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

OCT 07 2016

REPLY TO THE ATTENTION OF:
WC-15J

CERTIFIED MAIL 7009 1680 0000 7645 8566
RETURN RECEIPT REQUESTED

David St. Pierre
Executive Director
Metropolitan Water Reclamation District
of Greater Chicago
100 East Erie Street
Chicago, Illinois 60611

Re: *U.S. EPA et al. v. Metropolitan Water Reclamation District of Greater Chicago,* Calumet TARP System Post Construction Monitoring Plan

Dear Mr. St. Pierre:

The U.S. Environmental Protection Agency received the September 30, 2016 letter from the Metropolitan Water Reclamation District of Greater Chicago (MWRD) submitting the revised Calumet TARP System Post Construction Monitoring Plan for approval pursuant to Paragraph 35(a) and Section X of the Consent Decree in *U.S. et al. v. Metropolitan Water Reclamation District of Greater Chicago*, Civil Action No. 11-C-8859. EPA has reviewed MWRD's revised Calumet TARP System Post Construction Monitoring Plan and has consulted with the Illinois Environmental Protection Agency regarding the plan, pursuant to Section X of the Consent Decree.

By this letter, EPA approves MWRD's revised Calumet TARP System Post Construction Monitoring Plan pursuant to Section X of the Consent Decree. Pursuant to Paragraph 35(d) of the Consent Decree, MWRD must implement the approved Calumet TARP System Post Construction Monitoring Plan after MWRD has commenced full operation of the Thornton Reservoir in accordance with Paragraph 16(e) of the Consent Decree. If you have any questions, please contact Keith Middleton, of my staff, at (312) 886-6465 or middleton.keith@epa.gov.

Sincerely,

for Tinka G. Hyde
Director, Water Division

Protecting Our Water Environment

Metropolitan Water Reclamation District of Greater Chicago

100 EAST ERIE STREET CHICAGO, ILLINOIS 60611-3154 312.751.6565

RONALD M. HILL
General Counsel
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September 30, 2016

Chief, Environmental Enforcement Section
Environment & Natural Resources Division
U.S. Department of Justice
Box 7611 Ben Franklin Station
Washington, D.C. 20044-7611
Re: DOJ No. 90-5-1-1-07679

Chief, Water Enforcement & Compliance Assurance Branch
Water Division
U.S. Environmental Protection Agency
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Re: *United States of America, et al. v. Metropolitan Water Reclamation District of Greater Chicago*
Case: 1:11-cv-08859 ("Consent Decree")
Post Construction Monitoring Plan for Calumet TARP System ("PCMP")

To Whom It May Concern:

Within the time frame set forth in this Consent Decree, the Metropolitan Water Reclamation District of Greater Chicago ("District") submitted the PCMP. Thereafter, in response to questions, comments, and information exchanges between our respective agencies, we revised the PCMP, a copy of which is enclosed herein. The referenced exhibits are on the enclosed CD-ROM.

Thank you for your attention to this matter.

Please do not hesitate to contact me at 312.751.6581 with any questions.

Sincerely,

Brendan O'Connor
Principal Attorney

BO'C:nm
Enclosures
cc: J. Murray
T. Granato
C. O'Connor

Post Construction Monitoring Plan for Calumet TARP System

Background

Portions of the Calumet tunnel system began operation in 1986 and the entire system was completed in 2006. The design storage capacity of the Calumet tunnel system is approximately 630 million gallons. The Thornton Composite Reservoir of the Calumet TARP System measures approximately 2,500 by 1,600 feet with a maximum water depth of 292 feet and has a total capacity of 7.9 billion gallons (4.8 billion gallons for combined sewerage and 3.1 billion gallons for Thorn Creek floodwater). However, the Metropolitan Water Reclamation District of Greater Chicago (MWRD or the District) has arranged to provide additional protection by extending its lease of the transitional reservoir (in the West Lobe of the quarry) through 2020. During that time the community will receive the benefit of 3.1 billion gallons of Thorn Creek floodwater storage provided by the transitional reservoir, in addition to the 7.9 billion gallons of CSO storage in the Thornton Composite Reservoir. This five-year "extra storage period" was made possible because of an agreement between MWRD and the mining company, involving MWRD paying for this extra storage period at a cost of $750,000.00 per year for five years, for a total cost of $3,750,000.00.

The Calumet River System is made up of natural and man-made channels as well as natural waterways upstream of the Chicago Area Waterway System (CAWS). The Cal-Sag Channel extends upstream from its junction with the Chicago Sanitary and Ship Canal for 16.2 miles to the Little Calumet River. At this point, the waterway becomes the Little Calumet River and extends upstream 6.9 miles, ending at the O'Brien Lock and Dam. The Calumet River extends upstream of the O'Brien Lock and Dam to Lake Michigan. The Grand Calumet River flows from the State of Indiana into the Little Calumet River, and the Little Calumet River South, flows north into the Cal-Sag Channel, also carrying flows from Thorn Creek (Figure 1).

Reaches of the Calumet River System with combined sewer overflows (CSOs) include the Cal-Sag Channel (16 outfalls), the Little Calumet River (41 outfalls, including the 125th Street Pumping Station), the Grand Calumet River (4 outfalls), and the Calumet River (3 outfalls, including the 122nd and 95th Street Pumping Stations). Appendix A is a detailed list of CSOs, including outfall number, TARP connection ID, ownership, and monitoring status.

Objectives

One of the requirements of the (MWRD) Consent Decree is that a Post Construction Monitoring Plan (PCMP) shall be developed which includes, "in stream water quality monitoring relating to applicable water quality standards," and "determination of whether MWRD's CSOs are in compliance with the then-effective Calumet Water Reclamation Plant (WRP) National Pollutant Discharge Elimination System (NPDES) Permit, including applicable water quality standards incorporated therein." The District's Maintenance and Operations (M&O) Department will be

responsible for tracking the frequency, duration, and volume of CSOs within the Calumet River System and the District's Monitoring and Research Department (M&R) will be responsible for implementing the water quality monitoring component of the PCMP. M&R will conduct monitoring in the Calumet River System in 2017 and 2018 (January 1, 2017 through December 31, 2018), following completion of the Calumet TARP System's Thornton Composite Reservoir. MWRD will compare the 2017 – 2018 post-completion data under wet and dry weather conditions to water quality standards to assess the effectiveness of TARP. In addition, MWRD will compare ambient water quality monitoring data collected prior to 1985, before any portion of the Calumet TARP system was on-line, and 2014 – 2015 monitoring data to post completion ambient water quality data collected in 2017 and 2018, to assess overall improvements due to Calumet TARP.

The District will conduct ambient water quality monitoring, continuous dissolved oxygen monitoring, and wet weather water quality monitoring during 2017 and 2018 to document water quality under various weather conditions in the Calumet River System following the completion of the Calumet TARP System's Thornton Composite Reservoir. By June 30, 2019, a report will be submitted summarizing and analyzing CSO frequency, duration, and volume, as well as water quality data generated during the post construction monitoring period.

As a result of the "extra storage period" described above, for any storms in which the volume of CSOs captured by the Thornton Composite Reservoir exceeds 4.8 billion gallons, MWRD will estimate the volume of CSOs that would have occurred in the absence of the additional storage, during the post construction monitoring period. The District will also estimate the locations of any CSOs that may have resulted without the additional storage using the Calumet TARP System Model. In addition, the District will perform a water quality analysis of those potential CSOs, sampling for 5-day biochemical oxygen demand (BOD_5), total suspended solids (TSS), total dissolved solids (TDS), dissolved oxygen (DO) and fecal coliform, as set forth on pages 6 – 9 of this plan. The results will be included in the final Post Construction Monitoring Report due June 30, 2019.

CSO Monitoring

The MWRD intends to utilize its approved CSO Representative Monitoring and Reporting Plan for the Calumet area to track the frequency, duration, and volume of individual CSOs within the Calumet River System (Appendix B). In summary, the District has tide gate monitors installed on 51 of the 67 total outfalls. Unmonitored outfalls are assumed to discharge when select monitored ones discharge because of similar invert elevations. Signals are transmitted to the Calumet WRP when the tide gate is open and assumed to be discharging. These signals are verified by plant staff and then volume estimates are performed via a conservative method which assumes that all rainfall that falls during the period that a tide gate is open, is being discharged to the waterway. These discharge volumes are then compared to two boundary conditions: (1) total area rainfall volume and (2) outfall pipe capacity. The minimum of these three values is used as the final discharge volume.

Per the Calumet WRP NPDES permit, all individual CSO discharges resulting from the same storm shall be reported as one CSO event. MWRD compiles the above detailed individual CSO information in order to obtain an annual number of CSO events per waterway reach. Appendix C contains an example of the summary CSO report by reach from 2013.

Water Quality Monitoring

Ambient Water Quality Monitoring

Table 1 shows the ambient water quality monitoring (AWQM) stations on the Calumet River System that will be used to assess the overall impact of Calumet TARP System completion. A map of these stations is presented in Figure 1. AWQM will be conducted on a monthly basis in the Calumet River Watershed on the fourth Monday of each month.

Table 1: AWQM locations that will be assessed in Calumet TARP System monitoring

Location	Waterway	Station Number	GPS Coordinates	
Burnham Ave.	Grand Calumet River	86	41° 37' 52.75"	-87° 32' 20.76"
130th St.	Calumet River	55	41° 39' 33.48"	-87° 34' 21.66"
Indiana Ave.	Little Calumet River	56	41° 39' 01.19"	-87° 37' 01.64"
Halsted St.	Little Calumet River	76	41° 39' 27.05"	-87° 38' 28.13"
Ashland Ave.	Little Calumet River, South	57	41° 39' 06.04"	-87° 39' 38.13"
170th St.	Thorn Creek	97	41° 35' 11.90"	-87° 34' 32.96"
Cicero Ave.	Calumet-Sag Channel	59	41° 39' 19.23"	-87° 44' 17.67"
Route 83	Calumet-Sag Channel	43	41° 41' 46.82"	-87° 56' 10.71"
Wentworth Ave.	Little Calumet River, South	52	41° 35' 06.34"	-87° 31' 46.89"

Monitoring activities will be conducted in accordance with Revision 2.5 of the District's Ambient Water Quality Monitoring Quality Assurance Project Plan, effective September 1, 2015. (Appendix D).

In order to assess effects of CSOs on the Calumet River Watershed after the Thornton Composite Reservoir is on-line, the constituents listed in Table 2 will be analyzed. The rationale for inclusion of these constituents is also shown in Table 2.

Table 2: Constituents to be Analyzed in Post Construction Monitoring Plan

Water Quality Constituent (Analytical Method)	Rationale for Inclusion
Dissolved oxygen (SM 4500-O C)	Current designated use impairment in one or more receiving waterbodies
Ammonia (EPA 350.1)	Commonly present in combined sewage
Total Suspended Solids (SM2540 D)	Commonly present in combined sewage
Total Dissolved Solids (SM2530 C)	Current designated use impairment in one or more receiving waterbodies
Fecal Coliform (SM 9222 D) [1]	Current designated use impairment in one or more receiving waterbodies
	Commonly present in combined sewage
Escherichia coli (USEPA 1603)[2]	Illinois bacterial water quality standard may change to *E. coli* by the post construction monitoring period
Five-day Biochemical Oxygen Demand (SM 5210 B)	Commonly present in combined sewage

[1] MWRD will sample for fecal coliform at each AWQM location for the duration of the sampling period, unless a new *E. coli* state water quality standard replaces the current fecal coliform state water quality standard.

[2]This applies to condition number 3 below, wet weather with CSOs. For condition numbers 1 and 2 below (dry weather and wet weather without CSOs), select samples will be analyzed for *E. coli*, as described on page 8 of this document. If a new *E. coli* state water quality standard replaces the current fecal coliform state water quality standard, *E. coli* will be analyzed for the remainder of samples collected under this plan. In other samples that are not analyzed for *E. coli*, it will be estimated based on empirically established fecal coliform to *E. coli* relationship in the Calumet River System.

Wet Weather Sampling

In addition to the monthly sampling in the AWQM Program, water quality sampling will be conducted during various wet weather conditions at each of the nine sampling locations in the Calumet River System. Constituents listed in Table 2 will be measured during the conditions listed in items 1, 2 and 3 below.

The USEPA CSO Post Construction Compliance Monitoring guidance document (2012) prescribes wet weather sampling to evaluate receiving water impacts under a range of weather conditions. To achieve this, MWRD will capture five events for each of the following conditions during 2017 and 2018:

1. Dry weather (<0.1 inch precipitation). Dry weather will be defined by antecedent dry conditions for 2 days following a 0.25-0.49 inch event, 4 days following a 0.50-0.99 inch event, and 6 days following a >1.0 inch event (from wet weather limited

use analysis done during Chicago Area Waterway System Use Attainability Analysis).

2. Wet weather without CSOs (>0.5 inch precipitation). Water sampling to occur within 12 hours of the end of the rain event.

3. Wet weather with CSOs, to the extent such events occur, including 125th Street Pump Station, if discharging. Water sampling to occur within 12 hours of the end of the rain event or as soon as safe sampling conditions resume. In the Calumet TARP System Final Post Construction Monitoring Report submitted pursuant to Consent Decree Paragraph 36, MWRD will document any instances of delayed sampling, including the reason sampling was delayed, the impacted sampling locations and the amount of the delay.

Average rainfall from the four District rain gages in the Calumet area (Figure 2) will be used to determine that the above conditions have been met.

M&R staff will work closely with M&O staff to predict potential wet weather sampling events. The M&O dispatcher will notify M&R staff when wet weather events are forecast for the Calumet area. M&R staff will consult with M&O staff at Calumet WRP to confirm the above wet weather criteria have been met. As soon as monitoring of a wet weather event is scheduled, lab managers should be notified (see notification flow chart in Figure 3).

Whenever possible, sampling events will be scheduled for weekdays during normal work hours. As the post construction monitoring period progresses, however, if MWRD has not been able to capture enough events for each weather condition, MWRD may need to require overtime for sampling during off-work hours.

The AWQM and wet weather sampling locations are representative of water quality in the various waterbody reaches receiving CSO flow. The 130th Street sampling location on the Calumet River represents "background" upstream conditions, as it is upstream of CSOs with the exception of the 95th Street and 122nd Street Pumping Stations, discharge of which would actually constitute a reversal of flow towards Lake Michigan. The Route 83 station is located at the most downstream location of the Calumet River System and constitutes well mixed flow from all of the CSOs that discharge into the system upstream. Figure 2 displays CSO locations in the Calumet River System.

M&R will also collect hourly DO data from MWRD's Continuous Dissolved Oxygen Monitoring (CDOM) program for use in assessing waterway compliance and impact of CSOs on the Calumet River System.

Table 3 shows the CDOM locations on the Calumet River System that will be used to assess the impact of the Calumet TARP System completion. These stations are also indicated on Figure 1. CDOM stations will be located in the Little Calumet River, upstream and downstream

of the Calumet WRP; the Little Calumet River South, just upstream of the confluence with the Little Calumet River; and in the Cal-Sag Channel, both immediately downstream of the reach receiving most of the CSO flows, and at the downstream end of the system at Route 83. These station locations will allow MWRD to compare in-stream DO concentrations to applicable water quality standards in waterway reaches receiving CSO flow. If DO concentrations decrease below the water quality standard following CSO discharges into the Calumet River System, continuous DO data will be included in the Post Construction Monitoring Report for the period until DO increases to above the water quality standard. If DO does not decrease below the water quality standard following CSO discharge, then 7 days of continuous DO data will be included in the report.

Table 3: CDOM locations that will be assessed in Calumet TARP System monitoring

Location	Waterway	GPS Coordinates	
C&W Indiana Railroad	Little Calumet River	41° 39' 01.07"	-87° 36' 42.75"
Halsted St.	Little Calumet River	41° 39' 25.95"	-87° 38' 27.86"
Ashland Ave.	Little Calumet River, South	41° 39' 06.64"	-87° 39' 37.27"
Cicero Ave.	Calumet-Sag Channel	41° 39' 20.70"	-87° 44' 18.78"
Route 83	Calumet-Sag Channel	41° 41' 46.68"	-87° 56' 29.29"

Continuous DO monitoring activities will be conducted in accordance with Revision 2.1 of the District's Continuous Dissolved Oxygen Monitoring Program Quality Assurance Project Plan, effective July 1, 2016 (Appendix E).

Extra Storage Period Sampling and Analysis

After entry of the consent decree, the District successfully negotiated an extension of its agreement with Hanson Material Services, to keep the Thornton Transitional Reservoir (TTR) available to take flood water from Thorn Creek through 2020. Originally, this reservoir was set to be decommissioned once the Thornton Composite Reservoir (TCR) went on-line. One benefit of this new arrangement is that the entire 7.9 BG volume of the TCR will be available for combined sewer overflow storage, instead of the 4.8 BGs required by the consent decree. While this has the potential to further reduce CSOs during extremely wet periods, the additional storage volume is currently only temporary. Therefore, the Calumet TARP post construction monitoring period may not be representative of conditions that will exist after 2020. If, during the monitoring period, there are any events in which the TCR contains more than 4.8 BG of CSO, the District will provide an estimate of the volume and location of CSOs that would have occurred had that additional

storage volume not been available (as could be the case after 2020). The District will use the TARP computer models to predict the location and volume of CSOs under that scenario and will also use best efforts to take representative water quality samples (DO, BOD_5, TSS, TDS, fecal coliform, and ammonia) of the CSO that was captured. This will enable the District to form an opinion on what impact the CSO would have had on the waterways, if the TTR had not been available.

In the possible but unlikely scenario that the Thornton Composite Reservoir exceeds a CSO volume over 4.8 billion gallons at any given time during the post construction monitoring period, the District will adhere to the following protocol:

Sampling Protocol and Reporting: MWRD shall determine an elevation within the Thornton Reservoir that corresponds to 4.8 BG and have the ability to both monitor the water surface elevation of Thornton Reservoir at all times and estimate the volume captured in the Thornton Reservoir. If the total CSO storage volume in Thornton Reservoir exceeds 4.8 BG, MWRD shall record the storage value and time every 15 minutes until the storage volume is less than 4.8 BG. MWRD shall also record the rainfall during the applicable wet weather event at each of its rain gauges in the Calumet system network. MWRD shall include both the rainfall information and the storage value dataset within its final Calumet Post Construction Monitoring Report. MWRD shall take a representative water quality sample from the suction line of the pumps at the Calumet TARP Pump Station within the first two hours of the exceedance of 4.8 BG of CSO storage in Thornton Reservoir. MWRD may also take the sample within 30 minutes prior to CSO storage in the Thornton Reservoir exceeding 4.8 BG. MWRD shall sample enough wastewater to perform pollutant analysis for DO, BOD_5, TSS, TDS, ammonia, and fecal coliform. MWRD shall ensure that all the sampling procedures and the results conform to the requirements in 40 C.F.R. Part 136. MWRD shall report all of the results of any sampling conducted within the TARP shaft in the final Calumet Post Construction Monitoring Report. It is anticipated that sampling at the suction line at the Calumet TARP Pumps set forth above will be sufficient, because the combined stormwater and sanitary sewer flow within this line would be well mixed and the pollutant concentrations relatively consistent.

Hydrologic and Hydraulic Model Evaluation: MWRD shall use its hydrologic and hydraulic model (Metro Flow), developed in part by the University of Illinois, to determine the location and volume of potential CSOs that would have occurred if Thornton Reservoir had allocated only 4.8 BG of total storage for CSO capture. MWRD shall base the Metro Flow model run on the specific storm rainfall data gathered by MWRD from its network of representative rain gauges within the Calumet TARP system during the relevant wet weather event.

Previous Water Quality Comparison: MWRD shall compare the location and the volume of the potential CSOs predicted by its Metro Flow model to the CSO locations and estimated CSO discharge event volumes that occurred in 2014 and 2015 for which sufficient in-stream water quality monitoring exists. The sampling data shall be consistent with the criteria set forth in the wet weather sampling protocol elsewhere in MWRD's Calumet Post-Construction Monitoring Plan. MWRD will utilize the previous in-stream

water quality sampling data from the corresponding 2014 or 2015 sampling event and compare this specific event's sampling results with the applicable water quality standards in the final Calumet Post-Construction Monitoring Report if a specific sampling event from the 2014 or 2015 sampling period has: (1) a CSO discharge duration (minutes) that is similar to Metro Flow's CSO duration for each CSO in the Calumet TARP system; (2) estimated total CSO total volume (gallons) within a range +20% to -10%[1] of the Metro Flow's CSO total volume for each CSO in the Calumet TARP system; and (3) in-stream water quality data collected during the event from a location representative of the affected waterway. MWRD shall only make this comparison if previous sampling data includes sampling results for DO, BOD_5, TSS, TDS, ammonia, and fecal coliform and the applicable water quality standards have not been changed to include different parameters. If a new *E. coli* state water quality standard replaces the current fecal coliform state water quality standard, *E. coli* will be estimated based on the empirically established fecal coliform to *E. coli* relationship in the Calumet River System. To validate the relationship, MWRD will collect and analyze a total of five rounds of *E. coli* samples between 2017 and 2018 from the five identified locations (Indiana (56) and Halsted (76) on the Little Calumet River; Ashland on the Little Calumet River, South (57), Burnham on the Grand Calumet River (86), and Cicero on the Cal-Sag Channel (59)) during wet weather events when there are no CSOs in the Calumet TARP System for a total of 25 *E. coli* samples. MWRD will also collect and analyze one round of *E. coli* samples during dry weather in 2018 from those same locations in the Calumet TARP System for a total of five *E. coli* samples. MWRD will compare the *E. coli* and fecal coliform samples it collects while implementing the PCMP during dry weather and during wet weather without CSOs, with its established fecal coliform to *E. coli* Calumet River system relationship. If the sampling data does not verify the relationship, MWRD will revise the relationship, using the updated Post-Construction Monitoring Plan sampling data. MWRD shall use the applicable sampling period's Continuous Dissolved Oxygen Monitoring (CDOM) data for the receiving waters in the Calumet TARP system, as part of its evaluation of potential water quality impacts from the potential CSOs.

Water Quality Modeling Protocol: If MWRD finds that none of its previous CSO event and corresponding in-stream water quality data collected during the 2014-2015 monitoring are representative of the potential CSO discharges estimated by the Metro Flow model as stated above, MWRD shall evaluate the potential water quality impacts of the potential CSOs through a water quality model analysis. For DO, TSS, fecal coliform, and ammonia, MWRD shall use the existing applicable water quality model (DUFLOW water quality model) to determine the potential CSO(s) in-stream water quality impacts for each of the sampling parameters. Based upon the current applicable bacterial state water quality standard as of the date of the Calumet Post Construction Monitoring Report, it may be necessary to estimate *E. coli* based on empirically established fecal coliform to *E. coli* relationship in the Calumet River System, since *E. coli* is not included in the CAWS DUFLOW model. To validate the relationship, MWRD will collect and analyze a total of five rounds of *E. coli* samples between 2017 and 2018 from the five identified locations

[1] This range is derived from the Water Environment Federation Manual of Practice, "Prevention and Control of Sewer System Overflows" (FD-17) Table 5.2, pg. 209.

(Indiana (56) and Halsted (76) on the Little Calumet River; Ashland on the Little Calumet River, South (57), Burnham on the Grand Calumet River (86), and Cicero on the Cal Sag Channel (59)) during wet weather events when there are no CSOs in the Calumet TARP System for a total of 25 *E. coli* samples. MWRD will also collect and analyze one round of *E. coli* samples during dry weather in 2018 from those same locations in the Calumet TARP System for a total of five *E. coli* samples. MWRD will compare the *E. coli* and fecal coliform samples it collects while implementing the PCMP during dry weather and during wet weather without CSOs, with its established fecal coliform to *E. coli* Calumet River system relationship. If the sampling data does not verify the relationship, MWRD will revise the relationship, using the updated Post-Construction Monitoring Plan sampling data. MWRD shall utilize the CSO locations and volumes from the Metro Flow model along with the sampling results from the Calumet TARP Pump Station as CSO discharge inputs in each of its water quality models. MWRD shall include the water quality modeling results for each of the pollutant parameters in the Calumet Post-Construction Monitoring Report as part of MWRD's evaluation of potential water quality impacts from the potential CSOs.

Deliverables

After it is approved, MWRD will conduct monitoring in accordance with this PCMP and complete such monitoring by December 31, 2018. The Post Construction Monitoring Report for the Thornton TARP System will be submitted to EPA and Illinois EPA by June 30, 2019. The report will detail receiving water impacts and effectiveness of CSO controls and otherwise meet the requirements of Section IX of the Consent Decree.

Reference

United States Environmental Protection Agency. EPA-833-K-11-001. *CSO Post Construction Compliance Monitoring Guidance*. May, 2012.

Figure 1: Ambient Water Quality and Continuous Dissolved Oxygen Monitoring Stations for Thornton TARP Post Construction Monitoring.

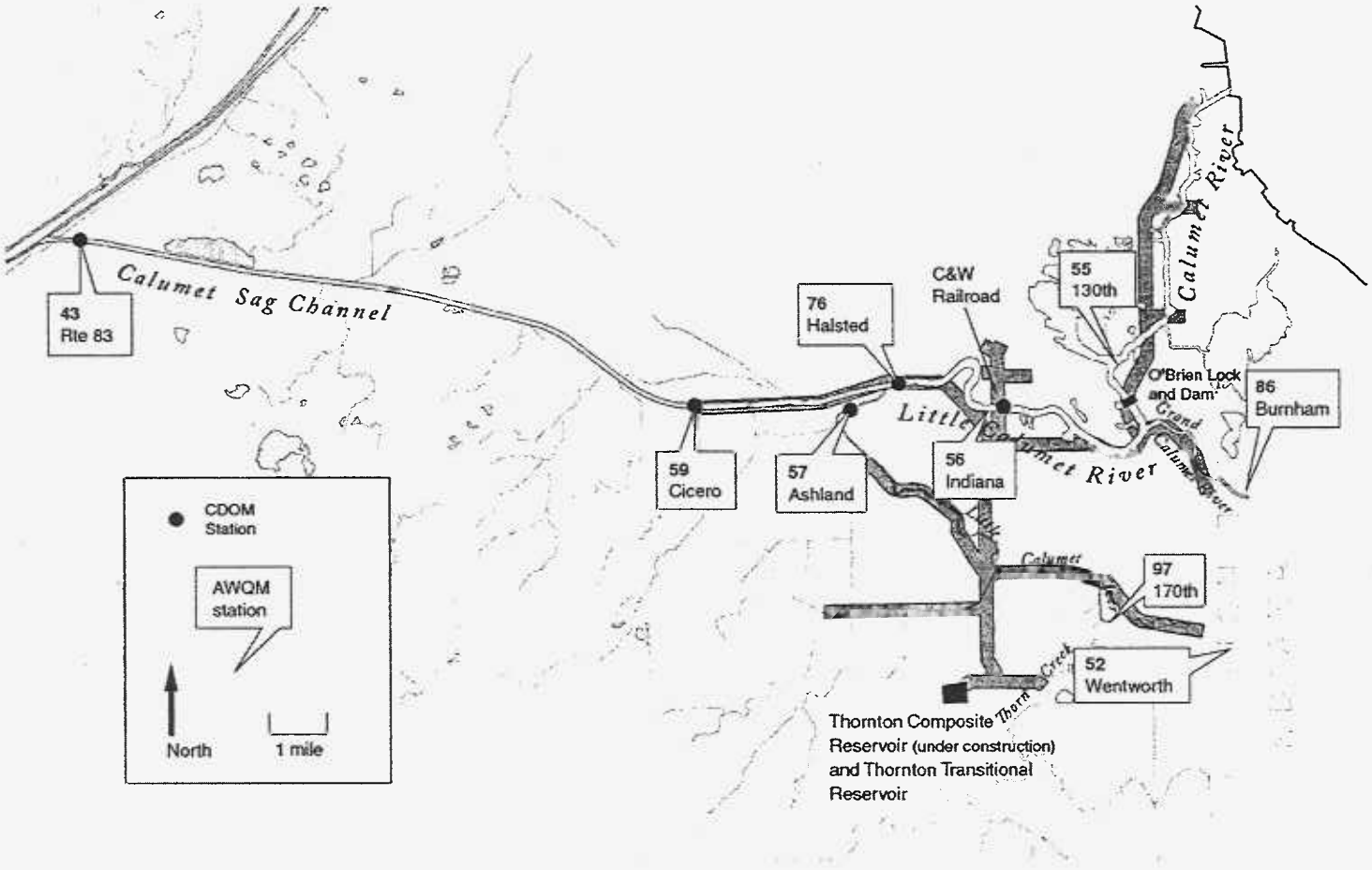

Figure 2: Map of Calumet area Combined Sewer Overflow Outfalls and Precipitation Gages

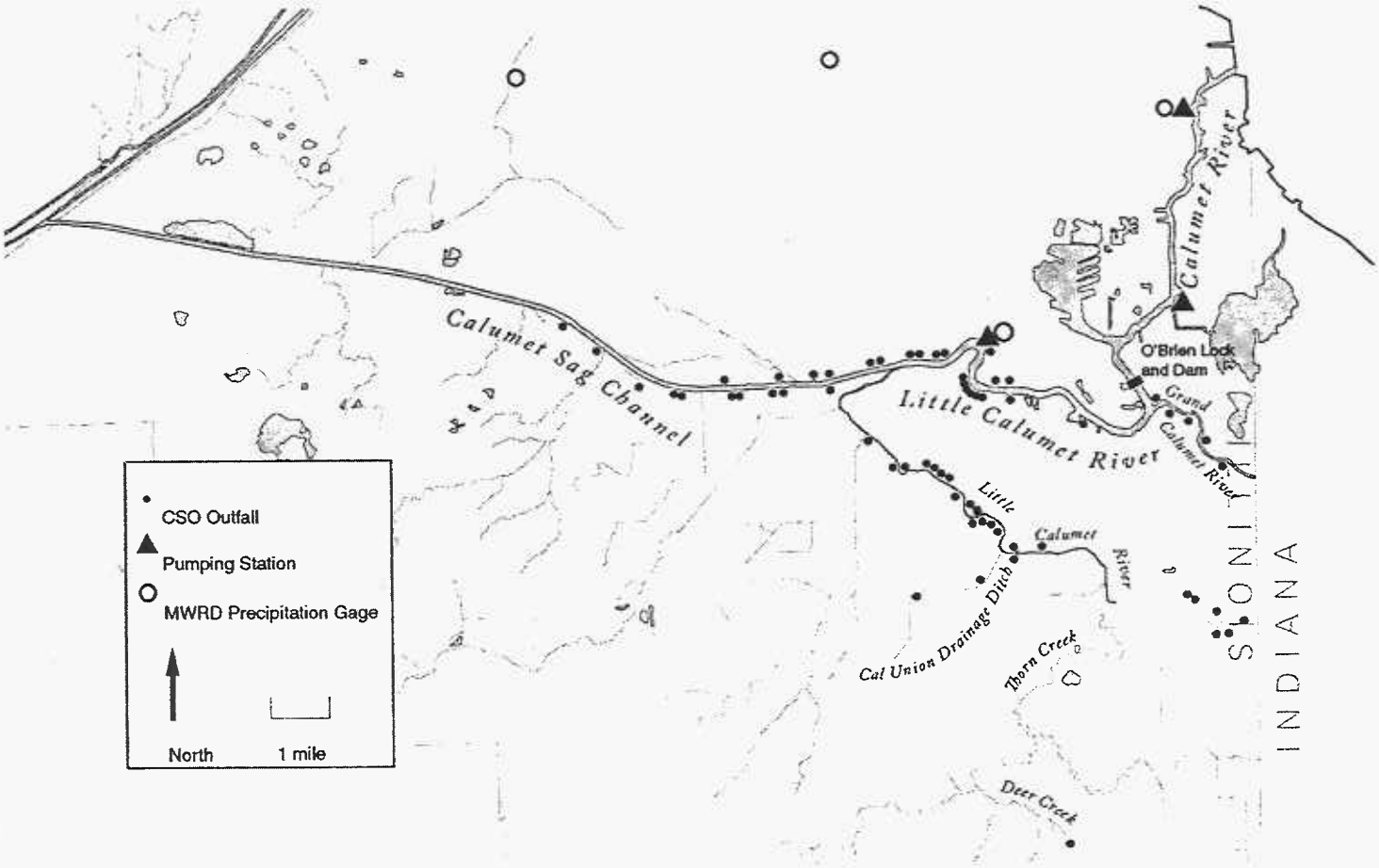

Figure 3: Notification flow chart for Thornton TARP post construction wet weather event sampling