EAST CHICAGO SANITARY DISTRICT

EAST CHICAGO, INDIANA

LOCAL LIMIT STUDY

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Acronyms and Abbreviations

AHL(s)	Allowable Headworks Loading(s)
BOD_5	Biological Oxygen Demand
CFR	Code of Federal Regulation
CIU	Categorical Industrial User
COD	Chemical Oxygen Demand
CSO	Combined Sewer Overflow
DO	Dissolved Oxygen
ECSD	East Chicago Sanitary District
IDEM	Indiana Department Environmental Management
IHSC	Indiana Harbor Ship Canal
IU(s)	Industrial User(s)
MAHL(s)	Maximum Allowable Headworks Loading(s)
MAIL(s)	Maximum Allowable Industrial Loading(s)
MDL	Method Detection Limit
mg/L	Milligrams per Liter
MGD	Million Gallons per Day
MRE	Mean Removal Efficiency
MRO	Monthly Report of Operations
NPDES	National Pollutant Discharge Elimination System
OSRW	Outstanding State Resource Water
POC(s)	Pollutant(s) of Concern
POTW	Publicly Owned Treatment Works
RCRA	Resource Conservation and Recovery Act
RL	Reporting Limit
ROS	Regression Order Statistic
SIU	Significant Industrial User
SUO	Sewer User Ordinance
TCLP	Toxicity Characteristic Leaching Procedure
TSS	Total Suspended Solids
USEPA	United States Environmental Protection Agency
WBGCR	West Branch of the Grand Calumet River
WLA	Wasteload Allocation
WWTP	Wastewater Treatment Plant
WQBEL	Water Quality Based Effluent Limits

1. INTRODUCTION

1.1 Regulatory Background

The National Pretreatment Program addresses discharges from industries to publicly owned treatment works (POTWs). The goal of the program is to prevent pass-through and interference at the POTW and improve opportunities to recycle and reclaim municipal and industrial wastewater and sludge. Three national pretreatment standards control industrial wastewater discharges. These standards consist of prohibited discharges, categorical standards, and local limits. Local limits are site-specific, technically-based effluent limits developed by each POTW to protect its treatment works and receiving waters. Requirements for local limits are found in the General Pretreatment Regulations at 40 Code of Federal Regulations (CFR) 403.

Per 40 CFR 403.8(f)(4), the East Chicago Sanitary District (ECSD) developed local limits that were first promulgated in its sewer user ordinance (SUO) in 1985. The local limits were incorporated into ECSD's pretreatment program which was approved by the United States Environmental Protection Agency (USEPA) on February 14, 1986. ECSD is required by 40 CFR 122.44(j) (2) (ii) and National Discharge Pollution Elimination System (NDPES) Permit No. IN0022829 (Attachment A) to "*provide a written technical evaluation of the need to revise local limits under 40 CFR 403.5(c)(1), following permit issuance or reissuance*". ECSD has had its NPDES permit renewed twice since the local limits were last revised in 2007. Pursuant to Section 308(a) of the Clean Water Act (CWA), ECSD received an information request from USEPA on May 29, 2014. Paragraph 30 of the information request required a local limit evaluation be initiated in compliance with 40 CFR 122.44(j)(2)(ii).

1.2 Local Limits Background

Local limits were first promulgated in the ECSD SUO in 1985. The local limits were revised in 1993 and again in 2007. The resultant local limits promulgated in the 2007 City Ordinance No. 06-007 are the current enforceable local limits. Table 1.1 summarizes the historical local limits.

ECSD currently regulates the discharge of 20 parameters through its local limits, whose concentrations represent daily maximum concentrations and are uniformly allocated across all industrial users. ECSD also applies a surcharge for excess discharges of chemical oxygen demand (COD) and total suspended solids (TSS). The extra strength charges are $0.28 per lb. in excess of 250 milligrams per liter (mg/L) for COD and $0.92 in excess of 100 mg/L for TSS.

Table 1.1 Historical ECSD Local Limits

Pollutant	1985 Ordinance 3403 Local Limits	1993 Ordinance 93-0017 Local Limits	2007 Ordinance No. 06-007 Local Limits (Current Limits)
Arsenic	-	-	0.5 mg/L
Ammonia-Nitrogen	77 mg/L	77 mg/L	77 mg/L
Cadmium	0.140 mg/L	0.140 mg/L	0.140 mg/L
Chromium	0.390 mg/L	0.282 mg/L	0.282 mg/L
Copper	0.170 mg/L	0.170 mg/L	0.170 mg/L
Cyanide (total)	0.930 mg/L	0.407 mg/L	Removed
Cyanide (amenable)	-	-	0.003 mg/L
Iron (soluble)	2.4 mg/L	2.4 mg/L	Removed
Lead	2.8 mg/L	0.224 mg/L	0.224 mg/L
Mercury	0.003 mg/L	0.003 mg/L	0.0002 mg/L
Molybdenum	-	-	0.2 mg/L
Nickel	0.390 mg/L	0.390 mg/L	0.390 mg/L
Silver	0.05 mg/L	0.05 mg/L	0.05 mg/L
Zinc	5.5 mg/L	5.5 mg/L	5.5 mg/L
Total Phosphorus	5.5 mg/L	5.5 mg/L	5.5 mg/L
Fluoride	50 mg/L	2.9 mg/L	2.9 mg/L
Chlorine (Residual)	-	-	0.4 mg/L
Oil and Grease (FOG)	50 mg/L	50 mg/L	50 mg/L
Phenols (4-AAP)	14 mg/L	14 mg/L	0.7 mg/L
Thallium	4.3 mg/L	4.3 mg/L	4.3 mg/L
Methylene Chloride	0.960 mg/L	0.960 mg/L	Removed
Fluoranthene	0.690 mg/L	0.690 mg/L	0.69 mg/L
Bis (2-ethylhexyl) Phthalate	1.03 mg/L	1.03 mg/L	1.03 mg/L

1.3 Scope of Work

The purpose of this local limit study is to evaluate the existing local limits, investigate the need for additional limits, and collect current data for evaluating any revision to the existing local limits. ECSD conducted the current evaluation according to guidelines established by the *USEPA Local Limit Development Guidance (2004)*. The study includes identification of pollutants of concern (POCs), flow and load analysis, maximum allowable headworks loading (MAHL) analysis, maximum allowable industrial loading (MAIL) analysis, and local limits development.

1.4 Wastewater Treatment Plant Description

ECSD operates a Class IV Wastewater Treatment Plant (WWTP) with an average daily design flow of 15 million gallons per day (MGD). The plant became operational in 1988. The plant consists of two bar screens, grit removal, an influent meter, two oxidization ditches, five clarifiers, six sand filters, post aeration, ultraviolet disinfection, and phosphorus removal by ferric sulfate. Dewatered sludge is transported and disposed of off-site as a special non-hazardous waste at the Newton County Landfill located in Morocco, Indiana, approximately 63 miles south of East Chicago. A flow diagram of the WWTP is included as Figure 1.1.

The ECSD POTW collection system is a combined sanitary and storm sewer system with three permitted Combined Sewer Overflow (CSO) locations. The WWTP is served by 72 miles of sewer, 92% of which are considered combined. ECSD serves approximately 5,780 residential, 90 public, 1,230 commercial and small, unpermitted industrial, and 26 permitted industrial accounts.

The WWTP discharges into the West Branch of the Grand Calumet River (WBGCR) under NPDES Permit No. IN0022829. The WBGCR flows into the Indiana Harbor Ship Canal (IHSC), into the Indiana Harbor, and eventually into the Indiana portion of the open waters of Lake Michigan. The WBGCR, IHSC, and Indiana Harbor are designated for full-body contact recreation. The Indiana portion of the open water of Lake Michigan is designated a salmonid water and an outstanding state resource water (OSRW).

1.5 Industrial Discharges

ECSD permits the industrial user discharges from 26 outfalls throughout the city. The discharges range from non-contact cooling water to process waters regulated for categorical pretreatment standards. ECSD permits eight significant industrial users (SIUs), five of which are classified as categorical industrial users (CIUs) in accordance with 40 CFR 403.5. Table 1.2 summarizes the current industrial permitted discharges to ECSD's POTW. The majority of the industrial user's discharges consist primarily of sanitary wastewater and non-contact cooling water.

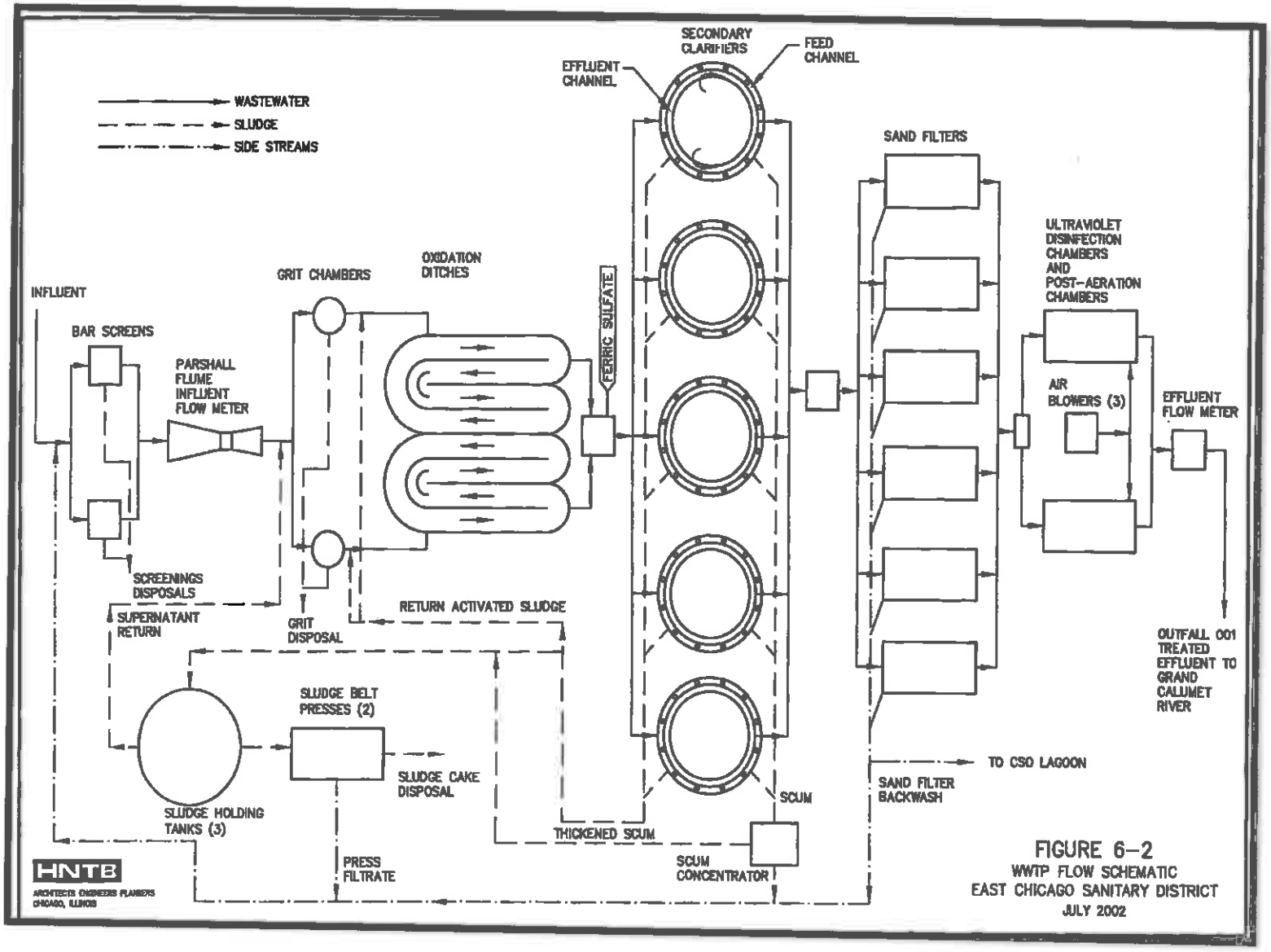


Figure 1.1 ECSD WWTP Flow Diagram

Table 1.2 Industrial Discharges

Company Name	Outfall No.	SIU	CIU	Nature of Discharge
ArcelorMittal IN Harbor East	804			Sanitary and non-contact cooling water from steel production operations.
ArcelorMittal IN Harbor East (Long Carbon)	805			Sanitary and non-contact cooling tower water from office buildings.
ArcelorMittal IN Harbor East (Research)	611			Sanitary and non-contact cooling water from steel production research laboratories.
ArcelorMittal IN Harbor West	931			Sanitary and non-contact cooling water from steel finishing facility.
ArcelorMittal IN Harbor West	934			Sanitary and non-contact cooling water from warehouse and contractor trailers.
ArcelorMittal IN Harbor West	935			Sanitary and non-contact cooling water from steel production operations
Buckeye Terminals	124			Groundwater and hydro testing wastewater from petroleum product storage and transportation operations.
Central States Marketing	421			Contact cooling water from straw manufacturing process.
Electric Coating Technologies	312	✓	✓	Pretreated rinse water from electroplating facility regulated under 40 CFR 433.17
GATX	112			Pretreated waters from groundwater remediation site.
Green Lake Tube, LLC	511			Sanitary and non-contact cooling water from production of steel tubes.
ICO Polymers	518			Contact cooling water from plastic pellet production.
Indiana Radiator	731			No discharge from industrial radiator repair and refurbishing shop.
Kemira Water Solutions	702			No discharge from water treatment chemical production.
National Processing	514	✓	✓	Rinse waters from steel pickling operations regulated under 40 CFR
Praxair, Inc. Hydrogen Plant	941			Sanitary and non-contact cooling water from gas production operations.
Praxair, Inc. Production	531			Sanitary and non-contact cooling water from gas production operations.
Praxair, Inc. Rare Gases	541			Sanitary and non-contact cooling water from gas production operations.
Safety-Kleen Oil Recovery	901	✓	✓	Pretreated wastewater from oil re-refinery regulated under 40 CFR
TAC East, Inc.	415	✓	✓	Pretreated wash waters from tank trucks regulated under 40 CFR 442.16.
Tradebe Treatment & Recycling	561			Non-contact cooling water and stormwater
United States Steel Corporation	936	✓		Boiler blowdown and sanitary.
Lakeshore Railcar Services	521	✓	✓	Pretreated wash waters from tank car and rail tank car cleaning operations regulated under 40 CFR 422.15 and 40 CFR 442.26
United States Gypsum Company	951	✓		Wash-out waters from latex loading bay, sanitary, and stormwater.
USS Lead Refinery	411			Groundwater from hydraulic gradient control for a closed disposal facility
W.R. Grace	401	✓		Process water from silicate and colloidal silica production

1.6 Study Methodology

As required by Part III (Requirement to Operate a Pretreatment Program), Paragraph 12 (POTW Pretreatment Program Revision Requirements), ECSD conducted a technical re-evaluation of its local limits consistent with the *USEPA Local Limits Development Guidance (July 2004)*. Chapter 7 of the *USEPA Local Limits Development Guidance (2004)* outlines two means of evaluating local limits, a review and a detailed re-evaluation. In a review, current headworks loadings are compared with the MAHLs and recent violations are examined. A detailed re-evaluation involves an in-depth look at all the data, criteria, and assumptions on which local limits are based to determine whether any changes affecting the local limits have occurred. ECSD determined a detailed re-evaluation was necessary given the minimal documentation of the assumptions on which many of the previous and existing local limits were based and the changes that have presumably occurred consistent with these assumptions.

An assessment of current conditions revealed that for 75% of the current limits there is no record of the associated MAHLs. It was also noted that 50% of the current limits were developed in 1985, prior to the construction of the current treatment plant in 1988. ECSD does have documentation of the MAHLs associated with the 2007 limits. Unfortunately, a review of the 2005 evaluation associated with these limits revealed the development of a number of these limits did not follow proper USEPA guidance. Given these issues, ECSD recalculated MAHLs for all the local limits and determined if MAHLs were necessary for any additional limits. In order to establish a new baseline, ECSD essentially followed the steps for local limit development as outlined below:

1) Determine the POCs
2) Collect and analyze data
3) Calculate MAHLs for each POC
4) Designate and implement the local limits

2. DETERMINATION OF POLLUTANTS OF CONCERN (POCs)

A POC is *any pollutant that might reasonably be expected to be discharged to the POTW in sufficient amounts to cause pass-through or interference, cause problems in its collection system, or jeopardize its workers*. ECSD began the study by compiling a list of POCs to be evaluated to determine the need for local limits to control them. When determining POCs, ECSD considered the following items.

1. USEPA has identified 15 pollutants it considers national POCs given they are often found in POTW sludge and effluent. All 15 national POCs were considered POCs for this study.

2. ECSD's currently controls industrial discharges of 20 pollutants through local limits. All the pollutants currently controlled by local limits were considered POCs for this study.

3. ECSD's NPDES permit contains effluent limitations and monitoring requirements. Each of the pollutants in the NPDES permit having specific limitations or designated as "report only" were considered POCs.

4. ECSD reviewed historical POTW sampling data from the following sources for possible pollutants of concern:

    a. Monthly Report of Operations – The results of sampling required by ECSD's NPDES permit must be reported to the Indiana Department of Environmental Management (IDEM) monthly. These Monthly Reports of Operations (MROs) were reviewed for any loading trends as well as any pollutants causing NPDES compliance issues.

    b. Annual Priority Pollutant Scan – ECSD is required per its NPDES permit to perform an annual sample the plant's influent, effluent, and sludge for priority pollutants found at 40 CFR 423 Appendix A. Any pollutants that were found consistently in these scans were included as POCs.

    c. Sludge Sampling – ECSD reviewed sludge sampling data, including Toxicity Characteristic Leaching Procedure (TCLP) and bi-weekly arsenic samples. ECSD currently landfills its sludge, but may be considering other options in the future, including land application. Pollutants regulated for land application under 40 CFR 503 were all considered POCs for this study.

5. ECSD reviewed the permits and historical sampling data of its industrial users

    a. Permits – The permit limits, including any applicable categorical limits were reviewed for possible POCs.

    b. Sampling Data – The pretreatment program conducts monthly compliance sampling of the majority of its permitted industrial users. The analytical data associated with the compliance sampling was reviewed for loading trends as well as any pollutants causing pretreatment compliance issues

A summary of the POCs and the items that were considered for their inclusion are contained in Table 2.1

Table 2.1 Summary of POCs

POC	15 National POC List	Current SUO Local Limit	2011 NPDES Permit	2016 NPDES Permit	Cause of Past NPDES Compliance Issues	Annual Organic Scan	503 Sludge Quality Standards	Industrial Discharge Sources
Ammonia	✓	✓	✓	✓				✓
Arsenic	✓	✓					✓	✓
Bis (2-ethylhexyl) phthalate		✓						
$CBOD_5$	✓		✓	✓				✓
Cadmium	✓	✓	Report Only	Report Only			✓	
Chloride			✓	Report Only	✓			
Chlorine (Residual)		✓						✓
Chloroform						✓		
Chromium (Total)	✓	✓	Report Only	Report Only				
Copper	✓	✓	Report Only	Report Only			✓	
Cyanide (Available)	✓	✓	✓	✓	✓			✓
Fluoranthene		✓						
Fluoride		✓	Report Only					
Iron (Dissolved)			Report Only					
Lead	✓	✓	Report Only	Report Only			✓	
Mercury	✓	✓	✓	✓			✓	
Molybdenum	✓	✓					✓	
Nickel	✓	✓		Report Only			✓	
Oil & Grease		✓	✓	✓				✓
Phenols (4-AAP)		✓	Report Only					✓
Phosphorous		✓	✓	✓				
Selenium	✓						✓	
Silver	✓	✓						
Sulfate			Report Only	Report Only				
Thallium		✓	Report Only					
TSS	✓		✓	✓				✓
Zinc	✓	✓	Report Only	Report Only			✓	

3. DATA COLLECTION AND ANALYSIS

3.1 Introduction

Data collection for the local limit evaluation included compilation and review of three full years of historical plant and industrial data from January 1, 2013 to December 31, 2016 and additional sampling conducted at the WWTP and in the collection system. The data necessary for the evaluation included WWTP, receiving stream, and industrial flow data. Also, necessary were pollutant concentration data from the WWTP, industries, and collection system.

3.2 Historical Data Collection

Historical WWTP Data

MROs from January 1, 2013 to December 31, 2016 were reviewed for historical flow and pollutant concentration data, including the influent and effluent concentrations of select POCs at the WWTP. A summary of the POC concentration data contained in the MROs is included as Attachment B.

Historical Industrial Data

Flow data from each industrial user is collected on a monthly basis for billing purposes. Compliance monitoring is performed on a monthly basis at 20 of the 26 industrial permitted outfalls. Quarterly sampling is performed at three of the remaining industrial users and the other three industrial users have no industrial discharges related to their operations and are not monitored. The flow data and compliance monitoring analytical data collected from January 1, 2013 to December 31, 2016 were evaluated for this study.

3.3 WWTP & Collection System Sampling

ECSD performed sampling for POCs that had not been historically sampled. ECSD conducted sampling at the WWTP and at sewers in the collection system during five sampling periods. The WWTP sampling consisted of composite sampling of the WWTP's influent and effluent. Collection system sampling consisted of composite sampling of three pump station locations, Marktown, Magoun Avenue and Roxanna. These lift stations were selected because each of them collect predominantly residential and commercial wastewaters as opposed to permitted industrial wastewater discharges. For all composite samples, time-proportional 24-hour composites were taken with a portable automatic sampler. Where required, grab samples were taken. A description of the sampling schedule and the resulting data is included as Attachment C.

4. DEALING WITH NON-DETECTS

4.1 Introduction

40 CFR 136 Appendix B describes the procedure for determining the method detection limit (MDL) for an analytical procedure. The MDL is the minimum concentration of a substance that can be measured and reported with 99% confidence the analyte concentration is greater than zero. For the samples that were collected and analyzed as part of the sampling plan described in Attachment C, any results below the MDL were reported as non-detects. In order to account for these non-detects in the averages of the sampling data, statistical methods were used. These statistical methods are described in detail in Attachment D.

Non-detects in the historical data were dealt with differently than non-detects measured in the data gathered from sampling performed for the evaluation. Historical WWTP results were reported down to the reporting limit (RL). The RL is a laboratory specific number that generally has safety factors that account for variability in instrument sensitivity. It is the lowest concentration at which an analyte can be detected in a sample and be reported by the lab with a reasonable degree of accuracy and precision. The MROs which were reviewed for historical WWTP influent and effluent concentrations did not distinguish between results measured at the RL and results measured below the RL. A measured concentration of <4.0 mg/L of chloride and a measured concentration of 4.0 mg/L are both reported as 4.0 mg/L. Because data measured at the RL could not be distinguished from data measured below the RL, statistical methods were not applied to historical data below the reporting limit. Non-detects found in reviews of historical industrial data were reported as zeros and detection limits were not reported. Because ECSD did not know the detection limits for some of the historical industrial data that was reviewed, no statistical analysis was applied to this data.

5. REMOVAL EFFICIENCY

Removal efficiency is the percentage of the influent pollutant loading that is removed from the waste stream across the entire wastewater treatment process or a specific treatment unit within the POTW. The USEPA local limit guidance offers three methods for removal efficiency calculation. The mean removal efficiency (MRE) method was used to calculate the plant removal efficiency for pollutants that are measured and reported consistently by ECSD. Equation 5.1 gives the formula used in the MRE method for calculating removal efficiency.

$$R_{POTW} = \frac{\bar{I} - \bar{E}}{\bar{I}} \tag{5.1}$$

R_{POTW} = Plant removal efficiency from headworks to plant effluent, as decimal

I = POTW influent concentration at headworks, mg/L

E = POTW effluent pollutant concentration, mg/L

The removal efficiencies calculated for each pollutant are presented in Table 5.1. Only influent and effluent pollutant concentrations were evaluated, so these removal efficiencies reflect the efficiency of the entire wastewater treatment and not any individual processes. Per USEPA guidance, the negative removal efficiency for fluoride was retained because there was no technical justification available for its removal.

Table 5.1 POTW Removal Efficiencies

POC	Removal Efficiency
Ammonia	97%
Arsenic	61%
Bis (2-ethylhexyl) phthalate	41%
Cadmium	12%
$CBOD_5$	94%
Chloride	3.4%
Chlorine (Residual)	85%
Chloroform	82%
Chromium	87%
Copper	88%
Cyanide (Amenable)	21%
Fluoranthene	28%
Fluoride	-10%
Iron (Dissolved)	77%
Lead	94%
Mercury	89%
Molybdenum	8.9%
Nickel	21%
Oil & Grease	69%
Phenols (4-AAP)	37%
Phosphorous	87%
Selenium	52%
Silver	92%
Sulfate	4.8%
Thallium	0%
TSS	97%
Zinc	81%

6. ALLOWABLE HEADWORKS LOADING (AHL) CALCULATIONS

6.1 Introduction

Allowable headworks loadings (AHLs) estimate the maximum headworks loading for each POC that would not cause a violation of a specific environmental criterion. ECSD calculated AHLs based on a number of environmental criteria including NPDES permit limits, state and federal water quality standards and criteria, federal sludge standards for land application, literature inhibition values, and plant design values.

All AHLs were calculated using the USEPA Region V *Local Limits Spreadsheet*. The Region V *Local Limits Spreadsheet* is included as Attachment E.

6.2 NPDES Permit Limit Based AHLs

AHLs based on NPDES permit limits estimated the maximum headworks loading of certain pollutants that would not cause a violation of the WWTP's NPDES daily maximum limits or NPDES monthly average permit limits. Equation 6.1 shows how NPDES permit limits are used to calculate AHLs.

$$AHL_{npdes} = \frac{(8.34)(C_{npdes})(Q_{potw})}{(1-R_{potw})} \qquad (6.1)$$

AHL_{npdes}	=	AHL based on NPDES permit limit, lbs/day
C_{npdes}	=	NPDES permit limit, mg/L
Q_{potw}	=	POTW average flow rate, MGD
R_{potw}	=	Plant removal efficiency from headworks to plant effluent, as a decimal
8.34	=	Conversion Factor

NPDES Daily Maximum Permit Limits

ECSD's NPDES permit includes effluent limits that limit the discharge of certain pollutants during a 24-hour period. AHLs based on NPDES daily maximum effluent limits are presented in Table 1 of the *Local Limits Spreadsheet.*

NPDES Monthly Average Permit Limits

ECSD's NDPES permit also includes limits for certain pollutants based upon the arithmetic average of samples taken for the pollutant over a calendar month. AHLs based on NPDES monthly average effluent limits are presented in Table 2 of the *Local Limits Spreadsheet.*

Water Quality Based Effluent Limitations (WQBELs)

Many of the 27 POCs are not controlled by NPDES permit limits. Per USEPA guidance, water quality standards and criteria were converted into NPDES permit limits and these calculated NPDES limits were used to develop AHLs where possible. A summary of WQBELs calculated by IDEM are included in Attachment F of this document.

6.3 Inhibition Based AHLs

USEPA guidance recommends that AHLs be based on pollutant levels that cause disruption of the POTW's biological processes. Calculations based on literature inhibition values for activated sludge and nitrification are included in Table 3 and Table 4 of the *Local Limits Spreadsheet*. Though Table 3 and Table 4 were completed, given the lack of specificity of the published inhibition values and that there have been no known past inhibition problems experienced at the POTW, inhibition based AHLs were not considered when determining MAHLs. The calculation of AHLs based on inhibition values is illustrated in Equation 6.2.

$$AHL_{sec} = \frac{(8.34)(C_{Inhib2})(Q_{potw})}{(1-R_{prim})} \qquad (6.2)$$

AHL_{sec}	=	AHL based on secondary treatment inhibition, lbs/day
C_{inhib2}	=	Inhibition criterion for secondary treatment, mg/L
Q_{potw}	=	POTW average flow rate, MGD
R_{prim}	=	Plant removal efficiency from headworks to primary treatment effluent, as a decimal
8.34	=	Conversion Factor

6.4 Sludge Quality Based AHLs

ECSD currently disposes of is sludge as non-hazardous solid waste by off-site landfilling at a licensed facility. The regulatory standards that apply to landfilled sludge are found at 40 CFR 261.24. ECSD performs TCLP tests annually on its sludge to proper characterize the material for waste disposal and demonstrate compliance with these standards. The waste sludge characterization test results do not exceed the TCLP limits for identifying a characteristic hazardous waste per Resource Conservation and Recovery Act (RCRA) requirements. Based upon these findings, ECSD is not required to develop AHLs based on TCLP levels.

AHLs were calculated based on federal sludge use or disposal regulations found at 40 CFR 503 for review in the future, but were not included in the MAHL determination. The AHL equation for sludge standards differs if the sludge flow is reported in dry metric tons or MGD. Table 5 of the Local Limit Spreadsheet calculates sludge quality based AHLs using sludge flows reported as MGD. ECSD reports its sludge flow in dry standard tons. Table 5 and 6 of the *Local Limits Spreadsheet* were modified to perform the calculations illustrated by Equation 6.3. Although Tables 5 and 6 were completed, because ECSD does not plan to change its disposal method of landfill for sludge, these sludge-based AHLs were not considered when determining the MAHLs.

$$AHL_{sldg} = \frac{(8.34)(C_{sldgd})(\frac{PS}{100})(Q_{sldg})(G_{sldg})}{R_{potw}}$$

(6.3)

AHL_{sldg}	=	AHL based on sludge, lbs/day
C_{sldgd}	=	Sludge standard, mg/kg dry sludge
PS	=	Percent solids of sludge to disposal
Q_{sldg}	=	Total sludge flow rate to disposal, MGD
G_{sldg}	=	Specific gravity of sludge, kg/L
R_{potw}	=	Plant removal efficiency from headworks to plant effluent, as a decimal
8.34	=	Conversion Factor

Clean Sludge

Table 4 of 40 CFR 503.13 establishes "clean" sludge standards for land application. The AHLs for these "clean" sludge standards are presented in Table 5 of the *Local Limit Spreadsheet.*

Ceiling Sludge

Table 1 of 40 CFR 503.13 establishes the maximum concentration of pollutants in sludge that can be land applied. The AHLs for these ceiling concentrations are presented in Table 6 of the *Local Limit Spreadsheet.*

6.5 Water Quality Based AHLs

Chronic and acute water quality criteria for certain POCs have been determined using information published in 327 Indiana Administrative Code (IAC) 2-1-6, a WLA conducted by IDEM in 2011, and USEPA's National Recommended Water Quality Criteria. In instances where there were multiple criteria for a POC were published, the most stringent criterion was applied. Equation 6.4 shows the calculation for water quality based AHLs. AHLs based on Chronic Water Quality Standards and Acute Water Quality Standards are attached in Table 7 and Table 8y, respectively, of the *Local Limits Spreadsheet*.

$$AHL_{wq} = \frac{8.34[C_{wq}(Q_{str}+Q_{potw})-(C_{str}*Q_{str})]}{1-R_{potw}} \quad (6.4)$$

AHL_{wq} = AHL based on water quality criteria, lbs/day

C_{str} = Receiving stream background concentration, mg/L

C_{wq} = State WQS or USEPA WQC, mg/L

Q_{str} = Receiving stream (upstream) flow rate, MGD

Q_{potw} = POTW average flow rate, MGD

R_{potw} = Plant removal efficiency from headworks to plant effluent (as decimal)

8.34 = Conversion factor

Flow of Receiving Stream

As there is no upstream of flow at its discharge into the WBGCR, a 7Q10 of 0.0 cfs was reported for the Grand Calumet River in a Wasteload Allocation Report completed by IDEM in 2016.

6.6 Plant Design Based AHLs

For conventional pollutants (ammonia, $CBOD_5$, and TSS), the WWTP design load was evaluated as a limit. These design loads represent the average load that can be treated by the WWTP at the design flow of 15 MGD. The NPDES permit limit equation was adapted for this calculation by replacing the permit limit load with the WWTP design load. Equation 6.5 shows the formula for this calculation. AHLs based on the WWTP design loads are attached in Table 9 of the *Local Limits Spreadsheet.*

$$AHL_{design} = \frac{(8.34)(C_{design})(Q_{potw})}{(1-R_{potw})} \tag{6.5}$$

AHL_{design}	=	AHL based on POTW design loads, lb/day
C_{design}	=	POTW design load, mg/L
Q_{potw}	=	POTW average flow rate, MGD
R_{potw}	=	Plant removal efficiency from headworks to plant effluent, as a decimal
8.34	=	Conversion Factor

7. MAXIMUM ALLLOWABLE HEADWORKS LOADING (MAHL) EVALUATION

7.1 Introduction

The maximum allowable headworks loading (MAHL) estimates the maximum loading of each POC that the POTW can receive. It is equal to the most stringent calculated AHLs. A summary of the MAHLs, including the most stringent standard, is provided in Table 7.1.

Table 7.1 Summary of MAHLs

POC	Most Stringent Standard	MAHL (lbs/day)
Ammonia	NPDES Monthly	4,255
Arsenic	NPDES Monthly (WQBEL)	36
Bis (2-ethylhexyl) phthalate	NPDES Monthly (WQBEL)	1.6
Cadmium	NPDES Monthly (WQBEL)	0.79
$CBOD_5$	Plant Design	201,144
Chloride	NPDES Monthly (WQBEL)	40,847
Chlorine (Residual)	NPDES Monthly (WQBEL)	45
Chloroform	NPDES Monthly (WQBEL)	88
Chromium	NPDES Monthly (WQBEL)	202
Copper	NPDES Monthly (WQBEL)	24
Cyanide (Amenable)	NPDES Monthly (WQBEL)	0.63
Fluoranthene	NPDES Monthly (WQBEL)	0.46
Fluoride	NPDES Monthly (WQBEL)	876
Iron (Dissolved)	Chronic WQS	498
Lead	NPDES Monthly (WQBEL)	62
Mercury	NPDES Monthly	0.0014
Molybdenum	NPDES Monthly (WQBEL)	76
Nickel	NPDES Monthly (WQBEL)	23
Oil & Grease	NPDES Daily	3,721
Phenols (4-AAP)	NPDES Monthly (WQBEL)	27
Phosphorous	NPDES Monthly	928
Selenium	NPDES Monthly (WQBEL)	1.0
Silver	NPDES Monthly (WQBEL)	7.6
Sulfate	NPDES Monthly (WQBEL)	121,961
Thallium	NPDES Monthly (WQBEL)	0.58
TSS	Plant Design	426,710
Zinc	NPDES Monthly	119

7.2 Comparison of Current Headworks Loadings to MAHLs

MAHLs are important in determining whether a local limit for a pollutant needs to be re-evaluated or created. The USEPA guidance recommends that MAHLs be compared to current headworks loadings for each parameter to determine if the POTW is at risk for exceeding the MAHLs. Current headworks loadings were taken as a percentage of MAHLs. USEPA guidance recommends that if a local limit does not currently exist, one should be implemented if the current headworks loading is above 60% of the MAHL. Only the current headwork loadings of available cyanide and mercury surpass the 60% threshold.

Available cyanide has passed through treatment at the WWTP in the past and there are consistent exceedances of the local limit from several industrial dischargers. ECSD believes the current loading of mercury is so much greater than the MAHL for two reasons. First, the existing water quality standard for mercury for the Great Lakes is very stringent. ECSD must comply with a 1.3 nanograms per liter (ng/L) monthly average for mercury in its effluent. Second, when ECSD changed its contracted lab in early 2015, a slight trend of increasing mercury concentrations was observed. This matter is still being investigated.

For the POCs that do not exceed the 60% threshold and are currently controlled by a local limit, ECSD considered whether this limit could be removed or raised. ECSD was careful to consider whether the enforcement of the existing limit was the reason for a low headworks loading. Section 9.3 includes further discussion of these considerations.

Table 7.2 Comparison of Current Headworks Loadings to MAHLs

POC	Current Headworks Loading (lbs/day)	MAHL (lbs/day)	Percent
Ammonia	588	4,255	14%
Arsenic	0.95	36	3%
Bis (2-ethylhexyl) phthalate	0.63	1.6	41%
Cadmium	0.020	0.79	3%
$CBOD_5$	4,890	239,238	2.0%
Chloride	22,110	40,847	54%
Chlorine (Residual)	17	45	38%
Chloroform	1.3	88	2%
Chromium	0.39	202	0.2%
Copper	2.1	24	9%
Cyanide (Available)	0.47	0.63	74%
Fluoranthene	0.0048	0.46	1%
Fluoride	68	876	8%
Iron (Dissolved)	20	497	4%
Lead	0.71	62	1%
Mercury	0.0016	0.0014	115%
Molybdenum	1.0	76	1%
Nickel	0.80	23	3%
Oil & Grease	125	3,721	3%
Phenols (4-AAP)	0.92	27	3%
Phosphorous	189	928	20%
Selenium	0.14	1.0	14%
Silver	0.015	7.6	0.2%
Sulfate	15,611	121,961	13%
Thallium	0.048	0.58	8%
TSS	18,601	426,709	4%
Zinc	8.8	119	7%

*Shading indicates current headwork loading exceeds 60% threshold

8. MAXIMUM ALLOWABLE INDUSTRIAL LOADING (MAIL) CALCULATIONS

In order to calculate local limits, POTW limits are used to calculate the maximum loading from controlled sources that can be treated at the POTW. This loading is called the allowable industrial loading (AIL). The most stringent AIL, which corresponds to the MAHL, is the maximum allowable industrial loading (MAIL). The formula used to calculate the MAILs is shown in equation 8.1.

$$MAIL = MAHL(1 - SF) - (L_{unc} + HW + GA) \quad (8.1)$$

MAIL = Maximum allowable industrial loading, lbs/day

MAHL= Maximum allowable headworks loading, lbs/day

SF = Safety factor

L_{unc} = Loading from uncontrolled sources, lbs/day

HW = Hauled waste (ECSD does not accept hauled waste so this value was considered to be zero)

GA = Growth allowance (ECSD does not believe that substantial growth will be happening in the future)

An AIL was calculated for each AHL using the *Local Limit Worksheet.* Table 8.1 contains a summary of the MAILs for each POC, including the conventional pollutants $CBOD_5$ and TSS.

8.1 Safety-Factor Determination

USEPA guidance recommends a safety factor between 10 and 20 percent be applied in MAIL calculations. For parameters where 50% or more of any data set used in the calculations were non-detects a safety factor of 20% was applied. For parameters where less than 50% of the data set used in the calculation of the MAIL were reported as non-detect, a safety factor of 15% was applied.

Table 8.1 Summary of Calculated MAILs

POC	Most Stringent Standard	MAIL (lbs./day)	Local Limit
Ammonia	NPDES Monthly	3,084	134
Arsenic	NPDES Monthly (WQBEL)	30	1.31
Bis (2-ethylhexyl) phthalate	NPDES Monthly (WQBEL)	0.91	0.03973
Cadmium	NPDES Monthly (WQBEL)	0.63	0.027
$CBOD_5$	Plant Design	201,144	8,738
Chloride	NPDES Monthly (WQBEL)	25,532	1109
Chlorine (Residual)	NPDES Monthly (WQBEL)	33	1.433
Chloroform	NPDES Monthly (WQBEL)	75	3.3
Chromium	NPDES Monthly (WQBEL)	161	7.0
Copper	NPDES Monthly (WQBEL)	20	0.88
Cyanide (Available)	NPDES Monthly (WQBEL)	0.43	0.019
Fluoranthene	NPDES Monthly (WQBEL)	0.37	0.016
Fluoride	NPDES Monthly (WQBEL)	680	30
Iron (Dissolved)	Chronic WQS	309	13.4
Lead	NPDES Monthly (WQBEL)	52	2.28
Mercury	NPDES Monthly	0.00081	0.000035
Molybdenum	NPDES Monthly (WQBEL)	64	2.8
Nickel	NPDES Monthly (WQBEL)	18	0.80
Oil & Grease	NPDES Daily	2,701	117
Phenols (4-AAP)	NPDES Monthly (WQBEL)	22	0.96
Phosphorous	NPDES Monthly	725	31
Selenium	NPDES Monthly (WQBEL)	0.71	0.031
Silver	NPDES Monthly (WQBEL)	6.1	0.2650
Sulfate	NPDES Monthly (WQBEL)	89,560	3891
Thallium	NPDES Monthly (WQBEL)	0.36	0.016
TSS	Plant Design	360,353	15,655
Zinc	NPDES Monthly	98	4

9. CALCULATION AND EVALUATION OF LOCAL LIMITS

9.1 Introduction

Local limits were developed by allocating the MAILs across all industrial users. These limits were calculated for all POCs using the *Local Limit Spreadsheet*. Additionally, monitoring requirements were assessed for POCs for which no local limit was recommended. The changes to the local limits and monitoring requirements were evaluated taking many factors into consideration including:

- Comparison of current headworks loadings to MAHLs
- Known industrial discharges of each POC, especially when an industrial process is the source of a POC
- Ability for industrial users to comply with the current local limit
- The character of the City's potable water
- Historical problems treating the POC at the WWTP
- Recent changes to the WWTP's NPDES permit in the 2016 cycle

9.2 Uniform Concentration Limit Calculation

The MAILs have to be allocated across the industrial users of the POTW. USEPA guidance states that limitations can be allocated in a number of ways. ECSD has elected to allocate limitations uniformly across each of its industrial users, meaning the effluent limitation for a given parameter is the same across all the industrial users. This is calculated by dividing the MAIL by the total flow rate of all controlled sources. Equation 9.1 shows the formula for the uniform concentration limit.

$$LL = \frac{MAIL}{(Q_{ind})(8.34)} \tag{9.1}$$

LL	=	Local limit, mg/L
$MAIL$	=	Maximum allowable industrial loading, lb/day
Q_{ind}	=	Total flow rate from controlled sources, MGD
8.34	=	Unit Conversion

9.3 Proposed Local Limits

Table 9.1 Summary of Proposed Local Limits

POC	Current Limit (mg/L)	Proposed Limit (mg/L)
Ammonia	77	134
Arsenic	0.5	1.31
Bis (2-ethylhexyl) phthalate	1.03	1.03
Cadmium	0.14	Removed
$CBOD_5$	-	-
Chloride	-	-
Chlorine (Residual)	0.4	Removed
Chloroform	-	-
Chromium	0.282	7.0
Copper	0.17	0.88
Cyanide (Available)	0.003	0.019
Fluoranthene	0.69	Removed
Fluoride	2.9	30
Iron (Dissolved)	-	-
Lead	0.224	2.28
Mercury	0.0002	0.0002
Molybdenum	0.2	2.8
Nickel	0.39	0.80
Oil & Grease	50	117
Phenols (4-AAP)	0.7	0.96
Phosphorous	5.5	31
Selenium	-	-
Silver	0.05	Removed
Sulfate	-	-
Thallium	4.3	Removed
TSS	-	-
Zinc	5.5	5.5

1. **Ammonia** – ECSD proposes the current limit for ammonia of 77 mg/L be raised to a limit of 134 mg/L limit. The 134 mg/L limit is based on the NPDES monthly average limit for ammonia. The 77 mg/L limit was adopted in 1985 and the environmental criterion on which it was based is unknown. The current headworks loading for ammonia is 14% of the MAHL. ECSD believes an increase in the limit would still be protective of the plant.

2. **Arsenic** – ECSD proposes the current limit for arsenic of 0.5 mg/L be raised to a limit of 1.31 mg/L. The 1.31 mg/L limit is based on a calculated monthly average WQBEL for arsenic. The current limit for arsenic was adopted in 2007, and was based on nitrification inhibition literature values. ECSD is unaware of any inhibition caused by arsenic loading and believes the literature value on which the current limit was based to be too conservative and not specific enough to be applied. The current headworks loading for arsenic is 3% of the MAHL. ECSD believes an increase in the limit would still be protective of the plant.

3. **Bis (2-ethylhexyl) phthalate** – ECSD proposes the current limit of 1.03 mg/L for bis (2-ethylhexyl) phthalate remain unchanged. A more stringent limit of 0.04 mg/L was calculated, based on a calculated monthly average WQBEL. ECSD believes the current limit is appropriately protective of the POTW, as the current headworks loading for bis (2-ethylhexyl) phthalate is 41% of the MAHL.

4. **Cadmium** – ECSD proposes the local limit of 0.140 mg/L for cadmium be removed. The 0.140 limit was adopted in 1985 and it is unknown on which environmental criterion it was based. There are no known industrial discharges of cadmium. Electric Coatings Technology, an electroplating facility is required to comply with categorical limits at 40 CFR 433.17 for cadmium. A more stringent limit of 0.027 mg/L applies to their process discharge. ECSD does not believe the removal of the cadmium local limit will lead to an increase in headworks loading.

5. **$CBOD_5$** – ECSD proposes no local limit for $CBOD_5$ be developed but that COD continue to be surcharged. ECSD believes the current surcharge is sufficient at controlling carbonaceous materials.

6. **Chloride** – ECSD proposes no local limit for chloride be applied. Though not controlled by a local limit, chloride is a known industrial pollutant in East Chicago and is currently monitored at industrial outfalls. Since the current headworks loading is 54% of the MAHL, nearing the 60% threshold at which EPA recommends a limit be developed, ECSD recommends the continued monitoring of chloride.

Chlorine (Residual) – ECSD proposes the limit for residual chlorine be removed. The 2005 evaluation in which the chlorine local limit was initially established does not document the environmental criterion on which it was based. Total residual chlorine concentrations in drinking water provided by the City of East Chicago range anywhere from 0.5 mg/L to 2 mg/L. Both the current local limit (0.4 mg/L) and the limit calculated in this evaluation (1.4 mg/L) are below the maximum disinfectant residual observed in the drinking water. There are no known dischargers of chlorine. Safety-Kleen does chlorinate in their wastewater treatment process, but dechlorinates before discharge. Given these factors, ECSD believes removing the limit will not increase the headworks loading for chlorine.

7. **Chloroform** – ECSD proposes no local limit for chloroform be applied. The current headworks loading is only 2% of the MAHL, less than the 60% threshold at which EPA recommends a limit be developed.

8. **Chromium** – ECSD proposes the current limit for chromium of 0.282 mg/L be raised to a limit of 7.0 mg/L based on the calculated monthly average WQBEL for chromium. The current limit for chromium was adopted in 1993 and it is unknown on what environmental criterion it was based. The current headworks loading for chromium is less than 1% of the MAHL. ECSD believes an increase in the limit would still be protective of the plant.

9. **Copper** – ECSD proposes the current limit for copper of 0.170 mg/L be raised to a limit of 0.88 mg/L. The 0.88 mg/L limit is based on a calculated monthly average WQBEL. The current limit for copper was adopted in 1985 and it is unknown on what environmental criterion it was based. Any copper discharges that ECSD is currently aware of are the result of leaching of copper piping. ECSD does not believe increasing the copper limit will lead to an increase in copper headworks loading, which is currently 9% of the MAHL. The proposed local limit is still below the National Primary Drinking Water Standard Maximum Contaminant Level Goal (MCLG) of 1.3 mg/L and below the National Secondary Drinking Water standard of 1.0 mg/L applicable to public drinking water supplies.

10. **Cyanide (Available)** – ECSD proposes the current limit for cyanide of 0.003 mg/L be raised to 0.019 mg/L. The 0.019 mg/L was calculated based on the ECSD monthly average NDPES limit for cyanide. The current local limit for cyanide was adopted in 2007 and was incorrectly based on a WQS for cyanide, although a NPDES permit limit existed. The use of the WQS instead of the NPDES permit limit was not in accordance with USEPA guidelines. USEPA guidance states that WQS should be used only when NPDES limits do not exist for a given POC. Additionally, ECSD has submitted a Site-Specific Criteria Cyanide (Free) Modification Request for the West Branch of the Grand Calumet River. When approved, this will result in a higher acceptable daily and monthly NPDES permitted discharge limits for

available cyanided and would allow for further adjustment to the local limit based upon a greater NPDES value.

11. **Fluoranthene** – ECSD proposes the current limit of 0.69 mg/L for fluoranthene be removed. The current limit was adopted in 1985 and it is unknown the environmental criterion on which it was based. The current headworks loading for fluoranthene is 1% of the MAHL Both Lakeshore Railcar and Safety-Kleen are required to comply with categorical fluoranthene discharge limits. There are no other known discharges of fluoranthene prior to or after treatment. ECSD believes enforcement of the categorical limits will be sufficient in protecting the POTW.

12. **Fluoride** – ECSD proposes the current limit of 2.9 mg/L for fluoride be raised to a limit of 30 mg/L. The 30 mg/L limit is based on a calculated monthly average WQBEL. The 2.9 mg/L was adopted in 1993 and the environmental criteria on which it was based is unknown. The only discharges of fluoride known to ECSD are a result of fluoride's presence in East Chicago drinking water and groundwater. ECSD believes the 30 mg/L limit will still be protective of the POTW.

13. **Iron (Dissolved)** – ECSD proposes no limit for dissolved iron be applied. The current headworks loading for iron is 4% of the MAHL, less than the 60% threshold at which EPA recommends a limit be developed.

14. **Lead** – ECSD proposes the current limit for lead of 0.224 mg/L be raised to 2.28 mg/L. The 2.28 mg/L limit is based on a calculated monthly average WQBEL. The current limit for lead was adopted in 1993, and it is unknown on which environmental criterion it was based. The current headworks loading for lead is 1% of the MAHL. ECSD believes raising the limit for lead will still be protective of the POTW.

15. **Mercury** – ECSD proposes the current limit for mercury of 0.0002 mg/L be retained. The current limit was adopted in 2007 and was based on a WQS for mercury. A more stringent limit of 0.000035 was calculated based on the monthly average NDPES limit. Although, the current headworks loading for mercury is 115% of the MAHL, ECSD believes the current limit is protective of the POTW. The POTW has been consistently in compliance with its mercury NPDES limit; enough so that the streamlined mercury variance (SMV) was removed in its most recent NPDES permit renewal.

16. **Molybdenum** – ECSD proposes the current limit for molybdenum of 0.2 mg/L be raised to 2.5 mg/L. The 2.5 mg/L limit is based on a calculated monthly average WQBEL. The current molybdenum limit was adopted in 2007 and was based on "clean sludge" limits for

molybdenum found at 40 CFR 503. Because ECSD does not plan to land apply its sludge at this time, ECSD believes the monthly average WQBEL limit can be increased and still be protective of the POTW.

17. **Nickel** – ECSD proposes the current limit for nickel of 0.39 mg/L be increased to 0.80 mg/L. The 0.80 mg/L limit was calculated using a monthly average WQBEL. The existing nickel local limit was adopted in 1985, and it is unknown on what environmental criterion it was based. The current headworks loading for nickel is 3% of the MAHL. ECSD believes raising the limit for nickel will still be protective of the POTW.

18. **Oil and Grease** – ECSD proposes the current limit for oil & grease of 50 mg/L be increased to 117 mg/L based on the calculations using the daily maximum NDPES permit limit for oil & grease. The current limit was adopted in 1985 and it is unknown the environmental criterion, on which it was based. The current headworks loading for oil & grease is 3% of the MAHL. ECSD believes an increase in the limit will still be protective of the POTW.

19. **Phenols (4-AAP)** – ECSD proposes the current limit for phenols of 0.7 mg/L be raised to 0.96 mg/L. The limit of 0.96 mg/L was calculated based on a calculated monthly average WQBEL. The current headworks loading for phenols is 3% of the MAHL. ECSD believes raising the limit for phenols will still be protective of the POTW.

20. **Phosphorus** – ECSD proposes the current limit for phosphorus of 5.5 mg/L be raised to 30 mg/L. The proposed 30 mg/L limit was calculated using the monthly average NPDES limit for phosphorus. The existing 5.5 mg/L local limit was adopted in 1985 and it is unknown on which environmental criterion it was based. The current headworks loading for phosphorus is 20% of the MAHL. ECSD believes raising the phosphorus will still be protective of the POTW.

21. **Selenium** – ECSD proposes no local limit for selenium be applied. Selenium was included in the evaluation because it is one of the 15 National POCs. The current headworks loading for selenium is 14% of the MAHL, less than the 60% threshold at which EPA recommends a limit be developed.

22. **Silver** – ECSD proposes the 0.05 mg/L limit for silver be removed. The current silver limit was adopted in 1985, and it is unknown on what environmental criterion it was based. Electric Coatings Technology is required to comply with categorical limits for silver. Outside of this discharge there are no known discharges of silver prior to or after treatment. The current headworks loading for silver is less than 1% of the MAHL. ECSD does not believe the removal of the silver limit will lead to an increase in the headworks loading for silver.

23. **Sulfate** – ECSD proposes no local limit for sulfate be applied. Sulfate was considered a POC for this evaluation because it is currently controlled in the ECSD's NDPES permit. The current headworks loading for sulfate is 13% of the MAHL, below the 60% threshold at which EPA recommends a limit be developed. Though not controlled by a local limit, sulfate is still monitored at industrial outfalls because it is a known pollutant in some of the discharges. Sulfate will continue to be monitored in industrial discharges.

24. **Thallium** – ECSD proposes the thallium limit of 4.3 mg/L be removed. It is unknown what environmental criterion the existing local limit was based on in 1985 and there are known discharges thallium to the POTW. ECSD does not believe removing the limit will increase headworks loading of thallium.

25. **TSS** – ECSD proposes no local limit for TSS be developed but that TSS continue to be surcharged. ECSD believes the current surcharge is sufficient at controlling solids discharges to the POTW.

26. **Zinc** – ECSD proposes the current limit for zinc of 5.5 mg/L be raised to 8.8 mg/L. The 8.8 mg/L was calculated based on a monthly average NPDES permit limit. The current headworks loading for zinc is 7% of the MAHL. ECSD believes raising the zinc local limit will still be protective of the POTW.

10. REFERENCES

City of Brawley Local Limit Study (2013)

City of East Chicago Ordinance No. 06-0007 (2007)

CWA Authority, Inc. Indianapolis Pretreatment Program Local Limits Evaluation (2012)

ECSD Annual POTW Organic Scans (2013-2015)

ECSD Discharge Monitoring Reports (2013-2015)

ECSD Industrial Permits

ECSD Industrial User Monitoring Reports (2014-2016)

ECSD Monthly Report of Operations (2013-2015)

ECSD NPDES Permit (2011)

ECSD NPDES Permit (2016)

Greeley and Hansen Local Limit Study for ECSD (2005)

USEPA Data Quality Assessment Statistical Methods for Practitioners (2006)

USEPA Local Limit Development Guidance (2004)

USEPA Statistical Analysis of Groundwater Monitoring Data at RCFR Facilities (2009)

Wasteload Allocation Report (2011)

ATTACHMENT A

NPDES Permit

Indiana Department of Environmental Management
We Protect Hoosiers and Our Environment.
100 N. Senate Avenue • Indianapolis, IN 46204
(800) 451-6027 • (317) 232-8603 • www.idem.IN.gov

Michael R. Pence
Governor

Carol S. Comer
Commissioner

VIA ELECTRONIC MAIL June 17, 2016

The Honorable Anthony Copeland, Mayor
City of East Chicago
5201 Indianapolis Blvd
East Chicago, Indiana 46312

Dear Mayor Copeland:

Re: Final NPDES Permit No. IN0022829
East Chicago Sanitary District
Wastewater Treatment Plant
Lake County

Your application for a National Pollutant Discharge Elimination System (NPDES) permit has been processed in accordance with Sections 402 and 405 of the Federal Water Pollution Control Act as amended, (33 U.S.C. 1251, et seq.), and IDEM's permitting authority under IC 13-15. The enclosed NPDES permit covers your discharges to the West Branch Grand Calumet River. All discharges from this facility shall be consistent with the terms and conditions of this permit.

One condition of your permit requires monthly reporting of several effluent parameters. Reporting is to be done on the applicable state Monthly Report of Operation (MRO) form. This form is available on the internet at the following web site:

http://in.gov/idem/cleanwater/2339.htm

Once you are on this page, select the "IDEM Forms" page and locate the version of the MRO applicable to your plant under the "Wastewater Facilities" heading. We recommend selecting the "XLS" version as it will complete all of the calculations on the data entered.

Additionally, if you are not already using NetDMR, you will soon be receiving an email with a supply of the federal NPDES DMR form attached. Both the state and federal forms need to be completed and submitted. If you do not receive the DMR forms in a timely manner, please call this office at 317/232-8670. Please note that IDEM will no longer accept paper DMR or MRO forms after December 31, 2016. After that date all NPDES permit holders will be required to submit their monitoring data to IDEM using NetDMR.

Another condition which needs to be clearly understood concerns violation of the effluent limitations in the permit. Exceeding the limitations constitutes a violation of the permit and may bring criminal or civil penalties upon the permittee. (See Part II.A.1 and II.A.11 of this permit). It is very important that your office and treatment operator understand this part of the permit.

Please note that this permit issuance can be appealed. An appeal must be filed under procedures outlined in IC 13-15-6, IC 4-21.5, and the enclosed public notice. The appeal must be initiated by you within 18 days from the date this letter is postmarked, by filing a request for an adjudicatory hearing with the Office of Environmental Adjudication (OEA), at the following address:

Office of Environmental Adjudication
Indiana Government Center North
100 North Senate Avenue, Room 501
Indianapolis, IN 46204 or contact: 317/232-8591

Please send a copy of any such appeal to me at IDEM, Office of Water Quality-Mail Code 65-42, 100 North Senate Avenue, Indianapolis, Indiana 46204-2251.

Please reference the "Post Public Notice Addendum," on the final pages of the Fact Sheet, for this Office's response to comments submitted during the public notice period.

The permit should be read and studied. It requires certain action at specific times by you, the discharger, or your authorized representative. One copy of this permit is also being sent to your operator to be kept at the treatment facility. You may wish to call this permit to the attention of your consulting engineer and/or attorney.

If you have any questions concerning your NPDES permit, please contact Jason House at 317/233-0470, jahouse@idem.in.gov .

Sincerely,

Paul Higginbotham
Deputy Assistant Commissioner
Office of Water Quality

Enclosures
cc: Nelson Cardona, Certified Operator
Scott Ireland and Jodie Opie, U.S. EPA, Region 5
Gregory Crowley, Utilities Director
Philip McKie, Consultant
Dennis M. Zawodni, Safety-Kleen

STATE OF INDIANA

DEPARTMENT OF ENVIRONMENTAL MANAGEMENT

AUTHORIZATION TO DISCHARGE UNDER THE

NATIONAL POLLUTANT DISCHARGE ELIMINATION SYSTEM

In compliance with the provisions of the Federal Water Pollution Control Act, as amended, (33 U.S.C. 1251 et seq., the "Act"), Title 13 of the Indiana Code, and regulations adopted by the Water Pollution Control Board, the Indiana Department of Environmental Management (IDEM) is issuing this permit to the

EAST CHICAGO SANITARY DISTRICT

hereinafter referred to as "the permittee." The permittee owns and/or operates the East Chicago Sanitary District Wastewater Treatment Plant, a major municipal wastewater treatment plant located at 5201 Indianapolis Boulevard, East Chicago, Indiana, Lake County. The permittee is hereby authorized to discharge from the outfalls identified in Part I of this permit to receiving waters named the West Branch Grand Calumet River, located within the Lake Michigan drainage basin, in accordance with the effluent limitations, monitoring requirements, and other conditions set forth in the permit. The permittee is also authorized to discharge from combined sewer overflow outfalls listed in Attachment A of this permit, to receiving waters named the Indiana Harbor Ship Canal and the Grand Calumet River in accordance with the effluent limitations, monitoring requirements, and other conditions set forth in this permit. This permit may be revoked for the nonpayment of applicable fees in accordance with IC 13-18-20.

Effective Date: July 1, 2016.

Expiration Date: June 30, 2021.

In order to receive authorization to discharge beyond the date of expiration, the permittee shall submit such information and application forms as are required by the Indiana Department of Environmental Management. The application shall be submitted to IDEM at least 180 days prior to the expiration date of this permit, unless a later date is allowed by the Commissioner in accordance with 327 IAC 5-3-2 and Part II.A.4 of this permit.

Issued June 17, 2016, for the Indiana Department of Environmental Management.

Paul Higginbotham
Deputy Assistant Commissioner
Office of Water Quality

TREATMENT FACILITY DESCRIPTION

The permittee currently operates a Class IV, 15 MGD treatment facility consisting of mechanical bar screens, preliminary grit removal, an influent flow meter, two (2) oxidation ditches, five (5) clarifiers, six (6) rapid sand filters, post aeration, ultraviolet light disinfection, phosphorus removal by ferric sulfate, and an effluent flow meter. Sludge is gravity thickened; belt filter press dewatered and disposed of at a landfill.

The collection system is comprised of combined sanitary and storm sewers with three (3) Combined Sewer Overflow (CSO) locations. The facility is served by a sewer system that has 72 miles of sewer that includes both combined and separate sanitary sewers. Approximately 92% of the sewer system is combined sanitary and storm sewer. The CSO locations have been identified and permitted with provisions in Attachment A of the permit.

The mass limits for $CBOD_5$, TSS and ammonia-nitrogen have been calculated utilizing the peak design flow of 27 MGD. This is to facilitate the maximization of flow through the treatment facility in accordance with this Office's CSO policy.

PART I

A. EFFLUENT LIMITATIONS AND MONITORING REQUIREMENTS

The permittee is authorized to discharge from the outfall listed below in accordance with the terms and conditions of this permit. The permittee shall take samples and measurements at a location representative of each discharge to determine whether the effluent limitations have been met. Refer to Part I.B of this permit for additional monitoring and reporting requirements.

1. Beginning on the effective date of this permit, the permittee is authorized to discharge from Outfall 001, which is located at Latitude: 41° 36' 54" N, Longitude: 87° 28' 14" W. The discharge is subject to the following requirements:

TABLE 1

	Quantity or Loading			Quality or Concentration			Monitoring Requirements	
Parameter	Monthly Average	Weekly Average	Units	Monthly Average	Weekly Average	Units	Measurement Frequency	Sample Type
Flow [1]	Report	----	MGD	----	----	----	5 X Weekly	24-Hr. Total
$CBOD_5$								
Summer [2]	1,126.6	1,689.9	lbs/day	5.0	7.5	mg/l	5 X Weekly	24-Hr. Composite
Winter [3]	1,599.7	2,410.9	lbs/day	7.1	10.7	mg/l	5 X Weekly	24-Hr. Composite
TSS	1,915.2	2,884.0	lbs/day	8.5	12.8	mg/l	5 X Weekly	24-Hr. Composite
Phosphorus [4]	----	----	----	1.0	----	mg/l	5 X Weekly	24-Hr. Composite

TABLE 2

Parameter	Quality or Concentration: Daily Minimum	Monthly Average	Daily Maximum	Units	Monitoring Requirements: Measurement Frequency	Sample Type
pH [5]	6.0	----	9.0	s.u.	5 X Weekly	Grab
Dissolved Oxygen [6]						
Summer [2]	7.0	----	----	mg/l	5 X Weekly	8 Grabs/24-Hrs.
Winter [3]	6.0	----	----	mg/l	5 X Weekly	8 Grabs/24-Hrs.
Oil and Grease	----	----	10.0	mg/l	5 X Weekly	Grab
E. coli [7]	----	125 [8]	235 [9]	cfu/100 ml	5 X Weekly	Grab

TABLE 3

Parameter	Quantity or Loading: Monthly Average	Daily Maximum	Units	Quality or Concentration: Monthly Average	Daily Maximum	Units	Monitoring Requirements: Measurement Frequency	Sample Type
Ammonia-nitrogen								
Summer [2]	270.4	628.6	lbs/day	1.20	2.79	mg/l	5 X Weekly	24-Hr. Composite
Winter [3]	333.5	777.3	lbs/day	1.48	3.45	mg/l	5 X Weekly	24-Hr. Composite
Whole Effluent Toxicity [10]								
Chronic	----	----	----	1.0	----	TUc	2 X Annually	24-Hr. Composite

[1] Effluent flow measurement is required per 327 IAC 5-2-13. The flow meter(s) shall be calibrated at least once every twelve months.

[2] Summer limitations apply from May 1 through November 30 of each year.

[3] Winter limitations apply from December 1 through April 30 of each year.

[4] In accordance with 327 IAC 5-10-2(b), the facility must produce an effluent containing no more than 1.0 mg/l total phosphorus (P) any month that the average phosphorus level in the raw sewage is greater than 5 mg/l. Otherwise, a degree of reduction, as prescribed below, must be achieved. Such reduction is to be calculated based on monthly average raw and final concentrations.

Phosphorus (P) Level in Raw Sewage (mg/l)	Required Removal (%)
greater than or equal to 4	80%
less than 4, greater than or equal to 3	75%
less than 3, greater than or equal to 2	70%
less than 2, greater than or equal to 1	65%
less than 1	60%

[5] If the permittee collects more than one grab sample on a given day for pH, the values shall not be averaged for reporting daily maximums or daily minimums. The permittee must report the individual minimum and the individual maximum pH value of any sample during the month on the Monthly Report of Operation forms.

[6] The daily minimum concentration of dissolved oxygen in the effluent shall be reported as the arithmetic mean determined by summation of the eight (8) daily grab sample results divided by the number of daily grab samples. These samples are to be collected over equal time intervals.

[7] The effluent shall be disinfected on a continuous basis such that violations of the applicable bacteriological limitations (*E. coli*) do not occur from April 1 through October 31, annually.]

The *E. coli* limitations and monitoring requirements apply from April 1 through October 31 annually. The monthly average *E. coli* value shall be calculated as a geometric mean.

IDEM has specified the following methods as allowable for the detection and enumeration of *Escherichia coli (E. coli)*:

1. Coliscan MF® Method
2. EPA Method 1603 Modified m-TEC agar
3. mColi Blue-24®
4. Colilert® MPN Method or Colilert-18® MPN Method

[8] The monthly average *E. coli* value shall be calculated as a geometric mean. Per 327 IAC 5-10-6, the concentration of *E. coli* shall not exceed one hundred twenty-five (125) cfu or mpn per 100 milliliters as a geometric mean of the effluent samples taken in a calendar month. No samples may be excluded when calculating the monthly geometric mean.

[9] If less than ten samples are taken and analyzed for *E. coli* in a calendar month, no samples may exceed two hundred thirty-five (235) cfu or mpn as a daily maximum. However, when ten (10) or more samples are taken and analyzed for *E. coli* in a calendar month, not more than ten percent (10%) of those samples may exceed two hundred thirty-five (235) cfu or mpn as a daily maximum. When calculating ten percent, the result must not be rounded up. In reporting for compliance purposes on the Discharge Monitoring Report (DMR) form, the permittee shall record the highest non-excluded value for the daily maximum.

[10] Please refer to Part I.D of this permit for Whole Effluent Toxicity requirements. The permittee is to report the more stringent of the results for the two test species (Fathead Minnow or *Ceriodaphnia dubia*) on the Discharge Monitoring Report forms. Please note that complete Whole Effluent Toxicity reports are required to be submitted to this Office's Compliance Data Section. In the event that the permittee is required to implement a toxicity reduction evaluation (TRE), WET monitoring frequencies will revert to the schedule outlined in Part I.D.2.e.

2. Minimum Narrative Limitations

At all times the discharge from any and all point sources specified within this permit shall not cause receiving waters:

a. including the mixing zone, to contain substances, materials, floating debris, oil, scum or other pollutants:

(1) that will settle to form putrescent or otherwise objectionable deposits;

(2) that are in amounts sufficient to be unsightly or deleterious;

(3) that produce color, visible oil sheen, odor, or other conditions in such degree as to create a nuisance;

(4) which are in amounts sufficient to be acutely toxic to, or to otherwise severely injure or kill aquatic life, other animals, plants, or humans;

(5) which are in concentrations or combinations that will cause or contribute to the growth of aquatic plants or algae to such a degree as to create a nuisance, be unsightly, or otherwise impair the designated uses.

b. outside the mixing zone, to contain substances in concentrations which on the basis of available scientific data are believed to be sufficient to injure, be chronically toxic to, or be carcinogenic, mutagenic, or teratogenic to humans, animals, aquatic life, or plants.

3. Additional Discharge Limitations and Monitoring Requirements

Beginning on the effective date of the permit, the effluent from Outfall 001 shall be limited and monitored by the permittee as follows:

TABLE 4

	Quantity or Loading			Quality or Concentration			Monitoring Requirements	
Parameter	Monthly Average	Daily Maximum	Units	Monthly Average	Daily Maximum	Units	Measurement Frequency	Sample Type
Cadmium [1]	----	Report	lbs/day	----	Report	mg/l	1 X Quarterly	24 Hr. Comp.
Chloride	----	Report	lbs/day	----	Report	mg/l	1 X Quarterly	24 Hr. Comp.
Sulfate	----	Report	lbs/day	----	Report	mg/l	1 X Quarterly	24 Hr. Comp.
Chromium [1]	----	Report	lbs/day	----	Report	mg/l	1 X Quarterly	24 Hr. Comp.
Copper [1]	----	Report	lbs/day	----	Report	mg/l	1 X Quarterly	24 Hr. Comp.
Cyanide [1]	0.54	1.1	lbs/day	0.0043	0.0085	mg/l	1 X Weekly	See [2] Below
Lead [1]	----	Report	lbs/day	----	Report	mg/l	1 X Quarterly	24 Hr. Comp.
Mercury [1][3]	0.00016	0.00040	lbs/day	1.3	3.2	ng/l	6 X Annually	Grab
Nickel [1]	----	Report	lbs/day	----	Report	mg/l	1 X Quarterly	24 Hr. Comp.
Zinc [1]	----	Report	lbs/day	----	Report	mg/l	1 X Quarterly	24 Hr. Comp.

Note: For measurement frequencies less than once per month, the permittee shall report the result from the monitoring period on the Discharge Monitoring Report (DMR) for the final month of the reporting timeframe, beginning with January of each year. For example, for quarterly monitoring, the permittee may conduct sampling within the month of January, February or March. The result from this reporting timeframe shall be reported on the March DMR, regardless of which of the months within the quarter the sample was taken.

[1] The permittee shall measure and report this parameter as Total Recoverable Metal. Cyanide shall be reported as Free Cyanide or Cyanide Amenable to Chlorination.

The following EPA test methods and/or Standard Methods and associated Limits of Detection (LODs) and Limits of Quantitation (LOQs) are recommended for use in the analysis of the effluent samples. Alternative 40 CFR 136 approved methods may be used provided the LOD is less than the monthly average and/or daily maximum effluent limitations.

The permittee may determine a case-specific Method Detection Level (MDL) using one of the analytical methods specified below, or any other test method which is approved by IDEM prior to use. The MDL shall be derived by the procedure specified for MDLs contained in 40 CFR Part 136, Appendix B, and the limit of quantitation shall be set equal to 3.18 times the MDL. NOTE: The MDL for purposes of this document, is synonymous with the "limit of detection" or "LOD" as defined in 327 IAC 5-1.5-26: "the minimum concentration of a substance that can be measured and reported with ninety-nine percent (99%) confidence that the analyte concentration is greater than zero (0) for a particular analytical method and sample matrix".

Parameter	EPA/Standard Method	LOD	LOQ
Cadmium	3113 B	0.1 ug/l	0.32 ug/l
Chloride	4500 Cl-E	1000 ug/l	3200 ug/l
Chromium	3111 C or 3113 B	2.0 ug/l	6.4 ug/l
Copper	3113 B	1.0 ug/l	3.2 ug/l
Cyanide, Free	1677	0.5 ug/l	1.6 ug/l
Lead	3113 B	1.0 ug/l	3.2 ug/l
Mercury	1631, Revision E	0.2 ng/l	0.5 ng/l
Nickel	3113 B	1.0 ug/l	3.2 ug/l
Sulfate	375.2, Revision 2.0	3000 ug/l	9500 ug/l
Zinc	200.7, Revision 4.4 or 3120 B	2.0 ug/l	6.4 ug/l

[2] The maximum holding time is 24 hours when sulfide is present. Therefore, initially the CN sample should be a grab sample that is tested with lead acetate paper before pH adjustments in order to determine if sulfide is present. If sulfide is present, it can be removed by the addition of cadmium nitrate powder until a negative spot test is obtained. The sample is filtered and then NaOH is added to pH 12. The sample may then be analyzed within 14 days. Alternatively, if the permittee can demonstrate that the wastewater contains no sulfide, the permittee may collect a composite sample and analyze it within 14 days.

[3] Mercury monitoring shall be conducted six times annually (i.e. every other month) for the term of the permit. Monitoring shall be conducted in the months of February, April, June, August, October, and December of each year. Mercury monitoring and analysis will be performed using EPA Test Method 1631, Revision E. If Method 1631, Revision E is further revised during the term of this permit, the permittee and/or its contract laboratory is required to utilize the most current version of the method immediately after approval by EPA.

4. Additional Monitoring Requirements

Beginning on the effective date of this permit, the permittee shall conduct the following monitoring activities:

a. Influent Monitoring

In addition to the requirements contained in Part I.B.2 of the NPDES permit, the permittee shall monitor the influent to its wastewater treatment facility for the following pollutants. Samples shall be representative of the raw influent in accordance with 327 IAC 5-2-13(b).

TABLE 5

	Quality or Concentration			Monitoring Requirements	
Parameter	Monthly Average	Daily Maximum	Unit	Measurement Frequency	Sample Type
Cadmium [1]	----	Report	mg/l	1 X Quarterly	24 Hr. Comp.
Chromium [1]	----	Report	mg/l	1 X Quarterly	24 Hr. Comp.
Chloride	----	Report	mg/l	1 X Quarterly	24 Hr. Comp.
Copper [1]	----	Report	mg/l	1 X Quarterly	24 Hr. Comp.
Cyanide [1]	Report	Report	mg/l	2 X Monthly	See [2] Below
Lead [1]	----	Report	mg/l	1 X Quarterly	24 Hr. Comp.
Mercury [1][3]	----	Report	ng/l	6 X Annually	Grab
Nickel [1]	----	Report	mg/l	1 X Quarterly	24 Hr. Comp.
Sulfate	----	Report	mg/l	1 X Quarterly	24 Hr. Comp.
Zinc [1]	----	Report	mg/l	1 X Quarterly	24 Hr. Comp.

Note: For measurement frequencies less than once per month, the permittee shall report the result from the monitoring period on the Discharge Monitoring Report (DMR) for the final month of the reporting timeframe, beginning with January of each year. For example, for quarterly monitoring, the permittee may conduct sampling within the month of January, February or March. The result from this reporting timeframe shall be reported on the March DMR, regardless of which of the months within the quarter the sample was taken.

[1] The permittee shall measure and report this parameter as Total Recoverable Metal. Cyanide shall be reported as Free Cyanide or Cyanide Amenable to Chlorination.

[2] The maximum holding time is 24 hours when sulfide is present. Therefore, initially the CN sample should be a grab sample that is tested with lead acetate paper before pH adjustments in order to determine if sulfide is present. If sulfide

is present, it can be removed by the addition of cadmium nitrate powder until a negative spot test is obtained. The sample is filtered and then NaOH is added to pH 12. The sample may then be analyzed within 14 days. Alternatively, if the permittee can demonstrate that the wastewater contains no sulfide, the permittee may collect a composite sample and analyze it within 14 days.

[3] Mercury monitoring shall be conducted six times annually (i.e. every other month) for the term of the permit. Monitoring shall be conducted in the months of February, April, June, August, October, and December of each year. Mercury monitoring and analysis will be performed using EPA Test Method 1631, Revision E. If Method 1631, Revision E is further revised during the term of this permit, the permittee and/or its contract laboratory is required to utilize the most current version of the method immediately after approval by EPA.

b. Priority Pollutants Monitoring

The permittee shall conduct an annual inventory of priority pollutants (see 40 CFR 423, Appendix A) and shall identify and quantify additional organic compounds which occur in the influent, effluent, and sludge. The analytical report shall be sent to the Pretreatment Group. This report is due in December of each year. The inventory shall consist of:

(1) Sampling and Analysis of Influent and Effluent

Sampling shall be conducted on a day when industrial discharges are occurring at normal or maximum levels. The samples shall be 24-hour flow proportional composites, except for volatile organics, which shall be taken by appropriate grab sampling techniques. Analysis for the U.S. EPA organic priority pollutants shall be performed using U.S. EPA methods 624, 625 and 608 in 40 CFR 136, or other equivalent methods approved by U.S. EPA. Equivalent methods must be at least as sensitive and specific as methods 624, 625 and 608.

All samples must be collected, preserved and stored in accordance with 40 CFR 136, Appendix A. Samples for volatile organics must be analyzed within 14 days of collection. Samples for semivolatile organics, PCBs and pesticides must be extracted within 7 days of collection and analyzed within 40 days of extraction. For composite samples, the collection date shall be the date at the end of the daily collection period.

(2) Sampling and Analysis of Sludge

Sampling collection, storage, and analysis shall conform to the U.S. EPA recommended procedures in accordance with 40 CFR 503. Special sampling and/or preservation techniques will be required for those pollutants which deteriorate rapidly.

Sludge samples for volatile organics must be analyzed within 14 days of collection. Sludge samples for semivolatile organics, PCBs and pesticides must be extracted within 14 days of collection and analyzed within 40 days of extraction.

(3) Additional Pollutant Identification

In addition to the priority organic pollutants, a reasonable attempt shall be made to identify and quantify the ten most abundant constituents of each fraction (excluding priority pollutants and unsubstituted aliphatic compounds) shown to be present by peaks on the total ion plots (reconstructed gas chromatograms) more than ten times higher than the adjacent background noise. Identification shall be attempted through the use of U.S. EPA/NIH computerized library of mass spectra, with visual confirmation by an experienced analyst. Quantification may be based on an order of magnitude estimate based upon comparison with an internal standard.

The annual pretreatment program report, required by Part III. A.7. of this permit, should identify the additional steps necessary to determine whether the pollutants that are present interfere, pass through, or otherwise violate 40 CFR 403.2. Upon such determination, the report must also identify the steps taken to develop and enforce local limitations on industrial discharges for those pollutants. This is a requirement of 40 CFR 403.5.

B. MONITORING AND REPORTING

1. Representative Sampling

Samples and measurements taken as required herein shall be representative of the volume and nature of the monitored discharge flow and shall be taken at times which reflect the full range and concentration of effluent parameters normally expected to be present. Samples shall not be taken at times to avoid showing elevated levels of any parameters.

2. Data on Plant Operation

The raw influent and the wastewater from intermediate unit treatment processes, as well as the final effluent shall be sampled and analyzed for the pollutants and operational parameters specified by the applicable Monthly Report of Operation Form, as appropriate, in accordance with 327 IAC 5-2-13. Except where the permit specifically states otherwise, the sample frequency for the raw influent and intermediate unit treatment process shall be at a minimum the same frequency as that for the final effluent. The measurement frequencies specified in each of the tables in Part I.A. are the minimum frequencies required by this permit.

3. Monthly Reporting

The permittee shall submit accurate monitoring reports to the Indiana Department of Environmental Management containing results obtained during the previous monitoring period and shall be postmarked no later than the 28th day of the month following each completed monitoring period. The first report shall be submitted by the 28th day of the month following the monitoring period in which the permit becomes effective. These reports shall include, but not necessarily be limited to, the Discharge Monitoring Report

(DMR) and the Monthly Report of Operation (MRO). Permittees with metals monitoring requirements shall also complete and submit the Indiana Monthly Monitoring Report Form (MMR-State Form 30530) to report their influent and/or effluent data for metals and other toxics. Permittees with combined sewer overflow discharges must also submit the CSO Monthly Report of Operation to IDEM by the 28th day of the month following each completed monitoring period. Until December 31, 2016, all reports shall be mailed to IDEM, Office of Water Quality –Compliance Data Section, 100 North Senate Ave., Indianapolis, Indiana 46204-2251or submitted to IDEM electronically by using the NetDMR application, upon registration and approval receipt. Electronically submitted reports (using NetDMR) have the same deadline as mailed reports. After December 31, 2016, all reports shall be submitted using NetDMR, and paper reports will no longer be accepted. The Regional Administrator may request the permittee to submit monitoring reports to the Environmental Protection Agency if it is deemed necessary to assure compliance with the permit.

A calendar week will begin on Sunday and end on Saturday. Partial weeks consisting of four or more days at the end of any month will include the remaining days of the week, which occur in the following month in order to calculate a consecutive seven-day average. This value will be reported as a weekly average or seven-day average on the MRO for the month containing the partial week of four or more days. Partial calendar weeks consisting of less than four days at the end of any month will be carried forward to the succeeding month and reported as a weekly average or a seven-day average for the calendar week that ends with the first Saturday of that month.

4. Definitions

a. Calculation of Averages

Pursuant to 327 IAC 5-2-11(a)(5), the calculation of the average of discharge data shall be determined as follows: For all parameters except fecal coliform and *E. coli*, calculations that require averaging of sample analyses or measurements of daily discharges shall use an arithmetic mean unless otherwise specified in this permit. For fecal coliform, the monthly average discharge and weekly average discharge, as concentrations, shall be calculated as a geometric mean. For *E. coli*, the monthly average discharge, as a concentration, shall be calculated as a geometric mean.

b. Terms

(1) "Monthly Average" -The monthly average discharge means the total mass or flow-weighted concentration of all daily discharges during a calendar month on which daily discharges are sampled or measured, divided by the number of daily discharges sampled and/or measured during such calendar month. The monthly average discharge limitation is the highest allowable average monthly discharge for any calendar month.

(2) "Weekly Average" - The weekly average discharge means the total mass or flow weighted concentration of all daily discharges during any calendar week for

which daily discharges are sampled or measured, divided by the number of daily discharges sampled and/or measured during such calendar week. The average weekly discharge limitation is the maximum allowable average weekly discharge for any calendar week.

(3) "Daily Maximum" - The daily maximum discharge limitation is the maximum allowable daily discharge for any calendar day. The "daily discharge" means the total mass of a pollutant discharged during the calendar day or, in the case of a pollutant limited in terms other than mass pursuant to 327 IAC 5-2-11(e), the average concentration or other measurement of the pollutant specified over the calendar day or any twenty-four hour period that represents the calendar day for purposes of sampling.

(4) "24-hour Composite" - A 24-hour composite sample consists of at least eight (8) individual flow-proportioned samples of wastewater, taken by the grab sample method over equal time intervals during the period of operator attendance or by an automatic sampler, and which are combined prior to analysis. A flow proportioned composite sample shall be obtained by:

(a) recording the discharge flow rate at the time each individual sample is taken,

(b) adding together the discharge flow rates recorded from each individual sampling time to formulate the "total flow value,"

(c) dividing the discharge flow rate of each individual sampling time by the total flow value to determine its percentage of the total flow value, and

(d) multiplying the volume of the total composite sample by each individual sample's percentage to determine the volume of that individual sample which will be included in the total composite sample.

Alternatively, a 24-hour composite sample may be obtained by an automatic sampler on an equal time interval basis over a twenty-four hour period provided that a minimum of 24 samples are taken and combined prior to analysis. The samples do not need to be flow-proportioned if the permittee collects samples in this manner.

(5) $CBOD_5$: Five-day Carbonaceous Biochemical Oxygen Demand

(6) TSS: Total Suspended Solids

(7) *E. coli*: Escherichia coli bacteria

(8) The "Regional Administrator" is defined as the Region V Administrator, U.S. EPA, located at 77 West Jackson Boulevard, Chicago, Illinois 60604.

(9) The "Commissioner" is defined as the Commissioner of the Indiana Department of Environmental Management, located at the following address: 100 North Senate Avenue, Indianapolis, Indiana 46204-2251.

(10) Limit of Detection or LOD is defined as a measurement of the concentration of a substance that can be measured and reported with 99% confidence that the analyte concentration is greater than zero (0) for a particular analytical method and sample matrix. The LOD is equivalent to the Method Detection Level or MDL.

(11) Limit of Quantitation or LOQ is defined as a measurement of the concentration of a contaminant obtained by using a specified laboratory procedure calibrated at a specified concentration about the method detection level. It is considered the lowest concentration at which a particular contaminant can be quantitatively measured using a specified laboratory procedure for monitoring of the contaminant. This term is also called the limit of quantification or quantification level.

(12) Method Detection Level or MDL is defined as the minimum concentration of an analyte (substance) that can be measured and reported with a ninety-nine percent (99%) confidence that the analyte concentration is greater than zero (0) as determined by the procedure set forth in 40 CFR Part 136, Appendix B. The method detection level or MDL is equivalent to the LOD.

5. Test Procedures

The analytical and sampling methods used shall conform to the current version of 40 CFR, Part 136, unless otherwise specified within this permit. Multiple editions of Standard Methods for the Examination of Water and Wastewater are currently approved for most methods, however, 40 CFR Part 136 should be checked to ascertain if a particular method is approved for a particular analyte. The approved methods may be included in the texts listed below. However, different but equivalent methods are allowable if they receive the prior written approval of the State agency and the U.S. Environmental Protection Agency.

a. Standard Methods for the Examination of Water and Wastewater
18th, 19th, or 20th Editions, 1992, 1995 or 1998 American Public Health Association, Washington, D.C. 20005.

b. A.S.T.M. Standards, Part 23, Water; Atmospheric Analysis
1972 American Society for Testing and Materials, Philadelphia, PA 19103.

c. Methods for Chemical Analysis of Water and Wastes
June 1974, Revised, March 1983, Environmental Protection Agency, Water Quality Office, Analytical Quality Control Laboratory, 1014 Broadway, Cincinnati, OH 45202.

6. Recording of Results

For each measurement or sample taken pursuant to the requirements of this permit, the permittee shall record and maintain records of all monitoring information and monitoring activities under this permit, including the following information:

a. The exact place, date, and time of sampling or measurements;

b. The person(s) who performed the sampling or measurements;

c. The dates and times the analyses were performed;

d. The person(s) who performed the analyses;

e. The analytical techniques or methods used; and

f. The results of all required analyses and measurements.

7. Additional Monitoring by Permittee

If the permittee monitors any pollutant at the location(s) designated herein more frequently than required by this permit, using approved analytical methods as specified above, the results of such monitoring shall be included in the calculation and reporting of the values required in the Monthly Discharge Monitoring Report and on the Monthly Report of Operation form. Such increased frequency shall also be indicated on these forms. Any such additional monitoring data which indicates a violation of a permit limitation shall be followed up by the permittee, whenever feasible, with a monitoring sample obtained and analyzed pursuant to approved analytical methods. The results of the follow-up sample shall be reported to the Commissioner in the Monthly Discharge Monitoring Report.

8. Records Retention

All records and information resulting from the monitoring activities required by this permit, including all records of analyses performed and calibration and maintenance of instrumentation and recording from continuous monitoring instrumentation, shall be retained for a minimum of three (3) years. In cases where the original records are kept at another location, a copy of all such records shall be kept at the permitted facility. The three-year period shall be extended:

a. automatically during the course of any unresolved litigation regarding the discharge of pollutants by the permittee or regarding promulgated effluent guidelines applicable to the permittee; or

b. as requested by the Regional Administrator or the Indiana Department of Environmental Management.

C. REOPENING CLAUSES

In addition to the reopening clause provisions cited at 327 IAC 5-2-16, the following reopening clauses are incorporated into this permit:

1. This permit may be modified or, alternately, revoked and reissued after public notice and opportunity for hearing to incorporate effluent limitations reflecting the results of a wasteload allocation if the Department of Environmental Management determines that such effluent limitations are needed to assure that State Water Quality Standards are met in the receiving stream.

2. This permit may be modified due to a change in sludge disposal standards pursuant to Section 405(d) of the Clean Water Act, if the standards when promulgated contain different conditions, are otherwise more stringent, or control pollutants not addressed by this permit.

3. This permit may be modified, or, alternately, revoked and reissued, to comply with any applicable effluent limitation or standard issued or approved under section 301(b)(2)(C), (D) and (E), 304(b)(2), and 307(a)(2) of the Clean Water Act, if the effluent limitation or standard so issued or approved:

   a. contains different conditions or is otherwise more stringent than any effluent limitation in the permit; or

   b. controls any pollutant not limited in the permit.

4. This permit may be modified or, alternatively, revoked and reissued after public notice and opportunity for hearing to incorporate monitoring requirements and effluent limitations for cadmium, chromium, copper, chloride, lead, nickel, sulfate, and/or zinc if the Department of Environmental Management determines that such monitoring requirements and effluent limitations are needed to assure that State Water Quality standards are met in the receiving streams.

5. This permit may be modified, or alternately, revoked and reissued after public notice and opportunity for hearing to include limitations for specific toxicants if the results of the biomonitoring and/or the Toxicity Reduction Evaluation (TRE) study indicate that such limitations are necessary.

6. This permit may be modified or, alternatively, revoked and reissued after public notice and opportunity for hearing to incorporate additional requirements or limitations for specific toxicants if the required additional analyses in Part I.A. indicate that such additional requirements and/or limitations are necessary to assure that State Water Quality Standards are met in the receiving stream.

D. WHOLE EFFLUENT TOXICITY TESTING REQUIREMENTS

The 1977 Clean Water Act explicitly states, in Section 101(3) that it is the national policy that the discharge of toxic pollutants in toxic amounts be prohibited. In support of this policy the U.S. EPA in 1995 amended the 40 CFR 136.3 (Tables IA and II) by adding testing methods for measuring acute and short-term chronic toxicity of whole effluents and receiving waters. To adequately assess the character of the effluent, and the effects of the effluent on aquatic life, the permittee shall conduct Whole Effluent Toxicity Testing. Part 1 of this section describes the testing procedures, Part 2 describes the Toxicity Reduction Evaluation which is only required if the effluent demonstrates toxicity, as described in paragraph f.

1. Whole Effluent Toxicity Tests

The permittee shall conduct the series of bioassay tests described below to monitor the toxicity of the discharge from Outfall 001.

If toxicity is demonstrated as defined under paragraph f below, the permittee is required to conduct a Toxicity Reduction Evaluation (TRE).

a. Bioassay Test Procedures and Data Analysis

(1) All test organisms, test procedures and quality assurance criteria used shall be in accordance with the Short-term Methods for Estimating the Chronic Toxicity of Effluents and Receiving Water to Freshwater Organisms; Fourth Edition Section 13, Cladoceran (*Ceriodaphnia dubia*) Survival and Reproduction Test Method 1002.0; and Section 11, Fathead Minnow (*Pimephales promelas*) Larval Survival and Growth Test Method, (1000.0) EPA 821-R-02-013, October 2002, or most recent update.

(2) Any circumstances not covered by the above methods, or that require deviation from the specified methods shall first be approved by the IDEM's Permits Branch Toxicologist.

(3) The determination of effluent toxicity shall be made in accordance with the Data Analysis general procedures for chronic toxicity endpoints as outlined in Section 9, and in Sections 11 and 13 of the respective Test Method (1000.0 and 1002.0) of Short-term Methods of Estimating the Chronic Toxicity of Effluent and Receiving Water to Freshwater Organisms (EPA 821-R-02-013), Fourth Edition, October 2002 or most recent update.

b. Types of Bioassay Tests

(1) The permittee shall conduct a 7-day Cladoceran (*Ceriodaphnia dubia*) Survival and Reproduction Test and a 7-day Fathead Minnow (*Pimephales promelas*) Larval Survival and Growth Test on samples of the final effluent. All tests will be conducted on 24-hour composite samples of final effluent. All test solutions shall

be renewed daily. On days three and five fresh 24-hour composite samples of the effluent collected on alternate days shall be used to renew the test solutions.

(2) If in any control more than 10% of the test organisms die in 96 hours, or more than 20% of the test organisms die in 7 days, that test shall be repeated. In addition, if in the *Ceriodaphnia* test control the number of newborns produced per surviving female is less than 15, or if 60% of surviving control females have less than three broods; and in the fathead minnow test if the mean dry weight of surviving fish in the control group is less than 0.25 mg, that test shall also be repeated. Such testing will determine whether the effluent affects the survival, reproduction, and/or growth of the test organisms. Results of all tests regardless of completion must be reported to IDEM.

c. Effluent Sample Collection and Chemical Analysis

(1) Samples for the purposes of Whole Effluent Toxicity Testing will be taken at a point that is representative of the discharge, but prior to discharge. The maximum holding time for whole effluent is 36 hours for a 24 hour composite sample. Bioassay tests must be started within 36 hours after termination of the 24 hour composite sample collection. Bioassay of effluent sampling may be coordinated with other permit sampling requirements as appropriate to avoid duplication.

(2) Chemical analysis must accompany each effluent sample taken for bioassay test, especially the sample taken for the repeat or confirmation tests as outlined in paragraph f.3. The analysis detailed under Part I.A. should be conducted for the effluent sample. Chemical analysis must comply with approved EPA test methods.

d. Frequency and Duration

The toxicity tests specified in paragraph b. shall be conducted once **every six months** for the duration of the permit. The results of the toxicity tests are due within each six month period as calculated from the effective date of the permit.

If toxicity is demonstrated as defined under paragraph f (1), (2) or (3), the permittee is required to conduct a toxicity reduction evaluation (TRE) as specified in Section 2.

e. Reporting

(1) Results shall be reported according to EPA 821-R-02-013, Section 10 (Report Preparation). Two copies of the completed report for each test shall be submitted to the Compliance Data Section of the IDEM no later than sixty days after completion of the test. An electronic copy of the report may be submitted to wwreports@idem.IN.gov in lieu of the two copies to the Compliance Data Section.

(2) For quality control, the report shall include the results of appropriate standard reference toxic pollutant tests for chronic endpoints and historical reference toxic pollutant data with mean values and appropriate ranges for the respective test species *Ceriodaphnia dubia* and *Pimephales promelas*. Biomonitoring reports must also include copies of Chain-of-Custody Records and Laboratory raw data sheets.

(3) Statistical procedures used to analyze and interpret toxicity data including critical values of significance used to evaluate each point of toxicity should be described and included as part of the biomonitoring report.

f. Demonstration of Toxicity

(1) Acute toxicity will be demonstrated if the effluent is observed to have exceeded **1.0** TU_a(acute toxic units) based on 100% effluent for the test organism in 48 and 96 hours for *Ceriodaphnia dubia* or *Pimephales promelas*, whichever is more sensitive.

(2) Chronic toxicity will be demonstrated if the effluent is observed to have exceeded **1.0** TU_c (chronic toxic units) for *Ceriodaphnia dubia* or *Pimephales promelas* .

(3) If toxicity is found in any of the tests specified above, a confirmation toxicity test using the specified methodology and same test species shall be conducted within two weeks of receiving the chronic toxicity test results. During the sampling for any confirmation tests the permittee shall also collect and preserve sufficient effluent samples for use in any Toxicity Identification Evaluation (TIE) and/or Toxicity Reduction Evaluation (TRE), if necessary. If any two (2) consecutive tests, <u>including any and all confirmation tests</u>, indicate the presence of toxicity, the permittee must begin the implementation of a Toxicity Reduction Evaluation (TRE) as described below. The whole effluent toxicity tests required above may be suspended (upon approval from IDEM) while the TRE is being conducted.

g. Definitions

(1)TU_c is defined as 100/NOEC or $100/IC_{25}$.

(2)TU_a is defined as $100/LC_{50}$ where the LC_{50} is expressed as a percent effluent in the test medium of an acute Whole Effluent Toxicity (WET) test that is statistically or graphically estimated to be lethal to fifty percent (50%) of the test organisms.

(3)"Inhibition concentration 25" or "IC_{25}" means the toxicant (effluent) concentration that would cause a twenty-five percent (25%) reduction in a nonquantal biological measurement for the test population. For example, the IC_{25} is the concentration of toxicant (effluent) that would cause a twenty-five percent (25%) reduction in mean young per female or in growth for the test population.

(4)"No observed effect concentration" or "NOEC" is the highest concentration of toxicant (effluent) to which organisms are exposed in a full life cycle or partial life cycle (short term) test, that causes no observable adverse effects on the test organisms, that is, the highest concentration of toxicant in which the values for the observed responses are not statistically significantly different from the controls.

2. Toxicity Reduction Evaluation (TRE) Schedule of Compliance

The development and implementation of a TRE (including any post-TRE biomonitoring requirements) is only required if toxicity is demonstrated as defined by Paragraph 1.f.

Development and Submittal of TRE Plan	Within 90 days of two failed toxicity tests.
Initiate Effluent TRE	Within 30 days of TRE Plan submittal to IDEM.
Progress Reports	Every 90 days from the initiation date of the TRE.
Submit Final TRE Results	Within 90 days of the completion of the TRE, not to exceed 3 years from the date of the initial determination of toxicity (two failed toxicity tests).
Post-TRE Biomonitoring Requirements	Immediately upon completion of the TRE, conduct 3 consecutive months of toxicity tests, if no toxicity is shown, reduce toxicity tests to once every 6 months for the duration of the permit term. If post – TRE biomonitoring demonstrates toxicity, revert to implementation of a TRE.

a. Development of TRE Plan

Within 90 days of determination of toxicity, the permittee shall submit plans for an effluent TRE to the Compliance Data Section of the IDEM. The TRE plan shall include appropriate measures to characterize the causative toxicant and the variability associated with these compounds. Guidance on conducting effluent toxicity reduction evaluations is available from EPA and from the EPA publications listed below:

(1) Methods for Aquatic Toxicity Identification Evaluations:

Phase I Toxicity Characterization Procedures, Second Edition (EPA/600/6-91/003), February 1991.

Phase II Toxicity Identification Procedures (EPA 600/R-92/080), September 1993.

Phase III Toxicity Confirmation Procedures (EPA/600/R-92/081), September 1993.

(2) Methods for Chronic Toxicity Identification Evaluations

Phase I Characterization of Chronically Toxic Effluents EPA/600/6-91/005F, May 1992.

(3) Generalized Methodology for Conducting Industrial Toxicity Reduction Evaluations (EPA/600/2-88/070), April 1989.

(4) Toxicity Reduction Evaluation Protocol for Municipal Wastewater Treatment Plants (EPA/833-B-99-022), August 1999

b. Conduct the TRE

Within 30 days after submittal of the TRE plan to IDEM, the permittee must initiate an effluent TRE consistent with the TRE plan. Progress reports shall be submitted every 90 days to the Compliance Data Section of the Office of Water Quality (OWQ) beginning 90 days after initiation of the TRE study.

c. Reporting

Within 90 days of the TRE study completion, the permittee shall submit to the Compliance Data Section of the Office of Water Quality (OWQ) the final study results and a schedule for reducing the toxicity to acceptable levels through control of the toxicant source or treatment of whole effluent.

d. Compliance Date

The permittee shall complete items a, b, and c from Section 2 and reduce the toxicity to acceptable levels as soon as possible but <u>no later than three years after the date of determination of toxicity</u>.

e. Post-TRE Biomonitoring Requirements (Only Required After Completion of a TRE)

After the TRE, the permittee shall conduct monthly toxicity tests with 2 or more species for a period of three months. Should three consecutive monthly tests demonstrate no toxicity, the permittee shall <u>conduct chronic tests every six months for the duration of the permit</u>. These tests shall be conducted in accordance with the procedures under the Whole Effluent Toxicity Tests Section. The results of these tests shall be submitted to the Compliance Data Section of the Office of Water Quality (OWQ).

If toxicity is demonstrated as defined in paragraph 1.f after the initial three month period, testing must revert to a TRE as in Part 2 (TRE).

PART II

STANDARD CONDITIONS FOR NPDES PERMITS

A. GENERAL CONDITIONS

1. Duty to Comply

The permittee shall comply with all terms and conditions of this permit in accordance with 327 IAC 5-2-8(1) and all other requirements of 327 IAC 5-2-8. Any permit noncompliance constitutes a violation of the Clean Water Act and IC 13 and is grounds for enforcement action or permit termination, revocation and reissuance, modification, or denial of a permit renewal application.

It shall not be a defense for a permittee in an enforcement action that it would have been necessary to halt or reduce the permitted activity in order to maintain compliance with the conditions of the permit.

2. Duty to Mitigate

In accordance with 327 IAC 5-2-8(3), the permittee shall take all reasonable steps to minimize or correct any adverse impact to the environment resulting from noncompliance with this permit. During periods of noncompliance, the permittee shall conduct such accelerated or additional monitoring for the affected parameters, as appropriate or as requested by IDEM, to determine the nature and impact of the noncompliance.

3. Duty to Provide Information

The permittee shall submit any information that the permittee knows or has reason to believe would constitute cause for modification or revocation and reissuance of the permit at the earliest time such information becomes available, such as plans for physical alterations or additions to the facility that:

a. could significantly change the nature of, or increase the quantity of, pollutants discharged; or

b. the Commissioner may request to evaluate whether such cause exists.

In accordance with 327 IAC 5-1-3(a)(5), the permittee must also provide any information reasonably requested by the Commissioner.

4. Duty to Reapply

If the permittee wishes to continue an activity regulated by this permit after the expiration date of this permit, the permittee must obtain and submit a renewal of this permit in accordance with 327 IAC 5-3-2(a)(2). It is the permittee's responsibility to obtain and

submit the application. In accordance with 327 IAC 5-2-3(c), the owner of the facility or operation from which a discharge of pollutants occurs is responsible for applying for and obtaining the NPDES permit, except where the facility or operation is operated by a person other than an employee of the owner in which case it is the operator's responsibility to apply for and obtain the permit. The application must be submitted at least 180 days before the expiration date of this permit. This deadline may be extended if:

a. permission is requested in writing before such deadline;

b. IDEM grants permission to submit the application after the deadline; and

c. the application is received no later than the permit expiration date.

As required under 327 IAC 5-2-3(g)(1) and (2), POTWs with design influent flows equal to or greater than one million (1,000,000) gallons per day and POTWs with an approved pretreatment program or that are required to develop a pretreatment program, will be required to provide the results of whole effluent toxicity testing as part of their NPDES renewal application.

5. Transfers

In accordance with 327 IAC 5-2-8(4)(D), this permit is nontransferable to any person except in accordance with 327 IAC 5-2-6(c). This permit may be transferred to another person by the permittee, without modification or revocation and reissuance being required under 327 IAC 5-2-16(c)(1) or 16(e)(4), if the following occurs:

a. the current permittee notified the Commissioner at least thirty (30) days in advance of the proposed transfer date.

b. a written agreement containing a specific date of transfer of permit responsibility and coverage between the current permittee and the transferee (including acknowledgment that the existing permittee is liable for violations up to that date, and the transferee is liable for violations from that date on) is submitted to the Commissioner.

c. the transferee certifies in writing to the Commissioner their intent to operate the facility without making such material and substantial alterations or additions to the facility as would significantly change the nature or quantities of pollutants discharged and thus constitute cause for permit modification under 327 IAC 5-2-16(d). However, the Commissioner may allow a temporary transfer of the permit without permit modification for good cause, e.g., to enable the transferee to purge and empty the facility's treatment system prior to making alterations, despite the transferee's intent to make such material and substantial alterations or additions to the facility.

d. the Commissioner, within thirty (30) days, does not notify the current permittee and the transferee of the intent to modify, revoke and reissue, or terminate the permit and

to require that a new application be filed rather than agreeing to the transfer of the permit.

The Commissioner may require modification or revocation and reissuance of the permit to identify the new permittee and incorporate such other requirements as may be necessary under the Clean Water Act or state law.

6. Permit Actions

In accordance with 327 IAC 5-2-16(b) and 327 IAC 5-2-8(4), this permit may be modified, revoked and reissued, or terminated for cause, including, but not limited to, the following:

a. Violation of any terms or conditions of this permit;

b. Failure of the permittee to disclose fully all relevant facts or misrepresentation of any relevant facts in the application, or during the permit issuance process; or

c. A change in any condition that requires either a temporary or permanent reduction or elimination of the authorized discharge controlled by the permittee (e.g., plant closure, termination of the discharge by connecting to a POTW, a change in state law or information indicating the discharge poses a substantial threat to human health or welfare).

Filing of either of the following items does not stay or suspend any permit condition: (1) a request by the permittee for a permit modification, revocation and reissuance, or termination, or (2) submittal of information specified in Part II.A.3 of the permit including planned changes or anticipated noncompliance.

The permittee shall submit any information that the permittee knows or has reason to believe would constitute cause for modification or revocation and reissuance of the permit at the earliest time such information becomes available, such as plans for physical alterations or additions to the permitted facility that:

1. could significantly change the nature of, or increase the quantity of, pollutants discharged; or

2. the commissioner may request to evaluate whether such cause exists.

7. Property Rights

Pursuant to 327 IAC 5-2-8(6) and 327 IAC 5-2-5(b), the issuance of this permit does not convey any property rights of any sort or any exclusive privileges, nor does it authorize any injury to persons or private property or an invasion of rights, any infringement of federal, state, or local laws or regulations. The issuance of the permit also does not

preempt any duty to obtain any other state, or local assent required by law for the discharge or for the construction or operation of the facility from which a discharge is made.

8. Severability

In accordance with 327 IAC 1-1-3, the provisions of this permit are severable and, if any provision of this permit or the application of any provision of this permit to any person or circumstance is held invalid, the invalidity shall not affect any other provisions or applications of the permit which can be given effect without the invalid provision or application.

9. Oil and Hazardous Substance Liability

Nothing in this permit shall be construed to relieve the permittee from any responsibilities, liabilities, or penalties to which the permittee is or may be subject to under Section 311 of the Clean Water Act.

10. State Laws

Nothing in this permit shall be construed to preclude the institution of any legal action or relieve the permittee from any responsibilities, liabilities, or penalties established pursuant to any applicable state law or regulation under authority preserved by Section 510 of the Clean Water Act or state law.

11. Penalties for Violation of Permit Conditions

Pursuant to IC 13-30-4, a person who violates any provision of this permit, the water pollution control laws; environmental management laws; or a rule or standard adopted by the Water Pollution Control Board is liable for a civil penalty not to exceed twenty-five thousand dollars ($25,000) per day of any violation. Pursuant to IC 13-30-5, a person who obstructs, delays, resists, prevents, or interferes with (1) the department; or (2) the department's personnel or designated agent in the performance of an inspection or investigation commits a class C infraction.

Pursuant to IC 13-30-10, a person who intentionally, knowingly, or recklessly violates any provision of this permit, the water pollution control laws or a rule or standard adopted by the Water Pollution Control Board commits a class D felony punishable by the term of imprisonment established under IC 35-50-2-7(a) (up to one year), and/or by a fine of not less than five thousand dollars ($5,000) and not more than fifty thousand dollars ($50,000) per day of violation. A person convicted for a violation committed after a first conviction of such person under this provision is subject to a fine of not more than one hundred thousand dollars ($100,000) per day of violation, or by imprisonment for not more than two (2) years, or both.

12. Penalties for Tampering or Falsification

In accordance with 327 IAC 5-2-8(10), the permittee shall comply with monitoring, recording, and reporting requirements of this permit. The Clean Water Act, as well as IC 13-30-10, provides that any person who falsifies, tampers with, or knowingly renders inaccurate any monitoring device or method required to be maintained under a permit shall, upon conviction, be punished by a fine of not more than ten thousand dollars ($10,000) per violation, or by imprisonment for not more than one hundred eighty (180) days per violation, or by both.

13. Toxic Pollutants

If any applicable effluent standard or prohibition (including any schedule of compliance specified in such effluent standard or prohibition) is established under Section 307(a) of the Clean Water Act for a toxic pollutant injurious to human health, and that standard or prohibition is more stringent than any limitation for such pollutant in this permit, this permit shall be modified or revoked and reissued to conform to the toxic effluent standard or prohibition in accordance with 327 IAC 5-2-8(5). Effluent standards or prohibitions established under Section 307(a) of the Clean Water Act for toxic pollutants injurious to human health are effective and must be complied with, if applicable to the permittee, within the time provided in the implementing regulations, even absent permit modification.

14. Operator Certification

The permittee shall have the wastewater treatment facilities under the responsible charge of an operator certified by the Commissioner in a classification corresponding to the classification of the wastewater treatment plant as required by IC 13-18-11-11 and 327 IAC 5-22. In order to operate a wastewater treatment plant the operator shall have qualifications as established in 327 IAC 5-22-7. The permittee shall designate one (1) person as the certified operator with complete responsibility for the proper operations of the wastewater facility.

327 IAC 5-22-10.5(a) provides that a certified operator may be designated as being in responsible charge of more than one (1) wastewater treatment plant, if it can be shown that he will give adequate supervision to all units involved. Adequate supervision means that sufficient time is spent at the plant on a regular basis to assure that the certified operator is knowledgeable of the actual operations and that test reports and results are representative of the actual operations conditions. In accordance with 327 IAC 5-22-3(11), "responsible charge" means the person responsible for the overall daily operation, supervision, or management of a wastewater facility.

Pursuant to 327 IAC 5-22-10(4), the permittee shall notify IDEM when there is a change of the person serving as the certified operator in responsible charge of the wastewater treatment facility. The notification shall be made no later than thirty (30) days after a change in the operator.

15. Construction Permit

Except in accordance with 327 IAC 3, the permittee shall not construct, install, or modify any water pollution treatment/control facility as defined in 327 IAC 3-1-2(24). Upon completion of any construction, the permittee must notify the Compliance Data Section of the Office of Water Quality in writing.

16. Inspection and Entry

In accordance with 327 IAC 5-2-8(8), the permittee shall allow the Commissioner, or an authorized representative, (including an authorized contractor acting as a representative of the Commissioner) upon the presentation of credentials and other documents as may be required by law, to:

a. Enter upon the permittee's premises where a point source, regulated facility, or activity is located or conducted, or where records must be kept pursuant to the conditions of this permit;

b. Have access to and copy, at reasonable times, any records that must be kept under the terms and conditions of this permit;

c. Inspect at reasonable times any facilities, equipment or methods (including monitoring and control equipment), practices, or operations regulated or required pursuant to this permit; and

d. Sample or monitor at reasonable times, any discharge of pollutants or internal wastestreams for the purposes of evaluating compliance with the permit or as otherwise authorized.

17. New or Increased Discharge of Pollutants

This permit prohibits the permittee from undertaking any action that would result in a new or increased discharge of a bioaccumulative chemical of concern (BCC) or a new or increased permit limit for a regulated pollutant that is not a BCC unless one of the following is completed prior to the commencement of the action:

a. Information is submitted to the Commissioner demonstrating that the proposed new or increased discharges will not cause a significant lowering of water quality as defined under 327 IAC 2-1.3-2(50). Upon review of this information, the Commissioner may request additional information or may determine that the proposed increase is a significant lowering of water quality and require the submittal of an antidegradation demonstration.

b. An antidegradation demonstration is submitted to and approved by the Commissioner in accordance with 327 IAC 2-1.3-5 and 327 IAC 2-1.3-6.

B. MANAGEMENT REQUIREMENTS

1. Facility Operation, Maintenance and Quality Control

a. In accordance with 327 IAC 5-2-8(9), the permittee shall at all times maintain in good working order and efficiently operate all facilities and systems (and related appurtenances) for collection and treatment that are:

(1) installed or used by the permittee; and

(2) necessary for achieving compliance with the terms and conditions of the permit.

Neither 327 IAC 5-2-8(9), nor this provision, shall be construed to require the operation of installed treatment facilities that are unnecessary for achieving compliance with the terms and conditions of the permit. Taking redundant treatment units off line does not violate the bypass provisions of the permit, provided that the permittee is at all times: maintaining in good working order and efficiently operating all facilities and systems; providing best quality effluent; and achieving compliance with the terms and conditions of the permit.

b. The permittee shall operate the permitted facility in a manner which will minimize upsets and discharges of excessive pollutants. The permittee shall properly remove and dispose of excessive solids and sludges.

c. The permittee shall provide an adequate operating staff which is duly qualified to carry out the operation, maintenance, and testing functions required to ensure compliance with the conditions of this permit.

d. Maintenance of all waste collection, control, treatment, and disposal facilities shall be conducted in a manner that complies with the bypass provisions set forth below.

e. Any extensions to the sewer system must continue to be constructed on a separated basis. Plans and specifications, when required, for extension of the sanitary system must be submitted to the Facility Construction and Engineering Support Section, Office of Water Quality in accordance with 327 IAC 3-2-2. There shall also be an ongoing preventative maintenance program for the sanitary sewer system.

2. Bypass of Treatment Facilities

Pursuant to 327 IAC 5-2-8(12):

a. Terms as defined in 327 IAC 5-2-8(12)(A):

(1) "Bypass" means the intentional diversion of a waste stream from any portion of a treatment facility.

(2) "Severe property damage" means substantial physical damage to property, damage to the treatment facilities which would cause them to become inoperable, or substantial and permanent loss of natural resources which can reasonably be expected to occur in the absence of a bypass. Severe property damage does not mean economic loss caused by delays in production.

b. Bypasses, as defined above, are prohibited, and the Commissioner may take enforcement action against a permittee for bypass, unless:

(1) The bypass was unavoidable to prevent loss of life, personal injury, or severe property damage, as defined above;

(2) There were no feasible alternatives to the bypass, such as the use of auxiliary treatment facilities, retention of untreated wastes, or maintenance during normal periods of equipment downtime. This condition is not satisfied if adequate back-up equipment should have been installed in the exercise of reasonable engineering judgment to prevent a bypass that occurred during normal periods of equipment downtime or preventive maintenance; and

(3) The permittee submitted notices as required under Part II.B.2.d; or

(4) The condition under Part II.B.2.f below is met.

c. Bypasses that result in death or acute injury or illness to animals or humans must be reported in accordance with the "Spill Response and Reporting Requirements" in 327 IAC 2-6.1, including calling 888/233-7745 as soon as possible, but within two (2) hours of discovery. However, under 327 IAC 2-6.1-3(1), when the constituents of the bypass are regulated by this permit, and death or acute injury or illness to animals or humans does not occur, the reporting requirements of 327 IAC 2-6.1 do not apply.

d. The permittee must provide the Commissioner with the following notice:

(1) If the permittee knows or should have known in advance of the need for a bypass (anticipated bypass), it shall submit prior written notice. If possible, such notice shall be provided at least ten (10) days before the date of the bypass for approval by the Commissioner.

(2) The permittee shall orally report or fax a report of an unanticipated bypass within 24 hours of becoming aware of the bypass event. The permittee must also provide a written report within five (5) days of the time the permittee becomes aware of the bypass event. The written report must contain a description of the noncompliance (i.e. the bypass) and its cause; the period of noncompliance, including exact dates and times; if the cause of noncompliance has not been corrected, the anticipated time it is expected to continue; and steps taken or planned to reduce, eliminate and prevent recurrence of the bypass event. If a

complete fax or email submittal is sent within 24 hours of the time that the permittee became aware of the unanticipated bypass event, then that report will satisfy both the oral and written reporting requirement.

e. The Commissioner may approve an anticipated bypass, after considering its adverse effects, if the Commissioner determines that it will meet the conditions listed above in Part II.B.2.b. The Commissioner may impose any conditions determined to be necessary to minimize any adverse effects.

f. The permittee may allow any bypass to occur that does not cause a violation of the effluent limitations in the permit, but only if it also is for essential maintenance to assure efficient operation. These bypasses are not subject to the provisions of Part II.B.2.b.,d and e of this permit.

3. Upset Conditions

Pursuant to 327 IAC 5-2-8(13):

a. "Upset" means an exceptional incident in which there is unintentional and temporary noncompliance with technology-based permit effluent limitations because of factors beyond the reasonable control of the permittee. An upset does not include noncompliance to the extent caused by operational error, improperly designed treatment facilities, inadequate treatment facilities, lack of preventive maintenance, or careless or improper operation.

b. An upset shall constitute an affirmative defense to an action brought for noncompliance with such technology-based permit effluent limitations if the requirements of Paragraph c of this subsection, are met.

c. A permittee who wishes to establish the affirmative defense of upset shall demonstrate, through properly signed, contemporaneous operating logs or other relevant evidence, that:

(1) An upset occurred and the permittee has identified the specific cause(s) of the upset;

(2) The permitted facility was at the time being operated in compliance with proper operation and maintenance procedures;

(3) The permittee complied with any remedial measures required under "Duty to Mitigate", Part II.A.2; and

(4) The permittee submitted notice of the upset as required in the "Incident Reporting Requirements," Part II.C.3, or 327 IAC 2-6.1, whichever is applicable. However, under 327 IAC 2-6.1-3(1), when the constituents of the discharge are regulated by this permit, and death or acute injury or illness to animals or humans does not occur, the reporting requirements of 327 IAC 2-6.1 do not apply.

d. In any enforcement proceeding, the permittee seeking to establish the occurrence of an upset has the burden of proof pursuant to 40 CFR 122.41(n)(4).

4. Removed Substances

Solids, sludges, filter backwash, or other pollutants removed from or resulting from treatment or control of wastewaters shall be disposed of in a manner such as to prevent any pollutant from such materials from entering waters of the State and to be in compliance with all Indiana statutes and regulations relative to liquid and/or solid waste disposal.

a. Collected screenings, slurries, sludges, and other such pollutants shall be disposed of in accordance with provisions set forth in 329 IAC 10, 327 IAC 6.1, or another method approved by the Commissioner.

b. The permittee shall comply with existing federal regulations governing solids disposal, and with applicable provisions of 40 CFR Part 503, the federal sludge disposal regulation standards.

c. The permittee shall notify the Commissioner prior to any changes in sludge use or disposal practices.

d. The permittee shall maintain records to demonstrate its compliance with the above disposal requirements.

5. Power Failures

In accordance with 327 IAC 5-2-10 and 327 IAC 5-2-8(14) in order to maintain compliance with the effluent limitations and prohibitions of this permit, the permittee shall either:

a. provide an alternative power source sufficient to operate facilities utilized by the permittee to maintain compliance with the effluent limitations and conditions of this permit, or

b. shall halt, reduce or otherwise control all discharge in order to maintain compliance with the effluent limitations and conditions of this permit upon the reduction, loss, or failure of one or more of the primary sources of power to facilities utilized by the permittee to maintain compliance with the effluent limitations and conditions of this permit.

6. Unauthorized Discharge

Any overflow or release of sanitary wastewater from the wastewater treatment facilities or collection system that results in a discharge to waters of the state and is not specifically authorized by this permit is expressly prohibited. These discharges are subject to the reporting requirements in Part II.C.3 of this permit.

C. REPORTING REQUIREMENTS

1. Planned Changes in Facility or Discharge

Pursuant to 327 IAC 5-2-8(11)(F) and 5-2-16(d), the permittee shall give notice to the Commissioner as soon as possible of any planned alterations or additions to the facility (which includes any point source) that could significantly change the nature of, or increase the quantity of, pollutants discharged. Following such notice, the permit may be modified to revise existing pollutant limitations and/or to specify and limit any pollutants not previously limited. Material and substantial alterations or additions to the permittee's operation that were not covered in the permit (e.g., production changes, relocation or combination of discharge points, changes in the nature or mix of products produced) are also cause for modification of the permit. However those alterations which constitute total replacement of the process or the production equipment causing the discharge converts it into a new source, which requires the submittal of a new NPDES application.

2. Monitoring Reports

Pursuant to 327 IAC 5-2-8(10), 327 IAC 5-2-13, and 327 IAC 5-2-15, monitoring results shall be reported at the intervals and in the form specified in "Data On Plant Operation", Part I.B.2.

3. Incident Reporting Requirements

Pursuant to 327 IAC 5-2-8(11) and 327 IAC 5-1-3, the permittee shall orally report to the Commissioner information on the following incidents within 24 hours from the time permittee becomes aware of such occurrence. If the incident meets the emergency criteria of item b (Part II.C.3.b) or 327 IAC 2-6.1, then the report shall be made as soon as possible, but within two (2) hours of discovery. However, under 327 IAC 2-6.1-3(1), when the constituents of the discharge are regulated by this permit, and death or acute injury or illness to animals or humans does not occur, the reporting requirements of 327 IAC 2-6.1 do not apply.

a. Any unanticipated bypass which exceeds any effluent limitation in the permit;

b. Any emergency incident which may pose a significant danger to human health or the environment. Reports under this item shall be made as soon as the permittee becomes aware of the incident by calling 317/233-7745 (888/233-7745 toll free in Indiana). This number should only be called when reporting these emergency events;

c. Any upset (as defined in Part II.B.3 above) that exceeds any technology-based effluent limitations in the permit;

d. Any release, including basement backups, from the sanitary sewer system (including satellite sewer systems operated or maintained by the permittee) not specifically authorized by this permit. Reporting of known releases from private laterals not caused by a problem in the sewer system owned or operated by the permittee is not

required under Part II.C.3, however, documentation of such events must be maintained by the permittee and available for review by IDEM staff.

e. Any discharge from any outfall from which discharge is explicitly prohibited by this permit as well as any discharge from any other outfall or point not listed in this permit; or

f. Violation of a maximum daily discharge limitation for any of the following toxic pollutants: mercury and/or cyanide.

The permittee can make the oral reports by calling 317/232-8670 during regular business hours. A written submission shall also be provided within five (5) days of the time the permittee becomes aware of the circumstances. For incidents involving effluent limit violations or discharges, the written submission shall contain: a description of the event and its cause; the period of occurrence, including exact dates and times, and, if the event has not concluded, the anticipated time it is expected to continue; and steps taken or planned to reduce, mitigate and eliminate the event and steps taken or planned to prevent its recurrence. For sewer releases which do not meet the definition of a discharge, the written submission shall contain: a description of the event and its believed cause; the period of occurrence; and any steps taken or planned to mitigate the event and steps taken or planned to prevent its recurrence. The permittee may submit a "Bypass Overflow/Incident Report" or a "Noncompliance Notification Report", whichever is applicable, to IDEM at 317/232-8637 or 317/232-8406 or to wwreports@idem.IN.gov. If a complete fax or email submittal is sent within 24 hours of the time that the permittee became aware of the occurrence, then that report will satisfy both the oral and written reporting requirements.

4. Other Noncompliance

Pursuant to 327 IAC 5-2-8(11)(D), the permittee shall report any instance of noncompliance not reported under the "Incident Reporting Requirements" in Part II.C.3 at the time the pertinent Discharge Monitoring Report is submitted. The written submission shall contain: a description of the noncompliance and its cause; the period of noncompliance, including exact dates and times, and, if the noncompliance has not been corrected, the anticipated time it is expected to continue; and steps taken or planned to reduce, eliminate and prevent the noncompliance.

5. Other Information

Pursuant to 327 IAC 5-2-8(11)(E), where the permittee becomes aware that it failed to submit any relevant facts or submitted incorrect information in a permit application or in any report to the Commissioner, the permittee shall promptly submit such facts or corrected information to the Commissioner.

6. Signatory Requirements

Pursuant to 327 IAC 5-2-22 and 327 IAC 5-2-8(15):

a. All reports required by the permit and other information requested by the Commissioner shall be signed and certified by a person described below or by a duly authorized representative of that person:

(1) For a corporation: by a principal executive defined as a president, secretary, treasurer, any vice-president of the corporation in charge of a principal business function, or any other person who performs similar policy-making functions for the corporation or the manager of one or more manufacturing, production, or operating facilities employing more than two hundred fifty (250) persons or having gross annual sales or expenditures exceeding twenty-five million dollars ($25,000,000) (in second quarter 1980 dollars), if authority to sign documents has been assigned or delegated to the manager in accordance with corporate procedures.

(2) For a partnership or sole proprietorship: by a general partner or the proprietor, respectively; or

(3) For a federal, state, or local governmental body or any agency or political subdivision thereof: by either a principal executive officer or ranking elected official.

b. A person is a duly authorized representative only if:

(1) The authorization is made in writing by a person described above.

(2) The authorization specifies either an individual or a position having responsibility for the overall operation of the regulated facility or activity, such as the position of plant manager, operator of a well or a well field, superintendent, or position of equivalent responsibility. (A duly authorized representative may thus be either a named individual or any individual occupying a named position.); and

(3) The authorization is submitted to the Commissioner.

c. Certification. Any person signing a document identified under paragraphs a and b of this section, shall make the following certification:

"I certify under penalty of law that this document and all attachments were prepared under my direction or supervision in accordance with a system designed to assure that qualified personnel properly gather and evaluate the information submitted. Based on my inquiry of the person or persons who manage the system, or those persons directly responsible for gathering the information, the information submitted is, to the best of

my knowledge and belief, true, accurate, and complete. I am aware that there are significant penalties for submitting false information, including the possibility of fine and imprisonment for knowing violations."

7. Availability of Reports

Except for data determined to be confidential under 327 IAC 12.1, all reports prepared in accordance with the terms of this permit shall be available for public inspection at the offices of the Indiana Department of Environmental Management and the Regional Administrator. As required by the Clean Water Act, permit applications, permits, and effluent data shall not be considered confidential.

8. Penalties for Falsification of Reports

IC 13-30 and 327 IAC 5-2-8(15) provides that any person who knowingly makes any false statement, representation, or certification in any record or other document submitted or required to be maintained under this permit, including monitoring reports or reports of compliance or noncompliance, shall, upon conviction, be punished by a fine of not more than $10,000 per violation, or by imprisonment for not more than 180 days per violation, or by both.

9. Progress Reports

In accordance with 327 IAC 5-2-8(11)(A), reports of compliance or noncompliance with, or any progress reports on, interim and final requirements contained in any compliance schedule of this permit shall be submitted no later than fourteen (14) days following each schedule date.

10. Advance Notice for Planned Changes

In accordance with 327 IAC 5-2-8(11)(B), the permittee shall give advance notice to IDEM of any planned changes in the permitted facility, any activity, or other circumstances that the permittee has reason to believe may result in noncompliance with permit requirements.

11. Additional Requirements for POTWs and/or Treatment Works Treating Domestic Sewage

a. All POTWs shall identify, in terms of character and volume of pollutants, any significant indirect discharges into the POTW which are subject to pretreatment standards under section 307(b) and 307 (c) of the CWA.

b. All POTWs must provide adequate notice to the Commissioner of the following:

(1) Any new introduction of pollutants into the POTW from an indirect discharger that would be subject to section 301 or 306 of the CWA if it were directly discharging those pollutants.

(2) Any substantial change in the volume or character of pollutants being introduced into that POTW by any source where such change would render the source subject to pretreatment standards under section 307(b) or 307(c) of the CWA or would result in a modified application of such standards.

As used in this clause, "adequate notice" includes information on the quality and quantity of effluent introduced into the POTW, and any anticipated impact of the change on the quantity or quality of the effluent to be discharged from the POTW.

c. This permit incorporates any conditions imposed in grants made by the U.S. EPA and/or IDEM to a POTW pursuant to Sections 201 and 204 of the Clean Water Act, that are reasonably necessary for the achievement of effluent limitations required by Section 301 of the Clean Water Act.

d. This permit incorporates any requirements of Section 405 of the Clean Water Act governing the disposal of sewage sludge from POTWs or any other treatment works treating domestic sewage for any use for which rules have been established in accordance with any applicable rules.

e. POTWs must develop and submit to the Commissioner a POTW pretreatment program when required by 40 CFR 403 and 327 IAC 5-19-1, in order to assure compliance by industrial users of the POTW with applicable pretreatment standards established under Sections 307(b) and 307(c) of the Clean Water Act. The pretreatment program shall meet the criteria of 327 IAC 5-19-3 and, once approved, shall be incorporated into the POTW's NPDES permit.

D. ADDRESSES

1. Municipal NPDES Permits Section

Indiana Department of Environmental Management
Office of Water Quality – Mail Code 65-42
Municipal NPDES Permits Section
100 N. Senate Avenue
Indianapolis, Indiana 46204-2251

The following correspondence shall be sent to the Municipal NPDES Permits Section:

a. NPDES permit applications (new, renewal or modifications) with fee

b. Preliminary Effluent Limits request letters

c. Comment letters pertaining to draft NPDES permits

d. NPDES permit transfer of ownership requests

e. NPDES permit termination requests

f. Notifications of substantial changes to a treatment facility, including new industrial sources

g. Combined Sewer Overflow (CSO) Operational Plans

h. CSO Long Term Control Plans (LTCP)

i. Stream Reach Characterization and Evaluation Reports (SRCER)

2. Facility Construction and Engineering Support Section

Indiana Department of Environmental Management
Office of Water Quality – Mail Code 65-42
Facility Construction and Engineering Support Section
100 N. Senate Avenue
Indianapolis, Indiana 46204-2251

The following correspondence shall be sent to the Facility Construction and Engineering Support Section:

a. Construction permit applications with fee

3. Compliance Data Section

Indiana Department of Environmental Management
Office of Water Quality – Mail Code 65-42
Compliance Data Section
100 N. Senate Avenue
Indianapolis, Indiana 46204-2251

The following correspondence shall be sent to the Compliance Data Section:

a. Discharge Monitoring Reports (DMRs)

b. Monthly Reports of Operation (MROs)

c. Monthly Monitoring Reports (MMRs)

d. CSO MROs

e. Gauging station and flow meter calibration documentation

f. Compliance schedule progress reports

g. Completion of Construction notifications

h. Whole Effluent Toxicity Testing reports

i. Toxicity Reduction Evaluation (TRE) plans and progress reports

j. Bypass/Overflow Reports

k. Anticipated Bypass/Overflow Reports

l. Streamlined Mercury Variance Annual Reports

4. Pretreatment Group

Indiana Department of Environmental Management
Office of Water Quality – Mail Code 65-42
Compliance Data Section – Pretreatment Group
100 N. Senate Avenue
Indianapolis, Indiana 46204-2251

The following correspondence shall be sent to the Pretreatment Group:

a. Organic Pollutant Monitoring Reports

b. Significant Industrial User (SIU) Quarterly Noncompliance Reports

c. Pretreatment Program Annual Reports

d. Sewer Use Ordinances

e. Enforcement Response Plans (ERP)

f. Sludge analytical results

PART III

REQUIREMENT TO OPERATE A PRETREATMENT PROGRAM

A. CONDITIONS

The permittee, hereinafter referred to as the "Control Authority," is required to operate its approved industrial pretreatment program approved on **February 14, 1986**, and any subsequent modifications approved up to the issuance of this permit. To ensure the program is operated as approved and consistent with 327 IAC 5-16 through 5-21, the following conditions and reporting requirements are hereby established. The Control Authority (CA) shall:

1. Legal Authority

   The CA shall develop, enforce and maintain adequate legal authority in its Sewer Use Ordinance (SUO) to fully implement the pretreatment program in compliance with State and local law. As part of this requirement, the CA shall develop and maintain local limits as necessary to implement the prohibitions and standards in 327 IAC 5-18.

2. Permit Issuance

   In accordance with 327 IAC 5-19-3(1) the CA is required to issue/reissue permits to Significant Industrial User(s) (SIU) as stated in the SUO. The CA must issue permits to new SIUs prior to the commencement of discharge. A SIU is defined in the 40 CFR 403.3(v).

3. Industrial Compliance Monitoring

   The CA is required to conduct inspection, surveillance, and monitoring activities to determine SIU compliance status with the approved program and the SUO independent of data supplied by the SIU. SIU compliance monitoring performed by the CA will be conducted in accordance with the program plan or yearly program plan. SIUs will be inspected once per year, at a minimum.

4. Enforcement

   The CA is required to initiate the appropriate enforcement action against a SIU violating any provision of the SUO and/or discharge permit in accordance with the Enforcement Response Procedures (ERP) adopted by the CA. The CA must investigate violations by collecting and analyzing samples and collecting other information with sufficient care to produce evidence admissible in enforcement proceedings or in judicial actions in accordance with 40 CFR 403.8(f)(1)(iii) and 327 IAC 5-19-3(1)(F).

5. SIU Quarterly Noncompliance Report

The CA is required to report the compliance status of each SIU quarterly. The report is due by the 28th of the following months: April, July, October, and January of each year. The report shall include a description of corrective actions that have or will be taken by the CA and SIU to resolve the noncompliance situations. This report is to be sent to the Compliance Branch of the Office of Water Quality.

6. Public Participation and Annual Publishing of SIUs in Significant Noncompliance

The CA is required to comply with the public participation requirements under 40 CFR 25 and 327 IAC 5-19-3(2)(L). The CA must publish annually, by January 28, in the largest daily newspaper in the area, a list of SIUs that have been in Significant Noncompliance (SNC) with the SUO during the calendar year. The CA shall include in the ANNUAL REPORT a list of the SIUs published along with the newspaper clipping.

6. Industrial User Survey

The CA shall prepare and maintain a list of its Industrial Users meeting the criteria in 40 CFR 403.3(v)(1). The list shall identify the criteria in 40 CFR 403.3(v)(1) applicable to each Industrial User and where applicable, shall also indicate whether the CA has made a determination pursuant to 40 CFR 403.3(v)(2) that such Industrial User should not be considered a Significant Industrial User. Modifications to the list shall be submitted to the Approval Authority pursuant to 40 CFR 403.12(i)(1).

7. Annual Report

The CA is required to submit an annual report to the Pretreatment Group and EPA Region 5 by April 1, of each year. The CA shall also include a copy of the updated industrial user survey list. The annual report will be submitted in accordance with 40 CFR 403.12(i) to the following addresses:

Pretreatment Program Manager
U.S. EPA Region 5, WN-16J
NPDES Programs Branch
77 W. Jackson Blvd.
Chicago, IL 60604

Indiana Department of Environmental Management
Office of Water Quality - Mail Code 65-42
Compliance Data Section – Pretreatment Group
100 North Senate Avenue
Indianapolis, IN 46204-2251

8. Records Retention

Pursuant to 327 IAC 5-16-5.3(b), the CA shall retain any pretreatment reports from an industrial user a minimum of three (3) years and shall make such reports available for inspection and copying by IDEM or the U.S. EPA. This period of retention shall be extended during the course of any unresolved litigation regarding the discharge of pollutants by the industrial user, the operation of the POTW pretreatment program or when requested by IDEM or the U.S. EPA.

9. Confidentiality

The CA is required to comply with all confidentiality requirements set forth in 40 CFR 403.14, as well as the procedures established in the SUO.

10. Program Resources

Pursuant to 327 IAC 5-19-3(3), The CA shall maintain sufficient resources and qualified personnel to carry out the pretreatment program requirements.

11. Interjurisdictional Agreements

The CA must maintain sufficient legal authority to ensure compliance with all applicable pretreatment limits and requirements by all SIUs discharging to the POTW, including SIUs within governmental jurisdictions outside the immediate jurisdiction of the POTW. The CA must maintain the interjurisdictional agreements necessary to ensure full compliance by SIUs located within other jurisdictions as discussed in 40 CFR 403.8(f)(1).

12. POTW Pretreatment Program Revision Requirements

No later than 6 months after the effective date of this permit, the permittee shall re-evaluate its SUO to determine whether it provides adequate legal authority to fully implement the pretreatment program. Any modifications to the permittee's SUO shall be consistent with U.S. EPA's EPA Model Pretreatment Ordinance, available at: http://cfpub.epa.gov/npdes/docs.cfm?program_id=3&view=allprog&sort=name#model_ordinance.

In addition, the re-evaluation must include a technical re-evaluation of the local limits in accordance with 40 CFR 122.44(j)(2)(ii). The CA is to conduct the local limitations technical evaluation consistent with U.S. EPA's Local Limits Development Guidance (July 2004) document and U.S. EPA Region 5 Local Limits Spreadsheet (February 2011)

available at: http://www.epa.gov/r5water/npdestek/npdprta.htm. The permittee shall submit these re-evaluations to U.S. EPA Region 5 and IDEM Pretreatment Group for review and approval.

13. Program Modification

Pursuant to 327 IAC 5-19-6 and 40 CFR 403.18, any significant proposed program modification shall be submitted to the Pretreatment Group and the U.S. EPA for approval. A significant modification shall include, but not be limited to, any change in the SUO, major modification in the approval program's administrative procedures, a significant reduction in monitoring procedures, a significant change in the financial/revenue system, a significant change in the local limitations contained in the SUO, and a change in the industrial user survey.

NOTE: A summary of the revisions to the General Pretreatment Regulations (40 CFR 403) is available from the Pretreatment Group of the Compliance Data Section.

ATTACHMENT A

Precipitation Related Combined Sewer Overflow Discharge Authorization Requirements

I. Discharge Authorization

A. Combined Sewer Overflows are point sources subject to both technology-based and water quality-based requirements of the Clean Water Act and state law. The permittee is authorized to have wet weather discharges from outfall(s) listed below subject to the requirements and provisions of this permit, including Attachment A.

Outfall	Location	Receiving Water
002	Michigan Avenue CSO 41° 38' 56" N 87° 27' 54" W	Indiana Harbor Ship Canal
003	Alder Street Lift Station 41° 36' 48" N 87° 25' 57" W	Grand Calumet River
005	Magoun CSO Lagoon 41° 36' 59" N 87° 28' 46" W	Grand Calumet River

B. At all times the discharge from any and all CSO outfalls herein shall not cause receiving waters:

1. including the mixing zone, to contain substances, materials, floating debris, oil, scum, or other pollutants:
   a. that will settle to form putrescent or otherwise objectionable deposits;
   b. that are in amounts sufficient to be unsightly or deleterious;
   c. that produce color, visible oil sheen, odor, or other conditions in such a degree as to create a nuisance;
   d. which are in amounts sufficient to be acutely toxic to, or otherwise severely injure or kill aquatic life, other animals, plants, or humans;
   e. which are in concentrations or combinations that will cause or contribute to the growth of aquatic plants or algae to such a degree as to create a nuisance, be unsightly, or otherwise impair the designated uses.
2. outside the mixing zone, to contain substances in concentrations which on the basis of available scientific data are believed to be sufficient to injure, be chronically toxic to, or be carcinogenic, mutagenic, or teratogenic to humans, animals, aquatic life, or plants.

C. Dry weather discharges from any portion of the sewer collection system, except WWTP outfall No. 001, are prohibited. If such a prohibited discharge should occur, the permittee is required to report the discharge in accordance with the provisions in Part II.C.3 of this permit.

II. Monitoring and Reporting Requirements

The permittee shall complete and submit accurate monitoring reports to the Indiana Department of Environmental Management. The permittee shall submit data specified on the CSO Monthly Report of Operation (MRO) for untreated CSO events (State Form 50546 (R3/7-13)), including but not limited to, WWTP data, precipitation data, and performance data for all discharges from untreated CSO Outfalls identified in Part I of this Attachment A. Submitted CSO MROs shall contain results obtained during each month (a monitoring period) and shall be postmarked no later than 28 days following each completed monitoring period.

All reports shall be mailed to IDEM, Office of Water Quality – Mail Code 65-42, Compliance Data Section, 100 North Senate Ave., Indianapolis, Indiana 46204-2251. Please note that IDEM will no longer accept paper DMR or MRO forms after December 31, 2016. After that date all NPDES permit holders will be required to submit their monitoring data to IDEM using NetDMR. Electronically submitted reports (using NetDMR) have the same deadline as mailed reports.

III. CSO Operational Plan

A. The permittee shall comply with the following minimum technology-based controls, in accordance with EPA's National CSO Control Policy:

1. The permittee shall implement proper operation and regular maintenance programs for the sewer system and the CSOs. The purpose of the operation and maintenance programs is to reduce the magnitude, frequency and duration of CSOs. The programs shall consider regular sewer inspections; sewer, catch basin, and regulator cleaning; equipment and sewer collection system repair or replacement, where necessary; and disconnection of illegal connections.
2. The permittee shall implement procedures that will maximize the use of collection system for wastewater storage that can be accommodated by the storage capacity of the collection system in order to reduce the magnitude, frequency and duration of CSOs.
3. The permittee shall review and modify, as appropriate, its existing pretreatment program to minimize CSO impacts from non-domestic users. The permittee shall identify all industrial users that discharge to the collection system upstream of any CSO outfalls; this identification shall also include the pollutants in the industrial user's wastewater and the specific CSO outfall(s) that are likely to discharge the wastewater.
4. The permittee shall operate the POTW at the maximum treatable flow during all wet weather flow conditions to reduce the magnitude, frequency and duration of CSOs. The permittee shall deliver all flows to the treatment plant within the

constraints of the treatment capacity of the POTW.

5. Dry weather overflows from CSO outfalls are prohibited. Each dry weather overflow must be reported to IDEM as soon as the permittee becomes aware of the overflow. When the permittee detects a dry weather overflow, it shall begin corrective action immediately. The permittee shall inspect the dry weather overflow each subsequent day until the overflow has been eliminated.
6. The permittee shall implement measures to control solid and floatable materials in CSO discharges.
7. The permittee shall implement a pollution prevention program focused on reducing the impact of CSOs on receiving waters.
8. The permittee shall implement a public notification process to inform citizens of when and where CSO discharges occur and their impacts. This notification must also be done in accordance with 327 IAC 5-2.1.
9. The permittee shall monitor to effectively characterize CSO impacts and the efficacy of CSO controls.

B. The permittee's implementation of each of the minimum controls in Part III.A of this Attachment A shall be documented in its approved CSO Operational Plan (CSOOP). The permittee shall update the CSOOP, as necessary, to reflect changes in its operation or maintenance practices; changes to measures taken to implement the above minimum requirements; and changes to the treatment plant or collection system, including changes in collection system flow characteristics, collection system or WWTP capacity or discharge characteristics (including volume, duration, frequency and pollutant concentration). All updates to the CSOOP must be submitted to IDEM, Office of Water Quality, Municipal NPDES Permits Section for approval.

The CSOOP update(s) shall include a summary of the proposed revisions to the CSOOP as well as a reference to the page(s) that have been modified. Any CSOOP updates shall not result in:

1. a lower amount of flow being sent to and through the plant for treatment, or
2. more discharges (measured either by volume, duration, frequency, or pollutant concentration) occurring from the CSO outfalls.

The permittee shall maintain a current CSO Operational Plan, including all approved updates, on file at the POTW.

IV. Sewer Use Ordinance Review/Revision and Enforcement

The permittee's Sewer Use Ordinance must contain provisions which: (1) prohibit introduction of inflow sources to any sanitary sewer; (2) prohibit construction of new combined sewers outside of the existing combined sewer service area; and (3) provide that for any new building the inflow/clear water connection to a combined sewer shall be made separate and distinct from sanitary waste connection to facilitate disconnection of the former if a separate storm sewer subsequently becomes available. The permittee shall continuously enforce these provisions.

V. Reopening Clauses

A. This permit may be reopened to address changes in the EPA National CSO Policy or state or federal law.

B. The permit may be reopened, after public notice and opportunity for hearing, to incorporate applicable provisions of IC 13-18.

Fact Sheet
February 2016
Updated: June 2016

East Chicago Sanitary District Wastewater Treatment Plant
located at 5201 Indianapolis Boulevard, East Chicago, Indiana, Lake County

Outfall 001 Location	Latitude:	41° 36' 54" N
	Longitude:	87° 28' 14" W

NPDES Permit No. IN0022829

Background

This is the proposed renewal of the NPDES permit for the East Chicago Sanitary District Wastewater Treatment Plant which was issued on June 24, 2011, and has an expiration date of June 30, 2016. The permittee submitted an application for renewal which was received on January 29, 2016. During the public comment period two comment letters were received by this Office. The comments received and this Office's corresponding responses are included in the "Post Public Notice Addendum" section of this Fact Sheet.

The permittee currently operates a Class IV, 15 MGD treatment facility consisting of mechanical bar screens, preliminary grit removal, an influent flow meter, two (2) oxidation ditches, five (5) clarifiers, six (6) rapid sand filters, post aeration, ultraviolet light disinfection, phosphorus removal by ferric sulfate, and an effluent flow meter. Sludge is gravity thickened, belt filter press dewatered and disposed of at a landfill.

Collection System

The collection system is comprised of combined sanitary and storm sewers with three (3) Combined Sewer Overflow (CSO) locations. The facility is served by a sewer system that has 72 miles of sewers that includes both combined and separate sanitary sewers. Approximately 92% of the sewer system is combined sanitary and storm sewer. The CSO locations have been identified and permitted with provisions in Attachment A of the permit.

CSO Statutory or Regulatory Basis for Permit Provisions

CSOs are point sources subject to NPDES permit requirements, including both technology-based and water quality-based requirements of the CWA and state law. Thus the permit contains provisions IDEM deems necessary to meet water quality standards, as well as technology-based treatment requirements, operation and maintenance requirements, and best management practices. This permit is based on various provisions of state and federal law, including (1) Title 13 of the Indiana Code; (2) the water quality standards set forth in 327 IAC 2-1.5; (3) the NPDES rules set forth in 327 IAC 2 and 327 IAC 5, including 327 IAC 5-2-8 and 327 IAC 5-2-10; and (4) section 402(q) of the CWA (33 USC § 1342), which requires all permits or orders issued for discharges from municipal CSOs to conform with the provisions of EPA's National CSO Control

Policy (58 Fed. Reg. 18688, April 19, 1994). EPA's CSO Policy contains provisions that, among other things, require permittees to develop and implement minimum technological and operational controls and long term control plans to meet state water quality standards. The permit's penalty provisions are based in large part on IC 13-30. In addition to the regulatory provisions previously cited, the data collection and reporting requirements are based in part on 327 IAC 5-1-3, 327 IAC 5-2-13 and section 402(q) of the CWA.

Explanation of Effluent Limitations and Conditions

The effluent limitations set forth in Part I of Attachment A are derived in part from the narrative water quality standards set forth in 327 IAC 2-1.5-8. The narrative standards are minimum standards that apply to all waters at all times, and therefore are applicable to all discharges of pollutants. Because EPA has not issued national effluent limitation guidelines for this category of discharges, the technology-based BAT/BCT provisions are based on best professional judgment (BPJ) in addition to section 402(q) of the CWA. (CSO discharges are not subject to the secondary treatment requirements applicable to publicly owned treatment works because overflow points have been determined to not be part of the treatment plant. Montgomery Environmental Coalition v. Costle, 646 F.2d 568 (D.C. Cir. 1980).)

CSO Long-Term Control Plan

East Chicago is currently implementing their approved CSO Long Term Control Plan (LTCP). The LTCP involves the elimination of Outfall 002 by separating sewers in the Michigan Avenue drainage area. Discharges from Outfall 003 up to and including the 10 year, 1 hour event will be transported to the CSO Lagoon at the Wastewater Treatment Plant (WWTP) for storage. Stored combined sewage in the CSO Lagoon will be returned to the WWTP for full treatment once WWTP capacity is available. If a discharge from CSO 005 is necessary, the flow will receive a minimum of primary treatment and disinfection prior to discharge. An itemized list of projects and estimated costs are identified in Table 6-1 of the LTCP.

The LTCP proposes an implementation schedule of 20 years and is expected to result in the following statistical level of control:

- Wet-weather flows up to and including the 1 year, 1 hour storm will receive full treatment at the WWTP.
- Wet-weather flows greater than the 1 year, 1 hour storm will receive a minimum of primary treatment and disinfection by the CSO Lagoon prior to discharge.
- There will be no untreated CSO discharges caused by wet-weather flows up to and including the 10 year, 1 hour storm.
- Flows greater than the 10 year, 1 hour storm will receive treatment to the greatest extent possible.

Full LTCP implementation is anticipated to be completed in 2032. The implementation schedule is enforced through Agreed Judgment Cause No. 45D02-0710-CC-85.

Spill Reporting Requirements

Reporting requirements associated with the Spill Reporting, Containment, and Response requirements of 327 IAC 2-6.1 are included in Part II.B.2.c. and Part II.C.3. of the NPDES permit. Spills from the permitted facility meeting the definition of a spill under 327 IAC 2-6.1-4(15), the applicability requirements of 327 IAC 2-6.1-1, and the Reportable Spills requirements of 327 IAC 2-6.1-5 (other than those meeting an exclusion under 327 IAC 2-6.1-3 or the criteria outlined below) are subject to the Reporting Responsibilities of 327 IAC 2-6.1-7.

It should be noted that the reporting requirements of 327 IAC 2-6.1 do not apply to those discharges or exceedences that are under the jurisdiction of an applicable permit when the substance in question is covered by the permit and death or acute injury or illness to animals or humans does not occur. In order for a discharge or exceedence to be under the jurisdiction of this NPDES permit, the substance in question (a) must have been discharged in the normal course of operation from an outfall listed in this permit, and (b) must have been discharged from an outfall for which the permittee has authorization to discharge that substance.

Solids Disposal

The permittee is required to dispose of its sludge in accordance with 329 IAC 10, 327 IAC 6.1, or 40 CFR Part 503.

Receiving Stream

The facility discharges to the West Branch Grand Calumet River via Outfall 001. The receiving water is located within the Lake Michigan drainage basin. The receiving water has a seven day, ten year low flow ($Q_{7,10}$) of 0.0 cubic feet per second at the outfall location. The receiving stream is designated for full body contact recreational use and shall be capable of supporting a well-balanced warm water aquatic community in accordance with 327 IAC 2-1.5-5.

The West Branch Grand Calumet River is on the 2012 303(d) list for ammonia, dissolved oxygen, *E. coli*, impaired biotic communities, nutrients, and PCBs in fish tissue.

Industrial Contributions

The permittee accepts industrial flow from Electric Coatings Technologies, W.R. Grace Conn, TAC East, Inc., USS Lead Remediation CAMU, Central States, Green Lake Tubing, National Processing, ICO Polymers, United Transportation Group, Praxair Inc., Kemira Water Solutions, ArcelorMittal, Safety-Kleen Systems, Inc., US Steel Corp., US Gypsum, Buckeye Pipeline Co. and Tradebe. Based on the industrial flow received by the treatment facility, the permittee is required to operate its approved industrial pretreatment program approved on February 14, 1986. Provisions for the industrial pretreatment program are included in Part III of this permit renewal. In addition, monitoring requirements and/or effluent limitations for cadmium, chromium, copper, cyanide, lead, mercury, nickel, zinc, chloride, and sulfate are being included in the permit renewal. Additionally, two (2) times yearly whole effluent toxicity testing is required.

Antidegradation

327 IAC 2-1.3 outlines the state's Antidegradation Standards and Implementation Procedures. The Tier 1 antidegradation standard found in 327 IAC 2-1.3-3(a) applies to all surface waters of the state regardless of their existing water quality. Based on this standard, for all surface waters of the state, existing uses and the level of water quality necessary to protect existing uses shall be maintained and protected. IDEM implements the Tier 1 antidegradation standard by requiring NPDES permits to contain effluent limits and best management practices for regulated pollutants that ensure the narrative and numeric water quality criteria applicable to the designated use are achieved in the water and any designated use of the downstream water is maintained and protected.

The Tier 2 antidegradation standard found in 327 IAC 2-1.3-3(b) applies to surface waters of the state where the existing quality for a parameter is better than the water quality criterion for that parameter established in 327 IAC 2-1.5. These surface waters are considered high quality for the parameter and this high quality shall be maintained and protected unless the commissioner finds that allowing a significant lowering of water quality is necessary and accommodates important social or economic development in the area in which the waters are located. IDEM implements the Tier 2 antidegradation standard for regulated pollutants with numeric water quality criteria quality adopted in or developed pursuant to 327 IAC 2-1.5 and utilizes the antidegradation implementation procedures in 327 IAC 2-1.3-5 and 2-1.3-6.

According to 327 IAC 2-1.3-1(b), the antidegradation implementation procedures in 327 IAC 2-1.3-5 and 2-1.3-6 apply to a proposed new or increased loading of a regulated pollutant to surface waters of the state from a deliberate activity subject to the Clean Water Act, including a change in process or operation that will result in a significant lowering of water quality.

The NPDES permit does not propose to establish a new or increased loading of a regulated pollutant; therefore, the Antidegradation Implementation Procedures in 327 IAC 2-1.3-5 and 2-1.3-6 do not apply to the permitted discharge.

Effluent Limitations and Rationale

The effluent limitations proposed herein are based on Indiana Water Quality Standards, NPDES regulations, and Wasteload Allocation (WLA) analyses performed by this Office's Permits Branch staff on May 6, 2004, January 21, 2011, and February 12, 2016. These limits are in accordance with antibacksliding regulations specified in 327 IAC 5-2-10(a)(11). Monitoring frequencies are based upon facility size and type. IDEM has waived the 85% removal requirement for $CBOD_5$ and TSS under the provisions of 40 CFR 133.103(a). The periodic improvements required under the permittee's LTCP would make the percent removal level a dynamic measurement and any limitation based on percent removal impractical.

The final effluent limitations to be limited and/or monitored include: Flow, Carbonaceous Biochemical Oxygen Demand ($CBOD_5$), Total Suspended Solids (TSS), Ammonia-nitrogen (NH_3-N), Phosphorus, pH, Dissolved Oxygen (DO), *Escherichia coli* (*E. coli*), cadmium, chloride, sulfate, chromium, copper, cyanide, lead, mercury, nickel, and zinc.

Final Effluent Limitations

The summer monitoring period runs from May 1 through November 30 of each year and the winter monitoring period runs from December 1 through April 30 of each year. The disinfection season runs from April 1 through October 31 of each year.

The mass limits for $CBOD_5$, TSS and ammonia-nitrogen have been calculated utilizing the peak design flow of 27 MGD. This is to facilitate the maximization of flow through the treatment facility in accordance with this Office's CSO policy.

Mass Loading Limitations

Ordinarily water quality-based effluent limitations (WQBELs) for facilities in the GLI area must be calculated in accordance with the provisions of 327 IAC 5-2-11.4(a)(9) which would require that the alternate effluent flow value be used in the wasteload allocation study for determining both the concentration and mass limits. Additionally 327 IAC 5-2-11.6(g) requires that the WQBELS be expressed as both a concentration value and a corresponding mass loading rate. In reviewing Indiana statutes, IDEM has determined that statute cite IC 13-18-19-2(a)(2) overrides these rule provisions. It gives IDEM the authority to provide increased mass limitations for POTWs that:

(1) are capable of treating wastewater flows that exceed the design flow used to calculate normal WQBELs, and
(2) as a result of the increased limitations, can reduce the volume of discharge of wastewater from plant bypasses or combined sewer overflows.

The federal GLI rules required the Great Lake states to adopt water quality criteria and implementation procedures consistent with 40 CFR 132.4. (See in particular 40 CFR 132.4(a)(7) and (e)). Note that 40 CFR 132.4(e)(2) gives states *some* flexibility in the adoption of the implementation procedures, it was limited to <u>only</u> those pollutants specifically listed in Table 5 of 40 CFR 132.4. Thus, for all other pollutants, which are not listed in Table 5 of 50 CFR 132.4, IDEM is required to adhere to 327 IAC 5-2-11.4(a)(9) and 327 IAC 5-2-11.6(g).

Therefore, the mass limitations for the conventional parameters were derived by multiplying the facility's peak design flow rate of 27 MGD X the corresponding concentration limitation X 8.345, while the mass limitations for cyanide and mercury were derived by multiplying the facility's average design flow of 15 MGD X the corresponding concentration limit X 8.345.

Influent Monitoring

The raw influent and the wastewater from intermediate unit treatment processes, as well as the final effluent shall be sampled and analyzed for the pollutants and operational parameters specified by the applicable Monthly Report of Operation Form, as appropriate, in accordance with 327 IAC 5-2-13 and Part I.B.2 of the permit. Except where the permit specifically states otherwise, the sample

frequency for the raw influent and intermediate unit treatment process shall be at a minimum the same frequency as that for the final effluent. The measurement frequencies specified in each of the tables in Part I.A. are the minimum frequencies required by the permit.

Flow

Flow is to be measured five (5) times weekly as a 24-hour total. Reporting of flow is required by 327 IAC 5-2-13.

$CBOD_5$

$CBOD_5$ is limited to 5.0 mg/l (1,126.6 lbs/day) as a monthly average and 7.5 mg/l (1,689.9 lbs/day) as a weekly average during the summer monitoring period. During the winter monitoring period, $CBOD_5$ is limited to 7.1 mg/l (1,599.7 lbs/day) as a monthly average and 10.7 mg/l (2,410.9 lbs/day) as a weekly average.

Monitoring is to be conducted five (5) times weekly by 24-hour composite sampling. The $CBOD_5$ concentration limitations included in this permit are set in accordance with the Wasteload Allocation (WLA) analysis performed by this Office's Permits Branch staff on May 6, 2004, and are the same as the concentration limitations found in the facility's previous permit.

TSS

TSS is limited to 8.5 mg/l (1,915.2 lbs/day) as a monthly average and 12.8 mg/l (2,884.0 lbs/day) as a weekly average.

Monitoring is to be conducted five (5) times weekly by 24-hour composite sampling. The TSS concentration limitations included in this permit are set in accordance with the Wasteload Allocation (WLA) analysis performed by this Office's Permits Branch staff on May 6, 2004, and are the same as the concentration limitations found in the facility's previous permit.

Ammonia-nitrogen

Ammonia-nitrogen is limited to 1.20 mg/l (270.4 lbs/day) as a monthly average and 2.79 mg/l (628.6 lbs/day) as a daily maximum during the summer monitoring period. During the winter monitoring period, ammonia-nitrogen is limited to 1.48 mg/l (333.5 lbs/day) as a monthly average and 3.45 mg/l (777.3 lbs/day) as a daily maximum.

Monitoring is to be conducted five (5) times weekly by 24-hour composite sampling. The ammonia-nitrogen concentration limitations included in this permit are set in accordance with the Wasteload Allocation (WLA) analysis performed by this Office's Permits Branch staff on May 6, 2004, and are the same as the concentration limitations found in the facility's previous permit.

Phosphorus

In accordance with 327 IAC 5-10-2(a) & (b), as the treatment facility discharges into receiving waters located within the Lake Michigan drainage basins, phosphorus removal facilities shall achieve a degree of reduction as prescribed in the sliding scale of phosphorus removal in Footnote 4 of the permit, or produce an effluent containing no more than 1.0 mg/l total phosphorus (P), whichever is more stringent. Monitoring is to be conducted five (5) times weekly by 24-hour composite sampling. These phosphorus limitations are the same as the limitations found in the facility's previous permit.

pH

The pH limitations have been based on 40 CFR 133.102 which is cross-referenced in 327 IAC 5-5-3.

To ensure conditions necessary for the maintenance of a well-balanced aquatic community, the pH of the final effluent must be between 6.0 and 9.0 standard units in accordance with provisions in 327 IAC 2-1.5-8(c)(2).

pH must be measured five (5) times weekly by grab sampling. These pH limitations are the same as the limitations found in the facility's previous permit.

Dissolved Oxygen

Dissolved oxygen shall not fall below 7.0 mg/l as a daily minimum average during the summer monitoring period. During the winter monitoring period, dissolved oxygen shall not fall below 6.0 mg/l as a daily minimum average.

These dissolved oxygen limitations are based on the Wasteload Allocation (WLA) analysis performed by this Office's Permits Branch staff on May 6, 2004, and are the same as the concentration limitations found in the facility's previous permit. Dissolved oxygen measurements must be based on the average of eight (8) grab samples taken within a 24-hr. period. This monitoring is to be conducted five (5) times weekly.

E. coli

The *E. coli* limitations and monitoring requirements apply from April 1 through October 31, annually. *E. coli* is limited to 125 count/100 ml as a monthly average, and 235 count/100 ml as a daily maximum. The monthly average *E. coli* value shall be calculated as a geometric mean. This monitoring is to be conducted five (5) times weekly by grab sampling. These *E. coli* limitations are set in accordance with regulations specified in 327 IAC 5-10-6.

Mercury

IDEM received East Chicago's Streamlined Mercury Variance (SMV) application submittal dated January 28, 2016. IDEM has determined that the submittal does not meet the applicability criteria under 327 IAC 5-3.5-2. This rule states that a SMV is available for the duration of the NPDES permit issued to a wastewater discharging facility that has an NPDES permit in effect containing a discharge limitation for mercury that cannot be achieved consistently by the facility.

IDEM analyzed East Chicago's mercury effluent data over the most recent two year period, the time period required for evaluation of the interim discharge limit under 327 IAC 5-3.5-8(b). The reported effluent data was compared to the proposed mercury Water Quality Based Effluent Limitations (WQBELs) of 1.3 ng/l monthly average and 3.2 ng/l daily maximum. Only one sample (taken on December 9, 2015 with a result of 12.5 ng/l) would have resulted in violation of the proposed mercury WQBELs.

Based on this review, IDEM has determined that the data does not demonstrate that the proposed discharge limitations for mercury cannot be consistently achieved. Therefore, further processing of the SMV application will not occur.

Mercury is limited to 1.3 ng/l (0.00016 lbs/day) as a monthly average and 3.2 ng/l as a daily maximum (0.00040 lbs/day). The mercury WQBELs are based on the wildlife criterion in 327 IAC 2-1.5-8(b)(6), Table 8-4. In accordance with 327 IAC 5-2-11.4(b)(1) the criteria for mercury are applied without the utilization of a mixing zone.

The NPDES permit requires that mercury grab sampling be conducted bi-monthly (every other month) for the term of the permit (influent and effluent).

Metals/Non-conventional Pollutants

Reasonable Potential Evaluations (RPE) were performed in conjunction with the Wasteload Allocation Analysis performed by this Office's Permits Branch staff on February 12, 2016. In reviewing the RPE, the projected effluent quality (PEQ) for cadmium, chromium, copper, lead, thallium, zinc, phenol, chloride, fluoride, and sulfate is less than the projected effluent limitations (PEL). Therefore, effluent limitations have not been included in the permit renewal for these parameters. However, due to the industrial contributors to the collection system, monitoring requirements for cadmium, chloride, sulfate, chromium, copper, lead, and zinc are being retained, at a reduced frequency of one (1) time quarterly in both the wastewater influent and effluent. Thallium, fluoride, iron, and phenol have been removed from the permit as these parameters are no longer considered to be pollutants of concern for this permit. Nickel monitoring has been added to the permit and is to be monitored on a quarterly basis in both the influent and effluent.

The RPE performed by this Office's Permits Branch staff on February 12, 2016, revealed that the projected effluent quality (PEQ) for cyanide was greater than the projected effluent limitations (PELs). Therefore, effluent limitations for cyanide are being retained in this permit. Cyanide is

limited to 0.0043 mg/l (0.54 lbs/day) as a monthly average and 0.0085 mg/l (1.1 lbs/day) as a daily maximum. This monitoring is to be conducted weekly by grab sampling. The influent is to be monitored for cyanide two (2) times monthly.

Whole Effluent Toxicity Testing

The permittee submitted a Whole Effluent Toxicity Tests (WETT) with the renewal application as required in 327 IAC 5-2-3(g).

Indiana's regulations for the Great Lakes system include narrative criteria with numeric interpretations for acute (2-1.5-8(b)(1)(E)(ii)) and chronic (2-1.5-8(b)(2)(A)(iv)) whole effluent toxicity (WET) and a procedure for conducting reasonable potential for WET (5-2-11.5(c)(1)). The U.S. EPA did not approve the reasonable potential procedure for WET so Indiana is now required under 40 CFR Part 132.6(c) to use the reasonable potential procedure in Paragraphs C.1 and D of Procedure 6 in Appendix F of 40 CFR Part 132. IDEM used this procedure in conducting the reasonable potential analysis for WET. The analysis is included in the Wasteload Allocation Analysis conducted by this Office's Permits Branch staff on January 21, 2011.

The results of the reasonable potential analysis for WET show that the discharge from Outfall 001 has a reasonable potential to exceed the numeric interpretation of the narrative criterion for chronic WET. Therefore, WQBELs are required for chronic WET.

Once a determination is made that WQBELs are required for WET, the WQBELs are established in accordance with 327 IAC 5-2-11.6(d). This provision allows a case-by-case determination of whether to establish a WQBEL for only acute or chronic WET, or WQBELs for both acute and chronic WET. No acute toxicity has been demonstrated so it was decided to establish a WQBEL for only chronic WET at Outfall 001. The chronic WQBEL was established as a monthly average limit and set equal to the chronic wasteload allocation in accordance with 327 5-2-11.6(d)(1)(E). The monthly average WQBEL for WET is 1.0 chronic toxicity units (TUc) and chronic WET testing is required twice annually.

Backsliding

None of the concentration limits included in this permit conflict with antibacksliding regulations found in 327 IAC 5-2-10(a)(11)(A), therefore, backsliding is not an issue.

Reopening Clauses

Six reopening clauses were incorporated into the permit in Part I.C. One clause is to incorporate effluent limits from any further wasteload allocations performed; a second clause is to allow for changes in the sludge disposal standards; a third clause is to incorporate any applicable effluent limitation or standard issued or approved under section 301(b)(2)(C), (D) and (E), 304(b)(2), and 307(a)(2) of the Clean Water Act; a fourth clause is to incorporate monitoring requirements and effluent limitations for cadmium, chromium, copper, chloride, lead, nickel, sulfate, and/or zinc; a fifth clause is to include limitations for specific toxicants based on results of biomonitoring and/or a

Toxicity Reduction Evaluation (TRE) ; and a sixth clause is to incorporate additional requirements or limitations for specific toxicants if the required additional analyses in Part I.A. indicate that such additional requirements and/or limitations are necessary.

Compliance Status

The permittee is subject to Agreed Order (Order No. 2014-22488) dated December 3, 2014. The Agreed Order cites the permittee for failure to do complete WET testing and failure to meet cyanide and chloride limitations, and contains an order for the permittee to ensure compliance with the NPDES permit.

Expiration Date

A five-year NPDES permit is proposed.

Drafted by: Jason House
February 2016

Updated by: Jason House
May 2016

POST PUBLIC NOTICE ADDENDUM: May 2016

The draft NPDES permit renewal for the East Chicago Sanitary District Wastewater Treatment Plant was made available for public comment from May 11, 2016, through June 13, 2016, as part of Public Notice No. 2016-5A-RD. During this comment period, two comment letters dated June 13, 2016, from the City of East Chicago and Safety-Kleen, were received by this Office. The comments submitted and this Office's corresponding responses are summarized below: Any changes to the permit and/or Fact Sheet are so noted below.

Comments from the City of East Chicago:

Comment 1:
"In the Treatment Facility Description on page 2 of 44 and in the Background section of the Fact Sheet, the draft permit states that ECSD uses ferric chloride for phosphorus removal. ECSD requests that ferric chloride be corrected to ferric sulfate.

ECSD's wastewater treatment plant is served by 72 miles of sanitary sewer that includes both combined and separate sanitary sewers. In the Treatment Facility Description on page 2 of 44 and in the Background section of the Fact Sheet, the draft permit states that ECSD is served by 72 miles of combined sewers. ECSD requests that this be corrected to 'the facility is served by 72 miles of sewer that includes both combined and separate sanitary sewers'."

Response 1:

Page 2 of the permit, "Treatment Facility Description" section, and Page 1 of this Fact Sheet, "Background" section have been updated to reflect the use of ferric sulfate instead of ferric chloride, as requested.

Page 2 of the permit, "Treatment Facility Description" section, and Page 1 of this Fact Sheet, "Collection System" section, have been updated to reflect that the collection system is comprised of both combined and separate sanitary sewers as requested. Additionally, clarification has been added to reflect that approximately 92% of the sewer system is combined sanitary and storm sewer.

Comment 2:
"At Part I.A.4.b.2 "Sampling and Analysis of Sludge, it should be noted that the ECSD does not currently have any land application, surface disposal or incineration of its sludge for which the requirements of 40 CFR 503 apply. ECSD disposes of the sludge as municipal solid waste; therefore ECSD requests that the following be added:

> 'Disposal of sewage sludge in a municipal solid waste landfill unit, as defined in 40 CFR 258.2, that complies with the requirements in 40 CFR part 258 constitutes compliance with section 405(d) of the CWA. Any person who prepares sewage sludge that is disposed in a municipal solid waste landfill unit shall ensure that the sewage sludge meets the

requirements in 40 CFR Part 258 concerning the quality of materials disposed in a municipal solid waste landfill unit.'"

Response 2:

Part I.A.4.b.2 is a requirement for priority pollutant monitoring for permittees which have pretreatment program delegation from U.S. EPA. The priority pollutants must be screened on an annual basis. This required sampling includes sampling of the sludge from the wastewater treatment plant. The required sampling of 40 CFR Part 258 does not substitute for the annual requirement for the screening of the priority pollutants.

No changes have been made in response to this comment.

Comment 3:
"At Part II.B.1.e., on page 26 of 44, there is a reference to 327 IAC 3-2-1. 327 IAC 3-2-1 appears to have expired under IC 13-14-9.5, effective January 1, 2002. ECSD suggests the reference be changed to 327 IAC 3-2-2."

Response 3:

Part II.B.1.e of the permit has been changed to update the rule reference, as requested.

Comment 4:
"ECSD requests the following corrections be made to the following references to IAC 5-2-8:

a. Under Penalties for Tampering or Falsification on page 24 of 44, ECSD requests that the reference to 327 IAC 5-2-8(9) be corrected to 327 IAC 5-2-8(10)

b. Under Inspection and Entry on page 25 of 44, ECSD requests that the reference to 327 IAC 5-2-8(7) be corrected to 327 IAC 5-2-8(8)

c. Under Facility Operation, Maintenance and Quality Control on page 26 of 44, ECSD requests that the reference to 327 IAC 5-2-8(8) be corrected to 327 IAC 5-2-8(9) at Part II.B.1.a. and Part II.B.1.a.2.

d. Under Bypass of Treatment Facilities on page 26 of 44, ECSD requests that the reference to 327 IAC 5-2-8(11) be corrected to 327 IAC 5-2-8(12)

e. Under Upset Conditions on page 28 of 44, ECSD requests that the reference to 327 IAC 5-2-8(12) be corrected to 327 IAC 5-2-8(13)

f. Under Power Failures on page 29 of 44, ECSD requests that the reference to 327 IAC 5-2-8(13) be corrected to 327 IAC 5-2-8(14)

g. Under Planned Changes in Facility or Discharge on page 30 of 44, ECSD requests that the reference to 327 IAC 5-2-8(10) be corrected to 327 IAC 5-2-8(11)

h. Under Monitoring Reports on page 30 of 44, ECSD requests that the reference to 327 IAC 5-2-8(9) corrected to 327 IAC 5-2-8(10)

i. Under Incident Reporting Requirements on page 30 of 44, ECSD requests that the reference to 327 IAC 5-2-8(10) be corrected to 327 IAC 5-2-8(11)

j. Under Other Noncompliance on page 31 of 44, ECSD requests that the reference to 327 IAC 5-2-8(10) be corrected to 327 IAC 5-2-8(11)

k. Under Other Information on page 31 of 44, ECSD requests that the reference to 327 IAC 5-2-8(10) be corrected to 327 IAC 5-2-8(11)

l. Under Signatory Requirements on page 32 of 44, ECSD requests that the reference to 327 IAC 5-2-8(14) be corrected to 327 IAC 5-2-8(15)

m. Under Penalties for Falsification of Reports on page 33 of 44, ECSD requests that the reference to 327 IAC 5-2-8(14) corrected to 327 IAC 5-2-8(15)

n. Under Progress Reports on page 33 of 44, ECSD requests that the reference to 327 IAC 5-2-8(10) be corrected to 327 IAC 5-2-8(11)

o. Under Advanced Notice of Planned Changes on page 33 of 44, ECSD requests that the reference to 327 IAC 5-2-8(10) be corrected to 327 IAC 5-2-8(11)"

Response a. thru o:

All rule reference revisions have been incorporated in the permit, as requested.

Comment 5:
"At Part III.A.2., on page 37 of 44, the reference for the definition of SIU should be corrected from 40 CFR 403.3(t) to 40 CFR 403.3(v)."

Response 5:
The change of rule reference has been made, as requested.

Comment 6:
"On pages 6 and 7 of the Fact Sheet, under CBOD5, TSS, Ammonia Nitrogen and Dissolved Oxygen, the Wasteload Allocation (WLA) analyses performed should include references to the

January 21, 2011 and February 12, 2016 WLAs performed by the Permit Branch, consistent with the information provided on Page 4 concerning "Effluent Limitations and Rationale"."

Response 6:

The limitations for $CBOD_5$, TSS, Ammonia-nitrogen, and Dissolved Oxygen were developed in the WLA conducted on May 6, 2004. The 2011 and 2016 WLAs were conducted for metals and other toxics, not for $CBOD_5$, TSS, Ammonia-nitrogen, and Dissolved Oxygen. Therefore, the Fact Sheet contains the correct reference for the justification of these limitations.

No changes have been made in response to this comment.

Comments from Safety-Kleen:

"Safety-Kleen is providing a comment to the East Chicago Sanitation District's (ECSD) Draft NPDES Permit No. IN0022829 regarding the final cyanide limitations of 4.3 micrograms per liter (ug/L) monthly average and 8.5 ug/L daily maximum limits. Safety-Kleen is aware that the final cyanide limitations are based on a limiting chronic aquatic life criteria of 5.2 ug/L, which is overprotective for the West Branch of the Calumet River. Safety-Kleen is requesting IDEM to update the criteria for the West Branch of the Grand Calumet River that reflects the approved chronic aquatic life criteria of up to 10.7 ug/L for the East Branch of the Grand Calumet River. With the update, Safety-Kleen is anticipating that IDEM will revise the final cyanide limitations of 4.3 ug/L monthly average and 8.5 ug/L daily maximum limits. Safety-Kleen is requesting that IDEM delay renewing the ECSD NPDES permit until the modification language can be incorporated into the renewal."

Response:

This Office received a request for site-specific water quality criteria for free cyanide for the West Branch of Calumet River at the East Chicago Sanitary District WWTP outfall on June 8, 2015. This request has not been approved and cannot be implemented in this NPDES permit renewal. This Office must move forward with the permit renewal process in accordance with currently effective rules and criteria. If site-specific water quality criteria for free cyanide are approved at a later date, the permittee may apply for a modification of the NPDES permit.

No changes have been made to the permit in response to this comment.

No substantial changes have been made to the permit due to these comments; therefore, no additional public notice is required.

Draft by: Jason House
June 2016

STATE OF INDIANA
DEPARTMENT OF ENVIRONMENTAL MANAGEMENT
PUBLIC NOTICE NO: 2016 – 6C – F
DATE OF NOTICE: JUNE 17, 2016

The Office of Water Quality issues the following NPDES FINAL PERMIT.

MAJOR – RENEWAL

EAST CHICAGO SANITARY DISTRICT WWTP, Permit No. IN0022829, LAKE COUNTY, 5201 Indianapolis Blvd, East Chicago, IN. This major municipal facility discharges 15 million gallons daily of sanitary, industrial & combined sewer wastewater into West Branch of Grand Calumet River. Permit Manager: Jason House, jahouse@idem.in.gov, 317/233-0470.

APPEAL PROCEDURES FOR FINAL PERMITS

The Final Permit documents are available for review & copies at IDEM, Indiana Government Center, North Bldg, 100 N Senate Ave, Indianapolis, IN, Rm 1203, Office of Water Quality/NPDES Permit Section, from 9 – 4, M - F (copies 10¢ per page). The Final Permit is available at the local County Health Department . See these sites for your rights & responsibilities: Public Participation: http://www.in.gov/idem/5474.htm; Citizen Guide: http://www.in.gov/idem/5903.htm. **Please tell others you think would be interested in this matter**

Appeal Procedure: Any person affected by the issuance of the Final Permit may appeal by filing a Petition for Administrative Review with the Office of Environmental Adjudication **within** eighteen (18) days of the date of this Public Notice. Any appeal request must be filed in accordance with IC 4-21.5-3-7 and must include facts demonstrating that the party requesting appeal is the applicant; a person aggrieved or adversely affected or is otherwise entitled to review by law.
Timely filing: The Petition for Administrative Review must be received by the Office of Environmental Adjudication (OEA) **within** 18 days of the date of this Public Notice; either by U.S. Mail postmark or by private carrier with dated receipt. This Petition for Administrative Review represents a request for an Adjudicatory Hearing, therefore must:

- state the name and address of the person making the request;
- identify the interest of the person making the request;
- identify any persons represented by the person making the request;
- state specifically the reasons for the request;
- state specifically the issues proposed for consideration at the hearing;
- identify the Final Permit Rule terms and conditions which, in the judgment of the person making the request, would be appropriate to satisfy the requirements of the law governing this NPDES Permit rule.

If the person filing the Petition for Administrative Review desires any part of the NPDES Final Permit Rule to be stayed pending the outcome of the appeal, a Petition for Stay must be included in the appeal request, identifying those parts to be stayed. Both Petitions shall be mailed or delivered to the address here:
Phone: 317/232-8591.

Environmental Law Judge
Office of Environmental Adjudication
IGC – North Building- Rm 501
100 N. Senate Avenue
Indianapolis IN 46204

Stay Time frame: If the Petition (s) is filed **within** eighteen (18) days of the mailing of this Public Notice, the effective date of any part of the permit, within the scope of the Petition for Stay is suspended for fifteen (15) days. The Permit will become effective again upon expiration of the fifteen (15) days, unless or until an Environmental Law Judge stays the permit action in whole or in part.

Hearing Notification: Pursuant to Indiana Code, when a written request is submitted, the OEA will provide the petitioner or any person wanting notification, with the Notice of pre-hearing conferences, preliminary hearings, hearing stays or orders disposing of the Petition for Administrative Review. Petition for Administrative Review must be filed in compliance with the procedures and time frames outlined above. Procedural or scheduling questions should be directed to the OEA at the phone listed above.

ATTACHMENT B

Summary of MRO Data (2013-2016)

Table B.1 Summary of MRO Data (2013)

Parameter (mg/L unless otherwise indicated)	Sampling Location	MRO Data 2013											
		Jan-13	Feb-13	Mar-13	Apr-13	May-13	Jun-13	Jul-13	Aug-13	Sep-13	Oct-13	Nov-13	Dec-13
Ammonia	Influent	7.243	6.131	7.88	5.527	5.393	4.477	7.076	8.998	7.876	7.497	6.261	6.572
	Effluent	0.1257	0.13	0.101	0.1177	0.1	0.187	0.1	0.1168	0.1486	0.1052	0.2767	0.2845
Cadmium	Influent	0.0001	-	0.0001	-	-	0.0003	-	-	0.0001	-	-	0.0001
	Effluent	0.0001	-	0.0001	-	-	0.0001	-	-	0.0001	-	-	0.0002
CBOD5	Influent	100	59	42	67	46	36	43	35	30	45	42	39
	Effluent	2.3	2	2.2	2	2	2.4	2.3	2.1	2	2	2	2
Chloride	Influent	259	216	175	192	175.5	161	141	180	163.5	182.5	142	180
	Effluent	222	209.5	185.25	179.17	177.4	180.5	165	157.2	157	167.2	148.25	161.8
Chromium	Influent	-	-	0.0008	-	-	0.0042	-	-	0.0011	-	-	0.0024
	Effluent	-	-	0.0005	-	-	0.0005	-	-	0.0005	-	-	0.0005
Copper	Influent	-	-	0.006	-	-	0.0235	-	-	0.0068	-	-	0.0141
	Effluent	-	-	0.001	-	-	0.0018	-	-	0.0026	-	-	0.0024
Cyanide	Influent	0.0055	0.0085	0.00045	0.0035	0.002	0.0035	0.003	0.0035	0.0025	0.002	0.003	0.005
	Effluent	0.0044	0.003	0.003	0.0032	0.0026	0.0028	0.0032	0.0028	0.0023	0.0024	0.002	0.007
Fluoride	Influent	-	-	0.76	-	-	0.7	-	-	0.86	-	-	0.63
	Effluent	-	-	0.699	-	-	0.691	-	-	0.832	-	-	0.682
Iron	Influent	-	-	0.222	-	-	0.077	-	-	0.354	-	-	0.274
	Effluent	-	-	0.01	-	-	0.01	-	-	0.06	-	-	0.02
Lead	Influent	-	-	0	-	-	0.0113	-	-	0.0013	-	-	0
	Effluent	-	-	0.0001	-	-	0.0002	-	-	0.0001	-	-	0.0002
Mercury (ng/L)	Influent	-	0.05	-	0.83	-	2.55	-	1.88	-	5.53	-	13.76
	Effluent	-	0.05	-	0.5	-	1.05	-	0.5	-	2.09	-	10.69
Oil & Grease	Effluent	1.00	1.01	1.03	1.00	1.08	1.10	1.02	1.15	1.21	1.04	1.00	1.00
Phenols	Influent	-	-	0.008	-	-	0.005	-	-	0.008	-	-	0.018
	Effluent	-	-	0.005	-	-	0.005	-	-	0.005	-	-	0.005

MRO Data 2013													
Parameter (mg/L unless otherwise indicated)	Sampling Location	Jan-13	Feb-13	Mar-13	Apr-13	May-13	Jun-13	Jul-13	Aug-13	Sep-13	Oct-13	Nov-13	Dec-13
Phosphorus	Influent	1.973	1.648	1.92	2.356	1.562	1.616	1.183	1.563	1.273	1.802	1.69	1.617
	Effluent	0.1304	0.155	0.1	0.1	0.1	0.2	0.2	0.3	0.3	0.3	0.2	0.2
Sulfate	Influent	150	-	180	-	-	176	-	-	136	-	-	110
	Effluent	146	-	170	-	-	164	-	-	131	-	-	123
Thallium	Influent	0.0001	-	0.0001	-	-	0.0004	-	-	0.0005	-	-	0.001
	Effluent	0.0001	-	0.0001	-	-	0.0004	-	-	0.0005	-	-	0.001
TSS	Influent	161	130	150	251	175	136	61	91	71	113	121	107
	Effluent	3.3	3.9	1.7	1.8	1.6	3.3	1.7	2.2	2.1	2.1	3.2	1.3
Zinc	Influent	-	-	0.02	-	-	0.08	-	-	0.02	-	-	0.04
	Effluent	-	-	0.0079	-	-	0.0049	-	-	0.0089	-	-	0.0064

Table B.2 Summary of MRO Data (2014)

Parameter (mg/L unless otherwise indicated)	Sampling Location	MRO Data 2014											
		Jan-14	Feb-14	Mar-14	Apr-14	May-14	Jun-14	Jul-14	Aug-14	Sep-14	Oct-14	Nov-14	Dec-14
Ammonia	Influent	5.973	5.135	4.383	4.728	3.585	3.327	4.334	4.56	4.303	5.255	5.619	5.557
	Effluent	0.2409	0.1	0.121	0.1018	0.1338	0.1	0.1	0.1129	0.1673	0.1048	0.1025	0.1
Cadmium	Influent	-	-	0.0001	-	-	0.0004	-	-	0.0001	-	-	0.0001
	Effluent	-	-	0.0001	-	-	0.0005	-	-	0.0001	-	-	0.0001
CBOD5	Influent	39	48	40	59	46	52	28	37	24	29	48	51
	Effluent	2	2	2.1	2	2.1	2.2	2	2	2	2	2.1	2.1
Chloride	Influent	195.67	191.5	200	218.5	209	195	167.5	355	187.5	179	177	176.5
	Effluent	224.4	197	199.75	176.4	185.6	178	183.5	190	189.2	174.25	157.25	176.2
Chromium	Influent	-	-	0.0006	-	-	0.0109	-	-	0.002	-	-	0.0048
	Effluent	-	-	0.0005	-	-	0.0005	-	-	0.0005	-	-	0.0005
Copper	Influent	-	-	0.0065	-	-	0.0614	-	-	0.0115	-	-	0.0218
	Effluent	-	-	0.0021	-	-	0.0022	-	-	0.0023	-	-	0.0028
Cyanide	Influent	0.0055	0.0065	0.0045	0.0085	0.006	0.0025	0.003	0.003	0.003	0.003	0.0045	0.008
	Effluent	0.009	0.0048	0.0043	0.0052	0.0036	0.0026	0.0033	0.0035	0.0028	0.0035	0.0033	0.007
Fluoride	Influent	-	-	0.63	-	-	0.751	-	-	0.708	-	-	0.584
	Effluent	-	-	0.648	-	-	0.812	-	-	0.695	-	-	0.592
Iron	Influent	-	-	0.207	-	-	0.104	-	-	0.11	-	-	0.141
	Effluent	-	-	0.19	-	-	0.0137	-	-	0.011	-	-	0.035
Lead	Influent	-	-	0.0013	-	-	0.0259	-	-	0.0039	-	-	0.0086
	Effluent	-	-	0.0001	-	-	0.00001	-	-	0.0002	-	-	0.0003
Mercury	Influent	-	-	-	0.76	-	1.66	-	0.5	-	0.65	-	2.5
	Effluent	-	-	-	0.5	-	0.5	-	0.5	-	0.5	-	1.24
Oil & Grease	Effluent	1.04	1.47	1.00	1.03	1.05	1.10	1.04	1.00	1.159	1.013	1.07	1.0957
Phenols	Influent	-	-	0.005	-	-	0.005	-	-	0.005	-	-	0.005
	Effluent	-	-	0.005	-	-	0.005	-	-	0.005	-	-	0.005

MRO Data 2014													
Parameter (mg/L unless otherwise indicated)	Sampling Location	Jan-14	Feb-14	Mar-14	Apr-14	May-14	Jun-14	Jul-14	Aug-14	Sep-14	Oct-14	Nov-14	Dec-14
Phosphorus	Influent	1.367	1.222	1.252	2.325	2.075	1.949	1.944	1.67	1.462	1.547	1.987	2.248
	Effluent	0.1	0.2	0.1	0.2	0.2	0.3	0.2	0.2	0.3	0.2	0.2	0.2
Sulfate	Influent	-	-	129	-	-	144	-	-	122	-	-	125
	Effluent	-	-	120	-	-	149	-	-	126	-	-	125
Thallium	Influent	-	-	0.0001	-	-	0.0001	-	-	0.0006	-	-	0.0006
	Effluent	-	-	0.0001	-	-	0.0001	-	-	0.0006	-	-	0.0006
TSS	Influent	87	105	85	204	170	168	105	126	70	90	172	159
	Effluent	1.1	1.7	1.2	1.8	1.1	2.4	2.5	1.6	1.2	1.2	3.2	3.2
Zinc	Influent	-	-	0.02	-	-	0.178	-	-	0.0344	-	-	0.064
	Effluent	-	-	0.0121	-	-	0.0101	-	-	0.007	-	-	0.017

Table B.3 Summary of MRO Data (2015)

Parameter (mg/L unless otherwise indicated)	Sampling Location	MRO Data 2015											
		Jan-15	Feb-15	Mar-15	Apr-15[1]	May-15	Jun-15	Jul-15	Aug-15	Sep-15	Oct-15	Nov-15	Dec-15
Ammonia	Influent	4.845	4.49	5.07	4.25	4.205	2.691	3.613	4.586	3.759	4.768	4.676	3.391
	Effluent	0.1	0.1005	0.1159	0.1145	0.1119	0.1527	0.1423	0.18	0.1677	0.1505	0.1252	0.561
Cadmium	Influent	-	-	0.0003	-	-	0.002	-	-	0.002	-	-	0.002
	Effluent	-	-	0.0001	-	-	0.002	-	-	0.002	-	-	0.002
CBOD5	Influent	40	39	50	44	37	17	14	19	26	32	31	36
	Effluent	2.2	2.2	2.2	2.1	2.1	2.1	3.3	2	4	2	2	2.3
Chloride	Influent	145.5	167.5	197	175	155	185	205	225	200	210	245	180
	Effluent	199.25	190.5	172.42	185	152.5	178	240	226	205	202.5	226	155
Chromium	Influent	-	-	0.0038	-	-	0.0056	-	-	0.004	-	-	0.012
	Effluent	-	-	0.0005	-	-	0.003	-	-	0.003	-	-	0.003
Copper	Influent	-	-	0.015	-	-	0.025	-	-	0.031	-	-	0.05
	Effluent	-	-	0.0026	-	-	0.01	-	-	0.01	-	-	0.01
Cyanide	Influent	0.01	0.0085	0.008	0.0035	0.0042	0.0021	0.0021	0.002	0.002	0.002	0.0069	0.0115
	Effluent	0.007	0.0065	0.0068	0.0037	0.0025	0.002	0.002	0.002	0.002	0.002	0.0029	0.002
Fluoride	Influent	-	-	0.442	-	-	0.002	-	-	0.62	-	-	0.48
	Effluent	-	-	0.379	-	-	0.74	-	-	0.64	-	-	0.49
Iron	Influent	-	-	0.0603	-	-	0.12	-	-	0.065	-	-	0.1
	Effluent	-	-	0.0117	-	-	0.05	-	-	0.05	-	-	0.062
Lead	Influent	-	-	0.0031	-	-	0.0098	-	-	0.013	-	-	0.024

[1] In April 2015, ECSD began using a new contracted laboratory for analysis of wastewater samples. The new lab generally reported to a much higher reporting limit (RL) than the previous lab. Because non-detect (ND) MRO data was reported down to RL, data sets with many ND's were significantly impacted by this change. To avoid this affecting the local limits, data for cadmium, chromium, copper, lead, oil and grease, phenols, and thallium from May 2015 to December 2016 were not considered in the calculation of the local limits.

MRO Data 2015													
Parameter (mg/L unless otherwise indicated)	Sampling Location	Jan-15	Feb-15	Mar-15	Apr-15[1]	May-15	Jun-15	Jul-15	Aug-15	Sep-15	Oct-15	Nov-15	Dec-15
	Effluent	-	-	0.002	-	-	0.0075	-	-	0.0075	-	-	0.0075
Mercury (ng/L)	Influent	-	0.73	-	2.09	-	23.6	-	19	-	-	-	2.31
	Effluent	-	0.5	-	0.55	-	1.04	-	0.828	-	-	-	0.5
Oil & Grease	Effluent	1.0045	1.18	1.2773	1.0318	1	1	1	1	1	1	2.0905	1
Phenols	Influent	-	-	0.012	-	-	0.014	-	-	0.01	-	-	0.01
	Effluent	-	-	0.005	-	-	0.01	-	-	0.01	-	-	0.021[1]
Phosphorus	Influent	1.818	1.51	1.091	2.105	1.853	1.396	1.252	0.947	1.014	1.407	1.277	1.726
	Effluent	0.2	0.1	0.2	0.2	0.2	0.2	0.2	0.2	0.2	0.3	0.2	0.2
Sulfate	Influent	-	-	133	-	-	150	-	-	100	-	-	89
	Effluent	-	-	121	-	-	160	-	-	95	-	-	89
Thallium	Influent	-	-	0.0006	-	-	0.05	-	-	0.05	-	-	0.05
	Effluent	-	-	0.0006	-	-	0.05	-	-	0.05	-	-	0.05
TSS	Influent	97	86	125	206	297	216	257	150	133	163	220	188
	Effluent	1.6	1.3	1.2	2.7	5.7	8.5	14.2	6.7	4.4	7.5	9.4	8.6
Zinc	Influent	-	-	0.0439	-	-	0.066	-	-	0.087	-	-	0.18
	Effluent	-	-	0.0117	-	-	0.02	-	-	0.02	-	-	0.02

[1] In April 2015, ECSD began using a new contracted laboratory for analysis of wastewater samples. The new lab generally reported to a much higher reporting limit (RL) than the previous lab. Because historical plant data was reported down to the RL, calculations based on data sets with many ND's were significantly influenced by this change. To avoid this impact, data for cadmium, chromium, copper, lead, oil and grease, phenols, and thallium from May 2015 to December 2016 was not considered in the calculation of the local limits.

Table B.3 Summary of MRO Data (2016)

Parameter (mg/L unless otherwise indicated)	Sampling Location	MRO Data 2016											
		Jan-16	Feb-16	Mar-16	Apr-16	May-16	Jun-16	Jul-16	Aug-16	Sep-16	Oct-16	Nov-16	Dec-16
Ammonia	Influent	3.1	3.743	4.213	3.981	4.005	4.855	4.267	3.004	5.455	5.805	6.441	6.164
	Effluent	0.1362	0.2	0.2	0.2	0.575	0.1868	0.3	0.2	0.25	0.1438	0.135	0.1314
Cadmium	Influent	0.002	-	-	0.002	-	-	0.002	-	-	0.002	-	-
	Effluent	0.002	-	-	0.002	-	-	0.002	-	-	0.002	-	-
CBOD5	Influent	53	105	45	35	48	43	40	30	32	33	41	47
	Effluent	5.0	3.8	2.5	2.6	2.2	2.6	3.5	3.2	2.4	2.4	3.4	2.8
Chloride	Influent	175	185	180	200	170	180	-	-	160	-	-	220
	Effluent	187.5	194	160	190	182	180	-	-	140	-	-	190
Chromium	Influent	-	-	0.0037	-	-	0.003	-	-	0.0033	-	-	0.003
	Effluent	-	-	0.003	-	-	0.003	-	-	0.003	-	-	0.003
Copper	Influent	-	-	0.042	-	-	0.018	-	-	0.033	-	-	0.026
	Effluent	-	-	0.01	-	-	0.01	-	-	0.01	-	-	0.01
Cyanide	Influent	0.002	0.002	0.0025	0.00463	0.0043	0.002	0.0024	0.0035	0.0013	0.0026	0.0013	0.002
	Effluent	0.002	0.0017	0.0013	0.0016	0.0023	0.0021	0.0018	0.0011	0.0013	0.0019	0.0015	0.0016
Fluoride	Influent	-	-	0.5	-	-	0.59	-	-	-	-	-	-
	Effluent	-	-	0.56	-	-	0.62	-	-	-	-	-	-
Iron	Influent	-	-	0.05	-	-	0.079	-	-	-	-	-	-
	Effluent	-	-	0.05	-	-	0.05	-	-	-	-	-	-
Lead	Influent	-	-	0.017	-	-	0.0075	-	-	0.012	-	-	0.0075
	Effluent	-	-	0.0075	-	-	0.0075	-	-	0	-	-	0.0075
Mercury	Influent	-	43.2	-	41.8	-	18.6	-	42.9	-	52	-	23.1
	Effluent	-	1.32	-	1.94	-	2.37	-	0.5	-	1.64	-	3.67

MRO Data 2016													
Parameter (mg/L unless otherwise indicated)	Sampling Location	Jan-16	Feb-16	Mar-16	Apr-16	May-16	Jun-16	Jul-16	Aug-16	Sep-16	Oct-16	Nov-16	Dec-16
Nickel[1]	Influent	-	-	-	-	-	-	-	-	0.01	-	-	0.01
	Effluent	-	-	-	-	-	-	-	-	0.01	-	-	0.01
Oil & Grease	Effluent	1.5762	1	1	1	1	1	1	1	5	5	5	5
Phenols	Influent	-	-	0.01	-	-	0.01	-	-	0.01	-	-	0.01
	Effluent	-	-	0.088	-	-	0.01	-	-	0.01	-	-	0.01
Phosphorus	Influent	1.464	2.481	2.594	2.076	1.699	1.667	1.141	0.923	1.033	1.159	1.525	1.865
	Effluent	0.27	0.1329	0.3043	0.1438	0.2	0.3	0.1762	0.1809	0.2	0.2	0.3	0.3
Sulfate	Influent	-	-	140	-	-	95	-	-	210	-	-	97
	Effluent	-	-	120	-	-	87	-	-	140	-	-	110
Thallium	Influent	-	-	0.05	-	-	0.05	-	-	-	-	-	-
	Effluent	-	-	0.05	-	-	0.05	-	-	-	-	-	-
TSS	Influent	119	282	316	250	227	183	216	158	173	144	164	213
	Effluent	6.1	24.3	14.3	11.1	5.7	8	4.6	4.5	4.8	5.6	4.5	6.1
Zinc	Influent	-	-	0.18	-	-	0.047	-	-	0.11	-	-	0.048
	Effluent	-	-	0.02	-	-	0.02	-	-	0.02	-	-	0.02

[1] ECSD's current NDPES permit, which became effective in July 2016, includes a requirement to sample for nickel on a quarterly basis. Samples for nickel were taken in the influent and effluent of the WWTP in September and December of 2016. These samples were all non-detect for nickel and the reported value for each was the RL. The RLs for these samples were much higher than the samples taken for the nickel samples taken at the WWTP in 2014. To prevent these non-detect values from biasing the data high, the 2016 nickel data was not considered in calculations of the local limits.

ATTACHMENT C

Sampling Plan

WWTP Sampling

Period 1

Sampling in the influent and the effluent of the WWTP for POCs not reported in the MROs was conducted in period 1 from 9/29/2014 to 10/8/2014. The instability of chlorine in water requires analysis be conducted on samples immediately. Residual chlorine samples were not correctly analyzed in the field, and had to be resampled at a later date. Residual chlorine results from period 1 were thrown out and are highlighted in red below.

Table C.1 WWTP Sampling Period 1

Parameter (mg/L unless otherwise indicated)	Location	9/29/2014	9/30/2014	10/1/2014	10/2/2014	10/6/2014	10/7/2014	10/8/2014
Arsenic	Influent	0.01	0.0077	0.01	0.0088	0.0062	0.0079	0.0068
	Effluent	0.0036	0.0035	0.0034	0.0034	0.0028	0.0029	0.0027
Bis (2-ethyhexyl) phthalate	Influent	0.0068	0.009	0.0056	0.0061	0.005	0.0054	0.0072
	Effluent	0.0028	0.0026	<0.00015	<0.00015	<0.00015	<0.00015	2.9
Chlorine, Residual	Influent	<0.027	<0.027	<0.027	0.072	0.15	<0.027	<0.027
	Effluent	<0.027	<0.027	<0.027	<0.027	0.047	<0.027	<0.027
Chloroform	Influent	11	7	10	13	15	<0.00025	15
	Effluent	2.1	2.1	2.5	1.9	1.8	2.2	1.7
Fluoranthene	Influent	<0.06	<0.06	0.11	<0.06	<0.06	<0.06	<0.06
	Effluent	<0.06	<0.06	<0.06	<0.06	<0.06	<0.06	<0.06
Molybdenum	Influent	0.0091	0.0082	0.01	0.011	0.0086	0.008	0.0077
	Effluent	0.0085	0.0082	0.0093	0.0085	0.0074	0.0078	0.0073
Nickel	Influent	0.0047	0.0041	0.011	0.01	0.0033	0.0056	0.0034
	Effluent	0.0027	0.0031	0.0086	0.008	0.0024	0.0023	0.0022
Selenium	Influent	<0.00075	0.0015	0.0022	<0.00075	0.00084	0.0012	0.0012
	Effluent	<0.00075	0.0015	<0.00075	0.00096	<0.00075	<0.00075	0.00081
Silver	Influent	0.00018	0.000097	0.00021	0.00019	0.000064	0.00011	0.000071
	Effluent	<0.00002	<0.00002	<0.00002	<0.00002	<0.00002	<0.00002	<0.00002

Period 2

ECSD is required to report effluent oil & grease concentration in the MRO; however, it is not required to sample the influent for oil and grease. The WWTP's influent was sampled for oil & grease on seven business days over 3/2/2015 to 3/10/2015.

Table C.2 WWTP Sampling Period 2

WWTP System Sampling Period 2								
Parameter (mg/L unless otherwise indicated)	Location	3/2/2015	3/3/2015	3/4/2015	3/5/2015	3/6/2015	3/9/2015	3/10/2015
Oil & Grease	Influent	3.6	2.6	2.4	4	4.3	5.4	2.2
	Effluent	-	-	-	-	-	-	-

Period 3

Residual chlorine was correctly analyzed in the field at the influent and effluent of the WWTP over seven business days from 5/19/2016 to 5/27/2016.

Table C.3 WWTP Sampling Period 3

WWTP System Sampling Period 3								
Parameter (mg/L unless otherwise indicated)	Location	5/19/2016	5/20/2016	5/23/2016	5/24/2016	5/25/2016	5/26/2016	5/27/2016
Chlorine, Residual	Influent	0.03	0.07	0.01	<0.02	0.07	0.11	0.12
	Effluent	0.01	0.02	0.03	0.02	0.03	0.03	0.02

Period 4

Bis (2-ethylhexyl) phthalate was resampled in the influent and effluent of the WWTP from 11/17/2016 to 12/1/2016 to compare with the results from sampling period 1.

Table C.4 WWTP Sampling Period 4

WWTP System Sampling Period 4								
Parameter (mg/L unless otherwise indicated)	Location	11/17/2016	11/21/2016	11/22/2016	11/28/2016	11/29/2016	11/30/2016	12/1/2016
Bis (2-ethyhexyl) phthalate	Influent	0.0039	<0.0073	<0.0061	<0.006	<0.0014	<0.0061	<0.0062
	Effluent	<0.0012	<0.0012	<0.0012	<0.0012	<0.0061	<0.0012	<0.0012

Collection System Sampling

Period 1

Magoun pump station was chosen as a sampling point in the collection system to represent uncontrolled flows to the WWTP. Uncontrolled flow includes domestic and commercial users and inflow and infiltration (I&I). Magoun pump station receives residential, commercial, and uncontrolled industrial discharges. Sampling at Magoun occurred over seven business days from 9/29/2015 to 10/8/2015.

Cyanide is currently sampled for and controlled as available cyanide at the industries and the WWTP. Cyanide was incorrectly analyzed as total cyanide in sampling period 1. Results were thrown out and are highlighted in red below. The instability of chlorine in water requires analysis be conducted on samples immediately. Residual chlorine was incorrectly analyzed during sampling period 1 at an off-site laboratory, instead of in the field. Results were also thrown out and highlighted in red below.

Table C.5 Collection Sampling Period 1

Collection System Sampling Period 1								
Parameter (mg/L unless otherwise indicated)	Location	9/29/2014	9/30/2014	10/1/2014	10/2/2014	10/6/2014	10/7/2014	10/8/2014
Ammonia	Magoun	7.3	7.4	7.6	2.6	6.9	7.4	8.4
	Marktown	-	-	-	-	-	-	-
	Roxanna	-	-	-	-	-	-	-
Arsenic	Magoun	0.0027	0.0024	0.003	0.0016	0.0025	0.0025	0.0026
	Marktown	-	-	-	-	-	-	-
	Roxanna	-	-	-	-	-	-	-
Bis (2-ethylhexyl) phthalate (µg/L)	Magoun	8.5	8.7	4.7	<0.15	7.9	7.6	16
	Marktown	-	-	-	-	-	-	-
	Roxanna	-	-	-	-	-	-	-
$CBOD_5$	Magoun	50	39	49	35	44	43	54
	Marktown	-	-	-	-	-	-	-
	Roxanna	-	-	-	-	-	-	-
Cadmium	Magoun	<0.000026	<0.000026	<0.000026	0.000046	0.000032	<0.000026	0.00003
	Marktown	-	-	-	-	-	-	-
	Roxanna	-	-	-	-	-	-	-
Chloride	Magoun	94	95	96	41	110	100	110
	Marktown	-	-	-	-	-	-	-
	Roxanna	-	-	-	-	-	-	-
Chlorine (Residual)	Magoun	<0.027	<0.027	<0.027	0.066	0.11	<0.027	<0.027
	Marktown	-	-	-	-	-	-	-
	Roxanna	-	-	-	-	-	-	-
Chloroform (µg/L)	Magoun	2.2	2	2.5	1.2	2.2	1.7	1.7
	Marktown	-	-	-	-	-	-	-
	Roxanna	-	-	-	-	-	-	-

Collection System Sampling Period 1 (cont'd)								
Parameter (mg/L unless otherwise indicated)	Location	9/29/2014	9/30/2014	10/1/2014	10/2/2014	10/6/2014	10/7/2014	10/8/2014
Chromium	Magoun	0.00093	0.00039	0.00059	0.0021	<0.00013	<0.00013	0.00021
	Marktown	-	-	-	-	-	-	-
	Roxanna	-	-	-	-	-	-	-
Copper	Magoun	0.0091	0.0076	0.0088	0.01	0.0071	0.0066	0.0088
	Marktown	-	-	-	-	-	-	-
	Roxanna	-	-	-	-	-	-	-
Cyanide	Magoun	0.0067	0.0088	0.0075	<0.003	0.0055	0.017	0.0081
	Marktown	-	-	-	-	-	-	-
	Roxanna	-	-	-	-	-	-	-
Fluoranthene (µg/L)	Magoun	<0.06	0.11	<0.06	<0.06	<0.06	<0.06	<0.06
	Marktown	-	-	-	-	-	-	-
	Roxanna	-	-	-	-	-	-	-
Fluoride	Magoun	0.22	0.4	0.39	0.24	0.42	0.41	0.39
	Marktown	-	-	-	-	-	-	-
	Roxanna	-	-	-	-	-	-	-
Iron	Magoun	0.38	0.49	0.43	0.32	0.35	0.28	0.36
	Marktown	-	-	-	-	-	-	-
	Roxanna	-	-	-	-	-	-	-
Lead	Magoun	0.0016	0.00092	0.0013	0.0055	0.0015	0.00076	0.0016
	Marktown	-	-	-	-	-	-	-
	Roxanna	-	-	-	-	-	-	-
Mercury (ng/L)	Magoun	5.2	3.5	6.2	4.3	1.4	7.3	8.3
	Marktown	-	-	-	-	-	-	-
	Roxanna	-	-	-	-	-	-	-

Collection System Sampling Period 1 (cont'd)								
Parameter (mg/L unless otherwise indicated)	Location	9/29/2014	9/30/2014	10/1/2014	10/2/2014	10/6/2014	10/7/2014	10/8/2014
Molybdenum	Magoun	0.01	0.011	0.013	0.0043	0.011	0.008	0.011
	Marktown	-	-	-	-	-	-	-
	Roxanna	-	-	-	-	-	-	-
Nickel	Magoun	0.0029	0.0028	0.0073	0.0045	0.0025	0.0022	0.0021
	Marktown	-	-	-	-	-	-	-
	Roxanna	-	-	-	-	-	-	-
Oil & Grease	Magoun	4.8	5.8	5.4	5.1	3.4	6.1	6
	Marktown	-	-	-	-	-	-	-
	Roxanna	-	-	-	-	-	-	-
Phenols (4AAP)	Magoun	0.033	0.017	0.022	0.015	0.015	0.017	0.017
	Marktown	-	-	-	-	-	-	-
	Roxanna	-	-	-	-	-	-	-
Phosphorus	Magoun	1.3	1.2	1.4	0.84	1.2	1.2	1.5
	Marktown	-	-	-	-	-	-	-
	Roxanna	-	-	-	-	-	-	-
Selenium	Magoun	<0.00075	<0.00075	0.0011	<0.00075	<0.00075	0.0012	0.001
	Marktown	-	-	-	-	-	-	-
	Roxanna	-	-	-	-	-	-	-
Silver	Magoun	<0.00002	<0.00002	<0.00002	<0.00002	<0.00002	<0.00002	<0.00002
	Marktown	-	-	-	-	-	-	-
	Roxanna	-	-	-	-	-	-	-
Sulfate	Magoun	120	120	150	43	100	110	120
	Marktown	-	-	-	-	-	-	-
	Roxanna	-	-	-	-	-	-	-

Collection System Sampling Period 1 (cont'd)								
Parameter (mg/L unless otherwise indicated)	Location	9/29/2014	9/30/2014	10/1/2014	10/2/2014	10/6/2014	10/7/2014	10/8/2014
Thallium	Magoun	<0.000048	<0.000048	<0.000048	<0.000048	0.0021	<0.000048	<0.000048
	Marktown	-	-	-	-	-	-	-
	Roxanna	-	-	-	-	-	-	-
TSS	Magoun	39	27	25	26	30	66	42
	Marktown	-	-	-	-	-	-	-
	Roxanna	-	-	-	-	-	-	-
Zinc	Magoun	0.034	0.028	0.042	0.041	0.038	0.026	0.051
	Marktown	-	-	-	-	-	-	-
	Roxanna	-	-	-	-	-	-	-

Period 2

Cyanide was resampled over seven business days from 11/10/2014 to 11/19/2014 at Magoun pump station and was analyzed as available cyanide.

Table C.6 Collection Sampling Period 2

Collection System Sampling Period 2								
Parameter (mg/L unless otherwise indicated)	Location	11/10/2014	11/12/2014	11/13/2014	11/14/2014	11/17/2014	11/8/2014	11/19/2014
Cyanide	Magoun	<0.00083	<0.00083	<0.00083	<0.00083	<0.00083	<0.00083	<0.00083
	Marktown	-	-	-	-	-	-	-
	Roxanna	-	-	-	-	-	-	-

Period 3

Per USEPA comments, ECSD increased the number of collection system sampling locations, and included a location that included I&I. Two more pump stations were added to the sampling schedule to represent uncontrolled flow to the WWTP. Roxanna and Marktown pump stations both receive predominately residential flow. Roxanna also experiences I&I. Sampling for all the POCs was conducted on seven business days from 3/39/2016 to 4/6/2016 at Roxanna and Marktown Pump Station. Mercury was not correctly analyzed using the low-level method and results were thrown out. The results are highlighted in red below.

Table C.7 Collection Sampling Period 3

Collection System Sampling Period 3								
Parameter (mg/L unless otherwise indicated)	Location	3/29/2016	3/30/2014	3/31/2014	4/4/2014	4/5/2014	4/6/2014	4/7/2014
Ammonia	Magoun	-	-	-	-	-	-	-
	Marktown	1.4	1.1	1.1	1.1	0.95	1	1.1
	Roxanna	2.3	2.4	2.4	2.4	2.2	2.5	2.5
Arsenic	Magoun	-	-	-	-	-	-	-
	Marktown	0.0057	<0.003	0.0038	<0.003	0.008	0.0077	0.0072
	Roxanna	<0.003	<0.003	<0.003	<0.003	<0.003	<0.003	<0.003
Bis (2ethylhexyl) phthalate (µg/L)	Magoun	-	-	-	-	-	-	-
	Marktown	1.9	1.7	1.9	1.4	2.6	1.9	1.9
	Roxanna	<1.3	<1.3	2.8	6.4	1.7	1.4	<1.2
$CBOD_5$	Magoun	-	-	-	-	-	-	-
	Marktown	23	32	19	16	23	18	4
	Roxanna	4	6.9	5.9	6	4.3	5.2	17
Cadmium	Magoun	-	-	-	-	-	-	-
	Marktown	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002
	Roxanna	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002
Chloride	Magoun	-	-	-	-	-	-	-
	Marktown	160	180	180	180	180	180	190
	Roxanna	25	21	27	26	26	26	26

Collection System Sampling Period 3								
Parameter (mg/L unless otherwise indicated)	Location	3/29/2016	3/30/2014	3/31/2014	4/4/2014	4/5/2014	4/6/2014	4/7/2014
Chlorine (Residual)	Magoun	-	-	-	-	-	-	-
	Marktown	-	-	-	-	-	-	-
	Roxanna	-	-	-	-	-	-	-
Chloroform	Magoun	-	-	-	-	-	-	-
	Marktown	1.2	1.6	1.4	1.3	1.5	1.4	0.93
	Roxanna	<0.21	<0.21	0.44	<0.21	0.31	<0.21	<0.21
Chromium	Magoun	-	-	-	-	-	-	-
	Marktown	<0.001	<0.001	<0.001	<0.001	<0.001	0.0012	0.0013
	Roxanna	<0.001	<0.001	<0.001	0.001	<0.001	<0.001	<0.001
Copper	Magoun	-	-	-	-	-	-	-
	Marktown	0.0077	<0.001	0.0043	0.0036	0.006	0.0053	0.0055
	Roxanna	0.0041	0.0027	0.0019	0.0027	0.0034	0.0021	0.0023
Cyanide	Magoun	-	-	-	-	-	-	-
	Marktown	0.00183	0.000867	0.00302	0.000875	0.000758	0.000347	<0.000265
	Roxanna	0.00274	0.00243	0.00302	0.00068	<0.00265	<0.00265	<0.00265
Fluoranthene (µg/L)	Magoun	-	-	-	-	-	-	-
	Marktown	<0.0054	<0.0054	<0.0053	<0.0051	<0.005	<0.005	<0.005
	Roxanna	<0.0054	<0.0054	<0.0056	<0.0051	<0.0051	<0.0051	<0.0051
Fluoride	Magoun	-	-	-	-	-	-	-
	Marktown	0.9	0.9	0.93	0.93	0.93	0.95	0.95
	Roxanna	0.79	0.81	0.8	0.79	0.8	0.83	0.84
Iron	Magoun	-	-	-	-	-	-	-
	Marktown	4	<0.005	1.2	1.2	4	4.5	4.2
	Roxanna	0.39	0.21	0.24	1.8	0.91	0.26	0.25

Collection System Sampling Period 3								
Parameter (mg/L unless otherwise indicated)	Location	3/29/2016	3/30/2014	3/31/2014	4/4/2014	4/5/2014	4/6/2014	4/7/2014
Lead	Magoun	0.0016	0.00092	0.0013	0.0055	0.0015	0.00076	0.0016
	Marktown	-	-	-	-	-	-	-
	Roxanna	-	-	-	-	-	-	-
Mercury (ng/L)	Magoun	-	-	-	-	-	-	-
	Marktown	<20	<20	<20	<20	<20	<20	<20
	Roxanna	<20	<20	<20	<20	<20	<20	<20
Molybdenum	Magoun	-	-	-	-	-	-	-
	Marktown	0.0039	<0.002	0.0039	0.0076	0.0058	0.0053	0.0058
	Roxanna	<0.002	0.0022	<0.002	<0.002	<0.002	<0.002	<0.002
Nickel	Magoun	-	-	-	-	-	-	-
	Marktown	0.0013	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001
	Roxanna	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001
Oil & Grease	Magoun	-	-	-	-	-	-	-
	Marktown	3.7	3	5.5	<1.4	3.7	3	3.1
	Roxanna	5	<1.4	<1.4	32	<1.4	<1.4	<1.4
Phenols (4AAP)	Magoun	-	-	-	-	-	-	-
	Marktown	0.018	<0.007	<0.007	0.02	<0.007	<0.007	<0.007
	Roxanna	0.017	0.0078	0.0099	<0.007	<0.007	<0.007	<0.007
Phosphorous	Magoun	-	-	-	-	-	-	-
	Marktown	0.51	0.5	0.18	0.44	0.99	0.45	0.43
	Roxanna	0.21	0.36	0.36	0.4	0.3	0.38	0.31
Selenium	Magoun	-	-	-	-	-	-	-
	Marktown	<0.003	<0.003	<0.003	0.0035	<0.003	<0.003	<0.003
	Roxanna	<0.003	<0.003	<0.003	<0.003	<0.003	<0.003	<0.003

Collection System Sampling Period 3								
Parameter (mg/L unless otherwise indicated)	Location	3/29/2016	3/30/2014	3/31/2014	4/4/2014	4/5/2014	4/6/2014	4/7/2014
Silver	Magoun	-	-	-	-	-	-	-
	Marktown	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005
	Roxanna	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005
Sulfate	Magoun	-	-	-	-	-	-	-
	Marktown	170	180	190	170	210	190	170
	Roxanna	150	160	180	180	160	160	150
Thallium	Magoun	-	-	-	-	-	-	-
	Marktown	<0.003	<0.003	<0.003	<0.003	<0.003	<0.003	<0.003
	Roxanna	<0.003	<0.003	<0.003	<0.003	<0.003	<0.003	<0.003
TSS	Magoun	-	-	-	-	-	-	-
	Marktown	38	52	12	16	49	24	50
	Roxanna	3.2	2	2.3	14	4.8	4	4
Zinc	Magoun	-	-	-	-	-	-	-
	Marktown	0.048	<0.004	0.024	0.021	0.043	0.039	0.029
	Roxanna	<0.004	<0.004	<0.004	0.028	0.009	<0.004	0.0045

Period 4

Residual chlorine was correctly analyzed in the field at Magoun, Marktown, and Roxanna pump stations over seven business days from 7/26/2016 to 8/8/2016.

Table C.8 Collection Sampling Period 4

Collection System Sampling Period 4								
Parameter (mg/L unless otherwise indicated)	Location	7/26/2016	7/28/2016	7/29/2016	8/1/2016	8/3/2016	8/5/2016	8/8/2014
Chlorine, Residual	Magoun	0.15	0.03	0.01	0.02	<0.02	0.04	0.04
	Marktown	0.14	0.03	0.13	0.05	0.03	0.12	0.05
	Roxanna	0.05	0.09	0.1	0.03	0.06	0.02	0.05

Period 5

Unexpectedly high bis (2-ethylhexyl) phthalate concentrations were observed in samples taken at Magoun Pump Station during sampling period 1. ECSD conducted seven more days of sampling at the WWTP and at Magoun Pump Station to confirm these numbers.

Table C.9 Collection Sampling Period 5

Collection System Sampling Period 5								
Parameter (mg/L unless otherwise indicated)	Location	3/29/2016	3/30/2014	3/31/2014	4/4/2014	4/5/2014	4/6/2014	4/7/2014
Bis (2ethylhexyl) phthalate (µg/L)	Magoun	0.0062	<0.008	<0.0073	<0.0061	<0.006	<0.006	<0.0062
	Marktown	-	-	-	-	-	-	-
	Roxanna	-	-	-	-	-	-	-
Mercury (ng/L)	Magoun	-	-	-	-	-	-	-
	Marktown	2.31	1.99	0.777	2.28	1.77	2.29	1.99
	Roxanna	0.872	0.729	1.03	5.99	4.06	<0.396	1.51

ATTACHMENT D

Statistical Analysis of Non-Detects

Methods for Handling Data Below Detection Level

USEPA guidance for dealing with data below detection levels is presented in Appendix Q of the *Local Limit Development Guidance*. Based on USEPA guidance, three methods were used based on the percent of sampling data that was below the detection limit. Table 4.1 summarizes these methods.

Table D.1 Summary of Statistical Analysis Methods

Approximate Percentage of Non-Detects	Statistical Analysis Method
<15%	Simple Substitution
15-50%	Regression Order Statistic (ROS) Method
50-90%	Kaplan-Meier Method
>90%	Simple Substitution

Statistical methods were not used to deal with non-detects reported in MROs or for industrial compliance. Non-detects in the MROs are reported at the reporting limit and were undistinguishable from detects at the reporting limit. Non-detects in industrial compliance data are reported as zeros and do not without detection limit information. Because of these reasons statistics were not applied when dealing with this data. Statistical methods were applied to data collected in the sampling plan however. Table summarizes which data sets the statistical methods were applied

Statistical Analysis

Simple Substitution

For parameters where non-detects were reported for either less than 15% or more than 90% of all sampling data, simple substitution was used. Non-detect concentration values were substituted with a value equal to one-half of the minimum detection level. These adjusted values were then added to the total of the detected values and averaged. The data sets where simple substitution was used are presented below. The highlighted numbers are the substituted values.

WWTP Data

Chlorine, Residual (WWTP Influent)

Chlorine, Residual (mg/L)	Transformed Data (mg/L)
0.03	0.03
0.07	0.7
0.01	0.01
<0.01	0.005
0.07	0.07
0.11	0.11
0.12	0.12
Average	**0.149285714**

Chloroform (WWTP Influent)

Chloroform (mg/L)	Transformed Data (mg/L)
0.011	0.011
0.007	0.007
0.01	0.01
0.013	0.013
0.015	0.015
<0.00025	0.000125
0.015	0.015
Average	**0.010161**

Fluoranthene (WWTP Influent)

Fluoranthene (mg/L)	Transformed Data (mg/L)
<0.00006	0.00003
<0.00006	0.00003
0.00011	0.00011
<0.00006	0.00003
<0.00006	0.00003
<0.00006	0.00003
<0.00006	0.00003
Average	**0.000041**

Fluoranthene (WWTP Effluent)

Fluoranthene (mg/L)	Transformed Data (mg/L)
<0.00006	0.00003
<0.00006	0.00003
<0.00006	0.00003
<0.00006	0.00003
<0.00006	0.00003
<0.00006	0.00003
<0.00006	0.00003
Average	**0.00003**

Silver (WWTP Effluent)

Silver (mg/L)	Transformed Data (mg/L)
<0.00002	0.00001
<0.00002	0.00001
<0.00002	0.00001
<0.00002	0.00001
<0.00002	0.00001
<0.00002	0.00001
<0.00002	0.00001
Average	**0.00001**

Collection System Data

Chlorine, Residual (Collection System)

Chlorine, Residual (mg/L)	Transformed Data
0.14	0.14
0.03	0.03
0.01	0.01
0.05	0.05
<0.02	0.01
0.04	0.04
0.04	0.04
0.15	0.15
0.05	0.05
0.03	0.03
0.09	0.09
0.13	0.13
0.1	0.1
0.02	0.02
0.03	0.03
0.06	0.06
0.02	0.02
0.06	0.06
0.12	0.12
0.05	0.05
0.05	0.05
Average	**0.060952381**

Fluoranthene (Collection System)

Fluoranthene (µg/L)	Transformed Data
<0.06	0.03
0.11	0.11
<0.06	0.03
<0.06	0.03
<0.06	0.03
<0.06	0.03
<0.06	0.03
<0.0054	0.0027
<0.0054	0.0027
<0.0054	0.0027
<0.0054	0.0027
<0.0053	0.00265
<0.0056	0.0058
<0.0051	0.00255
<0.0051	0.00255
<0.005	0.0025
<0.0051	0.00255
<0.0051	0.00255
<0.005	0.0025
<0.005	0.0025
<0.0051	0.00255
Average	**1.56905E-05**

Iron (Collection System)

Iron (mg/L)	Transformed Data
0.38	0.38
0.49	0.49
0.43	0.43
0.32	0.32
0.35	0.35
0.28	0.28
0.36	0.36
4	4
0.39	0.39
<0.005	0.0025
0.21	0.21
1.2	1.2
0.24	0.24
1.2	1.2
1.8	1.8
4	4
0.26	0.26
0.91	0.91
4.5	4.5
4.2	4.2
0.25	0.25
Average	**1.227262**

Mercury (Collection System)

Mercury (mg/L)	Transformed Data (mg/L)
0.00000231	0.00000231
0.000000872	0.000000872
0.00000199	0.00000199
0.000000729	0.000000729
0.000000777	0.000000777
0.00000103	0.00000103
0.00000228	0.00000228
0.00000599	0.00000599
0.00000177	0.00000177
0.00000406	0.00000406
0.00000229	0.00000229
<0.000000396	0.000000198
0.00000199	0.00000199
0.00000151	0.00000151
0.0000052	0.0000052
0.0000035	0.0000035
0.0000062	0.0000062
0.0000043	0.0000043
0.0000014	0.0000014
0.0000073	0.0000073
0.0000083	0.0000083
Average	**3.04743E-06**

Silver (Collection System)

Silver (mg/L)	Transformed Data (mg/L)
<0.00002	0.00001
<0.00002	0.00001
<0.00002	0.00001
<0.00002	0.00001
<0.00002	0.00001
<0.00002	0.00001
<0.00002	0.00001
<0.0005	0.00025
<0.0005	0.00025
<0.0005	0.00025
<0.0005	0.00025
<0.0005	0.00025
<0.0005	0.00025
<0.0005	0.00025
<0.0005	0.00025
<0.0005	0.00025
<0.0005	0.00025
<0.0005	0.00025
<0.0005	0.00025
<0.0005	0.00025
<0.0005	0.00025
<0.0005	0.00025
Average	**0.000178**

Thallium (Collection System)

Thallium (mg/L)	Transformed Data (mg/L)
<0.00048	0.00024
<0.00048	0.00024
<0.00048	0.00024
<0.00048	0.00024
0.0021	0.21
<0.00048	0.00024
<0.00048	0.00024
<0.003	0.0015
<0.003	0.0015
<0.003	0.0015
<0.003	0.0015
<0.003	0.0015
<0.003	0.0015
<0.003	0.0015
<0.003	0.0015
<0.003	0.0015
<0.003	0.0015
<0.003	0.0015
<0.003	0.0015
<0.003	0.0015
<0.003	0.0015
<0.003	0.0015
Average	**0.001215**

MR Method

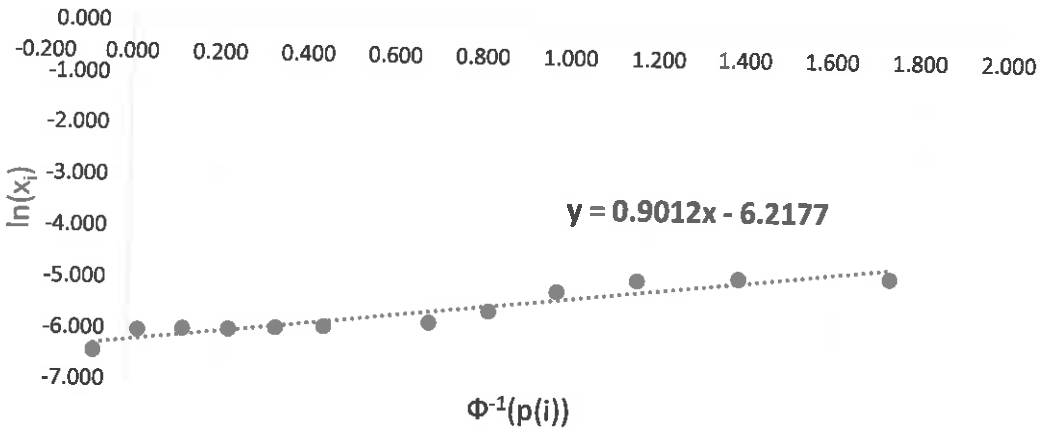
ECSD applied an extension of the regression order statistics (ROS) method, called the MR method, to data sets containing 15-50% non-detects. ECSD followed steps for the MR method outlined in Appendix Q of the USEPA local limit guidance.

The ROS and MR methods assume sampling data come from a normal or normalized distribution. Because of this assumption, percentiles for each detected observation can be estimated. The detected observations or normalized detected observations can then be plotted against the z-scores corresponding with their estimated percentiles. The regression equation can then be used to calculate "fill-in" values for the non-detects. The distribution with the "fill-in" values included can then be used to calculate an estimated mean and standard deviation.

The guidance found in Appendix Q assumes data is from a log-normal distribution, so the natural logs of detected concentrations ($\ln(x_i)$) were plotted against their respective z-scores ($\Phi^{-1}(p(i))$). The resulting graphs are presented as Figures A.1-A.8. The regression equation was used to extrapolate "fill-in" values for concentrations below the detection limit (highlighted values in Tables A.1, A.3, A.5, and A.7). The distribution of the log-normalized detected values and calculated "fill-in" values was used to estimate summary statistics including the arithmetic mean of the original data set (Tables A.2, A.4, A.6, and A.8).

Arsenic (Collection System)

Linear Regression



Original and Log-Normalized Concentrations

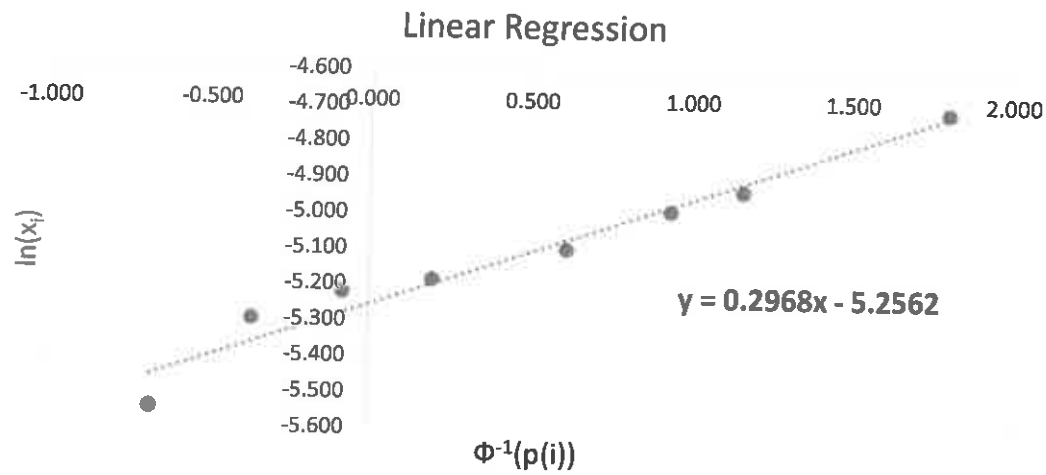
Arsenic Conc. (mg/L)	Natural Log Conc. (mg/L)
<0.003	-7.766
<0.003	-7.450
<0.003	-7.239
<0.003	-7.073
<0.003	-6.931
<0.003	-6.805
<0.003	-6.690
<0.003	-6.582
<0.003	-6.480
0.0016	-6.438
0.0024	-6.032
0.0025	-5.991
0.0025	-5.991
0.0026	-5.952
0.0027	-5.915
0.003	-5.809
0.0038	-5.573
0.0057	-5.167
0.0072	-4.934
0.0077	-4.867
0.008	-4.828

Calculation of Sample Mean

Natural log mean	$\mu = -6.215$
Natural log standard deviation	$\sigma = 0.849$
Arithmetic mean of original data set	$m = e^{(\mu+0.5\sigma^2)}$ $m = 0.00287$

Bis (2-ethylhexyl) Phthalate (WWTP Influent)

Linear Regression



Original and Transformed Concentrations

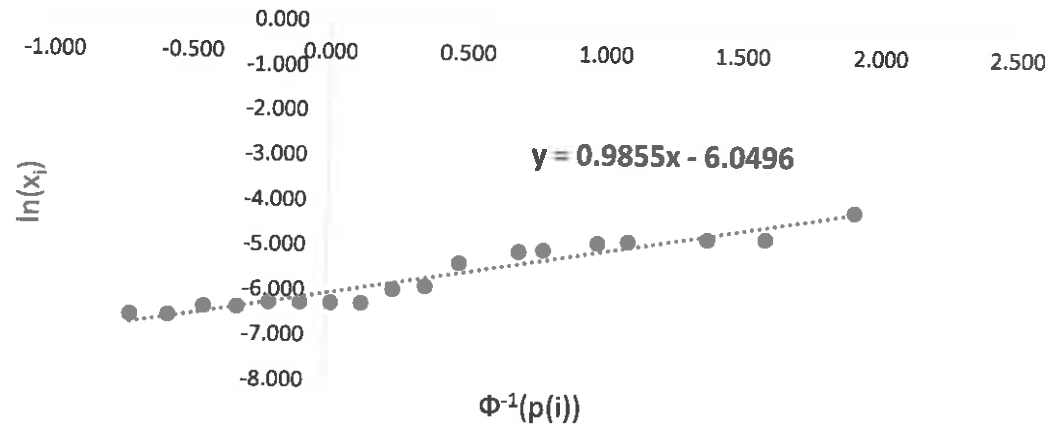
Bis (2-ethylhexyl) Phthalate Conc. (mg/L)	Natural Log Conc. (mg/L)
<0.0014	-7.603
<0.006	-6.537
<0.0061	-6.864
<0.0061	-6.261
<0.0062	-6.395
<0.0073	-6.089
0.0039	-5.547
0.005	-5.298
0.0054	-5.221
0.0056	-5.185
0.0061	-5.099
0.0068	-4.991
0.0072	-4.934
0.009	-4.711

Calculation of Summary Statistics

Natural log mean	$\mu = -5.246$
Natural log standard deviation	$\sigma = 0.256$
Arithmetic mean of original data set	$m = e^{(\mu+0.5\sigma^2)}$ $m = 0.00544$

Bis (2-ethyhexyl) Phthalate (Collection System)

Linear Regression



Original and Transformed Concentrations

Bis (2-ethyhexyl) Phthalate Conc. (mg/L)	Natural Log Conc. (mg/L)
<0.00015	-7.320
<0.0013	-7.677
<0.0013	-7.320
<0.0013	-7.079
<0.006	-6.724
<0.006	-6.065
<0.0061	-6.376
<0.0062	-6.376
<0.0073	-6.276
<0.008	-6.182
0.0014	-6.571
0.0014	-6.571
0.0017	-6.377
0.0017	-6.377
0.0019	-6.266
0.0019	-6.266
0.0019	-6.266
0.0019	-6.266
0.0026	-5.952
0.0028	-5.878
0.0047	-5.360
0.0062	-5.083
0.0064	-5.051
0.0076	-4.880
0.0079	-4.841

Original and Transformed Concentrations (cont'd)

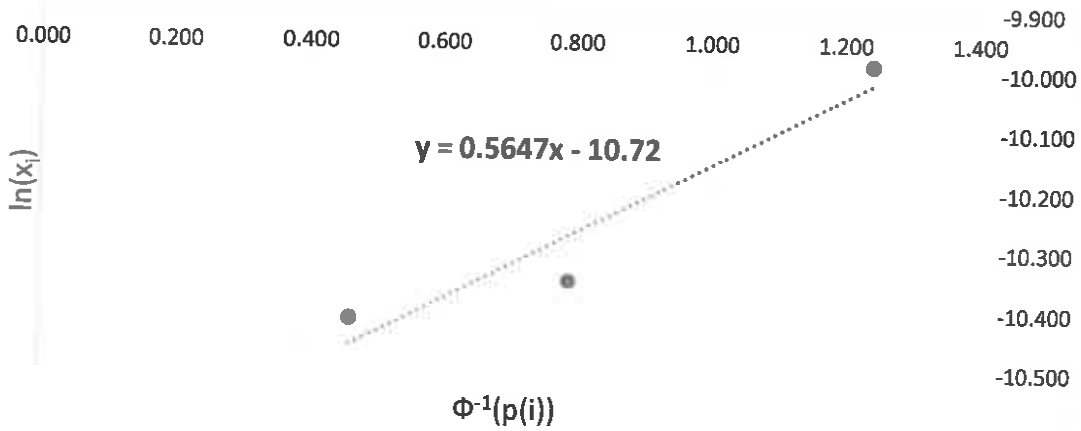
0.0085	-4.768
0.0087	-4.744
0.016	-4.135

Table A.6 Calculation of Summary Statistics

Natural log mean	$\mu = -6.027$
Natural log standard deviation	$\sigma = 0.891$
Arithmetic mean of original data set	$m = e^{(\mu+0.5\sigma^2)}$ $m = 0.00359$

Chloroform (Collection System)

Linear Regression



Original and Transformed Concentrations

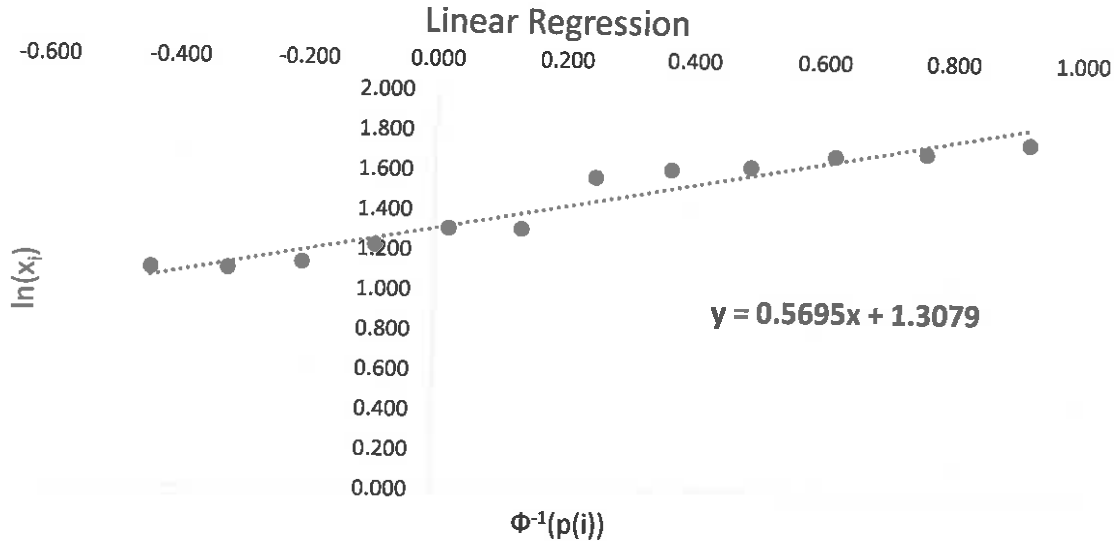
Chloroform Conc. (mg/L)	Natural Log Conc. (mg/L)
<0.000026	-10.040
<0.000026	-10.300
<0.000026	-10.491
<0.000026	-10.659
<0.0002	-9.872
<0.0002	-10.093
<0.0002	-10.245
<0.0002	-10.368
<0.0002	-10.477
<0.0002	-10.577
<0.0002	-10.673
<0.0002	-10.767
<0.0002	-10.863
<0.0002	-10.963
<0.0002	-11.072
<0.0002	-11.195
<0.0002	-11.347
<0.0002	-11.568
0.00003	-10.414
0.000032	-10.350
0.000046	-9.987

Calculation of Summary Statistics

Natural log mean	$\mu = -10.587$
Natural log standard deviation	$\sigma = 0.457$
Arithmetic mean of original data set	$m = e^{(\mu+0.5\sigma^2)}$ $m = 2.80 \times 10^{-5}$

Oil & Grease (Collection System)

Linear Regression



Original and Transformed Concentrations

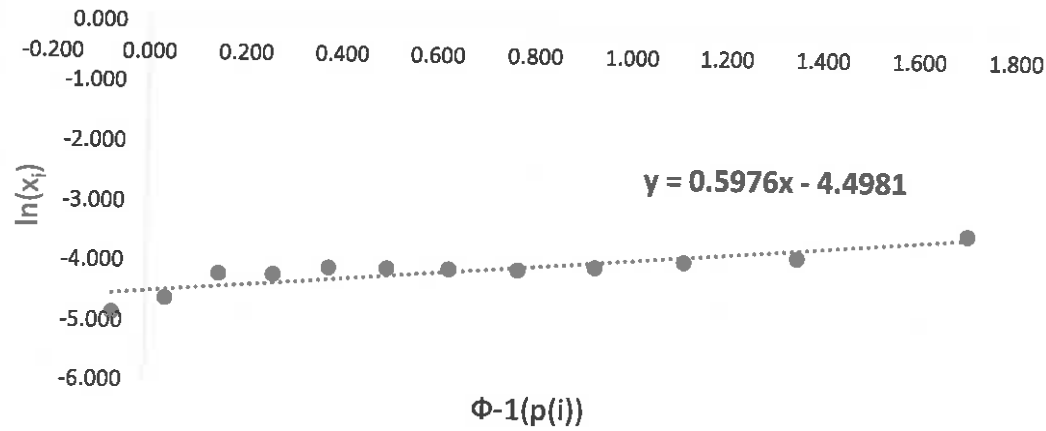
Oil & Grease Conc. (mg/L)	Natural Log Conc. (mg/L)
<1.4	0.316
<1.4	0.514
<1.4	0.646
<1.4	0.749
<1.4	0.837
<1.4	0.915
3	1.099
3	1.099
3.1	1.131
3.4	1.224
3.7	1.308
3.7	1.308
4.8	1.569
5	1.609
5.1	1.629
5.4	1.686
5.5	1.705
5.8	1.758
6	1.792
6.1	1.808
32	3.466

Calculation of Summary Statistics

Natural log mean	$\mu = -1.341$
Natural log standard deviation	$\sigma = 0.661$
Arithmetic mean of original data set	$m = e^{(\mu+0.5\sigma^2)}$ $m = 0.437$

Phenols (Collection System)

Linear Regression



Original and Transformed Concentrations

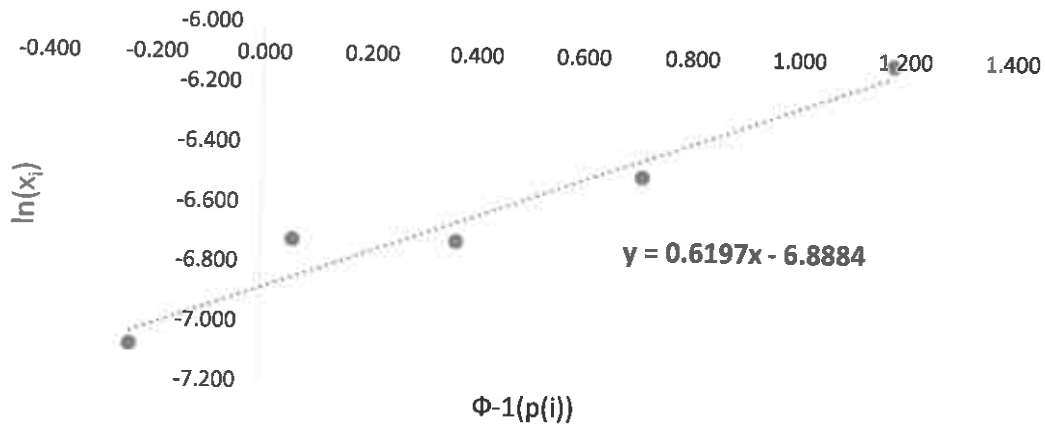
Phenols Conc. (mg/L)	Natural Log Conc. (mg/L)
<0.007	-5.525
<0.007	-5.315
<0.007	-5.175
<0.007	-5.065
<0.007	-4.971
<0.007	-4.888
<0.007	-4.811
<0.007	-4.740
<0.007	-4.672
0.0078	-4.854
0.0099	-4.615
0.015	-4.200
0.015	-4.200
0.017	-4.075
0.017	-4.075
0.017	-4.075
0.017	-4.075
0.018	-4.017
0.02	-3.912
0.022	-3.817
0.033	-3.411

Calculation of Summary Statistics

Natural log mean	$\mu = -4.499$
Natural log standard deviation	$\sigma = 0.562$
Arithmetic mean of original data set	$m = e^{(\mu+0.5\sigma^2)}$ $m = 0.0130$

Selenium (WWTP Influent)

Linear Regression



Original and Transformed Concentrations

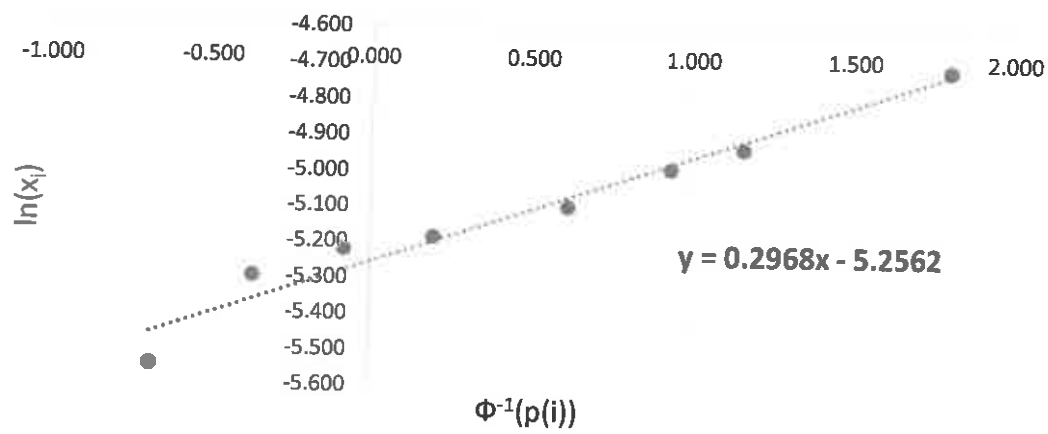
Arsenic Conc. (mg/L)	Natural Log Conc. (mg/L)
<0.00075	-7.700
<0.00075	-7.431
0.00084	-7.082
0.0012	-6.725
0.0012	-6.725
0.0015	-6.502
0.0022	-6.119

Calculation of Summary Statistics

Natural log mean	$\mu = -6.898$
Natural log standard deviation	$\sigma = 0.545$
Arithmetic mean of original data set	$m = e^{(\mu+0.5\sigma^2)}$ $m = 0.0117$

Zinc (Collection System)

Linear Regression



Original and Transformed Concentrations

Zinc Conc. (mg/L)	Natural Log Conc. (mg/L)
<0.004	-6.143
<0.004	-5.695
<0.004	-5.397
<0.004	-5.163
<0.004	-4.965
0.0045	-5.404
0.009	-4.711
0.021	-3.863
0.024	-3.730
0.026	-3.650
0.028	-3.576
0.028	-3.576
0.029	-3.540
0.034	-3.381
0.038	-3.270
0.039	-3.244
0.041	-3.194
0.042	-3.170
0.043	-3.147
0.048	-3.037
0.051	-2.976

Calculation of Summary Statistics

Natural log mean	$\mu = -4.040$
Natural log standard deviation	$\sigma = 1.011$
Arithmetic mean of original data set	$m = e^{(\mu+0.5\sigma^2)}$ $m = 0.0294$

Kaplan-Meier Method

For parameters where non-detects accounted for between 50-90% of all sampling data, ECSD applied the Kaplan-Meier method to estimate the mean of the sampling data. ECSD followed steps for applying the Kaplan-Meier method outlined in Statistical Analysis of Groundwater Monitoring Data at RCRA Facilities (EPA 530-R-09-007). Similar to the MR method, the Kaplan-Meier method assumes the data comes from a normal or normalized distribution, which allowed for estimation of the mean.

For each detected value and distinct detection limit, a probability was calculated that was adjusted for the non-detects in the data set. The calculated probability was an estimate of the cumulative distribution function (CDF). Tables B.2, B.5, B.8, B.11, B.14, B.17, and B.20 show the detected values and the calculated CDF for each data set. The CDF's were then used to estimate the mean of each data set (See Tables B.3, B.6, B.9, B.12, B.15, B.18, and B.21).

Unlike in the MR method, lognormality was not assumed for the distributions. Instead, multiple transformations were attempted and the transformation that optimally normalized the data was chosen. The optimal transformation was chosen by plotting the transformed data against the z-score that corresponded with the estimated CDF, creating a censored probability plot. The correlation coefficient was calculated and the transformation with the highest correlation coefficient and most linear appearance was one that optimally normalized the data (See Figures B.1-B.7)

Bis (2-ethylhexyl) Phthalate (WWTP Effluent)

Original Data Set

Bis (2-ethylhexyl) Phthalate (mg/L)
0.0028
0.0026
<0.00015
<0.00015
<0.00015
<0.00015
0.0029
<0.0012
<0.0012
<0.0012
<0.0012
<0.0061
<0.0012
<0.0012

Estimated CDF's

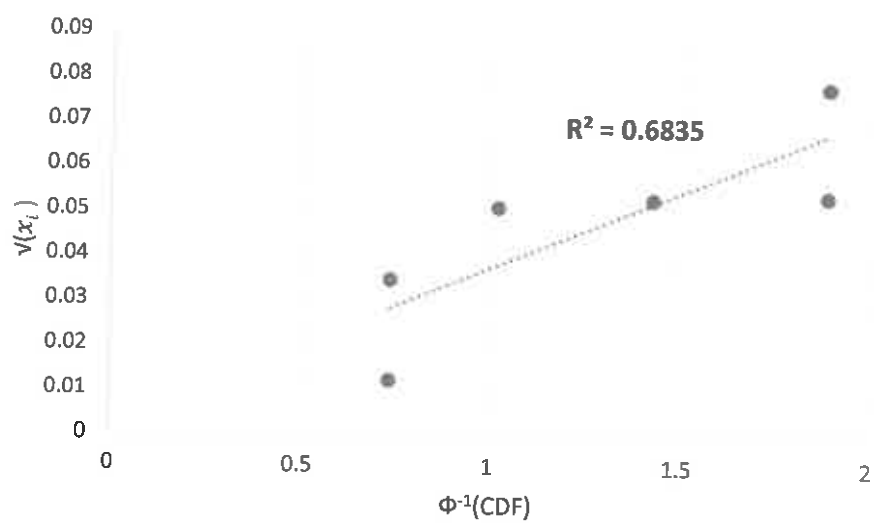
x_i	CDF
<0.00015	0.769231
<0.0012	0.769231
0.0026	0.846154
0.0028	0.923077
0.0029	1*
<0.0061	1*

*CDF was adjusted when calculating z-score

Mean Calculation

Optimal Transformation	$\sqrt{x_i}$
Mean of Transformed Data	$\mu = 0.022$
Mean of Transformed Data	$\sigma = 0.017$
Arithmetic Mean of Original Data Set	$m = (\mu + \sigma^2)^2$ $m = 0.000471$

Censored Probability Plot



Cadmium (Collection System)

Original Data Set

Cadmium (mg/L)
<0.000026
<0.000026
<0.000026
0.000046
0.000032
<0.000026
0.00003
<0.0002
<0.0002
<0.0002
<0.0002
<0.0002
<0.0002
<0.0002
<0.0002
<0.0002
<0.0002
<0.0002
<0.0002
<0.0002

Estimated CDF's

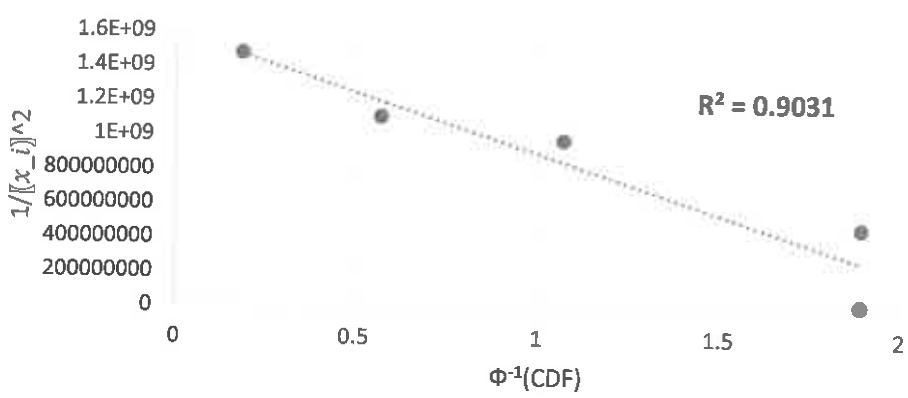
x_i	CDF
<0.000026	0.571428571
0.00003	0.714285714
0.000032	0.857142857
0.000046	1*
<0.0002	1*

* CDF was adjusted when calculating z-score -

Table B.6 Mean Calculation

Optimal Transformation	$\frac{1}{x_i^2}$
Mean of Transformed Data	$\mu = 1.21 \times 10^9$
Standard Deviation of Transformed Data	$\sigma = 3.58 \times 10^8$
Arithmetic Mean of Original Data Set	$m = \sqrt{1/(u + 0.5\sigma^2)}$ $m = 2.79 \times 10^{-9}$

Censored Probability Plot



Chromium (Collection System)

Original Data Set

Chromium

(mg/L)
0.00021
0.00039
0.00059
0.00093
0.001
0.0012
0.0013
0.0021
<0.00013
<0.00013
<0.001
<0.001
<0.001
<0.001
<0.001
<0.001
<0.001
<0.001
<0.001
<0.001
<0.001

Estimated CDF's

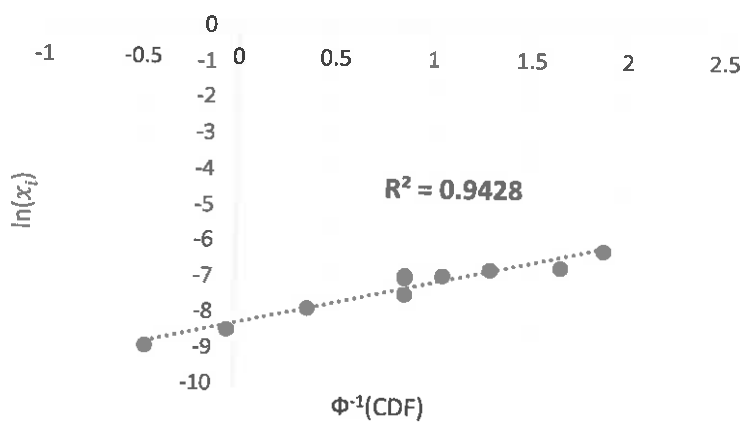
x_i	CDF
0.00013	0.32381
0.00021	0.485714
0.00039	0.647619
0.00059	0.809524
0.00093	0.809524
<0.001	0.809524
0.001	0.857143
0.0012	0.904762
0.0013	0.952381
0.0021	1*

* CDF was adjusted when calculating z-score

Mean Calculation

Optimal Transformation	$\ln(x_i)$
Square Root Mean	$\mu = -7.822$
Square Root Standard Deviation	$\sigma^2 = 0.846$
Arithmetic Mean of Original Data Set	$m = e^{(u+0.5\sigma^2)}$ $m = 0.000574$

Censored Probability Plot



Cyanide (Collection System)

Original Data Set

Cyanide (mg/L)
<0.00083
<0.00083
<0.00083

<0.00083
<0.00083
<0.00083
<0.00083
0.00183
0.00274
0.000867
0.00243
0.00302
0.00302
0.000875
0.00068
0.000758
<0.000265
<0.000265
0.000347
<0.000265
<0.000265

Estimated CDF's

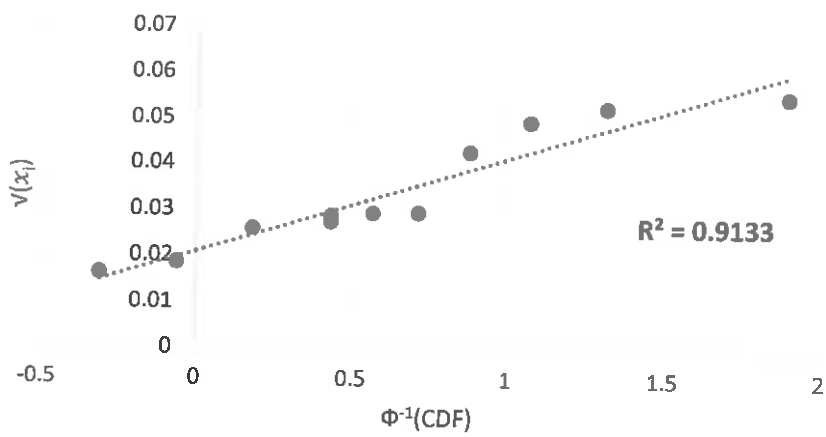
x_i	CDF
<0.000265	0.380952381
0.000347	0.476190476
0.00068	0.571428571
0.000758	0.666666667
<0.00083	0.666666667
0.000867	0.714285714
0.000875	0.761904762
0.00183	0.80952381
0.00243	0.857142857
0.00274	0.904761905
0.00302	1*

* CDF was adjusted when calculating z-score

Mean Calculation

Optimal Transformation	$\sqrt{x_i}$
Square Root Mean	$\mu = 0.0280$
Square Root Standard Deviation	$\sigma^2 = 0.014$
Arithmetic Mean of Original Data Set	$m = (\mu + \sigma^2)^2$ $m = 0.000790$

Censored Probability Plot



Nickel (Collection System)

Original Data Set

Nickel (mg/L)
0.0013
0.0021
0.0022
0.0025
0.0028
0.0029
0.0045

0.0073
<0.001
<0.001
<0.001
<0.001
<0.001
<0.001
<0.001
<0.001
<0.001
<0.001
<0.001
<0.001
<0.001

Estimated CDF's

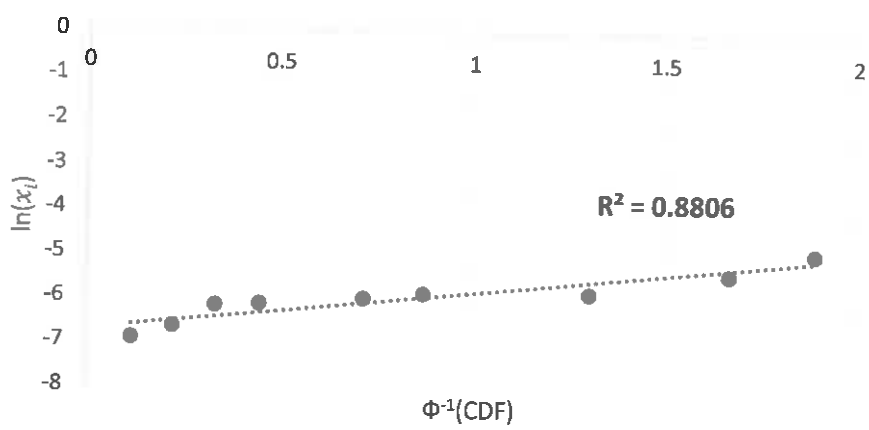
x_i	CDF
<0.001	0.548115
0.0013	0.590278
0.0021	0.63244
0.0022	0.674603
0.0025	0.76455
0.0028	0.809524
0.0029	0.904762
0.0045	0.952381
0.0073	1*

* CDF was adjusted when calculating z-score

Mean Calculation

Optimal Transformation	$\ln(x_i)$
Square Root Mean	$\mu = -6.291$
Square Root Standard Deviation	$\sigma^2 = 0.568$
Arithmetic Mean of Original Data Set	$m = e^{(\mu+\sigma^2)}$ $m = 0.0.00218$

Censored Probability



Selenium (WWTP Effluent)

Original Data Set

Selenium (mg/L)
<0.00075
0.0015
<0.00075
0.00096
<0.00075
<0.00075
0.00081

Estimated CDF's

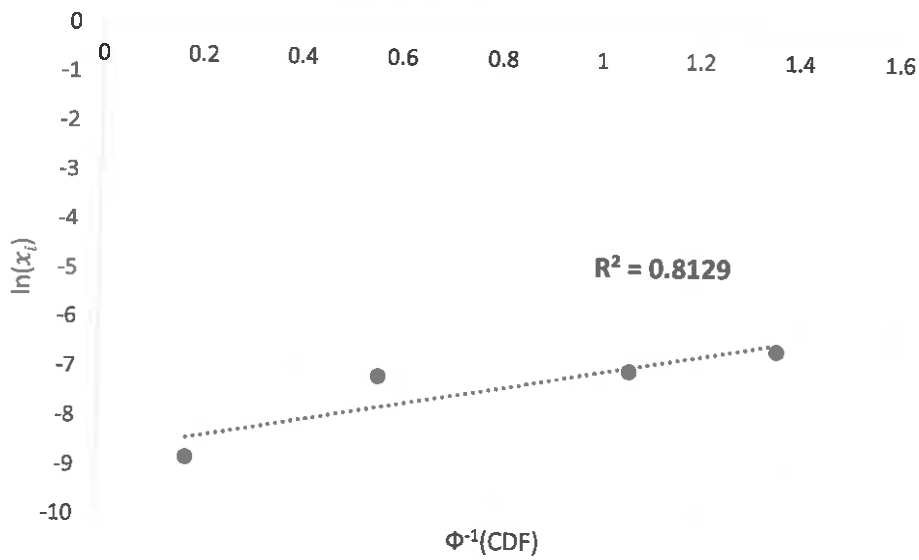
x_i	CDF
<0.00075	0.571428571
0.00081	0.714285714
0.00096	0.857142857
0.0015	1*

* CDF was adjusted when calculating z-score

Optimal Transformation	$\ln(x_i)$
Square Root Mean	$\mu = -6.97$
Square Root Standard Deviation	$\sigma^2 = 0.122$
Arithmetic Mean of Original Data Set	$m = e^{(\mu+\sigma^2)}$ $m = 1.00 \times 10^{-6}$

Mean Calculation

Censored Probability Plot



Selenium (Collection System)

Original Data Set

Selenium (mg/L)
<0.00075
<0.00075
0.0011
<0.00075
<0.00075
0.0012
0.001
<0.003
<0.003
<0.003
<0.003

<0.003
<0.003
0.0035
<0.003
<0.003
<0.003
<0.003
<0.003
<0.003
<0.003

Estimated CDF's

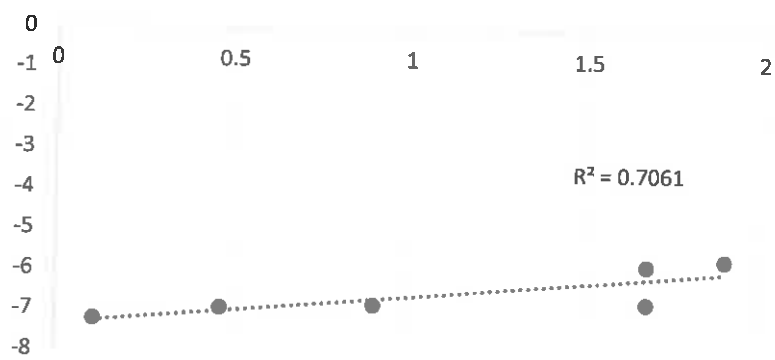
x_i	CDF
<0.00075	0.544218
0.001	0.680272
0.0011	0.816327
0.0012	0.952381
<0.003	0.952381
0.0035	1*

* CDF was adjusted when calculating z-score

Mean Calculation

Optimal Transformation	$\ln(x_i)$
Square Root Mean	$\mu = -6.9671$
Square Root Standard Deviation	$\sigma^2 = 0.122$
Arithmetic Mean of Original Data Set	$m = e^{(\mu+\sigma^2)}$ $m = 0.0.00218$

Censored Probability Plot



ATTACHMENT E

Region V Local Limit Spreadsheet Tables

TABLE 1

Local Limits Determination Based on NPDES Daily Effluent Limits

ENVIRONMENTAL CRITERIA AND PROCESS DATA BASE

Pollutant	IU Pollut. Flow (MGD) (Qind)	POTW Flow (MGD) (Qpotw)	Removal Efficiency (%) (Rpotw)	NPDES Daily Limit (mg/l) (Ccrit)	Domestic and Conc. (mg/l) (Cdom)	Commercial Flow (MGD) (Qdom)	MAXIMUM LOADING Allowable Headworks (lbs/day) (Lhw)	Domestic/ Commercial (lbs/day) (Ldom)	INDUSTRIAL Allowable Loading (lbs/day) (Lind)	Local Limit (mg/l) (Cind)	Safety Factor (%) (SF)
Ammonia	2.76	13.92	97	2.79	3.4	11.16	9892	319	7595	330	20
Arsenic	2.76	13.92	61	0.24	0.0033	11.16	72	0.31	61	2.63	15
Bis(2-ethylhexyl) Phthalate	2.76	13.92	41	0.008	0.0036	11.16	1.6	0.33	0.91	0.040	20
Cadmium	2.76	13.92	11.8	0.012	0.000030	11.16	1.6	0.0028	1.3	0.055	20
CBOD5	2.76	13.92	94		24	11.16	-	2209	-	-	15
Chloride	2.76	13.92	3.4	690	99	11.16	82895	9188	61273	2662	15
Chlorine	2.76	13.92	85	0.06	0.061	11.16	45	5.7	33.0	1.43	15
Chloroform	2.76	13.92	82	0.28	0.0013	11.16	177	0.12	150	6.5	15
Chromium	2.76	13.92	87	0.45	0.00057	11.16	395	0.053	316	13.7	20
Copper	2.76	13.92	88	0.05	0.0052	11.16	49	0.49	41	1.8	15
Cyanide	2.76	13.92	21	0.0085	0.00079	11.16	1.2	0.074	0.93	0.040	20
Fluoranthene	2.76	13.92	28	0.0059	0.00002	11.16	0.95	0.0015	0.76	0.033	20
Fluoride	2.76	13.92	-10	17	0.70	11.16	1795	65	1461	63	15
Iron, Dissolved	2.76	13.92	77		1.2	11.16	-	114	-	-	15
Lead	2.76	13.92	94	0.061	0.0041	11.16	122	0.38	104	4.50	15
Mercury	2.76	13.92	89	0.0000032	0.0000030	11.16	0.0034	0.00028	0.0024	0.000105	20
Molybdenum	2.76	13.92	8.9	1.2	0.0058	11.16	153	0.54	130	5.6	15
Nickel	2.76	13.92	30		0.0022	11.16	-	0.20	-	-	20
Oil and Grease	2.76	13.92	69	10	5.0	11.16	3721	461	2701	117	15
Phenols, 4-AAP	2.76	13.92	37	0.3	0.013	11.16	55	1.2	45	2.0	15
Phosphorus	2.76	13.92	87		0.69	11.16	-	64	-	-	15
Selenium	2.76	13.92	52	0.0082	0.0010	11.16	2.0	0.093	1.5	0.065	20
Silver	2.76	13.92	92	0.0001	0.00017	11.16	0.15	0.016	0.11	0.0046	20
Sulfates	2.76	13.92	4.8	2100	152	11.16	256119	14107	203594	8845	15
Thallium	2.76	13.92	0	0.012	0.0011	11.16	1.4	0.10	1.0	0.044	20
TSS	2.76	13.92	97		25	11.16	-	2350	-	-	15
Zinc	2.76	13.92	81	0.39	0.028	11.16	244	2.6	205	8.9	15

(Qind) POTW's average influent flow in MGD.
(Qpotw) Removal efficiency across POTW as percent.
(Rpotw) NPDES daily maximum permit limit for a particular pollutant in mg/l.
(Ccrit) Domestic/commercial background flow in MGD.
(Qdom) Domestic/commercial background concentration for a particular pollutant in mg/l.
(Cdom) Maximum allowable headworks pollutant loading to the POTW in pounds per day (lbs/day).
(Lhw) Domestic/commercial background loading to the POTW for a particular pollutant in pounds per day (lbs/day).
(Ldom) Maximum allowable industrial loading to the POTW in pounds per day.
(Lind) Industrial allowable local limit for a given pollutant in mg/l.
(Cind) Safety factor as a percent.
(SF) Unit conversion factor
8.34 8.34 * Ccrit * Qpotw
Lhw = 1 - Rpotw

TABLE 2

Local Limits Determination Based on NPDES Monthly Effluent Limits

ENVIRONMENTAL CRITERIA AND PROCESS DATA BASE

Pollutant	IU Pollut. Flow (MGD) (Qind)	POTW Flow (MGD) (Qpotw)	Removal Efficiency (%) (Rpotw)	NPDES Monthly Limit (mg/l) (Ccrit)	Domestic and Conc. (mg/l) (Cdom)	Commercial Flow (MGD) (Qdom)
Ammonia	2.76	13.92	97	1.2	3.4	11.16
Arsenic	2.76	13.92	61	0.12	0.0033	11.16
Bis(2-ethylhexyl) Phthalate	2.76	13.92	41	0.008	0.0036	11.16
Cadmium	2.76	13.92	11.8	0.006	0.000030	11.16
CBOD5	2.76	13.92	94	5	24	11.16
Chloride	2.76	13.92	3.4	340	99	11.16
Chlorine	2.76	13.92	85	0.06	0.061	11.16
Chloroform	2.76	13.92	82	0.14	0.0013	11.16
Chromium	2.76	13.92	87	0.23	0.00057	11.16
Copper	2.76	13.92	88	0.025	0.0052	11.16
Cyanide	2.76	13.92	21	0.0043	0.00079	11.16
Fluoranthene	2.76	13.92	28	0.0029	0.00002	11.16
Fluoride	2.76	13.92	-10	8.3	0.70	11.16
Iron, Dissolved	2.76	13.92	77		1.2	11.16
Lead	2.76	13.92	94	0.031	0.0041	11.16
Mercury	2.76	13.92	89	0.0000013	0.000	11.16
Molybdenum	2.76	13.92	8.9	0.6	0.0058	11.16
Nickel	2.76	13.92	30	0.14	0.0022	11.16
Oil and Grease	2.76	13.92	69		5.0	11.16
Phenols, 4-AAP	2.76	13.92	37	0.15	0.013	11.16
Phosphorus	2.76	13.92	87	1	0.69	11.16
Selenium	2.76	13.92	52	0.0041	0.0010	11.16
Silver	2.76	13.92	92	0.005	0.00017	11.16
Sulfate	2.76	13.92	4.8	1000	152	11.16
Thallium	2.76	13.92	0	0.005	0.0011	11.16
TSS	2.76	13.92	97	8.5	25	11.16
Zinc	2.76	13.92	81	0.19	0.028	11.16

MAXIMUM LOADING — INDUSTRIAL

Pollutant	Allowable Headworks (lbs/day) (Lhw)	Domestic/ Commercial (lbs/day) (Ldom)	Allowable Loading (lbs/day) (Lind)	Local Limit (mg/l) (Cind)	Safety Factor (%) (SF)
Ammonia	4255	319	3084	134	20
Arsenic	36	0.31	30	1.31	15
Bis(2-ethylhexyl) Phthalate	1.6	0.33	0.91	0.03973	20
Cadmium	0.79	0.0028	0.63	0.027	20
CBOD5	10224	2209	6482	282	15
Chloride	40847	9188	25532	1109	15
Chlorine	45	5.7	33	1.433	15
Chloroform	88	0.12	75	3.3	15
Chromium	202	0.053	161	7.0	20
Copper	24	0.49	20	0.88	15
Cyanide	0.63	0.074	0.43	0.019	20
Fluoranthene	0.46	0.0015	0.37	0.016	20
Fluoride	876	65	680	30	15
Iron, Dissolved	-	114	-	-	15
Lead	62	0.38	52	2.28	15
Mercury	0.00137	0	0.00081	0.000035	20
Molybdenum	76	0.54	64	2.8	15
Nickel	23	0.20	18	0.80	20
Oil and Grease	-	461	-	-	15
Phenols, 4-AAP	27	1.2	22	0.96	15
Phosphorus	928	64	725	31	15
Selenium	1.00	0.093	0.71	0.031	20
Silver	7.6	0.016	6.1	0.2650	20
Sulfate	121961	14107	89560	3891	15
Thallium	0.58	0.10	0.36	0.016	20
TSS	34217	2350	26734	1161	15
Zinc	119	2.6	98	4	15

(Qind) Industrial User total plant discharge flow in Million Gallons per Day (MGD) that contains a particular pollutant.
(Qpotw) POTW's average influent flow in MGD.
(Rpotw) Removal efficiency across POTW as percent.
(Ccrit) NPDES monthly maximum permit limit for a particular pollutant in mg/l.
(Qdom) Domestic/commercial background flow in MGD.
(Cdom) Domestic/commercial background concentration for a particular pollutant in mg/l.
(Lhw) Maximum allowable headworks pollutant loading to the POTW in pounds per day (lbs/day).
(Ldom) Domestic/commercial background loading to the POTW for a particular pollutant in pounds per day (lbs/day).
(Lind) Maximum allowable industrial loading to the POTW in pounds per day.
(Cind) Industrial allowable local limit for a given pollutant in mg/l.
(SF) Safety factor as a percent.
8.34 Unit conversion factor
Lhw = 8.34 * Ccrit * Qpotw / 1 - Rpotw

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Local Limits Determination Based on Activated Sludge Inhibition Level

TABLE 3

ENVIRONMENTAL CRITERIA AND PROCESS DATA BASE

Pollutant	IU Pollut. Flow (MGD) (Qind)	POTW Flow (MGD) (Qpotw)	Removal Efficiency (%) (Rprim)	Activated Sludge Inhibition Level (mg/l) (Ccrit)	Domestic and Conc. (mg/l) (Cdom)	Commercial Flow (MGD) (Qdom)	MAXIMUM LOADING Allowable Headworks (lbs/day) (Lhw)	Domestic/ Commercial (lbs/day) (Ldom)	INDUSTRIAL Allowable Loading (lbs/day) (Lind)	Local Limit (mg/l) (Cind)	Safety Factor (%) (SF)
Ammonia	2.76	13.92	97	480	3.4	11.16	1701907	319	1361206	59136	20
Arsenic	2.76	13.92	61	0.1	0.0033	11.16	30	0.31	25	1.09	15
Bis(2-ethylhexyl) Phthalate	2.76	13.92	41		0.0036	11.16	-	0.33	-	-	20
Cadmium	2.76	13.92	11.8	1	0.000030	11.16	132	0.0028	105	5	20
CBOD5	2.76	13.92	94		24	11.16	-	2209	-	-	15
Chloride	2.76	13.92	3.4		99	11.16	-	9188	-	-	15
Chlorine	2.76	13.92	85		0.061	11.16	-	5.7	-	-	15
Chloroform	2.76	13.92	82		0.0013	11.16	-	0.12	-	-	15
Chromium	2.76	13.92	87	1	0.00057	11.16	877	0.053	702	30	20
Copper	2.76	13.92	88	1	0.0052	11.16	977	0.49	830	36	15
Cyanide	2.76	13.92	21	0.1	0.00079	11.16	15	0.074	12	0.51	20
Fluoranthene	2.76	13.92	28		0.00002	11.16	-	0.0015	-	-	20
Fluoride	2.76	13.92	-10		0.70	11.16	-	65	-	-	15
Iron, Dissolved	2.76	13.92	77		1.2	11.16	-	114	-	-	15
Lead	2.76	13.92	94	1	0.0041	11.16	2004	0.38	1703	74	15
Mercury	2.76	13.92	89	0.1	0.000	11.16	106	0	84	3.7	20
Molybdenum	2.76	13.92	8.9		0.0058	11.16	-	0.54	-	-	15
Nickel	2.76	13.92	30	1	0.0022	11.16	167	0.20	133	5.8	20
Oil and Grease	2.76	13.92	69		5.0	11.16	-	461	-	-	15
Phenols, 4-AAP	2.76	13.92	37	50	0.013	11.16	9158	1.2	7783	338	15
Phosphorus	2.76	13.92	87		0.69	11.16	-	64	-	-	15
Selenium	2.76	13.92	52		0.0010	11.16	-	0.093	-	-	20
Silver	2.76	13.92	92		0.00017	11.16	-	0.016	-	-	20
Sulfates	2.76	13.92	4.8		152	11.16	-	14107	-	-	15
Thallium	2.76	13.92	0		0.0011	11.16	-	0.10	-	-	20
TSS	2.76	13.92	97		25	11.16	-	2350	-	-	15
Zinc	2.76	13.92	81	0.5	0.028	11.16	313	2.6	263	11	15

(Qind) Industrial User total plant discharge flow in Million Gallons per Day (MGD) that contains a particular pollutant.
(Qpotw) POTW's average influent flow in MGD.
(Rprim) Removal efficiency across across primary treatment as percent.
(Ccrit) Activated sludge threshold inhibition level, mg/l.
(Qdom) Domestic/commercial background flow in MGD.
(Cdom) Domestic/commercial background concentration for a particular pollutant in mg/l.
(Lhw) Maximum allowable headworks pollutant loading to the POTW in pounds per day (lbs/day).
(Ldom) Domestic/commercial background loading to the POTW for a particular pollutant in pounds per day (lbs/day).
(Lind) Maximum allowable industrial loading to the POTW in pounds per day.
(Cind) Industrial allowable local limit for a given pollutant in mg/l.
(SF) Safety factor as a percent.
8.34 Unit conversion factor
Lhw = 8.34 * Ccrit * Qpotw
1 - Rprim

Local Limits Determination Based on Nitrification Inhibition Level

TABLE 4

ENVIRONMENTAL CRITERIA AND PROCESS DATA BASE

Pollutant	IU Pollut. Flow (MGD) (Qind)	POTW Flow (MGD) (Qpotw)	Removal Efficiency (%) (Rsec)	Nitrification Inhibition Level (mg/l) (Ccrit)	Domestic and Commercial Conc. (mg/l) (Cdom)	Flow (MGD) (Qdom)	MAXIMUM LOADING Allowable Headworks (lbs/day) (Lhw)	Domestic/ Commercial (lbs/day) (Ldom)	INDUSTRIAL Allowable Loading (lbs/day) (Lind)	Local Limit (mg/l) (Cind)	Safety Factor (%) (SF)
Ammonia	2.76	13.92	97		3.4	11.16	-	319	-	-	20
Arsenic	2.76	13.92	61	1.5	0.0033	11.16	448	0.31	381	16.5	15
Bis(2-ethylhexyl) Phthalate	2.76	13.92	41		0.0036	11.16	-	0.33	-	-	20
Cadmium	2.76	13.92	11.8	5.2	0.000030	11.16	684	0.0028	547	24	20
CBOD5	2.76	13.92	94		24	11.16	-	2209	-	-	15
Chloride	2.76	13.92	3.4	180	99	11.16	21625	9188	9193	399	15
Chlorine	2.76	13.92	85		0.061	11.16	-	5.7	-	-	15
Chloroform	2.76	13.92	82		0.0013	11.16	-	0.12	-	-	15
Chromium	2.76	13.92	87	0.25	0.00057	11.16	219	0.053	175	7.6	20
Copper	2.76	13.92	88	0.48	0.0052	11.16	469	0.49	398	17	15
Cyanide	2.76	13.92	21	0.34	0.00079	11.16	50	0.074	40	1.7	20
Fluoranthene	2.76	13.92	28		0.00002	11.16	-	0.0015	-	-	20
Fluoride	2.76	13.92	-10		0.70	11.16	-	65	-	-	15
Iron, Dissolved	2.76	13.92	77		1.2	11.16	-	114	-	-	15
Lead	2.76	13.92	94	0.5	0.0041	11.16	1002	0.38	851	37.0	15
Mercury	2.76	13.92	89		0.000	11.16	-	0	-	-	20
Molybdenum	2.76	13.92	8.9		0.0058	11.16	-	0.54	-	-	15
Nickel	2.76	13.92	30	0.25	0.0022	11.16	42	0.20	33	1.4	20
Oil and Grease	2.76	13.92	69		5.0	11.16	-	461	-	-	15
Phenols, 4-AAP	2.76	13.92	37	4	0.013	11.16	733	1.2	622	27	15
Phosphorus	2.76	13.92	87		0.69	11.16	-	64	-	-	15
Selenium	2.76	13.92	52		0.0010	11.16	-	0.093	-	-	20
Silver	2.76	13.92	92		0.00017	11.16	-	0.016	-	-	20
Sulfates	2.76	13.92	4.8		152	11.16	-	14107	-	-	15
Thallium	2.76	13.92	0		0.0011	11.16	-	0.10	-	-	20
TSS	2.76	13.92	97		25	11.16	-	2350	-	-	15
Zinc	2.76	13.92	81	0.5	0.028	11.16	313	2.6	263	11	15

(Qind) Industrial User total plant discharge flow in Million Gallons per Day (MGD) that contains a particular pollutant.
(Qpotw) POTW's average influent flow in MGD.
(Rsec) Removal efficiency across primary treatment and secondary treatment as percent.
(Ccrit) Nitrification threshold inhibition level, mg/l.
(Qdom) Domestic/commercial background flow in MGD.
(Cdom) Domestic/commercial background concentration for a particular pollutant in mg/l.
(Lhw) Maximum allowable headworks pollutant loading to the POTW in pounds per day (lbs/day).
(Ldom) Domestic/commercial background loading to the POTW for a particular pollutant in pounds per day (lbs/day).
(Lind) Maximum allowable industrial loading to the POTW in pounds per day.
(Cind) Industrial allowable local limit for a given pollutant in mg/l.
(SF) Safety factor as a percent.
8.34 Unit conversion factor

$$Lhw = \frac{8.34 * Ccrit * Qpotw}{1 - Rsec}$$

TABLE 5

Local Limits Determination Based on USEPA 503 "Clean" Sludge Regulations
ENVIRONMENTAL CRITERIA AND PROCESS DATA BASE

Pollutant	IU Pollut. Flow (MGD) (Qind)	POTW Flow (MGD) (Qpotw)	Sludge Flow (tonnes/day) (Qsldg)	Removal Efficiency (%) (Rpotw)	503 "Clean" Sludge Criteria (mg/kg) (Cslcrit)	Domestic and Conc. (mg/l) (Cdom)	Commercial Flow (MGD) (Qdom)	MAXIMUM LOADING Allowable Headworks (lbs/day) (Lhw)	Domestic/ Commercial (lbs/day) (Ldom)	Allowable Loading (lbs/day) (Lind)	INDUSTRIAL Local Limit (mg/l) (Cind)	Safety Factor (%) (SF)
Ammonia	2.76	13.92	10.19	97		3.4	11.16	-	319	-	-	20
Arsenic	2.76	13.92	10.19	61	41	0.0033	11.16	2	0.31	1	0.042	15
Bis(2-ethylhexyl) Phthalate	2.76	13.92	10.19	41		0.0036	11.16	-	0.33	-	-	20
Cadmium	2.76	13.92	10.19	11.8	39	0.000030	11.16	7	0.0028	6	0.3	20
CBOD5	2.76	13.92	10.19	94		24	11.16	-	2209	-	-	15
Chloride	2.76	13.92	10.19	3.4		99	11.16	-	9188	-	-	15
Chlorine	2.76	13.92	10.19	85		0.061	11.16	-	5.7	-	-	15
Chloroform	2.76	13.92	10.19	82		0.0013	11.16	-	0.12	-	-	15
Chromium	2.76	13.92	10.19	87		0.00057	11.16	-	0.053	-	-	20
Copper	2.76	13.92	10.19	88	1500	0.0052	11.16	38	0.49	32	1.4	15
Cyanide	2.76	13.92	10.19	21		0.00079	11.16	-	0.074	-	-	20
Fluoranthene	2.76	13.92	10.19	28		0.00002	11.16	-	0.0015	-	-	20
Fluoride	2.76	13.92	10.19	-10		0.70	11.16	-	65	-	-	15
Iron, Dissolved	2.76	13.92	10.19	77		1.2	11.16	-	114	-	-	15
Lead	2.76	13.92	10.19	94	300	0.0041	11.16	7.1	0.38	5.7	0.25	15
Mercury	2.76	13.92	10.19	89	17	0.000	11.16	0.43	0	0.34	0.015	20
Molybdenum	2.76	13.92	10.19	8.9		0.0058	11.16	-	0.54	-	-	15
Nickel	2.76	13.92	10.19	30	420	0.0022	11.16	31	0.20	25	1.07	20
Oil and Grease	2.76	13.92	10.19	69		5.0	11.16	-	461	-	-	15
Phenols, 4-AAP	2.76	13.92	10.19	37		0.013	11.16	-	1.2	-	-	15
Phosphorus	2.76	13.92	10.19	87		0.69	11.16	-	64	-	-	15
Selenium	2.76	13.92	10.19	52	100	0.0010	11.16	4.3	0.093	3.3	0.14	20
Silver	2.76	13.92	10.19	92		0.00017	11.16	-	0.016	-	-	20
Sulfates	2.76	13.92	10.19	4.8		152	11.16	-	14107	-	-	15
Thallium	2.76	13.92	10.19	0		0.0011	11.16	-	0.10	-	-	20
TSS	2.76	13.92	10.19	97		25	11.16	-	2350	-	-	15
Zinc	2.76	13.92	10.19	81	2800	0.028	11.16	77	2.6	63	2.7	15

(Qind) Industrial User total plant discharge flow in Million Gallons per Day (MGD) that contains a particular pollutant.
(Qpotw) POTW's average influent flow in MGD.
(Qsldg) Sludge flow to disposal in dry metric tons per day.
(Rpotw) Removal efficiency across POTW as a percent.
(Cslcrit) 503 sludge criteria in mg/kg dry sludge.
(Qdom) Domestic/commercial background flow in MGD.
(Cdom) Domestic/commercial background concentration for a particular pollutant in mg/l.
(Lhw) Maximum allowable headworks pollutant loading to the POTW in pounds per day (lbs/day).
(Ldom) Domestic/commercial background loading to the POTW for a particular pollutant in pounds per day (lbs/day).
(Lind) Maximum allowable industrial loading to the POTW in pounds per day.
(Cind) Industrial allowable local limit for a given pollutant in mg/l.
(SF) Safety factor as a percent.
8.34 Unit conversion factor

$$Lhw = \frac{0.0022 * Cslcrit * Qsldg}{Rpotw}$$

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TABLE 6

Local Limits Determination Based on 503 Ceiling Sludge Criteria
ENVIRONMENTAL CRITERIA AND PROCESS DATA BASE

Pollutant	IU Pollut. Flow (MGD) (Qind)	POTW Flow (MGD) (Qpotw)	Sludge Flow (tonnes/day) (Qsldg)	Removal Efficiency (%) (Rpotw)	503 Ceiling Sludge Criteria (mg/kg) (Cslcrit)	Domestic and Conc. (mg/l) (Cdom)	Commercial Flow (MGD) (Qdom)	MAXIMUM LOADING Allowable Headworks (lbs/day) (Lhw)	Domestic/ Commercial (lbs/day) (Ldom)	Allowable Loading (lbs/day) (Lind)	INDUSTRIAL Local Limit (mg/l) (Cind)	Safety Factor (%) (SF)
Ammonia	2.76	13.92	10.19	97		3.4	11.16	-	319	-	-	20
Arsenic	2.76	13.92	10.19	61	75	0.0033	11.16	3	0.31	2	0.1	15
Bis(2-ethylhexyl) Phthalate	2.76	13.92	10.19	41		0.0036	11.16	-	0.33	-	-	20
Cadmium	2.76	13.92	10.19	11.8	85	0.000030	11.16	16	0.0028	13	0.6	20
CBOD5	2.76	13.92	10.19	94		24	11.16	-	2209	-	-	15
Chloride	2.76	13.92	10.19	3.4		99	11.16	-	9188	-	-	15
Chlorine	2.76	13.92	10.19	85		0.061	11.16	-	5.7	-	-	15
Chloroform	2.76	13.92	10.19	82		0.0013	11.16	-	0.12	-	-	15
Chromium	2.76	13.92	10.19	87		0.00057	11.16	-	0.053	-	-	20
Copper	2.76	13.92	10.19	88	4300	0.0052	11.16	109	0.49	92	4.0	15
Cyanide	2.76	13.92	10.19	21		0.00079	11.16	-	0.074	-	-	20
Fluoranthene	2.76	13.92	10.19	28		0.00002	11.16	-	0.0015	-	-	20
Fluoride	2.76	13.92	10.19	-10		0.70	11.16	-	65	-	-	15
Iron, Dissolved	2.76	13.92	10.19	77		1.2	11.16	-	114	-	-	15
Lead	2.76	13.92	10.19	94	840	0.0041	11.16	20	0.38	17	0.72	15
Mercury	2.76	13.92	10.19	89	57	0.000	11.16	1.4	0	1.1	0.050	20
Molybdenum	2.76	13.92	10.19	8.9	75	0.0058	11.16	19	0.54	15	0.67	15
Nickel	2.76	13.92	10.19	30	420	0.0022	11.16	31	0.20	25	1.07	20
Oil and Grease	2.76	13.92	10.19	69		5.0	11.16	-	461	-	-	15
Phenols, 4-AAP	2.76	13.92	10.19	37		0.013	11.16	-	1.2	-	-	15
Phosphorus	2.76	13.92	10.19	87		0.69	11.16	-	64	-	-	15
Selenium	2.76	13.92	10.19	52	100	0.0010	11.16	4.3	0.093	3.3	0.14	20
Silver	2.76	13.92	10.19	92		0.00017	11.16	-	0.016	-	-	20
Sulfates	2.76	13.92	10.19	4.8		152	11.16	-	14107	-	-	15
Thallium	2.76	13.92	10.19	0		0.0011	11.16	-	0.10	-	-	20
TSS	2.76	13.92	10.19	97		25	11.16	-	2350	-	-	15
Zinc	2.76	13.92	10.19	81	7500	0.028	11.16	206	2.6	173	7.5	15

(Qind) Industrial User total plant discharge flow in Million Gallons per Day (MGD) that contains a particular pollutant.
(Qpotw) POTW's average influent flow in MGD.
(Qsldg) Sludge flow to disposal in dry metric tons per day.
(Rpotw) Removal efficiency across POTW as a percent.
(Cslcrit) State sludge criteria in mg/kg dry sludge.
(Qdom) Domestic/commercial background flow in MGD.
(Cdom) Domestic/commercial background concentration for a particular pollutant in mg/l.
(Lhw) Maximum allowable headworks pollutant loading to the POTW in pounds per day (lbs/day).
(Ldom) Domestic/commercial background loading to the POTW for a particular pollutant in pounds per day (lbs/day).
(Lind) Maximum allowable industrial loading to the POTW in pounds per day.
(Cind) Industrial allowable local limit for a given pollutant in mg/l.
(SF) Safety factor as a percent.
8.34 Unit conversion factor

$$Lhw = \frac{0.0022 * Cslcrit * Qsldg}{Rpotw}$$

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TABLE 7

Local Limits Determination Based on Chronic Water Quality Standards

ENVIRONMENTAL CRITERIA AND PROCESS DATA BASE

Pollutant	IU Pollut. Flow (MGD) (Qind)	POTW Flow (MGD) (Qpotw)	Upstream Flow (MGD) (Qstr)	Upstream Conc. (mg/l) (Cstr)	Removal Efficiency (%) (Rpotw)	Chronic WQS (mg/l) (Ccrit)	Domestic and Conc. (mg/l) (Cdom)	Commercial Flow (MGD) (Qdom)	MAXIMUM LOADING Allowable Headworks (lbs/day) (Lhw)	Domestic/ Commercial (lbs/day) (Ldom)	INDUSTRIAL Allowable Loading (lbs/day) (Lind)	Local Limit (mg/l) (Cind)	Safety Factor (%) (SF)
Ammonia	2.76	13.92	0	0	97		3.4	11.16	-	319	-	-	20
Arsenic	2.76	13.92	0	0	61	0.000175	0.0033	11.16	0.052	0.31	-0.27	-0.012	15
Bis(2-ethylhexyl) Phthalate	2.76	13.92	0	0	41	50	0.0036	11.16	9756	0.33	7804	339	20
Cadmium	2.76	13.92	0	0	11.8	0.00335537	0.000030	11.16	0.4414722	0.0028	0.350364106	0.015221045	20
CBOD5	2.76	13.92	0	0	94		24	11.16	-	2209	-	-	15
Chloride	2.76	13.92	0	0	3.4	230	99	11.16	27631.828	9188	14299.28092	621.2108975	15
Chlorine	2.76	13.92	0	0	85	0.011	0.061	11.16	8.3	5.7	1.4	0.062	15
Chloroform	2.76	13.92	0	0	82	0.157	0.0013	11.16	99	0.12	84	3.7	15
Chromium	2.76	13.92	0	0	87	0.652560951	0.00057	11.16	572.390967	0.053	457.8593645	19.89101608	20
Copper	2.76	13.92	0	0	88	0.038490953	0.0052	11.16	37.5987803	0.49	31.47098747	1.367210035	15
Cyanide	2.76	13.92	0	0	21	0.0052	0.00079	11.16	0.76358751	0.074	0.537341232	0.023343987	20
Fluoranthene	2.76	13.92	0	0	28	0.054	0.00002	11.16	8.7	0.0015	6.9	0.30	20
Fluoride	2.76	13.92	0	0	-10	2	0.70	11.16	211.140584	65	114.6719852	4.981753085	15
Iron, Dissolved	2.76	13.92	0	0	77	1	1.2	11.16	498	114	309	13.4	15
Lead	2.76	13.92	0	0	94	0.018462717	0.0041	11.16	36.9918142	0.38	31.05930961	1.349325306	15
Mercury	2.76	13.92	0	0	89	0.000012	0.000	11.16	0.01267126	0	0.009853373	0.000428085	20
Molybdenum	2.76	13.92	0	0	8.9	0.8	0.0058	11.16	102	0.54	86	3.7	15
Nickel	2.76	13.92	0	0	30	0.507267459	0.0022	11.16	85	0.20	67	2.9	20
Oil and Grease	2.76	13.92	0	0	69		5.0	11.16	-	461	-	-	15
Phenols, 4-AAP	2.76	13.92	0	0	37	0.18	0.013	11.16	32.9703552	1.2	26.81305985	1.164853328	15
Phosphorus	2.76	13.92	0	0	87		0.69	11.16	-	64	-	-	15
Selenium	2.76	13.92	0	0	52	0.035	0.0010	11.16	8.5	0.093	6.7	0.29	20
Silver	2.76	13.92	0	0	92		0.00017	11.16	-	0.016	-	-	20
Sulfate	2.76	13.92	0	0	4.8	2037	152	11.16	248435.498	14107	197062.7532	8561.096914	15
Thallium	2.76	13.92	0	0	0	0.048	0.0011	11.16	5.5724544	0.10	4.353853155	0.189146646	20
TSS	2.76	13.92	0	0	97		25	11.16	-	2350	-	-	15
Zinc	2.76	13.92	0	0	81	0.341627439	0.028	11.16	213.798097	2.6	179.1332372	7.782175876	15

(Qind) Industrial User total plant discharge flow in Million Gallons per Day (MGD) that contains a particular pollutant.
(Qpotw) POTW's average influent flow in MGD.
(Qstr) Receiving stream (upstream) 7Q10 flow in MGD.
(Cstr) Receiving stream background level in mg/l.
(Rpotw) Removal efficiency across POTW as percent.
(Ccrit) State chronic water quality standard for a particular pollutant in mg/l.
(Qdom) Domestic/commercial background flow in MGD.
(Cdom) Domestic/commercial background concentration for a particular pollutant in mg/l.
(Lhw) Maximum allowable headworks pollutant loading to the POTW in pounds per day (lbs/day).
(Ldom) Domestic/commercial background loading to the POTW for a particular pollutant in pounds per day (lbs/day).
(Lind) Maximum allowable industrial loading to the POTW in pounds per day.
(Cind) Industrial allowable local limit for a given pollutant in mg/l.
(SF) Safety factor as a percent.
8.34 Unit conversion factor

Lhw = $\frac{8.34 * (Ccrit * (Qstr + Qpotw) - (Cstr * Qstr))}{1 - Rpotw}$

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TABLE 8

Local Limits Determination Based on Acute Water Quality Standards

ENVIRONMENTAL CRITERIA AND PROCESS DATA BASE

Pollutant	IU Pollut. Flow (MGD) (Qind)	POTW Flow (MGD) (Qpotw)	Upstream Flow (MGD) (Qstr)	Upstream Conc. (mg/l) (Cstr)	Removal Efficiency (%) (Rpotw)	Acute WQS (mg/l) (Ccrit)	Domestic and Conc. (mg/l) (Cdom)	Commercial Flow (MGD) (Qdom)	Allowable Headworks (lbs/day) (Lhw)	MAXIMUM LOADING Domestic/ Commercial (lbs/day) (Ldom)	INDUSTRIAL Allowable Loading (lbs/day) (Lind)	Local Limit (mg/l) (Cind)	Safety Factor (%) (SF)
Ammonia	2.76	13.92	0	0	97		3.4	11.16	-	319	-	-	20
Arsenic	2.76	13.92	0	0	61	0.36	0.0033	11.16	108	0.31	91	4.0	15
Bis(2-ethylhexyl) Phthalate	2.76	13.92	0	0	41		0.0036	11.16	-	0.33	-	-	20
Cadmium	2.76	13.92	0	0	11.8	0.018629	0.000030	11.16	2	0.0028	2	0.085063592	20
CBOD5	2.76	13.92	0	0	94		24	11.16	-	2209	-	-	15
Chloride	2.76	13.92	0	0	3.4	860	99	11.16	103319	9188	78633.38492	3416.109934	15
Chlorine	2.76	13.92	0	0	85	0.019	0.061	11.16	14	5.7	6.6	0.29	15
Chloroform	2.76	13.92	0	0	82		0.0013	11.16	-	0.12	-	-	15
Chromium	2.76	13.92	0	0	87	5.3984783	0.00057	11.16	4735	0.053	3788.147781	164.5704211	20
Copper	2.76	13.92	0	0	88	0.0651332	0.0052	11.16	64	0.49	53.59199323	2.328224083	15
Cyanide	2.76	13.92	0	0	21	0.022	0.00079	11.16	3	0.074	2.510921257	0.109083223	20
Fluoranthene	2.76	13.92	0	0	28		0.00002	11.16	-	0.0015	-	-	20
Fluoride	2.76	13.92	0	0	-10	2	0.70	11.16	211	65	114.6719852	4.981753085	15
Iron, Dissolved	2.76	13.92	0	0	77		1.2	11.16	-	114	-	-	15
Lead	2.76	13.92	0	0	94	0.4737849	0.0041	11.16	949	0.38	806.4985125	35.03712302	15
Mercury	2.76	13.92	0	0	89	0.0024	0.000	11.16	3	0	2	0.088065135	20
Molybdenum	2.76	13.92	0	0	8.9	1.2	0.0058	11.16	153	0.54	130	5.6	15
Nickel	2.76	13.92	0	0	30	4.5630128	0.0022	11.16	761	0.20	609	26	20
Oil and Grease	2.76	13.92	0	0	69		5.0	11.16	-	461	-	-	15
Phenols, 4-AAP	2.76	13.92	0	0	37	1.3	0.013	11.16	238	1.2	201	8.740381831	15
Phosphorus	2.76	13.92	0	0	87		0.69	11.16	-	64	-	-	15
Selenium	2.76	13.92	0	0	52	0.13	0.0010	11.16	32	0.093	25	1.10	20
Silver	2.76	13.92	0	0	92	0.0218358	0.00017	11.16	33	0.016	27	1.2	20
Sulfate	2.76	13.92	0	0	4.8		152	11.16	-	14107	-	-	15
Thallium	2.76	13.92	0	0	0		0.0011	11.16	-	0.10	-	-	20
TSS	2.76	13.92	0	0	97		25	11.16	-	2350	-	-	15
Zinc	2.76	13.92	0	0	81	0.3771793	0.028	11.16	236	2.6	198	8.603769808	15

(Qind) Industrial User total plant discharge flow in Million Gallons per Day (MGD) that contains a particular pollutant.
(Qpotw) POTW's average influent flow in MGD.
(Qstr) Receiving stream (upstream) 1Q10 flow in MGD.
(Cstr) Receiving stream background level in mg/l.
(Rpotw) Removal efficiency across POTW as percent.
(Ccrit) State acute water quality standard for a particular pollutant in mg/l.
(Qdom) Domestic/commercial background flow in MGD.
(Cdom) Domestic/commercial background concentration for a particular pollutant in mg/l.
(Lhw) Maximum allowable headworks pollutant loading to the POTW in pounds per day (lbs/day).
(Ldom) Domestic/commercial background loading to the POTW for a particular pollutant in pounds per day (lbs/day).
(Lind) Maximum allowable industrial loading to the POTW in pounds per day.
(Cind) Industrial allowable local limit for a given pollutant in mg/l.
(SF) Safety factor as a percent.
8.34 Unit conversion factor

$$Lhw = \frac{8.34 * (Ccrit * (Qstr + Qpotw) - (Cstr * Qstr))}{1 - Rpotw}$$

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Local Limits Determination Based on .

TABLE 9

ENVIRONMENTAL CRITERIA AND PROCESS DATA BASE

Pollutant	IU Pollut. Flow (MGD) (Qind)	POTW Flow (MGD) (Qpotw)	Removal Efficiency (%) (Rpotw)	NPDES Daily Limit (mg/l) (Ccrit)	Domestic and Conc. (mg/l) (Cdom)	Commercial Flow (MGD) (Qdom)	MAXIMUM LOADING Allowable Headworks (lbs/day) (Lhw)	Domestic/ Commercial (lbs/day) (Ldom)	INDUSTRIAL Allowable Loading (lbs/day) (Lind)	Local Limit (mg/l) (Cind)	Safety Factor (%) (SF)
Ammonia	2.76	13.92	97	28	3.4	11.16	99278	319	79103	3437	20
CBOD5	2.76	13.92	94	117	24	11.16	239238	2209	201144	8738	15
TSS	2.76	13.92	97	106	25	11.16	426710	2350	360353	15655	15

(Qind) POTW's average influent flow in MGD.
(Qpotw) Removal efficiency across POTW as percent.
(Rpotw) NPDES daily maximum permit limit for a particular pollutant in mg/l.
(Ccrit) Domestic/commercial background flow in MGD.
(Qdom) Domestic/commercial background concentration for a particular pollutant in mg/l.
(Cdom) Maximum allowable headworks pollutant loading to the POTW in pounds per day (lbs/day).
(Lhw) Domestic/commercial background loading to the POTW for a particular pollutant in pounds per day (lbs/day).
(Ldom) Maximum allowable industrial loading to the POTW in pounds per day.
(Lind) Industrial allowable local limit for a given pollutant in mg/l.
(Cind) Safety factor as a percent.
(SF) Unit conversion factor
8.34 8.34 * Ccrit * Qpotw
Lhw = 1 - Rpotw

ATTACHMENT F

Summary of WQBEL Calculations

Table F.1 Summary of WQBELs

Parameter	Monthly Average WQBEL (mg/L)	Daily Maximum WQBEL (mg/L)
Arsenic III	0.12	0.24
Bis (2-ehtylhexyl) phthalate	0.0025[1]	0.0061[1]
Cadmium	0.0060	0.012
Chloride	340	690
Chlorine (Total Residual)	0.010[2]	0.020*
Chloroform	0.14	0.28
Chromium	0.0080	0.016
Copper	0.025	0.050
Fluoranthene	0.0029	0.0059
Fluoride	8.3	17
Lead	0.031	0.061
Mercury	0.0000013	0.0000032
Molybdenum	0.60	1.2
Nickel	0.14	0.28
Phenols (4-AAP)	0.15	0.30
Selenium	0.0041	0.0082
Silver	0.000047[1]	0.0001[1]
Thallium	0.005	0.012
Zinc	0.19	0.39

[1] For parameters where the WQBEL was less than a detection limit, the detection limit was used in the calculation of the AHL. The highest detection limit for that parameter from the data collected from the sampling plan was used. For bis (2-ethylhexyl) phthalate this was 0.008 mg/L and for silver it was 0.05 mg/L.

[2] Compliance with effluent limits for chlorine that are less than the LOQ are demonstrated if measured concentrations are less than the LOQ, so the LOQ (0.06 mg/L) was used in calculations of the WQBEL instead of the WQBEL.