BEFORE THE ILLINOIS POLLUTION CONTROL BOARD

IN THE MATTER OF:

WATER QUALITY STANDARDS AND EFFLUENT LIMITATIONS FOR THE CHICAGO AREA WATERWAY SYSTEM AND THE LOWER DES PLAINES RIVER: PROPOSED AMENDMENTS TO 35 ILL. Adm. Code 301, 302, 303 and 304

R08-9(D) (Rulemaking-Water)

NOTICE OF FILING

To: John Therriault, Clerk Illinois Pollution Control Board James R. Thompson Center 100 West Randolph St., Suite 11-500 Chicago, IL 60601

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Please take notice that on November 22, 2013, we filed electronically with the Office of

the Clerk of the Illinois Pollution Control Board the attached Pre-Filed Testimony of: Larry

Tyler, Bruce Nelson, Roger Klocek and James Huff, a copy of which is served upon you.

CITGO PETROLEUM CORPORATION and PDV MIDWEST, LLC, Petitioners Bv:

Jeffrey C. Fort Irina Dashevsky Dentons US LLP 233 S. Wacker Drive Suite 7800 Chicago, IL 60606-6404

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TESTIMONY OF LARRY TYLER

I. <u>BACKGROUND</u>

My name is Larry Tyler. I am currently the Environmental Advisor for the Water Compliance Programs for the CITGO Lemont Refinery ("Lemont Refinery," "Refinery" or "we"). I have had this responsibility since June 2010. I have worked for Lemont Refinery for 31 years in ten different positions [Summer Engineer, Project Engineer, Field Construction Supervisor, Process Control Engineer, Environmental Engineer (SARA 313 Toxic Chemical Release Reporting), Sulfur Plant Engineer, Blend Center Technical Supervisor, Planning and Logistics Supervisor, Lab Manager and current position]. I received a BS degree in Mechanical Engineering from University of Illinois at Chicago. I also completed a MA degree at Trinity Evangelical Divinity School, Deerfield Illinois.

II. PRESENTATION OVERVIEW

The Lemont Refinery appreciates the opportunity to present testimony in this Subdocket rulemaking to support the appropriate water quality standards for protection of the "ALU B" designation, which has been defined for the Lower Chicago Sanitary & Ship Canal (CSSC).

Toward this end, testimony here will be offered by:

- **Bruce Nelson**, CITGO Fire & Safety Supervisor/Training Coordinator, who has extensive, firsthand experience with CSSC conditions, including barge activity in the vicinity of Lemont Refinery's discharge. Bruce will be featured in a brief video to illustrate eye-witness details regarding the electric fish barrier system as well as the associated Safety Zone and Regulated Navigation Area ("RNA"), which require communication with the U.S. Coast Guard.
- **Roger Klocek**, with Huff & Huff and Former Marine Biologist at Shedd Aquarium, performed recent biological investigations on the Lower Ship Canal in the vicinity of the Lemont Refinery. Roger will summarize field reports and research data on fish, benthic and plankton to derive a chloride WQS that is protective of the Use.
- Jim Huff, Senior VP of Huff & Huff, who also has performed multiple technical investigations, will address the economic costs and technical feasibility of meeting the proposed standards for chlorides and mercury. This will be foundational for reaching agreement to perform Best Management Practices.

III. GENERAL REFINERY INFORMATION

The Lemont Refinery operates a refinery at 135th and New Avenue in Will County, Illinois, located about 35 miles southwest of Chicago. The Lemont Refinery occupies approximately 1,100 acres and was put on line in 1969 with a rated production of 168,626 barrels per day.

Approximately twenty-five different products are produced at the Lemont Refinery, including gasolines, turbine fuels, diesel fuels, furnace oils, petroleum coke and high-quality hydrocarbon solvents used in the production of paints, adhesives and coatings. Ninety percent of the Lemont Refinery's yield comprises several grades of gasoline, diesel fuels, home heating oils and turbine fuels for use in Illinois and throughout the Midwest.

The Lemont Refinery has approximately 520 employees and about 400 contract employees on average for the last year. During major equipment maintenance periods, the peak number of contract employees can exceed 3,000.

During storm events, the topographical conditions surrounding the Refinery result in stormwater runoff from nearby residential developments. The Refinery also takes storm water from Oxbow, Exxon Mobil Terminal, Oneok, Seneca and Linde. All storm water is received into the Refinery's stormwater collection system, which is normally processed through the onsite biological waste treatment plant.

The Refinery draws from and discharges effluent to the CSSC. This is made possible by the Refinery's lease agreement with MWRDGC for easement access as well as a water use agreement where a nominal cost is paid for net water consumed. The Refinery withdraws on average approximately 6.4 million gallons of water daily from the CSSC, and on average discharges approximately 4.9 million gallons to the CSSC, the difference being cooling tower evaporation and steam losses. The Lemont Refinery includes a physical/chemical and biological wastewater treatment plant, which performs treatment on wastewater before it is discharged to the CSSC. Wastewater collection consists of three separate refinery-wide sewer systems:

1) The Sanitary Wastewater is transferred from both the North Plant and South Plant, via a series of lift stations and is charged directly to the treatment plant.

2) The Storm Water system captures rainwater runoff from the Lemont Refinery and surrounding elevations and directs it to the Storm Water Retention Basin before it is charged to the treatment plant.

3) The Process Water Sewer System is comprised of two separate collection networks, one for the North Plant and one for the South Plant. Water effluent goes to process water tanks prior to routing to the wastewater treatment plant. Recovered oil is pumped to the slop oil system.

Process water, storm water, sanitary water and cooling tower blowdowns are routed to the Equalization Tank, where these streams are mixed and heated. The water then gravity-flows to the Sedimentation Tank. Three Aeration Tanks in parallel, followed by two Final Clarifiers, provide final treatment before the effluent gravity-flows to the Treated Water Basin (TWB). Effluent from the FCC Wet Gas Scrubber's purge treatment unit is also directly routed to the TWB. Water from the TWB is used as Refinery firewater or discharged to the CSSC.

The Refinery has invested in excess of \$45 million over the past 15 years, including a purge treatment unit for scrubber discharge in 2007. This investment goes beyond the "Best Available Treatment" (BAT) as decided by the Board in several proceedings relating to ammonia nitrogen treatment. A substantial portion of this investment was made under the Adjusted Standard and Site Specific Rule which the Refinery obtained from the Board to improve the ammonia nitrogen treatment at the Refinery. The last of the Adjusted Standards is AS 08-08, which expires at the end of 2013. The Refinery is not planning to seek further relief from the Board, provided the appropriate special condition is included in the NPDES permit which is pending.

The Lemont Refinery also submitted information showing a Best Technology Available (BTA) determination that the current cooling water intake meets the requirements of Clean Water Act (CWA) sec. 316(b) to IEPA on January 24, 2013, also as part of the pending renewal of the NPDES permit.

The wastewater effluent contains dissolved salts extracted from crude oil at the beginning of the refining process. Total Dissolved Solids ("TDS") from the intake water, concentrated from evaporation cooling, are also present in the effluent. In addition, the purge stream from the

Wet Gas Scrubber operation contains dissolved solids, primarily sodium sulfates, and water softening for the boiler feed water also contributes dissolved solids to the effluent.

The Refinery operates under a National Pollutant Discharge Elimination System ("NPDES") permit (No. IL0001589), issued by the Illinois Environmental Protection Agency ("IEPA" or "Agency"). The most recent NPDES permit became effective July 28, 2006 and was modified and reissued June 22, 2007 for the Wet Gas Scrubber operation, where an internal outfall A01 was added subject to a General Use Temperature limitation. The Refinery filed a timely NPDES renewal application in December 2010 in advance of the NPDES permit expiration on July 31, 2011. The renewal of that permit is now pending with U.S.EPA and IEPA.

IV. LEMONT REFINERY INTAKE AND DISCHARGE POINT

The NPDES permit covers the main Refinery discharge stream (Outfall 001) located at river mile 296.8 on the CSSC (Latitude 41°38'58", Longitude 88°03'31"). This discharge point is within the RNA defined by the U.S. Coast Guard in the Federal Register 33CFR 165.923 [http://www.gpo.gov/fdsys/pkg/FR-2011-12-12/html/2011-31706.htm] as a permanently established zone between river mile 295.5 and river mile 297.7 of the Lower CSSC. The Lemont Refinery's discharge is less than 600 feet upstream of the aerial pipeline arch which coincides with the beginning of the Safety Zone, defined by the U.S. Coast Guard as consisting of all waters between river mile 296.1 and river mile 296.7 of the lower CSSC. The Coast Guard has established through final rule both the Safety Zone and a RNA to place "navigational, environmental and operational restrictions" on all vessels transiting through the electric fish barriers operated by the U.S. Army Corp of Engineers. **Exhibit A** to my testimony is a diagram

of the Ship Canal through the Safety Zone and the RNA, with notations depicting the refinery intake, outfall and mixing zone.

In its final rule, the U.S. Coast Guard stated that the current generated by the fish barrier system poses safety risks to "commercial vessels, recreational boaters and people on or in portions of the CSSC in the vicinity of the barriers." The Coast Guard further states that "...there are no indications of their use being terminated in the foreseeable future."

The other federal agencies involved, both the Corps of Engineers and the U.S. EPA, agree that the electric fish barrier, or "invasive species barrier", is a permanent feature of the Ship CSSC.

As detailed in our Added Comments on Proposed Second Notice Opinion and Order, this barrier is not going to be removed any time in the foreseeable future. It is now a "permanent" feature of the CSSC. The Lemont Refinery has had to adjust its practices to accommodate this barrier and to comply with the requirements of the Coast Guard and the Army Corps of Engineers. The testimony of Bruce Nelson, and accompanying video, describe this portion of the CSSC in greater detail.

V. OVERVIEW OF PRIOR VARIANCE PROCEEDINGS

TDS has been an issue for the Refinery due to a Consent Decree agreement that CITGO reached with U.S. EPA and the states of Illinois, Louisiana, New Jersey and Georgia to substantially reduce the sulfur dioxide and nitrous oxide emissions in covered facilities. The Wet Gas Scrubber generates sodium sulfates that are directed to the wastewater treatment facilities, resulting in increased levels of TDS in the final outfall. During project development, it was ascertained that regulatory relief from the 1,500 mg/L TDS water quality standard was

necessary because the CSSC already exceeds this standard during significant snow de-icing periods. IEPA advised that it would not issue a construction permit for that project unless a variance was granted by the Board, even though the Wet Gas Scrubber was required by the Consent Decree.

Treatment options for TDS in the wastewater stream were evaluated to be neither technically feasible nor economically reasonable. This led to questions about pending changes in the water quality standards in the Lower CSSC such as efforts by IEPA to eliminate the existing TDS water quality standard - for both general use and secondary contact waters.

The Lemont Refinery met with the IEPA to discuss an adjusted standard for TDS to allow the Refinery to proceed with the air pollution control construction project. While initially supportive, the Agency suggested that the Refinery proceed with a variance request noting: 1) U.S.EPA would not have to approve the variance and 2) the TDS water quality standard would be eliminated and replaced with sulfate and chloride water quality standards before the variance would expire. Given the obligations imposed on the Refinery by U.S.EPA and IEPA, the only viable option to allow construction of the Wet Gas Scrubber to proceed was to file a variance.

On October 6, 2004, the Refinery's Consent Decree was lodged. The required installation of air pollution control equipment by December 2007, costing approximately \$142 million, would result in a scrubber wastewater stream with elevated TDS. On November 8, 2004, the Refinery filed a petition for a variance from TDS water quality standards. On December 21, 2004, the construction permit application for the purge treatment unit was submitted to the Agency.

First Variance: On April 21, 2005, the Board granted a five-year TDS variance to the Lemont Refinery. [*CITGO Petroleum Corporation and PDV Midwest Refining, LLC v. IEPA*, PCB 05-85 (issued April 21, 2005)]. On May 1, 2006, IEPA granted a construction permit for the purge treatment unit.

Second Variance: The Lemont Refinery filed an amended petition with IEPA's recommendation with stipulations resulting in the board granting the second variance on May 15, 2008. [CITGO Petroleum Corporation and PDV Midwest Refining, LLC v. IEPA, PCB 08-33 (issued May 15, 2008)]. The second variance anticipated the removal of TDS from water quality standards in UAA rulemaking before expiration. The Refinery reported on the levels of TDS in the Ship Canal at both the Lemont Refinery as well as at the I-55 Bridge. From that data, it was apparent that the TDS levels in the discharge from the Lemont Refinery were not associated with the level in the Ship Canal or at the I-55 Bridge.¹ Further, this second variance also reported the duration of elevated TDS levels were longer than had first been expected; the duration of the higher levels could run to three weeks. This meant that a much larger amount of storage capacity would be required to hold the wastewater discharge of the Refinery during those times, in order to comply with the TDS standard with the mixing zone rule. Based in part on this finding, and the possibility of an extended time period during the winter months of TDS levels above the water quality standard, the conditions of the variance focused on use of management strategies. Given the average permitted rate of discharge (5.79 MGD) with a need to hold water for as long as 20 days, 100 MG of storage would be needed. While the first variance required the Lemont Refinery to prepare a "TDS Water Quality Management Plan", the conditions for the second

¹ After the second variance was granted, when U.S. EPA approved the TDS standard of 1,686 mg/l for the Des Plaines River, sampling at the I-55 Bridge was no longer required. This led to a focus to sample during the winter months at the Refinery water intake and effluent.

variance modified the condition to require a "TDS Water Quality Management Plan/Best Management Plan." The use of a "BMP" was justified as being more flexible and would avoid the massive construction activity and costs which would be associated with treating or merely storing the substantial quantity of water which the mixing rule would require. [*See CITGO Petroleum Corporation and PDV Midwest Refining, LLC v. IEPA*, Illinois Pollution Control Board Opinion and Order, PCB 08-33, (issued May 15, 2008.)]

Third Variance: Since the UAA proceedings were still pending, the Lemont Refinery sought a further extension of the variance on December 20, 2011. [*CITGO Petroleum Corporation and PDV Midwest Refining, LLC v. IEPA*, PCB 12-94]. The Agency issued a favorable recommendation, its only suggested change being that the Refinery also sample the intake water for chlorides. In response to questions by the Board, the Refinery reported that the amount of TDS in the discharge was actually much less than had been predicted by the First Variance. This lead to the Refinery agreeing to report and submit a new variance application if the levels of TDS increased to a level above what was authorized by the First Variance. Furthermore, like prior key determinations in the preceding variances, the relief sought was viewed by the Refinery and the Agency as being consistent with the Clean Water Act. The Board followed with granting the third variance on October 18, 2012. [*See CITGO Petroleum Corporation and PDV Midwest Refining, LLC v. IEPA*, Illinois Pollution Control Board Opinion and Order, PCB 12-94, (issued October 8, 2012.)]

Shortly after the third variance was issued, IEPA submitted the variance to U.S. EPA for review. The Lemont Refinery first learned of this action by IEPA only after it had occurred. Indeed, this information came out as part of a coincidental in a face-to-face meeting with IEPA on December 13, 2012, concerning Public Noticed draft permit comments. We were told that the

Lemont Refinery could do nothing further to impact this review and at that point, there was no need to be concerned. IEPA advised the Lemont Refinery that it was impractical to take further steps to revise the permit until they received a decision from U.S. EPA regarding the variance.

U.S. EPA's Rejection of the Third Variance: On March 20, 2013, the Lemont Refinery received notice from IEPA advising it of U.S. EPA's Objection to the NPDES permit, as well as to the Variance. U.S. EPA apparently concluded that for the period covered by the variance, the lack of an interim water quality standard for TDS (or alternatively for chlorides and sulfates) was not protective of the Secondary Contact uses of the CSSC. Also, U.S. EPA indicated IEPA had not provided it with the appropriate technical and scientific data and analysis. Indeed, it appears that U.S. EPA did not consider any of the information that was in the Board's UAA docket for R08-09, including Docket C, which deals with the designated uses of the Ship Canal. The Lemont Refinery was surprised by this conclusion and by the manner in which a major decision was made without any opportunity for comment, and without considering the substantial record pending before the Board in Docket C of the UAA.

As the Board is aware, on June 21, 2013, IEPA filed a motion to vacate the 2012 Variance. In response, on July 10, 2013 the Lemont Refinery filed a "Petition for Modification of Variance to Include Additional Conditions for Protection of Aquatic Life Uses," to fix the third variance by proposing an additional condition to specify a maximum TDS and sulfate levels in order to protect the aquatic uses of the Ship Canal. These matters remain pending before the Board. Against this backdrop, the Lemont Refinery urges the Board to take note of the Proposed Rule published by U.S. EPA to amend its rules for reviewing state water quality regulations [*available at http://water.epa.gov/lawsregs/lawsguidance/wqs_index.cfm*].

While only a proposed rule, it appears that U.S. EPA expects, if variances are to be granted from state water quality standards, that those procedures must be included in the standards themselves. The Lemont Refinery is hopeful that the Board will agree to adopt the regulatory changes which are being highlighted here. We are not expecting to file a variance from this rulemaking, but we respectfully, urge the Board and the Agency to take this policy of U.S. EPA into account in this Docket D.

VI. <u>WATER QUALITY INFORMATION FROM THE SHIP CANAL WITH</u> RESPECT TO TOTAL DISSOLVED SOLIDS AND CHLORIDES

As a result of these variances, the Lemont Refinery has collected over 8-years of water quality data for TDS and chlorides from the Ship Canal. This information is included in the testimony of Jim Huff. Several conclusions can be reached from these data.

- TDS levels are present during the winter months at levels above the current water quality standard for TDS (1500 mg/l). During the winter months, the chloride levels in the stream are also above the proposed standard for chlorides (500mg/l).
- Those elevated TDS (and chloride) levels are episodic and associated with snowmelt run-off. These elevated TDS and chloride levels are associated with the practice of de-icing roadways as a safety measure. Chlorides are, of course a principal material in many de-icing compounds.
- The Lemont Refinery has no control over the chemicals or the practices of upstream sources of snow-melt run-off.
- In a similar manner, there is a possibility of elevated mercury levels in our intake in the Ship canal, from re-suspension of sediments, from the MWRDGC dischargers or from other upstream sources.
- The Lemont Refinery has a very small Mixing Zone, which extends along the eastern wall of the Ship Canal from the outfall reaching into the Black Safety Zone as shown in **Exhibit A.** It is entirely within the RNA.
- The Lemont Refinery has investigated the feasibility of BMP measures and believes that such could be useful and effective in reducing chloride levels in the Ship canal. The Lemont Refinery is willing to do its part and perform BMP measures on its deicing activities with respect to chlorides. We submit the same

principles could be applied to any other pollutant in the Ship Canal which is withdrawn in the Lemont Refinery intake and exceeds a water quality standard.

The Agency has proposed the Board remove TDS as a water quality standard and to add standards for chlorides and sulfates, as it has been previously done for General Use waters. It is also apparent that the proposed chloride value will cause the same exceedance issues we have had with TDS, namely elevated levels upstream in the CSSC during snow melt conditions.

Due to lack of causation between Wet Gas Scrubber operation and elevated chlorides in the Lemont Refinery's effluents, the proposed chloride standard for the CSSC were not part of the reasons for seeking prior variances. However, during the winter season, the same issue that caused potential TDS exceedances, led to the need for a variance in the first instance. This issue will be duplicated with chlorides due to upstream conditions in an effluent dominated stream. During the winter season, the largest source of chlorides in the Lemont Refinery effluent is due to what comes in the influent.

The Ship Canal, as it passes the Lemont Refinery Water Intake, is an effluent dominated stream. Scott Twait of IEPA testified that at times, 100% of the flow in the Ship Canal at this point is from wastewater effluent from upstream sources -- the MWRDGC. Jim Huff will testify about the sources of chlorides into the Ship Canal.

It does not seem appropriate to require the Lemont Refinery to "clean up" the TDS and chloride levels discharged by upstream sources. It is important to note here that the Lemont Refinery has a very small mixing zone and can comply with the Agency- proposed water quality standards if it has the use of an appropriate mixing zone. Jim Huff will describe the mixing zone information.

The Lemont Refinery urges the Board to amend the existing mixing zone rule as part of this proceeding in order to provide relief to the Lemont Refinery (or any other discharger to the Use B waters which is similarly situated by having a water intake in the Ship Canal). All Use B waters are "effluent dominated" and certainly all dischargers to the Ship canal above the Lockport Locks discharge into such a stream.

For our part, the Lemont Refinery is willing to institute Best Management Practices with the objective of offsetting the amount of chlorides it adds to the Ship Canal during these periods where upstream sources are causing a condition which would violate the proposed water quality standard for chloride, the same measure which the Board ordered be evaluated in the TDS Variances. Jim Huff will describe a recommended approach to BMP as it would apply to minimizing chloride losses during to snow melt run-off.

VII. <u>CONCLUSION</u>

The Lemont Refinery appreciates the opportunity to testify on the proposed water quality standards for the CSSC. My colleagues will present their indicated testimony. Together, we would submit that the Board should do the following:

• if the Board is to adopt the Agency-proposed standards for chlorides and sulfates, while removing the TDS standard, we recommend the following:

(1) that the Board adopt a seasonal standard for chlorides consistent with the recommendations made by Huff & Huff in its report and testimony; and

(2) that the Board amend the mixing zone rule to provide an opportunity for use of a mixing zone for discharges into waters which exceed applicable water quality standards, if the discharger employs best management practices for that pollutant with an objective of that BMP plan being to offset the amount by which the discharger would discharge that pollutant during times of water quality above the applicable standard.

while this recommendation is focused on chlorides, it could also apply to any other pollutant in an "effluent dominated" water. For our purposes, we are focusing only on the CSSC as a "Use B" water.

We have drafted proposed language to meet the above recommendation for an amendment to the mixing zone rule, as well as to incorporate the use of Best Management Practices. The Lemont Refinery intends to seek input from the Agency and other stakeholders in the next few weeks and reserves the opportunity to submit it to the Board at the merit hearings herein, on December 17-19.

Thank you, this concludes my pre-filed testimony.

Larry Tyler

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EXHIBIT A



CERTIFICATE OF SERVICE

I, the undersigned, certify that on November 22, 2013, I served electronically the attached

Pre-Filed Testimony of: Larry Tyler, Bruce Nelson, Roger Klocek and James Huff, upon

the following:

John Therriault, Clerk Pollution Control Board James R. Thompson Center 100 West Randolph St., Suite 11-500 Chicago, IL 60601

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