolved solids, sulfates and chlorides for coal mines
  - Editorial changes

Part 406: Mine Waste Effluent and Water Quality Standards

- Section 406.100(d), Mine Waste Effluent and Water Quality Standards
  - Exemption from Illinois' water quality standards for mine discharges is eliminated.

- Section 406.203 TDS Related Permit Conditions (Repealed)
  - Repeals rule for establishing TDS limits in permits for coal mines in NPDES permits.

- Section 406.209 Expiration of Former Exemptions (Repealed)
  - Repeals rule expiring exemptions from WQS granted prior to the effective data of 406.203.

Part 407, Compliance and Effective Dates (REPEALED)

B. <u>Rule Development and Submittal History</u>

- Illinois EPA proposed revisions to 35 Ill. Adm. Code 302.102, 302.208, 309.103, 405.109, 406.100, 406.203, and 407 to the IBCB on October 18, 2006, docketed as R07-009.

- The IPCB held two hearing on the proposal.
  - The first hearing was held in Springfield on March 7, 2007.
  - The second in Chicago on April 23, 2007.

- The IPCB issued its First Notice Opinion on September 20, 2007.

- On May 1, 2008, the IPCB adopted a proposed Second Notice Opinion to allow for Submissions of State Regulations 35 Ill. Adm. Code 302.102, 302.208, 309.103, 405.109, 406.100, 406.203, and 407 requesting comments on the proposed second notice.

- On June 19, 2008, the IPCB adopted the rule for second notice and filed the rule with JCAR.
- On August 19, 2008, JCAR voted a certificate of no objection to the rule.
- On September 4, 2008, the IPCB adopted the final amendments to the rule.

The complete record of the public comments received on the proposed rules and the responses to those comments may be found in the IPCB case file for this rulemaking, R2007-009, available at http://www.ipcb.state.il.us/Cool/External/CaseView2.asp?referer=coolsearch&case=13086.

III. EPA ACTIONS

A. Possible EPA actions on Illinois revised water quality standards include:

- **Approval** – where EPA has concludes that approval of certain revisions will have no effect on listed species, or is otherwise not subject to ESA consultation;
- **Approval subject to ESA consultation** – where EPA has concluded that certain revisions may affect listed species (including beneficial effects);
- **Disapproval** – where EPA has concluded that certain revisions do not meet the requirements of the CWA or Federal regulations; and
- **No EPA Action** – where EPA has concluded that the changes to Illinois' rules are not revisions to Illinois' designated uses of Illinois surface waters, new or revised water quality criteria to protect the uses of Illinois surface waters, new or revised antidegradation policies or implementation procedures, or new or revised policies generally affecting implementation of Illinois water quality standards. Such changes do not require EPA approval under section 303(c)(2)(A) of the CWA. EPA will update EPA's docket of Illinois' water quality standards rules to reflect these revisions and the revised rules are effective pursuant to Illinois law.

B. EPA actions on Illinois' revised rules

Title 35: Environmental Protection
Subtitle C: Water Pollution
Chapter I: Pollution Control Board
Part 302: Water Quality Standards

Section 302.102 Allowed Mixing, Mixing Zones and ZIDs

- CHANGES TO ILLINOIS' RULES:

b) The portion, volume and area of any receiving waters within which mixing is allowed pursuant to subsection (a) shall be limited by the following:

6) Mixing must allow for a zone of passage for aquatic life in which water quality standards are met. *However, a zone of passage is not required in receiving streams that have zero flow for at least seven consecutive days recurring on average in nine years out of ten.*

8) The area and volume in which mixing occurs, alone or in combination with other areas and volumes of mixing must not contain more than 25% of the cross-sectional area or volume of flow of a stream except for those streams where the dilution ratio is less than

3:1. *In streams where the dilution ratio is less than 3:1, the volume in which mixing occurs, alone or in combination with other volumes of mixing must not contain more than 50 % of the volume flow unless an applicant for an NPDES permit demonstrates pursuant subsection (d) of this section that an adequate zone of passage is provided for pursuant to Section 302.102(b)(6).* ~~Mixing is not allowed in receiving waters which have a zero minimum seven day low flow which occurs once in ten years.~~

10) No body of water may be used totally for mixing of single outfall or combination of outfalls, *except as provided in Section 302.102(b)(6).*

- ILLINOIS' RATIONAL FOR THESE REVISIONS:

These revisions amend the mixing regulations to allow mixing in 7Q1.1 zero flow streams; provided there is adequate upstream dilution. Prior to these changes, 302.202 (b)(8) prohibited mixing in streams that have a zero flow for a minimum of seven consecutive days at a recurrence frequency of once in ten years ("zero 7Q10 flow"). This is set in order to protect aquatic life from discharges during drought conditions. The new changes would allow mixing during wet weather events such as rainfall or snowmelt where smaller streams receive significant storm water runoff from the watershed.

During these events, flows may exist where they don't occur under non-wet weather occurrences. Illinois is proposing changes to Section 302.102(b)(6) to allow mixing in very small streams without imposing the zone of passage requirement. These small streams are zero flow streams in dry weather and they are also, by nature, narrow streams. The mixture of effluent and stream water will quickly encompass the entire width of the stream bed since the stream flows present when effluents are discharged are often high velocity, typical of runoff events. The Agency is proposing changes to 302.102(b)(10) to ensure consistency with the changes made to Sections 302.102(b)(6) and (b)(8). Illinois' proposal provides that no body of water may be used in its entirety for mixing purposes unless it is a 7Q1.1 zero flow stream [1].

- EPA'S REVIEW OF ILLINOIS' REVISED RULES FOR CONSISTENCY WITH THE CWA AND FEDERAL REGULATIONS:

Approve subject to ESA consultation. EPA reviewed Illinois' rule revisions and Illinois' rationale for making these changes. EPA accepts Illinois' rationale and agrees that these changes will protect the designated uses of Illinois surface waters because the new rules will only allow mixing in streams with zero 7Q10 flow for discharges that occur when there actually is dilution flow.

Section 302.208 Numeric Standards for Chemical Constituents

- CHANGES TO ILLINOIS' RULES:

302.208(e) Numeric Water Quality Standards for the Protection of Aquatic Organisms:

Summary of changes made: Illinois made editorial changes to the table of aquatic life criteria at 302.208 (e) consisting of replacing the term "exp" with the mathematical symbol "e."

- ILLINOIS' RATIONALE FOR THESE REVISIONS:

These changes are editorial in nature. The use of the commonly-accepted symbol "e" in lieu of "exp" makes the mathematical equations easier to read and understand.

- EPA'S REVIEW OF ILLINOIS' REVISED RULES FOR CONSISTENCY WITH THE CWA AND FEDERAL REGULATIONS:

No EPA Action – EPA reviewed the changes to 302.208 (e) to determine whether or not the revisions made by Illinois to theses rules that are part of Illinois' water quality standards constituted new or revised designated uses of Illinois surface waters, new or revised water quality criteria to protect the uses of Illinois surface waters, new or revised antidegradation policies or implementation procedures, or new or revised policies generally affecting implementation of Illinois water quality standards. EPA concluded that the editorial changes to this rule are not revisions to the State's water quality standards because they do consist of any of the types of changes described above. Therefore EPA determined that the changes to 302.208 e) do not require EPA approval under section 303(c)(2)(A) of the CWA. EPA has updated EPA's docket of Illinois' water quality standards rules to reflect these revisions and the revised rules are effective pursuant to Illinois law.

- CHANGES TO ILLINOIS' RULES:

302.208(g) Concentrations of the following chemical constituents shall not be exceeded except in waters for which mixing is allowed pursuant to Section 302.102.

Summary of changes made: Illinois struck the existing criteria for TDS and sulfate. These criteria are replaced by the new sulfate criterion adopted at 302.208(h), summarized below. 302.208(g) and 302.208(h) are reviewed together.

g) Concentrations of the following chemical constituents shall not be exceeded except in waters for which mixing is allowed pursuant to Section 302.102.

Constituent	Unit	STORET Number	Standard
Barium (total)	mg/L	01007	5.0
Boron (total)	mg/L	01022	1.0
Chloride (total)	mg/L	00940	500
Fluoride	mg/L	00951	1.4
Iron (dissolved)	mg/L	01046	1.0
Manganese (total)	mg/L	01055	1.0
Phenols	mg/L	32730	0.1
Selenium (total)	mg/L	01147	1.0
Silver (total)	µg/L	01077	5.0
~~Sulfate~~	~~mg/L~~	~~00945~~	~~500~~
~~Total Dissolved Solids~~	~~mg/L~~	~~70300~~	~~1000~~

where: mg/L = milligram per liter and
µg/L = microgram per liter

New 302.208 (h):

(h) The following concentrations for sulfate must not be exceeded except in receiving waters for which mixing are allowed pursuant to Section 302.102:

1) At any point where water is withdrawn or accessed for purposes of livestock watering, the average of sulfate concentrations must not exceed 2,000 mg/L when measured at a representative frequency over a 30 day period.

2) The results of the following equations provide sulfate water quality standards in mg/L for the specified ranges of hardness (in mg/L as CaCO3) and chloride (in mg/L) and must be met at all times:

A) If the hardness concentration of receiving waters is greater than or equal to 100 mg/L but less than or equal to 500 mg/L, and if the chloride concentration of waters is greater than or equal to 25 mg/L but less than or equal to 500 mg/L, then:

C = [1276.7 + 5.508 (hardness) - 1.457 (chloride)] * 0.65
where: C = sulfate concentration

B) If the hardness concentration of waters is greater than or equal to 100 mg/L but less than or equal to 500 mg/L, and if the chloride concentration of waters is greater than or equal to 5 mg/L but less than 25 mg/L, then:

C = [-57.478 + 5.79 (hardness) + 54.163 (chloride)] * 0.65
where: C = sulfate concentration

3) The following sulfate standards must be met at all times when hardness (in mg/L as CaCO3) and chloride (in mg/L) concentrations other than specified in (h)(2) are present:

A) If the hardness concentration of waters is less than 100 mg/L or chloride concentration of waters is less than 5 mg/L, the sulfate standard is 500 mg/L.

B) If the hardness concentration of waters is greater than 500 mg/L and the chloride concentration of waters is 5 mg/L or greater, the sulfate standard is 2,000 mg/L.

C) If the combination of hardness and chloride concentrations of existing waters are not reflected in subsection (h)(3)(A) or (B), the sulfate standard will be determined on a case-by-case basis in conjunction with an applicable NPDES permitting process.

ILLINOIS' RATIONALE FOR THESE REVISIONS:

Sulfate Aquatic Life Water Quality Standard: The technical support for Illinois' revised sulfate criterion is described in detail in Attachment I, Exhibits K -V of Illinois EPA's proposal to the Illinois Pollution Control Board. To summarize, the Illinois water quality standards for sulfate and TDS that existed prior to these revisions were adopted in 1972 to protect aquatic life and agricultural uses, prior to EPA's 1985 guidelines for calculating aquatic life criteria. The new criterion for sulfate was calculated the EPA's 1985 guidelines to protect aquatic life with a maximum value to protect use of Illinois surface waters for livestock watering.

The new criterion for sulfate is expressed as an equation with the criterion dependent upon the hardness and chloride concentrations in the receiving water. The criterion consists of two equations that provide water quality criteria for sulfate that shall not be exceeded in all surface waters outside the mixing zone based on ranges of chloride (in mg/L) or hardness (in mg/L as CaCO3). The relationship between sulfate toxicity, hardness, and chloride is different at low and high ranges; therefore, two equations are necessary. A series of toxicity tests run under a range of hardness and chloride concentrations for *Hyalella azteca* and *Ceriodaphnia dubia* provide the scientific basis of these equations.

Sulfate Livestock Watering Water Quality Standard: The technical support for Illinois' revised sulfate criterion is described in detail in Attachment I, Exhibits E - J of Illinois EPA's proposal to the Illinois Pollution Control Board. The result of an extensive literature search also prompted Illinois to revise its sulfate standard for livestock. It was found that livestock are capable withstanding sulfate concentration higher than the current aquatic life criterion. Studies suggest that chronic exposures to drinking waters high in sulfate may lead to weight loss, diseases, and livestock mortality. Illinois is therefore proposing a sulfate standard of 2,000 mg/L where livestock use is present. Illinois considers this to be protective. To verify the suitability of this proposed standard, Dr. Gavin Meerdink from the Department of Veterinary Medicine at University of Illinois Champaign-Urbana was contacted. Dr. Meerdink stated that a 2,000 mg/L sulfate standard would adequately protect livestock.

TDS Water Quality Standard: Illinois is proposing to delete the TDS water quality standard from Section 302.208 of the IPCB regulations. TDS represent the sum of dissolved substances in water; sulfate, chloride, sodium, calcium, carbonate, and magnesium are the major components. Illinois believes that the existing TDS standard is unnecessary as the toxicity of the individual components, most significantly sulfate and chloride, is impacting aquatic life as opposed to all the components together. Therefore, with a toxicity based sulfate and chloride standards in effect, a TDS standard is not necessary.

- EPA'S REVIEW OF ILLINOIS' REVISED RULES FOR CONSISTENCY WITH THE CWA AND FEDERAL REGULATIONS:

Approve subject to ESA consultation – EPA has reviewed Illinois' revised sulfate and TDS criteria and the technical basis for Illinois' revised sulfate and TDS criteria. EPA's review consisted of determining whether or not the data gathered and generated by Illinois were acceptable, whether or not the data satisfied EPA's minimum data requirements for deriving a water quality criterion, whether or not the criterion derived by Illinois is scientifically-defensible, and whether or not the criterion will protect the uses of Illinois surface waters. Based on this review of the data gathered and generated by Illinois and the criterion derived from the data, EPA concludes that the new Illinois sulfate criterion and the existing chloride criterion is sufficient to

protect the uses of Illinois surface waters, and that the removal of the existing TDS standard is no longer needed to protect the aquatic life use.

Part 309: Permits

Section 309.103 Application – General

- CHANGES MADE TO ILLINIOS' RULES:

309.103(a) Application Forms

3) Effluent toxicity monitoring

A) In addition to the above application forms, the Agency may require, pursuant to Section 39 of the Act, the installation, use, maintenance and reporting of results from monitoring equipment and methods, including biological monitoring. The Agency may require, pursuant to Section 39 of the Act, effluent toxicity testing to show compliance with 35 Ill. Adm. Code 302.621 and 302.630. If this toxicity testing shows the effluent to be toxic, the Agency may require pursuant to Section 39 of the Act further testing and identification of the *toxicants* ~~toxicant(s)~~ pursuant to 35 Ill. Adm. Code 302.210(a).

C) In addition to the POTWs listed in *subsection* (a)(3)(B), the Agency may require other POTWs to submit the result of toxicity tests with their permit applications, based on consideration of the following factors.

D) The POTWs required under *subsection* ~~subsections~~ (a)(3)(B) or (a)(3)(C) to conduct toxicity testing shall use the methods prescribed at 35 Ill. Adm. Code 302.Subpart F. Such testing must have been conducted since the later of the last NPDES permit reissuance or permit modification pursuant to Section 309.182, 309.183 or 309.184 for any of the reasons listed at 40 CFR 122.62(a) (1994), as amended at 60 Fed. Reg. 33926 effective June 29, 1995, herein incorporated by reference (including no later amendments or editions).

309.103(c) Mining Activities

3) As provided by 35 Ill. Adm. Code 406.100, except to the extent provided in 35 Ill. Adm. Code: Subtitle D, Chapter I, the effluent and water quality standards of 35 Ill. Adm. Code ~~302, 303 and~~ 304 are inapplicable to mine discharges and non-point source mine discharges.

309.109(d) New Discharges

Any person whose discharge will begin after the effective date of this Subpart A or any person having an NPDES Permit issued by the U.S. Environmental Protection Agency for an existing discharge which will substantially change in nature, or increase in volume or frequency, must apply for an NPDES Permit either:

2) In sufficient time prior to the anticipated commencement of the discharge to insure compliance with the requirements of Section 306 of the Clean Water Act (CWA) (33 *USC* ~~U.S.C~~. 1251 et seq), or with any other applicable water quality standards and applicable effluent standards and limitations.

- ILLINOIS' RATIONALE FOR THESE REVISIONS:

The changes in this section are either editorial or changes necessary to conform with the changes made to Illinois mining permitting rules in Subpart D (described below).

- EPA'S REVIEW OF ILLINOIS' REVISED RULES FOR CONSISTENCY WITH THE CWA AND FEDERAL REGULATIONS:

No EPA Action – EPA reviewed the changes to 309 to determine whether or not the revisions made by Illinois to theses rules that are part of Illinois' water quality standards constituted new or revised designated uses of Illinois surface waters, new or revised water quality criteria to protect the uses of Illinois surface waters, new or revised antidegradation policies or implementation procedures, or new or revised policies generally affecting implementation of Illinois water quality standards. EPA concluded that the editorial changes to this rule are not revisions to the State's water quality standards because they do consist of any of the types of changes described above. Therefore EPA determined that the changes to 309 do not require EPA approval under section 303(c)(2)(A) of the CWA. Since the revisions may be covered by other EPA authorities, the revisions were forwarded to the NPDES Branch for consideration and possible action.

Subtitle D: Mine Related Water Pollution
Part 405: State and NPDES Permits and Part 406: Mine Waste Effluent and Water Quality Standards

Section 405.109 Abandonment Plan

- CHANGES MADE BY ILLINOIS:

b) An abandonment plan shall be incorporated into the permit by reference if it:

2) Shows that the mine related facilities and mining activities will be abandoned so as not to cause a violation of the Act or this Chapter.~~;~~

~~A) If the plan includes a discharge which will remain after abandonment which will not meet the requirements of 35 Ill. Adm. Code 406.202, and if the permit included water quality-based conditions under 35 Ill. Adm. Code 406.203 during active mining, the discharge shall be deemed to meet 35 Ill. Adm. Code 406.202 with respect to total dissolved solids, chloride, sulfate, iron and manganese if it will meet the requirements of 35 Ill. Adm. Code 406.106 and 406.203(e)(1) and (e)(2); or~~

~~B) If the plan includes impoundments which will remain after abandonment and which will not meet the water quality standards of 35 Ill. Adm. Code 302.204 or 302.208, with respect to total dissolved solids, chloride, sulfate, iron, manganese and pH, such fact shall not prevent approval of the plan if the impoundment will meet the requirements of 35 Ill. Adm. Code 406.106 and 406.203(e)(1) and (e)(2).~~

c) If the abandonment plan does not meet the standard of *paragraph* ~~subsection~~ (b) the Agency may either deny the permit or issue it with an abandonment plan modified by conditions subject to Section 405.101.

d) The time limit provided by *paragraph* ~~subsection~~ (b)(1) is inapplicable to abandonment plans for surface coal mines which are approved as reclamation plans under the Surface Coal Mining Land Conservation and Reclamation Act, *[225 ILCS 720]* ~~(Ill. Rev. Stat. 1983, ch. 96 1/2, par. 7902.03)~~.

e) Any abandonment plan constituting a substantial change from the permitted abandonment plan is a revised abandonment plan.

f) A permittee shall apply for a new or revised or supplemental NPDES or *State* ~~state~~ permit prior to implementation of a revised abandonment plan within the time limits provided by 35 Ill. Adm. Code 403.104(c).

~~g) An abandonment plan incorporated into a permit pursuant to showing under 35 Ill. Adm. Code 406.203 shall include conditions pursuant to 35 Ill. Adm. Code 406.203(e)(1) and (e)(2).~~

Section 406.100, Mine Waste Effluent and Water Quality Standards

d) Except to the extent provided in this Part 406, *Part* ~~Parts 302, 303 and~~ 304 of subtitle C *is* ~~are~~ inapplicable to mine discharges and non-point source mine discharges.

Section 406.203 TDS Related Permit Conditions (Repealed)
[Repeals rule for establishing TDS limits in permits for coal mines]

Section 406.209 Expiration of Former Exemptions (Repealed)
[Repeals rule expiring exemptions from WQS granted prior to the effective data of 406.203.]

- ILLINOIS' RATIONALE FOR THESE REVISIONS:

Illinois deleted the provisions of Subtitle D that address water quality requirements for sulfates and chlorides. Under the revised rules, limits in mine permits are based on the Subtitle C water quality standards for sulfates and chlorides.

- EPA'S REVIEW OF ILLINOIS' REVISED RULES FOR CONSISTENCY WITH THE CWA AND FEDERAL REGULATIONS:

No EPA Action – EPA reviewed the changes to Parts 405 and 406 of Illinois' rules to determine whether or not the revisions made by Illinois to theses rules that are part of Illinois' water quality standards constituted new or revised designated uses of Illinois surface waters, new or revised water quality criteria to protect the uses of Illinois surface waters, new or revised antidegradation policies or implementation procedures, or new or revised policies generally affecting implementation of Illinois water quality standards. EPA concluded that the changes to these rules are not revisions to the State's water quality standards because they do consist of any of the types of changes described above. Therefore EPA determined that the changes to Parts 405 and 406 do not require EPA approval under section 303(c)(2)(A) of the CWA. Since the revisions may be covered by other EPA authorities, the revisions were forwarded to the NPDES Branch for consideration and possible action.

Part 407: Compliance and Effective Dates (REPEALED)

- CHANGES MADE BY ILLINOIS:

The Part 407 rules were repealed.

- ILLINOIS' RATIONALE FOR THESE REVISIONS:

The repealed rules were outdated.

- EPA'S REVIEW OF ILLINOIS' REVISED RULES FOR CONSISTENCY WITH THE CWA AND FEDERAL REGULATIONS:

No EPA Action – EPA reviewed the changes to Part 407 of Illinois' rules to determine whether or not the revisions made by Illinois to theses rules that are part of Illinois' water quality standards constituted new or revised designated uses of Illinois surface waters, new or revised water quality criteria to protect the uses of Illinois surface waters, new or revised antidegradation policies or implementation procedures, or new or revised policies generally affecting implementation of Illinois water quality standards. EPA concluded that the changes to these rules are not revisions to the State's water quality standards because they do consist of any of the types of changes described above. Therefore EPA determined that the changes to Parts 407 do not require EPA approval under section 303(c)(2)(A) of the CWA. Since the revisions may be covered by other EPA authorities, the revisions were forwarded to the NPDES Branch for consideration and possible action.

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.

EXHIBIT 8

ILLINOIS POLLUTION CONTROL BOARD
October 18, 2012

CITGO PETROLEUM CORPORATION and PDV MIDWEST REFINING, L.L.C.,	)
Petitioners,	)
v.	)
ILLINOIS ENVIRONMENTAL PROTECTION AGENCY,	)
Respondent.	)

OPINION AND ORDER OF THE BOARD (by C.K. Zalewski):

PROPOSED ORDER

The Board grants CITGO Petroleum Corporation and PDV Midwest Refining, L.L.C. (petitioners) a variance from the Total Dissolved Solids (TDS) water quality standards of 35 Ill. Adm. Code 302.407, subject to the following conditions:

1. The duration of the variance relief from the identified TDS water quality standards is five years, from October 18, 2012 through October 18, 2017. This variance modifies and extends certain conditions of the variance in PCB 08-33, issued May 15, 2008.

2. This variance applies only to petitioners' Lemont Refinery at 135th Street and New Avenue in Lemont, Will County, regarding TDS concentrations in the effluent of Outfall 001 due to operation of the wet gas scrubber under the Consent Decree entered January 27, 2005, in the United States District Court for the Southern District of Texas, Case No. H-04-3833.

3. Unless and until the United States Environmental Protection Agency (USEPA) approves the elimination of the TDS water quality standard for the Chicago Sanitary and Ship Canal (S & S Canal), petitioners must monitor their water intake from the S & S Canal two times per week, during the winter months (December 1 to March 30) for TDS and chlorides. Petitioners must submit the TDS and chloride sample results monthly to the Illinois Environmental Protection Agency (IEPA).

4. Unless and until USEPA approves the elimination of the TDS water quality standard for the S & S Canal, petitioners must monitor TDS and chlorides in the effluent from Outfall 001 two times per week, during winter months (December 1 to March 30). Petitioners must submit the TDS and chloride sample results monthly to IEPA.

5. Unless and until USEPA approves the elimination of the TDS water quality standard for the S & S Canal, petitioners must diligently attempt to identify any relationship between the TDS and chloride levels in the effluent from Outfall 001, and the water quality samples required to be collected pursuant to paragraphs 3 and 4 of this order.

6. Unless USEPA has approved the elimination of the TDS water quality standard for the S & S Canal, by 50 months from the date of the Board order, petitioners must prepare a TDS water quality management plan to identify and minimize its contributions of TDS to the Ship Canal utilizing Best Management Practices. Elements to be considered in developing this plan may include a system to retain, treat, or dispose of the FCCU wet gas scrubber bleed or any other approach to eliminate wet gas scrubber bleed from Outfall 001 during periods when applicable TDS water quality standards are exceeded. Options to be considered may include holding tanks and de-icing and softening practices at the Lemont Refinery.

7. Unless USEPA has approved the elimination of the TDS water quality standard for the S & S Canal, by 51 months from the date of the Board order, petitioners must design the TDS water quality management plan/Best Management Plan for the conditions identified in paragraphs 5 and 6 of this order and submit the plan to IEPA.

8. Unless USEPA has approved the elimination of the TDS water quality standard for the S & S Canal, by 52 months from the date of the Board order, petitioners must submit to IEPA a wastewater construction permit application for any elements of the TDS water quality management plan/Best Management Plan for which permits or amended permits are required.

9. Unless USEPA has approved the elimination of the TDS water quality standard for the S & S Canal, by 57 months from the date of the Board order, petitioners must begin construction as needed for an FCCU wet gas scrubber bleed control system and/or implement the TDS water quality management plan/Best Management Plan.

10. Unless USEPA has approved the elimination of the TDS water quality standard for the S & S Canal, by 60 months from the date of the Board order, petitioners must operate any equipment required to be constructed by the TDS water quality management plan/Best Management Plan as needed so as to not cause or contribute to any exceedences of applicable water quality standards.

11. Petitioners shall assess, on an annual basis, the quantity of TDS incrementally being added to the wet gas scrubber. If the amount of incremental TDS exceeds, or threatens to exceed, 215,000 pounds as a daily average on an annual basis, then petitioners shall expeditiously either reduce their incremental TDS discharge to below 215,000 pounds on a daily average or submit a variance request for another variance with appropriate conditions.

12. During the Term of this Variance, the discharge from Outfall 001 of the Lemont Refinery outside the mixing zone shall not cause an exceedance of a TDS standard of 1686 mg/L and a sulfate standard of 1,371 mg/L.

IT IS SO ORDERED.

If petitioners choose to accept this variance extension, they must, within 45 days after the date of this opinion and order, file with the Board and serve on IEPA a certificate of acceptance and agreement to be bound by all the terms and conditions of the granted variance. "A variance and its conditions are not binding upon the petitioner until the executed certificate is filed with the Board and served on the Agency. Failure to timely file the executed certificate with the Board and serve the Agency renders the variance void." 35 Ill. Adm. Code 104.240. The form of the certificate follows:

EXHIBIT 9

CITGO LEMONT REFINERY

TDS Chloride Data

Influent TDS		Influent Chlorides		Effluent TDS		Effluent Chlorides	
12/4/2012	577	12/4/2012	121	12/4/2012	7189	12/4/2012	770
12/7/2012	597	12/6/2012	139	12/6/2012	6972	12/6/2012	759
12/11/2012	735	12/11/2012	130	12/11/2012	4638	12/11/2012	755
12/14/2012	587	12/13/2012	145	12/13/2012	4462	12/13/2012	872
12/18/2012	590	12/18/2012	124	12/18/2012	4728	12/18/2012	731
12/21/2012	531	12/20/2012	133	12/20/2012	4795	12/20/2012	755
12/28/2012	426	12/24/2012	116	12/25/2012	5101	12/24/2012	947
1/4/2013	524	12/27/2012	115	12/27/2012	4632	12/27/2012	719
1/8/2013	618	1/1/2013	132	1/1/2013	5245	1/1/2013	706
1/11/2013	697	1/3/2013	139	1/3/2013	5667	1/3/2013	732
1/15/2013	552	1/8/2013	156	1/8/2013	5545	1/8/2013	762
1/18/2013	625	1/10/2013	161	1/10/2013	5872	1/10/2013	765
1/22/2013	592	1/15/2013	63	1/15/2013	4920	1/15/2013	715
1/25/2013	538	1/17/2013	154	1/17/2013	4908	1/17/2013	765
1/29/2013	686	1/22/2013	156	1/22/2013	5669	1/22/2013	824
2/1/2013	698	1/24/2013	164	1/24/2013	4423	1/24/2013	800
2/5/2013	775	1/29/2013	156	1/29/2013	5208	1/29/2013	826
2/8/2013	752	1/31/2013	280	1/31/2013	4675	1/31/2013	862
2/12/2013	1183	2/5/2013	207	2/5/2013	3257	2/5/2013	670
2/15/2013	1147	2/7/2013	284	2/7/2013	4270	2/7/2013	706
2/19/2013	1113	2/12/2013	569	2/12/2013	4979	2/12/2013	850
2/22/2013	808	2/14/2013	640	2/14/2013	5090	2/14/2013	914
2/26/2013	857	2/19/2013	375	2/19/2013	5472	2/19/2013	1030
3/1/2013	1057	2/21/2013	325	2/21/2013	5985	2/21/2013	1099
3/5/2013	1449	2/26/2013	284	2/26/2013	5331	2/26/2013	1102
3/8/2013	1153	2/28/2013	418	2/28/2013	5392	2/28/2013	1052
3/12/2013	905	3/5/2013	659	3/5/2013	5608	3/5/2013	1180
3/15/2013	902	3/7/2013	711	3/7/2013	5886	3/7/2013	1306
3/19/2013	847	3/12/2013	450	3/12/2013	4902	3/12/2013	1202
3/22/2013	856	3/14/2013	298	3/14/2013	4336	3/14/2013	994
3/26/2013	890	3/19/2013	398	3/19/2013	5095	3/19/2013	1014
3/29/2013	894	3/21/2013	275	3/21/2013	5377	3/21/2013	1028
		3/26/2013	282	3/26/2013	4902	3/26/2013	1020
		3/28/2013	345	3/28/2013	5207	3/28/2013	1236
Min:	426		63		3257		670
Avg:	786		268		5169		896
Max:	1449		711		7189		1306

CITGO LEMONT REFINERY

TDS Data

Influent TDS		Effluent TDS	
10/4/2011	386	10/4/2011	5433
10/7/2011	438	10/6/2011	5828
10/11/2011	506	10/11/2011	5063
10/14/2011	476	10/13/2011	4936
10/18/2011	493	10/18/2011	4968
10/21/2011	450	10/20/2011	4644
10/25/2011	453	10/25/2011	6011
10/28/2011	412	10/27/2011	5849
11/1/2011	494	11/1/2011	5296
11/4/2011	441	11/3/2011	5334
11/8/2011	540	11/8/2011	5346
11/11/2011	416	11/10/2011	4775
11/15/2011	390	11/15/2011	3779
11/18/2011	578	11/17/2011	4670
11/25/2011	636	11/22/2011	5360
12/6/2011	535	11/24/2011	5383
12/9/2011	563	11/29/2011	4840
12/13/2011	563	12/1/2011	4634
12/16/2011	494	12/6/2011	4278
12/23/2011	632	12/8/2011	4428
12/27/2011	610	12/13/2011	4644
12/30/2011	671	12/15/2011	4331
1/3/2012	613	12/20/2011	3865
1/6/2012	681	12/22/2011	4222
1/10/2012	744	12/27/2011	4715
1/13/2012	708	12/29/2011	4745
1/17/2012	789	1/3/2012	4463
1/24/2012	1081	1/5/2012	4747
1/27/2012	1236	1/11/2012	4699
1/31/2012	1000	1/13/2012	4854
2/3/2012	965	1/17/2012	5148
2/7/2012	849	1/19/2012	5261
2/10/2012	698	1/24/2012	4345
2/15/2012	887	1/26/2012	4294
2/17/2012	839	1/31/2012	4254
2/21/2012	813	2/2/2012	4417
2/24/2012	880	2/7/2012	4793
2/28/2012	1276	2/9/2012	4834
3/2/2012	975	2/14/2012	4688
3/6/2012	861	2/16/2012	4395
3/9/2012	644	2/21/2012	4862

CITGO LEMONT REFINERY

TDS Data

3/13/2012	796	2/23/2012	4407
3/16/2012	843	2/28/2012	4635
3/20/2012	951	3/1/2012	4956
3/23/2012	782	3/6/2012	5248
3/27/2012	676	3/8/2012	4615
3/30/2012	534	3/13/2012	4280
4/6/2012	645	3/15/2012	4343
4/10/2012	761	3/16/2012	4594
4/13/2012	702	3/20/2012	4738
4/17/2012	644	3/22/2012	5218
4/20/2012	579	3/27/2012	4632
4/24/2012	658	3/29/2012	4446
4/27/2012	708	4/10/2012	5491
5/1/2012	739	4/12/2012	5203
5/4/2012	631	4/25/2012	6639
5/8/2012	481	4/26/2012	6970
5/11/2012	429	5/1/2012	6337
5/15/2012	421	5/3/2012	6184
5/18/2012	587	5/8/2012	3633
5/22/2012	669	5/10/2012	2817
5/25/2012	780	5/15/2012	2034
5/29/2012	731	5/17/2012	1968
6/1/2012	621	5/22/2012	5698
6/5/2012	644	5/24/2012	6413
6/8/2012	576	5/29/2012	5236
6/12/2012	627	5/31/2012	4724
6/15/2012	612	6/5/2012	4939
6/19/2012	546	6/7/2012	4204
6/22/2012	524	6/12/2012	4249
6/26/2012	557	6/14/2012	4408
6/29/2012	584	6/19/2012	5478
7/3/2012	438	6/21/2012	5658
7/6/2012	485	6/26/2012	5089
7/10/2012	550	6/28/2012	4979
7/13/2012	492	7/3/2012	5027
7/17/2012	524	7/5/2012	4616
7/20/2012	397	7/10/2012	4859
7/24/2012	457	7/12/2012	5310
7/27/2012	460	7/17/2012	5010
7/31/2012	482	7/19/2012	4878
8/3/2012	464	7/24/2012	4481
8/7/2012	479	7/26/2012	4253
8/10/2012	422	7/31/2012	2031
8/14/2012	487	8/2/2012	1868

CITGO LEMONT REFINERY

TDS Data

8/17/2012	332	8/7/2012	1700
8/21/2012	325	8/9/2012	2104
8/24/2012	518	8/14/2012	1532
8/28/2012	348	8/16/2012	1557
8/31/2012	442	8/21/2012	1638
9/4/2012	493	8/23/2012	2258
9/7/2012	408	8/28/2012	4325
9/11/2012	390	8/30/2012	4064
9/14/2012	389	9/4/2012	4062
9/18/2012	450	9/6/2012	5032
9/21/2012	411	9/11/2012	5332
9/25/2012	415	9/13/2012	4973
9/28/2012	426	9/18/2012	4664
10/2/2012	473	9/20/2012	4497
10/5/2012	392	9/25/2012	5481
10/9/2012	504	9/27/2012	6080
10/12/2012	546	10/2/2012	7333
10/16/2012	466	10/4/2012	6462
10/19/2012	444	10/9/2012	6708
10/23/2012	483	10/11/2012	6307
10/26/2012	465	10/16/2012	5111
10/30/2012	446	10/18/2012	4915
11/2/2012	428	10/23/2012	4627
11/6/2012	586	10/25/2012	4606
11/9/2012	491	10/30/2012	4902
11/13/2012	641	11/1/2012	4756
11/16/2012	528	11/6/2012	4498
11/20/2012	512	11/8/2012	5143
11/23/2012	577	11/13/2012	5229
11/27/2012	566	11/15/2012	4547
11/30/2012	555	11/20/2012	5022
12/4/2012	577	11/22/2012	5310
12/7/2012	597	11/27/2012	5995
12/11/2012	735	11/29/2012	5942
12/14/2012	587	12/4/2012	7189
12/18/2012	590	12/6/2012	6972
12/21/2012	531	12/11/2012	4638
12/28/2012	426	12/13/2012	4462
1/4/2013	524	12/18/2012	4728
1/8/2013	618	12/20/2012	4795
1/11/2013	697	12/25/2012	5101
1/15/2013	552	12/27/2012	4632
1/18/2013	625	1/1/2013	5245
1/22/2013	592	1/3/2013	5667

CITGO LEMONT REFINERY

TDS Data

1/25/2013	538	1/8/2013	5545
1/29/2013	686	1/10/2013	5872
2/1/2013	698	1/15/2013	4920
2/5/2013	775	1/17/2013	4908
2/8/2013	752	1/22/2013	5669
2/12/2013	1183	1/24/2013	4423
2/15/2013	1147	1/29/2013	5208
2/19/2013	1113	1/31/2013	4675
2/22/2013	808	2/5/2013	3257
2/26/2013	857	2/7/2013	4270
3/1/2013	1057	2/12/2013	4979
3/5/2013	1449	2/14/2013	5090
3/8/2013	1153	2/19/2013	5472
3/12/2013	905	2/21/2013	5985
3/15/2013	902	2/26/2013	5331
3/19/2013	847	2/28/2013	5392
3/22/2013	856	3/5/2013	5608
3/26/2013	890	3/7/2013	5886
3/29/2013	894	3/12/2013	4902
		3/14/2013	4336
		3/19/2013	5095
		3/21/2013	5377
		3/26/2013	4902
		3/28/2013	5207

Min:	325	1532
Avg:	632	4815
Max:	1449	7333

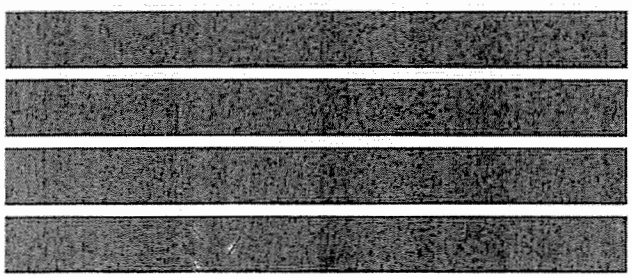
EXHIBIT 10

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

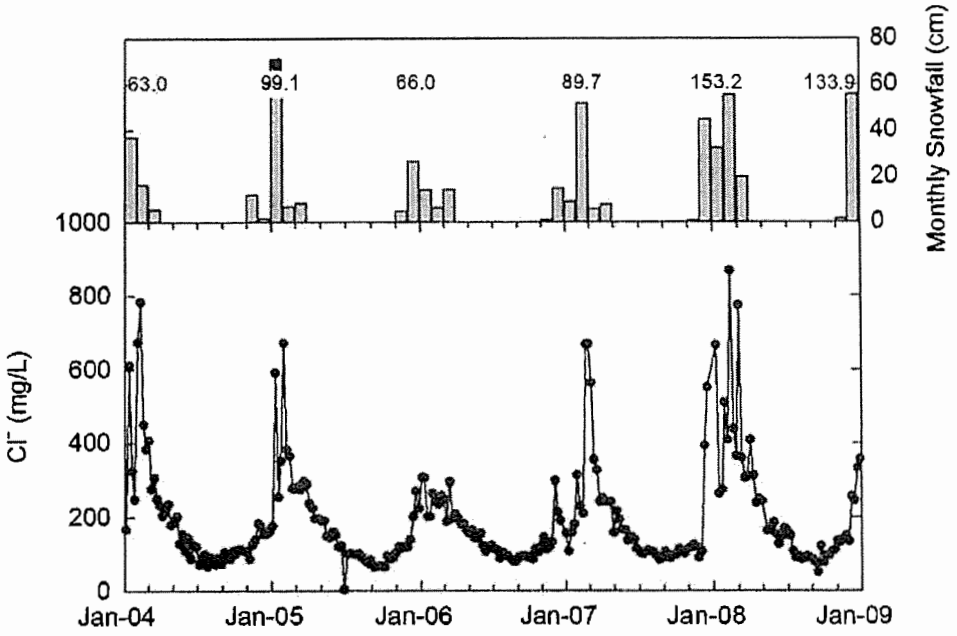


Figure 13. Chloride concentrations at MWRDGC station 92 on the CSSC at Lockport, IL, and monthly snowfall totals in Chicago (winter totals shown above bar). Snowfall data from NOAA, 2010.

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 25th percentile) were significantly greater than at high (top 25th percentile) and intermediate (middle 50th 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).

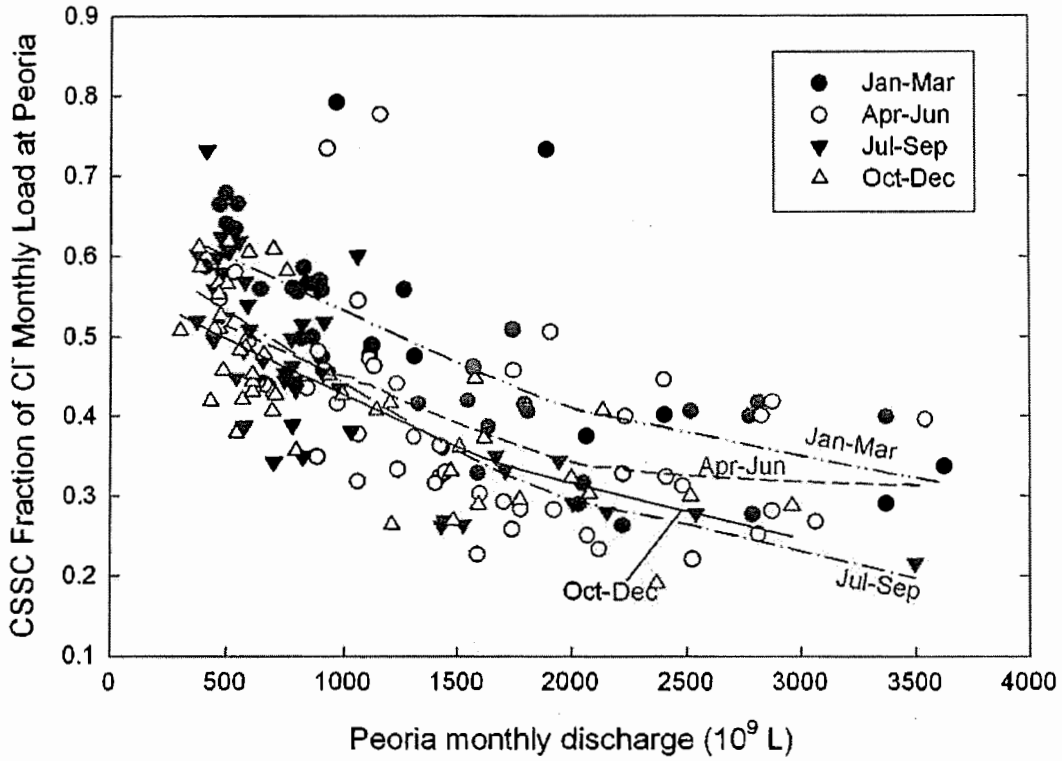


Figure 16. Fractions of the chloride monthly loads in the Illinois River at Peoria that can be attributable to discharge from the CSSC (Romeoville) as a function of monthly discharge at Peoria (1987–2001) Lines are smoothed regressions using LOWESS. Figure from Kelly et al. (2010), data from USGS (2008).

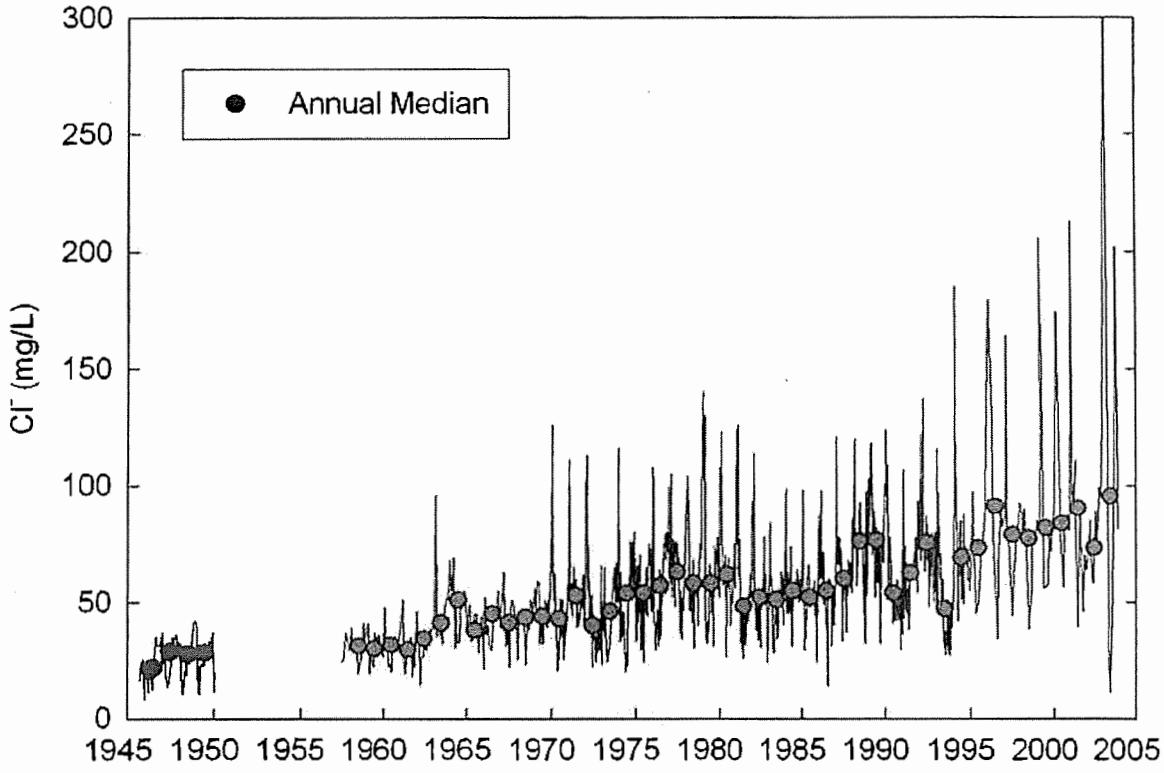


Figure 17. Chloride concentrations in Illinois River at Peoria. Data from ISWS and USGS.

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.

EXHIBIT 11

ATTACHMENT 3C

CHLORIDE AND SURROGATE TDS IN CSSC, RE-EVALUATION BASED ON CURRENT TAXA TOXICITY

Chloride and Surrogate TDS in Chicago Sanitary & Ship Canal
Re-Evaluation Based on Current Taxa Toxicity

Chlorides

The existing chloride water quality criteria were published by the U.S. Environmental Protection Agency (USEPA) in 1988. Increased chloride concentrations in natural waters are a common problem during winter de-icing practices due to the use of road salts, primarily sodium chloride. A 2010 study in southeastern Wisconsin (Milwaukee area), examined 11 watersheds during winter and found that chloride concentrations exceeded U.S. Environmental Protection Agency (USEPA) acute (860 mg/L) standards at 55% of the stations, and chronic (230 mg/L) water-quality criteria at 100% of monitored sites. On a national scale, historic U.S. Geological Survey chloride data from 168 northern metropolitan stations was examined, with 55% of stations exceeding chronic standards and 25% exceeding acute standards from November through April. (Corsi et al., 2010).

The Iowa Department of Natural Resources (Iowa DNR, 2009), compiled updated toxicity information from the literature and from studies commissioned by the USEPA. The result of this effort by Iowa DNR demonstrates that water chemistry such as hardness and sulfate influence the toxicity of chloride to aquatic life. These studies resulted in the development of chloride criteria that are based on the concentrations of chloride and sulfate levels that can be site specific, and are more consistent with the current scientific understanding about toxicity of chloride to aquatic organisms. Iowa adopted new chloride standards in 2009 (USEPA approved 2010), with Pennsylvania, Missouri, Indiana, and Wisconsin currently in the process of adopting the same standards as Iowa.

Testing Procedures

National Criteria for Chloride were developed by the USEPA in 1988. Test results used to derive water quality standards for chloride toxicity were based on taxa including rainbow trout, American eel, bluegill, fathead minnow, daphnia, midges, caddisfly, mosquito larvae, fingernail clam, and tubifex worms. Fish were generally more tolerant to chlorides and invertebrates less tolerant, with fingernail clams being among the least tolerant organisms identified in 1988.

The calculations used to set the criteria are linked to the taxa's *Final Acute Value* that is calculated using a method that gives equal weight to the four lowest taxa values. Although the four lowest taxa values receive the most weight, the other taxa values also have an effect on the Final Acute Value.

The *Final Acute Value* is defined in terms of *Genus Mean Acute Values* rather than *Species Mean Acute Values*. A Genus Mean Acute Value is the geometric mean of all the Species Mean Acute Values available for species in the genus. Species within a genus are toxicologically similar, so the use of Genus Mean Acute Values prevents data sets from being biased by an overabundance of species in one or a few genera.

The *Criterion Maximum Concentration* (Chronic standard), is equal to one-half the Final Acute Value, when laboratory data are lacking for chronic tolerance values (Stephen et al. 1985). The Criterion Maximum Concentration is intended to protect 95 percent of a group of diverse genera, unless a commercially or recreationally important species is very sensitive. Dividing the Final Acute Value by 2 is intended to result in a concentration that will not adversely affect sensitive organisms.

The 1988 USEPA list used 12 taxa for calculations while the 2009 list, used by Iowa to calculate recent chloride criteria, contains 29 taxa presented in Table 1.

Fish and Invertebrates of the CSSC

A Rotenone collection was made of the Chicago Area Waterway (Caws) that included the Chicago Sanitary and Ship Canal (CSSC) during December 3 and 4, 2009 to determine Asian Carp presence. Multi agencies cooperated to ensure thorough coverage of the areas, including the Illinois Department Natural Resources, U.S. Fish and Wildlife service, U.S. Army Corps of Engineers (USACE), and others. The collection represented the most comprehensive collection documented for the CAWS and had stations on the Chicago Area Waterway at Cargill, at the Lockport controlling Structure (CSSC), and at Ruby Street in Joliet, Illinois (CSSC).

Thirty One (31) species of fish were reported by the USACE during the 2009 collections. Table 2 provides the common, scientific names, numbers and percentage of each species taken during the 2009 collection.

Fish collected at the Lockport site, which is the closet station to the Refinery, captured 5,741 total fish of 24 species during the 2009 rotenone collection. Of the 24 species collected in 2009, six species accounted for 98 percent of the total numbers of fish captured; (common carp, 71.1%, yellow bullhead 11.8%, channel catfish 5%, gizzard shad 4.8%, emerald shiner 2.8%, bluegill 1.7% and bluntnose minnow 0.9%).

Of the 31 fish species captured at Lockport, Illinois in 2009, four species The bluegill (*Lepomis macrochirus*), green sunfish (*Lepomis cyanellus*), yellow bullhead (*Ameiurus natalis*) and bluntnose minnow (*Pimephales notatus*) are represented or have closely related surrogates represented on USEPA chloride tolerance list. The yellow bullhead is represented by the black bullhead (*Ameiurus melas*) and the bluntnose minnow is represented by the fathead minnow (*Pimephales promelas*) on the chloride tolerance list. The most sensitive fish in CSSC is the fathead minnow with a genus mean acute value of 6,515 mg/L of chloride.

Macroinvertebrate collections were made by Ponar dredge and Hester-Dendy multiple substrate samplers during 2001-2004 by the Metropolitan Water Reclamation District of Greater Chicago (MWRDGC). Thirty six taxa of invertebrates were collected over the four year period at Lockport, Illinois. Of the 36 taxa, four are represented on the USEPA chloride tolerance list. The four taxa are Glossiphoniidae (leeches), Turbellaria (flatworms), Oligochaeta (aquatic earthworms, and Physa sp. (snail). Of the four taxa, the snail is the least tolerant invertebrate with Physa gyrina having an acute tolerance value of 3,350 mg/L of chloride. Where

experimental Chronic Concentration Values are lacking, the USEPA recommends dividing the acute values by 2 (Stephen et al. 1985). Table 4 presents the acute and chronic values for the two least tolerant organisms found on the CSSC.

Sodium Chloride is composed of 60.7 percent chloride. A TDS concentration of 2,759 mg/L would contain 1,675 mg/L of chloride (60.7%) on the CSSC, assuming that sodium chloride is the sole contributor. A TDS level of 2,759 mg/L would be protective of the least tolerant organism on the CSSC currently identified, the Physa snail.

Chloride Levels in the Chicago Sanitary & Ship Canal

Winter chloride levels in the Chicago Sanitary & Ship Canal often exceed the current Illinois General Use standard of 500 mg/L for several days after heavy snows due to deicing road salt applications and subsequent melting events. Data collected during the winter of 2010 demonstrates that chloride above 500 mg/L on four out of five consecutive days after snowfall events attributed to the road salting practices. Figure 1 depicts the chloride rise and fall during those five events in 2010.

The City of Chicago is the primary contributor to the chlorides in this waterway, and until the City begins to seriously reduce its salt consumption, chloride levels above 500 mg/L will continue after each significant snowfall event.

Works Consulted

Benoit, Duane A. 1988. Ambient Water Quality Criteria for Chloride. United States Environmental Protection Agency. EPA 440/5 8801.

Corsi, Stephen., David Graczyk, Stephen Gies, Nathaniel Booth, and Kevin Richards. 2010. A Fresh Look at Road Salt: Aquatic Toxicity and Water Quality Impacts on a Local, Regional and National Scale. Enviro. Sci. and Technology. V 44. pp 7376-7382.

Eldridge, William H, David B. Arscott and S John K. Jackson 2010. Stroud Water Research Center Expert Report on the Proposed Rulemaking by the Pennsylvania Environmental Quality Board [25 PA. CODE CH. 93] for Ambient Water Quality Criterion; Chloride (Ch) [40 Pa.B. 2264] [Saturday, May 1 2010]

Erickson, R. and C. Stephan. 1988. Calculation of the Final Acute Value for water Quality Criteria for Aquatic Organisms. U.S. Environmental Protection Agency, Washington, D.C., EPA/600/3-88/018 (NTIS PB88214994), 1988.

Iowa DNR 2009. Water Quality Standards Review: Chloride, Sulfate and Total Dissolved Solids Iowa Department of Natural Resources Consultation Package. February 9, 2009.

Kelly, Walton R., Samuel V. Panno, and Keith Hackley. 2012. The Sources, Distribution, and Trends of Chloride in the Waters of Illinois. Illinois State Water Survey. Prairie Research Institute University of Illinois at Urbana-Champaign . Bulletin B-74.

Lee, Jin-Yong and Sung-Ho Song. 2007. Groundwater Chemistry and Ionic Ratios in a Western Coastal Aquifer of Buan, Korea: Implication for Seawater Intrusion. Geosciences Journal. Vol. 11, No. 3, p. 259 – 270.

Miguntanna, Nadeeka S., Prasanna Egodawatta, Serge Koko, and Ashantha Goonetilleke. 2010. Determination of a Set of Surrogate Parameters to Assess Urban Stormwater Quality. Sci. Tot. Environ. Vol. 408, pp. 6251-6259.

MWRDGC. 2010. Metropolitan Water Reclamation District of Greater Chicago: Technical Data and Reports. http://www.mwrdgc.dst.il.us/.

NOAA. 2010. National Weather Service Weather Forecast Office, Chicago monthly snowfall amounts, http://www.crh.noaa.gov/lot/?n=chi_jan_snow_rankings.

Sindt, Gregory L. 2008. Chloride and TDS Water Quality Standards Update. Technical Advisory Committee, Iowa Depart Natural Resources. January 15, 2008.

Soucek, D. J. and Kennedy, A. J. (2005), Effects of hardness, chloride, and acclimation on the acute toxicity of sulfate to freshwater invertebrates. Environmental Toxicology and Chemistry, 24: 1204–1210. DOI: 10.1897/04-142.1 Abstract and Power Point Presentation.

Stephan, C. E. 2009a. (in Etheridge et al.. 2010). Calculation of aquatic life criteria for chloride. 9FebChlorideCriteria.wpd, U.S. Environmental Protection Agency, Duluth, MN.

Stephen, Charles E., Donald I. Mount, David J. Hansen, John R. Gentile, Gary A. Chapman, and William A. Brungs. 1985. Guidelines for Deriving Numerical National Water Quality Criteria for the Protection of Aquatic Organisms and Their Uses. PB85-227049. Washington, D.C.

Twait, Scott. 2011. Illinois Environmental Protection Agency. Personal Communication. 1-28-2011.

USEPA 2010. Final Report on Acute and Chronic Toxicity of Nitrate, Nitrite, Boron, Manganese, Fluoride, Chloride and Sulfate to Several Aquatic Animal Species. Region 5 EPA 905-R-10-002. November 2010.

USEPA 2009. Approval letter for changes to water quality criteria for Illinois.

U.S. EPA. September 26, 2008. Acute Toxicity of Chloride to Select Freshwater Invertebrates. EPA Contract Number: 68-C-04-006, Work Assignment 4-34 Sub-task. Data table in Sindt 2008.

Table 1.
CHLORIDE TAXA, TAXA RANKS, GENUS MEAN ACUTE VALUES(GMAV)
And SPECIES MEAN ACUTE VALUES (SMAV)

Rank	GMAV	Genus	SMAV
29	17,161	American eel *Anguilla rostrata*	17,161
28	16,203	Crayfish *Cambarus sp.*	16,203
27	14,897	Plains killifish *Fundulus kansae*	14,897
26	14,843	Dragonfly *Libellulidae*	14,843
25	13,453	Threespine stickleback *Gasterosteus aculeatus*	13,453
24	>11,860	Guppy *Poecilia reticulata*	>11,860
23	9,933	Mosquitofish *Gambusia affinis*	9,933
22	9,157	Green sunfish *Lepomis cyanellus*	9,975
22	9,157	Bluegill *Lepomis macrochirus*	8,407
21	8,971	Red shiner *Notropis lutrensis*	8,971
20	8,043	Rainbow trout *Oncorhynchus mykiss*	8,043
19	7,442	Black bullhead *Ameiurus melas*	7,442
18	6,515	Fathead minnow *Pimephales promelas*	6,515
17	6,219	Tubificid worm *Tubifex tubifex*	6,219
16	6,111	Bannerfin shiner *Cyprinella leedsi*	6,111
15	6,072	Midge *Chironomus dilutus*	6,072
14	5,897	Bullfrog (tadpole) *Rana catesbeiana*	5,897
13	5,444	Aquatic worm *Lumbriculus variegatus*	5,444
12	5,078	Amphipod *Hyalella azteca*	5,078
11	4,686	Chorus frog *Pseudacris sp.*	4,686
10	4,369	Leech *Nephelopsis obscura*	4,369
9	3,946	Copepod *Diaptomus clavipes*	3,946
8	3,891	Isopod *Lirceus fontinalis*	3,891
7	3,728	Snail *Gyraulus parvus*	3,728
6	3,350	Snail *Physa gyrina*	3,350
5	3,086	Mussel *Villosa delumbis*	3,821
5	3,086	Mussel *Villosa iris*	2,492
4	2,835	Mussel *Lampsilis fasciola*	2,907
4	2,835	Mussel *Lampsilis siliquoidea*	2,764
3	2,326	Cladoceran *Daphnia ambigua*	1,650
3	2,326	Cladoceran *Daphnia magna*	3,773
3	2,326	Cladoceran *Daphnia pulex*	2,020
2	1542	Cladoceran *Ceriodaphnia dubia*	1,542
1	1128	Fingernail clam *Sphaerium simile*	1,128

Source: Stephan 2009[a].

Table 2.
Fish Collected From the Chicago Sanitary and Ship Canal
Vicinity Brandon Pool, At Joliet and Lockport, Illinois
December, 2009

Common name	Genus - species	12/03/09	12/04/09		TOTAL	Percent
		Lockport	Lockport	Ruby St		of Catch*
common carp	*Cyprinus carpio*	3364	715	527	4606	65.3
yellow bullhead	*Ameiurus natalis*	77	602	220	899	12.8
channel catfish	*Ictalurus punctatus*	178	107	131	416	5.9
gizzard shad	*Dorosoma cepedianum*	263	11	44	318	4.5
emerald shiner	*Notropis atherinoides*	103	60	65	228	3.2
goldfish	*Carassius auratus*	15	22	107	144	2.0
freshwater drum	*Aplodinotus grunniens*	31	16	97	144	2.0
bluegill	*Lepomis macrochirus*	90	5	2	97	1.4
bluntnose minnow	*Pimephales notatus*	10	40	15	65	0.9
round goby	*Neogobius melanostomus*	5		42	47	0.7
sauger	*Stizostedion canadense*			13	13	0.2
flathead catfish	*Pylodictis olivaris*	3		6	9	0.1
pumpkinseed	*Lepomis gibbosus*		5	3	8	0.1
golden shiner	*Notemigonus crysoleucas*			7	7	<0.1
hybrid sunfish	*Lepomis spp.*		5	1	6	<0.1
black crappie	*Pomoxis nigromaculatus*	1		4	5	<0.1
yellow bass	*Morone mississippiensis*	3		2	5	<0.1
threadfin shad	*Dorosoma petenense*	1		3	4	<0.1
green sunfish	*Lepomis cyanellus*	1	1	2	4	<0.1
northern pike	*Esox lucius*			4	4	<0.1
white bass	*Morone chrysops*			3	3	<0.1
largemouth bass	*Micropterus salmoides*	1		2	3	<0.1
white perch	*Morone americana*	1		1	2	<0.1
white sucker	*Catostomus commersoni*	1		1	2	<0.1
orange-spotted sunfish	*Lepomis humilis*			2	2	<0.1
white crappie	*Pomoxis annularis*		1	1	2	<0.1
redear sunfish	*Lepomis microlophus*	1		1	2	<0.1
smallmouth buffalo	*Ictiobus bubalus*			2	2	<0.1
tadpole madtom	*Noturus gyrinus*	1		0	1	<0.1
bighead carp	*Hypophthalmichthys nobilis*		1	0	1	<0.1
yellow perch	*Perca flavescens*			1	1	<0.1
Totals		4150	1591	1309	7050	99.1

* Percentage may not equal 100 due to rounding

Source: USACE 2009.

TABLE 3
Benthic Invertebrates In Chicago Sanitary and Ship Canal
At Lemont and Lockport, Illinois 2001 - 2004

	Waterway:	Chicago Sanitary & Ship Canal							
	Station Number and Name:	42 - Route 83[1]		48 - Stephen Street[2]		92 - Lockport, IL			
	Year(s) of Collection:	2002		2002		2001 - 2004			
	Sampling Device Used:	Petite-Ponar		Petite-Ponar		Petite-Ponar		Hester-Dendy	
Phylum and (Common Name)	**Taxon**	N/meter^2	%	N/meter^2	%	4yr Mean N/m^2	%	4yr Mean N/m^2	%
	Cricotopus sp.							18	0.2
	Xenochironomus sp.							16	0.2
	Dreissena polymorpha			57	34			17	0.2
Annelida Hirudinea (Leeches)	Glossiphoniidae			14	8	36	<0.1	43	0.5
	Ablabesmyia sp.							53	0.6
Pelecypoda (Mussels and Clams)	*Corbicula fluminea*			7	4	65	<0.1	78	0.9
	Nanocladius sp.					117	0.2	224	2.6
Gastropoda (Snails)	*Ferrissia sp.*					54	<0.1	246	2.9
Coelenterata (Hydroids)	*Hydra*							364	4.0
Amphipoda (Amphipods)	*Gammarus fasciatus*					334	0.5	830	9.6
	Dicrotendipes sp.					99	<0.1	854	9.9
Platyhelminthes (Flat Worms)	Turbellaria	14	3	50	30	23	<0.1	903	10.5
Annelida Oligochaeta (Aquatic Worms)	Oligochaeta	416	94	22	13	62,365	98.0	4,923	57.2
Diptera (two-winged flies)	*Pericoma sp.*					4	<0.1	....	....
	Procladius sp.					700	1.0	....	....
	Tanypus sp.					18	<0.1	....	....
	Cryptochironomus			14	8	45	<0.1	....	....
Ectoprocta (Bryzoans)	*Plumatella*							1	<0.1
Isopoda (Sow Bugs)	*Caecidotea sp.*	7	2					3	<0.1
Ephemoptera (Mayflies)	*Stenacron sp.*							1	<0.1
	Stenonema integrum							1	<0.1
Trichoptera (Caddisflies)	*Cymellus fraternus*							5	<0.1
	Cheumatopsyche					18	<0.1	1	<0.1
	Hydropsyche sp.							2	<0.1
	Berosus sp.							1	<0.1
Chironomidae (midges)	Chironomidae					18	<0.1	2	<0.1
	Glyptotendipes sp.							5	<0.1
	Polypedilum spp.							4	<0.1
	Stenochironomus							1	<0.1
Mollusca (Clams and snails)	*Physa sp.*							2	<0.1
	Menetus sp.							1	<0.1
	Musculium sp.							1	<0.1
	Total Number Per Square Meter:	437	....	166	....	63,897	....	8,603	....
	Total Percent Per Square Meter*	....	101	....	97	....	99.7	....	99.3
	Total Taxa:	3	....	6	....	14	....	28	....
	Total EPT Taxa:	1	....	1	....	1	....	6	....

Source: MWRDGC 2001-2004

[1] Rt 83 located in Lemont, Illinois

[2] Stephen Street located in Lemont, Illinois

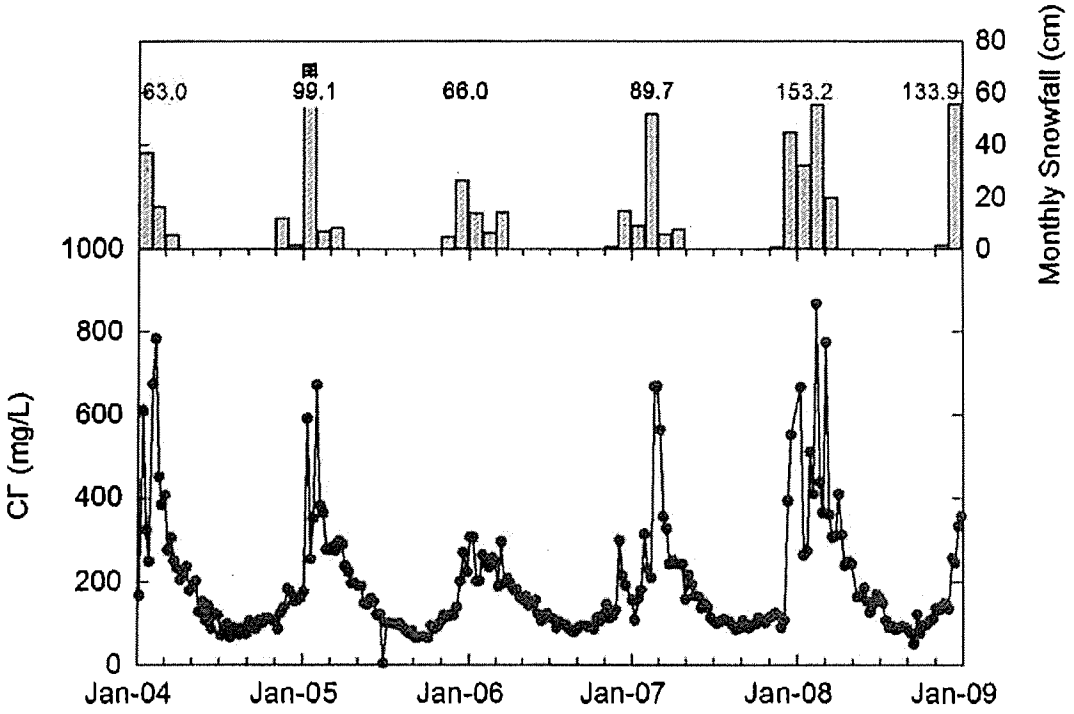
* Percent may not equal 100% due to rounding

TABLE 4.
Acute and Chronic Concentrations of Chloride Tolerance
For The Two Most Sensitive Organisms Found In CSSC

Common name	Genus species	Acute Concentration	Chronic Concentration
Fathead minnow	*Pimephales promelas*	6,515	3,257
Physa snail	*Physa sp.*	3,350	1,675

Source: Stephan 2009a, MWRDGC 2006

FIGURE 1. Chloride Concentration for CSSC at Lockport, Illinois 2010



Source: Kelly, Panno, Hackley, 2012.

EXHIBIT 12

CHICAGO SANITARY & SHIP CANAL
SULFATE WATER QUALITY STANDARDPROPOSAL

c=(1276.7)+5.508(hardness)-1.457(chlorides)^0.65

		Enter hardness	Enter chorides
Sulfate		205	204
Sulfate Limit, mg/L	Constant	Hardness Term	Chloride term
Formula	1276.7	1129.1	297.2

Proposed Sulfate Water Quality Standard **1,371**

Critical Hardness from Des Plaines River Above I55 Bridge
Critical Chlorides Average of Citgo's inlet water, see attached data

SANITARY & SHIP CANAL
CITGO INTAKE CHLORIDE DATA

Date	Chloride, mg/L	Date	Chloride, mg/L	Date	Chloride, mg/L	Date	Chloride, mg/L	Date	Chloride
03/13/04	248	**01/10/05**	**835**	01/02/06	330	01/01/07	174	1/1/10	344
03/20/04	195	01/12/05	492	01/06/06	320	01/05/07	156	1/4/10	350
03/27/04	231	**01/13/05**	**580**	01/09/06	314	01/08/07	113	1/6/10	301
04/03/04	187	01/14/05	274	01/13/06	276	01/12/07	133	1/8/10	276
04/17/04	180	01/17/05	242	01/16/06	226	01/19/07	239	1/11/10	223
04/24/04	129	01/19/05	250	01/20/06	215	01/22/07	203	1/15/10	311
05/08/04	178	01/21/05	235	01/23/06	220	01/26/07	384	1/18/10	267
05/15/04	102	01/24/05	430	01/27/06	413	01/29/07	286	1/22/10	297
05/22/04	150	**01/31/05**	**634**	01/30/06	308	02/02/07	225	1/25/10	342
06/12/04	96	02/04/05	413	02/03/06	298	02/05/07	227	1/29/10	281
06/19/04	114	02/11/05	416	02/06/06	252	02/09/07	181	2/1/10	310
06/26/04	117	02/14/05	364	02/10/06	243	02/12/07	224	2/5/10	259
07/10/04	92	02/25/05	307	02/13/06	238	02/16/07	181	2/8/10	305
07/24/04	65	03/07/05	283	02/17/06	251	**02/19/07**	**695**	2/12/10	283
07/31/04	78	03/11/05	286	02/20/06	276	**02/23/07**	**549**	**2/15/10**	**833**
08/14/04	72	03/14/05	277	02/24/06	249	**02/26/07**	**600**	2/19/10	446
09/04/04	103	03/21/05	300	02/27/06	484	**03/02/07**	**734**	**2/26/10**	**648**
09/18/04	99	03/25/05	272	03/03/06	200	**03/05/07**	**616**	**3/1/10**	**559**
09/25/04	102	03/28/05	270	03/17/06	209	03/09/07	395	**3/3/10**	**580**
10/02/04	108	04/04/05	240	03/20/06	201	03/16/07	350	**3/5/10**	**528**
10/23/04	115	04/08/05	232	03/31/06	189	03/19/07	340	3/8/10	422
		04/11/05	221	04/03/06	208	03/23/07	281	3/12/10	343
		04/15/05	200	04/07/06	189	03/23/07	281	**3/19/10**	**536**
		04/18/05	199	04/10/06	183	03/26/07	415	3/22/10	261
		04/22/05	197	04/14/06	188			3/22/10	261
		04/25/05	196	04/17/06	190			3/26/10	259
		04/29/05	184	04/21/06	128			3/29/10	285
		05/02/05	190	04/24/06	154			4/2/10	266
		05/06/05	195	04/28/06	162			4/5/10	246
		05/13/05	164	05/01/06	175			4/9/10	187
		05/16/05	151	05/05/06	152			4/12/10	192
		05/20/05	167	05/12/06	166			4/16/10	210
		05/23/05	147	05/15/06	145			4/19/10	215
		05/27/05	151	05/19/06	145			4/23/10	218
		05/30/05	163	05/19/06	145			4/26/10	191
		06/01/05	160	05/22/06	147			4/30/10	197
		06/03/05	156	05/26/06	167			5/3/10	196
		06/10/05	121	05/29/06	145			5/7/10	177
		06/13/05	124	06/02/06	134			5/10/10	165
		06/17/05	128	06/05/06	122			5/14/10	143
		06/20/05	127	06/09/06	132			5/17/10	129
		06/24/05	122	06/12/06	108			5/21/10	234
		06/27/05	118	06/16/06	109			5/24/10	252
		07/01/05	119	06/19/06	129			5/28/10	131
		07/04/05	103	06/23/06	123			5/31/10	336
		07/08/05	103	06/26/06	119			6/4/10	100
		07/11/05	103	06/30/06	294			6/7/10	132
		07/15/05	100	06/30/06	294			6/11/10	127
		07/18/05	100	07/03/06	110			6/14/10	143
		07/22/05	92	07/07/06	12			6/18/10	104
		07/25/05	99	07/10/06	85			6/21/10	457
		07/29/05	99	07/14/06	103			6/25/10	197
		08/01/05	92	07/17/06	414			6/28/10	100
		08/05/05	102	07/21/06	92			7/2/10	580
		08/08/05	88	07/24/06	227			7/5/10	143
		08/12/05	93	07/28/06	104			7/12/10	123
		08/15/05	88	07/31/06	96			7/16/10	122
		08/19/05	98	08/04/06	74			7/19/10	435

SANITARY & SHIP CANAL
CITGO INTAKE CHLORIDE DATA

Date	Chloride, mg/L	Date	Chloride, mg/L	Date	Chloride, mg/L	Date	Chloride, mg/L	Date	Chloride
		08/22/05	76	08/07/06	91			7/23/10	158
		08/26/05	80	08/11/06	93			7/26/10	100
		08/29/05	88	08/14/06	92			7/30/10	146
		09/02/05	87	08/18/06	85			8/2/10	109
		09/05/05	68	08/21/06	96			8/6/10	554
		09/09/05	67	08/25/06	81			8/9/10	116
		09/12/05	73	08/28/06	90			8/13/10	110
		09/16/05	70	09/01/06	71			8/20/10	116
		09/19/05	86	09/04/06	87			8/23/10	122
		09/23/05	63	09/08/06	82			8/27/10	102
		09/26/05	73	09/11/06	100			8/30/10	105
		09/30/05	60	09/15/06	245			9/6/10	80
		10/03/05	68	09/18/06	200			9/10/10	83
		10/07/05	81	09/25/06	95			9/13/10	293
		10/10/05	96	09/29/06	107			9/17/10	89
		10/14/05	88	10/02/06	95			9/20/10	105
		10/17/05	100	10/06/06	83			9/24/10	83
		10/21/05	87	10/09/06	113			9/27/10	445
		10/24/05	92	10/13/06	119			10/4/10	95
		10/28/05	85	10/16/06	209				
		10/31/05	106	10/20/06	146				
		11/04/05	146	10/23/06	109				
		11/07/05	126	10/27/06	126				
		11/11/05	105	10/30/06	120				
		11/14/05	132	11/03/06	134				
		11/18/05	110	11/06/06	149				
		11/21/05	116	11/13/06	118				
		11/25/05	128	11/17/06	108				
		11/28/05	128	11/20/06	128				
		12/02/05	146	11/24/06	140				
		12/05/05	130	11/27/06	143				
		12/09/05	183	12/01/06	105				
		12/12/05	192	12/04/06	14				
		12/16/05	406	12/08/06	195				
		12/19/05	264	12/11/06	236				
		12/23/05	295	12/15/06	249				
		12/26/05	253	12/18/06	200				
		12/30/05	357	12/22/06	198				
				12/25/06	129				
				12/29/06	139				
Average	**131**		**183**		**168**		**333**		**254**
Maximum	**248**		**835**		**484**		**734**		**833**

R:\Citgo\Des Plaines River Sampling 2006\[Citgo Chloride Data from Ship Canal.xls]Influent Cl

EXHIBIT 13

Table 1. Chicago Ship and Sanitary Canal Chloride Mass Flow Rate and Citgo Chloride Mass Loading - December 2012 through March 2013
Days with Downstream Chloride Concentration Greater Than 500 ppm

	Influent to Citgo			Effluent from Citgo				Ship and Sanitary Canal				
Date	Flow Rate (MGD)	Chloride Concentration for Calculation (ppm)	Chloride Mass Flow Rate (lb/day)	Flow Rate (MGD)	Chloride Concentration for Calculation (ppm)	Chloride Mass Flow Rate (lb/day)	Net Chloride Mass Loading (lb/day)	Flow Rate (MGD)	Upstream Chloride Concentration (ppm)	Upstream Chloride Mass Flow Rate (lb/day)	Downstream Chloride Concentration (ppm)	Ratio of Net Chloride Mass Loading to Upstream Chloride Mass Flow Rate (%)
--	Q_{in}	C_{in}	$R_{m,in}$	Q_{eff}	C_{eff}	$R_{m,eff}$	$R_{m,net}$	Q_0	$C_0 = C_{in}$	$R_{m,0}$	C_1	$F_{net/0}$
02/11/13	7.20	*512*	*30,761*	6.20	*821*	*42,456*	*11,696*	2470	*512*	*10,552,607*	*513*	*0.11%*
02/12/13	6.34	569	30,102	5.37	850	38,088	7,986	1771	569	8,408,599	570	0.09%
02/13/13	6.38	*605*	*32,195*	6.42	*882*	*47,282*	*15,088*	1337	*605*	*6,744,046*	*606*	*0.22%*
02/14/13	6.56	640	35,042	6.61	914	50,378	15,336	1319	640	7,043,972	641	0.22%
02/15/13	6.32	*587*	*30,959*	5.32	*937*	*41,639*	*10,680*	874	*587*	*4,280,972*	*589*	*0.25%*
02/16/13	6.43	*534*	*28,668*	3.79	*960*	*30,402*	*1,734*	918	*534*	*4,090,504*	*536*	*0.04%*
03/02/13	7.57	*514*	*32,501*	6.17	*1103*	*56,769*	*24,268*	1285	*514*	*5,515,653*	*517*	*0.44%*
03/03/13	7.70	*563*	*36,132*	6.16	*1129*	*58,045*	*21,913*	1173	*563*	*5,506,689*	*566*	*0.40%*
03/04/13	7.59	*611*	*38,672*	6.16	*1154*	*59,332*	*20,660*	671	*611*	*3,419,908*	*616*	*0.60%*
03/05/13	7.61	659	41,839	5.71	1180	56,175	14,336	1393	659	7,660,011	661	0.19%
03/06/13	7.59	*685*	*43,411*	5.53	*1243*	*57,325*	*13,914*	1095	*685*	*6,258,893*	*688*	*0.22%*
03/07/13	7.86	711	46,654	5.57	1306	60,736	14,082	1111	711	6,591,382	714	0.21%
03/08/13	8.08	*659*	*44,438*	5.79	*1285*	*62,065*	*17,627*	1425	*659*	*7,833,598*	*661*	*0.23%*
03/09/13	7.90	*607*	*39,971*	5.79	*1264*	*61,100*	*21,129*	1144	*607*	*5,790,569*	*610*	*0.36%*
03/10/13	8.01	*554*	*37,056*	6.02	*1244*	*62,503*	*25,447*	4501	*554*	*20,822,126*	*555*	*0.12%*
03/11/13	5.91	*502*	*24,745*	7.47	*1223*	*76,231*	*51,486*	5007	*502*	*20,982,012*	*503*	*0.25%*

Notes:

a) Gray, italicized font indicates results based on interpolated concentration value. Normal font indicates results based on concentration measured during that day.

b) Chicago Ship and Sanitary Canal flow rate data was obtained from the *USGS National Water Information System: Web Interface* on June 6, 2013 for the Lemont, Illinois flow meter (ID: 05536890)
http://waterdata.usgs.gov/il/nwis/uv/?site_no=05536890&agency_cd=USGS

Calculation Method:

$R_{m,in}$ (lb/day) = Q_{in} (MGD) x C_{in} (ppm) x (10^6 gal/MG) x (3.785 L/gal) x (1 mg/L / ppm) / (1000 mg/g) / (453.6 g/lb)

$R_{m,eff}$ (lb/day) = Q_{eff} (MGD) x C_{eff} (ppm) x (10^6 gal/MG) x (3.785 L/gal) x (1 mg/L / ppm) / (1000 mg/g) / (453.6 g/lb)

$R_{m,0}$ (lb/day) = Q_0 (MGD) x C_0 (ppm) x (10^6 gal/MG) x (3.785 L/gal) x (1 mg/L / ppm) / (1000 mg/g) / (453.6 g/lb)

C_0 (ppm) = C_{in} (ppm)

$R_{m,net}$ (lb/day) = $R_{m,eff}$ (lb/day) - $R_{m,in}$ (lb/day)

$F_{net/0}$ (%) = [$R_{m,net}$ (lb/day)] / [$R_{m,0}$ (lb/day)] x 100%

Table 2. Statistical Summary Based Only On Days with Measured Concentration Data

	Influent			Effluent			Ship and Sanitary Canal					
Date	Flow Rate (MGD)	Measured Chloride Concentration (ppm)	Chloride Mass Loading (lb/day)	Flow Rate (MGD)	Measured Chloride Concentration (ppm)	Chloride Mass Loading (lb/day)	Net Chloride Mass Loading (lb/day)	Flow Rate (MGD)	Measured Upstream Chloride Concentration (ppm)	Upstream Chloride Mass Flow Rate (lb/day)	Downstream Chloride Concentration (ppm)	Ratio of Net Chloride Mass Loading to Upstream Chloride Mass Flow Rate (%)
Average	7.093	645	38,409	5.813	1063	51,344	12,935	1399	645	7,425,991	647	0.18%
Standard Deviation	0.755	59	7,305	0.546	216	9,801	3,343	276	59	787,992	60	0.06%
Median	7.085	650	38,440	5.639	1047	53,277	14,209	1356	650	7,351,991	651	0.20%
95'th Percentile	7.825	703	45,932	6.470	1287	60,052	15,186	1714	703	8,296,311	706	0.22%
Maximum	7.864	711	46,654	6.605	1306	60,736	15,336	1771	711	8,408,599	714	0.22%
Minimum	6.340	569	30,102	5.370	850	38,088	7,986	1111	569	6,591,382	570	0.09%

Table 3. Statistical Summary Based On Days with Measured and Filled/Interpolated Concentration Data

	Influent			Effluent			Ship and Sanitary Canal					
Date	Flow Rate (MGD)	Chloride Concentration for Calculation (ppm)	Chloride Mass Loading (lb/day)	Flow Rate (MGD)	Chloride Concentration for Calculation (ppm)	Chloride Mass Loading (lb/day)	Net Chloride Mass Loading (lb/day)	Flow Rate (MGD)	Upstream Chloride Concentration (ppm)	Upstream Chloride Mass Flow Rate (lb/day)	Downstream Chloride Concentration (ppm)	Ratio of Net Chloride Mass Loading to Upstream Chloride Mass Flow Rate (%)
Average	7.191	594	35,822	5.880	1094	53,783	17,961	1718	594	8,218,846	597	0.25%
Standard Deviation	0.734	64	6,287	0.770	171	11,399	10,855	1256	64	5,252,740	64	0.14%
Median	7.580	596	35,587	5.907	1142	57,047	15,212	1302	596	6,667,714	597	0.22%
95'th Percentile	8.029	692	44,992	6.822	1290	65,935	31,957	4628	692	20,862,098	694	0.48%
Maximum	8.084	711	46,654	7.471	1306	76,231	51,486	5007	711	20,982,012	714	0.60%
Minimum	5.905	502	24,745	3.794	821	30,402	1,734	671	502	3,419,908	503	0.04%