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WASHINGTON, D.C. 20460

APR 1 0 2017

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Governor —

Thanks for your time today... I very much appreciate the dialogue and partnership! Hope to see you soon, hopefully in Wyoming!

Scott

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The Office of Governor Gary Herbert
50 North State Street, Suite 200
PO Box 142220
Salt Lake City, Utah 84114-2220

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April 10, 2017

Dale Moore
Deputy Executive Director
American Farm Bureau Federation
600 Maryland Ave SW #1000w
Washington, DC 20024

Dale,

It was a pleasure meeting you and members of the Council. I enjoyed the dialogue very much.

Our discussion was extremely helpful to me in learning more about the concerns and issues that impact production agricultural.

We look forward to continuing our relationship with Crop for Life America. Please don't hesitate to contact me or members of my team for further assistance

All the best,

E. Scott Pruitt

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April 10, 2017

Barb Glenn
CEO, ex-officio
National Association of State Departments
of Agriculture
4350 Fairfax Drive #910
Arlington, VA 22203

Barb,

It was a pleasure meeting you and members of the Council. I enjoyed the dialogue very much.

Our discussion was extremely helpful to me in learning more about the concerns and issues that impact production agricultural.

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April 10, 2017

Betsy Ward
President and CEO
USA Rice Federation
2101 Wilson Blvd # 610
Arlington, VA 22201

Betsy,

It was a pleasure meeting you and members of the Council. I enjoyed the dialogue very much.

Our discussion was extremely helpful to me in learning more about the concerns and issues that impact production agricultural.

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April 10, 2017

Tom Stenzel
President and CEO
United Fresh Produce Association
The George Washington University
1901 Pennsylvania Ave NW #1100
Washington, DC 20006

Tom,

It was a pleasure meeting you and members of the Council. I enjoyed the dialogue very much.

Our discussion was extremely helpful to me in learning more about the concerns and issues that impact production agricultural.

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April 10, 2017

Neil Dierks
CEO
National Pork Producers Council
122 C St NW #875
Washington, DC 20001

Neil,

It was a pleasure meeting you and members of the Council. I enjoyed the dialogue very much.

Our discussion was extremely helpful to me in learning more about the concerns and issues that impact production agricultural.

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April 10, 2017

Chuck Conner
President and CEO
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50 F St NW #900
Washington, DC 20001

Chuck,

It was a pleasure meeting you and members of the Council. I enjoyed the dialogue very much.

Our discussion was extremely helpful to me in learning more about the concerns and issues that impact production agricultural.

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April 10, 2017

Gary Adams
President and CEO
National Cotton Council
1521 New Hampshire Ave NW
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Gary,

It was a pleasure meeting you and members of the Council. I enjoyed the dialogue very much.

Our discussion was extremely helpful to me in learning more about the concerns and issues that impact production agricultural.

We look forward to continuing our relationship with Crop for Life America. Please don't hesitate to contact me or members of my team for further assistance

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THE ADMINISTRATOR

April 10, 2017

Chris Novak
CEO (Co-Chair)
National Corn Growers Association
20 F St NW #600
Washington, DC 20001

Chris,

It was a pleasure meeting you and members of the Council. I enjoyed the dialogue very much.

Our discussion was extremely helpful to me in learning more about the concerns and issues that impact production agricultural.

We look forward to continuing our relationship with Crop for Life America. Please don't hesitate to contact me or members of my team for further assistance

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THE ADMINISTRATOR

April 10, 2017

Chris Jahn
President
The Fertilizer Institute
Capitol View, 425 3rd St SW #950
Washington, DC 20024

Chris,

It was a pleasure meeting you and members of the Council. I enjoyed the dialogue very much.

Our discussion was extremely helpful to me in learning more about the concerns and issues that impact production agricultural.

We look forward to continuing our relationship with Crop for Life America. Please don't hesitate to contact me or members of my team for further assistance

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THE ADMINISTRATOR

April 10, 2017

Jay Vroom
President and CEO (Co-Chair)
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Jay,

It was a pleasure meeting you and members of the Council. I enjoyed the dialogue very much.

Our discussion was extremely helpful to me in learning more about the concerns and issues that impact production agricultural.

We look forward to continuing our relationship with Crop for Life America. Please don't hesitate to contact me or members of my team for further assistance

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WASHINGTON, D.C. 20460

THE ADMINISTRATOR

April 10, 2017

Dana O'Brien
Executive Vice President
Biotechnology Innovation Organization
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Washington, DC 20024

Dana,

It was a pleasure meeting you and members of the Council. I enjoyed the dialogue very much.

Our discussion was extremely helpful to me in learning more about the concerns and issues that impact production agricultural.

We look forward to continuing our relationship with Crop for Life America. Please don't hesitate to contact me or members of my team for further assistance

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E. Scott Pruitt

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THE ADMINISTRATOR

April 10, 2017

Steve Censky
Chief Executive Officer (Co-Chair)
ASA Washington DC Office
Gordley Associates
600 Pennsylvania Ave., SE
Washington, DC 20003

Steve,

It was a pleasure meeting you and members of the Council. I enjoyed the dialogue very much.

Our discussion was extremely helpful to me in learning more about the concerns and issues that impact production agricultural.

We look forward to continuing our relationship with Crop for Life America. Please don't hesitate to contact me or members of my team for further assistance

All the best,

E. Scott Pruitt

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THE ADMINISTRATOR

April 10, 2017

Andrew "Andy" LaVigne
President and CEO
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Alexandria, VA 22314

Andy,

It was a pleasure meeting you and members of the Council. I enjoyed the dialogue very much.

Our discussion was extremely helpful to me in learning more about the concerns and issues that impact production agricultural.

We look forward to continuing our relationship with Crop for Life America. Please don't hesitate to contact me or members of my team for further assistance.

All the best,

Scott

E. Scott Pruitt

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WASHINGTON, D.C. 20460

April 12, 2017

THE ADMINISTRATOR

Mr. Harry M. Johnson
Hunton & Williams, LLP
Riverfront Plaza, East Tower
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Richmond, Virginia 23129-4074

Mr. Major Clark
Mr. Kevin Bromberg
U.S. Small Business Administration
Office of Advocacy
409 3rd Street, SW, 7th Floor
Washington, D.C. 20416

Re: Petitions for Agency Reconsideration and Stay of Effluent Guidelines for the Steam Electric Point Source Category

Dear Mr. Johnson, Mr. Clark and Mr. Bromberg:

This letter concerns petitions from the Utility Water Action Group dated March 24, 2017, and the U.S. Small Business Administration dated April 5, 2017, to the U.S. Environmental Protection Agency requesting reconsideration and an administrative stay of provisions of the EPA's final rule titled "Effluent Limitations Guidelines and Standards for the Steam Electric Power Generating Point Source Category," 80 FR 67838 (November 3, 2015).

After considering your petitions, I have decided that it is appropriate and in the public interest to reconsider the rule. The EPA is acting promptly to issue an administrative stay of the compliance dates in the rule that have not yet passed pending judicial review, pursuant to Section 705 of the Administrative Procedure Act. This stay will be effective upon publication in the Federal Register. The EPA also intends to request that the U.S. Court of Appeals for the Fifth Circuit stay the pending litigation on the rule for 120 days (until September 12, 2017), by which time the agency intends to inform the Court of the portions of the rule, if any, that it seeks to have remanded to the agency for further rulemaking, after careful consideration of the merits in your petitions. Also, because an administrative stay lasts only during the pendency of judicial review, the EPA intends to conduct notice and comment rulemaking during the reconsideration period to stay or

amend the compliance deadlines for the rule. This letter does not address the merits of, or suggest a concession of error on, any issue raised in the petitions.

As part of the reconsideration process, should the EPA conduct a rulemaking to amend the rule or any part of it, the EPA expects to provide an opportunity for notice and comment.

If you have questions regarding the reconsideration process, please contact Sarah Greenwalt at (202) 564-1722. If you have any questions or wish to discuss the litigation, please have your counsel direct inquiries to Jessica O'Donnell at (202) 305-0851.

Respectfully yours,

E. Scott Pruitt

HUNTON & WILLIAMS

HUNTON & WILLIAMS LLP
RIVERFRONT PLAZA, EAST TOWER
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EMAIL: pjohnson@hunton.com

FILE NO: 29142.070312

April 12, 2017

By U.S. Mail and E-mail

Docket No. EPA-HQ-OW-2009-0819

The Honorable E. Scott Pruitt
Administrator
United States Environmental Protection Agency
William Jefferson Clinton Building
1200 Pennsylvania Avenue, N. W.
Mail Code: 1101A
Washington, DC 20460

Supplemental Information in Support of the Utility Water Act Group's Petition for Rulemaking to Reconsider and Administratively Stay the Effluent Limitations Guidelines and Standards for the Steam Electric Power Generating Point Source Category; Final Rule, 80 Fed. Reg. 67,838 (Nov. 3, 2015)

Dear Administrator Pruitt:

Enclosed please find a study by the Electric Power Research Institute entitled *Biological Treatment of Flue Gas Desulfurization Wastewater at a Power Plant Burning Powder River Basin Coal.* We are submitting this study in support of the Utility Water Act Group's Petition for Rulemaking to Reconsider and Administratively Stay the Effluent Limitations Guidelines and Standards for the Steam Electric Power Generating Point Source Category; Final Rule, 80 Fed. Reg. 67,838 (Nov. 3, 2015).

As discussed in our Petition, this study examined the performance of a biological treatment pilot system for flue gas desulfurization wastewater (FGDW) installed at a power plant burning 100% Powder River Basin (PRB) coal. See Petition, pp. 48-49. The results of the study support UWAG's contention that the model FGDW biological treatment used by EPA as a basis for limits within the ELG rule is not demonstrated for FGDW generated by plants burning subbituminous coals such as PRB. The enclosed study, to our knowledge, is the only study of biological treatment at a facility burning 100% PRB coal. The study shows

HUNTON & WILLIAMS

the pilot was unsuccessful in attaining consistent compliance with the rule's monthly average selenium limit for FGDW. For most of the pilot study—despite significant adjustments to ordinary operations, including a 50/50 dilution of the FGDW prior to treatment—the pilot results indicate a failure to meet the selenium limit.

A copy of this study has also been electronically mailed to the Office of Water Docket Center for filing in Docket No. EPA-HQ-OW-2009-0819.

Additionally, we will be submitting a supplemental filing in support of our Petition tomorrow.

Please contact me if you have any questions about the study or the Petition.

Sincerely,

Harry M. Johnson, III

Enclosure

cc by hand delivery and e-mail:
Mr. Michael H. Shapiro

cc by e-mail:
Jessica O'Donnell, Esq.
Kevin S. Minoli, Esq.
EPA Docket Center

ELECTRIC POWER RESEARCH INSTITUTE

Biological Treatment of Flue Gas Desulfurization Wastewater at a Power Plant Burning Powder River Basin Coal

Pilot Demonstration with the ABMet Technology

2017 TECHNICAL REPORT

Biological Treatment of Flue Gas Desulfurization Wastewater at a Power Plant Burning Powder River Basin Coal

Pilot Demonstration with the ABMet Technology

3002006089

Final Report, March 2017

EPRI Project Manager
J. Preece

ELECTRIC POWER RESEARCH INSTITUTE
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THE FOLLOWING ORGANIZATION, UNDER CONTRACT TO EPRI, PREPARED THIS REPORT:

CH2M Hill

NOTE

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ACKNOWLEDGMENTS

The following organizations, under contract to the Electric Power Research Institute (EPRI), prepared this report:

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Principal Investigator
J. Preece

This report describes research sponsored by EPRI.

This publication is a corporate document that should be cited in the literature in the following manner:

Biological Treatment of Flue Gas Desulfurization Wastewater at a Power Plant Burning Powder River Basin Coal: Pilot Demonstration with the ABMet Technology. EPRI, Palo Alto, CA: 2017. 3002006089.

PRODUCT DESCRIPTION

This report documents a pilot demonstration conducted to evaluate treatment of wet flue gas desulfurization (FGD) wastewater at a power plant burning Powder River Basin (PRB) coal. FGD wastewater at PRB sites tends to have very high concentrations of total dissolved solids (TDS), calcium, magnesium, sulfate, nitrate, selenium, and various metals. The low chlorine content of PRB coal enables high cycles of concentration in the FGD absorber because absorber cycles are generally limited on chloride concentration due to specific metallurgy requirements. The resulting wastewater is typically challenging to treat due to the high TDS and high hardness scaling potential.

Background

The U.S. Environmental Protection Agency's (EPA's) revision of effluent limitations guidelines (ELGs) in 2015 has resulted in new requirements for FGD wastewater. Under the rule, EPA established limits based on physical/chemical (P/C) and biological treatment technologies with numeric limits on total arsenic, total mercury, total selenium, and nitrate/nitrite as nitrogen. Limited data are currently available on the treatment of FGD wastewater from PRB coal plants using biological treatment technologies.

Objectives

A pilot system was operated to evaluate and study processes in treating FGD wastewater, using pilot effluent water quality targets associated with the monthly average limits from the U.S. EPA 2015 ELGs. Target concentrations for arsenic, mercury, selenium, and nitrate/nitrite as nitrogen from the pilot system treated effluent were established as 50% of the 2015 ELG monthly average limits to account for initial blending with service water. Analytical and field data were collected to study performance of biological treatment systems on FGD wastewater at a PRB coal site.

Approach

For this demonstration, GE Water & Process Technologies (GE) provided and operated a pilot treatment system consisting of a membrane bioreactor (MBR) process, for nitrification and denitrification, and the Advanced Biological Metals Removal (ABMet) system for denitrification and selenium reduction. The pilot systems were evaluated using a small continuous portion of effluent from the host plant's full-scale P/C treatment system. After initial evaluations of the P/C effluent, GE determined the scaling potential was too high and would create issues in the small pilot equipment. GE also determined that the TDS was too high to support efficient bacteria growth and performance for reducing ammonia, nitrates, and selenium to the demonstration targets. The result of the initial evaluation was a decision to blend the P/C treatment effluent with plant service water (untreated water from Lake Michigan) in equal proportion, and send the combined stream to the pilot system.

Results

The ABMet pilot was initially operated with a total empty bed contact time (EBCT) of 18.8 hours vs. GE's commercial system target of 8 hours. Upon achieving acclimation, GE increased the flow rate through the treatment system to more closely simulate full-scale conditions. After the initial change, the total EBCT for the ABMet pilot was 12.4 hours and remained unchanged due to performance degradation that followed. The pilot system met the effluent targets for the first 3.5 weeks but performance quickly degraded after the flow rate was increased. It is suspected that inhibitory compounds affecting bacteria performance may be present in the FGD wastewater; however, despite various attempts to reduce inhibitory compounds, no resolution was achieved. The ABMet system produced effluent selenium concentrations three times higher than the 6 µg/L target (between 15 and 21 µg/L total selenium). A combination of factors may have resulted in the loss of selenium reduction performance, including:

- Oxidants – Data are limited on specific oxidation compounds present in FGD wastewater and how they may impact biological treatment. Surrogate data on ORP, COD, and BOD were monitored, but do not provide sufficient clarity or causality.
- Non-biodegradable organics – Based on data collected during the test (COD and nitrogen-compound concentrations), it is plausible that organic species were present that are potentially inhibitory to the ABMet bacteria.
- Nitrogen species removal (ammonia, nitrate, nitrite, and organic nitrogen) – This was the first known test using MBR for pretreatment of FGD wastewater and the first known test using a separate denitrification step before ABMet.
- Sulfate-reducing bacteria (SRB) – SRB are known to exist at ABMet conditions due to low ORP conditions and are evident by the presence of sulfide production. It is plausible that the high concentration of sulfates in the site's FGD wastewater, along with the nutrients used, encouraged SRB to suppress selenium-reducing bacteria growth.

Analytical issues with total and dissolved selenium measurements were identified during the project. In some samples, values for total selenium reported low, giving false indications of water quality. Suggested studies to evaluate analytical interferences are presented. Following data validation, the analytical results show that the pilot did not meet the effluent targets for 13 weeks, and the ABMet system was never operated at full-scale conditions.

Applications, Value, and Use

The methods used in this study may provide value for similar biological treatment technology evaluations. Due to site-specific conditions, each site should conduct its own evaluations.

Keywords

Flue gas desulfurization
Wastewater treatment
Selenium removal
ABMet
Effluent Limitation Guidelines
Biological treatment

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EXECUTIVE SUMMARY

Deliverable Number: 3002006089

Product Type: Technical Report

Product Title: Biological Treatment of Flue Gas Desulfurization Wastewater at a Power Plant Burning Powder River Basin Coal: Pilot Demonstration with the ABMet Technology

---

PRIMARY AUDIENCE: Power plant operators, chemists, and engineers and environmental managers

KEY RESEARCH QUESTION

The main objectives of the pilot system were to evaluate and study processes in treating FGD wastewater, using pilot effluent water quality targets associated with the monthly average limits from the U.S. Environmental Protection Agency (EPA) 2015 effluent limitations guidelines (ELGs). This project investigated selenium removal using EPA's selected best available technology (BAT) in order to help plants consistently meet ELG limits, and specifically for plants burning Powder River Basin (PRB) coals.

RESEARCH OVERVIEW

Effluent from the host site's full-scale physical/chemical treatment system was collected and blended with service water (originating from Lake Michigan and untreated) at a 1:1 ratio and supplied to a pilot system designed and operated by GE Water & Process Technologies. Prior to beginning the pilot evaluation, GE determined that dilution of the full-scale physical/chemical treatment system effluent is required in order to minimize the potential negative impacts of scaling, high TDS concentrations, and toxicity in the processes. The pilot system consisted of a membrane biological reactor (MBR) process with two anoxic zones, an aerobic zone with GE's ZeeWeed 500D membranes, and a final anoxic stage. The MBR process was designed mainly to reduce nitrate/nitrite concentrations prior to the Advanced Biological Metals Removal (ABMet) process. The pilot ABMet system consisted of two attached growth, packed-bed biofilters in series, each containing granular activated carbon (GAC) media. Laboratory analyses were conducted on many sample streams in the pilot process, and data were analyzed with process operating data collected throughout the pilot evaluation.

KEY FINDINGS

- The pilot test did not consistently demonstrate that the MBR/ABMet combination of technologies adequately treats selenium to meet the 2015 ELGs limits.
- 100% dilution of FGD wastewater from the effluent of the host site's full-scale physical/chemical treatment system was required for the MBR/ABMet pilot system.
- Complete denitrification (reduction of nitrate nitrogen to nitrogen gas) was achievable in the pretreatment MBR.
- Selenium, present mainly in dissolved form, was significantly reduced by the pretreatment MBR (approximately 75% on average for the entire demonstration).
- Analytical issues with total and dissolved selenium measurements were identified during the project.
- Following data validation, the analytical results show that the pilot did not meet the effluent targets for 13 weeks, and the ABMet system was never operated at full-scale conditions.

ELECTRIC POWER RESEARCH INSTITUTE

EXECUTIVE SUMMARY

WHY THIS MATTERS

This study provided the opportunity for EPRI and its members to evaluate selenium removal in an especially challenging FGD wastewater at a power plant burning PRB coal. The results, learnings, and analytical data from the study will continue to support ongoing research related to biological treatment of FGD wastewater.

HOW TO APPLY RESULTS

Due to site-specific conditions that do not translate to every application, each site should conduct its own evaluations related to FGD wastewater treatment. The methods used in this project may provide guidance for users to apply similar approaches when evaluating biological treatment technologies.

LEARNING AND ENGAGEMENT OPPORTUNITIES

Related projects are:

- *Wet Flue Gas Desulfurization Wastewater Physical/Chemical Treatment Guidelines.* EPRI, Palo Alto, CA: 2016. 3002008515.
- *EPRI Technical Manual: Guidance for Assessing Wastewater Impacts of FGD Scrubbers.* EPRI, Palo Alto, CA: 2006. 1013313.
- *Flue Gas Desulfurization (FGD) Wastewater Characterization and Management: Preliminary Summary: 2007 Update.* EPRI, Palo Alto, CA, 2008. 1014073.
- *Case Studies to Evaluate FGD Wastewater Physical/Chemical Treatment Performance.* EPRI, Palo Alto, CA: 2013. 3002001202.
- *Flue Gas Desulfurization (FGD) Wastewater Chemical Precipitation Treatment Performance Characterization Study.* EPRI, Palo Alto, CA, 2015. 3002006251.
- *Pilot Evaluation of the ABMet Technology for Flue Gas Desulphurization Wastewater Treatment.* EPRI, Palo Alto, CA: 2014. 3002004550.

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PROGRAM: Water Management Technology, P185

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ACRONYMS AND ABBREVIATIONS

°C	degrees Celsius
°F	degrees Fahrenheit
<	less than or fewer than
µg/L	microgram per liter
µm	micrometer
µS/cm	microSiemen per centimeter
BOD	biochemical oxygen demand
COD	chemical oxygen demand
DO	dissolved oxygen
DOC	dissolved organic carbon
EBCT	empty bed contact time
ELG	Effluent Limitations Guidelines
EPA	U.S. Environmental Protection Agency
EPRI	Electric Power Research Institute, Inc.
FGD	flue gas desulfurization
GAC	granular activated carbon
GPD	gallons per day
GPM	gallons per minute
HRT	hydraulic retention time
Inf/EQ	influent equalization
MBR	membrane biological reactor
mg/L	milligram per liter
mg-N/L	milligram of nitrogen per liter
MLSS	mixed liquor suspended solids
mS/cm	microSiemen per centimeter
mV	millivolt

N	nitrogen
NA	not applicable
ng/L	nanogram per liter
NO_3/NO_2-N	nitrate/nitrite nitrogen
O&G	oil and grease
ORP	oxidation reduction potential
PAC	powdered activated carbon
P4	Pleasant Prairie Power Plant
Phys/Chem	physical/chemical
RAS	return activated sludge
Se	selenium
Se(IV)	selenite
Se(VI)	selenate
SeCN	selenocyanate
SeMe	selenomethionine
SRT	solids retention time
S.U.	standard unit
TCLP	toxicity characteristic leaching procedure
TDS	total dissolved solids
TKN	total Kjeldahl nitrogen
TMP	transmembrane pressure
TOC	total organic carbon
TSS	total suspended solids
WQBEL	water quality-based effluent limit
ZVI	zero-valent iron

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1
INTRODUCTION

Project Understanding

The U.S. Environmental Protection Agency (EPA) sets technology-based standards, termed effluent limitations guidelines (ELGs), by industry category based on various levels of technology performance, the most stringent of which is the Best Available Technology Economically Achievable (BAT). EPA revised the ELGs for the steam electric industry in 2015 to include BAT limits for flue gas desulfurization (FGD) wastewater.

The BAT limits set by EPA for FGD wastewater are based on physical/chemical and biological treatment technologies with numeric limits on total arsenic, total mercury, total selenium, and nitrate/nitrites as N. The ELGs also include Best Practicable Control Technology (BPT) limits for total suspended solids and oil & grease. EPA's ELG limits for FGD wastewater are shown in Table 1-1. Additionally, water quality-based effluent limits (WQBELs) in some states are necessitating removal of selenium and other trace metals from FGD wastewater.

Table 1-1
ELG Limits on FGD Wastewater

Parameter	Units of Measure	Monthly Average Limit	Daily Maximum Limit
Arsenic, total	µg/L	8	11
Mercury, total	ng/L	356	788
Selenium, total	µg/L	12	23
Nitrate/Nitrite as N	mg/L	4.4	17.0
Total Suspended Solids (TSS)	mg/L	30	100
Oil and Grease	mg/L	15	20

µg/L = microgram per liter
mg/L = milligram per liter
ng/L = nanogram per liter

The primary objective of this project was to investigate and study selenium removal using EPA's selected BAT to help plants consistently meet ELG limits, specifically for plants burning Powder River Basin (PRB) coals. The ELGs also include mercury, arsenic, and nitrate/nitrite limits; studying their removal was a secondary project goal.

This study provided the opportunity for the Electric Power Research Institute, Inc. (EPRI) and its members to help evaluate selenium removal in an especially challenging FGD wastewater at We Energies Pleasant Prairie Power Plant (P4). The main properties of this wastewater that make treatment challenging are scaling tendency due to high sulfate and calcium concentrations; concentrations of dissolved/ionic species such as halogens, which are much higher than other FGD wastewaters from sites burning non-PRB coals; and nitrate/nitrite-nitrogen and total Kjeldahl nitrogen[1] (TKN) concentrations, both of which are also much higher than other FGD wastewaters. Hence, pretreatment for reducing suspended solids, dilution of dissolved solids and a nitrification/denitrification step were included ahead of the selenium removal unit for the P4 pilot, adding to the operational complexity of the pilot system.

P4 burns 100% subbituminous coal from the Powder River Basin, and has a low FGD blowdown rate for its power capacity (40 GPM), allowing the concentrations of ammonia, nitrates/nitrites, sulfates, arsenic, mercury, and selenium to reach very high levels. To EPRI's knowledge, this was the first time that biological treatment has been attempted on a wastewater stream from a plant that burns 100% subbituminous coal.

Pilot Objectives

The main objectives of the pilot system were to evaluate and study processes in treating FGD wastewater, with pilot effluent water quality targets equal to those listed in Table 1-2, and to validate the operating parameters for the membrane biological reactor (MBR) nitrification/denitrification pretreatment step and the Advanced Biological Metals Removal (ABMet) systems. Given the many potential changes and variations in chemistry that are inherent to FGD wastewater, the study attempted to maintain consistent selenium removal performance. When the performance changed, conditions were documented and process changes were made to recover performance.

[1] Other than uptake for cell synthesis, a selenium treatment system does not remove TKN. Therefore, if a discharge limit for ammonia nitrogen or total nitrogen is included in the permit, a TKN removal step will be required. Because ammonia removal was part of the pilot effluent water quality objectives, the reduction/removal of TKN was monitored.

Table 1-2
Effluent Water Quality Objectives

Parameter	Effluent Target[2]	Pilot Effluent Target[3]
Selenium[1]	<12 µg/L	<6 µg/L
Mercury[1]	<356 ng/L	<178 ng/L
Arsenic[1]	<8 µg/L	<4 µg/L
Nitrate/Nitrite Nitrogen[1] (NO_3/NO_2-N)	<4.4 mg/L	<2.2 mg/L
Total Suspended Solids (TSS)	<30 mg/L	<15 mg/L
Oil and Grease (O&G)	<15 mg/L	<7.5 mg/L
Ammonia	1.9 to 30 mg/L	0.45 to 15 mg/L
Phosphorus	<0.6 mg/L	<0.3 mg/L

Notes:
[1] Regulated pollutants (2015 ELG Final Rule)
[2] 2015 ELGs BAT Monthly Average Limits
[3] 50% of the ELG BAT Monthly Average Limits to account for dilution to reduce high TDS and scale potential
< = less than/fewer than
µg/L = microgram per liter
mg/L = milligram per liter
ng/L = nanogram per liter

2
BACKGROUND

Selenium removal from wastewater is particularly challenging because of its complicated chemistry. Selenium removal typically requires multiple treatment processes, and the species of selenium can vary throughout the different unit processes that target selenium removal. Other constituents in the wastewater may also interfere with the selenium removal processes. As FGD wastewater is a highly complex wastewater (high concentrations of many ions), there are many potential constituents that can affect treatment. Examples include oxyanions like sulfate, halogens like chloride, and nutrients like nitrogen species. Additionally, variations in coal sources, coal composition, plant operations, scrubber operations and other air emission control technologies, and other factors can cause the wastewater composition to vary. Even after successful treatment of selenium, treatment system residuals and byproducts containing selenium must be managed and disposed of properly. This section describes the treatment technologies used for the pilot demonstration.

P4 Existing Full-Scale Wastewater Treatment Plant Description

The full-scale P4 wastewater treatment plant was designed to treat 75 GPM of wastewater with a total suspended solids (TSS) content of less than 1.5%. An overview of the existing physical/chemical system is provided in Figure 2-1. After equalization, wastewater flows to Reaction Tank 1 where pH is adjusted from approximately 5.6 to 8.5 S.U. by adding hydrated lime to the wastewater. Effluent from Reaction Tank 1 flows by gravity to a primary clarifier where polymer is added to aid in solids removal. Primary effluent flows to Reaction Tank 2 where METCLEAR MR2405 (commonly referred to as an organosulfide) is added for mercury precipitation. Effluent from Reaction Tank 2 flows by gravity to Reaction Tank 3 where ferric chloride is added for coagulation and for iron co-precipitation. Effluent from Reaction Tank 3 passes to a flash mix tank where polymer is added, and then to a flocculation tank, followed by a parallel plate clarifier (secondary clarifier). The plant was equipped with an upflow sand filter, but its use has been discontinued due to problems with scaling of sand, recurring fouling issues in the filters, and because it had limited effectiveness in removing mercury below the level achieved by secondary clarification alone. Optional cartridge filters can be installed after the final effluent tanks, when necessary, to filter to 0.45 microns for removal of suspended particles which may contain large amounts of mercury. Sludge is pressed in plate and frame filter presses and combined with coal combustion residuals (CCR) before being landfilled on plant property.

The average operating flow rate for the system is currently 40 GPM. Operations staff run the primary clarifier continuously when the treatment plant is in operation. The secondary clarifier mainly runs throughout the five-day work week and is shut down on weekends for cleaning (to remove scale). The two effluent discharge tanks hold approximately 10,000 gallons each and are used for storage during the weekend cleaning activities.

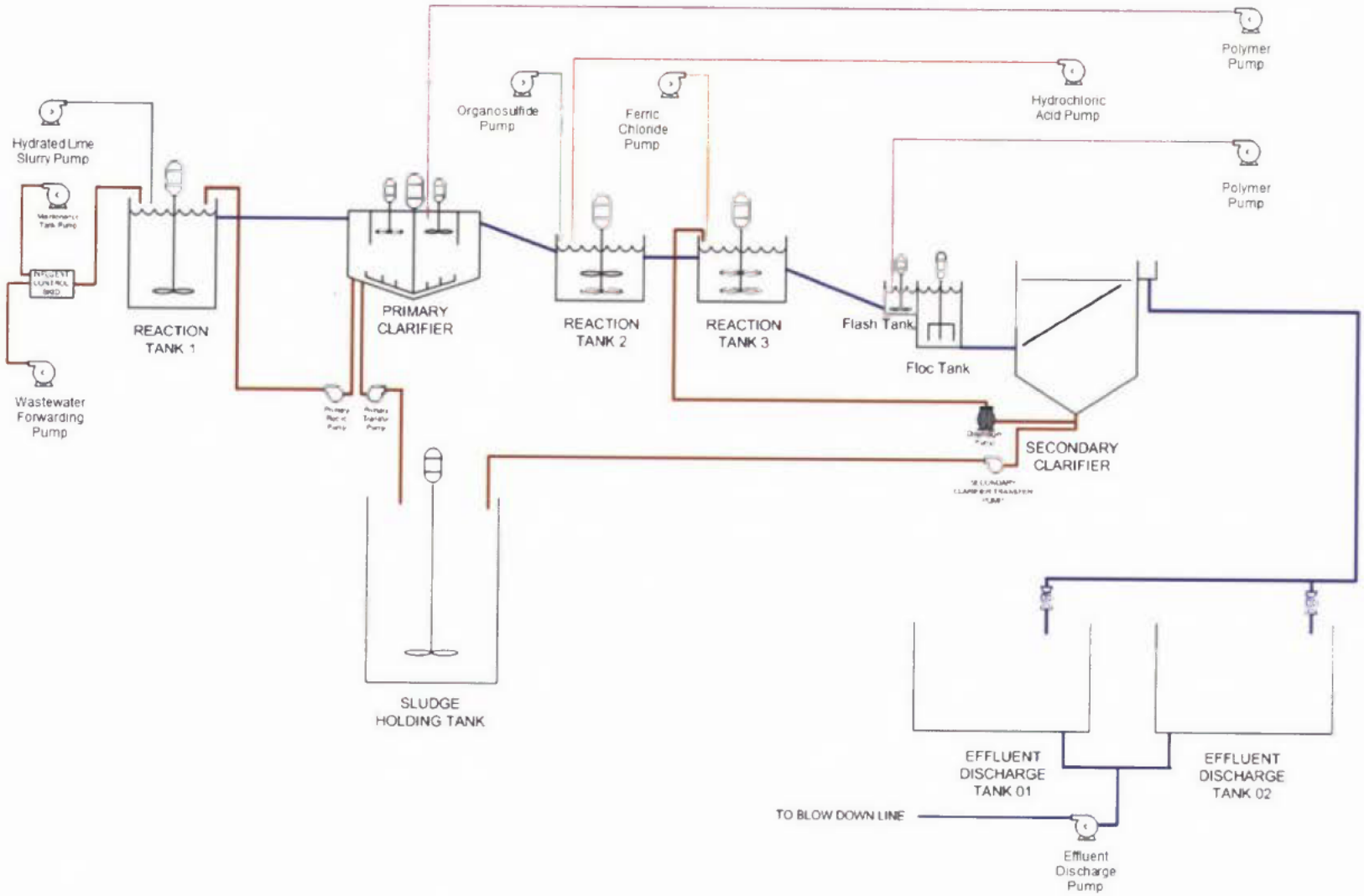

Figure 2-1
P4 FGD wastewater treatment plant process flow diagram
Courtesy of We Energies

Treating Wet Flue Gas Desulfurization Wastewater

Some technologies have been implemented full-scale at FGD wastewater treatment facilities in the United States to remove particulate (generally >0.45 μm) and/or dissolved/soluble selenium from the wastewater stream. Additional processes have been tested on a pilot scale on FGD or other selenium-containing streams. These technologies fall into two main categories:

- Physical/chemical treatment technologies, in which various configurations are possible:
  - Solids settling (is tank-based or in a settling pond; generally removes some particulate selenium, but is likely not sufficient to meet new ELG limits as much of the selenium tends to be in the soluble fraction)
  - Zero valent iron (ZVI) contact (uses complex redox and adsorption reactions to remove soluble forms of selenium)
  - Filtration (removes particulate selenium using media or ultrafiltration membranes; reverse osmosis membrane filtration can potentially remove all forms of selenium, including soluble forms)
- Biological treatment:
  - Fixed-film anaerobic/anoxic (where there are low levels of dissolved oxygen [DO]) reactor-based biological treatment; generally removes various selenium species, including selenate and selenite
  - Passive treatment by surface-flow aerobic wetlands and anaerobic subsurface, vertical flow wetlands (which are generally similar in function to fixed-film systems) have been demonstrated to remove various selenium species
  - Suspended growth anaerobic/anoxic systems (have recently been pilot tested in membrane biological reactors [MBRs] and moving bed biofilm reactors [MBBRs] to remove various selenium species using mechanisms similar to the established fixed-film systems)

The pilot system evaluated by EPRI at P4 is based on active biological treatment for selenium removal, which included anoxic/aerobic MBR for nitrogen pretreatment and the GE ABMet primarily for selenium removal, tested on P4's full-scale chemical precipitation system effluent.

Summary of Treatment Systems and Equipment

The P4 pilot included the following treatment systems:

- ZeeWeed 500D MBR Pilot
- ABMet Pilot

ZeeWeed 500D Membrane Biological Reactor

In anoxic/anaerobic biological treatment, nitrate must be removed from the wastewater in order to create conditions conducive to the biological reduction of selenate and selenite to insoluble elemental selenium. Nitrate removal occurs via denitrification where nitrate/nitrite nitrogen is

ultimately reduced to nitrogen gas, but at ORP conditions higher than where reduction of senate and selenite occurs. Unfortunately, removing high concentrations of nitrate using downflow reactors, such as those in ABMet, leads to plugging caused by high bacterial solids growth and the need for more frequent backwashes. Also, because ABMet operates at low oxidation reduction potential (ORP), some ammonia-nitrogen may be formed when high nitrate is present in the influent. Additional reactors may be required to achieve the conditions needed to facilitate effective selenium reduction when high nitrate levels are present in the influent; however, site-specific evaluations must be conducted to determine the exact process suitable for treatment. Therefore, nitrate removal is key to successfully treating selenium in FGD wastewater using any of the established treatment technologies. In this P4 wastewater, the TKN concentration is also high requiring ammonia-nitrogen oxidation to nitrate-nitrogen (nitrification). Therefore, an MBR was included in the pilot system as a pretreatment nitrification/denitrification step to remove both the nitrates in the influent and nitrates generated from the nitrification process.

An MBR is a combination of suspended growth activated sludge and membranes, with the latter performing the liquid/solids separation function. The membranes provide a positive barrier resulting in permeate with negligible TSS concentration. The ZeeWeed 500 module is designed to reject particles greater than 0.04 microns. Treated water is drawn through membrane by vacuum, enters the hollow fibers of the membrane, and is then pumped out of membrane. The redox conditions in stages within the activated sludge system can be manipulated to achieve target reactions (for example, carbon oxidation, nitrification, and denitrification). Target reactions can also convert dissolved species into insoluble constituents and result in rejection by the membranes.

A diagram of the ZeeWeed membrane fiber and ZeeWeed 500 module is provided in Figure 2-2.

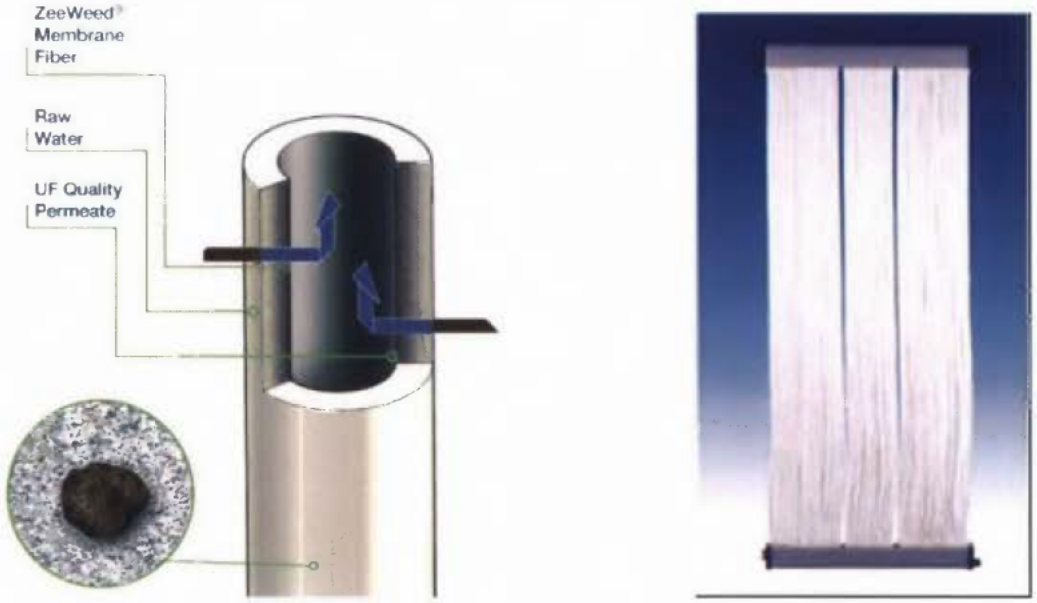

Figure 2-2
ZeeWeed membrane fiber and ZeeWeed 500 module
Courtesy of GE Water & Process Technologies

Membrane permeability is maintained through multiple approaches. During normal operation, continuous air scouring from the bottom of the module is used to remove accumulated solids, containing biological activity and biomass, on the membrane surface. Mixed liquor in the membrane tank is recirculated back to the biological reactors to maintain solids distribution throughout the system. Solids are wasted from the membrane tank based on the targeted solids retention time (SRT). Treatment of the wasted solids is generally a separate process that includes dewatering and disposal of the sludge.

Maintenance of the membranes includes backwashing, maintenance cleanings, and recovery clean-in-place (CIP) activities, all of which can be implemented on a set frequency or based on transmembrane pressure (TMP - calculated by the difference between the membrane influent and effluent pressures). Because the ZeeWeed 500 system is designed to maintain a constant flux, an increase in TMP indicates membrane fouling. Detailed descriptions of each cleaning option are as follows:

- A backwash is performed by reversing the flow through the membrane (also called "back pulse") for a short time period using permeate (clean water produced by the membrane during normal operation) from the inside of the membrane to the outside where the suspended solids are held. For this study, aeration was also used during the backwashes.
- A maintenance cleaning using aeration and chemical cleaning solutions to remove more challenging material from the membrane surface that can lead to fouling. Cleaning solutions may include sodium hypochlorite, citric acid, and other traditional products used to restore membranes. These chemicals are generally recirculated, in separate batches, through the membrane system for a length of time (on the order of 15 minutes) depending on conditions.
- The recovery CIP process is generally conducted only one or two times per year. The process is more aggressive than maintenance cleanings with higher concentrations of chemicals and longer contact times for each batch. Defining the recovery CIP process requires an understanding of treatment and membrane conditions.

ABMet

The ABMet system is an attached growth downflow carbon filter. It was developed by Applied Biosciences and is currently marketed by GE Water & Process Technologies. The ABMet system uses microbes cultured in bioreactor granular activated carbon (GAC) beds that create anoxic/anaerobic conditions for selenate and selenite reduction to insoluble elemental selenium particles. The GAC material acts as a physical media for fixed biofilm development. A diagram of the ABMet biofilter is presented in Figure 2-3.

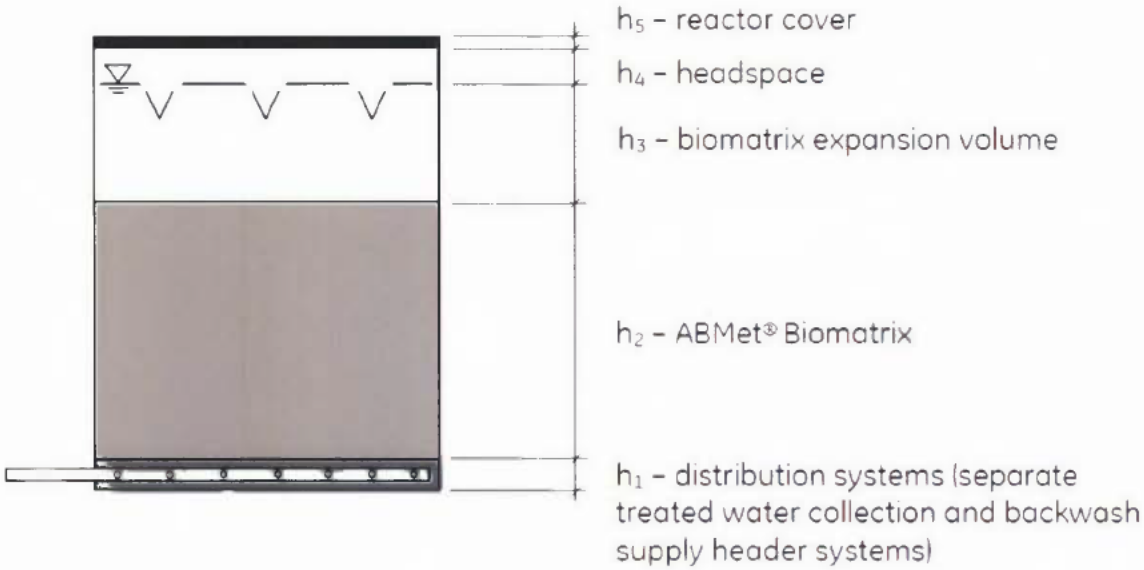

Figure 2-3
ABMet biofilter cross-section
Courtesy of GE Water & Process Technologies

The ABMet process uses certain heterotrophic facultative bacteria, which, in addition to reducing nitrate to nitrogen gas, reduce selenate and selenite to elemental selenium. Elemental selenium then exists as insoluble solids along with bacterial solids in the filter bed. An image of the ABMet selenium reducing bacteria and elemental selenium particles is presented in Figure 2-4.

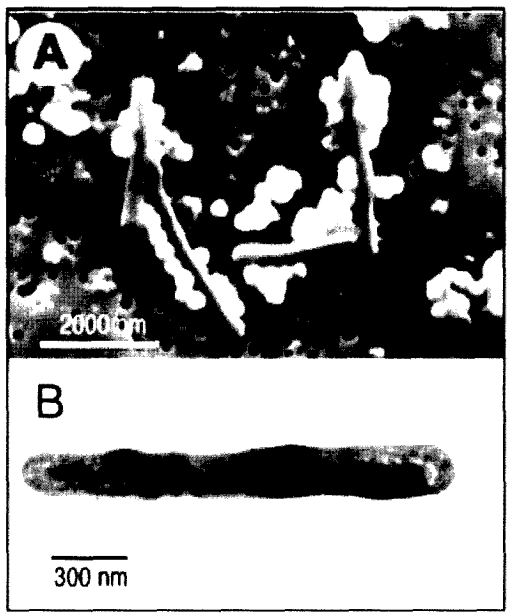

Figure 2-4
ABMet selenium reducing bacteria with selenium particles
Courtesy of GE Water & Process Technologies

The microbes are selected as a site-specific inoculum for the bioreactors. These bacteria are mesophilic bacteria requiring the wastewater temperature to be typically between 50 degrees Fahrenheit (°F) and 100°F (10 degrees Celsius [°C] and 38°C) and pH between 6 and 7 S.U. These microbes use oxygen (O_2) and the oxygen in the nitrate (NO_3^-), selenate (SeO_4^{2-}), and selenite (SeO_3^{2-}) oxyanions as an electron acceptor for their respiration and an organic carbon (electron donor) source to meet their food/energy requirements. Biochemical reactions for the reduction of nitrate/nitrite and selenate/selenite (excluding biomass production) are presented below.

$$NO_3^- + organic\ carbon \rightarrow NO_2^- + organic\ carbon \rightarrow N_2 + CO_2 + H_2O$$

$$2SeO_4^{2-} + organic\ carbon \rightarrow 2SeO_3^{2-} + organic\ carbon \rightarrow SeO + CO_2 + H_2O$$

The carbon source can be either organic compounds present in the wastewater, typically expressed as chemical oxygen demand (COD), or an organic compound from an external source (such as methanol, acetic acid, ethanol, molasses, or corn syrup). The ABMet system typically uses a molasses-based nutrient supplement (supplied by GE), which also is a source of phosphate for the bacteria, however acetic acid was used for this study as a carbon source for both nitrate and selenium reduction processes. Nutrient addition can also impact pH of the system, where too much nutrient may cause an increase in production of organic acids and CO_2 (both produced by bacteria) that lower the pH.

Biological reduction converts the selenate or selenite ions into elemental selenium, which exists as a particle and is enmeshed and attached to the biofilm within the reactor. The reactors are backwashed periodically to prevent excess biomass and solids buildup and resulting hydraulic head loss, and the waste stream is then treated by dewatering the solids and disposing of the sludge with concentrated selenium. The system is also routinely degassed (similar to backwash, but for a shorter time period) to remove accumulated gases (such as carbon dioxide and nitrogen) from the filter bed to reduce hydraulic head loss. The effluent water from the ABMet unit may be aerated in a polishing aeration tank to increase the DO and to aerobically treat any excess soluble degradable COD-contributing organics, if required.

Monitoring of pH and ORP is performed to control the chemical dosing and ensure selenate and selenite reduction. ORP is an indicator of biological activity in the ABMet system, where lower ORP correlates to anaerobic conditions created by biological activity in reducing oxygen, nitrate/nitrite, and selenium. Once nitrate and nitrite are fully utilized as electron acceptors, selenate, selenite, and sulfate will be used as the primary electron acceptor with remaining biodegradable COD by a different population of heterotrophic microbes. These sulfate-reducing microbe species are generally naturally occurring and their presence/biological activity results in the formation of hydrogen sulfide[2].The sulfate-reducing bacteria may overgrow and outcompete selenate and selenite reducing bacteria for electron donors at high sulfate concentrations. The electron donor (organic carbon) for the ABMet system must also be carefully monitored and controlled to avoid providing too much carbon source for the sulfur-reducing microorganisms. Allowable total sulfide concentrations in the ABMet effluent should be defined during pilot testing for specific applications to minimize competition from sulfate-reducing bacteria.

Solids generated from backwashing (which contain selenium) can generally be recycled upstream to the physical/chemical treatment system (if used) for removal or be treated separately. The resulting dewatered solids are typically tested using the toxicity characteristic leaching procedure (TCLP) to verify nonhazardous classification for disposal, but standards and requirements should be referenced for each site. Solids can generally be processed using solids dewatering equipment such as a plate-and-frame filter press with other solids.

[2] Hydrogen sulfide is an odorous gas that is detectable at low concentrations (around 1 part per million [ppm]) and can be a human health issue at sufficient concentrations (the U.S. Department of Labor maintains exposure limits under the Occupational Safety and Health Administration standards).

3
PILOT DEMONSTRATION DESIGN

Pilot System Design

Effluent from P4's full-scale physical/chemical treatment system (that is, hydrated lime addition, primary solids removal, trace metals precipitation, and secondary solids removal) was collected and blended with service water (originating from Lake Michigan and untreated) at a 1:1 ratio in the 500-gallon pilot equalization tank. GE designed and operated the pilot system and determined that dilution of the full-scale physical/chemical effluent to minimize the potential impacts of scaling, high TDS concentration, and toxicity was required. For purposes of ELG compliance, however, this sort of dilution would require application of more stringent (i.e., lower) ELGs for constituents. Therefore, treatment without dilution would be preferable to the extent it is feasible. Blended wastewater from the equalization tank provided influent to the nitrification/denitrification pretreatment membrane biological reactor (MBR) system. Effluent from the pretreatment MBR system was collected in a feed tank for the two-stage ABMet system.

An overview of the P4 Pilot system is provided on Figure 3-1.

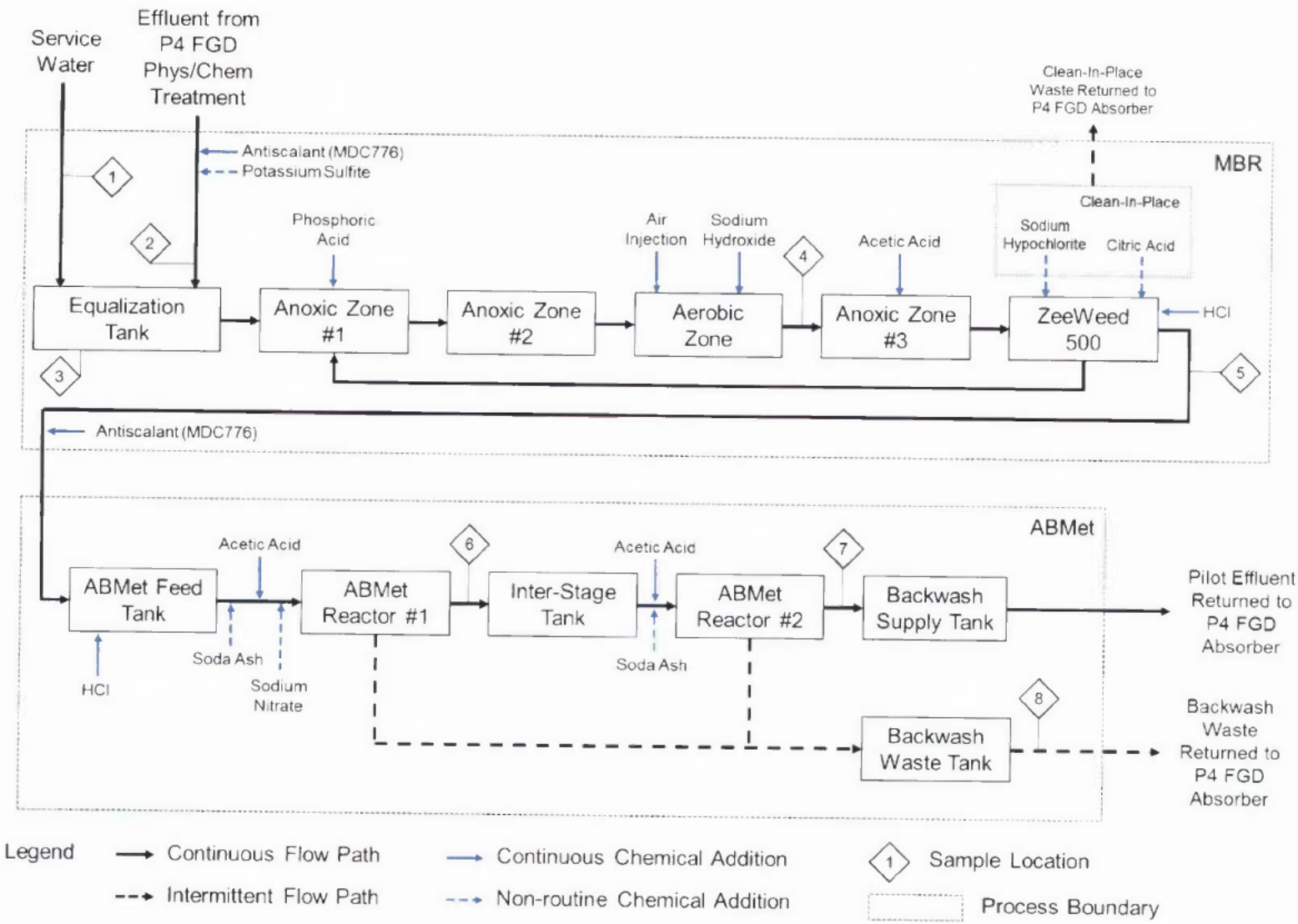

Figure 3-1
Pilot process block flow diagram

Equalization Tank

The 500-gallon equalization tank was provided for blending of P4's full-scale physical/chemical effluent and service water from Lake Michigan (untreated) at a 1:1 volume ratio. A combination of hand valves, flow meters, and flow control valves was used to balance the flows and achieve the targeted 1:1 volume ratio. The blended water from the equalization tank was pumped via submersible pump to anoxic zone #1 in the pretreatment MBR system.

While initial provisions were made to feed different types of chemicals, only antiscalant (MDC776) and potassium sulfite were added to the EQ Tank during testing.

- Antiscalant (MDC776) – To mitigate scaling of calcium, sulfate, phosphate, and other precipitating species. A dosage of 5 mg/L was maintained throughout the study.
- Potassium sulfite – For removal of potential oxidants for mitigating negative impacts to biological activity that may inhibit selenium reduction. Addition began on January 5, 2016, near the end of Condition 2 through Condition 3.

Pretreatment Membrane Biological Reactor

The pretreatment MBR pilot system was seeded with 2,500 gallons of municipal mixed liquor from the Kenosha Wastewater Treatment Plant located in Kenosha, WI. The seeding occurred on October 20, 2015 and the acclimation period, after seeding, lasted four weeks. The system consisted of four zones (anoxic #1, anoxic #2, aerobic, and anoxic #3) followed by the membrane tank, which are described in Table 3-1.

Table 3-1
Pilot MBR System Description

Item	Volume (gallons)	Chemical Addition	Description
Anoxic zone #1	100 [working volume]	Phosphoric acid – macronutrient for bacteria; began in Condition 2 due to switch in acetic acid source from a blended product (which contains phosphorus, but the concentration was deemed too high) to an 80% product (20% balance is water). Target phosphorus concentration was ≤3 mg/L in MBR permeate and ≤ 0.5 mg/L in the ABMet effluent.	• Received blended water from equalization tank and mixed liquor recirculation from the membrane tank • Mixing provided via mechanical mixer
Anoxic zone #2	100 [working volume]	None	• Received water from anoxic zone #1 • Mixing provided via mechanical mixer
Aerobic zone	1,000 [working volume]	• Ferric chloride – To reduce phosphorus that had been added by the acetic acid blended product, used only during 2-day period in Condition 3; originally intended for soluble arsenic precipitation if it had been needed (but soluble arsenic was not present at concentrations higher than the target value). The blended acetic acid product contained excess phosphorus which may have led to the precipitation of material that created issues with excess solids building in the ABMet biofilter during testing. Scaling and excess solids were ultimately controlled by adjusting the phosphorous content in the nutrient. • Sodium hydroxide – to increase pH	• Received water from anoxic zone #2 • Continuous aeration provided by a blower and fine bubble diffusers
Anoxic zone #3	1,000 [working volume]	• Acetic acid – carbon source for denitrification and partial selenate/ selenite reduction; blended type used during Condition 1; change to 80% acetic acid made in Condition 2. Switched made due to high concentration of phosphorus in blended product.	• Received water from aerobic zone • Mixing provided via mixing pump
ZeeWeed Membrane tank	270	• Sodium hypochlorite – membrane cleaning • Citric acid – membrane cleaning • Hydrochloric acid – to decrease pH (beginning in Condition 2)	Three ZeeWeed modules provided, but only one was placed in service

The blended water was pumped from the equalization tank to anoxic zone #1, which had an underflow to anoxic zone #2. The water then overflowed to the aerobic tank. The aerobic tank was fitted with 10 fine bubble diffusers to achieve the desired dissolved oxygen (DO) concentration of 2 to 4 mg/L. Also, pH monitoring, with a control set point of 6 - 7[3] S.U., was provided in the aerobic tank. Level controls within the aerobic tank controlled the flow to anoxic zone #3. A mixing pump and eductors were provided in anoxic zone #3 for mixing and allowed for the water to be pumped to the membrane tank.

The membrane tank consisted of three 370 ft^2 ZeeWeed 500 membranes, which is a scaled-down version of a full-scale membrane system. Only one membrane, located in the middle module, was in service for this pilot; the other two membranes/modules were plugged and not placed into service. This configuration allowed for normal operation of the air diffuser system that is located inside the membrane tank. Suction drives the treated water through the hollow fibers of the membrane using an outside-in configuration. Membranes were cleaned with constant air scouring along with periodic chemical cleans. For a full-scale system, all waste streams would be evaluated for treatment, potentially by recycle to the physical/chemical process upstream. Overflow from the membrane tank was recirculated to anoxic tank #1.

The main objectives of the pretreatment MBR were as follows:

- Nitrify influent TKN/ammonia nitrogen – oxidation of ammonia nitrogen to nitrate nitrogen
- Denitrify influent and produce nitrate nitrogen – reduce nitrate/nitrite nitrogen to nitrogen gas
- Produce an effluent with very low TSS suitable for treatment in the downstream ABMet system
- Remove insoluble selenium in influent and produced in the MBR anoxic tank

Permeate from the pretreatment MBR was collected in the ABMet system's feed tank. A picture of the MBR pilot equipment is shown in Figure 3-2.

[3] The pilot MBR pH control set point of 6 - 7 S.U. was established by GE. CH2M suggested that a slightly higher control range of 6.8 - 7.5 S.U. would minimize impacts on nitrification. Actual operating range, as discussed in Section 4, was 6.8 - 7.2 S.U.

Figure 3-2
ZeeWeed 500 MBR pilot
Courtesy of GE Water & Process Technologies

ABMet

The ABMet pilot system consisted of two reactor stages (each with 1,270 L of GAC), feed and inter-stage tanks, a backwash system, and chemical feed systems, which are described in Table 3-2. The ABMet reactors were seeded with GE's bacteria on November 20, 2015, and placed into forward flow on November 23.

Table 3-2
Pilot ABMet System Description

Item	Volume (gallons)	Chemical Addition	Description
ABMet feed tank		• Hydrochloric acid – to decrease pH (beginning in Condition 2) • Soda ash – to increase alkalinity (Condition 2 only) • Antiscalant, MDC776 (Began at Condition 2)	Received pretreatment MBR permeate
ABMet stage 1	335	• Acetic acid – carbon source for denitrification and selenate/ selenite reduction; used blended version that contained nutrients (ammonium and phosphorus) starting in Condition 2 • Sodium nitrate – nitrate (electron acceptor) source to enhance denitrification, but added only mid-way through Condition 4	Received pretreatment MBR permeate from the ABMet feed tank
ABMet inter-stage tank		Soda ash – to increase alkalinity (Condition 2 only)	Received ABMet stage 1 effluent

Table 3-2 (continued)
Pilot ABMet System Description

Item	Volume (gallons)	Chemical Addition	Description
ABMet stage 2	335	Acetic acid – carbon source for denitrification and selenate/selenite reduction; used blended product (containing acetic acid, ammonium, and phosphorus) during Condition 1 and 80% acetic acid product (20% water) during Conditions 2, 3, and 4.	Received ABMet stage 1 effluent from the ABMet inter-stage tank
ABMet effluent tank		None	Received ABMet stage 2 effluent
Backwash supply tank	3,000	None	Received ABMet stage 2 effluent from the ABMet effluent tank to degas and backwash the ABMet filters
Backwash waste tank	800	None	Received backwash waste from ABMet stage 1 and ABMet stage 2

Permeate from the pretreatment MBR was collected in the ABMet feed tank from where it was pumped to the top of the ABMet stage 1 reactor. Effluent from the ABMet stage 1 was collected in an inter-stage tank from where it was pumped to the top of the ABMet stage 2 reactor. Effluent from the ABMet stage 2 was collected in an effluent tank and then pumped to the backwash supply tank that allowed the effluent to overflow from the system to the effluent where all waste was returned to the P4 FGD Absorber.

The GAC media in each ABMet stage reactor provided surface area for bacteria to grow and develop a biofilm. Nutrient addition, pH control, and alkalinity adjustment were provided for each ABMet stage to provide a suitable/optimized environment for selenium reduction.

The main objectives of the ABMet system operation were as follows:

- Denitrify any remaining influent nitrate nitrogen and reduce nitrate/nitrite nitrogen to nitrogen gas.
- Reduce soluble selenium species (selenate and selenite) to particulate, elemental selenium and remove it from the wastewater.

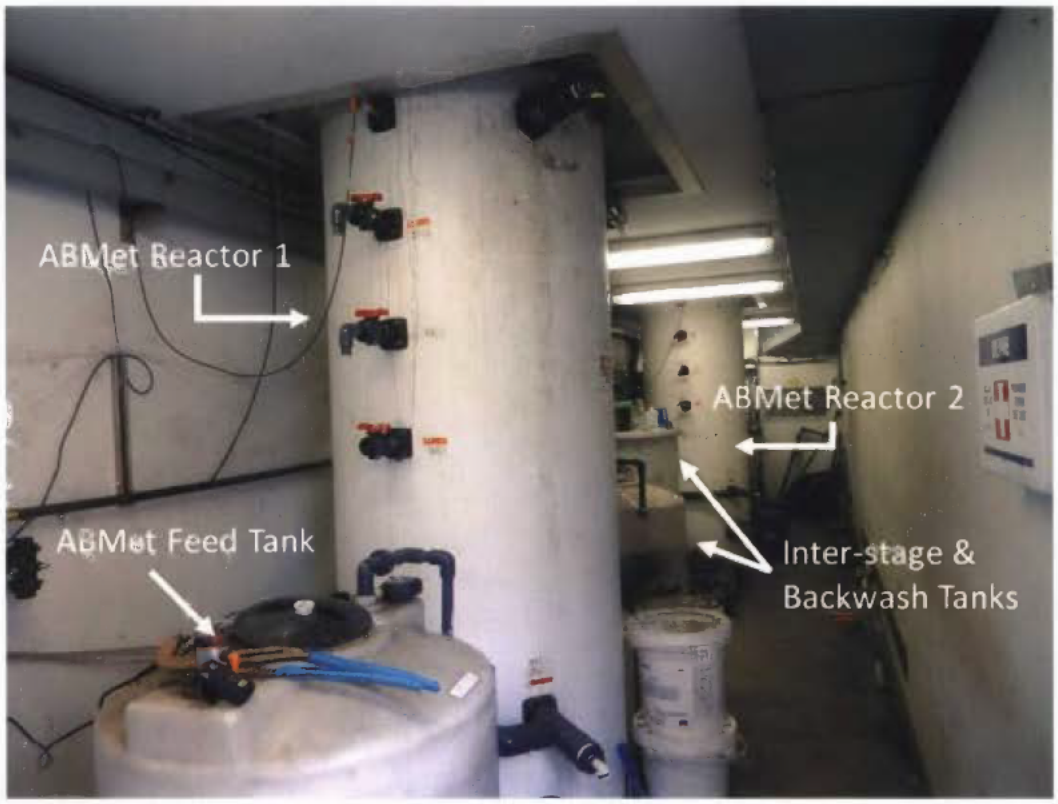

Figure 3-3
ABMet pilot equipment

Pilot Schedule and Conditions

Operating data for the MBR and ABMet systems have been divided into the following four conditions:

- Condition 1 – Startup and Acclimation (October 26, 2015 to December 16, 2015) – period where bacteria are growing and becoming established in the treatment system.
- Condition 2 – Initial Operation (December 17, 2015 to January 10, 2016) – operational period defined by GE's original test plan.
- Condition 3 – Increased Flow/Reduced HRT (January 11, 2016 to February 13, 2016) – operational period intended to more closely simulate full-scale HRT/EBCT conditions.
- Condition 4 – Process Adjustments (February 14, 2016 to March 3, 2016) – period where GE responded to decreased selenium removal performance of the ABMet.

Increasing the flow rate under Condition 3 was a conscious decision made by the project team in an effort to simulate full-scale conditions (i.e., to match HRT/EBCT for each process technology). Due to factors that resulted in poor selenium removal performance, of which increased flow rate is not believed to be a sole-contributor, additional process changes were made during Condition 4 in attempt to return the pilot systems back to original selenium removal performance (which had been meeting the effluent/treatment targets).

- The project team was able to extend the duration of the pilot demonstration past its original end date, but testing concluded when the P4 units entered an outage and were not able to supply FGD wastewater. For two weeks prior to pilot shutting down, the ABMet system was operated by feeding blended physical/chemical treatment effluent from the storage tanks with ABMet effluent; the MBR did not operate during this time.
- Details on the process conditions, adjustments, and performance changes are provided in the following sections.

Field and Laboratory Analytical Plans

Field and laboratory analyses were conducted to control system operation and optimize performance. Field analyses were conducted by GE throughout the demonstration on the MBR and ABMet pilot systems. A summary of field parameters and frequency of the analyses are provided in Table 3-3.

Table 3-3
Field Analyses

Parameter	Minimum Frequency (per week)
Chemical tank levels (inches)	3
pH (S.U.) by handheld meter	5
Dissolved oxygen (mg/L) by handheld meter	5
Conductivity (μS/cm) by handheld meter	5
ORP (mV) by inline meter	5
Nitrate/nitrate (mg of N/L) by HACH test kit	5
Temperature (°F)	5
Raw Water Totalizer (gallons)	5
Service Water Totalizer (gallons)	5
Anoxic zone #1 level (inches)	5
Anoxic zone #2 level (inches)	5
Anoxic zone #3 level (inches)	5

Laboratory analyses were conducted by We Energies' corporate lab, TestAmerica Laboratories, Inc., and Brooks Applied Labs for analytical chemistry evaluations. Parameters analyzed by each lab are summarized in Table 3-4, Table 3-5, and Table 3-6. Turnaround times for parameter results varied with each lab, but were generally one to two weeks with the exception of selenium by We Energies which was within three days. Samples were shipped to We Energies' lab and TestAmerica same-day and all samples requiring dissolved parameter analysis were filtered by the labs. Samples sent to Brooks Applied were on 24-hour delivery shipping. Samples analyzed

by We Energies and TestAmerica were taken every Monday, Tuesday, and Thursday during Conditions 1 and 2 and only Tuesday and Thursday during Condition 3. The entire analytical plan, which identifies the sample locations and frequencies, is provided in Appendix A.

Table 3-4
We Energies Lab Analyses

Parameter	Analytical Method
Aluminum, total and filtered	EPA 200.7
Arsenic, total and filtered	EPA 200.8 DRC-O2
Boron, total and filtered	EPA 200.7
Cadmium, total and filtered	EPA 200.7 / EPA 200.8
Calcium, total and filtered	EPA 200.7
Cobalt, total and filtered	EPA 200.7
Copper, total and filtered	EPA 200.7 / EPA 200.8
Iron, total and filtered	EPA 200.7
Lead, total and filtered	EPA 200.7 / EPA 200.8
Magnesium, total and filtered	EPA 200.7
Manganese, total and filtered	EPA 200.7
Mercury low-level, total and filtered	EPA 1631E
Mercury low-level, 0.45 µm	EPA 1631E
Molybdenum, total and filtered	EPA 200.7
Molybdenum, filtered	EPA 200.7
Nickel, total and filtered	EPA 200.7
Selenium, total and filtered	EPA 200.8 DRC-NH3
Silver, total and filtered	EPA 200.7
Sodium, total and filtered	EPA 200.7
Thallium, total and filtered	EPA 200.8
Tin, total and filtered	EPA 200.7
Zinc, total and filtered	EPA 1638 DRC

Table 3-5
TestAmerica Lab Analyses

Parameter	Analytical Method
Alkalinity	SM2320B
Ammonia	SM4500
Bicarbonate	SM2320B
BOD	SM5210B
Carbonate	SM2320B
Chlorides, filtered	SM4500
COD	SM5220C
Conductivity, µS/cm	SM2510B
Fluoride, total	SM4500
Nitrate/Nitrate (N)	SM4500
Phosphorus, total	SM4500
Sulfate, filtered	SM4500
Sulfide	SM4500
TDS	SM2540C
TKN	SM4500
TOC	SM5310C
TSS	SM2540D

Table 3-6
Brooks Applied Lab Analyses

Parameter	Analytical Method
Arsenic, total and filtered	EPA 200.8/6060
Arsenic Speciation, filtered[1]	EPA 200.8/6060
Selenium, total and filtered	EPA 200.8/6060
Selenium Speciation, filtered[1]	EPA 200.8/6060

[1]Speciation analyses only conducted on pilot influent and effluent samples

4
RESULTS AND DISCUSSION

This section presents the results associated with the P4 pilot study. Raw data from the pilot study are presented in Appendix C.

During the pilot study, influent water quality/chemistry was considered typical for the site (no major upsets/excursions or abnormal conditions occurred in any process upstream of the pilot system). The P4 wastewater treatment system was offline for two weeks in mid-November 2015 (during the MBR and ABMet acclimation period in Condition 1) due to mechanical issues, but stored effluent water provided consistent flow and chemistry to the pilot. In mid-February 2016, the P4 system shut down again through the beginning of March, but stored water (with consistent chemistry) was provided to the pilot. The demonstration ended March 3, 2016. There were many performance changes in the pilot MBR and ABMet processes throughout the demonstration. These changes are documented and described to the best of the project team's capabilities.

Pilot Influent Water Quality

Table 4-1 presents a summary of the blended pilot influent water quality (50 percent full-scale physical/chemical treatment effluent and 50 percent service water from Lake Michigan [untreated] by volume). The blended pilot influent total selenium concentration averaged 1,175 µg/L with a range of 770 to 2,500 µg/L. The blended pilot influent dissolved selenium concentration averaged 1,093 µg/L. Comparisons between each data set revealed most of the blended influent selenium was in the soluble form. Nitrate/nitrite nitrogen averaged 98 milligrams of nitrogen per liter (mg-N/L), with a range of 65 to 160 mg-N/L. Ammonia averaged 52 mg/L with a range of 10 to 180 mg/L[4]. The ranges indicate variability in the full-scale physical/chemical effluent, which was observed over the course of the pilot study. The variability could be explained in part by the site's normal maintenance process of shutting down the physical/chemical system every week for manual cleaning of the components. During this time, the concentrations of components build in the absorbers and a new "batch" of water is delivered to the system every Monday morning.

[4] The higher concentrations of ammonia may be attributed to selective catalytic reduction (SCR) layers approaching end of life at P4, causing higher ammonia injection rates to be used for meeting NO_x removal requirements which subsequently increases the ammonia concentration in the FGD wastewater. SCR catalyst life decays naturally over many years until replacement is needed. The replacement is generally scheduled with a steam generator/boiler outage.

Table 4-1
Blended Pilot Influent Water Quality

Parameter	Units	Pilot Influent – All Operating Conditions		
		Minimum	Maximum	Average
Total Selenium	µg/L	770	2,500	1,175
Dissolved Selenium	µg/L	710	1,900	1,093
NO_2/NO_3-N	mg/L	65	160	98
Total Mercury	ng/L	20	240	72
Dissolved Mercury	ng/L	6.9	29	13.5
Total Arsenic	µg/L	0.45	8.10	4.67
Dissolved Arsenic	µg/L	0.45	8.50	4.68
pH[1]	S.U.	6.6	7.7	
Total Calcium	mg/L	400	830	479
Dissolved Calcium	mg/L	400	840	471
Total Magnesium	mg/L	1,600	3,100	2,039
Dissolved Magnesium	mg/L	1,600	3,100	2,023
Ammonia	mg/L	10	180	52
Conductivity	µS/cm	11,000	22,000	13,378
COD	mg/L	360	1,600	596
BOD	mg/L	1.00	2.60	1.8
TOC	mg/L	5.1	77.0	28.1
Chloride	mg/L	2,300	3,200	2,690
Fluoride	mg/L	18.0	43.0	24.0
Sulfate	mg/L	6,200	11,000	7,805
Ortho-Phosphate	mg/L	<0.027	0.74	0.10
Total Phosphorus	mg/L	0.027	0.750	0.093
Total Kjeldahl Nitrogen (TKN)	mg/L	42	220	101
Sulfide	mg/L	<0.22	1.70	0.15
TSS	mg/L	4	31	12
TDS	mg/L	12,000	25,000	16,452
Total Alkalinity	mg/L	78	120	103
Bicarbonate Alkalinity	mg/L	78	120	103
Carbonate Alkalinity	mg/L	<3.9	<3.9	<3.9

Notes:
Blended Influent: 50 percent full-scale physical/chemical treatment effluent and 50 percent service water from Lake Michigan (untreated)
[1]Analysis performed onsite
BOD = biochemical oxygen demand
µS/cm = microSiemen per centimeter
S.U. = standard units
TDS = total dissolved solids
TOC = total organic carbon

Variability (the difference between minimum and maximum concentration values) was also observed in arsenic and mercury throughout the study. The data indicate pilot feed water contained arsenic mostly in the soluble form whereas mercury was mostly in the particulate form. The TDS ranged from 12,000 to 25,000 mg/L during the pilot study.

The following sections discuss the pilot study results, including operational parameters and effluent water quality for each operating condition.

Membrane Biological Reactor

Operating Parameters

MBR operational parameters are discussed in this section. As previously mentioned, the P4 full-scale physical/chemical treatment effluent was blended with service water from Lake Michigan at a 1:1 ratio in the pilot's equalization tank. This blended stream served as influent to the pilot system and was pumped to the MBR anoxic zone #1.

After the initial seeding with biomass from the local municipal wastewater treatment plant, the mixed liquor was recirculated through the MBR for two days with 300 gallons of blended pilot feed water. The system was placed in forward flow through the MBR after these two days and acclimation continued for four weeks. Table 4-2 compares the MBR operational parameters at the four test conditions. The flow rate to the MBR averaged approximately 1 GPM during Conditions 1 and 2 and 1.5 to 1.6 GPM in Conditions 3 and 4. This resulted in combined HRT in the bioreactor zones decreasing from approximately 35 hours during Conditions 1 and 2 to approximately 23 hours during Conditions 3 and 4. The increase in flow rate and subsequent reduction in HRT was part of the initial pilot test plan. Operating at the lower flow rate initially was intended to allow for adequate acclimation of the biomass and the plan was to increase the flow rate after acclimation in order to simulate full-scale conditions.

Table 4-2
MBR Operational Parameters

Condition Description	Startup and Acclimation	Initial Operation	Increased Flow/ Reduced HRT	Process Adjustments
Condition Number	**1**	**2**	**3**	**4**
Parameter/Dates	**10/26/15 to 12/16/15**	**12/17/15 to 1/10/16**	**1/11/16 to 2/13/16**	**2/14/16 to 3/3/16**
Influent Flow Rate				
Average	1.05 GPM	1.01 GPM	1.54 GPM	1.6 GPM
Range	1 to 2.6 GPM	1 to 1.25 GPM	1.25 to 1.6 GPM	1.6 GPM
MBR pH Control Set Point	6.8 to 7.2	6.8 to 7.2	6.8 to 7.2	6.8 to 7.2
MBR HRT Anoxic Zone #1	1.6 hours	1.7 hours	1.1 hours	1.0 hour
MBR HRT Anoxic Zone #2	1.6 hours	1.7 hours	1.1 hours	1.0 hour
MBR HRT Aerobic Zone	15.9 hours	16.5 hours	10.8 hours	10.4 hours
MBR HRT Anoxic Zone #3	15.9 hours	16.5 hours	10.8 hours	10.4 hours
ZeeWeed 500 Flux	10 GFD (first 3 weeks) 5.8 GFD	5.8 GFD	5.8 GFD	5.8 GFD
ZeeWeed 500 Backwash Flux	20 GFD	20 GFD	20 GFD	20 GFD
MBR Aeration Rate	12 SCFM	12 SCFM	12 SCFM	12 SCFM

Table 4-2 (continued)
MBR Operational Parameters

Condition Description	Startup and Acclimation	Initial Operation	Increased Flow/ Reduced HRT	Process Adjustments
Condition Number	**1**	**2**	**3**	**4**
Parameter/Dates	**10/26/15 to 12/16/15**	**12/17/15 to 1/10/16**	**1/11/16 to 2/13/16**	**2/14/16 to 3/3/16**
MBR MLSS				
Average	5,760 mg/L	3,950 mg/L	2,690 mg/L	4,183 mg/L
Range	3,400 to 6,500 mg/L	3,700 to 4,200 mg/L	1,000 to 6,500 mg/L	2,900 to 5,800 mg/L
RAS Flow Rate	6 to 8 GPM	6 to 8 GPM	6 to 8 GPM	6 to 8 GPM
Sludge Wasting Rate	none	none	80 GPD	none
MBR DO Anoxic Zone #1				
Average	0.93 mg/L	2.55 mg/L	3.37 mg/L	0.12 mg/L
Range	0.11 to 2.4 mg/L	1.74 to 3.90 mg/L	1.12 to 6.23 mg/L	0.02 to 0.49 mg/L
MBR DO Anoxic Zone #2				
Average	0.23 mg/L	0.29 mg/L	1.34 mg/L	0.02 mg/L
Range	0.01 to 2.06 mg/L	0 to 2.49 mg/L	0 to 5.53 mg/L	0 to 0.2 mg/L
MBR DO Aerobic Zone				
Average	3.20 mg/L	3.19 mg/L	4.02 mg/L	2.84 mg/L
Range	0.86 to 5.90 mg/L	1.7 to 4.93 mg/L	0.17 to 9.00 mg/L	0.43 to 5.22 mg/L
MBR DO Anoxic Zone #3				
Average	0.14 mg/L	0.02 mg/L	0.02 mg/L	0.01 mg/L
Range	0 to 0.56 mg/L	0 to 0.05 mg/L	0 to 0.13 mg/L	0 to 0.04 mg/L
MBR ORP Anoxic Zone #3				
Average	-387 mV	-423 mV	-331 mV	-354 mV
Range	-143 to -489 mV	-376 to -477 mV	-58 to -427 mV	-83 to -416 mV
Number of Membranes in Service	1	1	1	1
Chemical Doses				
Hydrochloric Acid (to ZeeWeed Tank)	950 mg/L	950 mg/L	400 mg/L	400 mg/L
Sodium Hydroxide (to Aerobic Zone)	350 mg/L	350 mg/L	350 mg/L	none
COD Added via Acetic Acid to Anoxic Zone #3				
Average Added	897 mg/L	618 mg/L	447 mg/L	643 mg/L
Range	563 to 1,464 mg/L	452 to 807 mg/L	227 to 565 mg/L	630 to 756 mg/L
Ferric Chloride (to Aerobic Zone)	60 mg/L (2 days only)	none	none	none
Phosphoric Acid (to Anoxic Zone #1)	none	5 mg/L	5 mg/L	5 mg/L
Potassium Sulfite (to Equalization Tank)	none	none	25 to 200 mg/L	none

Notes:

GFD = gallons per square feet per day

SCFM = standard cubic feet per minute

GPD = gallons per day

GPM = gallons per minute

mV = millivolt

RAS = return activated sludge (the flow from ZeeWeed tank to MBR Anoxic Zone #1)

On average, the DO was maintained above 2.8 mg/L (2-4 mg/L target) in the aerobic zone and was less than 0.1 mg/L (<0.5 mg/L target) in anoxic zone #3 during Conditions 2, 3, and 4. The ORP in anoxic zone #3 averaged less than -330 mV during all four conditions. These values were within GE's target range.

As noted in Table 3-1, the acetic acid product used to supply nutrients for the biological process was changed during the study. The blended acetic acid product was first used during Condition 1, and contains an organic carbon source (acetic acid), ammonium, and phosphorus (the latter two are nutrients). Due to the higher than anticipated phosphorus concentration (20 times higher) in the blended acetic acid, the carbon source was switched to an 80 percent solution of unblended acetic acid (the balance 20 percent is water) for Conditions 2, 3, and 4 to limit excess phosphorus in the final effluent. The excess phosphorous led to precipitation of excess solids which, if left untreated, could cause prolific scaling in the process equipment. To prevent scaling with the blended nutrient product, ferric chloride was added to the aerobic zone for two days until the nutrient product was changed. Afterward the acetic acid source was changed, ferric chloride dosing was stopped. Phosphoric acid was fed after the acetic acid product was changed to achieve less than 3 mg/L in the MBR permeate. The reduction in COD added by the nutrient from Conditions 1 to 2 to 3 (noted in Table 4-2) coincides with the project team's attempts to increase nitrate/nitrite concentration in the MBR permeate in attempt to improve ABMet selenium reduction. Additional discussion is provided in the ABMet section.

The ZeeWeed membrane flux was initially set to 10 GFD with an operating cycle time[5] of 10 minutes and resting mode duration of 30 seconds. During the first three weeks of operation in the acclimation period, the ZeeWeed TMP averaged less than 1 PSI. It was also during this time that the acetic acid feed point was inadvertently placed at the aerobic zone instead of the anoxic zone #3. Once the feed point was moved, an increase in TMP was observed and the membrane flux set point was reduced to 5.8 GFD. A second spike in TMP occurred gradually from December 12 through 24, 2015. Once the TMP reached 8 PSI, the system was placed in automatic standby and from December 24 through 28, the MBR and ABMet systems were offline due to the high MBR TMP. A recovery clean was completed on December 27 and 28; the recovery clean included soaking the membranes in a 1,000 mg/L solution of sodium hypochlorite, followed by soaking in a 2,000 mg/L solution of citric acid. The system was placed back into operation on December 28 and the maintenance cleaning schedule was adjusted for a citric acid cleaning every other day.

The MBR process accumulates solids that come from biomass production and naturally by precipitation of various chemical species in the wastewater. The MBR solids, referred to as mixed liquor suspended solids (MLSS), were purged from the system beginning in early January 2016 at 80 GPD. The MLSS purge rate was set to 20 gallons every 6 hours to avoid reducing flow to the ABMet. Discharge of MLSS ended in mid-February due to low MLSS concentrations and decreased selenium reduction performance (additional details are provided in the next section).

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[5] Cycle time refers to the changing of the membrane operating mode from filtration to resting. In filtration mode, a vacuum is maintained to pull water through the membrane and produce treated effluent. In resting mode, no vacuum is applied to the membranes and the air scour is maintained to help remove solids. [1]

Treated Water Characteristics

This section discusses the characteristics of the MBR pilot treated effluent (permeate). The MBR process was operated to remove ammonia, nitrates, and selenium while being monitored for potential impacts from chemical scaling and high TDS. Membrane performance and optimization of the HRT and SRT were monitored throughout the study.

Table 4-3 summarizes the treated effluent water quality based on samples collected during each operating condition. Figures 4-1, 4-2, 4-3, 4-4, and 4-5 present MBR influent and effluent COD and phosphorus; ammonia and total Kjeldahl nitrogen (TKN); nitrate/nitrite nitrogen; selenium; and mercury, respectively.

As seen in Table 4-3, the MBR effluent phosphorus concentration was higher during Condition 1; however, as Figure 4-1 shows, the influent phosphorus concentration was consistent for the pilot study. The increased MBR effluent phosphorus concentration during Condition 1 was due to the higher-than-planned-for phosphorus content of the nutrient balanced acetic acid blend being added. Once the acetic acid was switched to the 80 percent solution in the first week of December 2015 (near the beginning of Condition 2), the MBR effluent phosphorus concentration decreased.

Table 4-3
MBR Treated Effluent (Permeate) Water Quality[1]

Parameter	Units	Condition 1			Condition 2			Condition 3			Condition 4		
		Min	Max	Avg.	Min	Max	Avg.	Min	Max	Avg.	Min	Max	Avg.
Total Selenium	µg/L	120	350	200	110	260	173	170	590	337	170	460	231
Dissolved Selenium	µg/L	120	340	190	120	260	167	170	600	330	160	460	233
NO_2/NO_3-N	mg/L	0.19	160	35	0.12	0.24	0.15	0.13	21	4.0	0.09	0.18	0.13
Total Mercury	ng/L	1.44	3.94	2.46	1.60	3.68	2.58	1.01	5.67	2.67	1.93	1.94	1.94
Dissolved Mercury	ng/L	1.10	3.33	2.02	0.23	3.06	1.96	0.64	2.97	1.92	0.66	0.90	0.78
Total Arsenic	µg/L	3.7	5.1	4.7	4	5	4	--	--	--	--	--	--
Dissolved Arsenic	µg/L	3.6	5.0	4.5	4	5	4	--	--	--	--	--	--
Total Calcium	mg/L	440	520	476	420	530	456	440	490	454	460	470	465
Dissolved Calcium	mg/L	450	510	476	420	540	460	430	480	457	460	470	465
Total Magnesium	mg/L	1,900	2,500	2,107	1,700	2,100	1,840	--	--	--	--	--	--
Dissolved Magnesium	mg/L	2,000	2,500	2,138	1,700	2,100	1,840	--	--	--	--	--	--
Total Sodium	mg/L	--	--	--	420	420	420	410	500	476	500	500	500
Ammonia	mg/L	0.31	13.0	3.75	4	14	9	0.23	12.0	5.09	1.3	110	37
Conductivity	µS/cm	13,000	16,000	13,923	11,000	14,000	12,429	11,000	13,000	12,500	12,000	13,000	12,200
COD	mg/L	260	640	501	370	570	513	370	550	433	370	570	455

Table 4-3 (continued)
MBR Treated Effluent (Permeate) Water Quality[1]

Parameter	Units	Condition 1			Condition 2			Condition 3			Condition 4		
		Min	Max	Avg.	Min	Max	Avg.	Min	Max	Avg.	Min	Max	Avg.
BOD	mg/L	--	--	--	<2.0	<2.0	<2.0	<2.0	<2.0	<2.0	<2.0	<2.0	<2.0
TOC	mg/L	--	--	--	14	14	14	6	69	37	2.5	3.8	3.0
Fluoride	mg/L	21	25	23	22	27	24	22	25	24	25	27	26
Sulfate	mg/L	--	--	--	6,700	6,900	6,800	6,000	9,100	7,100	6,300	7,900	6,917
Ortho-Phosphate	mg/L	13	36	19	1.2	1.2	1.2	--	--	--	--	--	--
Total Phosphorus	mg/L	2	25	14	1.2	6.5	3.9	0.86	4.30	2.64	0.03	3.00	2.06
TKN	mg/L	32	94	67	73	100	81	59	78	69	53	96	71
Sulfide	mg/L	<0.22	<0.22	<0.22	<0.22	<0.22	<0.22	<0.22	<0.22	<0.22	<0.22	<0.22	<0.22
TSS	mg/L	--	--	--	4	4	4	2	6	4	3	6	5
TDS	mg/L	14,000	20,000	17,286	12,000	16,000	14,714	13,000	16,000	14,600	14,000	16,000	14,600
Total Alkalinity	mg/L	200	200	200	100	110	105	40	180	116	220	270	240
Bicarbonate Alkalinity	mg/L	200	200	200	100	110	105	40	180	116	220	270	240
Carbonate Alkalinity	mg/L	--	--	--	<3.9	<3.9	<3.9	<3.9	<3.9	<3.9	<3.9	<3.9	<3.9

Notes:
[1] Average soluble concentrations were higher than total for some results due to analytical imprecision.
µS/cm = microSiemen per centimeter
Avg. = average
Max = maximum
Min = minimum
-- = no data

Figure 4-1 also shows that the MBR influent and effluent COD concentrations were similar. Given this, and the readily biodegradable nature of acetic acid, the data suggest that the influent COD was non-biodegradable. Also, from Table 4-3, it is evident that all the COD added through acetic acid was consumed in the MBR since the MBR effluent BOD and TOC concentrations were very low (higher BOD and TOC would indicate potential for additional biological activity in the oxidation of organic matter and the amount of carbon in organic material, respectively). This also raises the question whether all the COD in the influent reported is contributed by analytical interference or some other oxygen-demanding constituents, as opposed to organic carbon. It could also suggest that the organic compounds present were not fully oxidized in TOC tests (thus TOC readings would be lower than actual concentrations). The theory on analytical interference is drawn from low TOC concentrations reported during period of higher COD concentration measurements.

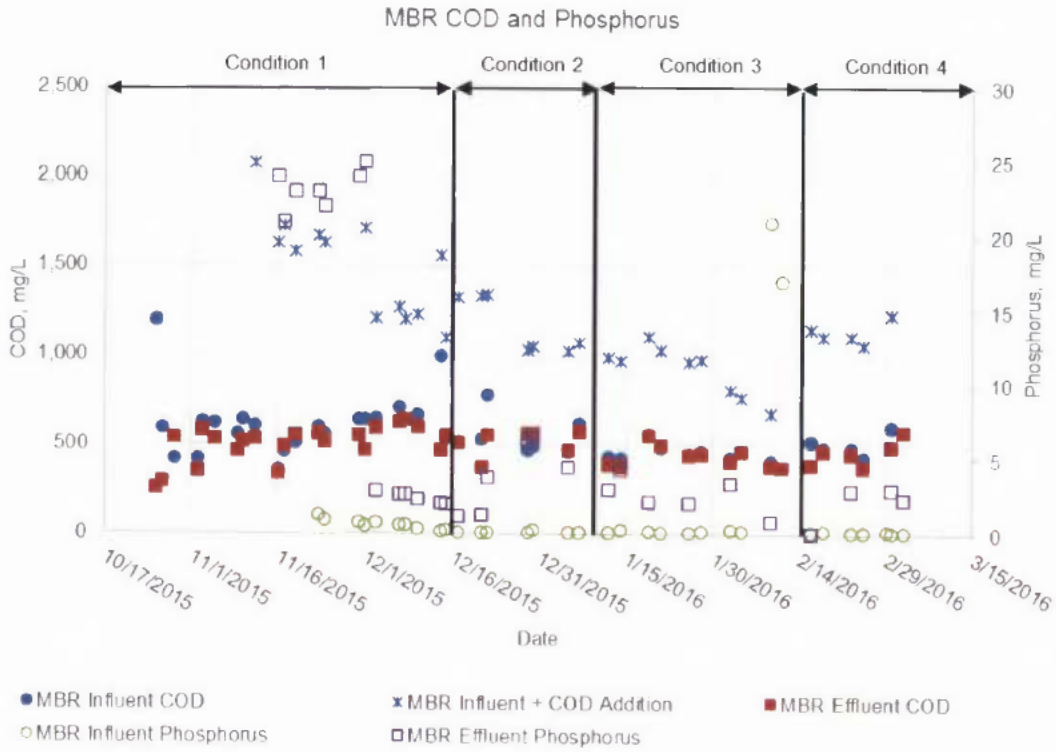

Figure 4-1
MBR influent and effluent COD and phosphorus

The data in Figure 4-2 show complete nitrification during October and November 2015. During this time, the influent ammonia concentration was high (ranging from 50 to 130 mg/L). Towards the end of Condition 1 and into Conditions 2 and 3, the influent ammonia concentration decreased to 10 to 20 mg/L, and nitrification appeared to stall (as seen by an increase in MBR effluent ammonia concentration).

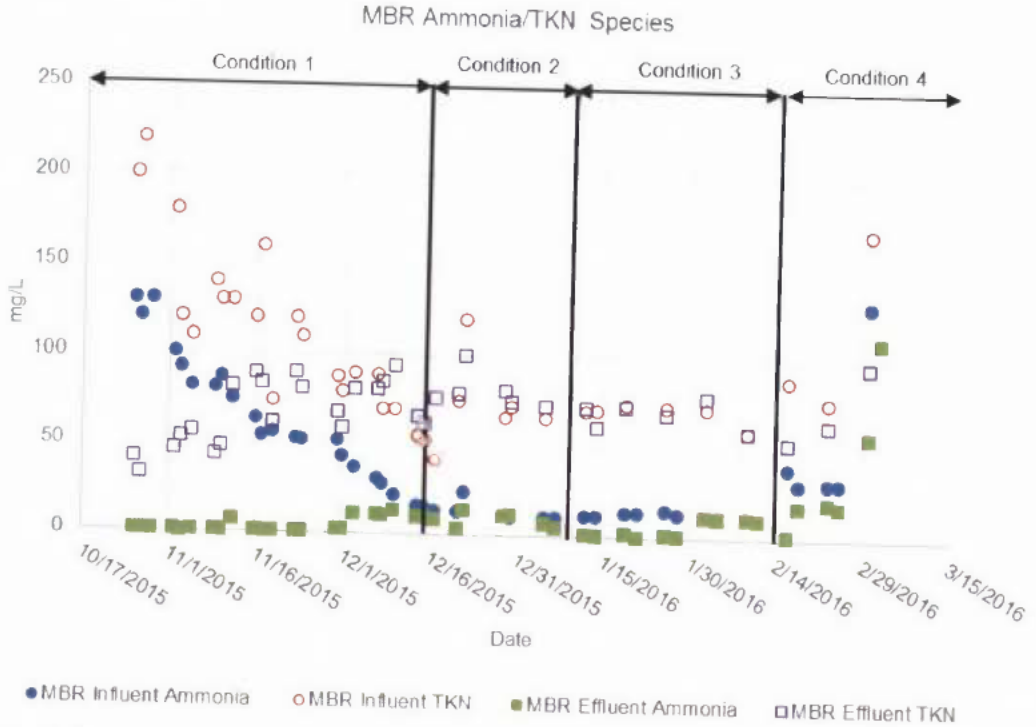

Figure 4-2
MBR influent and effluent ammonia and TKN

Also during this time, it was noticed that the pilot feed water alkalinity was lower than at the beginning of the demonstration and higher ammonia concentrations were coming from the P4 boiler units and creating higher pH values.

The generation of MLSS in the MBR varied throughout the pilot study. Wasting solids (MLSS) from the MBR was initiated during the middle of Condition 2 on December 28, 2015, at a rate of 80 GPD and was stopped in the middle of Condition 3 on January 30, 2016. This resulted in decreased MLSS concentrations during Conditions 2 and 3 from approximately 6,000 mg/L down to approximately 3,000 mg/L and an increase in MLSS concentration during Condition 4 to approximately 4,200 mg/L. These changes were not the cause of the loss of nitrification as the loss of complete nitrification occurred on November 30, 2015, one month prior to initiating the solids wasting. These changes do not appear to have impacted denitrification as full reduction of nitrate-nitrogen to nitrogen gas occurred throughout the pilot study. During Condition 4, the influent ammonia concentration started to increase with a corresponding increase in MBR effluent ammonia concentration, further indicating that nitrification had been lost. The reason(s) for losing the nitrification in the MBR could not be identified, but suspected to be caused by toxic or inhibitory compounds in the water.

In order to understand if toxicity/inhibitory compounds were contributing to the loss in nitrification, potassium sulfite was dosed to the Equalization Tank starting January 5, 2016, at a rate of 50 mg/L (to achieve 25 mg/L after dilution with service water). Higher dosages were added throughout Condition 3. The potassium sulfite was added to reduce potential oxidants that may have been contributing to the loss in nitrification performance. There were also concerns that the reduction in nitrification performance indicated the presence of inhibitory or toxic compounds that could have potentially also affected the ABMet bacteria and selenium reduction performance.

Nitrification performance did not noticeably improve when dosing potassium sulfite and dosing was discontinued on January 27. In an attempt to rule out the effectiveness of potassium sulfite versus the presence/impact of inhibitory compounds, 20 kg of powdered activated carbon (PAC) was added to MBR on February 6, 2016. The PAC should have absorbed inhibitory compounds present in the water; however, MBR nitrification performance did not improve with PAC addition.

Another observation from Figure 4-2 is that the blended influent contained recalcitrant TKN concentrations averaging 65 to 81 mg/L during all four conditions. TKN is comprised of ammonia and organic-nitrogen and the high concentrations in the MBR effluent suggest that a significant portion of the organic nitrogen fraction of the influent TKN was in a non-biodegradable form.

Nitrate/Nitrite

One of the main goals of the pretreatment MBR was to remove (denitrify) the nitrate/nitrite-nitrogen present in the influent and produced via nitrification in the aerobic zone. The average effluent nitrate/nitrite-nitrogen concentration during Condition 1 was 35 mg/L, indicating incomplete denitrification. This was due to the acetic acid dosing point inadvertently being installed in the aerobic zone of the MBR, which resulted in poor denitrification caused by anoxic zone #3 being carbon limited. After three weeks of poor denitrification, this situation was discovered and the acetic acid dosing point was relocated to the planned location (i.e., anoxic zone #3) on November 11, 2015.

As can be seen in Figure 4-3, once the acetic acid dosing point was relocated, complete denitrification occurred. Complete denitrification continued in the MBR throughout the remainder of the pilot study (other than a 2-week period towards the end of Condition 3, when the acetic acid dose was reduced intentionally to allow nitrate-nitrogen to pass through the pretreatment MBR to the ABMet system). Although nitrification was lost during Conditions 3 through 4, nitrate-nitrogen removal (denitrification) was never a problem in the MBR. For some unknown reason, more sensitive nitrifying bacteria were inhibited but the heterotrophic denitrifying bacteria were not inhibited.

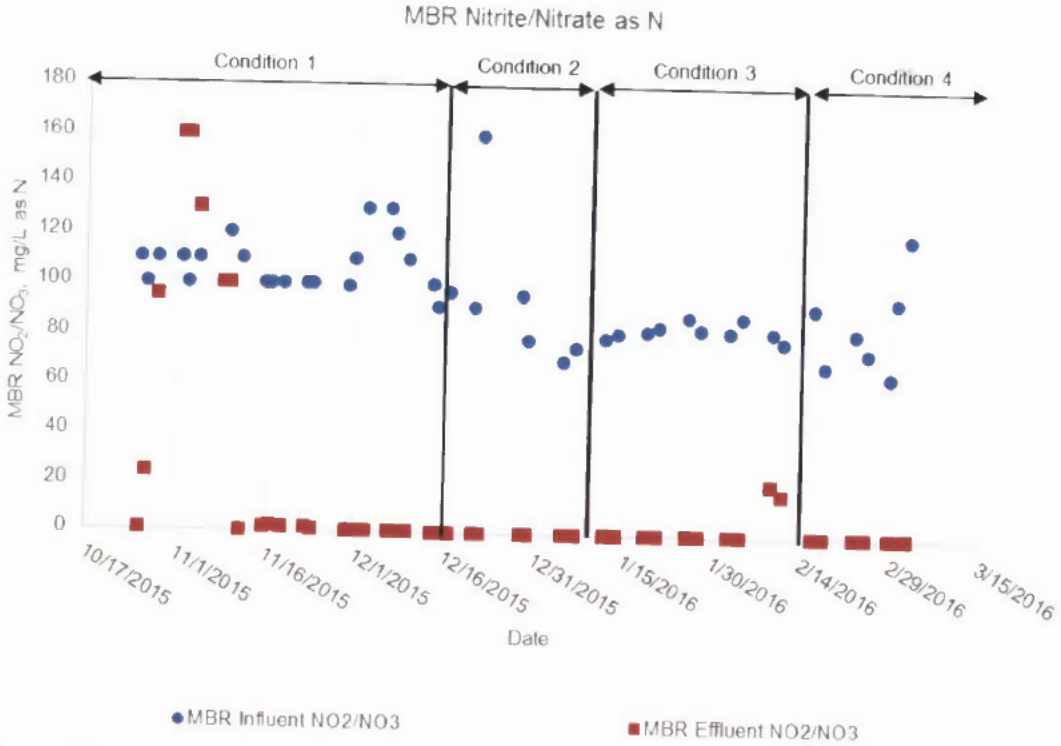

Figure 4-3
MBR influent and effluent nitrate/nitrite as nitrogen

Selenium

As seen in Figure 4-4, significant selenium reduction occurred in the pretreatment MBR. The overall average influent total selenium concentration was 1,175 µg/L, and the overall average effluent total selenium concentration was 250 µg/L. On average throughout all conditions, approximately 75 percent reduction in selenium concentration was observed. This is attributed to maintaining a very low ORP (approximately -350 mV) in the anoxic zone #3 with high acetic acid dosage. This ORP is comparable to that maintained in the ABMet reactors. Another observation from Figure 4-4 is that almost all of the influent selenium was soluble, which indicates that removal across the pretreatment MBR was by biological reduction to elemental selenium (which exists in particulate form) followed by filtration via the ultrafiltration membrane.

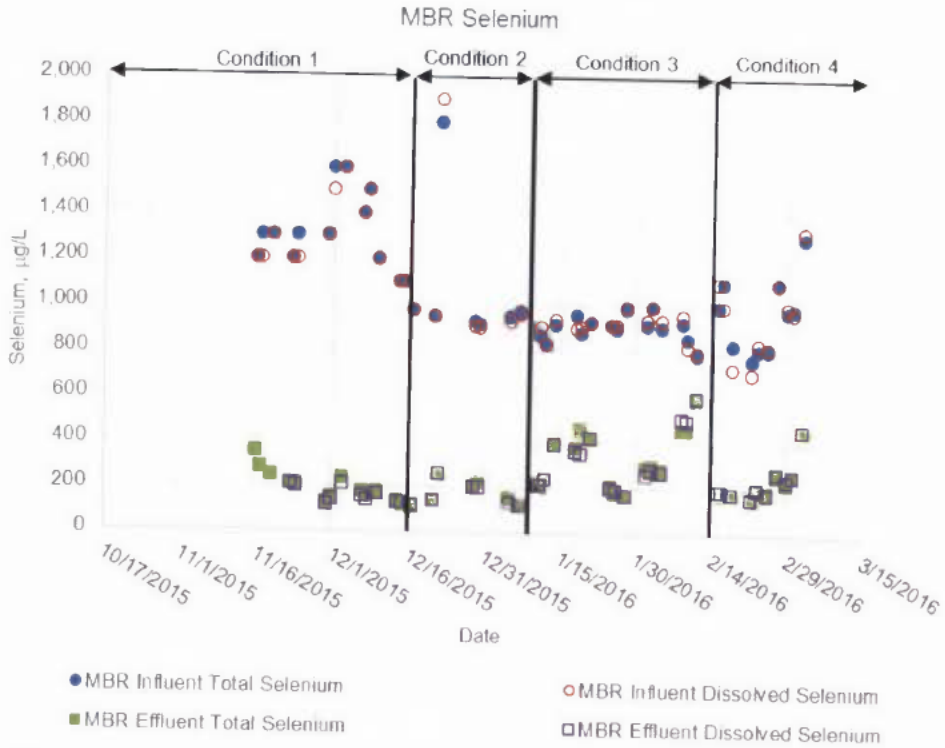

Figure 4-4
MBR influent and effluent selenium

On January 11, 2016, the MBR flow rate was increased from 1 GPM to 1.6 GPM. Prior to making this change, the MBR effluent was sampled and the selenium result was higher than previous results (220 µg/L vs. 120 µg/L from January 7). Acetic acid (nutrient) feed was increased proportionally with the feed rate and no changes in ORP were observed; there were no immediate indications as to why the effluent selenium concentrations began to increase.

Higher selenium concentration results continued until midway through Condition 3, when they decreased but again increased until the start of Condition 4. The increase in effluent selenium at the beginning of Condition 3 is not likely to be caused solely by the increased flow rate since the change occurred after the initial sample was taken that provided the indication. Selenium concentration results from the ABMet 1 and 2 reactor effluents were also higher that day (with no changes observed in either ORP or pH); again, emphasizing the increased flow rate was not the sole contributor.

Mercury

As seen in Figure 4-5, significant mercury reduction also occurred in the pretreatment MBR. The average influent total mercury concentration to the pretreatment MBR was approximately 72 ng/L, and the average effluent was 3 ng/L. The pretreatment MBR stage achieved approximately 96 percent reduction of mercury throughout the pilot study. This is likely due to mercury entering the MBR in mostly particulate form (see Table 4-1), the particulate mercury being removed by the ultrafiltration membrane, and potentially due to some of the soluble mercury precipitating to a particulate with sulfide generated under low ORP in the anoxic zone #3.

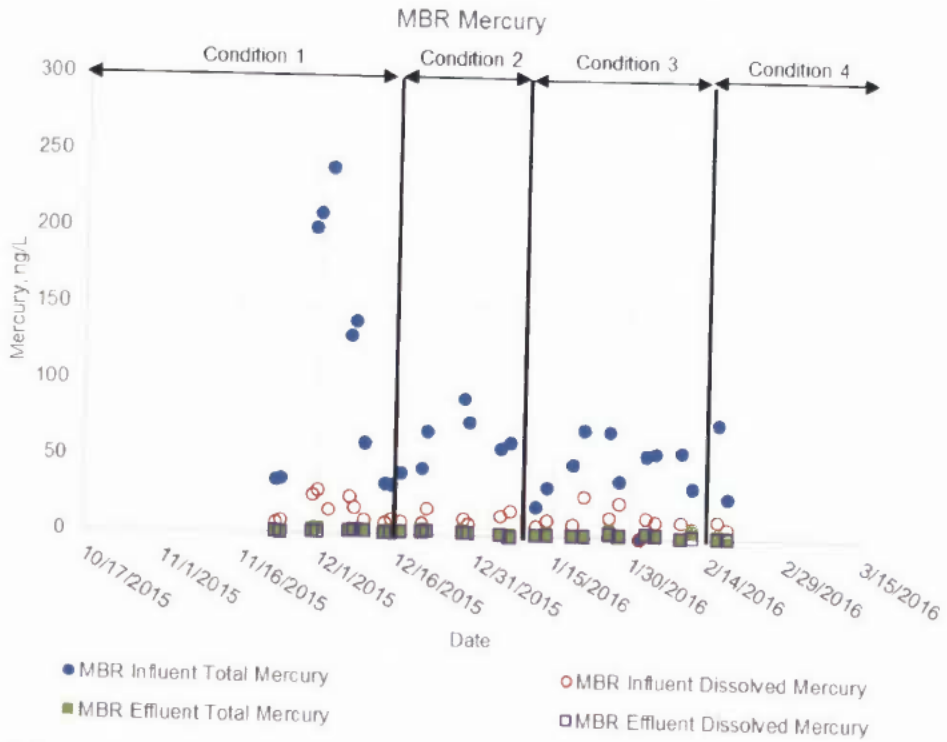

Figure 4-5
MBR influent and effluent mercury

Arsenic

Several weeks' worth of arsenic data were collected, which indicated no removal of arsenic in the pretreatment MBR. Average influent and effluent concentrations were both approximately 4.6 µg/L. This is indicative of the arsenic entering the MBR in mostly dissolved form, and not precipitating to a particulate form in the MBR (see Table 4-1).

ABMet

Operating Parameters

ABMet operational parameters are discussed in this section. The MBR effluent (permeate) was collected in the ABMet feed tank. From the feed tank, the water was pumped to the ABMet Stage 1. Table 4-4 compares the ABMet operational parameters at the four test conditions.

Table 4-4
ABMet Operational Parameters

Condition Description	Startup and Acclimation	Initial Operation	Increased Flow/ Reduced HRT	Process Adjustments
Condition Number	**1**	**2**	**3**	**4**
Parameter/Dates	**10/26/15 to 12/16/15**	**12/17/15 to 1/10/16**	**1/11/16 to 2/13/16**	**2/14/16 to 3/3/16**
ABMet Stage 1 Flow Average	0.5 GPM	0.6 GPM	0.9 GPM	0.9 GPM
ABMet Stage 1 EBCT	11.2 hours	9.4 hours	6.2 hours	6.2 hours
ABMet Stage 2 Flow Average	0.5 GPM	0.6 GPM	0.9 GPM	0.9 GPM
ABMet Stage 2 EBCT	11.2 hours	9.4 hours	6.2 hours	6.2 hours
ABMet Influent ORP				
Average	183 mV	91 mV	94 mV	368 mV
Range	110 to 263 mV	52 to 151 mV	34 to 224 mV	261 to 454 mV
ABMet Effluent ORP[1]				
Average	-125 mV	-184 mV	-365 mV	-350 mV
Range	-500 to 106 mV	-364 to 295 mV	-419 to -310 mV	-412 to -318 mV
Backwash Flow Rate	80 GPM	80 GPM	80 GPM	80 GPM
Degas Flow Rates	100 GPM	100 GPM	100 GPM	100 GPM
Feed Tank HRT	4 hours	4 hours	4 hours	4 hours
Chemical Doses				
Antiscalant, MDC776 (MBR Permeate to ABMet Feed Tank)	none	5 mg/L	5 mg/L	5 mg/L

[1] ORP data varied significantly, including positive values, potentially due to analytical error with the inline probes.
EBCT = empty bed contact time, calculated as total boundary volume occupied by the GAC media divided by the flow rate passing through the vessel

The average flow rate to the ABMet system during Condition 1 was 0.5 GPM, which corresponds to a total empty bed contact time (EBCT) of approximately 22.4 hours (11.2 hours for each stage). During Condition 2, the average flow rate increased to 0.6 GPM (due to mechanical issues, not intentionally increased), which corresponds to a total EBCT of approximately 18.8 hours. During Conditions 3 and 4, an intentional increase in flow rate to 0.9 GPM occurred. This corresponds to an average total EBCT of 12.4 hours. The project originally intended to increase flow rates to achieve EBCT closer to GE's target design of approximately 4 hours per reactor (8 hours total).

The average ORP in the ABMet effluent during each condition ranged from -125 to -365 mV, with the lowest average values of -365 and -350 mV occurring during Conditions 3 and 4, respectively. These correspond to increased acetic acid dosing during Conditions 3 and 4 and were within GE's target range of -250 to -400mV. The average ORP values during Conditions 1 and 2 may be artificially elevated due to several reported positive values that may have resulted from analytical error and/or issues with the inline measurement probes. A plot of inline ORP data from the MBR permeate (ABMet feed), ABMet stage 1 effluent, and ABMet stage 2 effluent are presented in Figure 4-6. Spikes in ORP from the ABMet locations are primarily associated with backwash and degas events. The ABMet system was taken offline from December 24 through 28 due to high TMP in the MBR system which required a cleaning. Both stages returned to <0 mV approximately one day after startup.

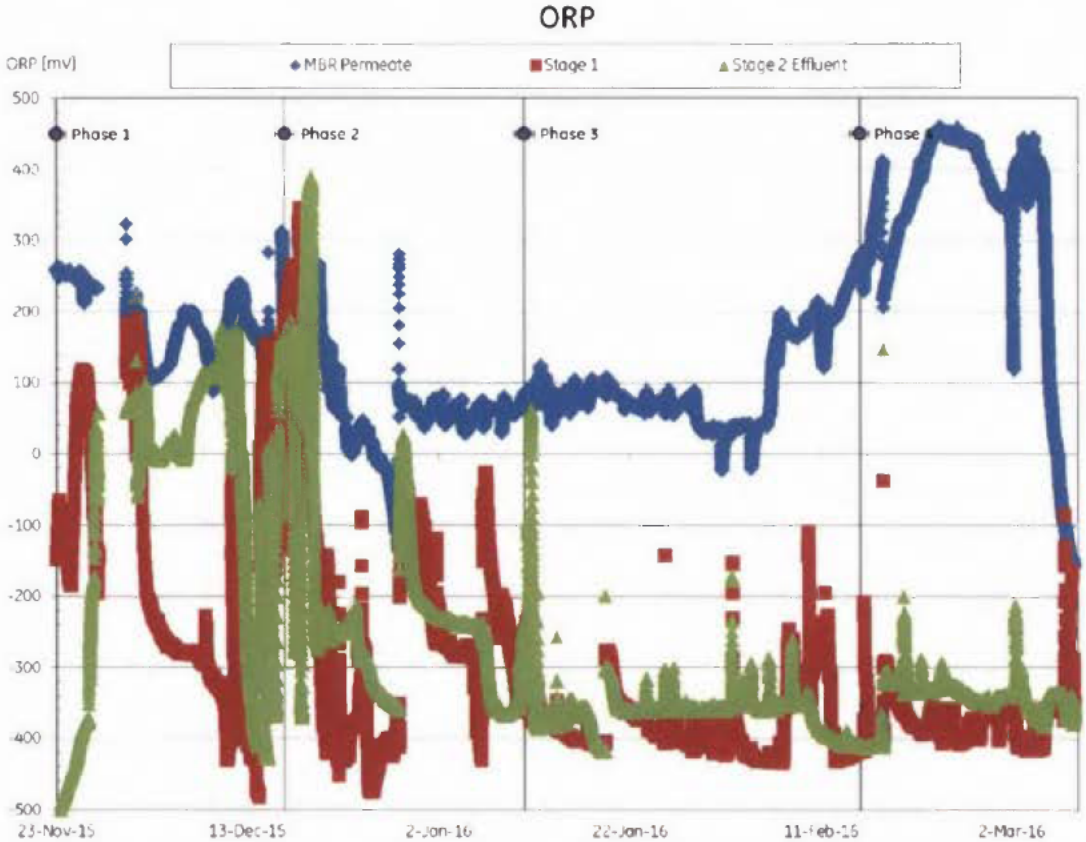

Figure 4-6
ABMet inline ORP trends
Courtesy of GE Water & Process Technologies

Four different nutrients were trialed for the ABMet pilot system. The initial nutrient was a blend of acetic acid, ammonium, and phosphorus (the same blend used initially for the MBR pilot). Due to formation of excess solids on the top of each ABMet reactor, a second nutrient containing 80% acetic acid (20% water) replaced the blended product. Three inches of carbon-containing excess solids were removed from each reactor. The third was a diluted blend of the first blended

product, made up of 50% pure acetic acid and 50% blended product. During the final phase of operation, molasses was added to the nutrient mix of pure acetic acid and blended product. A summary of the nutrient dosages and resulting COD concentration ranges are provided in Table 4-5.

Table 4-5
ABMet Nutrient Dosages

Condition Description	Startup and Acclimation	Initial Operation	Increased Flow/ Reduced HRT	Process Adjustments
Condition Number	**1**	**2**	**3**	**4**
Parameter/Dates	**10/26/15 to 12/16/15**	**12/17/15 to 1/10/16**	**1/11/16 to 2/13/16**	**2/14/16 to 3/3/16**
Nutrient	Blended acetic acid product containing acetic acid, ammonium, and phosphorus		50/50 mix of pure acetic acid (80%) and blended product	Molasses and 50/50 mix of pure acetic acid and blended product
Acetic Acid (COD) - ABMet Stage 1				
Average	28 mg/L	100 mg/L	76 mg/L	112 mg/L
Range	28 mg/L	87 to 175 mg/L	69 to 90 mg/L	90 to 134 mg/L
Acetic Acid (COD) - ABMet Stage 2				
Average	none	28 mg/L	37 mg/L	36 mg/L
Range	none	28 mg/L	28 to 70 mg/L	34 to 40 mg/L

The ABMet reactor head loss trends in Figure 4-7 provide indications of backwash and degas frequencies throughout the demonstration. Head loss is the water level above the media where a higher head loss is associated with an increased hydraulic resistance through the carbon media (and is indication of increased water level). For ABMet systems, increased head loss can indicate a need to backwash and/or degas the filters due to increased biomass and other solids or gases, respectively. Starting the week of January 11, 2016, degassing frequency was based on a schedule of once every Tuesday and Thursday (after water samples were taken). The length of each degassing event was originally set to 30 seconds, but was changed in mid-February to 90 seconds. According to GE, 90 seconds is more representative of full-scale systems.

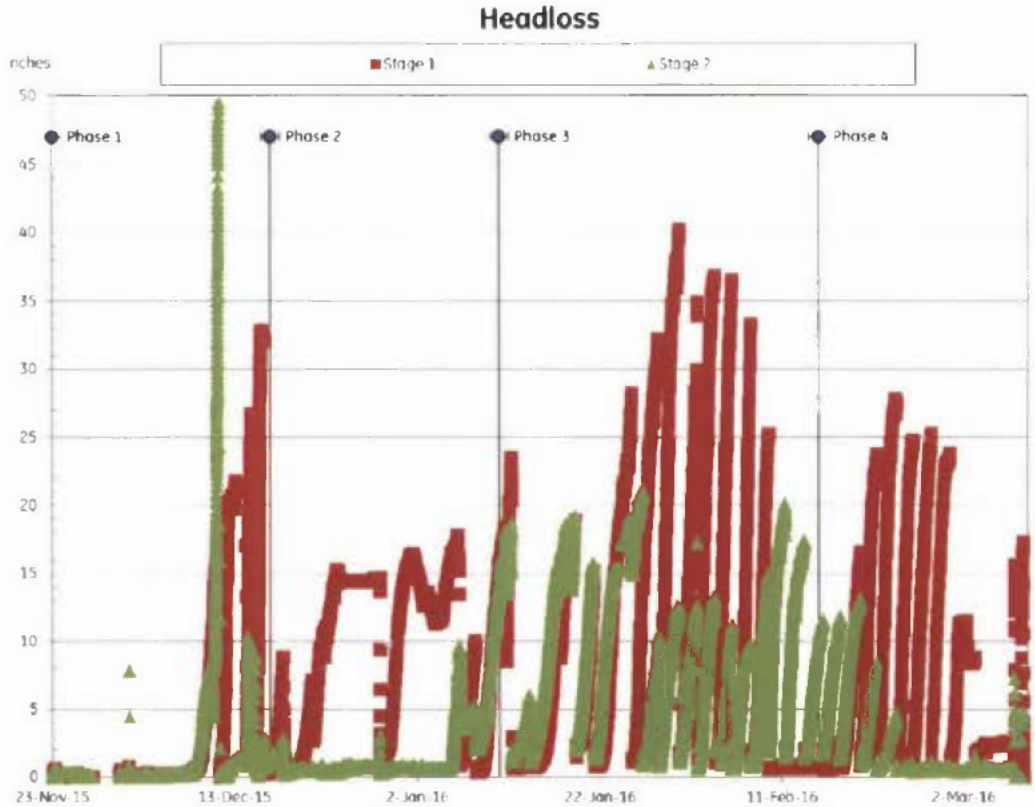

Figure 4-7
ABMet headloss trends
Courtesy of GE Water & Process Technologies

One backwash was completed for each ABMet stage during the demonstration. Stage 1 backwash occurred on January 25 and stage 2 occurred on January 26. Analytical results from samples taken at the Backwash Waste Tank after two backwash events are provided in Table 4-6. Note the selenium values are reported in mg/L as opposed to µg/L.

Table 4-6
ABMet Backwash Analysis

Sample Location and Date	Total selenium (mg/L)	Dissolved selenium (mg/L)	NO_2/NO_3 (mg-N/L)	Total Suspended Solids (mg/L)
ABMet Stage 1 1/25/2016	78	57	0.060	8.0[1]
ABMet Stage 2 1/26/2016	53	51	<0.045	7.5[1]

[1]According to GE, solids in backwash were lower than expected, which may be due to sampling error.

Treated Water Characteristics

This section discusses the characteristics of the ABMet pilot effluent. Table 4-7 summarizes the effluent water quality based on samples collected during each operating condition. Figures 4-8, 4-9, 4-10, 4-11, 4-12, and 4-13 present ABMet influent and effluent COD and phosphorus; ammonia and TKN; nitrate/nitrite nitrogen; selenium; mercury; and arsenic, respectively.

Table 4-7
ABMet Stage 2 Effluent Water Quality[1]

Parameter	Units	Condition 1			Condition 2			Condition 3			Condition 4		
		Min	Max	Avg.	Min	Max	Avg.	Min	Max	Avg.	Min	Max	Avg.
Total Selenium	µg/L	7	110	36	3	6	5	15	62	36	14	39	21
Dissolved Selenium	µg/L	5	76	27	3	7	5	15	56	37	11	26	17
Se(IV)[2]	µg/L	--	--	--	--	--	--	0.29	51.8	13	0.8	4.6	3.8
Se(VI)[2]	µg/L	--	--	--	--	--	--	<0.25	11.5	5.7	<0.25	<0.25	<0.25
MeSe[2]	µg/L	--	--	--	--	--	--	<0.25	1.3	0.9	<0.25	<0.25	<0.25
SeCN[2]	µg/L	--	--	--	--	--	--	0.52	69.7[3]	18	2.1	10.8	7.2
NO_2/NO_3-N	mg/L	<0.045	0.14	0.06	<0.045	0.13	0.081	<0.045	0.060	0.036	<0.045	0.081	0.046
Total Mercury	ng/L	0.50	4.57	1.45	0.41	2.25	1.21	0.37	1.20	0.84	0.53	1.16	0.85
Dissolved Mercury	ng/L	<0.31	3.16	0.73	0.23	0.59	0.42	0.45	1.20	0.76	0.68	0.90	0.79
Total Arsenic	µg/L	1.1	4.0	2.0	<0.36	1.8	0.9	<0.36	0.76	0.54	0.82	0.82	0.82
Dissolved Arsenic	µg/L	1.2	3.6	2.0	<0.36	2.0	0.9	0.38	0.76	0.61	0.82	0.82	0.82
Total Calcium	mg/L	430	580	477	410	500	451	430	480	452	460	500	480
Dissolved Calcium	mg/L	420	590	477	400	520	460	440	470	455	460	500	480
Total Magnesium	mg/L	1,900	2,400	2,150	1,600	1,900	1,743	1,800	2,100	1,950	1,900	2,100	2,000
Dissolved Magnesium	mg/L	1,900	2,400	2,140	1,600	2,000	1,786	1,800	2,100	1,950	1,900	2,100	2,000
Ammonia	mg/L	11	86	49	5	6	5	0.3	22	6.4	0.47	98	31

Table 4-7 (continued)
ABMet Stage 2 Effluent Water Quality[1]

Parameter	Units	Condition 1			Condition 2			Condition 3			Condition 4		
		Min	Max	Avg.	Min	Max	Avg.	Min	Max	Avg.	Min	Max	Avg.
Conductivity	µS/cm	14,000	16,000	14,500	11,000	14,000	12,250	11,000	13,000	12,500	12,000	14,000	12,400
COD	mg/L	290	1,600	674	150	540	383	260	370	335	340	600	427
BOD	mg/L	--	--	--	54	54	54	4.6	46	22.3	26	74	49
TOC	mg/L	--	--	--	19	19	19	2.0	12	8.3	0.73	0.93	0.86
Chloride	mg/L	--	--	--	2,700	2,700	2,700	2,600	3,300	2,940	2,700	2,900	2,800
Fluoride	mg/L	16	24	21	23	24	24	23	25	24	26	28	26
Sulfate	mg/L	--	--	--	6,500	7,000	6,750	6,300	8,300	6,860	5,600	8,200	6,817
Total Phosphorus	mg/L	0.59	3.5	2.2	2	2	2	1.3	5.4	4.1	0.75	7.90	5.36
TKN	mg/L	53	150	72	48	83	62	45	69	56	45	72	58
Sulfide	mg/L	<0.22	<0.22	<0.22	<0.22	<0.22	<0.22	<0.22	30	18	25	58	36
TSS	mg/L	12	44	28	11	18	13	4.0	8.0	6.1	3.0	21	8.3
TDS	mg/L	15,000	18,000	16,750	4,900	19,000	12,725	13,000	16,000	14,800	14,000	17,000	15,200
Total Alkalinity	mg/L	--	--	--	79	160	120	130	200	167	190	420	300
Bicarbonate Alkalinity	mg/L	--	--	--	79	160	120	130	200	167	190	420	300
Carbonate Alkalinity	mg/L	--	--	--	<3.9	<3.9	<3.0	<3.9	<3.9	<3.9	<3.9	<3.9	<3.9

[1] Average soluble concentrations were higher than total for some results, due to analytical imprecision
[2] Analyzed at Brooks Applied Labs: Se(IV) – selenite; Se(VI) – selenate; MeSe – selenomethionine; SeCN – selenocyanate
[3] SeCN concentration max value during Condition 3 appears to be biased high when compared to total and dissolved selenium maximum concentrations

Figure 4-8 shows that there was little removal of influent COD by the ABMet as the ABMet influent and effluent COD concentrations were similar; this trend was also observed in the pretreatment MBR system. The data again suggest that the influent COD was contributed by analytical interference or some other oxygen-demanding constituent, as opposed to organic carbon. The average ABMet influent and effluent COD concentrations for all conditions together were approximately 482 and 465 mg/L, respectively, during the pilot test.

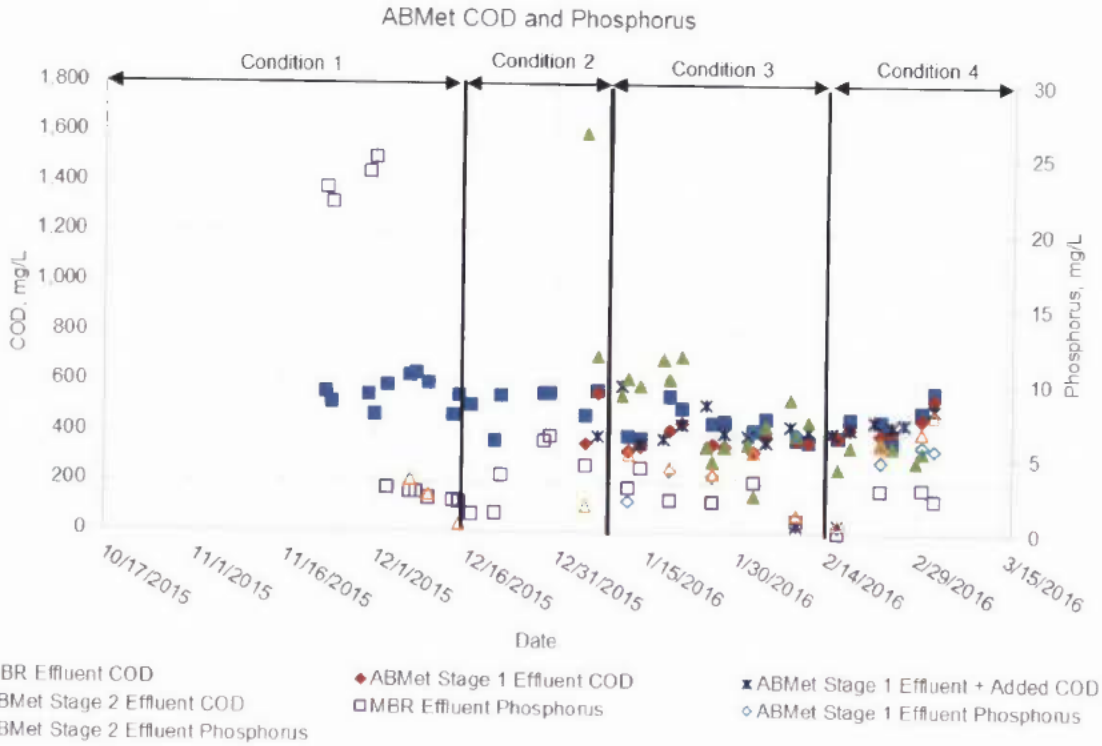

Figure 4-8
ABMet influent and effluent COD and phosphorus

A slight increase in phosphorus concentration in the ABMet can be seen at times in Figure 4-8 (presented on the secondary y-axis). This was due to the fact that the nutrient blended acetic acid (containing phosphorus) was used as a carbon source for the ABMet throughout the pilot study. Optimization of effluent phosphorus concentration was not an objective of this study. The phosphorus concentration could be reduced by separating the carbon source from the phosphorus source.

Nitrate/Nitrite

As seen in Figure 4-9, TKN and ammonia were not significantly impacted in the ABMet. The presence of nitrate/nitrite nitrogen in the ABMet influent only occurred during Condition 1 (when the acetic acid was being added to the wrong zone in the pretreatment MBR) and for a few weeks during Condition 3 (when nitrate/nitrite nitrogen was intentionally being maintained in the MBR effluent to provide the ABMet with electron donors) (Figure 4-10).

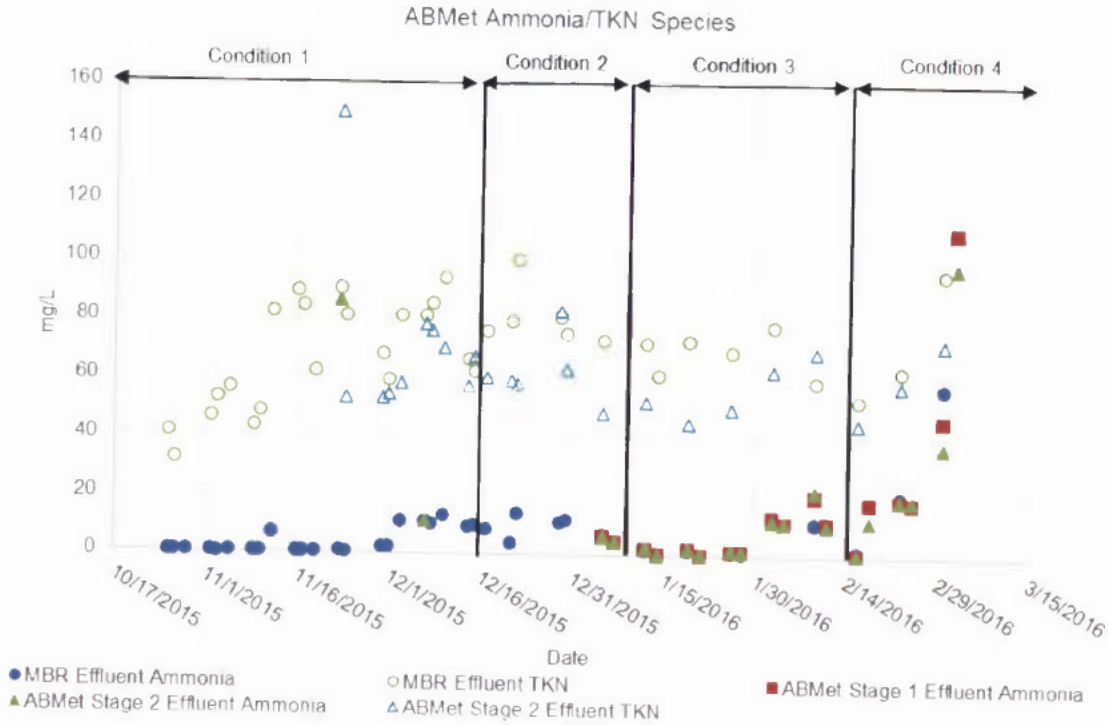

Figure 4-9
ABMet influent and effluent ammonia and TKN

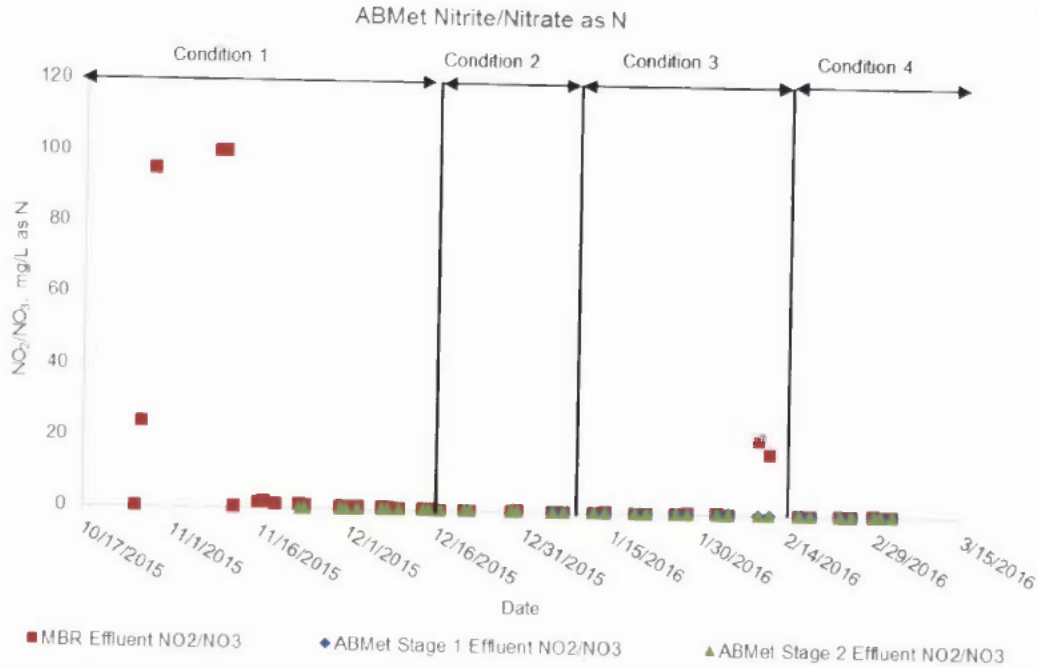

Figure 4-10
ABMet influent and effluent nitrate/nitrite as nitrogen

Selenium

Selenium removal in the ABMet varied throughout the pilot study, as seen in Figure 4-11.

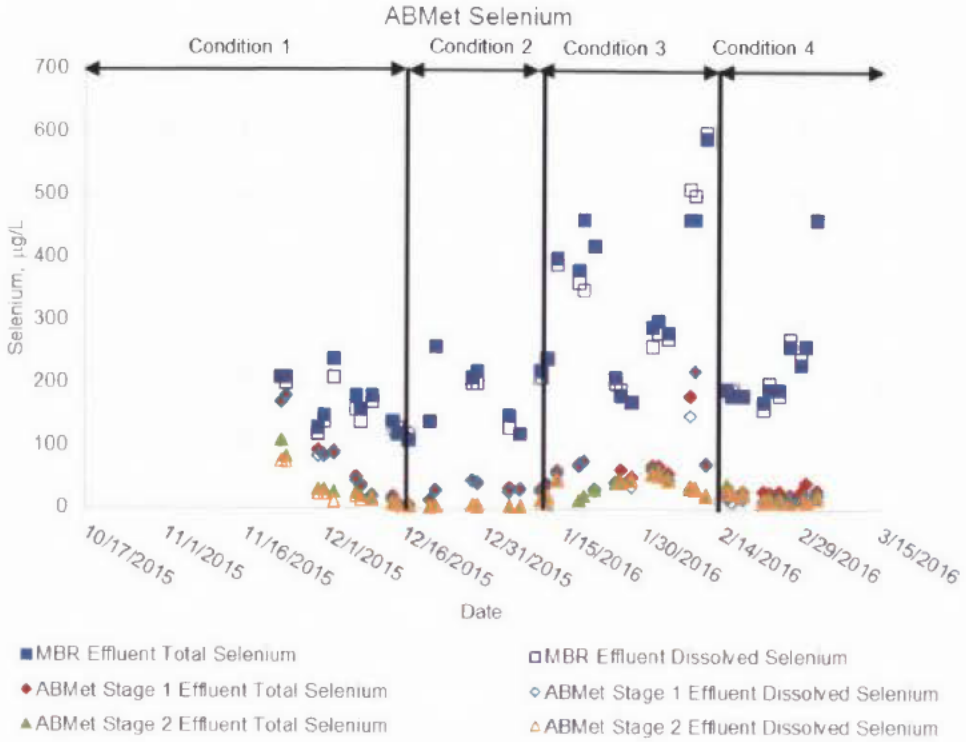

Figure 4-11
ABMet influent and effluent selenium

During Condition 1, improved performance is observed as the system is acclimating and the bacteria are being established. The best performance occurred during Condition 2, when the influent average total selenium concentration to Stage 1 was 173 µg/L and the effluent average total selenium concentration from Stage 2 was 5 µg/L. This is the only condition where the target effluent total selenium goal of 6 µg/L (half of the ELG limit due to 1:1 dilution) was achieved.

Selenium reduction during Condition 3 declined as the average ABMet effluent total selenium concentration increased from 6 to 36 µg/L. From Table 4-7, it can be seen that the predominant selenium species in the ABMet effluent during Condition 3 were selenite and selenocyanate. Unfortunately, selenium speciation data were not available in the MBR effluent. As described in the section on the MBR operating performance, the initial increase in effluent selenium from the ABMet coincided with flow rate increases (HRT and EBCT decreases) in the MBR and ABMet systems. However, the samples with the resulting higher selenium concentrations were taken prior to changing the flow rates that same day. On January 7, total selenium in the final ABMet effluent was 5.0 µg/L while on January 11, the same day flow rates were increased, total selenium was 15 µg/L. Given the strong performance of both systems leading up to this time, there were no indications that increasing the flow rate would have dramatic impacts on performance. Had the selenium result from January 11 been available, the project team may have decided to forgo increasing flow rates until the underlying issue(s) could be addressed.

Complicating the matter even further, results for total selenium from the ABMet effluent (stage two reactor effluent) from January 18, 19, and 21 failed We Energies' lab QA/QC checks. In these samples, the matrix spike recovery values were on the low end of the acceptable range, indicating the presence of analytical interferences. All matrix spike recoveries up to this point had been within the method control limits and the lab did not change anything in the sample preparation or analysis protocol. These were the first sets of results that failed matrix spike QC and We Energies' lab staff performed various tests in attempt to provide accurate analyses. On January 18, the We Energies lab staff who collected the samples noted a strong sulfide odor that had not been present in prior samples. The same odor was present in this sample for the duration of the test. This issue resulted in total selenium values being reported much lower than values later determined to be actual. Total selenium concentration results from these dates were originally reported as 13 µg/L, 11 µg/L, and 8.2 µg/L vs. 15 µg/L, 22 µg/L, and 31 µg/L reported after oxidizing the samples in the sample bottles using hydrogen peroxide. At the time, these lower values falsely indicated the ABMet had recovered from the unconfirmed upset and was tracking back to total selenium concentration of 6 µg/L or less. The project team decided not to alter the current pilot conditions until the accuracy of analytical results improved. By the time the analytical interferences had been overcome, the pilot system had been outside of the performance targets for three weeks. Comparisons of reported vs. verified selenium concentrations are provided in Table 4-8 and additional information on We Energies' evaluations is presented in Appendix B.

Table 4-8
Comparison of ABMet Effluent Selenium Concentrations During Period of Matrix Spike Recovery Failures

Sample Date	Total selenium initially reported (µg/L)	Dissolved selenium initially reported (µg/L)	Total selenium reported after improving matrix spike recovery (µg/L)	Dissolved selenium reported after improving matrix spike recovery (µg/L)
1/18/2016	13	12	15	Not measured
1/19/2016	11	10	22	
1/21/2016	8.2	7.7	31	

The sulfide odor that became present in samples taken after January 18 correspond to higher sulfide concentrations in the ABMet effluent (see Figure 4-12). The presence of sulfide is expected as bacteria naturally reduce sulfate to hydrogen sulfide gas. The decline in selenium reduction performance suggests that sulfate-reducing bacteria were present and may have become too predominant in the 2nd stage reactor.

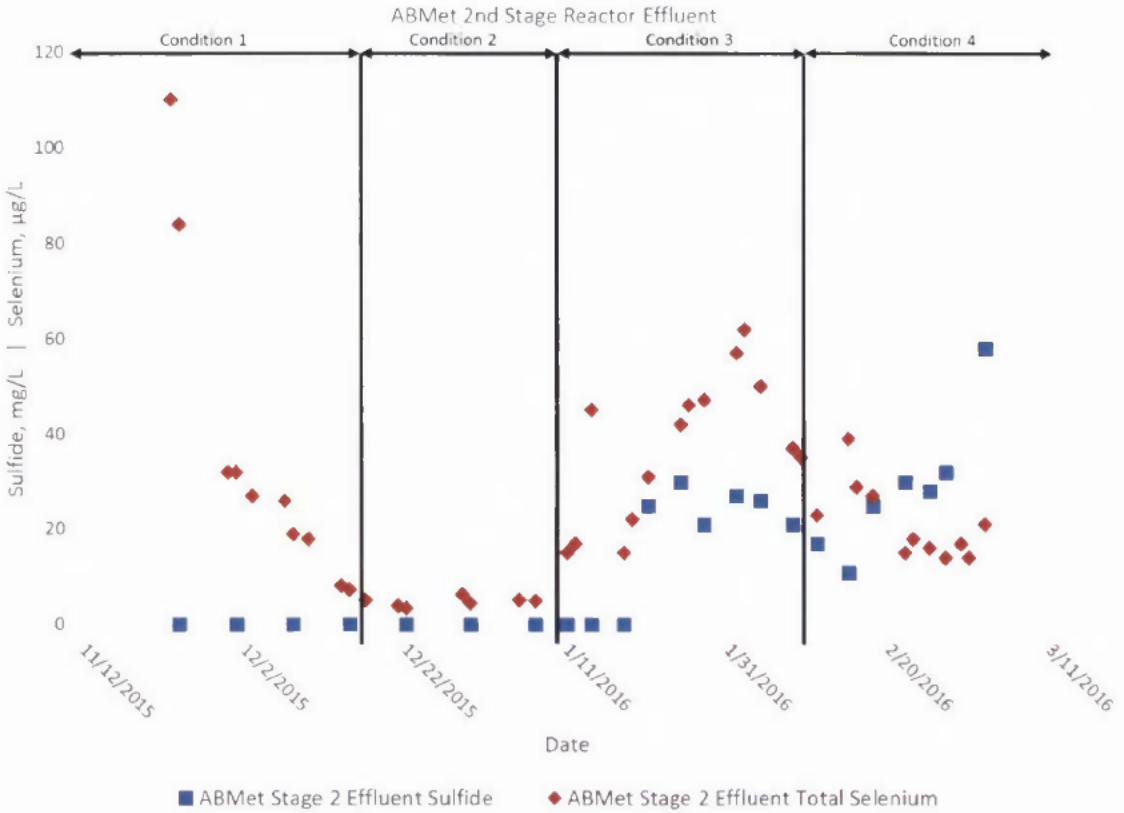

Figure 4-12
ABMet effluent sulfide and selenium

During Condition 3, several activities were done in attempt to improve performance in the ABMet. Reducing the ABMet flow rate was not implemented because the flow rate change was not believed to be a major contributing factor to the loss of selenium reduction performance.

The following actions were taken to improve ABMet performance.

- Potassium sulfite had been added to the Equalization Tank in an attempt to target oxidants potentially impacting the MBR nitrifying bacteria. Reducing oxidants was expected to also improve ABMet bacteria performance.
- 20 kilograms of PAC were added to the MBR in an attempt to adsorb any potential inhibitor compounds. Again, this was already part of the MBR plan in case the potassium sulfite addition not improved nitrification in the MBR.
- Nitrate was allowed to pass through the MBR to the ABMet, by reducing the acetic acid feed to the MBR, to provide more electron acceptors.

While performance did improve slightly in Condition 4 (where the average ABMet effluent total selenium decreased from 36 µg/L to 21 µg/L), the performance observed during Condition 2 and achievement of the effluent total selenium goal of 6 µg/L were not attained during Condition 4. Given the number of variables that may have impacted performance in the ABMet that occurred relatively close together, it is difficult to definitively say why performance decreased, as it may have been any one of, or a combination of, the variables and the trial concluded before complete recovery of performance occurred. Total and dissolved selenium concentration values from the ABMet stage 1 and stage 2 reactors are provided in Figure 4-13.

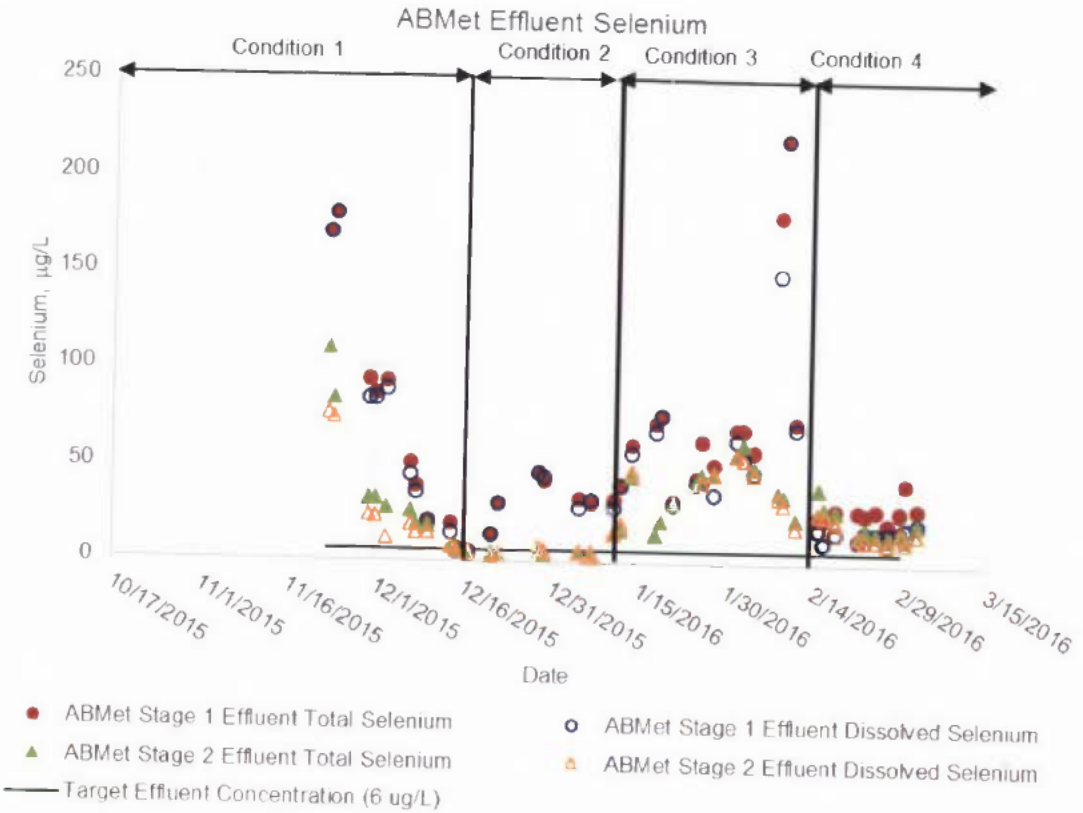

Figure 4-13
ABMet effluent selenium

As noted in discussion of Figure 4-1 (graph of MBR influent and effluent COD and phosphorus), influent and effluent COD concentrations were similar, suggesting that the influent COD was non-biodegradable. Jar tests with Fenton reagent were conducted on site to preliminarily investigate the feasibility of Advanced Oxidation Processes (AOPs) to partially oxidize these non-biodegradable organics in wastewater [2]. However, the jar tests were inconclusive due to high levels of inorganic scavengers, such as nitrate, sulfate, and chloride, and the limited time available. Simple onsite analytical tests were performed for COD, NO_3-N, NH_4-N, and pH on samples that had AOP (Fenton process) reactions as well as control samples. The results of this testing did not show any clear trends, and were likely not very accurate as they were performed using field test methods and were not performed in a controlled lab environment.

Mercury

Further reduction of mercury was observed in the ABMet data and can be seen in Figure 4-14. Mercury was reduced from an average of 2.5 ng/L in the MBR effluent to 1.1 ng/L in the ABMet effluent. These averages are consistent with performance over the entire length of the demonstration. The influent to the pilot system was compliant with the effluent mercury goal of 178 ng/L (half of the monthly ELG limit due to 1:1 dilution).

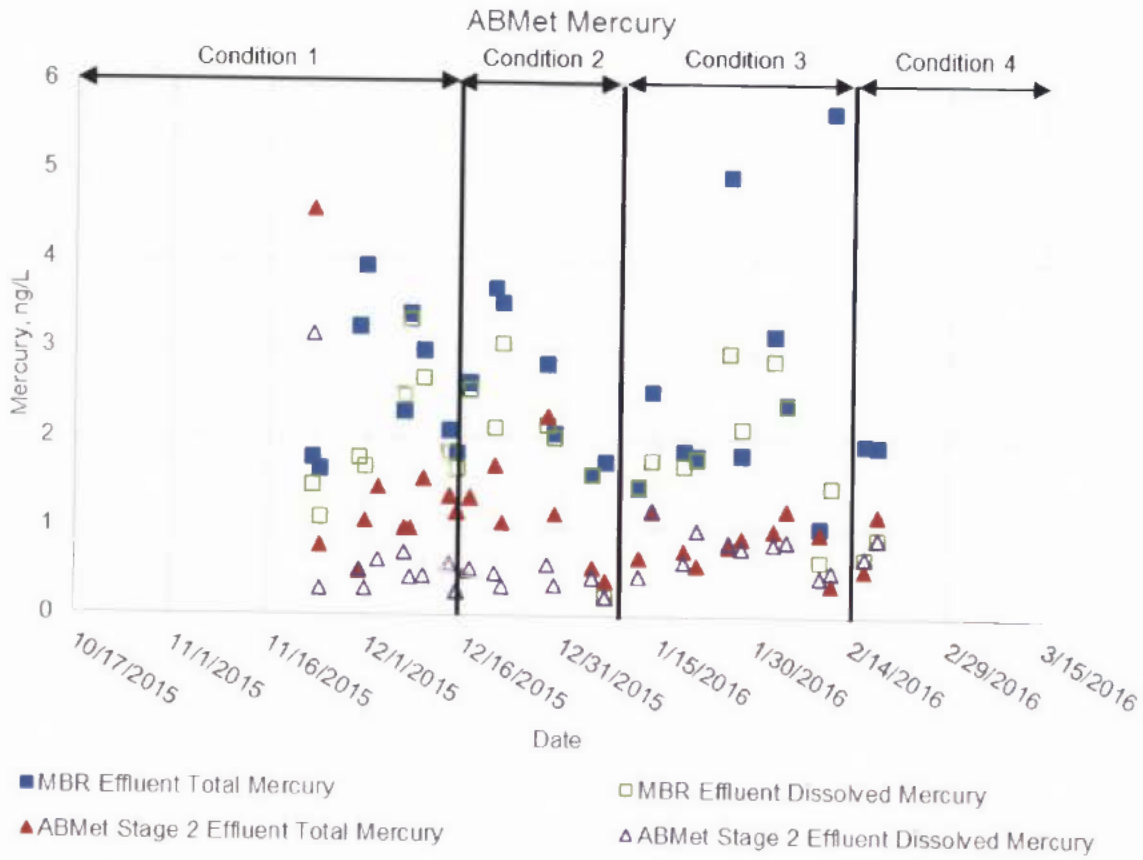

Figure 4-14
ABMet influent and effluent mercury

Arsenic

As described above, arsenic was not removed in the MBR; however, as seen in Figure 4-15, removal of arsenic in the ABMet did occur. The average ABMet influent arsenic concentration was 4.6 µg/L, and the average effluent over the entire demonstration was 1.4 µg/L, which is an average reduction of approximately 70 percent. During Conditions 3 and 4, the average total arsenic in the effluent was 0.67 µg/L (despite the loss of performance in selenium reduction during this time). This is significant given the effluent arsenic goal of 4 µg/L due to the dilution with service water.

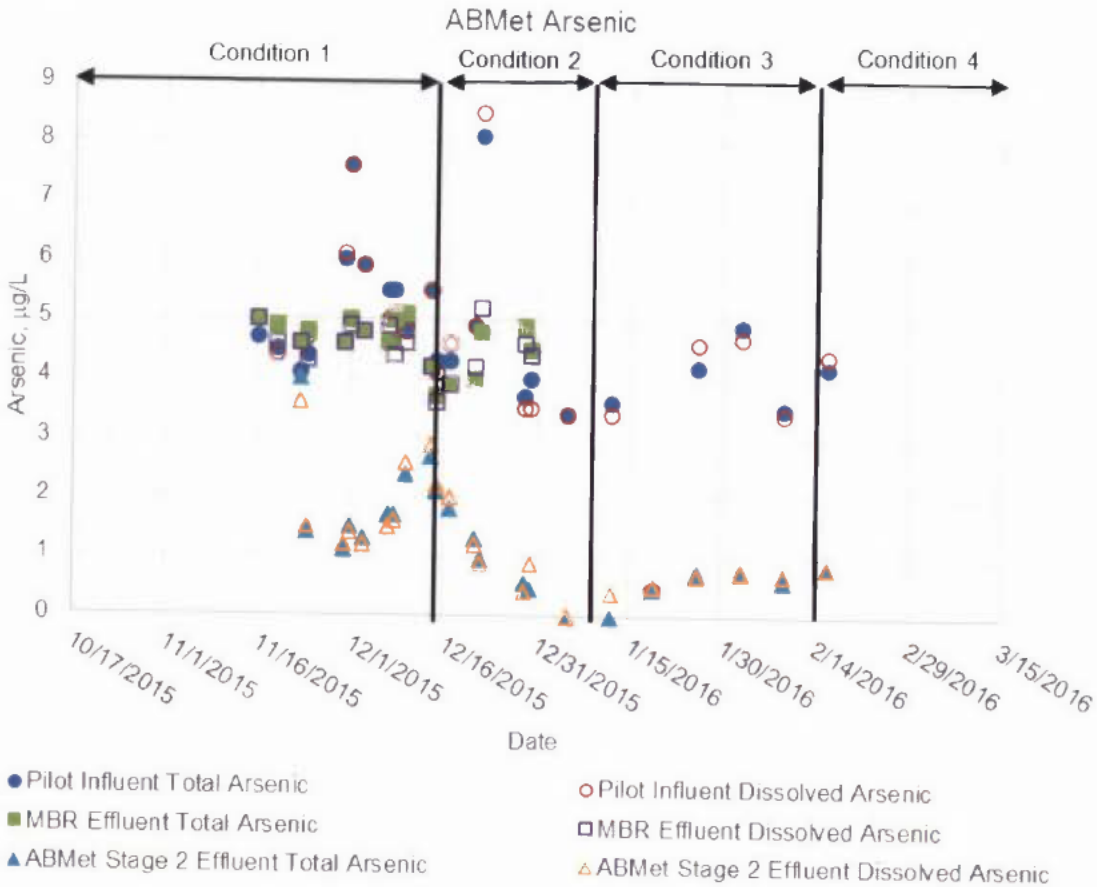

Figure 4-15
ABMet influent and effluent arsenic

5
SUMMARY AND CONCLUSIONS

Pilot Summary

A pilot demonstration of the GE MBR and ABMet processes ran from October 26, 2015 to March 3, 2016 (19 weeks). Results from the demonstration are described under four conditions that summarize performance changes observed. These conditions are summarized below.

- Condition 1 – Startup and Acclimation (October 26, 2015 to December 16, 2015) – period where bacteria are growing and becoming established in the treatment system.
- Condition 2 – Initial Operation (December 17, 2015 to January 10, 2016) – operational period defined by GE's original test plan.
- Condition 3 – Increased Flow/Reduced HRT (January 11, 2016 to February 13, 2016) – operational period intended to more closely simulate full-scale HRT/EBCT conditions.
- Condition 4 – Process Adjustments (February 14, 2016 to March 3, 2016) – period where GE responded to decreased selenium removal performance of the ABMet.

Other than one complete system shutdown from December 24 through December 28 to perform a recovery cleaning on the MBR membranes, the system ran consistently through the duration of the demonstration.

The full-scale FGD wastewater treatment process at P4 has an average operating flow rate of 40 GPM and is typically operated five days per week to allow for equipment cleanings (scale removal from the secondary clarifier plates) on the weekends. The two P4 boilers burn Powder River Basin coal which allows their FGD systems to reach high cycles of concentration and therefore generates wastewater with high TDS and significant scaling potential. The FGD wastewater treatment process consists of a chemical precipitation system that includes hydrated lime addition; primary clarification; organosulfide, ferric chloride, and flocculation polymer addition; and secondary clarification. Two effluent discharge tanks after the secondary clarifier hold approximately 10,000 gallons each. The pilot system in this demonstration received water from the discharge tanks which was blended with plant service water (untreated water from Lake Michigan) in a small equalization tank prior to the MBR process.

GE Water & Process Technologies supplied and operated the ZeeWeed 500D MBR and ABMet pilot systems. We Energies maintained operation of the physical/chemical treatment system. After initial evaluations of the FGD wastewater, GE determined that blending with service water (50/50 by volume) was required to minimize the impacts of scaling and TDS on the pilot systems and bacteria performance. Removing scale-forming compounds (calcium, magnesium, and sulfate) with chemical softening would have required an impractical amount of chemicals (approximately 1,300 lbs./day) and produced high quantities of sludge (approximately 2,000 lbs./day).

The MBR process consisted of pre-anoxic, aerobic, and post-anoxic zones (to target denitrification [in the anoxic zones] and nitrification [in the aerobic zone]) and the ZeeWeed 500 membrane unit to filter biomass and other solids prior to the ABMet pilot. Permeate from the MBR was treated by two ABMet reactors in series.

The MBR pilot was operated at 1 GPM (combined HRT of 35 hours) during Conditions 1 and 2 and at 1.6 GPM during Conditions 3 and 4 (combined HRT of 23 hours). The increase in flow rate was intentionally made by the project team to simulate full-scale conditions. Due to ABMet performance issues, the full-scale conditions for MBR HRT were not implemented. The MBR pilot ran consistently with only one shut down early in the demonstration for a membrane recovery cleaning. Following this cleaning, citric acid maintenance cleans were conducted every other day.

Acetic acid products were used to supply nutrients (in the form of COD, ammonium, and phosphorus) to the MBR pilot. During Condition 1, a blended acetic acid product containing ammonium and phosphorus was used but resulted in excess solids scale formation. To mitigate this issue in Conditions 2 through 4, an 80% acetic acid (20% water) product was used in conjunction with a separate phosphoric acid product.

The ABMet pilot was operated at 0.5 GPM (combined EBCT of 22.4 hours) during Condition 1, 0.6 GPM (combined EBCT of 18.8 hours) during Condition 2, and 0.9 GPM (combined EBCT of 12.4 hours) during Conditions 3 and 4. The increase in flow rate during Condition 2 was not intentional, but the increase in Conditions 3 and 4 were made by the project team in order to more closely simulate GE's commercial EBCT target of 4 to 4.5 hours per reactor (8 to 9 hours total). Due to ABMet performance issues, the full-scale conditions for ABMet EBCT were not implemented. Each stage of the ABMet pilot underwent only one backwash during the demonstration. Starting in Condition 3, degassing was conducted twice per week.

As with the MBR process, acetic acid products were used to supply COD and nutrients to the ABMet reactors. For Conditions 1 and 2, the blended acetic acid product was used. A 50/50 mix of blended product and pure (80%) acetic acid product was used in Condition 3. Molasses was added to this mix in Condition 4.

A summary of pilot influent, MBR effluent, and ABMet effluent water qualities for Conditions 2, 3, and 4 is provided in Table 5-1. The pilot evaluation failed to demonstrate that the ABMet system (with the feed water diluted by 50% and supplemented with the MBR ZeeWeed system) can meet the ELG limits on this water source. Limited information are available to explain the exact issue(s) related to the loss of selenium reduction performance and several variables were identified during the demonstration which may have impacted selenium removal performance.

Table 5-1
Summary of pilot results

Parameter	Units	Pilot Influent			MBR Effluent			ABMet Effluent			Pilot Objectives	
		Min	Max	Avg.	Min	Max	Avg.	Min	Max	Avg.	ELG monthly avg. limit	Target based on 100% dilution
Condition 2												
Total Selenium	µg/L	920	1800	1071	110	260	173	3	6	5	12	6
Dissolved Selenium	µg/L	900	1900	1071	120	260	167	3	7	5	-	-
NO_2/NO_3-N	mg/L	70	160	95	0.12	0.24	0.15	<0.045	0.13	0.081	4.4	2.2
Total Mercury	ng/L	41	90	63	1.60	3.68	2.58	0.41	2.25	1.21	356	178
Dissolved Mercury	ng/L	8.1	18	12.2	0.23	3.06	1.96	0.23	0.59	0.42	-	-
Total Arsenic	µg/L	3.4	8.1	4.7	4	5	4	<0.36	1.8	0.9	8	4
Dissolved Arsenic	µg/L	3.4	8.1	4.7	4	5	4	<0.36	2.0	0.9	-	-
Condition 3												
Total Selenium	µg/L	790	1000	910	170	590	337	15	62	36	12	6
Dissolved Selenium	µg/L	800	1000	915	170	600	330	15	56	37	-	-
NO_2/NO_3-N	mg/L	78	88	83	0.13	21	4.0	<0.045	0.060	0.036	4.4	2.2
Total Mercury	ng/L	20	71	48	1.01	5.67	2.67	0.37	1.20	0.84	356	178
Dissolved Mercury	ng/L	7	27	13	0.64	2.97	1.92	0.45	1.20	0.76	-	-
Total Arsenic	µg/L	0.45	4.9	3.3	no data	no data	no data	<0.36	0.76	0.54	8	4
Dissolved Arsenic	µg/L	0.45	4.7	3.3	no data	no data	no data	0.38	0.76	0.61	-	-
Condition 4												
Total Selenium	µg/L	770	1100	932	170	460	231	14	39	21	12	6
Dissolved Selenium	µg/L	710	1100	919	160	460	233	11	26	17	-	-
NO_2/NO_3-N	mg/L	65	95	80	0.09	0.18	0.13	<0.045	0.081	0.046	4.4	2.2
Total Mercury	ng/L	27	76	52	1.93	1.94	1.94	0.53	1.16	0.85	356	178
Dissolved Mercury	ng/L	7.4	12	9.7	0.66	0.90	0.78	0.68	0.90	0.79	-	-
Total Arsenic	µg/L	no data	no data	no data	no data	no data	no data	0.82	0.82	0.82	8	4
Dissolved Arsenic	µg/L	no data	no data	no data	no data	no data	no data	0.82	0.82	0.82	-	-

MBR Conclusions

- The increased MBR effluent phosphorus concentration during Condition 1 was due to the higher-than-planned-for phosphorus content of the nutrient balanced acetic acid blend being added.
- Influent and effluent BOD and TOC concentrations were low, indicating that all of the acetic acid added was degraded and this suggests that the influent and effluent COD concentrations of approximately 600 mg/L may be caused by analytical interference or some other oxygen-demanding constituents as opposed to organic carbon.
- Complete denitrification (reduction of nitrate nitrogen to nitrogen gas) was achievable in the pretreatment MBR.
- Although nitrification was lost during Conditions 3 and 4, nitrate-nitrogen removal (denitrification) was never a problem in the MBR. For some unknown reason, more sensitive nitrifying bacteria were inhibited while the heterotrophic denitrifying bacteria were not inhibited.
- Selenium, present mainly in dissolved form, was significantly reduced by the pretreatment MBR (approximately 75 percent on average for the entire demonstration).
- Mercury, present mainly in particulate/insoluble form, was significantly reduced by the pretreatment MBR (approximately 96 percent on average for the entire demonstration).
- Arsenic, present mainly in dissolved form, was not removed in the pretreatment MBR.

ABMet Conclusions

- To EPRI's knowledge, this is the first pilot to attempt to treat FGD wastewater from a power plant burning 100% subbituminous coal.
- The pilot test did not consistently demonstrate that the MBR/ABMet combination of technologies adequately treats selenium to meet the 2015 ELGs limits.
- The flow rate to the ABMet was increased on January 11, 2016 from an average of 0.6 GPM to an average of 0.9 GPM. This resulted in the combined EBCT in the ABMet decreasing from 18.8 to 12.4 hours. GE's target of approximately 8 hours for full-scale applications was a goal for the pilot demonstration but was never achieved.
- The flow rate was also increased to the MBR on January 11, 2016 from 1 to 1.5 GPM, which decreased the anoxic HRT from 20 to 13 hours. After this flow rate change (during Condition 3), the average MBR effluent total selenium increased by a factor of 2, doubling the selenium load on the downstream ABMet. However, analytical results taken prior to the flow rate increase were already showing an increase in ABMet effluent selenium. This information was not yet available to the project team when the decision was made to increase flow rates.

- Another variable that may have impacted performance is the complete denitrification that was achieved in the pretreatment MBR. The low nitrate-N available to the ABMet may have resulted in the desired heterotrophic bacteria capable of reducing nitrate/nitrite and selenate/selenite being displaced by sulfate-reducing bacteria in the absence of nitrate-nitrogen as electron acceptor (ABMet average effluent sulfide increased from non-detect to 18 mg/L from Condition 2 to Condition 3 and increased sulfide odors were observed by onsite personnel). The high cycles of concentration associated with the P4 absorbers results in sulfate concentrations approximately five to seven times higher than FGD wastewater from units that burn eastern bituminous coals [3].
- The presence of sulfate-reducing bacteria, indicated by the high concentration of hydrogen sulfide (H_2S) in the second reactor effluent, may also have influenced the loss of selenium reduction. The high COD available to the ABMet from dosing acetic acid may have resulted in the desired bacteria, capable of reducing selenate/selenite, being outcompeted by sulfate-reducing bacteria in the presence of the highly reducing conditions.
- Different nutrient product combinations were used in the demonstration (blended acetic acid containing ammonium and phosphorus, 80% acetic acid (20% water), an even mixture of the previous two products, an even mixture of the first two products and also molasses). Nutrient dosages were maintained based on COD concentrations, pH, and ORP and were within specifications throughout the demonstration. During Condition 4, GE began adding molasses in an attempt to mitigate excessive sulfate-reducing bacteria growth, but by the end of the demonstration (which ended due to a lack of FGD wastewater/pilot feed water supply) the target for selenium reduction had not been re-achieved. Acetic acid products may not provide benefits over molasses for selenium reduction (which is used at GE's commercial ABMet systems treating FGD wastewater for selenium), but there is insufficient information at this time to confirm this possibility.
- Significant arsenic reduction (approximately 70 percent on average for the entire demonstration) occurred in the ABMet. The effluent goal of 4 μg/L was achieved. This is notable, as other EPRI research has shown that for those few plants that have significant dissolved arsenic in their FGD wastewater, little removal is achieved by the physical/chemical treatment system [4].

Recommendations for Additional Research

As previously identified, many variables may have contributed to the loss of performance in the MBR nitrification process and the ABMet selenium reduction process. The following recommendations for additional research are made based on the results of this pilot demonstration.

- Future studies should aim to identify compounds present in FGD wastewater that may be inhibitory or toxic to bacteria used for nitrification, denitrification, and metals reduction. EPRI suspects that oxidants naturally present in FGD wastewater are one potential source of inhibitory effects, but their identity and control have not been fully defined [5]. Further studies to remove non-biodegradable organics in FGD wastewater are recommended. This demonstration tested the use of potassium sulfite, powder activated carbon, and advanced oxidation processes (Fenton reactions), but results are inconclusive.
- The impacts of TDS on bacteria performance should be studied in a controlled environment. Testing should evaluate how increasing FGD wastewater TDS concentration could inhibit reduction of metals or slow down biochemical reactions. Variability in FGD wastewater chemistry is a consistent challenge and potential upsets to treatment technologies are a risk for regulatory compliance. For this demonstration, dilution of P4's chemical precipitation treatment effluent reduced the TDS from an average of 32,300 mg/L to 18,600 mg/L. The dilution was also required to mitigate the high scaling potential of this wastewater. Dilution may not be an option for every site.
- The potential impacts of chemical scale formation in biological treatment FGD wastewater applications should be considered in future demonstrations. For this demonstration, dilution was used as a means to mitigate scale formation in the pilot systems, but dilution may not be an option for every site. General guidance for chemical softening are provided in the Wet Flue Gas Desulfurization Wastewater Physical/Chemical Treatment Guidelines [6].
- The pilot MBR process demonstrated strong performance in reducing nitrate/nitrite prior to the ABMet, but with the potential for competing sulfate-reducing bacteria to negatively influence selenium reduction, it is suggested that nitrate/nitrite reduction as a pretreatment step be more closely evaluated. At this time, there is no clear guidance or rule of thumb for denitrification prior to selenium reduction for a specific range of influent nitrate/nitrite. Future studies that evaluate denitrification as a pretreatment step could consider bypassing a portion of the feed stream directly to the selenium reduction step because controlling denitrification to a target effluent concentration (such as 5 to 10 mg-N/L) may not be feasible or practical. Future studies should also evaluate if sulfate concentrations are also related to the loss of selenium reduction performance due to the influence of sulfate-reducing bacteria.
- Three different nutrients were fed throughout the study. The use of the acetic acid products was a departure from GE's current commercial systems treating FGD wastewater and use molasses. The balance of COD, nitrogen, and phosphorus is important for maintaining bacteria performance in reducing metals. Future studies should focus on the control and application of nutrient products related to nitrification, denitrification, and selenium reduction performance for FGD wastewater.

- The analytical interferences observed in the ABMet pilot effluent (stage two reactor effluent) should be further studied to determine ways to improve accuracy for total selenium analysis. It is hypothesized that the highly reducing conditions of the water resulted in selenium remaining in a reduced valence state (insoluble) and reporting higher than actually present. There have been instances from other tests (see Appendix B) where insoluble selenium was adsorbed to sample bottles and led to total selenium results reporting lower than actually present and confirmed by dissolved species analyses.
- FGD wastewater is impacted by upstream air emission control equipment, boiler operation, fuel selection, and many other factors. Changes in chemistry and flow rates are common for many sites and the wide range of conditions could impact performance of wastewater treatment systems. Coordination with FGD and upstream operations should be considered for any FGD wastewater treatment application, including biological treatment. However, there are limits to what can be achieved by coordination with upstream systems. The final treatment system should be robust enough to handle system variability in a balanced and coordinated approach. Additionally, physical/chemical treatment systems upstream of biological treatment can have an impact on the reliability of selenium reduction and are an integral part of the treatment process.
- Limited data are publicly available on the operation and performance of biological treatment systems for FGD wastewater. The 2015 U.S. EPA Effluent Limitations Guidelines and Standards for the Steam Electric Power Generating Point Source Category may result in many new commercial systems over the next two to seven years. Continued research is needed to ensure power plant operators have the information they need to design, operate, and maintain treatment systems.

6
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A
SAMPLING AND LABORATORY ANALYTICAL PLAN

Table A-1
Analytical Plan – Frequency of Samples

Parameter	Laboratory	Method	Service Water (S1)	Phys/Chem Effluent (S2)	Inf/EQ Tank Effluent (S3)	MBR Mix Liquor (S4)	MBR Effluent (S5)	ABMet 1st Stage Effluent (S6)	ABMet 2nd Stage Effluent (S7)	ABMet Backwash (S8)
Condition 1										
Ammonia	TestAmerica	SM4500	2/month	2/month	3/week		3/week			
Arsenic, total	We Energies	EPA 200.8 DRC-O2	2/month	2/month	1/week		1/week		1/week	
Arsenic, filtered	We Energies	EPA 200.8 DRC-O2	2/month	2/month	1/week		1/week		1/week	
Calcium, total	We Energies	EPA 200.7	2/month	2/month	3/week		3/week	3/week	1/week	
Calcium, filtered	We Energies	EPA 200.7	2/month	2/month	3/week		3/week	3/week	1/week	
Conductivity, µS/cm	TestAmerica	SM2510B	2/month	2/month	3/week		3/week	3/week	1/week	
COD	TestAmerica	SM5220C	2/month	2/month	3/week		3/week		3/week	
Fluoride, total	TestAmerica	SM4500	2/month	2/month	3/week		3/week	3/week	1/week	
Magnesium, total	We Energies	EPA 200.7	2/month	2/month	3/week		3/week	3/week	3/week	
Magnesium, filtered	We Energies	EPA 200.7	2/month	2/month	3/week		3/week	3/week	3/week	
Nitrate/Nitrate (N)	TestAmerica	SM4500	2/month	2/month	3/week		3/week		3/week	
Phosphorus, total	TestAmerica	SM4500	2/month	2/month	3/week		3/week			
Selenium, total	We Energies	EPA 200.7* / 200.8 DRC-NH3	2/month	2/month	3/week		1/week	1/week	1/week	

Table A-1 (continued)
Analytical Plan – Frequency of Samples

Parameter	Laboratory	Method	Service Water (S1)	Phys/Chem Effluent (S2)	Inf/EQ Tank Effluent (S3)	MBR Mix Liquor (S4)	MBR Effluent (S5)	ABMet 1st Stage Effluent (S6)	ABMet 2nd Stage Effluent (S7)	ABMet Backwash (S8)
Condition 1 (continued)										
Selenium, filtered	We Energies	EPA 200.7* / 200.8 DRC-NH3	2/month	2/month	3/week		1/week	1/week	1/week	
Sulfite	We Energies	On-site; analyze immediately		2/month	3/week		3/week		1/week	
Sulfide	TestAmerica	SM4500		2/month	3/week		3/week	3/week	1/week	
TDS	TestAmerica	SM2540C	2/month	2/month	3/week		3/week	3/week	1/week	
TKN	TestAmerica	SM4500		2/month	3/week		3/week		3/week	
TSS	TestAmerica	SM2540D		2/month	3/week	3/week			1/week	
Conditions 2, 3 and 4										
Alkalinity	TestAmerica	SM2320B	1/month	1/month	2/week		2/week	2/week	2/week	
Aluminum, total	We Energies	EPA 200.7		1/month	1/week				1/week	
Aluminum, filtered	We Energies	EPA 200.7		1/month	1/week				1/week	
Ammonia	TestAmerica	SM4500	1/month	1/month	2/week		2/week	2/week	2/week	
Arsenic, total	We Energies	EPA 200.8 DRC-O2	1/month	1/month	1/week				1/week	
Arsenic, filtered	We Energies	EPA 200.8 DRC-O2	1/month	1/month	1/week				1/week	
Bicarbonate	TestAmerica	SM2320B		1/month	2/week		2/week	2/week	2/week	
BOD	TestAmerica	SM5210B	1/month	1/month	1/week		1/week	1/week	1/week	
Boron, total	We Energies	EPA 200.7		1/month	1/week				1/week	

Table A-1 (continued)
Analytical Plan – Frequency of Samples

Parameter	Laboratory	Method	Service Water (S1)	Phys/Chem Effluent (S2)	Inf/EQ Tank Effluent (S3)	MBR Mix Liquor (S4)	MBR Effluent (S5)	ABMet 1st Stage Effluent (S6)	ABMet 2nd Stage Effluent (S7)	ABMet Backwash (S8)
Conditions 2, 3 and 4 (continued)										
Boron, filtered	We Energies	EPA 200.7		1/month	1/week				1/week	
Cadmium, total	We Energies	EPA 200.7 / EPA 200.8		1/month	1/week				1/week	
Cadmium, filtered	We Energies	EPA 200.7 / EPA 200.8		1/month	1/week				1/week	
Calcium, total	We Energies	EPA 200.7	1/month	1/month	2/week		2/week	2/week	2/week	
Calcium, filtered	We Energies	EPA 200.7	1/month	1/month	2/week		2/week	2/week	2/week	
Carbonate	TestAmerica	SM2320B		1/month	1/week		1/week	1/week	1/week	
Chlorides, filtered	TestAmerica	SM4500	1/month	1/month	1/week				1/week	
Cobalt	We Energies	EPA 200.7		1/month	1/week				1/week	
COD	TestAmerica	SM5220C	1/month	1/month	2/week		2/week	2/week	2/week	
Conductivity, µS/cm	TestAmerica	SM2510B	1/month	1/month	2/week		2/week	2/week	2/week	
Copper, total	We Energies	EPA 200.7 / EPA 200.8		1/month	1/week				1/week	
Copper, filtered	We Energies	EPA 200.7 / EPA 200.8		1/month	1/week				1/week	
Fluoride, total	TestAmerica	SM4500	1/month	1/month	2/week		2/week	2/week	2/week	
Iron, total	We Energies	EPA 200.7		1/month	1/week				1/week	

Table A-1 (continued)
Analytical Plan – Frequency of Samples

Parameter	Laboratory	Method	Service Water (S1)	Phys/Chem Effluent (S2)	Inf/EQ Tank Effluent (S3)	MBR Mix Liquor (S4)	MBR Effluent (S5)	ABMet 1st Stage Effluent (S6)	ABMet 2nd Stage Effluent (S7)	ABMet Backwash (S8)
Conditions 2, 3 and 4 (continued)										
Iron, filtered	We Energies	EPA 200.7		1/month	1/week				1/week	
Lead, total	We Energies	EPA 200.7 / EPA 200.8		1/month	1/week				1/week	
Lead, filtered	We Energies	EPA 200.7 / EPA 200.8		1/month	1/week				1/week	
Magnesium, total	We Energies	EPA 200.7	1/month	1/month	2/week				2/week	
Magnesium, filtered	We Energies	EPA 200.7	1/month	1/month	2/week				2/week	
Manganese, total	We Energies	EPA 200.7		1/month	1/week				1/week	
Manganese, filtered	We Energies	EPA 200.7		1/month	1/week				1/week	
Mercury low-level, total	We Energies	EPA 1631E	1/month	1/month	2/week		2/week		2/week	
Mercury low-level, 0.45 µm	We Energies	EPA 1631E	1/month	1/month	2/week		2/week		2/week	
Molybdenum, total	We Energies	EPA 200.7		1/month	1/week				1/week	
Molybdenum, filtered	We Energies	EPA 200.7		1/month	1/week				1/week	
Nickel, total	We Energies	EPA 200.7		1/month	1/week				1/week	
Nickel, filtered	We Energies	EPA 200.7		1/month	1/week				1/week	

Table A-1 (continued)
Analytical Plan – Frequency of Samples

Parameter	Laboratory	Method	Service Water (S1)	Phys/Chem Effluent (S2)	Inf/EQ Tank Effluent (S3)	MBR Mix Liquor (S4)	MBR Effluent (S5)	ABMet 1st Stage Effluent (S6)	ABMet 2nd Stage Effluent (S7)	ABMet Backwash (S8)
Conditions 2, 3 and 4 (continued)										
Nitrate/Nitrate (N)	TestAmerica	SM4500	1/month	1/month	2/week		2/week	2/week	2/week	Each Occurrence
Phosphorus, total	TestAmerica	SM4500	1/month	1/month	1/week		1/week	1/week	1/week	
Selenium, total	We Energies	EPA 200.8 DRC-NH3	1/month	1/month	2/week		2/week	2/week	2/week	Each Occurrence
Selenium, filtered	We Energies	EPA 200.8 DRC-NH3	1/month	1/month	2/week		2/week	2/week	2/week	Each Occurrence
Silver	We Energies	EPA 200.7		1/month	1/week				1/week	
Sodium, total	We Energies	EPA 200.7		1/month	1/week		1/week		1/week	
Sodium, filtered	We Energies	EPA 200.7		1/month	1/week				1/week	
Sulfate, filtered	TestAmerica	SM4500	1/month	1/month	2/week		2/week	2/week	2/week	
Sulfite	We Energies	Onsite; analyze immediately		1/month	1/week				1/week	
Sulfide	TestAmerica	SM4500		1/month	2/week		2/week	2/week	2/week	
TDS	TestAmerica	SM2540C	1/month	1/month	2/week		2/week	2/week	2/week	
Thallium	We Energies	EPA 200.8		1/month	1/week				1/week	
Tin	We Energies	EPA 200.7		1/month	1/week				1/week	
TKN	TestAmerica	SM4500		1/month	1/week		1/week		1/week	
TOC	TestAmerica	SM5310C	1/month	1/month	1/week		1/week	1/week	1/week	

Table A-1 (continued)
Analytical Plan – Frequency of Samples

Parameter	Laboratory	Method	Service Water (S1)	Phys/Chem Effluent (S2)	Inf/EQ Tank Effluent (S3)	MBR Mix Liquor (S4)	MBR Effluent (S5)	ABMet 1st Stage Effluent (S6)	ABMet 2nd Stage Effluent (S7)	ABMet Backwash (S8)
Conditions 2, 3 and 4 (continued)										
TSS	TestAmerica	SM2540D		1/month	2/week	2/week	2/week	2/week	2/week	Each Occurrence
Zinc, total	We Energies	EPA 1638 DRC		1/month	1/week				1/week	
Zinc, filtered	We Energies	EPA 1638 DRC		1/month	1/week				1/week	
Arsenic, total	Brooks Rand	EPA 200.8/6060			1/month				1/month	
Arsenic, filtered	Brooks Rand	EPA 200.8/6060			1/month				1/month	
Arsenic Speciation, filtered	Brooks Rand	EPA 200.8/6060			1/month				1/month	
Mercury low-level, total	Brooks Rand	EPA 1631E DRC			1/month		1/month		1/month	
Mercury low-level, 0.45 µm	Brooks Rand	EPA 1631E DRC			1/month		1/month		1/month	
Mercury low-level, 0.1 µm	Brooks Rand	EPA 1631E DRC			1/month		1/month		1/month	

Table A-1 (continued)
Analytical Plan – Frequency of Samples

Parameter	Laboratory	Method	Service Water (S1)	Phys/Chem Effluent (S2)	Inf/EQ Tank Effluent (S3)	MBR Mix Liquor (S4)	MBR Effluent (S5)	ABMet 1st Stage Effluent (S6)	ABMet 2nd Stage Effluent (S7)	ABMet Backwash (S8)
Conditions 2, 3 and 4 (continued)										
Selenium, total	Brooks Rand	EPA 200.8/6060			1/month		1/month	1/month	1/month	
Selenium, filtered	Brooks Rand	EPA 200.8/6060			1/month		1/month	1/month	1/month	
Selenium Speciation, filtered	Brooks Rand	EPA 200.8/6060			3/month				1/week	

Notes:
Inf/EQ = influent equalization
Phys/Chem = physical/chemical

B
ANALTYICAL QA/QC DISCUSSION

Results for total selenium from the ABMet effluent (stage two reactor effluent) from January 18, 19, and 21 failed We Energies' lab QA/QC checks. In these samples, the matrix spike recovery values were on the low end of the acceptable range. Low matrix spike recovery could indicate selenium is adhering to the container walls or precipitating out of solution. All matrix spike recoveries up to this point had been within the method control limits and the lab did not change anything in the sample preparation or analysis protocol. These were the first sets of results that failed matrix spike QC and We Energies' lab staff performed various tests in attempt to provide accurate analyses. On January 18, the We Energies lab staff who collected the samples noted a strong sulfide odor that had not been present in prior samples. The same odor was present in this sample for the duration of the test.

Samples collected at the site for dissolved and total arsenic and selenium at We Energies' lab were not preserved in the field. The lab filtered a portion of the non-preserved sample for dissolved metals analysis and then acidified the filtered sample with nitric acid to achieve pH less than 2 s.u. The acidified samples were well shaken prior to pouring off the aliquot for totals metals digestion[6]. It was hypothesized that the low ORP in the ABMet stage two reactor effluent contributed to selenium remaining in a reduced valence state (insoluble). To test this hypothesis, the lab added 30% hydrogen peroxide and re-analyzed the samples. Select data comparing various sample preparation methods are presented in Table B-1. Analyses following peroxide addition resulted in matrix spike recovery improvements and total selenium concentrations reported higher than initial analyses. It is noted that EPA Method 200.7 does not include the addition of peroxide or other oxidants to improve accuracy.

[6] To accomplish the quick turnaround time requests, the lab kept digestion time to two to three hours in the hotblock.

Table B-1
ABMet Second Stage Reactor Effluent Selenium Analysis Using Hydroxide Preparation Method

Date	Tot. Se (µg/L)	Dis. Se (µg/L)	Dilution	MS/MSD mean % recovery	Spike Level (µg/L)	Analysis Comments
1/18/2016	13	12	10	16	40	EPA 200.2 digestion: 1mL HNO^3 + 0.25 mL HCl
	15	15	10	14	40	re-analysis for confirmation
	27	no data	10	116	5	10x dilution direct from sample bottle + 5 µg/L bench spike
	15	no data	10	N/A	N/A	Re-digested with 3mL/50mL 30% H_2O_2
1/19/2016	11	10	10	6	40	EPA 200.2 digestion: 1mL HNO_3 + 0.25 mL HCl
	-	-	10	104	N/A	5 µg/L post-digest (bench) spike
	9.4	no data	50	N/A	N/A	1:5 serial dilution of 10x digestate
	10	no data	10	7	N/A	alternate digestion - capped
	26	no data	10	105	5	10x dilution direct from sample bottle + 5 µg/L bench spike
1/21/2016	8.2	7.7	10	11	40	EPA 200.2 digestion: 1mL HNO_3 + 0.25 mL HCl
	19	no data	10	32	40	digested at 10x dilution
	26	no data	25	32	40	digested at 25x dilution
	31	no data	10	120	80	Re-digested with 3mL/50mL 30% H_2O_2
1/25/2016	42	-	10	106	40	Modified EPA 200.2 digestion: 2mL 30% H_2O_2 + 1mL HNO_3 + 0.25 mL HCl
	11	9.0	10	19	40	non-H_2O_2 treated

MS = matrix spike
MSD = matrix spike duplicate

Samples taken during Condition 3 of the demonstration were sent to Brooks Applied Labs in Bothell, WA for speciation analysis. The lab used EPA 200.8 and a closed-vessel, polytetrafluoroethylene (e.g., Teflon™) bomb oven digestion. Sample analysis was performed by triple quadrupole mass spectrometry (ICP-QQQ-MS) to report total and dissolved selenium. Speciation analyses were conducted for selenite (Se(IV)), selenate (Se(VI)), selenomethionine (MeSe (IV)), selenocyanate (SeCN), and selenosulfate ($SeSO_3$). These data are presented in

Table B-2. With a high level of analytical accuracy, the speciated selenium products should add up to the dissolved selenium value for each sample. While minor variation may be expected, the January 28 sample had significant variance – total reported as 17 µg/L, dissolved reported as 9.28 µg/L, the sum of reported dissolved species is 135 µg/L. The current theory for this condition is that selenium adsorbs to the sample bottle, causing the analysis for total selenium to report lower than dissolved. The lab attempted to digest the sample in the sample bottle using 10% nitric acid, but the results were the same. The selenium may have already adsorbed to the bottle and the effect was irreversible.

EPRI has begun additional studies to evaluate methods to improve analytical results from FGD wastewater biological treatment effluent. These studies are considering sample container use, preparation techniques, and analytical methods.

Table B-2
ABMet Effluent Selenium Speciation Results

	Brooks Applied Lab									We Energies Lab	
Date	Tot. Se	Dis. Se	Dis. Se(IV)	Dis. Se(VI)	Dis. MeSe (IV)	Dis. SeCN	Dis. $SeSO_3$	Dis. Unknown Se	Sum of Dis. Species	Tot. Se	Dis. Se
1/12/16	16.6	16.3	1.79 B	1.56 B	0.250 U	7.27	1.10 B	0.00 U	11.7	17	20
1/14/16	32.6	35.9	4.41	11.5	0.385 B	no data	2.21 B	0.465	19	45	47
1/19/16	25.5	25.5	7.61	4.77	0.250 U	7.46	2.53	3.1	25.5	22	no data
1/21/16	30.2	15.9	5.89	0.250 U	0.250 U	14.7	2.53 U	4.60	25.2	31	no data
1/26/16	30.4	27.6	10.8	0.965	0.497 B	11.9	2.50 U	1.52	25.7	46	42
1/28/16	17.0	9.28	51.8	0.965 U	1.32	69.7	3.82	8.71	135.4	47	46
2/2/16	23.3	12.5	8.16	0.965 U	0.588 B	20.1	2.50 U	1.12	30	62	54
2/4/16	22.6	9.69	5.94	0.965 U	0.638 B	17.2	2.50 U	1.11	24.9	50	46
2/9/16	12.6	13.0	9.47	0.250 U	0.398	11.4	2.50 U	1.02	22.3	35	31
2/11/16	8.48 B	6.28 U	1.18 B	0.250 U	0.154 B	5.24	0.275 B	1.63	8.5	23	19
2/16/16	14.2	9.26 B	4.55	0.250 U	0.250 U	10.8	2.73	1.69	19.8	29	25
2/18/16	18.0	4.88 B	3.01	0.250 U	0.250 U	8.01	2.53 U	1.46	12.5	27	22
2/23/16	8.80	5.23	2.06 B	0.250 U	0.250 U	2.10 B	2.04 B	0.551	6.8	18	13
2/25/16	10.3	3.79 B	0.828 B	0.250 U	0.250 U	2.65	0.222 U	0.814	4.3	16	13

Note: all data reported as µg/L
U = not detected
B = analyte is found in the associated blank, as well as in the sample

C
RAW DATA

Raw data from the pilot study are provided in the attachment.

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UNITED STATES ENVIRONMENTAL PROTECTION AGENCY
WASHINGTON, D.C. 20460

April 27, 2017

THE ADMINISTRATOR

The Honorable Catherine McKenna
Minister of Environment and Climate Change
200 Sacre-Coeur, 2nd Floor
Fontaine Building
Gatineau, Quebec K1A 0H3
CANADA

Dear Minister McKenna:

Thank you for your kind note. I, too, look forward to working together in the coming months and seeing you soon in Charlottetown, PEI.

Thank you for taking the time to meet with me during your visit to Washington.

Respectfully yours,

E. Scott Pruitt

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ENVIRONMENTAL PROTECTION AGENCY
WASHINGTON, D.C. 20460

Daniel Yergin
Vice Chairman, IHS Markit
1150 Connecticut Ave NW
Suite 400
DC 20036

THE ADMINISTRATOR

Dear Dan —

Wonderful to spend time with you yesterday ... I appreciated your connecting me the recommendation to connect with Steven Koonin, which we already have. Thank you for the referral! I look forward to connecting again soon.

Sincerely,

Scott

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WASHINGTON, D.C. 20460

Jack Walker

(b) (6)

THE ADMINISTRATOR

Dear Jack —

Great to meet you yesterday... Please know I appreciated your very kind and encouraging words. I am thankful for your leadership & behalf of our Country, and I do hope to see you again soon.

Sincerely,
Scott

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Lawrence Finn

(b) (6)

[redacted]

UNITED STATES
ENVIRONMENTAL PROTECTION AGENCY
WASHINGTON, D.C. 20460

THE ADMINISTRATOR

Dear Larry —

Great to meet you yesterday...

Please know I appreciated your remarks and feedback and — excited about the opportunities before us with the President's leadership!

I look forward to seeing you again soon.

Sincerely,

Scott

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UNITED STATES
ENVIRONMENTAL PROTECTION AGENCY
WASHINGTON, D.C. 20460

Paul Aitken
Patomac Global Partners
750 17th St NW
DC 20006

THE ADMINISTRATOR

Dear Paul —

Great to meet a fellow traveler yesterday... Please know I am thankful for your time and ideas and look forward to staying in touch! Please send my regards to Leonard!

Sincerely,

Scott

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UNITED STATES
ENVIRONMENTAL PROTECTION AGENCY
WASHINGTON, D.C. 20460

THE ADMINISTRATOR

Dear Mary —

Wonderful to spend time with you yesterday ... I appreciated your ideas and suggestions with regard to the "Mid-Term" Review. Please know I look forward to continuing the discussion!

Sincerely,

Pat

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April 13, 2017

By U.S. Mail and E-mail

The Honorable E. Scott Pruitt
Administrator
United States Environmental Protection Agency
William Jefferson Clinton Building
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Washington, DC 20460

The Utility Water Act Group's Supplemental Information In Support Of Its Petition For Rulemaking To Reconsider And Administratively Stay The Effluent Limitations Guidelines and Standards for the Steam Electric Power Generating Point Source Category; Final Rule, 80 Fed. Reg. 67,838 (Nov. 3, 2015)—Docket No. EPA-HQ-OW-2009-0819

Dear Administrator Pruitt:

Enclosed please find the Utility Water Act Group's Supplemental Information In Support Of Its Petition For Rulemaking To Reconsider And Administratively Stay The Effluent Limitations Guidelines and Standards for the Steam Electric Power Generating Point Source Category; Final Rule, 80 Fed. Reg. 67,838 (Nov. 3, 2015) A copy of this petition has been electronically mailed to the Office of Water Docket Center for filing in Docket No. EPA-HQ-OW-2009-0819.

Please do not hesitate to contact me if there are any questions.

Sincerely,

Harry M. Johnson, III

Enclosure
cc: Mr. Michael H. Shapiro (by hand delivery and e-mail)
Jessica O'Donnell, Esq. (by e-mail)
Kevin S. Minoli, Esq. (by e-mail)
EPA Docket Center (by e-mail)

UWAG
Utility Water Act Group©

The Utility Water Act Group's Supplemental Information In Support Of Its Petition For Rulemaking To Reconsider And Administratively Stay The Effluent Limitations Guidelines And Standards For The Steam Electric Power Generating Point Source Category; Final Rule, 80 Fed. Reg. 67,838-903 (Nov. 3, 2015)

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I. Introduction

This is supplemental information to support the Petition for Rulemaking to Reconsider and Administratively Stay the Effluent Limitations Guidelines and Standards for the Steam Electric Power Generating Point Source Category filed by the Utility Water Act Group (UWAG) on March 24, 2017. Specifically, this supplemental information further substantiates the need for immediate relief from the deadlines of the Effluent Limitations Guidelines and Standards for the Steam Electric Power Generating Point Source Category; Final Rule (the "ELG Rule" or "Rule") that are imposing tremendous costs and burdens on the industry.

The Petition demonstrates that the ELG Rule should be reconsidered. If the Agency grants the Petition as it should, it will necessitate a rulemaking that may take a year or more. While that reconsideration is pending, the utility industry should not remain subject to the ELG Rule or its deadlines. As described below in detail, UWAG members and other utilities have spent, are spending, and will imminently spend millions of dollars preparing to comply with the deadlines in the ELG Rule.[1] Those costs are irreversible and unnecessary if the rule is reconsidered, and ultimately they will be borne by the utilities' ratepayers through higher electricity costs or will directly impact the profitability of independent power producers (IPPs). Indeed, some imminent actions such as retrofits may complicate compliance with a future ELG Rule if the rule is changed and renders those actions moot. Moreover, decisions about whether

[1] Although the earliest deadline to be in compliance with the ELG Rule is approximately 18 months away (November 1, 2018), a rule of this magnitude and complexity requires substantial time to come into compliance for multiple wastestreams. Detailed studies and planning, followed by large capital expenditures and subsequent installation and testing, are time-consuming. This supplement demonstrates the actions that are already underway and that are imminent. These burdens would be alleviated with immediate relief from the deadlines while the ELG Rule is under reconsideration.

to retire plants are ongoing. Those decisions are impacted when resources are being spent on compliance with the ELG Rule.

Many affected utilities are rural cooperatives and municipal agencies whose resources are being strained investigating compliance strategies. Engineering and other resources are being devoted to exploring how to comply with a rule whose requirements should be reconsidered and changed. Utilities and IPPs have reserved many millions in their budgets for all these efforts, money that could be devoted to other productive uses.

Immediate relief is also necessary for additional reasons. At least 8 facilities have already been issued permits incorporating the ELG Rule's deadlines. Any stay or postponement of the ELG Rule's deadlines at the EPA level would then have to be incorporated into those permits via state administrative action. This, too, will take time. At least 10 other facilities have permits pending at the state level for issuance in the near term. Immediate action by EPA to stay the ELG Rule and its deadlines will make it clear that those deadlines should not be incorporated into the permits at least until EPA has had the opportunity to reconsider the Rule.

To the extent there could be any doubt about the nature and magnitude of the costs and problems caused by the ELG Rule, the information in this supplement definitively establishes the need for immediate relief, whether by administrative stay under Section 705 of the Administrative Procedure Act, by interim final rule, or other action to avoid the inefficiency of forcing compliance with the ELG Rule while it is under reconsideration.

II. Industry Members are Incurring Huge Costs for Evaluating ELG Rule Impacts and Options

The ELG Rule contains stringent "best available technology" (BAT) requirements for fly ash transport water and bottom ash transport water. For each, the Rule sets a zero discharge standard for existing facilities. If the Rule is not reconsidered, existing facilities will need to retrofit with technologies to ensure compliance with the zero discharge standard.

For flue gas desulfurization wastewater (FGDW), EPA derived very low BAT limits for arsenic, mercury, nitrate/nitrite, and selenium based on a complex, multi-step model technology of physical/chemical and biological treatment. Implementing these technologies will require much more than simply purchasing and installing them. Each retrofit requires careful evaluation of the plant's water balance and significant engineering evaluation before any other steps can be taken. EPA agrees that planning for FGDW treatment is complex. As explained in UWAG's Petition, EPA has recommended that plants design to a "worst case" scenario for FGDW systems and conduct extensive site-specific pilot studies. Petition, pp. 45-46. While the Rule also imposes requirements for other types of wastewater, UWAG members are most impacted by the costs for bottom ash transport water, fly ash transport water, and FGDW retrofits.

In its Regulatory Impact Analysis (RIA), EPA found that the largest number of plants (both by count and by generating capacity) will incur compliance costs in the first year of the Rule's applicability. According to EPA, 23.4% of the total number of plants impacted by the Rule, representing 41,507 MWs, will incur costs in 2019. Final RIA, Table 3-1, p. 3-5. But large technological changes at power plants—whether they be baseline or peaking plants—do not happen overnight. They require years of advance planning. Therefore, plants that are or

may be subject to early applicability dates (*i.e.*, deadlines) under the Rule are already undertaking significant, resource-intensive, and expensive planning steps.

Many industry members have initiated engineering efforts to identify and evaluate how the Rule will impact their facilities and to assess compliance options. For purposes of this supplement, UWAG is providing below a few specific examples of costs for these initial steps. These costs are illustrative only; other industry members may have much higher costs for the same actions.

- DTE Energy has already entered into contracts for detailed water balance development required for technology assessments for its Monroe and Belle River Stations. DTE will soon enter into contracts to complete the technology assessments and compliance development plans for these facilities. Monroe needs retrofits for fly ash transport water, bottom ash transport water, and FGDW, while Belle River needs a bottom ash transport water retrofit. The costs of these studies, assessments, and compliance plan developments total *approximately $5 million.*
- To date, Dynegy has already spent $2.895 million on ELG Rule compliance, including a study of compliance alternatives and engineering design.
- FirstEnergy reports that it has already spent approximately $387,000 to evaluate ELG Rule impacts at four power plants. Within the next 6 months, it anticipates spending an additional $260,000 to evaluate ELG compliance options at those plants.
- Within the next 6 months, Southern Illinois Power Company, a rural cooperative, is planning to spend $65,000 for consulting engineering costs necessary for ELG Rule compliance planning.
- For Eversource's Merrimack Station, the company has completed initial bottom ash transport water compliance feasibility reviews at a total cost of approximately $150,000 and is currently conducting a water balance study costing approximately $85,000. For a more detailed engineering review, the company expects to spend an additional $75,000 later this year.
- The City of Springfield, Illinois, with a population of 100,000, has been expending and—absent a stay of the Rule—will continue expending large sums to plan for compliance with the Rule. Thus far, it has spent $450,000 for engineering consultants to study alternatives and estimate costs of compliance with the ELG and Coal Combustion Residuals (CCR) rules. Over the next 6 months, the City anticipates that the costs will rise to over $700,000.

These are the types of heavy costs that will be incurred despite EPA's potential reconsideration of the Rule if the Rule is not stayed in the meantime.

III. Imminent Expenditures for Planning and Conducting Pilot Studies

As noted earlier and as discussed in the Petition, FGDW retrofits require site-specific pilot studies. The pilot studies are not simple, short-term efforts. They are data intensive and can be protracted, depending on operating conditions at the plant. As EPA states:

> [P]lants should conduct studies investigating the variability of their FGD purge stream in order to better inform their design process. Plants can use ... appropriate analytical methods to measure the flow rate, selenium concentration, nitrate/nitrate [sic] concentrations, and any other values necessary for design of the system. Plants should acquire this information over a long enough period of time that will include variability in plant operations such as shutdowns, fuel switches (preferably for all fuel types burned at the plant), variability in electricity generating loads, periods with high [oxidation reduction potential], etc.

EPA Memorandum, Variability in Flue Gas Desulfurization Wastewater: Monitoring and Response, EPA-HQ-OW-2009-0819-6033 (Sept. 30, 2015) at 15-16.

Members of the industry have provided the following specific cost information related to planning for and implementing FGDW pilot studies.

- WEC Energy Group anticipates spending $800,000 for a pilot test of a FGDW treatment system to be conducted at the Elm Road Generating Station beginning in late May or early June. This is in addition to pilot study expenditures that have already occurred to date, including $185,000 used to co-fund the EPRI ABMet study at Pleasant Prairie Power Plant[2] and $260,000 to conduct a second pilot test at Pleasant Prairie to evaluate the ability to treat bottom ash transport water and send it to the FGD scrubber.
- Cooperative Energy, a rural cooperative located in Mississippi, expects to spend *$2 million* over the next 6-9 months for engineering and mechanical expenses related to its FGDW pilot study.

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[2] The cost figure reported only includes WEC Energy Group's portion of the EPRI study.

- DTE Energy is participating in an EPRI-led pilot study at its Monroe Station. The pilot is testing technologies that combine FGDW with CCR material prior to disposal. The capital outlay for the water balance work and the pilot study is approximately $1 million.
- Muscatine Power and Water estimates that its pilot studies will cost approximately $150,000, including engineering consultant fees and lab analyses. These costs will be incurred in 2018.

Once again, these expenditures are necessary as long as the Rule remains in effect as is. But companies could put those funds to a better use if the ELG Rule is ultimately changed, as we believe it should be.

IV. Industry Members Will Be Harmed by Incurring Near-Term Capital Costs

Many industry members are on the verge of expending, or committing to expend, major capital costs for ELG Rule retrofits. If EPA plans to reconsider the Rule, it would be unjust for these companies to incur these expenditures. As a prime example, the utility owners and operators of plants within the American Electric Power System (AEP System) report that for the remainder of 2017 they have planned expenditures for ELG-associated projects totaling approximately *$16.5 million* in direct costs (no overhead or Allowance for Funds Used during Construction (AFUDC) included). For the first half of 2018, the AEP System plans expenditures totaling approximately *$21.4 million* in direct costs (not including AFUDC).

Industry members have offered the following additional examples of near-term capital cost expenditures.

- Hoosier Energy, a rural cooperative, reports that it must commit to a zero discharge FGD retrofit for its Merom Generating Station within the next 60 days. *The retrofit is estimated to cost $46 million.* Merom's permit contains a November 1, 2018 applicability date for FGDW, which is driving this decision.
- Santee Cooper faces imminent, irreversible financial commitments for ELG compliance costs at the Cross and Winyah Generating Stations. Beginning in May 2017, Santee Cooper will need to contract for additional construction and engineering services to meet the ELG requirements at both stations. The amount

contracted for this work over the short term is estimated to cost Santee Cooper *$5 million by May 2017 and another $22 million by July 2017*, for a total of $27 million. The total amount of the contract for these construction and engineering services is estimated to cost $90 million. These expenses will be in addition to the $5.5 million that Santee Cooper has already spent on pilot studies and development of compliance strategies for the ELG Rule.

- Southern Illinois Power Company expects to spend *$9.5 million* for a bottom ash transport water retrofit within the next 6-12 months.
- FirstEnergy expects to spend *$2.5 million* to modify a power plant's bottom ash system within the next 6-12 months.
- Within the next 6-12 months, WEC Energy Group estimates it will incur the following costs totaling *$2,750,000:*
    1. Weston Generating Station: About $1,500,000 will be expended on preliminary engineering for converting the bottom ash system for one of its units to a mechanical drag system.
    2. Elm Road Generating Station: About $1,000,000 will be expended on preliminary engineering for the technology selected for the FGDW system.
    3. Oak Creek Power Plant and Pleasant Prairie Power Plant: About $250,000 will be expended for preliminary engineering related to modifications needed for the bottom ash systems.
- For Eversource's Merrimack Station, following the detailed design study to be conducted this summer and fall, the company anticipates hiring a consultant to develop detailed bid specifications for the retrofit at a cost of $50,000-$75,000, to be incurred in 2018.
- For the City of Springfield, within the next 6 months it anticipates having to commit to an engineering design contract with an estimated cost of *$3 million.*
- The City of Colorado Springs is also burdened with a near-term commitment. It must contract *within the next month* for engineering/design services to meet the zero discharge bottom ash transport water requirement. The system retrofit must take place in late 2017/early 2018. It is expected that the retrofit will cost approximately $350,000-400,000.
- Lakeland Electric's McIntosh Power Plant is an indirect discharger and is subject to a deadline of November 1, 2018 for compliance with FGDW pretreatment limits as well as other requirements. To meet that compliance date, Lakeland Electric reports that it must enter into contracts for biological and/or physical/chemical treatment as soon as possible, because its estimated lead time to design, permit, construct, and commission the system is 16-24 months. As a result, Lakeland must commit to significant capital expenditures *within the next 60 days.*

V. Budgeting for Long-term Capital Costs of the Rule Affects Industry Members

As documented in the Petition, industry members have been budgeting for substantial long-term capital outlays related to the Rule. This budgeting is necessary not only for prudent corporate management, but also to reflect the anticipated capital costs appropriately in mandatory corporate filings such as 10-Ks. NRG anticipates that its total ELG costs will be approximately $200 million.[3] And, of AEP's total projected environmental investments for 2018 through 2025, the ELG Rule compliance costs alone are projected to range from $400-$550 million.[4]

Budgeting for the ELG Rule means that corporate funds are diverted from other ventures or opportunities. Also, the investment community will consider the anticipated outlays in valuing the company and evaluating its potential for growth and revenue enhancement. The long-term capital costs associated with the Rule are thus causing business repercussions now, even though construction may not have commenced.

VI. The Rule is Affecting Unit Retirement Decisions

The power industry is dynamic. Companies must routinely assess the strength of the market, its potential for growth, the dispatch patterns within the market, and the viability of their generating units within the regional market. The ELG Rule is impacting how companies assess their units, as it imposes costs that are large enough to affect the viability of some units. If EPA decides to reconsider the Rule, it should grant a stay of the Rule and its deadlines so

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[3] NRG, Form 10-K, filed with the U.S. Securities and Exchange Commission for the fiscal year ended December 31, 2016 (Feb. 28, 2017) at 32.

[4] For total expected environmental investments, *see* AEP, Inc. Form 10K, filed with the U.S. Securities and Exchange Commission for the fiscal year ended December 31, 2016 (Feb. 28, 2017) at 14.

that units facing the threat of early retirement can be maintained until EPA has finished its reconsideration of the Rule.

DTE Energy recently announced that it plans to retire three facilities (Trenton Channel, River Rouge, and St. Clair) prior to December 31, 2023. DTE committed to this specific retirement date based solely on the ELG Rule's applicability date range of November 1, 2018 to December 31, 2023. Also, one rural cooperative believes the ELG Rule will potentially cause retirement of its coal-fired facility and the loss of 83 full-time jobs, in addition to loss of numerous contractors' jobs.

Lakeland Electric reports that the very tight compliance deadline it faces as an indirect discharger, and the high expenses associated with the necessary retrofits, are forcing it to consider ceasing operations of its only coal unit. Given its estimate that it would take five years to bring a new unit online as replacement power, Lakeland Electric may have to purchase replacement power at a higher cost than that associated with the current unit and pass those costs onto its ratepayers. Also, if Lakeland Electric ceases to operate its coal unit, it will result in the loss of approximately 100 jobs and cause a significant economic impact to the Lakeland community.

Additionally, many companies are evaluating ELG Rule costs along with the costs of the many other rulemakings affecting coal-fired generation, such as the CCR Rule. In some cases, the cumulative impact of these multiple regulations is threatening the continued viability of coal units. Owensboro Municipal Utilities, for example, recently announced retirement of a coal-fired unit at its Elmer Smith Generating Station. The anticipated costs for ELG and CCR rule compliance were a major factor in the retirement decision.

Staying the ELG Rule during reconsideration will allow companies to make better business decisions based primarily on market forces and not affected by regulatory imperatives derived from a rule that is being reevaluated.

VII. Final Permits with ELG Applicability Dates Are Driving Expenditures

Under the ELG Rule, a facility's permit writer must set an applicability date for each wastestream impacted by the Rule. That applicability date must be "as soon as possible" (as that term is defined within the Rule) within the range of November 1, 2018 to December 31, 2023. Some of the final permits industry members have received to date are summarized in the table below.

Company	**Plant**	**Date of Final Permit**	**Applicability Dates**[5]
OVEC/IKEC	Clifty Creek	Mar. 28, 2017	April 1, 2022 (BATW and FGDW)
DTE	Belle River	Jan. 27, 2017	Dec. 31, 2021 (BATW)
Duke Energy	Edwardsport	Mar. 30, 2016	April 1, 2021 (gasification wastewater)*
Duke Energy	Marshall	Sept. 9, 2016	Nov. 1, 2018 (FATW) Jan. 31, 2021 (BATW and FGDW)
Ameren	Sioux Energy Center	Mar. 2017	May 1, 2021 (BATW and FATW)
Dynegy	Coffeen	Sept. 16, 2016	April 1, 2019 (BATW) April 1, 2020 (FGDW)
Hoosier Energy	Merom		Nov. 1, 2018 (FGDW)

*Subject to a reopener clause to allow, with appropriate justification, modification of the applicability date to no later than Dec. 31, 2023.

Also, Appendix A to this filing contains a collection of final permits with ELG applicability dates.

[5] BATW=bottom ash transport water; FATW=fly ash transport water; FGDW=flue gas desulfurization wastewater.

As noted earlier, even when applicability dates are several years in the future, the process of preparing for compliance is complex, multifaceted, and very time-consuming. Facilities must devote substantial resources now to ensure completion of all the necessary steps to be in full compliance on that date (*e.g.*, studies, design, testing, construction, further testing, etc.). Those steps have already, or are imminently being, commenced. If EPA decides to reconsider the Rule, a stay is necessary so that regulators can modify these permit deadlines before facilities with newly reissued permits are disadvantaged.

VIII. Industry Members Also Have Many Pending Permits with ELG Applicability Dates

In addition to the final permits already issued with ELG applicability dates, industry members have many pending permits with proposed ELG applicability dates. We include below some examples of pending permits expected to be issued within the next 6 months with ELG applicability dates.

Company	**Plant**
AEP	Cardinal
AEP	Conesville
Consumers Energy [6]	J. H. Campbell
Consumers Energy	D. E. Karn
WEC Energy Group	Weston
WEC Energy Group	Oak Creek/Elm Road
DTE Energy	Monroe
DTE Energy	Trenton Channel
DTE Energy	River Rouge

[6] Appendix B to this filing is the Direct Testimony of Heather A. Breining on behalf of Consumers Energy Company, filed with the Michigan Public Service Commission in March 2017. The testimony describes Consumer Energy's plans for complying with the ELG Rule.

These are just a few of the facilities facing the burden of actual ELG deadlines in pending permits that will soon be issued. There are many more permits close to finalization that will include ELG Rule deadlines.

IX. The ELG Rule's Dubious Model Technology for FGDW Magnifies the Need for a Stay

The need for immediate relief from the ELG Rule is magnified by the inability of the model technology for FGDW to meet the limits in the Rule. The Rule specifies a biological treatment system for FGDW as part of the BAT. But, as demonstrated in the Petition and confirmed in a subsequent report,[7] that technology is unable to reliably meet the limits in the Rule when a facility is burning a subbituminous coal such as Powder River Basin coal. Plants burning bituminous coal are likewise experiencing problems with the model system, and are finding they may not be able to meet the limits consistently. Rural cooperatives such as Cooperative Energy and municipalities such as the City of Springfield, among others, are facing huge costs for FGDW retrofits with no certainty that the final systems will consistently meet the ELG limits using EPA's model technology.

Because the model technology has never been validated across a broad range of operating conditions, companies are being forced to dedicate substantial resources investigating possible compliance strategies. Companies must obviously be in compliance with the FGDW limit no later than their applicability date. They cannot wait to begin their investigations because it is unclear when (and if) they will find a viable technical solution (or what that solution may entail). Consequently, members are already undertaking pilot studies

[7] *See* Report by the Electric Power Research Institute entitled *Biological Treatment of Flue Gas Desulfurization Wastewater at a Power Plant Burning Powder River Basin Coal*, submitted by UWAG on April 12, 2017.

and other measures trying to identify a solution as soon as possible. Given that the Rule's model technology for FGDW is a prime candidate for reconsideration, these costs will be unjustly incurred unless the Rule is stayed.

X. Conclusion

The ELG Rule should be reconsidered and it should be stayed while under reconsideration. Justice requires an immediate stay. Moreover, a stay is in the public interest and is necessary to avoid disadvantaging industry members whose permits have been or are being revised to include ELG applicability dates.

APPENDIX A

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

Eric J. Holcomb
Governor

Bruno Pigott
Commissioner

VIA ELECTRONIC MAIL March 28, 2017

Mr. J. Michael Brown, Environmental, Safety & Health Director
Indiana-Kentucky Electric Corporation
3932 U.S. Rte 23
PO Box 468
Piketon, OH 45661

Dear Mr. Brown:

Re: Final NPDES Permit No. IN0001759
IKEC – Clifty Creek Station
Madison, Jefferson County, Indiana

Your application for a National Pollutant Discharge Elimination System (NPDES) permit for authorization to discharge into the waters of the State of Indiana has been processed in accordance with Section 402 and 405 of the Federal Water Pollution Control Act, as amended (33 U.S.C. 1251, et seq.), and IC 13-15, IDEM's permitting authority. All discharges from this facility shall be consistent with the terms and conditions of this permit.

One condition of your permit requires periodic reporting of several effluent parameters. You are required to submit both federal discharge monitoring reports (DMRs) and state Monthly Monitoring Reports (MMRs) on a routine basis. The MMR form can be found on IDEM's web site at http://www.in.gov/idem/cleanwater/2396.htm.

Once you are on this page, select the "IDEM Forms" page and locate the "Monthly Monitoring Report (MMR) for Industrial Discharge Permits-30530" under the Wastewater Facilities heading. We recommend selecting the "XLS" version because it will complete all of the calculations when you enter the data.

Please note that IDEM will no longer accept paper DMR or MMR forms after December 28, 2016. After that date all NPDES permit holders are required to submit their monitoring data to IDEM using NetDMR. Please contact Rose McDaniel at (317) 233-2653 or Helen Demmings at (317) 232-8815 if you would like more information on NetDMR. Information is also available on our website at http://IN.gov/idem/cleanwater/2422.htm.

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 subject the permittee to criminal or civil penalties. (See Part II A.2.) It is therefore urged that your office and treatment operator understand this part of the permit.

A response to the comments contained in the letter from yourself, and an additional comment letter from Tony Mendoza and Casey Roberts, Staff Attorneys with Sierra club, jointly with Thomas Cmar, Attorney with Earth Justice, pertaining to the draft NPDES permit is contained in the Post Public Notice Addendum. The Post Public Notice Addendum is located at the end of the Fact Sheet.

It should also be noted that any 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 filing a petition for administrative review with the Office of Environmental Adjudication (OEA) within fifteen (15) days of the emailing of an electronic copy of this letter or within eighteen (18) days of the mailing of this letter by filing at the following addresses:

Director
Office of Environmental Adjudication
Indiana Government Center North
Room 501
100 North Senate Avenue
Indianapolis, Indiana 46204

Commissioner
Indiana Department of Environmental Management
Indiana Government Center North
Room 1301
100 North Senate Avenue
Indianapolis, Indiana 46204

If you have any questions concerning the permit, please contact Richard Hamblin at 317/232-8696 or rhamblin@idem.in.gov. Questions concerning appeal procedures should be directed to the Office of Environmental Adjudication, at 317/232-8591.

Sincerely,

Paul Novak

Paul Novak, Chief
Permits Branch
Office of Water Quality

Enclosures
cc: Jefferson County Health Department
U.S. EPA, Region 5
Tony Mendoza, Sierra Club

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"), and IDEM's authority under IC 13-15,

INDIANA-KENTUCKY ELECTRIC CORPORATION

is authorized to discharge from the Clifty Creek Generating Station that is located at 1335 Clifty Hollow Road, Madison, Indiana, to receiving waters identified as the Ohio River, Clifty Creek, and Unnamed Tributaries to Clifty Creek in accordance with effluent limitations, monitoring requirements, and other conditions set forth in Parts I, II, III, and IV hereof. This permit may be revoked for the nonpayment of applicable fees in accordance with IC 13-18-20.

Effective Date: May 1, 2017

Expiration Date: April 30, 2022

In order to receive authorization to discharge beyond the date of expiration, the permittee shall submit such information and forms as are required by the Indiana Department of Environmental Management no later than 180 days prior to the date of expiration.

Issued March 28, 2017, for the Indiana Department of Environmental Management.

Paul Novak, Chief
Permits Branch
Office of Water Quality

PART I

A. EFFLUENT LIMITATIONS AND MONITORING REQUIREMENTS

1. The permittee is authorized to discharge from the outfall listed below in accordance with the terms and conditions of this permit. The permittee is authorized to discharge from Outfall 001. The discharge is limited to landfill runoff and storm water runoff from the western portion of the coal combustion residual landfill watershed. Samples taken in compliance with the monitoring requirements below shall be taken at a point representative of the discharge but prior to entry into the Ohio River. Such discharge shall be limited and monitored by the permittee as specified below:

DISCHARGE LIMITATIONS [1][2][3][4]
Outfall 001

Table 1

	Quantity or Loading			Quality or Concentration			Monitoring	Requirements
Parameter	Monthly Average	Daily Maximum	Units	Monthly Average	Daily Maximum	Units	Measurement Frequency	Sample Type
Flow[5]	Report	Report	MGD	---------	----------	-----	1 X Weekly	24 Hour Total
TSS[6]	-------	-------	------	---------	50	mg/l	1 X Weekly	Grab
Copper[7]	-------	-------	------	Report	Report	mg/l	1 X Monthly	Grab
Iron[7]	-------	-------	------	Report	Report	mg/l	1 X Monthly	Grab
Aluminum[7]	-------	-------	------	Report	Report	mg/l	1 X Monthly	Grab
Arsenic[7]	-------	-------	------	Report	Report	mg/l	1 X Monthly	Grab
Cadmium[7]	-------	-------	------	Report	Report	mg/l	1 X Monthly	Grab
T. Chromium[7]	-------	-------	------	Report	Report	mg/l	1 X Monthly	Grab
Selenium[7]	-------	-------	------	Report	Report	mg/l	1 X Monthly	Grab
Zinc[7]	-------	-------	------	Report	Report	mg/l	1 X Monthly	Grab
Mercury[7][8]	-------	-------	------	Report	Report	ng/l	6 X Yearly	Grab
TDS	-------	-------	------	Report	Report	mg/l	1 X Monthly	Grab
Boron	-------	-------	------	Report	Report	mg/l	1 X Monthly	Grab
Alkalinity	-------	-------	------	Report	Report	mg/l	1 X Monthly	Grab
Sodium	-------	-------	------	Report	Report	mg/l	1 X Monthly	Grab

Table 2

	Quality or Concentration			Monitoring	Requirements
Parameter	Daily Minimum	Daily Maximum	Units	Measurement Frequency	Sample Type
pH	6.0	9.0	s.u.	1 X Weekly	Grab

[1] See Part I.B. of the permit for the Narrative Water Quality Standards.

[2] In the event that changes are to be made in the use of water treatment additives including dosage rates beyond the approved estimated maximum dosage rates, or changes that could significantly change the nature of, or increase the discharge concentration of the additive contributing to this Outfall, the permittee shall notify the Indiana Department of Environmental Management as required in Part II.C.1 of this permit. The use of any new or changed water treatment additives or dosage rates

shall not cause the discharge from any permitted outfall to exhibit chronic or acute toxicity. Acute and chronic aquatic toxicity information must be provided with any notification regarding any new or changed water treatment additives or dosage rates.

[3] The permittee shall post a permanent marker on the stream bank at each outfall discharging directly to the Ohio River.

The marker shall consist at a minimum of the name of the establishment to which the permit was issued, the permit number, and the outfall number. The information shall be printed in letters not less than two inches in height.

The marker shall be a minimum of 2 feet by 2 feet and shall be a minimum of 3 feet above the ground.

[4] The Storm Water Monitoring and Non Numeric Effluent Limits and the Storm Water Pollution Prevention Plan (SWPPP) requirements can be found in Part I.D. and I.E. of this permit.

[5] Flow is calculated at Outfall 001 based on depth measurements of the water overflowing the rectangular weir-type overflow structure.

[6] An exceedance of the concentration limitations for TSS which is demonstrated to have been caused by the presence of algae in the effluent will not constitute a violation of the permit. In such cases, if visual examination reveals the presence of algae, the permittee may quantitatively demonstrate the presence of algae by subtracting the results of a volatile suspended solids test (as described in the current U.S. EPA approved version of the Standard Methods for the Examination of Water and Wastewater) from measure TSS along with a letter of explanation to accompany monthly DMR forms. Standard tests for TSS are to be performed at all other times.

[7] The permittee shall measure and report the identified metal in total recoverable form.

[8] Mercury monitoring shall be conducted bi-monthly in the months of February, April, June, August, October, and December of each year for the term of the permit using EPA Test Method 1631, Revision E.

Parameter	EPA Method	LOD	LOQ
Total Mercury	1631, Revision E	0.2 ng/l	0.5 ng/l

2. The permittee is authorized to discharge from the outfall listed below in accordance with the terms and conditions of this permit. The permittee is authorized to discharge from Outfall 002. The discharge is limited to boiler slag sluice water, storm water runoff, boiler room sumps, coal pile runoff, stormwater runoff and leachate from the east portion of the coal combustion residual landfill, and treated FGD wastewater (Internal Outfall 201). Samples taken in compliance with the monitoring requirements below shall be taken at a point representative of the discharge but prior to entry into the Ohio River. Such discharge shall be limited and monitored by the permittee as specified below:

DISCHARGE LIMITATIONS [1][2][3][4][5]
Outfall 002

Table 1

	Quantity or Loading			Quality or Concentration			Monitoring Requirements	
Parameter	Monthly Average	Daily Maximum	Units	Monthly Average	Daily Maximum	Units	Measurement Frequency	Sample Type
Flow[6]	Report	Report	MGD	---------	----------	-----	1 X Weekly	24 Hour Total
O+G	-------	-------	------	10	15	mg/l	1 X Monthly	Grab
TSS[7][9]	-------	-------	------	28.4	94.1	mg/l	1 X Weekly	Grab
Copper[8]	-------	-------	------	Report	Report	mg/l	2 X Monthly[10]	Grab
Iron[8]	-------	-------	------	Report	Report	mg/l	2 X Monthly[10]	Grab
Aluminum[8]	-------	-------	------	Report	Report	mg/l	2 X Monthly[10]	Grab
Arsenic[8]	-------	-------	------	Report	Report	mg/l	2 X Monthly[10]	Grab
Cadmium[8]	-------	-------	------	Report	Report	mg/l	2 X Monthly[10]	Grab
T. Chromium[8]	-------	-------	------	Report	Report	mg/l	2 X Monthly[10]	Grab
Selenium[8]	-------	-------	------	Report	Report	mg/l	2 X Monthly[10]	Grab
Zinc[8]	-------	-------	------	Report	Report	mg/l	2 X Monthly[10]	Grab
Mercury[8][11]	-------	-------	------	12	20	ng/l	6 X Yearly	Grab
TDS	-------	-------	------	Report	Report	mg/l	2 X Monthly[10]	Grab
Boron	-------	-------	------	Report	Report	mg/l	2 X Monthly[10]	Grab
Alkalinity	-------	-------	------	Report	Report	mg/l	2 X Monthly[10]	Grab
Sodium	-------	-------	------	Report	Report	mg/l	2 X Monthly[10]	Grab
Fluoride	-------	-------	------	Report	Report	mg/l	2 X Monthly[10]	Grab
Manganese	-------	-------	------	Report	Report	mg/l	2 X Monthly[10]	Grab
BOD_5	-------	-------	------	Report	Report	mg/l	2 X Monthly[10]	Grab
Lead[8]	-------	-------	------	Report	Report	mg/l	2 X Monthly[10]	Grab
Ammonia, as N								
Summer[12]	-------	-------	------	3.7	7.4	mg/l	2 X Monthly[10]	Grab
Winter[12]	-------	-------	------	12.1	24.3	mg/l	2 X Monthly[10]	Grab
Nitrate/Nitrite, as N	-------	-------	------	Report	Report	mg/l	2 X Monthly[10]	Grab
Bromide[13]	-------	-------	------	Report	Report	mg/l	1 X Quarterly	Grab

Table 2

	Quality or Concentration			Monitoring Requirements	
Parameter	Daily Minimum	Daily Maximum	Units	Measurement Frequency	Sample Type
pH	6.0	9.0	s.u.	1 X Weekly	Grab

[1] See Part I.B. of the permit for the Narrative Water Quality Standards.

[2] In the event that changes are to be made in the use of water treatment additives including dosage rates beyond the approved estimated maximum dosage rates, or changes that could significantly change the nature of, or increase the discharge concentration of the additive contributing to this Outfall, the permittee shall notify the Indiana Department of Environmental Management as required in Part II.C.1 of this permit. The use of any new or changed water treatment additives or dosage rates shall not cause the discharge from any permitted outfall to exhibit chronic or acute toxicity. Acute and chronic aquatic toxicity information must be provided with any notification regarding any new or changed water treatment additives or dosage rates.

[3] The Storm Water Monitoring and Non Numeric Effluent Limits and the Storm Water Pollution Prevention Plan (SWPPP) requirements can be found in Part I.D. and I.E. of this permit.

[4] The permittee shall post a permanent marker on the stream bank at each outfall discharging directly to the Ohio River.

The marker shall consist at a minimum of the name of the establishment to which the permit was issued, the permit number, and the outfall number. The information shall be printed in letters not less than two inches in height.

The marker shall be a minimum of 2 feet by 2 feet and shall be a minimum of 3 feet above the ground.

[5] Effective April 1, 2022, there shall be no discharge of pollutants in bottom ash transport water.

[6] Flow is calculated based on maximum pump design capacities plus average daily rainfall and evaporation. Rainfall and evaporation calculations are based on annual rainfall and EPA coefficients of drainage/absorption/evaporation.

[7] An exceedance of either the monthly average or daily maximum concentration limitations for TSS which is demonstrated to be caused by the presence of algae in the effluent will not constitute a violation of the permit. In such cases, if visual examination reveals the presence of algae, the permittee may quantitatively demonstrate the presence of algae by subtracting the results of a volatile suspended solids test (as described in the current U.S. EPA approved version of the Standard Methods for the Examination of Water and Wastewater) from measure TSS along with a letter of explanation to accompany monthly DMR forms. Standard tests for TSS are to be performed at all other times.

[8] The permittee shall measure and report the identified metal in total recoverable form.

[9] Limitations developed using the Combined Wastestream Formula (CWF).

[10] Measurement frequency is twice monthly. Each measurement shall be taken with a minimum of five days between each sample over the course of a calendar month.

[11] Mercury monitoring shall be conducted bi-monthly in the months of February, April, June, August, October, and December of each year for the term of the permit using EPA Test Method 1631, Revision E.

Parameter	EPA Method	LOD	LOQ
Total Mercury	1631, Revision E	0.2 ng/l	0.5 ng/l

[12] Summer limitations apply from May 1 through November 30. Winter limitations apply from December 1 through April 30.

[13] The following EPA test methods and/or Standard Methods and associated LODs and LOQs are to be used in the analysis of the effluent samples. Alternative methods may be used if first approved by IDEM.

Parameter	Test Method	LOD	LOQ
Bromide	300.0, Rev 2.1	0.01	0.03

3. The permittee is authorized to discharge from the outfall listed below in accordance with the terms and conditions of this permit. The permittee is authorized to discharge from Outfall 003. The discharge is limited to non-contact cooling water and storm water runoff. Samples taken in compliance with the monitoring requirements below shall be taken at a point representative of the discharge but prior to entry into the Ohio River. Such discharge shall be limited and monitored by the permittee as specified below:

DISCHARGE LIMITATIONS [1][2][3][4][5]
Outfall 003

Table 1

Parameter	Quantity or Loading Monthly Average	Quantity or Loading Daily Maximum	Units	Quality or Concentration Monthly Average	Quality or Concentration Daily Maximum	Units	Monitoring Requirements Measurement Frequency	Monitoring Requirements Sample Type
Flow[6]	Report	Report	MGD	-------	---------	------	Daily	24 Hour Total
TRC								
Continuous[7][8]	-------	--------	------	0.016	0.038	mg/l	Daily	Grab
Intermittent[7][5]	-------	-------	------	--------	0.2	mg/l	Daily	Grab
Total Residual Oxidants [7][9][8]	----	--------	------	--------	0.06	mg/l	Daily	Grab
Chlorination/Bromination Frequency[7][10]	------	-------	------	--------	4	Times/Day	Monthly	Report
Chlorination/Bromination Dose Duration[7][10]	-------	-------	------	--------	40	Minutes/Dose	Monthly	Report
Chlorination/Bromination Duration/Day [7][10]	-------	-------	------	--------	120	Minutes/Day	Monthly	Report
Temperature [12][14]								
Intake[11]	--------	-------	------	--------	Report	°F	Daily	Continuous
Effluent[11]	--------	-------	------	--------	Report	°F	Daily	Continuous
Mixed River[13]	------	-------	------	--------	Report	°F	Daily	Report
ΔT[15][16]	--------	-------	------	--------	12	°F	Daily	Report

Table 2

Parameter	Quality or Concentration Daily Minimum	Quality or Concentration Daily Maximum	Units	Monitoring Requirements Measurement Frequency	Monitoring Requirements Sample Type
pH	6.0	9.0	s.u.	1 X Weekly	Grab

[1] See Part I.B. of the permit for the Narrative Water Quality Standards.

[2] In the event that changes are to be made in the use of water treatment additives including dosage rates beyond the approved estimated maximum dosage rates, or changes that could significantly change the nature of, or increase the discharge concentration of the additive contributing to this Outfall, the permittee shall notify the Indiana Department of Environmental Management as required in Part II.C.1 of this permit. The use of any new or changed water treatment additives or dosage rates shall not cause the discharge from any permitted outfall to exhibit chronic or acute toxicity. Acute and chronic aquatic toxicity information must be provided with any notification regarding any new or changed water treatment additives or dosage rates.

[3] See Part III of this permit for additional requirements and information for Alternate Thermal Effluent Limitations.

[4] The permittee shall post a permanent marker on the stream bank at each outfall discharging directly to the Ohio River.

The marker shall consist at a minimum of the name of the establishment to which the permit was issued, the permit number, and the outfall number. The information shall be printed in letters not less than two inches in height.

The marker shall be a minimum of 2 feet by 2 feet and shall be a minimum of 3 feet above the ground.

[5] The Storm Water Monitoring and Non Numeric Effluent Limits and the Storm Water Pollution Prevention Plan (SWPPP) requirements can be found in Part I.D. and I.E. of this permit.

[6] Flow is to be calculated based on maximum design capacities of each of the 12 circulating water pumps and the number of units in service.

[7] The effluent limitations for total residual chlorine (TRC) and total residual oxidants (TRO) for Outfall 003 applies to the peak concentration occurring during periods of chlorination/bromination.

Chlorination I Bromination shall be sequential; TRC or TRO shall not be detected from more than one discharge tunnel at anytime. Samples shall be taken in front of the discharge tunnel being chlorinated/dechlorinated and dechlorinated/debrominated at the time of sampling. Dilution by the discharge from tunnels not being treated by chlorination/bromination is allowed in calculating the TRC or TRO to be reported.

[8] The water quality based effluent limit (WQBEL) for chlorine is less than the limit of quantitation (LOQ) as defined below. Compliance with this permit will be demonstrated if the effluent concentrations measured are less than the LOQ.

If the measured concentration of chlorine is greater than the water quality based effluent limitations and above the respective LOD specified in the table below in any three (3) consecutive analyses, or any five (5) out of nine (9) analyses, then the discharger shall re-examine the chlorination/de-chlorination procedures.

Parameter	Test Method	LOD	LOQ
Chlorine	4500-Cl-D,E or 4500-Cl-G	0.02 mg/l	0.06 mg/l

Use the test methods for Total Residual Chlorine to determine Total Residual Oxidants. At present, two test methods are considered to be acceptable to IDEM,

amperometric (4500-Cl-D,E) and DPD colorimetric method (4500-Cl-G), to determine TRO concentrations at the level of 0.06 mg/l.

Case-Specific LOD/LOQ
The permittee may determine a case-specific LOD or LOQ using the analytical method specified above, or any other test method which is approved by the Commissioner prior to use. The LOD shall be derived by the procedure specified for method detection limits contained in 40 CFR Part 136, Appendix B, and the LOQ shall be set equal to 3.18 times the LOD. Other methods may be used if first approved by the Commissioner.

[9] If bromine is used less than two (2) hours per day for the station, the limit is 0.06 mg/l.

If the duration of bromination is greater than two (2) hours per day for the plant, debromination is required. Debromination is required on a stoichiometric basis to ensure that all bromine has been reduced to bromide.

[10] The monitoring for chlorination/bromination "frequency", "dose duration", and "duration/day" applies when the facility is applying chlorination and/or bromination.

[11] The water inlet and outlet temperatures are recorded continuously at the inlets and outlets of each of the six unit condensers at the plant. Those inlet and outlet temperatures are then averaged to determine the plants' daily inlet and outlet temperatures to be reported to IDEM.

[12] The following conditions apply for Temperature outside the mixing zone:

(1) There shall be no abnormal temperature changes that may adversely affect aquatic life unless caused by natural conditions.

(2) The normal daily and seasonal temperature fluctuations that existed before the addition of heat due to other than natural causes shall be maintained.

(3) The maximum temperature rise at any time or place above natural shall not exceed:

(i) five (5) degrees Fahrenheit (two and eight-tenths (2.8) degrees Celsius) in streams; and
(ii) three (3) degrees Fahrenheit (one and seven-tenths) (1.7) degrees Celsius) in lakes and reservoirs.

[13] The mixed river temperature is to be determined by employing the following mathematical model:

$$T_{MR} = T_u + \frac{Q_e(T_e - T_u)}{3553}$$

where:
T_{MR} = mixed river temperature (°F)
T_u = upstream river temperature (°F)
T_e = effluent temperature (°F)
Q_e = effluent flow (MGD)
3553 = one-half of the $Q_{7,10}$ low flow value of the receiving stream in MGD

[14] The maximum time interval between measurements is one minute. Temperature measurements shall be recorded continuously in one minute intervals, and the total number of minutes above the corresponding maximum limits in Table 1 for the twelve (12) months shall be reported. The twelve months shall include the current month and the previous eleven (11) months.

[15] $\Delta T = T_u - T_{mr}$

where:
T_{MR} = mixed river temperature (°F)
T_u = upstream river temperature (°F)

[16] The permittee is authorized to utilize thermal treatment for zebra mussel control, in accordance with the IDEM approval letter dated July 23, 1996 and the facility's thermal treatment plan.

Discharge resulting from the thermal treatment process should be scheduled to occur at such a time as to minimize the potential for human exposure.

Maximum discharge temperature is to be listed as a footnote on the DMR.

4. The permittee is required to collect intake water samples in conjunction with certain discharge samples. The intake structure is designated as 000 on the Discharge Monitoring Report (DMR) forms. Samples taken in compliance with the monitoring requirements below shall be taken at a point representative of the intake water characteristics. Such samples shall be monitored by the permittee as specified below:

DISCHARGE LIMITATIONS [1]
Intake Structure 000

Table 1

	Quantity or Loading			Quality or Concentration			Monitoring Requirements	
Parameter	Monthly Average	Daily Maximum	Units	Monthly Average	Daily Maximum	Units	Measurement Frequency	Sample Type
Aluminum[2]	-------	-------	------	Report	Report	mg/l	2 X Monthly[3]	Grab
Arsenic[2]	-------	-------	------	Report	Report	mg/l	2 X Monthly[3]	Grab
Cadmium[2]	-------	-------	------	Report	Report	mg/l	2 X Monthly[3]	Grab
T. Chromium[2]	-------	-------	------	Report	Report	mg/l	2 X Monthly[3]	Grab
Selenium[2]	-------	-------	------	Report	Report	mg/l	2 X Monthly[3]	Grab
Zinc[2]	-------	-------	------	Report	Report	mg/l	2 X Monthly[3]	Grab
Temperature[4]	--------	-------	------	--------	Report	°F	Daily	Continuous

[1] Gross, net, and intake values must be reported for select parameters at Outfall 002 and 003. The net result shall be calculated by subtracting the concentration value of the intake water, including any adjustments, from the concentration value of the gross discharge. The background values are to be calculated by using at a minimum of ten daily samples taken over a minimum of 30 days. The background levels are to be updated quarterly.

If the monitoring of the intake water indicates that the eligibility for net limitations has been altered or no longer exists, the permittee shall notify the Industrial NPDES Permits Section of the Office of Water Quality. In such a case, the permit may be modified or revoked and reissued, after public notice and opportunity for hearing to include appropriate effluent limitations.

[2] The permittee shall measure and report the identified metal in total recoverable form.

[3] Measurement frequency is twice monthly. Each measurement shall be taken with a minimum of five days between each sample over the course of a calendar month.

[4] The water inlet and outlet temperatures are recorded continuously at the inlets and outlets of each of the six unit condensers at the plant. Those inlet and outlet temperatures are then averaged to determine the plants' daily inlet and outlet temperatures to be reported to IDEM.

5. The permittee is authorized to discharge from the internal outfall listed below in accordance with the terms and conditions of this permit. The permittee is authorized to discharge from Internal Outfall 201. The discharge is limited to treated FGD wastewater. Samples taken in compliance with the monitoring requirements below shall be taken at a point representative of the discharge but prior to comingling with other wastestreams. Such discharge shall be limited and monitored by the permittee as specified below:

DISCHARGE LIMITATIONS

Internal Outfall 201

Table 1

	Quantity or Loading			Quality or Concentration			Monitoring Requirements	
Parameter	Monthly Average	Daily Maximum	Units	Monthly Average	Daily Maximum	Units	Measurement Frequency	Sample Type
Flow	Report	Report	MGD	---------	----------	-----	1 X Daily	24 Hour Total
TSS	-------	-------	------	30	100	mg/l	2 X Monthly	Grab
Arsenic[1]								
Interim	-------	-------	------	Report	Report	ug/l	1 X Weekly	Grab
Final[2]	-------	-------	------	8	11	ug/l	1 X Weekly	Grab
Selenium[1]								
Interim	-------	-------	------	Report	Report	ug/l	1 X Weekly	Grab
Final[2]	-------	-------	------	12	23	ug/l	1 X Weekly	Grab
Mercury[1][3]								
Interim	-------	-------	------	Report	Report	ng/l	6 X Yearly[4]	Grab
Final[2]	-------	-------	------	356	788	ng/l	1 X Weekly	Grab
Nitrate/Nitrite, as N								
Interim	-------	-------	------	Report	Report	mg/l	1 X Weekly	Grab
Final[2]	-------	-------	------	4.4	17.0	mg/l	1 X Weekly	Grab

Table 2

	Quality or Concentration			Monitoring Requirements	
Parameter	Daily Minimum	Daily Maximum	Units	Measurement Frequency	Sample Type
pH	6.0	9.0	s.u.	1 X Weekly	Grab

[1] The permittee shall measure and report the identified metal in total recoverable form.

[2] Final effluent limitations become effective April 1, 2022.

[3] Mercury monitoring shall be conducted using EPA Test Method 1631, Revision E.

Parameter	EPA Method	LOD	LOQ
Total Mercury	1631, Revision E	0.2 ng/l	0.5 ng/l

[4] Mercury monitoring shall be conducted bi-monthly in the months of February, April, June, August, October, and December of each year until the final effluent limitations become effective April 1, 2022.

6. The permittee is authorized to discharge storm water from the outfalls listed below in accordance with the terms and conditions of this permit. The permittee is authorized to discharge storm water from Outfalls 008S, 013S, 018S, 028S, and 030S. Samples taken in compliance with the monitoring requirements below shall be taken at a point representative of the discharge but prior to entry into Clifty Creek (008S, 013S, 030S), Unnamed Tributary to Clifty Creek (028S), or the Ohio River (018S). Such discharge shall be limited and monitored by the permittee as specified below:

DISCHARGE LIMITATIONS [1][2][3]

Parameter	Daily Maximum	Units	Monitoring Requirements Measurement Frequency	Sample Type
Flow	Report	MGD	1 X Yearly	Estimate Total
Total Suspended Solids	Report	mg/l	1 X Yearly	Grab
pH	Report	s.u.	1 X Yearly	Grab
Oil & Grease	Report	mg/l	1 X Yearly	Grab
COD	Report	mg/l	1 X Yearly	Grab
Ammonia, as N	Report	mg/l	1 X Yearly	Grab
Total Kjeldahl Nitrogen	Report	mg/l	1 X Yearly	Grab
Nitrate plus Nitrite Nitrogen	Report	mg/l	1 X Yearly	Grab
Total Phosphorus	Report	mg/l	1 X Yearly	Grab
Selenium[4]	Report	mg/l	1 X Yearly	Grab
Zinc[4]	Report	mg/l	1 X Yearly	Grab
Boron	Report	mg/l	1 X Yearly	Grab

[1] The Storm Water Monitoring and Non Numeric Effluent Limits and the Storm Water Pollution Prevention Plan (SWPPP) requirements can be found in Part I.D. and I.E. of this permit.

[2] All samples shall be collected from the discharge resulting from a storm event that is greater than 0.1 inches and at least 72 hours from the previously measurable (greater than 0.1 inch rainfall) storm event. There shall be a minimum of three (3) months between reported sampling events.

For each sample taken, the permittee shall record the duration and total rainfall of the storm event, the number of hours between beginning of the storm measured and the end of the previous measurable rain event, and the outside temperature at the time of sampling.

A grab sample shall be taken during the first thirty (30) minutes of the discharge (or as soon thereafter as practicable).

[3] The permittee shall post a permanent marker on the stream bank at Outfall 018S that discharges directly to the Ohio River.

The marker shall consist at a minimum of the name of the establishment to which the permit was issued, the permit number, and the outfall number. The information shall be printed in letters not less than two inches in height.

The marker shall be a minimum of 2 feet by 2 feet and shall be a minimum of 3 feet above the ground.

[4] The permittee shall measure and report the identified metal in <u>total recoverable</u> form.

B. NARRATIVE WATER QUALITY STANDARDS

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

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

   a. which will settle to form putrescent, or otherwise objectionable deposits;

   b. which are in amounts sufficient to be unsightly or deleterious;

   c. which produce color, visible oil sheen, odor, or other conditions in such degree as to create a nuisance;

   d. which are in amounts sufficient to be acutely toxic to, or to 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. 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. Monthly Reporting

   The permittee shall submit monitoring reports to the Indiana Department of Environmental Management (IDEM) containing results obtained during the previous month 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 month in which the

permit becomes effective. These reports shall include, but not necessarily be limited to, the Discharge Monitoring Report (DMR) and the Monthly Monitoring Report (MMR). All reports shall be submitted electronically by using the NetDMR applicationThe 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. Calculations that require averaging of measurements of daily values (both concentrations and mass) shall use an arithmetic mean, except the monthly average for *E. coli* shall be calculated as a geometric mean.

b. Daily effluent values (both mass and concentration) that are less than the LOQ that are used to determine the monthly average effluent level shall be accommodated in calculation of the average using statistical methods that have been approved by the Commissioner.

c. Effluent concentrations less than the LOD shall be reported on the Discharge Monitoring Report (DMR) forms as < (less than) the value of the LOD. For example, if a substance is not detected at a concentration of 0.1 µg/l, report the value as <0.1 µg/l.

d. Effluent concentrations greater than or equal to the LOD and less than the LOQ that are reported on a DMR shall be reported as the actual value and annotated on the DMR to indicate that the value is not quantifiable.

e. Mass discharge values which are calculated from concentrations reported as less than the value of the limit of detection shall be reported as less than the corresponding mass discharge value.

f. Mass discharge values that are calculated from effluent concentrations greater than the limit of detection shall be reported as the calculated value.

3. <u>Definitions</u>

a. "Monthly Average" 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.

b. "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 reasonably represents the calendar day for the purposes of sampling.

c. "Daily Maximum" means the maximum allowable daily discharge for any calendar day.

d. A "24-hour composite sample" means a sample consisting of at least 3 individual flow-proportioned samples of wastewater, taken by the grab sample method or by an automatic sampler, which are taken at approximately equally spaced time intervals for the duration of the discharge within a 24-hour period and which are combined prior to analysis. A flow-proportioned composite sample may be obtained by:

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

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

(3) the discharge flow rate of each individual sampling time is divided by the total flow value to determine its percentage of the total flow value,

(4) then multiply 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.

e. "Concentration" means the weight of any given material present in a unit volume of liquid. Unless otherwise indicated in this permit, concentration values shall be expressed in milligrams per liter (mg/l).

f. The "Regional Administrator" is defined as the Region 5 Administrator, U.S. EPA, located at 77 West Jackson Boulevard, Chicago, Illinois 60604.

g. The "Commissioner" is defined as the Commissioner of the Indiana Department of Environmental Management, who is located at the following address: 100 North Senate Avenue, Indianapolis, Indiana 46204.

h. "Limit of Detection" or "LOD" means 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.

i. "Limit of Quantitation" or "LOQ" means a measurement of the concentration of a contaminant obtained by using a specified laboratory procedure calibrated at a specified concentration above 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 sometimes called limit of quantification or quantification level.

j. "Method Detection Level" or "MDL" means 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 procedure set forth in 40 CFR 136, Appendix B. The method detection level or MDL is equivalent to the LOD.

k. "Grab Sample" means a sample which is taken from a wastestream on a one-time basis without consideration of the flow rate of the wastestream and without considerations of time.

4. Test Procedures

The analytical and sampling methods used shall conform to the current version of 40 CFR 136. 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 Commissioner 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, Parts 23, Water; Atmosphere 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.

5. Recording of Results

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

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

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

c. The date(s) and time(s) analyses were performed;

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

e. The analytical techniques or methods used; and

f. The results of such measurements and analyses.

6. 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 this monitoring shall be included in the calculation and reporting of the values required in the monthly Discharge Monitoring Report (DMR) and Monthly Monitoring Report (MMR). Such increased frequency shall also be indicated. Other monitoring data not specifically required in this permit (such as internal process or internal waste stream data) which is collected by or for the permittee need not be submitted unless requested by the Commissioner.

7. 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 years 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.

D. STORM WATER MONITORING AND NON-NUMERIC EFFLUENT LIMITS

Within twelve (12) months of the effective date of this permit, the permittee shall implement the non-numeric permit conditions in this Section of the permit for the entire site as it relates to storm water associated with industrial activity regardless which outfall the storm water is discharged from.

1. Control Measures and Effluent Limits

In the technology-based limits included in Part D.2-4., the term "minimize" means reduce and/or eliminate to the extent achievable using control measures (including best management practices) that are technologically available and economically practicable and achievable in light of best industry practice.

2. Control Measures

Select, design, install, and implement control measures (including best management practices) to minimize pollutant discharges that address the selection and design considerations in Part D.3 to meet the non-numeric effluent limits in Part D.4. The selection, design, installation, and implementation of these control measures must be in accordance with good engineering practices and manufacturer's specifications. Any deviation from the manufacturer's specifications shall be documented. If the control measures are not achieving their intended effect in minimizing pollutant discharges, the control measures must be modified as in accordance with the corrective action requirements in Part I.D.6. Regulated storm water discharges from the facility include storm water run-on that commingles with storm water discharges associated with industrial activity at the facility.

3. Control Measure Selection and Design Considerations

When selecting and designing control measures consider the following:

a. preventing storm water from coming into contact with polluting materials is generally more effective, and cost-effective, than trying to remove pollutants from storm water;

b. use of control measures in combination may be more effective than use of control measures in isolation for minimizing pollutants in storm water discharge;

c. assessing the type and quantity of pollutants, including their potential to impact receiving water quality, is critical to designing effective control measures that will achieve the limits in this permit;

d. minimizing impervious areas at the facility and infiltrating runoff onsite (including bioretention cells, green roofs, and pervious pavement, among other approaches), can reduce runoff and improve groundwater recharge and stream base flows in local streams, although care must be taken to avoid ground water contamination;

e. flow can be attenuated by use of open vegetated swales and natural depressions to reduce in-stream impacts of erosive flow;

f. conservation and/or restoration of riparian buffers will help protect streams from storm water runoff and improve water quality; and

g. use of treatment interceptors (e.g. swirl separators and sand filters) may be appropriate in some instances to minimize the discharge of pollutants.

4. Technology-Based Effluent Limits (BPT/BAT/BCT): Non-Numeric Effluent Limits

a. Minimize Exposure
Minimize the exposure of manufacturing, processing, and material storage areas (including loading and unloading, storage, disposal, cleaning, maintenance, and fueling operations) to rain, snow, snowmelt, and runoff. To the extent technologically available and economically practicable and achievable, either locate industrial materials and activities inside or protect them with storm resistant coverings in order to minimize exposure to rain, snow, snowmelt, and runoff (although significant enlargement of impervious surface area is not recommended). In minimizing exposure, pay particular attention to the following areas:

Loading and unloading areas: locate in roofed or covered areas where feasible; use grading, berming, or curbing around the loading area to divert run-on; locate the loading and unloading equipment and vehicles so that leaks are contained in existing containment and flow diversion systems.

Material storage areas: locate indoors, or in roofed or covered areas where feasible; install berms/dikes around these areas; use dry cleanup methods.

Note: Industrial materials do not need to be enclosed or covered if storm water runoff from affected areas will not be discharged to receiving waters.

b. Good Housekeeping

Keep clean all exposed areas that are potential sources of pollutants, using such measures as sweeping at regular intervals, store materials in appropriate containers, identify and control all on-site sources of dust to minimize stormwater contamination from the deposition of dust on areas exposed to precipitation, keep all dumpsters under cover or fit with a lid that must remain closed when not in use, and ensure that waste, garbage, and floatable debris are not discharged to receiving waters by keeping exposed areas free of such materials or by intercepting them before they are discharged.

Fugitive Dust Emissions. Minimize fugitive dust emissions from coal handling areas to minimize the tracking of coal dust offsite that could be discharged in stormwater through implementation of control measures such as the following, where determined to be feasible, (list not exclusive): installing specially designed tires; and washing vehicles in a designated area before they leave the site and controlling the wash water.

Delivery Vehicles. Minimize contamination of stormwater runoff from delivery vehicles arriving at the plant site. Implement procedures to inspect delivery vehicles arriving at the plant site as necessary to minimize discharges of pollutants in stormwater. Ensure the overall integrity of the body or container of the delivery vehicle and implement procedures to deal with leakage or spillage from delivery vehicles.

Fuel Oil Unloading Areas. Minimize contamination of precipitation or surface runoff from fuel oil unloading areas. Use containment curbs in unloading areas where feasible. In addition, ensure personnel familiar with spill prevention and response procedures are available to respond expeditiously in the event of a leak or spill during deliveries. Ensure that any leaks or spills are immediately contained and cleaned up, and use spill and overflow protection devices (e.g., drip pans, drip diapers, or other containment devices placed beneath fuel oil connectors to contain potential spillage during deliveries or from leaks at the connectors).

Chemical Loading and Unloading. Minimize contamination of precipitation or surface runoff from chemical loading and unloading areas. Use containment curbs at chemical loading and unloading areas to contain spills, where practicable. In addition, ensure personnel familiar with spill prevention and response procedures are available to respond expeditiously in the event of a leak or spill during deliveries. Ensure leaks and spills are immediately contained and cleaned up and, where practicable, load and unload in covered areas and store chemicals indoors.

Miscellaneous Loading and Unloading Areas. Minimize contamination of precipitation or surface runoff from loading and unloading areas through implementation of control measures such as the following, where determined to be feasible (list not exclusive): covering the loading area; grading, curbing, or berming around the loading area to divert run-on; locating the loading and unloading equipment and vehicles so that leaks are contained in existing containment and flow diversion systems; or equivalent procedures.

Liquid Storage Tanks. Minimize contamination of surface runoff from above-ground liquid storage tanks through implementation of control measures such as the following, where determined to be feasible, the following (list not exclusive): using protective guards around tanks; using containment curbs; installing spill and overflow protection; using dry cleanup methods; or equivalent measures.

Large Bulk Fuel Storage Tanks. Minimize contamination of surface runoff from large bulk fuel storage tanks. Use containment berms (or their equivalent). Comply with applicable state and federal laws, including Spill Prevention, Control and Countermeasure (SPCC) Plan requirements.

Spill Reduction Measures. Minimize the potential for an oil or chemical spill, or reference the appropriate part of the SPCC plan. Visually inspect as part of the routine facility inspection the structural integrity of all above-ground tanks, pipelines, pumps, and related equipment that may be exposed to stormwater, and make any necessary repairs immediately.

Oil-Bearing Equipment in Switchyards. Minimize contamination of surface runoff from oil-bearing equipment in switchyard areas. Use level grades and gravel surfaces to retard flows and limit the spread of spills, or collect runoff in perimeter ditches.

Residue-Hauling Vehicles. Inspect all residue-hauling vehicles for proper covering over the load, adequate gate sealing, and overall

integrity of the container body. Repair vehicles without load covering or adequate gate sealing, or with leaking containers or beds

Ash Loading Areas. Reduce or control the tracking of ash and residue from ash loading areas. Clear the ash building floor and immediately adjacent roadways of spillage, debris, and excess water as necessary to minimize discharges of pollutants in stormwater.

Areas Adjacent to Disposal Ponds or Landfills. Minimize contamination of surface runoff from areas adjacent to disposal ponds or landfills. Reduce ash residue that may be tracked on to access roads traveled by residue handling vehicles, and reduce ash residue on exit roads leading into and out of residue handling areas.

Landfills, Scrap Yards, Surface Impoundments, Open Dumps, General Refuse Sites. Minimize the potential for contamination of runoff from these areas.

c. Maintenance

Maintain all control measures which are used to achieve the effluent limits required by this permit in effective operating condition. Nonstructural control measures must also be diligently maintained (e.g., spill response supplies available, personnel appropriately trained). If control measures need to be replaced or repaired, make the necessary repairs or modifications as expeditiously as practicable.

d. Spill Prevention and Response Procedures

Minimize the potential for leaks, spills and other releases that may be exposed to storm water and develop plans for effective response to such spills if or when they occur. At a minimum, implement:

i. Procedures for plainly labeling containers (e.g., "Used Oil", "Spent Solvents", "Fertilizers and Pesticides", etc.) that could be susceptible to spillage or leakage to encourage proper handling and facilitate rapid response if spills or leaks occur;
ii. Preventive measures such as barriers between material storage and traffic areas, secondary containment provisions, and procedures for material storage and handling;
iii. Procedures for expeditiously stopping, containing, and cleaning up leaks, spills, and other releases. Employees who may cause, detect or respond to a spill or leak must be trained in these procedures and have necessary spill response equipment available. If possible, one of these individuals

should be a member of the storm water pollution prevention team;

iv. Procedures for notification of appropriate facility personnel, emergency response agencies, and regulatory agencies. State or local requirements may necessitate reporting spills or discharges to local emergency response, public health, or drinking water supply agencies. Contact information must be in locations that are readily accessible and available; and

v. A procedure for documenting all significant spills and leaks of oil or toxic or hazardous pollutants that actually occurred at exposed areas, or that drained to a storm water conveyance.

e. Erosion and Sediment Controls

Through the use of structural and/or non-structural control measures stabilize, and contain runoff from, exposed areas to minimize onsite erosion and sedimentation, and the resulting discharge of pollutants. Among other actions to meet this limit, place flow velocity dissipation devices at discharge locations and within outfall channels where necessary to reduce erosion and/or settle out pollutants. In selecting, designing, installing, and implementing appropriate control measures for erosion and sediment control, check out information from both the State and EPA websites. The following two websites are given as information sources:

http://www.in.gov/idem/stormwater/2363.htm
and
https://www.epa.gov/npdes/stormwater-discharges-industrial-activities

f. Management of Runoff

Divert, infiltrate, reuse, contain or otherwise reduce storm water runoff, to minimize pollutants in the discharge.

g. Salt Storage Piles or Piles Containing Salt

Enclose or cover storage piles of salt, or piles containing salt, used for deicing or other commercial or industrial purposes, including maintenance of paved surfaces. Implement appropriate measures (e.g., good housekeeping, diversions, containment) to minimize exposure resulting from adding to or removing materials from the pile. Piles do not need to be enclosed or covered if storm water runoff from the piles is not discharged.

h. Employee Training

Train all employees who work in areas where industrial material or activities are exposed to storm water, or who are responsible for implementing activities necessary to meet the conditions of this permit (e.g., inspectors, maintenance personnel), including all members of the Pollution Prevention Team.
The following personnel must understand the requirements of Part I.D. and Part I.E. of this permit and their specific responsibilities with respect to those requirements: Personnel who are responsible for the design, installation, maintenance, and/or repair of controls (including pollution prevention measures); personnel responsible for the storage and handling of chemicals and materials that could become contaminants in stormwater discharges; personnel who are responsible for conducting and documenting monitoring and inspections related to storm water; and personnel who are responsible for taking and documenting corrective actions as required in Part I.D.6.

Personnel must be trained in at least the following if related to the scope of their job duties (e.g., only personnel responsible for conducting inspections need to understand how to conduct inspections): an overview of what is in the SWPPP; spill response procedures, good housekeeping, maintenance requirements, and material management practices; the location of all controls on the site required by this permit, and how they are to be maintained; the proper procedures to follow with respect to the permit's pollution prevention requirements; and when and how to conduct inspections, record applicable findings, and take corrective actions.

i. Non-Storm water Discharges

Determine if any non-storm water discharges not authorized by an NPDES permit exist. Any non-storm water discharges discovered must either be eliminated or modified into this permit.

The following non-storm water discharges are authorized and should be documented when they occur in accordance with Part I.E.2.c. of the permit:

Discharges from fire-fighting activities;
Fire Hydrant flushings;
Potable water, including water line flushings;
Uncontaminated condensate from air conditioners, coolers, and other compressors and from the outside storage of refrigerated gases or liquids;

Irrigation drainage;
Landscape watering provided all pesticides, herbicides, and fertilizer have been applied in accordance with the approved labeling;
Pavement wash water where no detergents are used and no spills or leaks of toxic or hazardous material have occurred (unless all spilled material has been removed);
Routine external building washdown that does not use detergents;
Uncontaminated ground water or spring water;
Foundation or footing drains where flows are not contaminated with process materials;
Incidental windblown mist from cooling towers that collects on rooftops or adjacent portions of the facility, but not intentional discharges from cooling towers (e.g., "piped cooling tower blowdown or drains); and
Vehicle wash- waters where uncontaminated water without detergents or solvents is utilized;

j. Dust Generation and Vehicle Tracking of Industrial Materials

Minimize generation of dust and off-site tracking of raw, final, or waste materials.

5. Annual Review

At least once every 12 months, submit an Annual Report to the Industrial NPDES Permit Section which includes the following: the results or a summary of the past year's routine facility inspection documentation and quarterly visual assessment documentation; information copied or summarized from the corrective action documentation required (if applicable). If corrective action is not yet completed at the time of submission of this Annual Report, describe the status of any outstanding corrective action(s); and any incidents of noncompliance observed or, if there is no noncompliance, a certification signed by a responsible corporate officer, general partner or the proprietor, executive officer or ranking elected official, stating the facility is in compliance with this permit.

6. Corrective Actions – Conditions Requiring Review

a. If any of the following conditions occur, review the SWPPP to determine if and where revisions may need to be made to eliminate the condition and prevent its reoccurrence:

i. An unauthorized release or discharge (e.g., spill, leak, or discharge of non-stormwater not authorized by this NPDES permit) occurs at the facility;
ii. Control measures are not stringent enough for the discharge to meet applicable water quality standards;
iii. A required control measure was never installed, was installed incorrectly, or is not being properly operated or maintained;
iv. Visual assessments indicate obvious signs of stormwater pollution (e.g., color, odor, floating solids, settled solids, suspended solids, foam); or

b. If construction or a change in design, operation, or maintenance at the facility significantly changes the nature of pollutants discharged in storm water from the facility, or significantly increases the quantity of pollutants discharge the permittee must review and revise the selection, design, installation, and implementation of the control measures to determine if modifications are necessary to meet the effluent limits in this permit.

7. Corrective Action Deadlines

If additional changes are necessary, a new or modified control must be installed and made operational, or a repair completed, before the next storm event if possible, and within 30 calendar days from the time of discovery. If it is infeasible to complete the installation or repair within 30 calendar days, the reason(s) must be documented. A schedule for completing the work must also be identified, which must be done as soon as practicable after the 30-day timeframe but no longer than 120 days after discovery.

Where corrective actions result in changes to any of the controls or procedures documented in the SWPPP, the SWPPP must be modified accordingly within 30 calendar days of completing corrective action work.

These time intervals are not grace periods, but are schedules considered reasonable for documenting the findings and for making repairs and improvements. They are included in this permit to ensure that the conditions prompting the need for these repairs and improvements are not allowed to persist indefinitely.

8. Corrective Action Report

The existence of any of the conditions listed in Part I.D.6 must be documented within 24 hours of becoming aware of such condition. The following information must be included in the documentation:

a. Identification and description of the condition triggering the need for corrective action review. For any spills or leaks, include the following information: a description of the incident including material, date/time, amount, location, and reason for spill, and any leaks, spills or other releases that resulted in discharges of pollutants to waters of U.S., through stormwater or otherwise;

b. Date the condition was identified; and

c. A discussion of whether the triggering condition requires corrective action. For any spills or leaks, include response actions, the date/time clean-up completed, notifications made, and staff involved. Also include any measures taken to prevent the reoccurrence of such releases.

Document the corrective actions taken that occurred as a result of the conditions listed in Part I.D.6. within 30 days from the time of discovery of any of those conditions. Provide the dates when each corrective action was initiated and completed (or is expected to be completed). If applicable, document why it is infeasible to complete necessary installations or repairs within the 30-day timeframe and document the schedule for installing the controls and making them operational as soon as practicable after the 30-day timeframe.

9. Inspections

a. Routine Facility Inspections

During normal facility operating hours conduct inspections of areas of the facility covered by the requirements in this permit, including the following:

i. Areas where industrial materials or activities are exposed to stormwater;
ii. Areas identified in the SWPPP and those that are potential pollutant sources;
iii. Areas where spills and leaks have occurred in the past 3 years.
iv. Discharge points; and
v. Control measures used to comply with the effluent limits contained in this permit.

Inspections must be conducted at least quarterly (i.e., once each calendar quarter), or in some instances more frequently (e.g., monthly), as appropriate. Increased frequency may be appropriate for some types of equipment, processes and stormwater control measures, or areas of the facility with significant activities and

materials exposed to stormwater. At least one of the routine inspections must be conducted during a period when a stormwater discharge is occurring.

Inspections must be performed by qualified personnel with at least one member of the stormwater pollution prevention team participating. Inspectors must consider the results of visual and analytical monitoring (if any) for the past year when planning and conducting inspections.

During the inspection examine or look out for the following:

vi. Industrial materials, residue or trash that may have or could come into contact with stormwater;
vii. Leaks or spills from industrial equipment, drums, tanks and other containers;
viii. Offsite tracking of industrial or waste materials, or sediment where vehicles enter or exit the site;
ix. Tracking or blowing of raw, final or waste materials from areas of no exposure to exposed areas; and
x. Control measures needing replacement, maintenance or repair.

During an inspection occurring during a stormwater discharge, control measures implemented to comply with effluent limits must be observed to ensure they are functioning correctly. Discharge outfalls must also be observed during this inspection. If such discharge locations are inaccessible, nearby downstream locations must be inspected.

b. Routine Facility Inspection Documentation

The findings of facility inspections must be documented and the report maintained with the SWPPP. Findings must be summarized in the annual report. Document all findings, including but not limited to, the following information:

i. The inspection date and time;
ii. The name(s) and signature(s) of the inspector(s);
iii. Weather information;
iv. All observations relating to the implementation of control measures at the facility, including:
    (1) A description of any discharges occurring at the time of the inspection;
    (2) Any previously unidentified discharges and/or pollutants from the site;

(3) Any evidence of, or the potential for, pollutants entering the drainage system;
(4) Observations regarding the physical condition of and around all outfalls including any flow dissipation devices, and evidence of pollutants in discharges and/or the receiving water;
(5) Any control measures needing maintenance, repairs, or replacement;

v. Any additional control measures needed to comply with the permit requirements; and
vi. Any incidents of noncompliance observed.

Any corrective action required as a result of a routine facility inspection must be performed consistent with Part I.D.6. of this permit.

If the discharge was visual assessed, as required in Part I.D.9.c., during the facility inspection, include the results of the assessment with the report required in Part I.D.9.a., as long as all components of both types of inspections are included in the report.

c. Quarterly Visual Assessment Procedures

Once each quarter for the entire permit term, collect a stormwater sample from each outfall and conduct a visual assessment of each of these samples. These samples are not required to be collected consistent with 40 CFR Part 136 procedures but should be collected in such a manner that the samples are representative of the stormwater discharge. Guidance on monitoring is available at:

http://water.epa.gov/polwaste/npdes/stormwater/EPA-Multi-Sector-General-Permit-MSGP.cfm

The visual assessment must be made:

i. Of a sample in a clean, clear glass, or plastic container, and examined in a well-lit area;
ii. On samples collected within the first 30 minutes of an actual discharge from a storm event. If it is not possible to collect the sample within the first 30 minutes of discharge, the sample must be collected as soon as practicable after the first 30 minutes and document why it was not possible to take samples within the first 30 minutes. In the case of snowmelt, samples must be taken during a period with a measurable discharge from the site; and
iii. For storm events, on discharges that occur at least 72 hours (3 days) from the previous discharge. The 72-hour (3-day) storm

interval does not apply if you document that less than a 72-hour (3-day) interval is representative for local storm events during the sampling period.

Visually inspect or observe the sample for the following water quality characteristics:

iv. Color;
v. Odor;
vi. Clarity (diminished);
vii. Floating solids;
viii. Settled solids;
ix. Suspended solids;
x. Foam;
xi. Oil sheen; and
xii. Other obvious indicators of stormwater pollution.

Whenever the visual assessment shows obvious signs of stormwater pollution, initiate the corrective action procedures in Part I.D.6.

d. Quarterly Visual Assessment Documentation

Results of visual assessments must be documented and the documentation maintained onsite with the SWPPP. Documentation of the visual assessment must include, but is not be limited to:

i. Sample location(s);
ii. Sample collection date and time, and visual assessment date and time for each sample;
iii. Personnel collecting the sample and performing visual assessment, and their signatures;
iv. Nature of the discharge (i.e., runoff or snowmelt);
v. Results of observations of the stormwater discharge;
vi. Probable sources of any observed stormwater contamination; and
vii. If applicable, why it was not possible to take samples within the first 30 minutes.

Any corrective action required as a result of a quarterly visual assessment must be performed consistent with Part I.D.6. of this permit.

e. Exceptions to Quarterly Visual Assessments

i. Adverse Weather Conditions: When adverse weather conditions prevent the collection of samples during the quarter,

take a substitute sample during the next qualifying storm event. Documentation of the rationale for no visual assessment for the quarter must be included with the SWPPP records. Adverse conditions are those that are dangerous or create inaccessibility for personnel, such as local flooding, high winds, or electrical storms, or situations that otherwise make sampling impractical, such as extended frozen conditions.

ii. Snow: In areas subject to snow, at least one quarterly visual assessment must capture snowmelt discharge, taking into account the exception described above for climates with irregular stormwater runoff.

E. STORM WATER POLLUTION PREVENTION PLAN

1. Development of Plan

Within 12 months from the effective date of this permit, the permittee is required to revise and update the current Storm Water Pollution Prevention Plan (SWPPP) for the permitted facility. The SWPPP does not contain effluent limitations. The SWPPP is intended to document the selection, design, and installation of control measures. As distinct from the SWPPP, the additional documentation requirements are intended to document the implementation (including inspection, maintenance, monitoring, and corrective action) of the permit requirements.

2. Contents

The plan shall include, at a minimum, the following items:

a. Pollution Prevention Team – The SWPPP must identify the staff members (by name or title) that comprise the facility's stormwater pollution prevention team as well as their individual responsibilities. The stormwater pollution prevention team is responsible for overseeing development of the SWPPP, any later modifications to it, and for compliance with permit Parts I.D. and I.E. of this permit. Each member of the stormwater pollution prevention team must have ready access to either an electronic or paper copy of applicable portions of this permit, the most updated copy of the SWPPP, other relevant documents or information that must be kept with the SWPPP.

b. Site Description – As a minimum, the plan shall contain the following:

i. *Activities at the Facility.* Provide a description of the nature of the industrial activities at the facility.

ii. *General location map*. Provide a general location map (e.g., U.S. Geological Survey (USGS) quadrangle map) with enough detail to identify the location of the facility and all receiving waters for the stormwater discharges.

iii. *Site map*. Provide a map showing:

(A) Boundaries of the property and the size of the property in acres;

(B) Location and extent of significant structures and impervious surfaces;

(C) Directions of stormwater flow (use arrows);

(D) Locations of all stormwater control measures;

(E) Locations of all receiving waters, including wetlands, in the immediate vicinity of the facility. Indicate which waterbodies are listed as impaired and which are identified by the State of Indiana or EPA as Tier 2 or Tier 2.5 waters;

(F) Locations of all stormwater conveyances including ditches, pipes, and swales;

(G) Locations of potential pollutant sources identified;

(H) Locations where significant spills or leaks identified have occurred;

(I) Locations of all stormwater monitoring points;

(J) Locations of stormwater inlets and outfalls, with a unique identification code for each outfall (e.g., Outfall No. 1, No. 2), indicating if you are treating one or more outfalls as "substantially identical", and an approximate outline of the areas draining to each outfall;

(K) If applicable, municipal separate storm sewer systems and where the stormwater discharges to them;

(L) Areas of federally-listed critical habitat for endangered or threatened species, if applicable.

(M) Locations of the following activities where such activities are exposed to precipitation:

(a) fueling stations;

(b) vehicle and equipment maintenance and/or cleaning areas;

(c) loading/unloading areas;

(d) locations used for the treatment, storage, or disposal of wastes;

(e) liquid storage tanks;

(f) processing and storage areas;

(g) immediate access roads and rail lines used or traveled by carriers of raw materials, manufactured products, waste material, or by-products used or created by the facility;

(h) transfer areas for substances in bulk; and
(i) machinery
(j) locations and sources of run-on to the site from adjacent property that contains significant quantities of pollutants.

(N) Document in the SWPPP the locations of any of the following activities or sources that may be exposed to precipitation or surface runoff: storage tanks, scrap yards, and general refuse areas; short- and long-term storage of general materials (including but not limited to supplies, construction materials, paint equipment, oils, fuels, used and unused solvents, cleaning materials, paint, water treatment chemicals, fertilizer, and pesticides); landfills and construction sites; and stock pile areas (e.g., coal or limestone piles).

c. Potential Pollutant Sources:

The SWPPP must document areas at the facility where industrial materials or activities are exposed to stormwater or from which allowable non-stormwater discharges may be released. Industrial materials or activities include, but are not limited to: material handling equipment or activities; industrial machinery; raw materials; industrial production and processes; and intermediate products, by-products, final products, and waste products. *Material handling activities* include, but are not limited to: the storage, loading and unloading, transportation, disposal, or conveyance of any raw material, intermediate product, final product or waste product. For structures located in areas of industrial activity, be aware that the structures themselves are potential sources of pollutants. This could occur, for example, when metals such as aluminum or copper are leached from the structures as a result of acid rain.

For each area identified, the description must include:

i. *Activities in the Area.* A list of the industrial activities exposed to stormwater (e.g., material storage; equipment fueling, maintenance, and cleaning; cutting steel beams).
ii. *Pollutants.* A list of the pollutant(s) or pollutant constituents (e.g., crankcase oil, zinc, sulfuric acid, and cleaning solvents) associated with each identified activity, which could be exposed to rainfall or snowmelt and could be discharged from the facility. The pollutant list must include all significant materials that have been handled, treated, stored, or disposed, and that have been

exposed to stormwater in the three years prior to the date the SWPPP is prepared or amended.

iii. *Spills and Leaks.* The SWPPP must document where potential spills and leaks could occur that could contribute pollutants to stormwater discharges, and the corresponding outfall(s) that would be affected by such spills and leaks. The SWPPP must document all significant spills and leaks of oil or toxic or hazardous pollutants that actually occurred at exposed areas, or that drained to a stormwater conveyance, in the three years prior to the date the SWPPP is prepared or amended.

iv. *Non-Storm water Discharges* – The SWPPP must document that you have evaluated for the presence of non-storm water discharges not authorized by an NPDES permit. Any non-storm water discharges have either been eliminated or incorporated into this permit. Documentation of non-storm water discharges shall include:

A written non-storm water assessment, including the following:

(1) The date of the evaluation;
(2) A description of the evaluation criteria used;
(3) A list of the outfalls or onsite drainage points that were directly observed during the evaluation; and
(4) The action(s) taken, such as a list of control measures used to eliminate unauthorized discharge(s), or documentation that a separate NPDES permit was obtained. For example, a floor drain was sealed, a sink drain was re-routed to sanitary, or an NPDES permit application was submitted for an unauthorized cooling water discharge.

v. Salt Storage - The location of any storage piles containing salt used for deicing or other commercial or industrial purposes must be documented in the SWPPP.

vi. Sampling Data - All stormwater discharge sampling data collected at the facility during the previous permit term must be summarized in the SWPPP.

vii. Description of Control Measures to Meet Technology-Based Effluent Limits - The location and type of control measures you have specifically chosen and/or designed to comply with Permit Part I.D. must be documented in the SWPPP. Regarding the control measures, the following must be documented as appropriate:

(a) How the selection and design considerations of control measures were addressed.

(b) How the control measures address the pollutant sources identified.

d. Schedules and Procedures

The following must be documented in the SWPPP:

i. Good Housekeeping – A schedule for regular pickup and disposal of waste materials, along with routine inspections for leaks and conditions of drums, tanks and containers;

ii. Maintenance – Preventative maintenance procedures, including regular inspections, testing, maintenance and repair of all control measures to avoid situations that may result in leaks, spills, and other releases, and any back-up practices in place should a runoff event occur while a control measure is off-line. The SWPPP shall include the schedule or frequency for maintaining all control measures used to comply with the storm water requirements.

iii. Spill Prevention and Response Procedures – Procedures for preventing and responding to spills and leaks, including notification procedures. For preventing spills, include in the SWPPP the control measures for material handling and storage, and the procedures for preventing spills that can contaminate stormwater. Also specify cleanup equipment, procedures and spill logs, as appropriate, in the event of spills. You may reference the existence of other plans for Spill Prevention Control and Countermeasure (SPCC) developed for the facility under Section 311 of the CWA or BMP programs otherwise required by an NPDES permit for the facility, provided that you keep a copy of that other plan onsite and make it available for review;

iv. Erosion and Sediment Control – If you use polymers and/or other chemical treatments as part of the controls, identify the polymers and/or chemicals used and the purpose; and

v. Employee Training – The elements of the employee training plan shall include all, but not be limited to, the requirements set forth in Permit Part.I.D., and also the following:

(1) The content of the training;
(2) The frequency/schedule of training for employees who have duties in areas of industrial activities subject to this permit;
(3) A log of the dates on which specific employees received training.

e. Pertaining to Inspections

Document in the SWPPP the procedures for performing, as appropriate, the types of inspections specified by this permit, including:

i. Routine facility inspections and;
ii. Quarterly visual assessment of stormwater discharges.

For each type of inspection performed, the SWPPP must identify:

iii. Person(s) or positions of person(s) responsible for inspection;
iv. Schedules for conducting inspections, including tentative schedule for irregular stormwater runoff discharges; and
v. Specific items to be covered by the inspection, including schedules for specific outfalls.

f. Pertaining to Monitoring

Document in the SWPPP the procedures for conducting the five types of analytical monitoring specified by this permit, where applicable to the facility, including Benchmark monitoring;

For each type of monitoring, the SWPPP must document:

i. Locations where samples are collected, including any determination that two or more outfalls are substantially identical;
ii. Parameters for sampling and the frequency of sampling for each parameter;
iii. Schedules for monitoring at the facility, including schedule for alternate monitoring periods for climates with irregular stormwater runoff;
iv. Any numeric control values (effluent limitations guidelines, TMDL-related requirements, or other requirements) applicable to discharges from each outfall; and
v. Procedures (e.g., responsible staff, logistics, laboratory to be used) for gathering storm event data.

g. General Requirements – The SWPPP must meet the following general requirements:

i. The SWPPP shall be prepared in accordance with good engineering practices and to industry standards. The SWPPP may be developed by either a person on the staff or a third party, and it shall be certified in accordance with the signature

requirements, under Part II.C.6.

ii. Retain a complete copy of the current SWPPP required by this permit at the facility in any accessible format. A complete SWPPP includes any documents incorporated by reference and all documentation supporting parts I.D. and I.E. of this permit, as well as the signed and dated certification page. Regardless of the format, the SWPPP must be immediately available to facility employees, EPA, a state or tribe, the operator of an MS4 receiving discharges from the site; and representatives of the U.S. Fish and Wildlife Service (USFWS) or the National Marine Fisheries Service (NMFS) at the time of an onsite inspection. The current SWPPP or certain information from the current SWPPP must also be made available to the public (except any confidential business information (CBI) or restricted information, but clearly identify those portions of the SWPPP that are being withheld from public access.

iii. Where the SWPPP refers to procedures in other facility documents, such as a Spill Prevention, Control and Countermeasure (SPCC) Plan or an Environmental Management System (EMS), copies of the relevant portions of those documents must be kept with the SWPPP.

F. REOPENING CLAUSES

This permit may be modified, or alternately, revoked and reissued, after public notice and opportunity for hearing:

1. to comply with any applicable effluent limitation or standard issued or approved under 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.

2. to incorporate any of the reopening clause provisions cited at 327 IAC 5-2-16.

3. to include a case-specific Limit of Detection (LOD) and/or Limit of Quantitation (LOQ). The permittee must demonstrate that such action is warranted in accordance with the procedures specified under Appendix B, 40 CFR Part 136, using the most sensitive analytical methods approved by EPA under 40 CFR Part 136, or approved by the Commissioner.

4. to comply with any applicable standards, regulations and requirements issued or approved under section 316(b) of the Clean Water Act. The required studies and information collection activities may take 36 months or longer to complete.

5. to incorporate IDEM approved Alternative Thermal Effluent Limitations (ATELs) supported by an updated 316(a) Demonstration. The required studies and information collection activities may take 36 months or longer to complete.

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 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 an application for renewal of this permit in accordance with 327 IAC 5-2-8(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. Pursuant to 327 IAC 5-3-2(a)(2), 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.
Under the terms of the proposed Federal E-Reporting Rule, the permittee may be required to submit its application for renewal electronically in the future.

4. Permit 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; and

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.

5. 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 a permanent reduction or elimination of any discharge controlled by the permit, e.g., plant closure, termination of discharge by connection to a POTW, a change in state law that requires the reduction or elimination of the discharge, or information indicating that the permitted 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
1. 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.

6. 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 invasion of other private 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.

7. 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.

8. 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.

9. 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.

10. 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 Environmental Rules 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 performed under IC 13-14-2-2 commits a class C infraction.

Pursuant to IC 13-30-10-1.5(k), a person who willfully or recklessly violates any NPDES permit condition or filing requirement, any applicable standards or limitations of IC 13-18-3-2.4, IC 13-18-4-5, IC 13-18-8, IC 13-18-9, IC 13-18-10, IC 13-18-12, IC 13-18-14, IC 13-18-15, or IC 13-18-16, or who knowingly makes any false material statement, representation, or certification in any NPDES form, notice, or report commits a Class C misdemeanor.

Pursuant to IC 13-30-10-1.5(l), an offense under IC 13-30-10-1.5(k) is a Class D felony if the offense results in damage to the environment that renders the environment unfit for human or vertebrate animal life. An offense under IC 13-30-10-1.5(k) is a Class C felony if the offense results in the death of another person.

11. 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 13-30-10-1, provides that any person who knowingly or intentionally (a) destroys, alters, conceals, or falsely certifies a record that is required to be maintained under the terms of a permit issued by the department; and may be used to determine the status of compliance, (b) renders inaccurate or inoperative a

recording device or a monitoring device required to be maintained by a permit issued by the department, or (c) falsifies testing or monitoring data required by a permit issued by the department commits a Class B misdemeanor.

12. 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.

13. Wastewater treatment plant and certified operators

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.

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 operator" 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.

14. Construction Permit

In accordance with IC 13-14-8-11.6, a discharger is not required to obtain a state permit for the modification or construction of a water pollution treatment or control facility if the discharger has an effective NPDES permit.

If the discharger modifies their existing water pollution treatment or control facility or constructs a new water pollution treatment or control facility for the treatment or control of any new influent pollutant or increased levels of any existing pollutant, then, within thirty (30) days after commencement of operation, the discharger shall file with the Department of Environment Management a notice of installation for the additional pollutant control equipment and a design summary of any modifications.

The notice and design summary shall be sent to the Office of Water Quality, Industrial NPDES Permits Section, 100 North Senate Avenue, Indianapolis, IN 46204-2251.

15. 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.

16. 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. Proper Operation and Maintenance

The permittee shall at all times maintain in good working order and efficiently operate all facilities and systems (and related appurtenances) for the collection and treatment which are installed or used by the permittee and which are necessary for achieving compliance with the terms and conditions of this permit in accordance with 327 IAC 5-2-8(9).

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.

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

c. Bypasses, as defined in (a) above, are prohibited, and the Commissioner may take enforcement action against a permittee for bypass, unless the following occur:

(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.e; or

(4) The condition under Part II.B.2.b above is met.

d. 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.

e. 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 an unanticipated bypass that exceeds any effluent limitations in the permit within 24 hours of becoming aware of the bypass noncompliance. 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 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 e-mail submittal is provided 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-mails should be sent to wwreports@idem.in.gov.

f. 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.c. The Commissioner may impose any conditions determined to be necessary to minimize any adverse effects.

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 section, 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 properly operated;

(3) The permittee complied with any remedial measures required under Part II.A.2; and

(4) The permittee submitted notice of the upset as required in the "Twenty-Four Hour 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. The discharge of pollutants in treated wastewater is allowed in compliance with the applicable effluent limitations in Part I. of this permit.

C. REPORTING REQUIREMENTS

1. Planned Changes in Facility or Discharge

Pursuant to 327 IAC 5-2-8(11)(F), the permittee shall give notice to the Commissioner as soon as possible of any planned physical alterations or additions to the permitted facility. In this context, permitted facility refers to a point source discharge, not a wastewater treatment facility. Notice is required only when either of the following applies:

a. The alteration or addition may meet one of the criteria for determining whether the facility is a new source as defined in 327 IAC 5-1.5.

b. The alteration or addition could significantly change the nature of, or increase the quantity of, pollutants discharged. This notification applies to pollutants that are subject neither to effluent limitations in Part I.A. nor to notification requirements in Part II.C.9. of this permit.

Following such notice, the permit may be modified to revise existing pollutant limitations and/or to specify and limit any pollutants not previously limited.

2. Monitoring Reports

Pursuant to 327 IAC 5-2-8(10) and 327 IAC 5-2-13 through 15, monitoring results shall be reported at the intervals and in the form specified in "Monthly Reporting", Part I.C.2.

3. Twenty-Four Hour Reporting Requirements

Pursuant to 327 IAC 5-2-8(11)(C), the permittee shall orally report to the Commissioner information on the following types of noncompliance within 24 hours from the time permittee becomes aware of such noncompliance. If the noncompliance meets the requirements of item b (Part II.C.3.b) or 327 IAC 2-6.1, then the report shall be made within those prescribed time frames. However, under 327 IAC 2-6.1-3(1), when the constituents of the discharge that is in noncompliance 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 noncompliance 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 noncomplying circumstances;

c. Any upset (as defined in Part II.B.3 above) that causes an exceedance of any effluent limitation in the permit;

d. Violation of a maximum daily discharge limitation for any of the following toxic pollutants: mercury, arsenic, or selenium

The permittee can make the oral reports by calling (317)232-8670 during regular business hours or by calling (317) 233-7745 ((888)233-7745 toll free in Indiana) during non-business hours. A written submission shall also be provided within 5 days of the time the permittee becomes aware of the circumstances. 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 and eliminate the noncompliance and prevent its recurrence. The Commissioner may waive the written report on a case-by-case basis if the oral report has been received within 24 hours. Alternatively the permittee may submit a "Bypass/Overflow Report" (State Form 48373) or a "Noncompliance 24-Hour Notification Report" (State Form 54215), whichever is appropriate, to IDEM at (317) 232-8637 or wwreports@idem.in.gov. If a complete fax or e-mail submittal is sent within 24 hours of the time that the permittee became aware of the occurrence, then the fax report will satisfy both the oral and written reporting requirements.

Upon its effectiveness, the proposed Federal E-Reporting Rule will require these reports to be submitted electronically.

4. Other Compliance/Noncompliance Reporting

Pursuant to 327 IAC 5-2-8(11)(D), the permittee shall report any instance of noncompliance not reported under the "Twenty-Four Hour Reporting Requirements" in Part II.C.3, or any compliance schedules at the time the pertinent Discharge Monitoring Report is submitted. The report shall contain the information specified in Part II.C.3;

The permittee shall also give advance notice to the Commissioner of any planned changes in the permitted facility or activity which may result in noncompliance with permit requirements; and

All 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 14 days following each schedule date.

Upon its effectiveness, the proposed Federal E-Reporting Rule will require these reports to be submitted electronically.

5. Other Information

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

6. Signatory Requirements

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) The manager of one (1) or more manufacturing, production, or operating facilities provided the manager is authorized to make management decisions that govern the operation of the regulated facility including having the explicit or implicit duty to make major capital investment recommendations, and initiating and directing other comprehensive measures to assure long-term environmental compliance with environmental laws and regulations; the manager can ensure that the necessary systems are established or actions taken to gather complete and accurate information for permit application requirements; and where 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 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. Electronic Signatures. If documents described in this section are submitted electronically by or on behalf of the NPDES-regulated facility, any person providing the electronic signature for such documents shall meet all relevant requirements of this section, and shall ensure that all of the relevant requirements of 40 CFR part 3 (including, in all cases, subpart D to part 3) (Cross-Media Electronic Reporting) and 40 CFR part 127 (NPDES Electronic Reporting Requirements) are met for that submission.

d. Certification. Any person signing a document identified under Part II.C.9., 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 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, 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. Changes in Discharge of Toxic Substances

Pursuant to 40 CFR 122.42(a)(1), 40 CFR 122.42(a)(2), and 327 IAC 5-2-9, the permittee shall notify the Commissioner as soon as it knows or has reason to believe:

a. That any activity has occurred or will occur which would result in the discharge, on a routine or frequent basis, of any pollutant identified as toxic pursuant to Section 307(a) of the Clean Water Act which is not limited in the permit, if that discharge will exceed the highest of the following "notification levels."

(1) One hundred micrograms per liter (100µg/l);

(2) Two hundred micrograms per liter (200 µg/l) for acrolein and acrylonitrile; five hundred micrograms per liter (500µg/l) for 2,4-dinitrophenol and 2-methyl-4,6-dinitrophenol; and one milligram per liter (1mg/l) for antimony;

(3) Five (5) times the maximum concentration value reported for that pollutant in the permit application in accordance with 40 CFR 122.21(g)(7); or

(4) A notification level established by the Commissioner on a case-by-case basis, either at his own initiative or upon a petition by the permittee. This notification level may exceed the level specified in subdivisions (1), (2), or (3) but may not exceed the level which can be achieved by the technology-based treatment

requirements applicable to the permittee under the CWA (see 327 IAC 5-5-2).

b. That any activity has occurred or will occur which would result in any discharge, on a non-routine or infrequent basis, of a toxic pollutant which is not limited in the permit, if that discharge will exceed the highest of the following "notification levels":

(1) Five hundred micrograms per liter (500 µg/l);

(2) One milligram per liter (1 mg/l) for antimony;

(3) Ten (10) times the maximum concentration value reported for that pollutant in the permit application in accordance with Sec. 122.21(g)(7).

(4) A notification level established by the Commissioner on a case-by-case basis, either at his own initiative or upon a petition by the permittee. This notification level may exceed the level specified in subdivisions (1), (2), or (3) but may not exceed the level which can be achieved by the technology-based treatment requirements applicable to the permittee under the CWA (see 327 IAC 5-5-2).

c. That it has begun or expects to begin to use or manufacture, as an intermediate or final product or byproduct, any toxic pollutant which was not reported in the permit application under 40 CFR 122.21(g)(9).

PART III
Other Requirements

A. Thermal Effluent Requirements

The thermal effluent requirements can be found in Part I.A.4 of the permit. The facility is currently finishing a 316(a) study and will submit a modification request for a new 316(a) Alternate Thermal Effluent Limitations. The study and modification request is due by July 7, 2018.

B. Polychlorinated Biphenyl

There shall be no discharge of polychlorinated biphenyl (PCBs) compounds such as those commonly used for transformer fluid.

Many electrical transformers manufactured prior to 1978 contained PCBs. Therefore, in order to determine compliance with the PCB prohibition, the permittee shall provide the following PCB* data for Outfall[s] 001, 002, and 003, within twelve (12) months of the effective date of the permit. The permittee shall submit the data to the Office of Water Quality, Industrial NPDES Permits Section, 100 North Senate Avenue, Indianapolis, Indiana 46204 2251.

Parameter	Test Method	LOD	LOQ
PCBs*	608	0.1 ug/l	0.3 ug/l

*PCB-1242, PCB-1254, PCB-1221, PCB-1232, PCB-1248, PCB-1260, and PCB-1016

Part IV
Cooling Water Intake Structures

A. Best Technology Available (BTA) Determination

In accordance with 40 CFR 401.14, the location, design, construction and capacity of cooling water intake structures of any point source for which a standard is established pursuant to section 301 or 306 of the Act shall reflect the best technology available for minimizing adverse environmental impact.

The EPA promulgated a Clean Water Act (CWA) section 316(b) regulation on August 15, 2014, that establishes standards for cooling water intake structures. 79 Fed. Reg. 48300-439 (August 15, 2014). The regulation establishes best technology available standards to reduce impingement and entrainment of aquatic organisms at existing power generation and manufacturing facilities and it became effective on October 14, 2014.

For permits expiring prior to 45 months from the effective date (before July 2018), the permittee can (1) negotiate an alternative schedule for submitting required information with the Director (IDEM) after demonstrating need, or (2) request waiver(s) for submitting required information. An alternative schedule for submission of information required under the current CWA section 316(b), or waiver(s) of submittal requirements shall be reviewed by EPA Region 5 and approved by IDEM. Upon approval of such alternative schedules and /or waivers, or until the time the required information/reports are submitted and the permit is renewed or modified following public notice, the IDEM is required to make a BTA determination using Best Professional Judgment (BPJ) to comply with CWA Section 316(b) based on existing information. The BTA determination is subject to change after the required information is submitted in accordance with the federal regulations effective October 14, 2014.

Based on available information, IDEM has made a Best Technology Available (BTA) determination that the existing cooling water intake structures represent best technology available to minimize adverse environmental impact in accordance with Section 316(b) of the federal Clean Water Act (33 U.S.C. section 1326) at this time. This determination is based on Best Professional Judgment (BPJ) and will be reassessed at the next permit reissuance to ensure that the CWISs continue to meet the requirements of Section 316(b) of the federal Clean Water Act (33 U.S.C. section 1326).

B. Permit Requirements

In accordance with the recently promulgated rules at 40 CFR 122 and 40 CFR 125, the owner or operator of a facility that has CWIS with a Design Intake Flow (DIF) or Actual Intake Flow (AIF) > 125 MGD must submit the information required at 40 CFR 122.21(r)(2) through (13), including all of the associated supporting documentation and/or studies, no later than July 14, 2018, unless an alternate schedule for submission is approved or a waiver of a particular requirement is requested and granted under 40 CFR 125.95. In

addition, the permittee shall comply with requirements below:

1. In accordance with 40 CFR 125.98(b)(1), nothing in this permit authorizes take for the purposes of a facility's compliance with the Endangered Species Act.

2. At all times properly operate and maintain the intake equipment.

3. Inform IDEM of any proposed changes to the CWIS or proposed changes to operations at the facility that affect the information taken into account in the current BTA evaluation.

4. There shall be no discharge of debris from intake screen washing which will settle to form objectionable deposits which are in amounts sufficient to be unsightly or deleterious, or which will produce colors or odors constituting a nuisance.

5. All required reports shall be submitted to the IDEM, Office of Water Quality, NPDES Permits Branch.

6. The permittee shall submit all the information required by the applicable provisions of 40 CFR 122.21(r)(2) through (r)(10) as described above and under CWA Section 316(b) as soon as practicable but no later than January 31, 2018.

PERMIT NO. MI0038172

STATE OF MICHIGAN
DEPARTMENT OF ENVIRONMENTAL QUALITY

AUTHORIZATION TO DISCHARGE UNDER THE NATIONAL POLLUTANT DISCHARGE ELIMINATION SYSTEM

In compliance with the provisions of the Federal Water Pollution Control Act (33 U.S.C. 1251 *et seq.*, as amended; the "Federal Act"); Part 31, Water Resources Protection, of the Natural Resources and Environmental Protection Act, 1994 PA 451, as amended (NREPA); Part 41, Sewerage Systems, of the NREPA; and Michigan Executive Order 2011-1,

DTE Electric Company
One Energy Plaza
Detroit, MI 48226

is authorized to discharge from the Belle River Power Plant located at

4505 King Road
China, MI 48054

designated as **DECO-Belle River Plt**

to the receiving waters named the St. Clair River and an unnamed tributary of the Belle River in accordance with effluent limitations, monitoring requirements, and other conditions set forth in this permit.

This permit is based on a complete application submitted on April 12, 2013, as amended through October 14, 2015.

This permit takes effect on November 1, 2017. The provisions of this permit are severable. After notice and opportunity for a hearing, this permit may be modified, suspended, or revoked in whole or in part during its term in accordance with applicable laws and rules. On its effective date this permit shall supersede NPDES Permit No. MI0038172, expiring October 1, 2013.

This permit and the authorization to discharge shall expire at midnight, **October 1, 2022**. In order to receive authorization to discharge beyond the date of expiration, the permittee shall submit an application which contains such information, forms, and fees as are required by the Department of Environmental Quality (Department) by **April 4, 2022**.

Issued: January 27, 2017

Original signed by Christine Alexander
Christine Alexander, Acting Manager
Permits Section
Water Resources Division

PERMIT FEE REQUIREMENTS

In accordance with Section 324.3120 of the NREPA, the permittee shall make payment of an annual permit fee to the Department for each October 1 the permit is in effect regardless of occurrence of discharge. The permittee shall submit the fee in response to the Department's annual notice. The fee shall be postmarked by January 15 for notices mailed by December 1. The fee is due no later than 45 days after receiving the notice for notices mailed after December 1.

Annual Permit Fee Classification: Industrial-Commercial Major

In accordance with Section 324.3118 of the NREPA, the permittee shall make payment of an annual storm water fee to the Department for each January 1 the permit is in effect regardless of occurrence of discharge. The permittee shall submit the fee in response to the Department's annual notice. The fee shall be postmarked by March 15 for notices mailed by February 1. The fee is due no later than 45 days after receiving the notice for notices mailed after February 1.

CONTACT INFORMATION

Unless specified otherwise, all contact with the Department required by this permit shall be made to the Southeast Michigan District Office of the Water Resources Division. The Southeast Michigan District Office is located at 27700 Donald Court, Warren, MI 48092-2793, Telephone: 586-753-3700, Fax: 586-751-4690.

CONTESTED CASE INFORMATION

Any person who is aggrieved by this permit may file a sworn petition with the Michigan Administrative Hearing System within the Michigan Department of Licensing and Regulatory Affairs, c/o the Michigan Department of Environmental Quality, setting forth the conditions of the permit which are being challenged and specifying the grounds for the challenge. The Department of Licensing and Regulatory Affairs may reject any petition filed more than 60 days after issuance as being untimely.

PART I

Section A. Limitations and Monitoring Requirements

1. Final Effluent Limitations, Monitoring Point 001A

During the period beginning on the effective date of this permit and lasting until the expiration date of this permit, the permittee is authorized to discharge a maximum of 964.6 MGD of noncontact cooling water, treated bottom ash transport water, treated nonchemical metal cleaning wastewater, treated low volume wastewater, treated contaminated groundwater, and treated combustion residual leachate, and an unspecified amount of storm water from Monitoring Point 001A through Outfall 001. Outfall 001 discharges to the St. Clair River at Latitude 42.767828, Longitude -82.470347. Such discharge shall be limited and monitored by the permittee as specified below.

	Maximum Limits for Quantity or Loading			Maximum Limits for Quality or Concentration				
Parameter	**Monthly**	**Daily**	**Units**	**Monthly**	**Daily**	**Units**	**Monitoring Frequency**	**Sample Type**
Flow	(report)	(report)	MGD	---	---	---	Daily	Report Total Daily Flow
Total Residual Chlorine (TRC)								
TRC Discharge Mode								
Continuous (greater than 160 min/day)			---	---	38	ug/l	5x Weekly	Grab
Intermittent (less than/equal to 160 min/day)			---	---	200	ug/l	5x Weekly	Grab
TRC Discharge Time	---	---	---	---	(report)	min/day	5x Weekly	Report Total Discharge Time
Thermal Discharge	---	---	---	7,000	(report)	MBTU/hr	Daily	Calculation
Temperature								
Intake	---	---	---	---	(report)	°F	Daily	Reading
Effluent	---	---	---	---	(report)	°F	Daily	Reading
Total Copper	---	---	---	---	(report)	ug/l	2x Annually	24-Hr Composite
Outfall Observation	(report)	---	---	---	---	---	Daily	Visual
Total Mercury								
Corrected	(report)	(report)	lbs/day	(report)	(report)	ng/l	Quarterly	Calculation
Uncorrected	---	---	---	---	(report)	ng/l	Quarterly	Grab
Field Duplicate	---	---	---	---	(report)	ng/l	Quarterly	Grab
Field Blank	---	---	---	---	(report)	ng/l	Quarterly	Preparation
Laboratory Method Blank	---	---	---	---	(report)	ng/l	Quarterly	Preparation
				Minimum Daily				
pH	---	---	---	6.5	9.0	S.U.	Weekly	Grab

a. Narrative Standard
The receiving water shall contain no turbidity, color, oil films, floating solids, foams, settleable solids, suspended solids, or deposits as a result of this discharge in unnatural quantities which are or may become injurious to any designated use.

b. Monitoring Location
Samples, measurements, and observations taken in compliance with the monitoring requirements above shall be taken at Monitoring Point 001A prior to discharge to the St. Clair River.

c. Outfall Observation
Outfall observation shall be reported as "yes" or "no." The permittee shall report "yes" if this requirement was completed and "no" if this requirement was not completed. Any unusual characteristics of the discharge (i.e., unnatural turbidity, color, oil film, floating solids, foams, settleable solids, suspended solids, or deposits) shall be reported within 24 hours to the Department followed with a written report within five (5) days detailing the findings of the investigation and the steps taken to correct the condition.

d. Quarterly and Twice Annually Monitoring
Quarterly samples shall be collected during the months of January, April, July, and October. Twice annually samples shall be collected during the months of April and October. If the facility does not discharge during these months, the permittee shall sample the next discharge occurring during the period in question. If the facility does not discharge during the period in question, a sample is not required for that period. For any month in which a sample is not taken, the permittee shall enter "*G" on the Discharge Monitoring Report. Samples shall be collected to coincide with periods of discharge from the Range Road site.

e. Water Treatment Additives
This permit does not authorize the discharge of water treatment additives without approval. Approval of water treatment additives is authorized under separate correspondence. Water treatment additives include any material that is added to water used at the facility or to a wastewater generated by the facility to condition or treat the water. In the event a permittee proposes to discharge water treatment additives, including an increased discharge concentration of a previously approved water treatment additive, the permittee shall submit a request for approval in accordance with Part I.A.5. of this permit.

f. Quantification Level for Total Copper
The quantification level for total copper shall be 1 ug/l unless a higher level is appropriate because of sample matrix interference. Justification for higher quantification levels shall be submitted to the Department within 30 days of such determination. Upon approval of the Department, the permittee may use alternate analytical methods (for parameters with methods specified in 40 CFR 136, the alternate methods are restricted to those listed in 40 CFR 136).

g. Total Mercury Testing and Additional Reporting Requirements
The analytical protocol for total mercury shall be in accordance with EPA Method 1631, Revision E, "Mercury in Water by Oxidation, Purge and Trap, and Cold Vapor Atomic Fluorescence Spectrometry." The quantification level for total mercury shall be 0.5 ng/l, unless a higher level is appropriate because of sample matrix interference. Justification for higher quantification levels shall be submitted to the Department within 30 days of such determination.

The use of clean technique sampling procedures is required unless the permittee can demonstrate to the Department that an alternative sampling procedure is representative of the discharge. Guidance for clean technique sampling is contained in: EPA Method 1669, Sampling Ambient Water for Trace Metals at EPA Water Quality Criteria Levels (Sampling Guidance), EPA-821-R96-001, July 1996. Information and data documenting the permittee's sampling and analytical protocols and data acceptability shall be submitted to the Department upon request.

In order to demonstrate compliance with EPA Method 1631E and EPA Method 1669, the permittee shall report, on the daily sheet, the analytical results of all field blanks and field duplicates collected in conjunction with each sampling event, as well as laboratory method blanks when used for blank correction. The permittee shall collect at least one (1) field blank and at least one (1) field duplicate per sampling event. If more than ten (10) samples are collected during a sampling event, the permittee shall collect at least one (1) additional field blank AND field duplicate for every ten (10) samples collected. Only field blanks or laboratory method blanks may be used to calculate a concentration lower than the actual sample analytical results (i.e. a blank correction). Only one (1) blank (field OR laboratory method) may be used for blank correction of a given sample result, and only if the blank meets the quality control acceptance criteria. If blank correction is not performed on a given sample analytical result, the permittee shall report under 'Total Mercury – Corrected' the same value reported under 'Total Mercury – Uncorrected.' The field duplicate is for quality control purposes only; its analytical result shall not be averaged with the sample result.

The Department will review the mercury monitoring data using the reasonable potential process described in R 323.1211 of the Michigan Administrative Code to determine if there is a reasonable potential for the Water Quality Standard of 1.3 ng/l of total mercury to be exceeded in the effluent. If it is determined that the effluent has a reasonable potential to exceed 1.3 ng/l of total mercury, upon written notification by the Department, the permittee shall resume the Pollutant Minimization Program for Total Mercury in accordance with the provisions of Part I.A.6. of this permit. If, at any time during the life of the permit, the final effluent concentration exceeds 5 ng/l, the permittee shall notify the Department at the time of its next regular monthly monitoring report and shall resume the Pollutant Minimization Program for Total Mercury contained in Part 1.A.6. of this permit.

h. Total Residual Chlorine Requirements
Total Residual Chlorine (TRC) shall be analyzed in accordance with Part II.B.2. of this permit.

If chlorine discharge is intermittent, TRC monitoring is only required during periods of chlorine use and subsequent discharge. Limitations for the intermittent discharge of chlorine apply only when the discharge of chlorine is less than or equal to 160 minutes per day, otherwise the limitations for continuous discharge of chlorine apply.

During the intermittent discharge of chlorine, the daily concentration value reported for TRC shall be the average of a minimum of three (3) equally spaced grab samples taken during a chlorine discharge event, with the additional limitation that no single sample may exceed 300 ug/l.

For the purposes of TRC effluent limitation compliance, a week shall be defined as a calendar week from Monday through Sunday.

The permittee shall enter "*G" on the Discharge Monitoring Report for the TRC discharge modes not being used.

The permittee may use dechlorination techniques to achieve the applicable TRC limitations, using sodium thiosulfate, sodium sulfite, sodium bisulfite, or other dechlorinating reagents approved by the Department. The available concentration of the reagent(s) in the discharge shall be limited to 0.6 times the residual concentration of TRC for sodium thiosulfate, 1.6 times the residual concentration of TRC for sodium bisulfite, and 2.0 times the residual concentration of TRC for sodium sulfite. The TRC samples taken to determine the amount of each chemical to add shall be taken upstream of dechlorination. The Department may approve the use of additional quantities of reagents which are demonstrated to be protective of water quality standards.

i. Thermal Discharge Calculation
Thermal Discharge shall be determined using the following calculation: (flow rate in MGD) **times** (the conversion factor of 8.34) **times** (discharge temperature in °F **minus** intake temperature in °F), **divided by** 24. The resulting value is the amount of thermal discharge in MBTU/hr.

j. Power Plants - PCB Prohibition
The permittee shall not discharge any polychlorinated biphenyls to the receiving waters of the state of Michigan as a result of plant operations.

k. Use of Sodium Hypochlorite – Range Road Site
Treated contaminated groundwater is discharged from the groundwater capture and treatment system installed at the Range Road site. The permittee is authorized to use sodium hypochlorite to control biofouling in and maintain optimal performance of this treatment system. The use of sodium hypochlorite shall be in accordance with the plan submitted by the permittee, entitled "Chlorination Procedure and Total Residual Chlorine Monitoring Plan," dated November 2009. The facility's log books shall maintain a record of any TRC monitoring data obtained from this discharge, as well as any additional information required under the aforementioned plan, and shall be available upon request for review by the Department.

2. Final Effluent Limitations, Monitoring Point 001B

During the period beginning on the effective date of this permit and lasting until the expiration date of this permit, the permittee is authorized to discharge a maximum of 20 MGD of treated bottom ash transport water, treated nonchemical metal cleaning wastewater, treated low volume wastewater, treated groundwater, and treated combustion residual leachate, and an unspecified amount of storm water from Monitoring Point 001B through Outfall 001. Outfall 001 discharges to the St. Clair River at Latitude 42.767828, Longitude -82.470347. Such discharge shall be limited and monitored by the permittee as specified below.

	Maximum Limits for Quantity or Loading			Maximum Limits for Quality or Concentration				
Parameter	**Monthly**	**Daily**	**Units**	**Monthly**	**Daily**	**Units**	**Monitoring Frequency**	**Sample Type**
Flow	(report)	(report)	MGD	---	---	---	Daily	Report Total Daily Flow
Total Suspended Solids	---	---	---	30	100	mg/l	Weekly	Grab
Oil & Grease	---	---	---	15	20	mg/l	Weekly	Grab

a. Monitoring Location
Samples, measurements, and observations taken in compliance with the monitoring requirements above shall be taken at Monitoring Point 001B prior to mixing with other waste streams discharging through Monitoring Point 001A.

3. Final Effluent Limitations, Monitoring Point 001C

During the period beginning on the effective date of this permit and lasting until the expiration date of this permit, the permittee is authorized to discharge a maximum of 1.29 MGD of treated low volume wastewater and an unspecified amount of storm water from Monitoring Point 001C through Outfall 001. Outfall 001 discharges to the St. Clair River at Latitude 42.767828, Longitude -82.470347. Such discharge shall be limited and monitored by the permittee as specified below.

	Maximum Limits for Quantity or Loading			Maximum Limits for Quality or Concentration				
Parameter	**Monthly**	**Daily**	**Units**	**Monthly**	**Daily**	**Units**	**Monitoring Frequency**	**Sample Type**
Flow	(report)	(report)	MGD	---	---	---	Daily	Report Total Daily Flow
Total Suspended Solids	---	---	---	30	100	mg/l	Weekly	Grab
Oil & Grease	---	---	---	15	20	mg/l	Weekly	Grab

a. Monitoring Location
Samples, measurements, and observations taken in compliance with the monitoring requirements above shall be taken at Monitoring Point 001C prior to mixing with any other waste streams discharging through Monitoring Point 001A.

4. Final Effluent Limitations, Monitoring Point 002A

During the period beginning on the effective date of this permit and lasting until the expiration date of this permit, the permittee is authorized to discharge a maximum of 140 MGY of treated bottom ash transport water, treated nonchemical metal cleaning wastewater, and treated low volume wastewater, and an unspecified amount of storm water, over a cumulative time period of approximately seven days annually from Monitoring Point 002A through Outfall 002. Outfall 002 discharges to an unnamed tributary of the Belle River (known locally as Webster Drain), at Latitude 42.778275, Longitude -82.497379. Such discharge shall be limited and monitored by the permittee as specified below.

	Maximum Limits for Quantity or Loading			Maximum Limits for Quality or Concentration				
Parameter	**Monthly**	**Daily**	**Units**	**Monthly**	**Daily**	**Units**	**Monitoring Frequency**	**Sample Type**
Flow	(report)	(report)	MGD	---	---	---	Daily During Event	Report Total Daily Flow
Total Suspended Solids	---	---	---	30	100	mg/l	See Part I.A.4.h.	Grab
Oil & Grease	---	---	---	15	20	mg/l	See Part I.A.4.h.	Grab
Total Silver	---	0.035	lbs/day	---	11	ug/l	See Part I.A.4.h.	24-Hr Composite
Temperature (Jan – Feb)	---	---	---	---	(report)	°F	Daily During Event	Reading
Discharge Duration	(report)	(report)	hours	---	---	---	Event	Calculation
Outfall Observation	(report)	---	---	---	---	---	Daily During Event	Visual
Total Mercury								
Corrected	(report)	(report)	lbs/day	(report)	(report)	ng/l	See Part I.A.4.h.	Calculation
Uncorrected	---	---	---	---	(report)	ng/l	See Part I.A.4.h.	Grab
Field Duplicate	---	---	---	---	(report)	ng/l	See Part I.A.4.h.	Grab
Field Blank	---	---	---	---	(report)	ng/l	See Part I.A.4.h.	Preparation
Laboratory Method Blank	---	---	---	---	(report)	ng/l	See Part I.A.4.h.	Preparation
				Minimum Daily				
pH	---	---	---	6.5	9.0	S.U.	See Part I.A.4.h.	Grab

a. Narrative Standard
The receiving water shall contain no turbidity, color, oil films, floating solids, foams, settleable solids, or deposits as a result of this discharge in unnatural quantities which are or may become injurious to any designated use.

b. Monitoring Location
Samples, measurements, and observations taken in compliance with the monitoring requirements above shall be taken at Monitoring Point 002A prior to discharge to the unnamed tributary of the Belle River.

c. Definition of Event
A discharge event is herein defined as beginning when a discharge of wastewater through Monitoring Point 002A commences, and ending when this discharge ceases and does not resume within 24 hours.

d. Outfall Observation
Outfall observation shall be reported as "yes" or "no." The permittee shall report "yes" if this requirement was completed and "no" if this requirement was not completed. Any unusual characteristics of the discharge (i.e., unnatural turbidity, color, oil film, floating solids, foams, settleable solids, suspended solids, or deposits) shall be reported within 24 hours to the Department followed with a written report within five (5) days detailing the findings of the investigation and the steps taken to correct the condition.

e. Water Treatment Additives
This permit does not authorize the discharge of water treatment additives without approval. Approval of water treatment additives is authorized under separate correspondence. Water treatment additives include any material that is added to water used at the facility or to a wastewater generated by the facility to condition or treat the water. In the event a permittee proposes to discharge water treatment additives, including an increased discharge concentration of a previously approved water treatment additive, the permittee shall submit a request for approval in accordance with Part I.A.5. of this permit.

f. Total Mercury Testing and Additional Reporting Requirements
The analytical protocol for total mercury shall be in accordance with EPA Method 1631, Revision E, "Mercury in Water by Oxidation, Purge and Trap, and Cold Vapor Atomic Fluorescence Spectrometry." The quantification level for total mercury shall be 0.5 ng/l, unless a higher level is appropriate because of sample matrix interference. Justification for higher quantification levels shall be submitted to the Department within 30 days of such determination.

The use of clean technique sampling procedures is required unless the permittee can demonstrate to the Department that an alternative sampling procedure is representative of the discharge. Guidance for clean technique sampling is contained in: EPA Method 1669, Sampling Ambient Water for Trace Metals at EPA Water Quality Criteria Levels (Sampling Guidance), EPA-821-R96-001, July 1996. Information and data documenting the permittee's sampling and analytical protocols and data acceptability shall be submitted to the Department upon request.

In order to demonstrate compliance with EPA Method 1631E and EPA Method 1669, the permittee shall report, on the daily sheet, the analytical results of all field blanks and field duplicates collected in conjunction with each sampling event, as well as laboratory method blanks when used for blank correction. The permittee shall collect at least one (1) field blank and at least one (1) field duplicate per sampling event. If more than ten (10) samples are collected during a sampling event, the permittee shall collect at least one (1) additional field blank AND field duplicate for every ten (10) samples collected. Only field blanks or laboratory method blanks may be used to calculate a concentration lower than the actual sample analytical results (i.e. a blank correction). Only one (1) blank (field OR laboratory method) may be used for blank correction of a given sample result, and only if the blank meets the quality control acceptance criteria. If blank correction is not performed on a given sample analytical result, the permittee shall report under 'Total Mercury – Corrected' the same value reported under 'Total Mercury – Uncorrected.' The field duplicate is for quality control purposes only; its analytical result shall not be averaged with the sample result.

The Department will review the mercury monitoring data using the reasonable potential process described in R 323.1211 of the Michigan Administrative Code to determine if there is a reasonable potential for the Water Quality Standard of 1.3 ng/l of total mercury to be exceeded in the effluent. If it is determined that the effluent has a reasonable potential to exceed 1.3 ng/l of total mercury, upon written notification by the Department, the permittee shall resume the Pollutant Minimization Program for Total Mercury in accordance with the provisions of Part I.A.6. of this permit. If, at any time during the life of the permit, the final effluent concentration exceeds 5 ng/l, the permittee shall notify the Department at the time of its next regular monthly monitoring report and shall resume the Pollutant Minimization Program for Total Mercury contained in Part 1.A.6. of this permit.

g. Power Plants - PCB Prohibition
The permittee shall not discharge any polychlorinated biphenyls to the receiving waters of the state of Michigan as a result of plant operations.

h. Priority Pollutant Monitoring Requirements
The permittee shall sample the discharge through Monitoring Point 002A at least once per discharge event for a discharge event lasting four (4) days (i.e., 96 hours) or less, and at least twice per discharge event for a discharge event lasting more than four (4) days. (See the definition of "event" provided under Part I.A.4.c.). Samples required under this part shall be collected for selected pollutants identified in Table 2 – Organic Toxic Pollutants in Each GC/MS Fraction, and Table 3 – Other Toxic Pollutants (Metals and Cyanide) and Total Phenols. Pollutant selection shall be made in accordance with guidance provided in Table 1 – Testing Requirements for Organic Toxic Pollutants by Industrial Category. Test procedures shall conform with requirements set forth in Part II.B.2. of this permit, and with Table 7 – Quantification Levels and Analytical Methods for Selected Parameters. (Tables referenced under this part are found in the NPDES Permit Application Appendix, available at http://www.michigan.gov/deqnpdes, then under the Information banner click on How to Apply for an NPDES Permit, then under Downloadable Information click on Permit Application Appendix). With the exception of analytical results for Total Silver and Total Mercury (for which reporting is required through the Department's MiWaters system), analytical results obtained under this part shall be submitted on or before April 4, 2022, with the application for reissuance.

5. Request for Discharge of Water Treatment Additives

Prior to discharge of any water treatment additive, written approval shall be obtained by the permittee. Requests for such approval shall be submitted via the Department's MiWaters system. The MiWaters website is located at https://miwaters.deq.state.mi.us. Instructions for submitting such a request may be obtained via the Internet (http://www.michigan.gov/deqnpdes; then near the bottom of the page, click on one or both of the links located under the Water Treatment Additives banner). Additional monitoring and reporting may be required as a condition for the approval to discharge the additive.

A request to discharge water treatment additives shall include all of the following usage and discharge information for each water treatment additive proposed to be discharged:

a. Safety Data Sheet (formerly known as Material Safety Data Sheet);

b. the proposed water treatment additive discharge concentration with supporting calculations;

c. the discharge frequency (i.e., number of hours per day and number of days per year);

d. the outfall and monitoring point from which the product is to be discharged;

e. the type of removal treatment, if any, that the water treatment additive receives prior to discharge;

f. the product's function (i.e. microbiocide, flocculant, etc.);

g. a 48-hour LC_{50} or EC_{50} for a North American freshwater planktonic crustacean (either *Ceriodaphnia sp., Daphnia sp., or Simocephalus sp.*); and

h. the results of a toxicity test for one (1) other North American freshwater aquatic species (other than a planktonic crustacean) that meets a minimum requirement of R 323.1057(2) of the Water Quality Standards. Examples of tests that would meet this requirement include a 96-hour LC_{50} for rainbow trout, bluegill, or fathead minnow.

6. Pollutant Minimization Program for Total Mercury

This condition is required, upon written notification by the Department or if the permittee notifies the Department that the final effluent concentration of total mercury has exceeded 5 ng/l, as specified in Part I.A.1. and Part I.A.4. The goal of the Pollutant Minimization Program is to maintain the effluent concentration of total mercury at or below 1.3 ng/l. Immediately following written notification by the Department or immediately after the permittee notifies the Department that the final effluent concentration of total mercury has exceeded 5 ng/l, the Pollutant Minimization Program approved by the Department on September 19, 2011 shall take effect. The Pollutant Minimization Program shall include the following:

a. an annual review and semi-annual monitoring of potential sources of mercury entering the wastewater collection system;

b. a program for quarterly monitoring of influent for mercury; and

c. implementation of reasonable cost-effective control measures when sources of mercury are discovered. Factors to be considered include significance of sources, economic considerations, and technical and treatability considerations.

On or before March 31 of each year following the Pollutant Minimization Program taking effect, the permittee shall submit a status report for the previous calendar year to the Department that includes 1) the monitoring results for the previous year, 2) an updated list of potential mercury sources, and 3) a summary of all actions taken to reduce or eliminate identified sources of mercury.

Any information generated as a result of the Pollutant Minimization Program set forth in this permit may be used to support a request to modify the approved program or to demonstrate that the Pollutant Minimization Program requirement has been completed satisfactorily.

A request for modification of the approved program and supporting documentation shall be submitted in writing to the Department for review and approval. The Department may approve modifications to the approved program (approval of a program modification does not require a permit modification), including a reduction in the frequency of the requirements under items a. & b.

This permit may be modified in accordance with applicable laws and rules to include additional mercury conditions and/or limitations as necessary.

7. Discharge Monitoring Report – Quality Assurance Study Program

The permittee shall participate in the Discharge Monitoring Report – Quality Assurance (DMR-QA) Study Program. The purpose of the DMR-QA Study Program is to annually evaluate the proficiency of all in-house and/or contract laboratory(ies) that perform, on behalf of the facility authorized to discharge under this permit, the analytical testing required under this permit. In accordance with Section 308 of the Clean Water Act (33 U.S.C. § 1318); and R 323.2138 and R 323.2154 of Part 21, Wastewater Discharge Permits, promulgated under Part 31 of the NREPA, participation in the DMR-QA Study Program is required for all major facilities, and for minor facilities selected for participation by the Department.

Annually and in accordance with DMR-QA Study Program requirements and submittal due dates, the permittee shall submit to the Michigan DMR-QA Study Program state coordinator all documentation required by the DMR-QA Study. DMR-QA Study Program participation is required only for the analytes required under this permit and only when those analytes are also identified in the DMR-QA Study.

If the permitted facility's status as a major facility should change, participation in the DMR-QA Study Program may be reevaluated. Questions concerning participation in the DMR-QA Study Program should be directed to the Michigan DMR-QA Study Program state coordinator.

All forms and instructions required for participation in the DMR-QA Study Program, including submittal due dates and state coordinator contact information, can be found at http://www.epa.gov/compliance/discharge-monitoring-report-quality-assurance-study-program.

8. Cooling Water Intake Structures – Interim Approval

The federal rules promulgated by the United States Environmental Protection Agency in 40 CFR Parts 122 and 125 establishing the requirements of section 316(b) of the Clean Water Act for Existing Facilities took effect October 14, 2014. Beginning October 14, 2014, any facility covered by the rules requesting permit reissuance shall submit an application in accordance with the rules and shall be subject to the best technology available (BTA) standards for impingement mortality and entrainment as defined in the rules. Since the application for permit reissuance was submitted prior to the effective date of the rules, for this reissuance the permittee is subject to site-specific requirements as determined on a case-by-case Best Professional Judgment Basis.

The cooling water intake structure operated by the permittee has been evaluated using all available information relating to its location, design, construction, and capacity. At this time, the Department has made an **interim** determination that the cooling water intake structure represents BTA to minimize adverse environmental impact in accordance with section 316(b) of the federal Clean Water Act (33 U.S.C. section 1326). The permittee shall at all times properly operate and maintain the cooling water intake structure and associated equipment to minimize adverse environmental impact. The permittee shall give advance notice to the Department of any planned changes in the location, design, operation, or capacity of the intake structure. If the Department determines that additional technologies or control measures are necessary to reduce the impact of impingement or entrainment, the Department may revise the requirements of this condition. Nothing in this permit shall either be construed to relieve the permittee from civil or criminal penalties for previous or future fish losses, or authorize take for the purposes of a facility's compliance with the Endangered Species Act.

If the federal rules promulgated under section 316(b) remain in effect at the time of application for reissuance, on or before April 4, 2022, with the application for reissuance, the permittee shall submit the appropriate information specified in 40 CFR 122.21(r) for the cooling water intake structure at this facility. Any request for alternate application submittal requirements specific to the decommissioning of a facility or portions of a facility shall be approved by the Department prior to application submission.

9. Facility Contact

The "Facility Contact" was specified in the application. The permittee may replace the facility contact at any time, and shall notify the Department in writing within 10 days after replacement (including the name, address and telephone number of the new facility contact).

a. The facility contact shall be (or a duly authorized representative of this person):
   - for a corporation, a principal executive officer of at least the level of vice president; or a designated representative if the representative is responsible for the overall operation of the facility from which the discharge originates, as described in the permit application or other NPDES form,
   - for a partnership, a general partner,
   - for a sole proprietorship, the proprietor, or
   - for a municipal, state, or other public facility, either a principal executive officer, the mayor, village president, city or village manager or other duly authorized employee.

b. A person is a duly authorized representative only if:
   - the authorization is made in writing to the Department by a person described in paragraph a. of this section; and
   - 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, position of equivalent responsibility, or an individual or position having overall responsibility for environmental matters for the facility (a duly authorized representative may thus be either a named individual or any individual occupying a named position).

Nothing in this section obviates the permittee from properly submitting reports and forms as required by law.

10. Schedule for Elimination of Bottom Ash Transport Water Discharge

The permittee shall eliminate the discharge of bottom ash transport water to surface waters of the state in accordance with the following schedule. All submittals shall be to the Department.

a. On or before January 1, 2018, the permittee shall submit the completed technology feasibility evaluation and the approach selected to achieve elimination of the discharge of bottom ash transport water to surface waters of the state at Monitoring Point 001A, Monitoring Point 001B, and Monitoring Point 002A, specified in Part I.A.1., Part I.A.2., and Part I.A.4., respectively. The submittal shall include an assessment of the ability to design and build the selected approach.

b. On or before February 1, 2018, the permittee shall commence the engineering design process for the selected approach.

c. On or before February 1, 2019, the permittee shall submit a status report that describes the ongoing engineering design process, and the procurement/fabrication processes, of the selected approach.

d. On or before July 1, 2019, the permittee shall commence construction for the selected approach.

e. On or before July 1, 2020, the permittee shall submit a status report of the ongoing construction, and specify any impediments to meeting the final compliance date.

f. On or before July 1, 2021, the permittee shall submit a status report of the ongoing construction, and specify any impediments to meeting the final compliance date.

g. On or before December 31, 2021, the permittee shall eliminate the discharge of bottom ash transport water to surface waters of the state at Monitoring Point 001A, Monitoring Point 001B, and Monitoring Point 002A, specified in Part I.A.1., Part I.A.2., and Part I.A.4., respectively.

11. Bottom Ash Transport Water Discharge Prohibition

Beginning on December 31, 2021, the permittee is prohibited from discharging newly generated bottom ash transport water from any outfall.

12. Intake Screen Backwash, Outfall 000

During the period beginning on the effective date of this permit and lasting until the expiration date of this permit, the permittee is authorized to discharge intake screen backwash from outfall 000 to the St. Clair River. The permittee shall collect and remove debris accumulated on intake trash bars and dispose of such material on land in an appropriate manner.

13. Zebra Mussel Control Program

The permittee is authorized to treat its service water system for the control of zebra mussels in accordance with the document titled, "Zebra Mussel Control Program – Service Water System," submitted to the Department on July 8, 1992. If it is necessary for the permittee to make changes to the program, the proposed changes must be submitted to and approved by the Department prior to implementation.

PART I

Section B. Storm Water Pollution Prevention

1. Final Effluent Limitations and Monitoring Requirements

The permittee is authorized to discharge storm water associated with industrial activity, as defined under 40 CFR 122.26(b)(14)(i-ix), to the surface waters of the state. Such discharge shall be limited and monitored by the permittee as specified below.

a. Narrative Standard
The receiving water shall contain no turbidity, color, oil films, floating solids, foams, settleable solids, suspended solids, or deposits as a result of this discharge in unnatural quantities which are or may become injurious to any designated use.

b. Visual Assessment of Storm Water Discharges
To ensure that storm water discharges from the facility do not violate the narrative standard in the receiving waters, storm water discharges shall be visually assessed in accordance with this permit.

c. Implementation of Storm Water Pollution Prevention Plan
The permittee shall implement an acceptable Storm Water Pollution Prevention Plan (SWPPP) as required by this permit.

d. Certified Operator
The permittee shall have an Industrial Storm Water Certified Operator who has supervision over the facility's storm water treatment and control measures included in the SWPPP.

The Storm Water Pollution Prevention Plan (SWPPP) is a written procedure to reduce the exposure of storm water to significant materials and to reduce the amount of significant materials in the storm water discharge. An acceptable SWPPP shall identify potential sources of contamination and describe the controls necessary to reduce their impacts in accordance with Part I.B.2. through Part I.B.8. of this permit.

2. Source Identification

To identify potential sources of significant materials that can pollute storm water and subsequently be discharged from the facility, the SWPPP shall, at a minimum, include the following items:

a. A site map identifying:

1) buildings and other permanent structures;

2) storage or disposal areas for significant materials;

3) secondary containment structures and descriptions of the significant materials contained within the primary containment structures;

4) storm water discharge points (which include outfalls and points of discharge), numbered or otherwise labeled for reference;

5) location of storm water and non-storm water inlets (numbered or otherwise labeled for reference) contributing to each discharge point;

6) location of NPDES-permitted discharges other than storm water;

7) outlines of the drainage areas contributing to each discharge point;

8) structural controls or storm water treatment facilities;

9) areas of vegetation (with brief descriptions such as lawn, old field, marsh, wooded, etc.);

10) areas of exposed and/or erodible soils and gravel lots;

11) impervious surfaces (e.g., roofs, asphalt, concrete, etc.);

12) name and location of receiving water(s); and

13) areas of known or suspected impacts on surface waters as designated under Part 201 (Environmental Response) of the NREPA.

b. A list of all significant materials that could pollute storm water. For each material listed, the SWPPP shall include each of the following descriptions:

1) the ways in which each type of significant material has been, or has reasonable potential to become, exposed to storm water (e.g., spillage during handling; leaks from pipes, pumps, and vessels; contact with storage piles, contaminated materials, or soils; waste handling and disposal; deposits from dust or overspray; etc.);

2) identification of the discharge point(s) and the inlet(s) contributing the significant material to each discharge point through which the significant material may be discharged if released; and

3) an evaluation of the reasonable potential for contribution of significant materials to storm water from at least the following areas or activities:

a) loading, unloading, and other significant material-handling operations;

b) outdoor storage, including secondary containment structures;

c) outdoor manufacturing or processing activities;

d) significant dust- or particulate-generating processes;

e) discharge from vents, stacks, and air emission controls;

f) on-site waste disposal practices;

g) maintenance and cleaning of vehicles, machines, and equipment;

h) areas of exposed and/or erodible soils;

i) Sites of Environmental Contamination listed under Part 201 (Environmental Response) of the NREPA;

j) areas of significant material residues;

k) areas where animals (wild or domestic) congregate and deposit wastes; and

l) other areas where storm water may come into contact with significant materials.

c. A listing of significant spills and significant leaks of polluting materials that occurred in areas that are exposed to precipitation or that discharge to a point source at the facility. The listing shall include spills that occurred over the three (3) years prior to the effective date of a permit authorizing discharge. The listing shall include the date, volume, and exact location of the release, and the action taken to clean up the material and/or prevent exposure to storm water or contamination of surface waters of the state. Any release that occurs after the SWPPP has been developed shall be controlled in accordance with the SWPPP and is cause for the SWPPP to be updated as appropriate within 14 calendar days of obtaining knowledge of the spill or loss.

d. A determination as to whether its facility discharges storm water to a water body for which an EPA-approved Total Maximum Daily Load (TMDL) has been established. If so, the permittee shall assess whether the TMDL requirements for the facility's discharge are being met through the existing SWPPP controls or whether additional control measures are necessary. The permitee's assessment of whether the TMDL requirements are being met shall focus on the effectiveness, adequacy, and implementation of the permitee's SWPPP controls.

e. A summary of existing storm water discharge sampling data (if available), describing pollutants in storm water discharges at the facility. This summary shall be accompanied by a description of the suspected source(s) of the pollutants detected.

3. Nonstructural Controls

To prevent significant materials from contacting storm water at the source, the SWPPP shall, at a minimum, include each of the following nonstructural controls:

a. Written procedures and a schedule for routine preventive maintenance. Preventive maintenance procedures shall describe routine inspections and maintenance of storm water management and control devices (e.g., cleaning of oil/water separators and catch basins, routine housekeeping activities, etc.), as well as inspecting and testing plant equipment and systems to uncover conditions that could cause breakdowns or failures resulting in discharges of pollutants to the storm sewer system or the surface waters of the state. The routine inspection shall include areas of the facility in which significant materials have the reasonable potential to contaminate storm water. A written report of the inspection and corrective actions shall be retained in accordance with Record Keeping, below.

b. Written procedures and a schedule for good housekeeping to maintain a clean, orderly facility. Good housekeeping procedures shall include routine inspections that focus on the areas of the facility that have a reasonable potential to contaminate storm water entering the property. The routine housekeeping inspections may be combined with the routine inspections for the preventive maintenance program. A written report of the inspection and corrective actions shall be retained in accordance with Record Keeping, below.

c. Written procedures and a schedule for **quarterly** comprehensive site inspections, to be conducted by the Industrial Storm Water Certified Operator. At a minimum, one inspection shall be performed within each of the following quarters: January-March, April-June, July-September, and October-December. The comprehensive site inspections shall include, but not be limited to, inspection of structural controls in use at the facility, and the areas and equipment identified in the routine preventive maintenance and good housekeeping procedures. These inspections shall also include a review of the routine preventive maintenance reports, good housekeeping inspection reports, and any other paperwork associated with the SWPPP. The permittee may request Department approval of an alternate schedule for comprehensive site inspections. A written report of the inspection and corrective actions shall be retained in accordance with Record Keeping, below, and the following shall be included on the comprehensive inspection form/report:

1) Date of the inspection.

2) Name(s), title(s), and certification number(s) of the personnel conducting the inspection.

3) Precipitation information (i.e., a description of recent rainfall/snowmelt events).

4) All observations relating to the implementation of control measures. Items to include if applicable:

a) updates on corrective actions implemented due to previously identified pollutant and/or discharge issues;

b) any evidence of, or the potential for, pollutants to discharge to the drainage system or receiving waters and the condition of and around the discharge point including flow dissipation measures needing maintenance or repairs;

c) any control measures needing maintenance or repairs; and

d) any additional control measures needed to comply with permit requirements.

5) Any required revisions to the SWPPP resulting from the inspection.

6) A certification stating the facility is in compliance with this permit and the SWPPP, or, if there are instances of noncompliance, they are identified.

7) procedures and a schedule for **quarterly** visual assessments of storm water discharges. At a minimum, one visual assessment shall be conducted within each of the following quarters: January-March, April-June, July-September, and October-December. These assessments shall be conducted as part of the comprehensive site inspection within one month of control measure observations made in accordance with 4), above. If the Department has approved an alternate schedule for the comprehensive site inspection, the visual assessment may likewise be conducted in accordance with the same approved alternate schedule.

The following are the requirements of the visual assessment. The permittee shall develop and clearly document, in writing, procedures for meeting these requirements:

a) Within six (6) months of the effective date of this permit, the permittee shall develop written procedures for conducting the visual assessment and incorporate these procedures into the SWPPP. If Qualified Personnel rather than an Industrial Storm Water Certified Operator will collect storm water samples, these procedures shall include a written description of the training given to these personnel to qualify them to collect the samples, as well as documentation verifying that these personnel have received this training. The first visual assessment shall be conducted in conjunction

with the next occurring comprehensive inspection. If changes resulting in altered drainage patterns occur at the facility, the permittee shall modify the procedures for conducting the visual assessment in accordance with the requirements of Keeping SWPPPs Current, below, and these modifications shall be incorporated into the SWPPP prior to conducting the next visual assessment.

b) A visual assessment shall be conducted of a representative storm water **sample** collected **from each storm water discharge point**. Storm water samples shall be visually assessed for conditions that could cause a violation of water quality standards as defined in Water Quality Standards, below. The visual assessment shall be made of the storm water sample in a clean, clear glass or plastic container. Only an Industrial Storm Water Certified Operator shall conduct this visual assessment. Visual assessment of the storm water sample shall be conducted within 48 hours of sample collection.

Representative storm water samples shall be collected:

(1) from each storm water discharge point identified as set forth under Source Identification, above. These samples may be collected by one or more of the following: an Industrial Storm Water Certified Operator; and/or an individual who meets qualifications acceptable to the Department and who is authorized by an Industrial Storm Water Certified Operator to collect the sample ("Qualified Personnel"); and/or an automated sampling device; and

(2) within the first 30 minutes of the start of a discharge from a storm event and on discharges that occur at least 72 hours (3 days) from the previous discharge. If it is not possible to collect the sample within the first 30 minutes of discharge, the sample shall be collected as soon thereafter as practicable, but not exceeding 60 minutes. In the case of snowmelt, samples shall be collected during a period with measurable discharge from the site.

c) A visual assessment shall be conducted of the storm water **discharge at each storm water discharge point**. (If an automated sampling device is used to collect the storm water sample, this requirement is waived). Either an Industrial Storm Water Certified Operator and/or Qualified Personnel may conduct this visual assessment. This visual assessment may be conducted directly – by someone physically present at the storm water discharge at each storm water discharge point; or it may be conducted indirectly – through the use of a visual recording taken of the storm water discharge at each storm water discharge point. Direct visual assessment shall be conducted at the same time that the storm water sample is collected. Indirect visual assessment shall be conducted using a visual recording taken of the storm water discharge at the same time that the storm water sample was collected.

d) Visual assessments shall be documented. This documentation shall be retained in accordance with Record Keeping, below, and shall include the following:

(1) sampling location(s) at the storm water discharge point(s) identified on the site map (see Source Identification, above);

(2) storm event information (i.e., length of event expressed in hours, approximate size of event expressed in inches of precipitation, duration of time since previous event that caused a discharge, and date and time the discharge began);

(3) date and time of the visual assessment of each storm water **discharge** at each storm water discharge point;

(4) name(s) and title(s) of the Industrial Storm Water Certified Operator or Qualified Personnel who conducted the visual assessment of the storm water **discharge** at each storm water discharge point. If an automated sampling device was used to collect the storm water sample associated with this discharge point, this documentation requirement is waived;

(5) observations made during visual assessment of the storm water **discharge** at each storm water discharge point. If an automated sampling device was used to collect the storm water sample associated with this discharge point, this documentation requirement is waived;

(6) if applicable, any visual recordings used to conduct the visual assessment of the storm water **discharge** at each storm water discharge point;

(7) date and time of sample collection for each storm water **sample**;

(8) name(s) and title(s) of the Industrial Storm Water Certified Operator or Qualified Personnel who collected the storm water **sample**. If an automated sampling device was used to collect the storm water sample, the permittee shall document that, instead;

(9) date and time of the visual assessment of each storm water **sample**;

(10) name(s), title(s), and operator number(s) of the Industrial Storm Water Certified Operator(s) who conducted the visual assessment of each storm water **sample**;

(11) observations made during visual assessment of each storm water **sample**;

(12) full-color photographic evidence of the storm water **sample** against a white background;

(13) nature of the discharge (i.e., rainfall or snowmelt);

(14) probable sources of any observed storm water contamination; and

(15) if applicable, an explanation for why it was not possible to collect samples within the first 30 minutes of discharge .

e) When adverse weather conditions prevent a visual assessment during the quarter, a substitute visual assessment shall be conducted during the next qualifying storm event. Documentation of the rationale for no visual assessment during a quarter shall be included with the SWPPP records as described in Record Keeping, below. Adverse conditions are those that are dangerous or create inaccessibility for personnel, such as local flooding, high winds, electrical storms, or situations that otherwise make sampling impractical such as drought or extended frozen conditions.

f) If the facility has two (2) or more discharge points that are believed to discharge substantially identical storm water effluents, the facility may conduct visual assessments of the discharge at just one (1) of the discharge points and report that the results also apply to the other substantially identical discharge point(s). The determination of substantially identical discharge points is to be based on the significant material evaluation conducted as set forth under Source Identification, above, and shall be clearly documented in the SWPPP. Visual assessments shall be conducted on a rotating basis of each substantially identical discharge point throughout the period of coverage under this permit.

d. A description of material handling procedures and storage requirements for significant materials. Equipment and procedures for cleaning up spills shall be identified in the SWPPP and made available to the appropriate personnel. The procedures shall identify measures to prevent spilled materials or material residues from contaminating storm water discharges from the property. The SWPPP shall include language describing what a reportable spill or release is and the appropriate reporting requirements in accordance with Part II.C.6. and Part II.C.7. The SWPPP may include, by reference, requirements of either a Pollution Incident Prevention Plan (PIPP) prepared in accordance with the Part 5 Rules (R 324.2001 through R 324.2009 of the Michigan Administrative Code); a Hazardous Waste Contingency Plan prepared in accordance with 40 CFR 264 and 265 Subpart D, as required by Part 111 of the NREPA; or a Spill Prevention Control and Countermeasure (SPCC) plan prepared in accordance with 40 CFR 112.

e. Identification of areas which, due to topography, activities, or other factors, have a high potential for significant soil erosion. Gravel lots shall be included. The SWPPP shall also identify measures used to control soil erosion and sedimentation.

f. A description of the employee training program that will be implemented on an annual basis to inform appropriate personnel at all levels of their responsibility as it relates to the components and goals of the SWPPP. The SWPPP shall identify periodic dates for the employee training program. Records of the employee training program shall be retained in accordance with Record Keeping, below.

g. Identification of actions to limit the discharge of significant materials in order to comply with TMDL requirements, if applicable.

h. Identification of significant materials expected to be present in storm water discharges following implementation of nonstructural preventive measures and source controls.

4. Structural Controls

Where implementation of the measures required by Nonstructural Controls, above, does not control storm water discharges in accordance with Water Quality Standards, below, the SWPPP shall provide a description of the location, function, design criteria, and installation/construction schedule of structural controls for prevention and treatment. Structural controls may be necessary:

a. to prevent uncontaminated storm water from contacting, or being contacted by, significant materials; or

b. if preventive measures are not feasible or are inadequate to keep significant materials at the site from contaminating storm water. Structural controls shall be used to treat, divert, isolate, recycle, reuse, or otherwise manage storm water in a manner that reduces the level of significant materials in the storm water and provides compliance with water quality standards as identified in Water Quality Standards, below.

5. Keeping SWPPPs Current

a. The permittee and/or the Industrial Storm Water Certified Operator shall review the SWPPP annually after it is developed and maintain a written report of the review in accordance with Record Keeping, below. Based on the review, the permittee or the Industrial Storm Water Certified Operator shall amend the SWPPP as needed to ensure continued compliance with the terms and conditions of this permit. The written report shall be submitted to the Department on or before January 10th of each year.

b. The SWPPP developed under the conditions of a previous permit shall be amended as necessary to ensure compliance with this permit.

c. The SWPPP shall be updated or amended whenever changes at the facility have the potential to increase the exposure of significant materials to storm water, significant spills occur at the facility, or when the SWPPP is determined by the permittee or the Department to be ineffective in achieving the general objectives of controlling pollutants in storm water discharges associated with industrial activity. Updates based on increased activity or spills at the facility shall include a description of how the permittee intends to control any new sources of significant materials, or respond to and prevent spills in accordance with the requirements of this permit (see Source Identification; Nonstructural Controls; and Structural Controls, above).

d. The Department may notify the permittee at any time that the SWPPP does not meet minimum requirements of this permit. Such notification shall identify why the SWPPP does not meet minimum requirements of this permit. The permittee shall make the required changes to the SWPPP within 30 days after such notification from the Department or authorized representative and shall submit to the Department a written certification that the requested changes have been made.

e. Amendments to the SWPPP shall be signed and retained on-site with the SWPPP pursuant to Signature and SWPPP Review, below.

6. Industrial Storm Water Certified Operator Update

If the Industrial Storm Water Certified Operator is changed or an Industrial Storm Water Certified Operator is added, the permittee shall provide the name and certification number of the new Industrial Storm Water Certified Operator to the Department. If a facility has multiple Industrial Storm Water Certified Operators, the names and certification numbers of all shall be included in the SWPPP.

7. Signature and SWPPP Review

a. The SWPPP shall be reviewed and signed by the Industrial Storm Water Certified Operator(s) and by either the permittee or an authorized representative in accordance with 40 CFR 122.22. The SWPPP and associated records shall be retained on-site at the facility that generates the storm water discharge.

b. The permittee shall make the SWPPP, reports, log books, storm water discharge sampling data (if collected), and items required by Record Keeping, below, available upon request to the Department. The Department makes the non-confidential business information-portions of the SWPPP available to the public upon request.

8. Record Keeping

The permittee shall maintain records of all SWPPP-related inspection and maintenance activities. Records shall also be kept describing incidents such as spills or other discharges that may affect the quality of storm water discharged from the property. All such records shall be retained for three (3) years. The following records are required by this permit (see Nonstructural Controls; and Keeping SWPPPs Current, above):

a. routine preventive maintenance inspection reports

b. routine good housekeeping inspection reports

c. comprehensive site inspection reports

d. documentation of visual assessments

e. employee training records

f. written summaries of the annual SWPPP review

9. Water Quality Standards

At the time of discharge, there shall be no violation of water quality standards in the receiving waters as a result of the storm water discharge. This requirement includes, but is not limited to, the following conditions:

a. In accordance with R 323.1050 of the Part 4 Rules promulgated pursuant to Part 31 of the NREPA, the receiving waters shall not have any of the following unnatural physical properties as a result of this discharge in quantities which are, or may become, injurious to any designated use: turbidity, color, oil films, floating solids, foams, settleable solids, suspended solids, or deposits.

b. Any unusual characteristics of the discharge (i.e., unnatural turbidity, color, oil film, floating solids, foams, settleable solids, suspended solids, or deposits) shall be reported <u>within 24 hours</u> to the Department, followed by a written report <u>within five (5) days</u> detailing the findings of the investigation and the steps taken to correct the condition.

c. Any pollutant for which a level of control is specified to meet a TMDL established by the Department shall be controlled at the facility so that its discharge is reduced by/to the amount specified in the TMDL.

10. Prohibition of Non-Storm Water Discharges

Discharges of material other than storm water shall be in compliance with an NPDES permit issued for the discharge. Storm water shall be defined to include all of the following non-storm water discharges, provided pollution prevention controls for the non-storm water component are identified in the SWPPP:

a. discharges from fire hydrant flushing;

b. potable water sources, including water line flushing;

c. water from fire system testing and fire-fighting training without burned materials or chemical fire suppressants;

d. irrigation drainage;

e. lawn watering;

f. routine building wash-down that does not use detergents or other compounds;

g. pavement wash waters where contamination by toxic or hazardous materials has not occurred (unless all contamination by toxic or hazardous materials has been removed) and where detergents are not used;

h. uncontaminated condensate from air conditioners, coolers, and other compressors and from the outside storage of refrigerated gases or liquids;

i. springs;

j. uncontaminated groundwater;

k. foundation or footing drains where flows are not contaminated with process materials such as solvents; and

l. discharges from fire-fighting activities. Discharges from fire-fighting activities are exempted from the requirement to be identified in the SWPPP.

11. Tracer Dye Discharges

This permit does not authorize the discharge of tracer dyes without approval from the Department. Requests to discharge tracer dyes shall be submitted to the Department in accordance with Rule 1097 (R 323.1097 of the Michigan Administrative Code).

PART II

Part II may include terms and /or conditions not applicable to discharges covered under this permit.

Section A. Definitions

Acute toxic unit (TU_A) means $100/LC_{50}$ where the LC_{50} is determined from a whole effluent toxicity (WET) test which produces a result that is statistically or graphically estimated to be lethal to 50% of the test organisms.

Annual monitoring frequency refers to a calendar year beginning on January 1 and ending on December 31. When required by this permit, an analytical result, reading, value or observation shall be reported for that period if a discharge occurs during that period.

Authorized public agency means a state, local, or county agency that is designated pursuant to the provisions of section 9110 of Part 91 of the NREPA to implement soil erosion and sedimentation control requirements with regard to construction activities undertaken by that agency.

Best management practices (BMPs) means structural devices or nonstructural practices that are designed to prevent pollutants from entering into storm water, to direct the flow of storm water, or to treat polluted storm water.

Bioaccumulative chemical of concern (BCC) means a chemical which, upon entering the surface waters, by itself or as its toxic transformation product, accumulates in aquatic organisms by a human health bioaccumulation factor of more than 1000 after considering metabolism and other physiochemical properties that might enhance or inhibit bioaccumulation. The human health bioaccumulation factor shall be derived according to R 323.1057(5). Chemicals with half-lives of less than 8 weeks in the water column, sediment, and biota are not BCCs. The minimum bioaccumulation concentration factor (BAF) information needed to define an organic chemical as a BCC is either a field-measured BAF or a BAF derived using the biota-sediment accumulation factor (BSAF) methodology. The minimum BAF information needed to define an inorganic chemical as a BCC, including an organometal, is either a field-measured BAF or a laboratory-measured bioconcentration factor (BCF). The BCCs to which these rules apply are identified in Table 5 of R 323.1057 of the Water Quality Standards.

Biosolids are the solid, semisolid, or liquid residues generated during the treatment of sanitary sewage or domestic sewage in a treatment works. This includes, but is not limited to, scum or solids removed in primary, secondary, or advanced wastewater treatment processes and a derivative of the removed scum or solids.

Bulk biosolids means biosolids that are not sold or given away in a bag or other container for application to a lawn or home garden.

Certificate of Coverage (COC) is a document, issued by the Department, which authorizes a discharge under a general permit.

Chronic toxic unit (TU_C) means 100/MATC or $100/IC_{25}$, where the maximum acceptable toxicant concentration (MATC) and IC_{25} are expressed as a percent effluent in the test medium.

Class B biosolids refers to material that has met the Class B pathogen reduction requirements or equivalent treatment by a Process to Significantly Reduce Pathogens (PSRP) in accordance with the Part 24 Rules. Processes include aerobic digestion, composting, anaerobic digestion, lime stabilization and air drying.

Combined sewer system is a sewer system in which storm water runoff is combined with sanitary wastes.

Daily concentration is the sum of the concentrations of the individual samples of a parameter divided by the number of samples taken during any calendar day. If the parameter concentration in any sample is less than the quantification limit, regard that value as zero when calculating the daily concentration. The daily concentration will be used to determine compliance with any maximum and minimum daily concentration limitations (except for pH and dissolved oxygen). When required by the permit, report the maximum calculated daily concentration for the month in the "MAXIMUM" column under "QUALITY OR CONCENTRATION" on the Discharge Monitoring Reports (DMRs).

For pH, report the maximum value of any *individual* sample taken during the month in the "MAXIMUM" column under "QUALITY OR CONCENTRATION" on the DMRs and the minimum value of any *individual* sample taken during the month in the "MINIMUM" column under "QUALITY OR CONCENTRATION" on the DMRs. For dissolved oxygen, report the minimum concentration of any *individual* sample in the "MINIMUM" column under "QUALITY OR CONCENTRATION" on the DMRs.

Daily loading is the total discharge by weight of a parameter discharged during any calendar day. This value is calculated by multiplying the daily concentration by the total daily flow and by the appropriate conversion factor. The daily loading will be used to determine compliance with any maximum daily loading limitations. When required by the permit, report the maximum calculated daily loading for the month in the "MAXIMUM" column under "QUANTITY OR LOADING" on the DMRs.

Daily monitoring frequency refers to a 24-hour day. When required by this permit, an analytical result, reading, value or observation shall be reported for that period if a discharge occurs during that period.

Department means the Michigan Department of Environmental Quality.

Detection level means the lowest concentration or amount of the target analyte that can be determined to be different from zero by a single measurement at a stated level of probability.

Discharge means the addition of any waste, waste effluent, wastewater, pollutant, or any combination thereof to any surface water of the state.

EC_{50} means a statistically or graphically estimated concentration that is expected to cause 1 or more specified effects in 50% of a group of organisms under specified conditions.

Fecal coliform bacteria monthly
FOR WWSLs THAT COLLECT AND STORE WASTEWATER AND ARE AUTHORIZED TO DISCHARGE ONLY IN THE SPRING AND/OR FALL ON AN INTERMITTENT BASIS – Fecal coliform bacteria monthly is the geometric mean of all daily concentrations determined during a discharge event. Days on which no daily concentration is determined shall not be used to determine the calculated monthly value. The calculated monthly value will be used to determine compliance with the maximum monthly fecal coliform bacteria limitations. When required by the permit, report the calculated monthly value in the "AVERAGE" column under "QUALITY OR CONCENTRATION" on the DMR. If the period in which the discharge event occurred was partially in each of two months, the calculated monthly value shall be reported on the DMR of the month in which the last day of discharge occurred.

FOR ALL OTHER DISCHARGES – Fecal coliform bacteria monthly is the geometric mean of all daily concentrations determined during a reporting month. Days on which no daily concentration is determined shall not be used to determine the calculated monthly value. The calculated monthly value will be used to determine compliance with the maximum monthly fecal coliform bacteria limitations. When required by the permit, report the calculated monthly value in the "AVERAGE" column under "QUALITY OR CONCENTRATION" on the DMR.

Fecal coliform bacteria 7-day
FOR WWSLs THAT COLLECT AND STORE WASTEWATER AND ARE AUTHORIZED TO DISCHARGE ONLY IN THE SPRING AND/OR FALL ON AN INTERMITTENT BASIS – Fecal coliform bacteria 7-day is the geometric mean of the daily concentrations determined during any 7 consecutive days of discharge during a discharge event. If the number of daily concentrations determined during the discharge event is less than 7 days, the number of actual daily concentrations determined shall be used for the calculation. Days on which no daily concentration is determined shall not be used to determine the value. The calculated 7-day value will be used to determine compliance with the maximum 7-day fecal coliform bacteria limitations. When required by the permit, report the maximum calculated 7-day geometric mean value for the month in the "MAXIMUM" column under "QUALITY OR CONCENTRATION" on the DMRs. If the 7-day period was partially in each of two months, the value shall be reported on the DMR of the month in which the last day of discharge occurred.

FOR ALL OTHER DISCHARGES – Fecal coliform bacteria 7-day is the geometric mean of the daily concentrations determined during any 7 consecutive days in a reporting month. If the number of daily concentrations determined is less than 7, the actual number of daily concentrations determined shall be used for the calculation. Days on which no daily concentration is determined shall not be used to determine the value. The calculated 7-day value will be used to determine compliance with the maximum 7-day fecal coliform bacteria limitations. When required by the permit, report the maximum calculated 7-day geometric mean for the month in the "MAXIMUM" column under "QUALITY OR CONCENTRATION" on the DMRs. The first calculation shall be made on day 7 of the reporting month, and the last calculation shall be made on the last day of the reporting month.

Flow-proportioned sample is a composite sample with the sample volume proportional to the effluent flow.

General permit means a National Pollutant Discharge Elimination System permit issued authorizing a category of similar discharges.

Geometric mean is the average of the logarithmic values of a base 10 data set, converted back to a base 10 number.

Grab sample is a single sample taken at neither a set time nor flow.

IC_{25} means the toxicant concentration that would cause a 25% reduction in a nonquantal biological measurement for the test population.

Illicit connection means a physical connection to a municipal separate storm sewer system that primarily conveys non-storm water discharges other than uncontaminated groundwater into the storm sewer; or a physical connection not authorized or permitted by the local authority, where a local authority requires authorization or a permit for physical connections.

Illicit discharge means any discharge to, or seepage into, a municipal separate storm sewer system that is not composed entirely of storm water or uncontaminated groundwater. Illicit discharges include non-storm water discharges through pipes or other physical connections; dumping of motor vehicle fluids, household hazardous wastes, domestic animal wastes, or litter; collection and intentional dumping of grass clippings or leaf litter; or unauthorized discharges of sewage, industrial waste, restaurant wastes, or any other non-storm water waste directly into a separate storm sewer.

Individual permit means a site-specific NPDES permit.

Inlet means a catch basin, roof drain, conduit, drain tile, retention pond riser pipe, sump pump, or other point where storm water or wastewater enters into a closed conveyance system prior to discharge off site or into waters of the state.

Interference is a discharge which, alone or in conjunction with a discharge or discharges from other sources, both: 1) inhibits or disrupts the POTW, its treatment processes or operations, or its sludge processes, use or disposal; and 2) therefore, is a cause of a violation of any requirement of the POTW's NPDES permit (including an increase in the magnitude or duration of a violation) or, of the prevention of sewage sludge use or disposal in compliance with the following statutory provisions and regulations or permits issued thereunder (or more stringent state or local regulations): Section 405 of the Clean Water Act, the Solid Waste Disposal Act (SWDA) (including Title II, more commonly referred to as the Resource Conservation and Recovery Act (RCRA), and including state regulations contained in any state sludge management plan prepared pursuant to Subtitle D of the SWDA), the Clean Air Act, the Toxic Substances Control Act, and the Marine Protection, Research and Sanctuaries Act. [This definition does not apply to sample matrix interference].

Land application means spraying or spreading biosolids or a biosolids derivative onto the land surface, injecting below the land surface, or incorporating into the soil so that the biosolids or biosolids derivative can either condition the soil or fertilize crops or vegetation grown in the soil.

LC_{50} means a statistically or graphically estimated concentration that is expected to be lethal to 50% of a group of organisms under specified conditions.

Maximum acceptable toxicant concentration (MATC) means the concentration obtained by calculating the geometric mean of the lower and upper chronic limits from a chronic test. A lower chronic limit is the highest tested concentration that did not cause the occurrence of a specific adverse effect. An upper chronic limit is the lowest tested concentration which did cause the occurrence of a specific adverse effect and above which all tested concentrations caused such an occurrence.

Maximum extent practicable means implementation of best management practices by a public body to comply with an approved storm water management program as required by a national permit for a municipal separate storm sewer system, in a manner that is environmentally beneficial, technically feasible, and within the public body's legal authority.

MGD means million gallons per day.

Monthly concentration is the sum of the daily concentrations determined during a reporting period divided by the number of daily concentrations determined. The calculated monthly concentration will be used to determine compliance with any maximum monthly concentration limitations. Days with no discharge shall not be used to determine the value. When required by the permit, report the calculated monthly concentration in the "AVERAGE" column under "QUALITY OR CONCENTRATION" on the DMR.

For minimum percent removal requirements, the monthly influent concentration and the monthly effluent concentration shall be determined. The calculated monthly percent removal, which is equal to 100 times the quantity [1 minus the quantity (monthly effluent concentration divided by the monthly influent concentration)], shall be reported in the "MINIMUM" column under "QUALITY OR CONCENTRATION" on the DMRs.

Monthly loading is the sum of the daily loadings of a parameter divided by the number of daily loadings determined during a reporting period. The calculated monthly loading will be used to determine compliance with any maximum monthly loading limitations. Days with no discharge shall not be used to determine the value. When required by the permit, report the calculated monthly loading in the "AVERAGE" column under "QUANTITY OR LOADING" on the DMR.

Monthly monitoring frequency refers to a calendar month. When required by this permit, an analytical result, reading, value or observation shall be reported for that period if a discharge occurs during that period.

Municipal separate storm sewer means a conveyance or system of conveyances designed or used for collecting or conveying storm water which is not a combined sewer and which is not part of a publicly-owned treatment works as defined in the Code of Federal Regulations at 40 CFR 122.2.

Municipal separate storm sewer system (MS4) means all separate storm sewers that are owned or operated by the United States, a state, city, village, township, county, district, association, or other public body created by or pursuant to state law, having jurisdiction over disposal of sewage, industrial wastes, storm water, or other wastes, including special districts under state law, such as a sewer district, flood control district, or drainage district, or similar entity, or a designated or approved management agency under Section 208 of the Federal Act that discharges to the waters of the state. This term includes systems similar to separate storm sewer systems in municipalities, such as systems at military bases, large hospital or prison complexes, and highways and other thoroughfares. The term does not include separate storm sewers in very discrete areas, such as individual buildings.

National Pretreatment Standards are the regulations promulgated by or to be promulgated by the Federal Environmental Protection Agency pursuant to Section 307(b) and (c) of the Federal Act. The standards establish nationwide limits for specific industrial categories for discharge to a POTW.

No observed adverse effect level (NOAEL) means the highest tested dose or concentration of a substance which results in no observed adverse effect in exposed test organisms where higher doses or concentrations result in an adverse effect.

Noncontact cooling water is water used for cooling which does not come into direct contact with any raw material, intermediate product, by-product, waste product or finished product.

Nondomestic user is any discharger to a POTW that discharges wastes other than or in addition to water-carried wastes from toilet, kitchen, laundry, bathing or other facilities used for household purposes.

Outfall is the location at which a point source discharge enters the surface waters of the state.

Part 91 agency means an agency that is designated by a county board of commissioners pursuant to the provisions of section 9105 of Part 91 of the NREPA; an agency that is designated by a city, village, or township in accordance with the provisions of section 9106 of Part 91 of the NREPA; or the Department for soil erosion and sedimentation activities under Part 615, Part 631, or Part 632 pursuant to the provisions of section 9115 of Part 91 of the NREPA.

Part 91 permit means a soil erosion and sedimentation control permit issued by a Part 91 agency pursuant to the provisions of Part 91 of the NREPA.

Partially treated sewage is any sewage, sewage and storm water, or sewage and wastewater, from domestic or industrial sources that is treated to a level less than that required by the permittee's National Pollutant Discharge Elimination System permit, or that is not treated to national secondary treatment standards for wastewater, including discharges to surface waters from retention treatment facilities.

Point of discharge is the location of a point source discharge where storm water is discharged directly into a separate storm sewer system.

Point source discharge means a discharge from any discernible, confined, discrete conveyance, including but not limited to any pipe, ditch, channel, tunnel, conduit, well, discrete fissure, container, or rolling stock. Changing the surface of land or establishing grading patterns on land will result in a point source discharge where the runoff from the site is ultimately discharged to waters of the state.

Polluting material means any material, in solid or liquid form, identified as a polluting material under the Part 5 Rules (R 324.2001 through R 324.2009 of the Michigan Administrative Code).

POTW is a publicly owned treatment work.

Pretreatment is reducing the amount of pollutants, eliminating pollutants, or altering the nature of pollutant properties to a less harmful state prior to discharge into a public sewer. The reduction or alteration can be by physical, chemical, or biological processes, process changes, or by other means. Dilution is not considered pretreatment unless expressly authorized by an applicable National Pretreatment Standard for a particular industrial category.

Public (as used in the MS4 individual permit) means all persons who potentially could affect the authorized storm water discharges, including, but not limited to, residents, visitors to the area, public employees, businesses, industries, and construction contractors and developers.

Public body means the United States; the state of Michigan; a city, village, township, county, school district, public college or university, or single-purpose governmental agency; or any other body which is created by federal or state statute or law.

Qualified Personnel means an individual who meets qualifications acceptable to the Department and who is authorized by an Industrial Storm Water Certified Operator to collect the storm water sample.

Qualifying storm event means a storm event causing greater than 0.1 inch of rainfall and occurring at least 72 hours after the previous measurable storm event that also caused greater than 0.1 inch of rainfall. Upon request, the Department may approve an alternate definition meeting the condition of a qualifying storm event.

Quantification level means the measurement of the concentration of a contaminant obtained by using a specified laboratory procedure calculated at a specified concentration above the 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.

Quarterly monitoring frequency refers to a three month period, defined as January through March, April through June, July through September, and October through December. When required by this permit, an analytical result, reading, value or observation shall be reported for that period if a discharge occurs during that period.

Regional Administrator is the Region 5 Administrator, U.S. EPA, located at R-19J, 77 W. Jackson Blvd., Chicago, Illinois 60604.

Regulated area means the permittee's urbanized area, where urbanized area is defined as a place and its adjacent densely-populated territory that together have a minimum population of 50,000 people as defined by the United States Bureau of the Census and as determined by the latest available decennial census.

Secondary containment structure means a unit, other than the primary container, in which significant materials are packaged or held, which is required by State or Federal law to prevent the escape of significant materials by gravity into sewers, drains, or otherwise directly or indirectly into any sewer system or to the surface or ground waters of this state.

Separate storm sewer system means a system of drainage, including, but not limited to, roads, catch basins, curbs, gutters, parking lots, ditches, conduits, pumping devices, or man-made channels, which is not a combined sewer where storm water mixes with sanitary wastes, and is not part of a POTW.

Significant industrial user is a nondomestic user that: 1) is subject to Categorical Pretreatment Standards under 40 CFR 403.6 and 40 CFR Chapter I, Subchapter N; or 2) discharges an average of 25,000 gallons per day or more of process wastewater to a POTW (excluding sanitary, noncontact cooling and boiler blowdown wastewater); contributes a process waste stream which makes up five (5) percent or more of the average dry weather hydraulic or organic capacity of the POTW treatment plant; or is designated as such by the permittee as defined in 40 CFR 403.12(a) on the basis that the industrial user has a reasonable potential for adversely affecting the POTW's treatment plant operation or violating any pretreatment standard or requirement (in accordance with 40 CFR 403.8(f)(6)).

Significant materials Significant Materials means any material which could degrade or impair water quality, including but not limited to: raw materials; fuels; solvents, detergents, and plastic pellets; finished materials such as metallic products; hazardous substances designated under Section 101(14) of Comprehensive Environmental Response, Compensation, and Liability Act (CERCLA) (see 40 CFR 372.65); any chemical the facility is required to report pursuant to Section 313 of Emergency Planning and Community Right-to-Know Act (EPCRA); polluting materials as identified under the Part 5 Rules (R 324.2001 through R 324.2009 of the Michigan Administrative Code); Hazardous Wastes as defined in Part 111 of the NREPA; fertilizers; pesticides; and waste products such as ashes, slag, and sludge that have the potential to be released with storm water discharges.

Significant spills and significant leaks means any release of a polluting material reportable under the Part 5 Rules (R 324.2001 through R 324.2009 of the Michigan Administrative Code).

Special-use area means secondary containment structures required by state or federal law; lands on Michigan's List of Sites of Environmental Contamination pursuant to Part 201, Environmental Remediation, of the NREPA; and/or areas with other activities that may contribute pollutants to the storm water for which the Department determines monitoring is needed.

Stoichiometric means the quantity of a reagent calculated to be necessary and sufficient for a given chemical reaction.

Storm water means storm water runoff, snow melt runoff, surface runoff and drainage, and non-storm water included under the conditions of this permit.

Storm water discharge point is the location where the point source discharge of storm water is directed to surface waters of the state or to a separate storm sewer. It includes the location of all point source discharges where storm water exits the facility, including *outfalls* which discharge directly to surface waters of the state, and *points of discharge* which discharge directly into separate storm sewer systems.

SWPPP means the Storm Water Pollution Prevention Plan prepared in accordance with this permit.

Tier I value means a value for aquatic life, human health or wildlife calculated under R 323.1057 of the Water Quality Standards using a tier I toxicity database.

Tier II value means a value for aquatic life, human health or wildlife calculated under R 323.1057 of the Water Quality Standards using a tier II toxicity database.

Total maximum daily loads (TMDLs) are required by the Federal Act for waterbodies that do not meet water quality standards. TMDLs represent the maximum daily load of a pollutant that a waterbody can assimilate and meet water quality standards, and an allocation of that load among point sources, nonpoint sources, and a margin of safety.

Toxicity reduction evaluation (TRE) means a site-specific study conducted in a stepwise process designed to identify the causative agents of effluent toxicity, isolate the sources of toxicity, evaluate the effectiveness of toxicity control options, and then confirm the reduction in effluent toxicity.

Water Quality Standards means the Part 4 Water Quality Standards promulgated pursuant to Part 31 of the NREPA, being R 323.1041 through R 323.1117 of the Michigan Administrative Code.

Weekly monitoring frequency refers to a calendar week which begins on Sunday and ends on Saturday. When required by this permit, an analytical result, reading, value or observation shall be reported for that period if a discharge occurs during that period.

WWSL is a wastewater stabilization lagoon.

WWSL discharge event is a discrete occurrence during which effluent is discharged to the surface water up to 10 days of a consecutive 14 day period.

3-portion composite sample is a sample consisting of three equal-volume grab samples collected at equal intervals over an 8-hour period.

7-day concentration
FOR WWSLs THAT COLLECT AND STORE WASTEWATER AND ARE AUTHORIZED TO DISCHARGE ONLY IN THE SPRING AND/OR FALL ON AN INTERMITTENT BASIS – The 7-day concentration is the sum of the daily concentrations determined during any 7 consecutive days of discharge during a WWSL discharge event divided by the number of daily concentrations determined. If the number of daily concentrations determined during the WWSL discharge event is less than 7 days, the number of actual daily concentrations determined shall be used for the calculation. The calculated 7-day concentration will be used to determine compliance with any maximum 7-day concentration limitations. When required by the permit, report the maximum calculated 7-day concentration for the WWSL discharge event in the "MAXIMUM" column under "QUALITY OR CONCENTRATION" on the DMR. If the WWSL discharge event was partially in each of two months, the value shall be reported on the DMR of the month in which the last day of discharge occurred.

FOR ALL OTHER DISCHARGES – The 7-day concentration is the sum of the daily concentrations determined during any 7 consecutive days in a reporting month divided by the number of daily concentrations determined. If the number of daily concentrations determined is less than 7, the actual number of daily concentrations determined shall be used for the calculation. The calculated 7-day concentration will be used to determine compliance with any maximum 7-day concentration limitations in the reporting month. When required by the permit, report the maximum calculated 7-day concentration for the month in the "MAXIMUM" column under "QUALITY OR CONCENTRATION" on the DMR. The first 7-day calculation shall be made on day 7 of the reporting month, and the last calculation shall be made on the last day of the reporting month.

7-day loading
FOR WWSLs THAT COLLECT AND STORE WASTEWATER AND ARE AUTHORIZED TO DISCHARGE ONLY IN THE SPRING AND/OR FALL ON AN INTERMITTENT BASIS – The 7-day loading is the sum of the daily loadings determined during any 7 consecutive days of discharge during a WWSL discharge event divided by the number of daily loadings determined. If the number of daily loadings determined during the WWSL discharge event is less than 7 days, the number of actual daily loadings determined shall be used for the calculation. The calculated 7-day loading will be used to determine compliance with any maximum 7-day loading limitations. When required by the permit, report the maximum calculated 7-day loading for the WWSL discharge event in the "MAXIMUM" column under "QUANTITY OR LOADING" on the DMR. If the WWSL discharge event was partially in each of two months, the value shall be reported on the DMR of the month in which the last day of discharge occurred

FOR ALL OTHER DISCHARGES – The 7-day loading is the sum of the daily loadings determined during any 7 consecutive days in a reporting month divided by the number of daily loadings determined. If the number of daily loadings determined is less than 7, the actual number of daily loadings determined shall be used for the calculation. The calculated 7-day loading will be used to determine compliance with any maximum 7-day loading limitations in the reporting month. When required by the permit, report the maximum calculated 7-day loading for the month in the "MAXIMUM" column under "QUANTITY OR LOADING" on the DMR. The first 7-day calculation shall be made on day 7 of the reporting month, and the last calculation shall be made on the last day of the reporting month.

24-hour composite sample is a flow-proportioned composite sample consisting of hourly or more frequent portions that are taken over a 24-hour period. A time-proportioned composite sample may be used upon approval of the Department if the permittee demonstrates it is representative of the discharge.

PART II

Section B. Monitoring Procedures

1. Representative Samples

Samples and measurements taken as required herein shall be representative of the volume and nature of the monitored discharge.

2. Test Procedures

Test procedures for the analysis of pollutants shall conform to regulations promulgated pursuant to Section 304(h) of the Federal Act (40 CFR Part 136 – Guidelines Establishing Test Procedures for the Analysis of Pollutants), unless specified otherwise in this permit. **Test procedures used shall be sufficiently sensitive to determine compliance with applicable effluent limitations**. Requests to use test procedures not promulgated under 40 CFR Part 136 for pollutant monitoring required by this permit shall be made in accordance with the Alternate Test Procedures regulations specified in 40 CFR 136.4. These requests shall be submitted to the Chief of the Permits Section, Water Resources Division, Michigan Department of Environmental Quality, P.O. Box 30458, Lansing, Michigan, 48909-7958. The permittee may use such procedures upon approval.

The permittee shall periodically calibrate and perform maintenance procedures on all analytical instrumentation at intervals to ensure accuracy of measurements. The calibration and maintenance shall be performed as part of the permittee's laboratory Quality Control/Quality Assurance program.

3. Instrumentation

The permittee shall periodically calibrate and perform maintenance procedures on all monitoring instrumentation at intervals to ensure accuracy of measurements.

4. Recording Results

For each measurement or sample taken pursuant to the requirements of this permit, the permittee shall record the following information: 1) the exact place, date, and time of measurement or sampling; 2) the person(s) who performed the measurement or sample collection; 3) the dates the analyses were performed; 4) the person(s) who performed the analyses; 5) the analytical techniques or methods used; 6) the date of and person responsible for equipment calibration; and 7) the results of all required analyses.

5. 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 recordings from continuous monitoring instrumentation shall be retained for a minimum of three (3) years, or longer if requested by the Regional Administrator or the Department.

PART II

Section C. Reporting Requirements

1. Start-up Notification

If the permittee will not discharge during the first 60 days following the effective date of this permit, the permittee shall notify the Department within 14 days following the effective date of this permit, and then 60 days prior to the commencement of the discharge.

2. Submittal Requirements for Self-Monitoring Data

Part 31 of the NREPA (specifically Section 324.3110(7)); and R 323.2155(2) of Part 21, Wastewater Discharge Permits, promulgated under Part 31 of the NREPA, allow the Department to specify the forms to be utilized for reporting the required self-monitoring data. Unless instructed on the effluent limitations page to conduct "Retained Self-Monitoring," the permittee shall submit self-monitoring data via the Department's MiWaters system.

The permittee shall utilize the information provided on the MiWaters website, located at https://miwaters.deq.state.mi.us, to access and submit the electronic forms. Both monthly summary and daily data shall be submitted to the Department no later than the 20th day of the month following each month of the authorized discharge period(s). The permittee may be allowed to submit the electronic forms after this date if the Department has granted an extension to the submittal date.

3. Retained Self-Monitoring Requirements

If instructed on the effluent limits page (or otherwise authorized by the Department in accordance with the provisions of this permit) to conduct retained self-monitoring, the permittee shall maintain a year-to-date log of retained self-monitoring results and, upon request, provide such log for inspection to the staff of the Department. Retained self-monitoring results are public information and shall be promptly provided to the public upon request.

The permittee shall certify, in writing, to the Department, on or before January 10th (April 1st for animal feeding operation facilities) of each year, that: 1) all retained self-monitoring requirements have been complied with and a year-to-date log has been maintained; and 2) the application on which this permit is based still accurately describes the discharge. With this annual certification, the permittee shall submit a summary of the previous year's monitoring data. The summary shall include maximum values for samples to be reported as daily maximums and/or monthly maximums and minimum values for any daily minimum samples.

Retained self-monitoring may be denied to a permittee by notification in writing from the Department. In such cases, the permittee shall submit self-monitoring data in accordance with Part II.C.2., above. Such a denial may be rescinded by the Department upon written notification to the permittee. Reissuance or modification of this permit or reissuance or modification of an individual permittee's authorization to discharge shall not affect previous approval or denial for retained self-monitoring unless the Department provides notification in writing to the permittee.

4. 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 Discharge Monitoring Report. Such increased frequency shall also be indicated.

Monitoring required pursuant to Part 41 of the NREPA or Rule 35 of the Mobile Home Park Commission Act (Act 96 of the Public Acts of 1987) for assurance of proper facility operation shall be submitted as required by the Department.

5. Compliance Dates Notification

Within 14 days of every compliance date specified in this permit, the permittee shall submit a *written* notification to the Department indicating whether or not the particular requirement was accomplished. If the requirement was not accomplished, the notification shall include an explanation of the failure to accomplish the requirement, actions taken or planned by the permittee to correct the situation, and an estimate of when the requirement will be accomplished. If a written report is required to be submitted by a specified date and the permittee accomplishes this, a separate written notification is not required.

6. Noncompliance Notification

Compliance with all applicable requirements set forth in the Federal Act, Parts 31 and 41 of the NREPA, and related regulations and rules is required. All instances of noncompliance shall be reported as follows:

a. 24-Hour Reporting
Any noncompliance which may endanger health or the environment (including maximum and/or minimum daily concentration discharge limitation exceedances) shall be reported, verbally, within 24 hours from the time the permittee becomes aware of the noncompliance. A written submission shall also be provided within five (5) days.

b. Other Reporting
The permittee shall report, in writing, all other instances of noncompliance not described in a. above at the time monitoring reports are submitted; or, in the case of retained self-monitoring, within five (5) days from the time the permittee becomes aware of the noncompliance.

Written reporting shall include: 1) a description of the discharge and cause of noncompliance; and 2) the period of noncompliance, including exact dates and times, or, if not yet corrected, the anticipated time the noncompliance is expected to continue, and the steps taken to reduce, eliminate and prevent recurrence of the noncomplying discharge.

7. Spill Notification

The permittee shall immediately report any release of any polluting material which occurs to the surface waters or groundwaters of the state, unless the permittee has determined that the release is not in excess of the threshold reporting quantities specified in the Part 5 Rules (R 324.2001 through R 324.2009 of the Michigan Administrative Code), by calling the Department at the number indicated on the second page of this permit (or, if this is a general permit, on the COC); or, if the notice is provided after regular working hours, call the Department's 24-hour Pollution Emergency Alerting System telephone number, 1-800-292-4706 (calls from **out-of-state** dial 1-517-373-7660).

Within ten (10) days of the release, the permittee shall submit to the Department a full written explanation as to the cause of the release, the discovery of the release, response (clean-up and/or recovery) measures taken, and preventative measures taken or a schedule for completion of measures to be taken to prevent reoccurrence of similar releases.

8. Upset Noncompliance Notification

If a process "upset" (defined as 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) has occurred, the permittee who wishes to establish the affirmative defense of upset, shall notify the Department by telephone within 24 hours of becoming aware of such conditions; and within five (5) days, provide in writing, the following information:

a. that an upset occurred and that the permittee can identify the specific cause(s) of the upset;

b. that the permitted wastewater treatment facility was, at the time, being properly operated and maintained (note that 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); and

c. that the permittee has specified and taken action on all responsible steps to minimize or correct any adverse impact in the environment resulting from noncompliance with this permit.

No determination made during administrative review of claims that noncompliance was caused by upset, and before an action for noncompliance, is final administrative action subject to judicial review.

In any enforcement proceedings, the permittee, seeking to establish the occurrence of an upset, has the burden of proof.

9. Bypass Prohibition and Notification

a. Bypass Prohibition
Bypass is prohibited, and the Department may take an enforcement action, unless:

1) bypass was unavoidable to prevent loss of life, personal injury, or severe property damage;

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 backup equipment should have been installed in the exercise of reasonable engineering judgment to prevent a bypass; and

3) the permittee submitted notices as required under 9.b. or 9.c. below.

b. Notice of Anticipated Bypass
If the permittee knows in advance of the need for a bypass, it shall submit prior notice to the Department, if possible at least ten (10) days before the date of the bypass, and provide information about the anticipated bypass as required by the Department. The Department may approve an anticipated bypass, after considering its adverse effects, if it will meet the three (3) conditions listed in 9.a. above.

c. Notice of Unanticipated Bypass
The permittee shall submit notice to the Department of an unanticipated bypass by calling the Department at the number indicated on the second page of this permit (if the notice is provided after regular working hours, use the following number: 1-800-292-4706) as soon as possible, but no later than 24 hours from the time the permittee becomes aware of the circumstances.

d. Written Report of Bypass
A written submission shall be provided within five (5) working days of commencing any bypass to the Department, and at additional times as directed by the Department. The written submission shall contain a description of the bypass and its cause; the period of bypass, including exact dates and times, and if the bypass has not been corrected, the anticipated time it is expected to continue; steps taken or planned to reduce, eliminate, and prevent reoccurrence of the bypass; and other information as required by the Department.

e. Bypass Not Exceeding Limitations
The permittee may allow any bypass to occur which does not cause effluent limitations to be exceeded, but only if it also is for essential maintenance to ensure efficient operation. These bypasses are not subject to the provisions of 9.a., 9.b., 9.c., and 9.d., above. This provision does not relieve the permittee of any notification responsibilities under Part II.C.11. of this permit.

f. Definitions

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

2) Severe property damage means substantial physical damage to property, damage to the treatment facilities which causes 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.

10. Bioaccumulative Chemicals of Concern (BCC)

Consistent with the requirements of R 323.1098 and R 323.1215 of the Michigan Administrative Code, the permittee is prohibited from undertaking any action that would result in a lowering of water quality from an increased loading of a BCC unless an increased use request and antidegradation demonstration have been submitted and approved by the Department.

11. Notification of Changes in Discharge

The permittee shall notify the Department, in writing, as soon as possible but no later than 10 days of knowing, or having reason to believe, that any activity or change has occurred or will occur which would result in the discharge of: 1) detectable levels of chemicals on the current Michigan Critical Materials Register, priority pollutants or hazardous substances set forth in 40 CFR 122.21, Appendix D, or the Pollutants of Initial Focus in the Great Lakes Water Quality Initiative specified in 40 CFR 132.6, Table 6, which were not acknowledged in the application or listed in the application at less than detectable levels; 2) detectable levels of any other chemical not listed in the application or listed at less than detection, for which the application specifically requested information; or 3) any chemical at levels greater than five times the average level reported in the complete application (see the first page of this permit, for the date(s) the complete application was submitted). Any other monitoring results obtained as a requirement of this permit shall be reported in accordance with the compliance schedules.

12. Changes in Facility Operations

Any anticipated action or activity, including but not limited to facility expansion, production increases, or process modification, which will result in new or increased loadings of pollutants to the receiving waters must be reported to the Department by a) submission of an increased use request (application) and all information required under R 323.1098 (Antidegradation) of the Water Quality Standards or b) by notice if the following conditions are met: 1) the action or activity will not result in a change in the types of wastewater discharged or result in a greater quantity of wastewater than currently authorized by this permit; 2) the action or activity will not result in violations of the effluent limitations specified in this permit; 3) the action or activity is not prohibited by the requirements of Part II.C.10.; and 4) the action or activity will not require notification pursuant to Part II.C.11. Following such notice, the permit or, if applicable, the facility's COC may be modified according to applicable laws and rules to specify and limit any pollutant not previously limited.

13. Transfer of Ownership or Control

In the event of any change in control or ownership of facilities from which the authorized discharge emanates, the permittee shall submit to the Department 30 days prior to the actual transfer of ownership or control a written agreement between the current permittee and the new permittee containing: 1) the legal name and address of the new owner; 2) a specific date for the effective transfer of permit responsibility, coverage and liability; and 3) a certification of the continuity of or any changes in operations, wastewater discharge, or wastewater treatment.

If the new permittee is proposing changes in operations, wastewater discharge, or wastewater treatment, the Department may propose modification of this permit in accordance with applicable laws and rules.

14. Operations and Maintenance Manual

For wastewater treatment facilities that serve the public (and are thus subject to Part 41 of the NREPA), Section 4104 of Part 41 and associated Rule 2957 of the Michigan Administrative Code allow the Department to require an Operations and Maintenance (O&M) Manual from the facility. An up-to-date copy of the O&M Manual shall be kept at the facility and shall be provided to the Department upon request. The Department may review the O&M Manual in whole or in part at its discretion and require modifications to it if portions are determined to be inadequate.

At a minimum, the O&M Manual shall include the following information: permit standards; descriptions and operation information for all equipment; staffing information; laboratory requirements; record keeping requirements; a maintenance plan for equipment; an emergency operating plan; safety program information; and copies of all pertinent forms, as-built plans, and manufacturer's manuals.

Certification of the existence and accuracy of the O&M Manual shall be submitted to the Department at least sixty days prior to start-up of a new wastewater treatment facility. Recertification shall be submitted sixty days prior to start-up of any substantial improvements or modifications made to an existing wastewater treatment facility.

15. Signatory Requirements

All applications, reports, or information submitted to the Department in accordance with the conditions of this permit and that require a signature shall be signed and certified as described in the Federal Act and the NREPA.

The Federal Act 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 6 months per violation, or by both.

The NREPA (Section 3115(2)) provides that a person who at the time of the violation knew or should have known that he or she discharged a substance contrary to this part, or contrary to a permit, COC, or order issued or rule promulgated under this part, or who intentionally makes a false statement, representation, or certification in an application for or form pertaining to a permit or COC or in a notice or report required by the terms and conditions of an issued permit or COC, or who intentionally renders inaccurate a monitoring device or record required to be maintained by the Department, is guilty of a felony and shall be fined not less than $2,500.00 or more than $25,000.00 for each violation. The court may impose an additional fine of not more than $25,000.00 for each day during which the unlawful discharge occurred. If the conviction is for a violation committed after a first conviction of the person under this subsection, the court shall impose a fine of not less than $25,000.00 per day and not more than $50,000.00 per day of violation. Upon conviction, in addition to a fine, the court in its discretion may sentence the defendant to imprisonment for not more than 2 years or impose probation upon a person for a violation of this part. With the exception of the issuance of criminal complaints, issuance of warrants, and the holding of an arraignment, the circuit court for the county in which the violation occurred has exclusive jurisdiction. However, the person shall not be subject to the penalties of this subsection if the discharge of the effluent is in conformance with and obedient to a rule, order, permit, or COC of the Department. In addition to a fine, the attorney general may file a civil suit in a court of competent jurisdiction to recover the full value of the injuries done to the natural resources of the state and the costs of surveillance and enforcement by the state resulting from the violation.

16. Electronic Reporting

Upon notice by the Department that electronic reporting tools are available for specific reports or notifications, the permittee shall submit electronically all such reports or notifications as required by this permit.

PART II

Section D. Management Responsibilities

1. Duty to Comply

All discharges authorized herein shall be consistent with the terms and conditions of this permit. The discharge of any pollutant identified in this permit, more frequently than, or at a level in excess of, that authorized, shall constitute a violation of the permit.

It is the duty of the permittee to comply with all the terms and conditions of this permit. Any noncompliance with the Effluent Limitations, Special Conditions, or terms of this permit constitutes a violation of the NREPA and/or the Federal Act and constitutes grounds for enforcement action; for permit or Certificate of Coverage (COC) termination, revocation and reissuance, or modification; or denial of an application for permit or COC renewal.

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 this permit.

2. Operator Certification

The permittee shall have the waste treatment facilities under direct supervision of an operator certified at the appropriate level for the facility certification by the Department, as required by Sections 3110 and 4104 of the NREPA. Permittees authorized to discharge storm water shall have the storm water treatment and/or control measures under direct supervision of a storm water operator certified by the Department, as required by Section 3110 of the NREPA.

3. Facilities Operation

The permittee shall, at all times, properly operate and maintain all treatment or control facilities or systems installed or used by the permittee to achieve compliance with the terms and conditions of this permit. Proper operation and maintenance includes adequate laboratory controls and appropriate quality assurance procedures.

4. Power Failures

In order to maintain compliance with the effluent limitations of this permit and prevent unauthorized discharges, 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. 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, the permittee shall halt, reduce or otherwise control production and/or all discharge in order to maintain compliance with the effluent limitations and conditions of this permit.

5. Adverse Impact

The permittee shall take all reasonable steps to minimize or prevent any adverse impact to the surface waters or groundwaters of the state resulting from noncompliance with any effluent limitation specified in this permit including, but not limited to, such accelerated or additional monitoring as necessary to determine the nature and impact of the discharge in noncompliance.

6. Containment Facilities

The permittee shall provide facilities for containment of any accidental losses of polluting materials in accordance with the requirements of the Part 5 Rules (R 324.2001 through R 324.2009 of the Michigan Administrative Code). For a Publicly Owned Treatment Work (POTW), these facilities shall be approved under Part 41 of the NREPA.

7. Waste Treatment Residues

Residuals (i.e. solids, sludges, biosolids, filter backwash, scrubber water, ash, grit, or other pollutants or wastes) removed from or resulting from treatment or control of wastewaters, including those that are generated during treatment or left over after treatment or control has ceased, shall be disposed of in an environmentally compatible manner and according to applicable laws and rules. These laws may include, but are not limited to, the NREPA, Part 31 for protection of water resources, Part 55 for air pollution control, Part 111 for hazardous waste management, Part 115 for solid waste management, Part 121 for liquid industrial wastes, Part 301 for protection of inland lakes and streams, and Part 303 for wetlands protection. Such disposal shall not result in any unlawful pollution of the air, surface waters or groundwaters of the state.

8. Right of Entry

The permittee shall allow the Department, any agent appointed by the Department, or the Regional Administrator, upon the presentation of credentials and, for animal feeding operation facilities, following appropriate biosecurity protocols:

a. to enter upon the permittee's premises where an effluent source is located or any place in which records are required to be kept under the terms and conditions of this permit; and

b. at reasonable times to have access to and copy any records required to be kept under the terms and conditions of this permit; to inspect process facilities, treatment works, monitoring methods and equipment regulated or required under this permit; and to sample any discharge of pollutants.

9. Availability of Reports

Except for data determined to be confidential under Section 308 of the Federal Act and Rule 2128 (R 323.2128 of the Michigan Administrative Code), all reports prepared in accordance with the terms of this permit, shall be available for public inspection at the offices of the Department and the Regional Administrator. As required by the Federal Act, effluent data shall not be considered confidential. Knowingly making any false statement on any such report may result in the imposition of criminal penalties as provided for in Section 309 of the Federal Act and Sections 3112, 3115, 4106 and 4110 of the NREPA.

10. Duty to Provide Information

The permittee shall furnish to the Department, <u>within a reasonable time</u>, any information which the Department may request to determine whether cause exists for modifying, revoking and reissuing, or terminating this permit or the facility's COC, or to determine compliance with this permit. The permittee shall also furnish to the Department, upon request, copies of records required to be kept by this permit.

Where the permittee becomes aware that it failed to submit any relevant facts in a permit application, or submitted incorrect information in a permit application or in any report to the Department, it shall promptly submit such facts or information.

PART II

Section E. Activities Not Authorized by This Permit

1. Discharge to the Groundwaters

This permit does not authorize any discharge to the groundwaters. Such discharge may be authorized by a groundwater discharge permit issued pursuant to the NREPA.

2. POTW Construction

This permit does not authorize or approve the construction or modification of any physical structures or facilities at a POTW. Approval for the construction or modification of any physical structures or facilities at a POTW shall be by permit issued under Part 41 of the NREPA.

3. Civil and Criminal Liability

Except as provided in permit conditions on "Bypass" (Part II.C.9. pursuant to 40 CFR 122.41(m)), nothing in this permit shall be construed to relieve the permittee from civil or criminal penalties for noncompliance, whether or not such noncompliance is due to factors beyond the permittee's control, such as accidents, equipment breakdowns, or labor disputes.

4. Oil and Hazardous Substance Liability

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 to which the permittee may be subject under Section 311 of the Federal Act except as are exempted by federal regulations.

5. 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 Federal Act.

6. Property Rights

The issuance of this permit does not convey any property rights in either real or personal property, or any exclusive privileges, nor does it authorize violation of any federal, state or local laws or regulations, nor does it obviate the necessity of obtaining such permits, including any other Department of Environmental Quality permits, or approvals from other units of government as may be required by law.

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 March 30, 2016

Mr. Mark D. Peacock,
Senior EHS Professional
Duke Energy Indiana, LLC
15424 East State Road 358
Edwardsport, IN 47528

Dear Mr. Peacock:

Re: Final NPDES Permit No. IN0002780
Edwardsport IGCC Generating Station
Edwardsport, Knox County, Indiana

Your application for a National Pollutant Discharge Elimination System (NPDES) permit for authorization to discharge into the waters of the State of Indiana has been processed in accordance with Section 402 and 405 of the Federal Water Pollution Control Act, as amended (33 U.S.C. 1251, et seq.), and IC 13-15, IDEM's permitting authority. All discharges from this facility shall be consistent with the terms and conditions of this permit.

One condition of your permit requires periodic reporting of several effluent parameters. Reporting is to be done using the state Monthly Monitoring Report form. This form can be found 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 "Monthly Monitoring Report (MMR) for Industrial Discharge Permits-30530" under the Wastewater Facilities heading. We recommend selecting the "XLS" version because it will complete all of the calculations when you enter the data.

Additionally, if you are not already using NetDMR, you will soon be receiving an e-mail with a supply of the federal NPDES DMR forms attached. Both the state and federal forms need to be completed and submitted on a routine basis. 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 MMR forms after December 31, 2016. After that date all NPDES and IWP permit holders are 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 subject the permittee to criminal or civil penalties. (See Part II A.2.) It is therefore urged that your office and treatment operator understand this part of the permit.

A response to the comments contained in the letter dated December 22, 2015, from Patrick Coyle of Duke Energy, pertaining to the draft NPDES permit is contained in the Post Public Notice Addendum. The Post Public Notice Addendum is located at the end of the Fact Sheet.

It should also be noted that any 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 filing a petition for administrative review with the Office of Environmental Adjudication (OEA) within eighteen (18) days of the mailing of this letter by filing at the following address:

Office of Environmental Adjudication
Indiana Government Center North
100 North Senate Avenue, Room 501
Indianapolis, IN 46204

Please send a copy of any written appeal to me at the IDEM, Office of Water Quality, 100 North Senate Avenue, Indianapolis, Indiana 46204-2251.

If you have any questions concerning the permit, please contact Richard Hamblin at 317/232-8696. Questions concerning appeal procedures should be directed to the Office of Environmental Adjudication, at 317/232-8591.

Sincerely,

Paul Higginbotham,
Deputy Assistant Commissioner
Office of Water Quality

Enclosures
cc: Knox County Health Department

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"), and IDEM's authority under IC 13-15,

DUKE ENERGY INDIANA, LLC – EDWARDSPORT IGCC STATION

is authorized to discharge from the IGCC station that is located at 15424 East State Road 358, Edwardsport, Indiana, to receiving waters identified as the West Fork of the White River in accordance with effluent limitations, monitoring requirements, and other conditions set forth in Parts I, II, and III hereof. This permit may be revoked for the nonpayment of applicable fees in accordance with IC 13-18-20.

Effective Date: April 1, 2016.

Expiration Date: March 31, 2021.

In order to receive authorization to discharge beyond the date of expiration, the permittee shall submit such information and forms as are required by the Indiana Department of Environmental Management no later than 180 days prior to the date of expiration.

Signed March 30, 2016, for the Indiana Department of Environmental Management.

Paul Higginbotham,
Deputy Assistant Commissioner
Office of Water Quality

PART I

A. EFFLUENT LIMITATIONS AND MONITORING REQUIREMENTS

1. The permittee is authorized to discharge from the outfall listed below in accordance with the terms and conditions of this permit. The permittee is authorized to discharge from Outfall 002. The discharge is limited to coal pile runoff, coal pile runoff pond effluent, site storm water, treated sanitary wastewater, oil/water separator water, cooling tower blowdown, gasification and power block quenches and drains, softener regenerant, 'grey-water' treatment flow, and other wastewater treatment flows. Samples taken in compliance with the monitoring requirements below shall be taken at a point representative of the discharge but prior to entry into the West Fork of the White River. Such discharge shall be limited and monitored by the permittee as specified below:

DISCHARGE LIMITATIONS [1][2][11]

Table 1

	Quantity or Loading			Quality or Concentration			Monitoring	Requirements
Parameter	Monthly Average	Daily Maximum	Units	Monthly Average	Daily Maximum	Units	Measurement Frequency	Sample Type
Flow	Report	Report	MGD	-------	--------	-----	1 x Daily	24 Hour Total
O+G	-------	-------	-----	15	20	mg/l	1 x Weekly	Grab
TSS	-------	-------	-----	30	100	mg/l	1 x Weekly	Grab
Temperature[8]	Report	[9]	°F	-------	--------	-----	2 x Monthly	Grab
TRC[4][5]	-------	-------	-----	0.02	0.04	mg/l	1 x Weekly	Grab
Copper[3]	-------	-------	-----	0.042	0.084	mg/l	1 x Weekly	24-Hr. Comp.
Iron[3]	-------	-------	-----	1.0	1.0	mg/l	1 x Weekly	24-Hr. Comp.
Cadmium[3]	-------	-------	-----	0.011	0.022	mg/l	2 x Monthly	24-Hr. Comp.
Selenium[3][5]	-------	-------	-----	0.13	0.26	mg/l	2 x Monthly	24-Hr. Comp.
Zinc[3]	-------	-------	-----	0.25	0.51	mg/l	1 x Weekly	24-Hr. Comp.
Mercury[7]	-------	-------	-----	12	20	ng/l	1 x Bimonthly	Grab
Total Chromium[3]	----	-------	-----	0.2	0.2	mg/l	1 x Weekly	24-Hr. Comp.
Ammonia, as N	-------	-------	-----	12	24	mg/l	2 x Monthly	24-Hr. Comp.
Free Cyanide[5][6]	----	-------	-----	0.022	0.044	mg/l	1 x Weekly	Grab
Whole Effluent Toxicity Tests[10]								

Table 2

	Quality or Concentration			Monitoring	Requirements
Parameter	Daily Minimum	Daily Maximum	Units	Measurement Frequency	Sample Type
pH	6.0	9.0	s.u.	1 x Weekly	Grab

[1] See Part I.B. of the permit for the Narrative Water Quality Standards.

[2] In the event that changes are to be made in the use of water treatment additives including dosage rates contributing to this Outfall, the permittee shall notify the Indiana Department of Environmental Management as required in Part II.C.1 of this

permit. The use of any new or changed water treatment additives or dosage rates shall not cause the discharge from any permitted outfall to exhibit chronic or acute toxicity. Acute and chronic aquatic toxicity information must be provided with any notification regarding any new or changed water treatment additives or dosage rates.

[3] The permittee shall measure and report the identified metal in total recoverable form.

[4] The water quality based effluent limit (WQBEL) for TRC is less than the limit of quantitation (LOQ) as specified below. Compliance with this permit will be demonstrated if the effluent concentrations measured are less than the LOQ.

If the measured concentration of TRC is greater than the water quality based effluent limitations and above the respective LOD specified in the table below in any three (3) consecutive analyses, or any five (5) out of nine (9) analyses, then the discharger shall:

(1) Determine the source of the parameter through an evaluation of sampling techniques, analytical/laboratory procedures, and waste streams (including internal waste streams); and re-examine the chlorination /dechlorination procedures.

(2) The sampling and analysis for TRC shall be increased to 4 X weekly and remain at this increased sampling frequency until:

(a) The increased sampling frequency for TRC has been in place for at least three (3) consecutive analyses, or any five (5) out of nine (9) analyses.

(b) At least nine (9) samples have been taken under this increased sampling frequency; and

(c) The measured concentration of TRC is less than the LOD specified in the table above in at least seven (7) out of the nine (9) most recent analyses.

[5] The following EPA test methods and/or Standard Methods and associated LODs and LOQs are to be used in the analysis of the effluent samples. Alternative methods may be used if first approved by IDEM.

Parameter	Test Method	LOD	LOQ
Mercury	1631, Revision E	0.2 ng/l	0.5 ng/l
Selenium	3113B or 3114B	2 ug/l	6.4 ug/l
Selenium	200.8	2.1 ug/l	6.7 ug/l
Selenium	200.9	0.6 ug/l	1.9 ug/l

Chlorine	4500-Cl-D,E or 4500-Cl-G	0.02 mg/l	0.06 mg/l
Cyanide, Free	4500-CN-G	5 ug/l	16 ug/l
Cyanide, Free	1677	0.5 ug/l	1.6 ug/l

Case-Specific LOD/LOQ
The permittee may determine a case-specific LOD or LOQ using the analytical method specified above, or any other test method which is approved by the Commissioner prior to use. The LOD shall be derived by the procedure specified for method detection limits contained in 40 CFR Part 136, Appendix B, and the LOQ shall be set equal to 3.18 times the LOD. Other methods may be used if first approved by the Commissioner.

[6] Sample preservation procedures and maximum allowable holding times for total cyanide, or available (free) cyanide are prescribed in Table II of 40 CFR Part 136. Note the footnotes specific to cyanide. Preservation and holding time information in Table II takes precedence over information in specific methods or elsewhere.

[7] Mercury monitoring shall be conducted bi-monthly in the months of February, April, June, August, October, and December of each year for the term of the permit using EPA Test Method 1631, Revision E.

[8] The following conditions apply for Temperature outside the mixing zone:

(1) There shall be no abnormal temperature changes that may adversely affect aquatic life unless caused by natural conditions.

(2) The normal daily and seasonal temperature fluctuations that existed before the addition of heat due to other than natural causes shall be maintained.

(3) The maximum temperature rise at any time or place above natural temperatures shall not exceed five (5) degrees Fahrenheit (two and eight-tenths (2.8) degrees Celsius) in streams.

[9] The discharge from Outfall 002, as determined at the edge of the mixing zone described in 327 IAC 2-1-4, shall not exceed the maximum limits in the following table by more than three degrees Fahrenheit (3°F) (one and seven-tenths degrees Celsius (1.7°C)).

Table 1

	Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec
°F	50	50	60	70	80	90	90	90	90	78	70	57
°C	10	10	15.6	21.1	26.7	32.2	32.2	32.2	32.2	25.5	21.1	14

The permittee will have the option of either meeting the above limits at the end of pipe, or by meeting the limits with a mixed river temperature that takes into account

the mixing zone allowed by 327 IAC 2-1-6(b). The mixed river temperature is to be determined by employing the following mathematical model:

$$T_{MR} = T_u + \frac{Q_e(T_e - T_u)}{127 + Q_e}$$

where:

T_{MR} = mixed river temperature (°F)
T_u = upstream river temperature (°F)
T_e = effluent temperature (°F)
Q_e = effluent flow (MGD)
127 = one-half of the $Q_{7,10}$ low flow value of the receiving stream in MGD

[10] The permittee shall continue the biomonitoring program for Outfall 002 using the procedures contained in Part I.F. of this permit.

[11] The discharge of cooling tower blowdown is regulated by 40 CFR 423.15. 40 CFR 423.15(j)(1) prohibits the discharge, in detectable amounts, of the 126 priority pollutants listed in Appendix A of such regulation contained in chemicals added for cooling tower maintenance with the exception of total zinc and total chromium which have specific numeric limits. In accordance with 423.15(j)(3), instead of monitoring specified in 40 CFR 122.48(b), compliance with the limitations for the 126 priority pollutants may be determined by engineering calculations which demonstrate that the regulated pollutants are not detectable in the final discharge by the analytical methods in 40 CFR 136. However, compliance with the above limitations for the 126 priority pollutants (with the exception of zinc and chromium) must be reported each time there is a change in the chemicals added for cooling tower operation and/or maintenance.

2. The permittee is authorized to discharge from the internal outfall listed below in accordance with the terms and conditions of this permit. The permittee is authorized to discharge from Internal Outfall 201. The discharge is limited to treated sanitary effluent. Samples taken in compliance with the monitoring requirements below shall be taken at a point representative of the discharge but prior to co-mingling with other wastestreams. Such discharge shall be limited and monitored by the permittee as specified below:

DISCHARGE LIMITATIONS

Table 1

	Quantity or Loading			Quality or Concentration			Monitoring	Requirements
Parameter	Monthly Average	Daily Maximum	Units	Monthly Average	Daily Maximum	Units	Measurement Frequency	Sample Type
Flow	Report	Report	MGD	-------	--------	-----	1 x Weekly	24 Hour Total
TSS	-------	-------	-----	30	60	mg/l	1 x Weekly	Grab
$CBOD_5$	-------	-------	-----	25	50	mg/l	1 x Weekly	Grab

3. The permittee is authorized to discharge from the internal outfall listed below in accordance with the terms and conditions of this permit. The permittee is authorized to discharge from Internal Outfall 401. The discharge is limited to emergency overflow from the Southeast Pond. Samples taken in compliance with the monitoring requirements below shall be taken at a point representative of the discharge but prior to co-mingling with other wastestreams. Such discharge shall be limited and monitored by the permittee as specified below:

DISCHARGE LIMITATIONS

Table 1

	Quantity or Loading			Quality or Concentration			Monitoring	Requirements
Parameter	Monthly Average	Daily Maximum	Units	Monthly Average	Daily Maximum	Units	Measurement Frequency	Sample Type
Flow	Report	Report	MGD	-------	--------	-----	Daily	Est. Total
Whole Effluent Toxicity Testing[1]								

[1] The permittee shall continue the biomonitoring program for Internal Outfall 401 using the procedures contained in Part I.G. of this permit.

4. The permittee is authorized to discharge from the internal outfall listed below in accordance with the terms and conditions of this permit. The permittee is authorized to discharge from Internal Outfall 501. The discharge is limited to gasification process wastewater. Samples taken in compliance with the monitoring requirements below shall be taken at a point representative of the discharge but prior to co-mingling with other wastestreams. Such discharge shall be limited and monitored[1] by the permittee as specified below:

DISCHARGE LIMITATIONS

Table 1

	Quantity or Loading			Quality or Concentration			Monitoring Requirements	
Parameter	Monthly Average	Daily Maximum	Units	Monthly Average	Daily Maximum	Units	Measurement Frequency	Sample Type
Flow	Report	Report	MGD	-------	--------	-----	2 X Weekly	24 Hour Total
Arsenic[2]								
Interim	-------	-------	------	Report	Report	mg/l	2 X Monthly	Grab
Final[1]	--------	-------	------	-------	0.004	mg/l	2 X Weekly	Grab
Selenium[2]								
Interim	-------	-------	------	Report	Report	mg/l	2 X Monthly	Grab
Final[1]	-------	-------	------	0.227	0.453	mg/l	2 X Weekly	Grab
Mercury[2]								
Interim	-------	-------	------	Report	Report	ng/l	2 X Monthly	Grab
Final[1]	--------	-------	------	1.3	1.8	ng/l	2 X Weekly	Grab
Total Dissolved Solids								
Interim	-------	-------	------	Report	Report	mg/l	2 X Monthly	Grab
Final[1]	--------	--------	------	22	38	mg/l	2 X Weekly	Grab

[1] The effective date of the final monitoring conditions and effluent limitations for this outfall become effective on April 1, 2021. The permittee shall report from the effective date of the permit until the limits become final on an interim basis as indicated above.

[2] The permittee shall measure and report the identified metal in total recoverable form.

5. The permittee is authorized to discharge storm water from the outfall listed below in accordance with the terms and conditions of this permit. The permittee is authorized to discharge from Outfalls 003, 004, and 005. Samples taken in compliance with the monitoring requirements below shall be taken at a point representative of the discharge but prior to entry into West Fork of the White River and/or unnamed tributary (for Outfall 004). Such discharge shall be limited and monitored by the permittee as specified below:

DISCHARGE LIMITATIONS [1] [2]

			Monitoring Requirements	
Parameter	Daily Maximum	Units	Measurement Frequency	Sample Type
Flow	Report	MGD	1 x Quarterly	Estimate Total
Total Suspended Solids	Report	mg/l	1 x Quarterly	Grab
pH	Report	s.u.	1 x Quarterly	Grab
Oil & Grease	Report	mg/l	1 x Quarterly	Grab
COD	Report	mg/l	1 x Quarterly	Grab
$CBOD_5$	Report	mg/l	1 x Quarterly	Grab
Total Kjeldahl Nitrogen	Report	mg/l	1 x Quarterly	Grab
Nitrate plus Nitrite Nitrogen	Report	mg/l	1 x Quarterly	Grab
Total Phosphorus	Report	mg/l	1 x Quarterly	Grab

[1] The Storm Water Monitoring and Non Numeric Effluent Limits and the Storm Water Pollution Prevention Plan (SWPPP) requirements can be found in Part I.D. and I.E. of this permit.

[2] All samples shall be collected from the discharge resulting from a storm event that is greater than 0.1 inches and at least 72 hours from the previously measurable (greater than 0.1 inch rainfall) storm event.

For each sample taken, the permittee shall record the duration and total rainfall of the storm event, the number of hours between beginning of the storm measured and the end of the previous measurable rain event, and the outside temperature at the time of sampling.

A grab sample shall be taken during the first thirty (30) minutes of the discharge (or as soon thereafter as practicable).

B. NARRATIVE WATER QUALITY STANDARDS

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

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

   a. which will settle to form putrescent, or otherwise objectionable deposits;

   b. which are in amounts sufficient to be unsightly or deleterious;

   c. which produce color, visible oil sheen, odor, or other conditions in such degree as to create a nuisance;

   d. which are in amounts sufficient to be acutely toxic to, or to 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. 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. Monthly Reporting

   The permittee shall submit monitoring reports to the Indiana Department of Environmental Management (IDEM) containing results obtained during the previous month 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 month in which the permit becomes effective. These reports shall include, but not necessarily be limited to, the Discharge Monitoring Report (DMR) and the Monthly Monitoring Report (MMR). Until December 31, 2016, all reports shall be either mailed to the IDEM, Office of Water Quality, Compliance Data Section, 100 North Senate Ave., Indianapolis, Indiana 46204-2251 or submitted 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. Calculations that require averaging of measurements of daily values (both concentrations and mass) shall use an arithmetic mean, except the monthly average for *E. coli* shall be calculated as a geometric mean.

b. Daily effluent values (both mass and concentration) that are less than the LOQ that are used to determine the monthly average effluent level shall be accommodated in calculation of the average using statistical methods that have been approved by the Commissioner.

c. Effluent concentrations less than the LOD shall be reported on the Discharge Monitoring Report (DMR) forms as < (less than) the value of the LOD. For example, if a substance is not detected at a concentration of 0.1 µg/l, report the value as <0.1 µg/l.

d. Effluent concentrations greater than or equal to the LOD and less than the LOQ that are reported on a DMR shall be reported as the actual value and annotated on the DMR to indicate that the value is not quantifiable.

e. Mass discharge values which are calculated from concentrations reported as less than the value of the limit of detection shall be reported as less than the corresponding mass discharge value.

f. Mass discharge values that are calculated from effluent concentrations reported as greater than or equal to the LOQ shall be reported as the calculated value. Mass discharge values that are calculated from effluent concentrations reported as greater than or equal to the LOD, but less than the LOQ, shall be reported as the calculated value and annotated on the DMR to indicate that the value is not quantifiable.

3. Definitions

a. "Monthly Average" 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.

b. "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 reasonably represents the calendar day for the purposes of sampling.

c. "Daily Maximum" means the maximum allowable daily discharge for any calendar day.

d. A "24-hour composite sample" means a sample consisting of at least 3 individual flow-proportioned samples of wastewater, taken by the grab sample method or by an automatic sampler, which are taken at approximately equally spaced time intervals for the duration of the discharge within a 24-hour period and which are combined prior to analysis. A flow-proportioned composite sample may be obtained by:

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

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

(3) the discharge flow rate of each individual sampling time is divided by the total flow value to determine its percentage of the total flow value,

(4) then multiply 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.

e. "Concentration" means the weight of any given material present in a unit volume of liquid. Unless otherwise indicated in this permit, concentration values shall be expressed in milligrams per liter (mg/l).

f. The "Regional Administrator" is defined as the Region 5 Administrator, U.S. EPA, located at 77 West Jackson Boulevard, Chicago, Illinois 60604.

g. The "Commissioner" is defined as the Commissioner of the Indiana Department of Environmental Management, which is located at the following address: 100 North Senate Avenue, Indianapolis, Indiana 46204.

h. "Limit of Detection" or "LOD" means 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.

i. "Limit of Quantitation" or "LOQ" means a measurement of the concentration of a contaminant obtained by using a specified laboratory procedure calibrated at a specified concentration above 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 sometimes called limit of quantification or quantification level.

j. "Method Detection Level" or "MDL" means 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 procedure set forth in 40 CFR 136, Appendix B. The method detection level or MDL is equivalent to the LOD.

k. "Grab Sample" means a sample which is taken from a wastestream on a one-time basis without consideration of the flow rate of the wastestream and without considerations of time.

4. Test Procedures

The analytical and sampling methods used shall conform to the current version of 40 CFR 136. 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 Commissioner 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, Parts 23, Water; Atmosphere 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.

5. Recording of Results

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

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

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

c. The date(s) and time(s) analyses were performed;

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

e. The analytical techniques or methods used; and

f. The results of such measurements and analyses.

6. 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 this monitoring shall be included in the calculation and reporting of the values required in the monthly Discharge Monitoring Report (DMR) and Monthly Monitoring Report (MMR). Such increased frequency shall also be indicated. Other monitoring data not specifically required in this permit (such as internal process or internal waste stream data) which is collected by or for the permittee need not be submitted unless requested by the Commissioner.

7. 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 years 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.

D. STORM WATER MONITORING AND NON-NUMERIC EFFLUENT LIMITS

Within twelve (12) months of the effective date of this permit, the permittee shall implement the non-numeric permit conditions in this Section of the permit for the entire site as it relates to storm water associated with industrial activity regardless which outfall the storm water is discharged from.

1. Control Measures and Effluent Limits

In the technology-based limits included in Part D.2-4., the term "minimize" means reduce and/or eliminate to the extent achievable using control measures (including best management practices) that are technologically available and economically practicable and achievable in light of best industry practice.

2. Control Measures

Select, design, install, and implement control measures (including best management practices) to address the selection and design considerations in Part D.3 to meet the non-numeric effluent limits in Part D.4. The selection, design, installation, and implementation of these control measures must be in accordance with good engineering practices and manufacturer's specifications. Any deviation from the manufacturer's specifications shall be documented. If the control measures are not achieving their intended effect in minimizing pollutant discharges, the control measures must be modified as expeditiously as practicable. Regulated storm water discharges from the facility include storm water run-on that commingles with storm water discharges associated with industrial activity at the facility.

3. Control Measure Selection and Design Considerations

When selecting and designing control measures consider the following:

a. preventing storm water from coming into contact with polluting materials is generally more effective, and cost-effective, than trying to remove pollutants from storm water;
b. use of control measures in combination is more effective than use of control measures in isolation for minimizing pollutants in storm water discharge;

c. assessing the type and quantity of pollutants, including their potential to impact receiving water quality, is critical to designing effective control measures that will achieve the limits in this permit;

d. minimizing impervious areas at your facility and infiltrating runoff onsite (including bioretention cells, green roofs, and pervious pavement, among other approaches), can reduce runoff and improve groundwater recharge and stream base flows in local streams, although care must be taken to avoid ground water contamination;

e. flow can be attenuated by use of open vegetated swales and natural depressions;

f. conservation and/or restoration of riparian buffers will help protect streams from storm water runoff and improve water quality; and

g. use of treatment interceptors (e.g. swirl separators and sand filters) may be appropriate in some instances to minimize the discharge of pollutants.

4. Technology-Based Effluent Limits (BPT/BAT/BCT): Non-Numeric Effluent Limits

a. Minimize Exposure

Minimize the exposure of raw, final, or waste materials to rain, snow, snowmelt, and runoff. To the extent technologically available and economically practicable and achievable, either locate industrial materials and activities inside or protect them with storm resistant coverings in order to minimize exposure to rain, snow, snowmelt, and runoff (although significant enlargement of impervious surface area is not recommended). In minimizing exposure, pay particular attention to the following areas:

Loading and unloading areas: locate in roofed or covered areas where

feasible; use grading, berming, or curbing around the loading area to divert run-on; locate the loading and unloading equipment and vehicles so that leaks are contained in existing containment and flow diversion systems.

Material storage areas: locate indoors, or in roofed or covered areas where feasible; install berms/dikes around these areas; use dry cleanup methods.

Note: Industrial materials do not need to be enclosed or covered if storm water runoff from affected areas will not be discharged to receiving waters.

b. Good Housekeeping

Keep clean all exposed areas that are potential sources of pollutants, using such measures as sweeping at regular intervals, keeping materials orderly and labeled, and stowing materials in appropriate containers.

As part of the developed good housekeeping program, include a cleaning and maintenance program for all impervious areas of the facility where particulate matter, dust, or debris may accumulate, especially areas where material loading and unloading, storage, handling, and processing occur; and where practicable, the paving of areas where vehicle traffic or material storage occur but where vegetative or other stabilization methods are not practicable (institute a sweeping program in these areas too). For unstabilized areas where sweeping is not practicable, consider using storm water management devices such as sediment traps, vegetative buffer strips, filter fabric fence, sediment filtering boom, gravel outlet protection, or other equivalent measures that effectively trap or remove sediment.

c. Maintenance

Maintain all control measures which are used to achieve the effluent limits required by this permit in effective operating condition. Nonstructural control measures must also be diligently maintained (e.g., spill response supplies available, personnel appropriately trained). If control measures need to be replaced or repaired, make the necessary repairs or modifications as expeditiously as practicable.

d. Spill Prevention and Response Procedures

You must minimize the potential for leaks, spills and other releases that may be exposed to storm water and develop plans for effective

response to such spills if or when they occur. At a minimum, you must implement:

(1) Procedures for plainly labeling containers (e.g., "Used Oil", "Spent Solvents", "Fertilizers and Pesticides", etc.) that could be susceptible to spillage or leakage to encourage proper handling and facilitate rapid response if spills or leaks occur;

(2) Preventive measures such as barriers between material storage and traffic areas, secondary containment provisions, and procedures for material storage and handling;

(3) Procedures for expeditiously stopping, containing, and cleaning up leaks, spills, and other releases. Employees who may cause, detect or respond to a spill or leak must be trained in these procedures and have necessary spill response equipment available. If possible, one of these individuals should be a member of your storm water pollution prevention team;

(4) Procedures for notification of appropriate facility personnel, emergency response agencies, and regulatory agencies. State or local requirements may necessitate reporting spills or discharges to local emergency response, public health, or drinking water supply agencies. Contact information must be in locations that are readily accessible and available;

(5) Procedures for documenting where potential spills and leaks could occur that could contribute pollutants to storm water discharges, and the corresponding outfalls that would be affected by such spills and leaks; and

(6) A procedure for documenting all significant spills and leaks of oil or toxic or hazardous pollutants that actually occurred at exposed areas, or that drained to a storm water conveyance.

e. Erosion and Sediment Controls

Through the use of structural and/or non-structural control measures stabilize, and contain runoff from, exposed areas to minimize onsite erosion and sedimentation, and the resulting discharge of pollutants. Among other actions to meet this limit, place flow velocity dissipation devices at discharge locations and within outfall channels where necessary to reduce erosion and/or settle out pollutants. In selecting, designing, installing, and implementing appropriate control measures, you are encouraged to check out information from both the State and

EPA websites. The following two websites are given as information sources:

http://www.in.gov/idem/stormwater/2363.htm and
http://water.epa.gov/polwaste/npdes/swbmp/

f. Management of Runoff

Divert, infiltrate, reuse, contain or otherwise reduce storm water runoff, to minimize pollutants in the discharge.

g. Salt Storage Piles or Piles Containing Salt

Enclose or cover storage piles of salt, or piles containing salt, used for deicing or other commercial or industrial purposes, including maintenance of paved surfaces. You must implement appropriate measures (e.g., good housekeeping, diversions, containment) to minimize exposure resulting from adding to or removing materials from the pile. Piles do not need to be enclosed or covered if storm water runoff from the piles is not discharged.

h. Waste, Garbage, and Floatable Debris

Ensure that waste, garbage, and floatable debris are not discharged to receiving waters by keeping exposed areas free of such materials or by intercepting them before they are discharged.

i. Employee Training

Train all employees who work in areas where industrial material or activities are exposed to storm water, or who are responsible for implementing activities necessary to meet the conditions of this permit (e.g., inspectors, maintenance personnel), including all members of your Pollution Prevention Team. Training must cover the specific control measures used to achieve the effluent limits in this part, and monitoring, inspection, planning, reporting, and documentation requirements in other parts of this permit.

j. Non-Storm water Discharges

You must determine if any non-storm water discharges not authorized by an NPDES permit exist. Any non-storm water discharges discovered must either be eliminated or modified into this permit.

The following non-storm water discharges are authorized and should be documented when they occur in accordance with Part I.E.2.c. of the permit:

Discharges from fire-fighting activities;
Fire Hydrant flushings;
Potable water, including water line flushings;
Uncontaminated condensate from air conditioners, coolers, and other compressors and from the outside storage of refrigerated gases or liquids;
Irrigation drainage;
Landscape watering provided all pesticides, herbicides, and fertilizer have been applied in accordance with the approved labeling;
Pavement wash water where no detergents are used and no spills or leaks of toxic or hazardous material have occurred (unless all spilled material has been removed);
Routine external building washdown that does not use detergents;
Uncontaminated ground water or spring water;
Foundation or footing drains where flows are not contaminated with process materials;
Incidental windblown mist from cooling towers that collects on rooftops or adjacent portions of the facility, but not intentional discharges from cooling towers (e.g., "piped cooling tower blowdown or drains);
Vehicle wash- waters where uncontaminated water without detergents or solvents is utilized; and
Runoff from the use of dust suppressants approved for use by IDEM.

k. Dust Generation and Vehicle Tracking of Industrial Materials

You must minimize generation of dust and off-site tracking of raw, final, or waste materials.

l. Fugitive Dust Emission.

Minimize fugitive dust emissions from coal handling areas. To minimize the tracking of coal dust offsite, consider procedures such as installing specially designed tires or washing vehicles in a designated area before they leave the site and controlling the wash water.

m. Delivery Vehicles

Minimize contamination of storm water runoff from delivery vehicles arriving at the plant site. Consider procedures to inspect delivery vehicles arriving at the plant site and ensure overall integrity of the body or container and procedures to deal with leakage or spillage from vehicles or containers.

n. Fuel Oil Unloading Areas

Minimize contamination of precipitation or surface runoff from fuel oil unloading areas. Consider using containment curbs in unloading areas, having personnel familiar with spill prevention and response procedures present during deliveries to ensure that any leaks or spills are immediately contained and cleaned up, and using spill and overflow protection devices (e.g., drip pans, drip diapers, or other containment devices placed beneath fuel oil connectors to contain potential spillage during deliveries or from leaks at the connectors).

o. Chemical Loading and Unloading

Minimize contamination of precipitation or surface runoff from chemical loading and unloading areas. Consider using containment curbs at chemical loading and unloading areas to contain spills, having personnel familiar with spill prevention and response procedures present during deliveries to ensure that any leaks or spills are immediately contained and cleaned up, and loading and unloading in covered areas and storing chemicals indoors.

p. Miscellaneous Loading and Unloading Areas

Minimize contamination of precipitation or surface runoff from loading and unloading areas. Consider covering the loading area; grading, berming, or curbing around the loading area to divert run-on; locating the loading and unloading equipment and vehicles so that leaks are contained in existing containment and flow diversion systems; or equivalent procedures.

q. Liquid Storage Tanks

Minimize contamination of surface runoff from above-ground liquid storage tanks. Consider protective guards around tanks, containment curbs, spill and overflow protection, dry cleanup methods, or equivalent measures.

r. Large Bulk Fuel Storage Tanks

Minimize contamination of surface runoff from large bulk fuel storage tanks. Consider containment berms (or their equivalent). You must also comply with applicable State and Federal laws, including Spill Prevention, Control and Countermeasure (SPCC) Plan requirements.

s. Spill Reduction Measures

Minimize the potential for an oil or chemical spill, or reference the appropriate part of your SPCC plan. Visually inspect as part of your routine facility inspection the structural integrity of all above-ground tanks, pipelines, pumps, and related equipment that may be exposed to storm water, and make any necessary repairs immediately.

t. Oil-Bearing Equipment in Switchyards

Minimize contamination of surface runoff from oil-bearing equipment in switchyard areas. Consider using level grades and gravel surfaces to retard flows and limit the spread of spills, or collecting runoff in perimeter ditches.

u. Residue-Hauling Vehicles

Inspect all residue-hauling vehicles for proper covering over the load, adequate gate sealing, and overall integrity of the container body. Repair vehicles without load covering or adequate gate sealing, or with leaking containers or beds.

v. Ash Loading Areas

Reduce or control the tracking of ash and residue from ash loading areas. Clear the ash building floor and immediately adjacent roadways of spillage, debris, and excess water before departure of each loaded vehicle.

w. Areas Adjacent to Disposal Ponds or Landfills

Minimize contamination of surface runoff from areas adjacent to disposal ponds or landfills. Reduce ash residue that may be tracked on to access roads traveled by residue handling vehicles, and reduce ash residue on exit roads leading into and out of residue handling areas.

x. Landfills, Scrap yards, Surface Impoundments, Open Dumps, General Refuse Sites

Minimize the potential for contamination of runoff from these areas.

5. Annual Review

At least once every 12 months, the permittee must review the selection, design, installation, and implementation of its control measures to determine if modifications are necessary to meet the effluent limitations in this permit. The permittee must document the results of its review in a report that shall be retained within the SWPPP. The permittee must also submit the report to the Industrial NPDES Permit Section on an annual basis.

6. Corrective Actions – Conditions Requiring Review

a. If any of the following conditions occur, the permittee must review and revise the selection, design, installation, and implementation of its control measures to ensure that the condition is eliminated and will not be repeated:

(1) an unauthorized release or discharge (e.g., spill, leak, or discharge of non-storm water not authorized by this NPDES permit) occurs at this facility;

(2) it is determined that your control measures are not stringent enough for the discharge to meet applicable water quality standards;

(3) it is determined in the routine facility inspection, an inspection by EPA or IDEM, comprehensive site evaluation, or the Annual Review required in Part D.5 that modifications to the control measures are necessary to meet the effluent limits in this permit or that the control measures are not being properly operated and maintained; or

(4) Upon written notice by the Commissioner that the control measures prove to be ineffective in controlling pollutants in storm water discharges exposed to industrial activity.

b. If any of the following conditions occur, the permittee must review and revise the selection, design, installation, and implementation of its control measures to determine if modifications are necessary to meet the effluent limits in this permit:

(1) construction or a change in design, operation, or maintenance at your facility that significantly changes the nature of pollutants discharged in storm water from your facility, or significantly increases the quantity of pollutants discharge.

7. Corrective Action Deadlines

You must document your discovery of any of the conditions listed in Part I.D.6 within thirty (30) days of making such discovery. Subsequently, within one-hundred and twenty (120) days of such discovery, you must document any corrective action(s) to be taken to eliminate or further investigate the deficiency or if no corrective action is needed, the basis for that determination. Specific documentation required within 30 and 120 days is detailed below. If you determine that changes to your control measures are necessary following your review, any modifications to your control measures must be made before the next storm event if possible, or as soon as practicable following that storm event. These time intervals are not grace periods, but schedules considered reasonable for the documenting of your findings and for making repairs and improvements. They are included in this permit to ensure that the conditions prompting the need for these repairs and improvements are not allowed to persist indefinitely.

8. Corrective Action Report

Within 30 days of a discovery of any condition listed in Part I.D.6, you must document the following information:

a. Brief description of the condition triggering corrective action;

b. Date condition identified; and

c. How deficiency identified.

Within 120 days of discovery of any condition listed in Part I.D.6, you must document the following information:

a. Summary of corrective action taken or to be taken (or, for triggering events identified in Part I.D.6.b.(1), where you determine that corrective action is not necessary, the basis for this determination)

b. Notice of whether SWPPP modifications are required as a result of this discovery or corrective action;

c. Date corrective action initiated; and

d. Date corrective action completed or expected to be completed.

9. Inspections

The inspections in this Part must be conducted at this facility when the facility is operating. At least once during the calendar year, the routine facility inspection in Part 9.b of this subsection must be done when a discharge is occurring.

a. Monthly Site Compliance Inspection

The following areas shall be inspected monthly: coal handling areas, loading or unloading areas, switchyards, fueling areas, bulk storage areas, ash handling areas, areas adjacent to disposal ponds and landfills, maintenance areas, liquid storage tanks, and long term and short term material storage areas.

Areas contributing to a storm water discharge associated with industrial activity shall be visually inspected for evidence of, or the potential for, pollutants entering the drainage system. Measures to reduce pollutant loadings shall be evaluated to determine whether they are adequate and properly implemented in accordance with the terms of the permit or whether additional control measures are needed. Structural storm water management measures, sediment and erosion control measures, and other structural pollution prevention measures identified in the plan shall be observed to ensure that they are operating correctly. A visual inspection of equipment needed to implement the plan, such as spill response equipment, shall be made.

Each Comprehensive Site Inspection shall address all potential sources of pollutants, including (if applicable) air pollution control equipment (e.g., baghouses, electrostatic precipitator, scrubbers, and cyclones), for any signs of degradation (e.g., leaks, corrosion, or improper operation) that could limit their efficiency and lead to excessive emissions. Considering monitoring air flow at inlets and outlets (or use equivalent measures) to check for leaks (e.g., particulate deposition) or blockage in ducts. Also inspect all process and material handling equipment (e.g., conveyors, cranes, and vehicles) for leaks, drips, or the potential loss of material; and material storage areas (e.g., piles, bins, or hoppers for storing coke, coal, scrap, or slag, as well as chemicals stored in tanks and drums) for signs of material loss due to wind or storm water runoff.

Any corrective action required as a result of a routine facility inspection must be performed consistent with Part I.D.6 of this permit.

b. Routine Facility Inspections (Once per Calendar Quarter)

i. Routine Facility Inspection - At a minimum, quarterly routine inspections of the storm water management measures and storm water run-off conveyances. The routine inspections must be performed by qualified personnel with at least one member of your storm water pollution prevention team.

ii. Routine Facility Inspection Documentation – You must document the findings of each routine facility inspection performed and maintain this documentation within your SWPPP or have the on-site record keeping location referenced in the SWPPP. At a minimum, your documentation must include:

AA. The inspection date and time;

BB. The name(s) and signature(s) of the inspectors;

CC. Weather information and a description of any discharges occurring at the time of the inspection;

DD. Any previously unidentified discharges of pollutants from the site;

EE. Any control measures needing maintenance or repairs;

FF. Any failed control measures that need replacement;

GG. Any incidents of noncompliance observed; and

HH. Any additional control measures needed to comply with the permit requirements.

Any corrective action required as a result of a routine facility inspection must be performed consistent with Part I.D.6 of this permit.

c. <u>Comprehensive Site Inspections</u> (Once per Calendar Year)

Comprehensive Site Inspection - Qualified personnel and at least one member of your Pollution Prevention Team shall conduct a comprehensive site inspection, at least once per calendar year, to confirm the accuracy of the description of potential pollution sources contained in the plan, determine the effectiveness of the plan, and assess compliance with the permit. Each Comprehensive Site Inspection shall include:

i. Based on the results of the inspection, the description of potential pollutant sources identified in the SWPPP in accordance with Part I.E.2.b of this permit and pollution prevention measures and controls identified in the SWPPP in accordance with Part I.D.4. of this permit shall be revised as appropriate within the timeframes contained in Part I.D.7 of this permit.

ii. A report summarizing the scope of the inspection, personnel conducting the inspection, the date(s) of the inspection, major observations relating to the implementation of the storm water pollution prevention plan, and actions taken in accordance with the above paragraph must be documented and either contained in, or have on-site record keeping location referenced in, the SWPPP at least 3 years after the date of the inspection. The report shall identify any incidents of noncompliance. Where a report does not identify any incidents of noncompliance, the report shall contain a certification that the facility is in compliance with the storm water pollution prevention plan and this permit. The report shall be signed in accordance with the signatory requirements of Part II.C.6 of this permit.

iii. Where the inspection schedules overlap under this section, the Comprehensive Site Inspection may be conducted in place of one such inspection.

iv. Any corrective action required as a result of a routine facility inspection must be performed consistent with Part I.D.6 of this permit.

E. STORM WATER POLLUTION PREVENTION PLAN

1. Development of Plan

Within 12 months from the effective date of this permit, the permittee is required to revise and update the current Storm Water Pollution Prevention Plan (SWPPP) for the permitted facility. The plan shall at a minimum include the following:

a. Identify potential sources of pollution, which may reasonably be expected to affect the quality of storm water discharges associated with industrial activity from the facility. Storm water associated with industrial activity (defined in 40 CFR 122.26(b)(14)) includes, but is not limited to, the discharge from any conveyance which is used for collecting and conveying storm water and which is directly related to

manufacturing, processing or materials storage areas at an industrial plant;

b. Describe practices and measure to be used in reducing the potential for pollutants to be exposed to storm water; and

c. Assure compliance with the terms and conditions of this permit.

2. Contents

The plan shall include, at a minimum, the following items:

a. Pollution Prevention Team -The plan shall list, by position title, the member or members of the facility organization as members of a Storm Water Pollution Prevention Team who are responsible for developing the storm water pollution prevention plan (SWPPP) and assisting the facility or plant manager in its implementation, maintenance, and revision. The plan shall clearly identify the responsibilities of each storm water pollution prevention team member. Each member of the storm water pollution prevention team must have ready access to either an electronic or paper copy of applicable portions of this permit and your SWPPP.

b. Description of Potential Pollutant Sources – The plan shall provide a description of areas at the site exposed to industrial activity and have a reasonable potential for storm water to be exposed to pollutants. The plan shall identify all activities and significant materials (defined in 40 CFR 122.26(b)), which may potentially be significant pollutant sources. As a minimum, the plan shall contain the following:

(1) A soils map indicating the types of soils found on the facility property and showing the boundaries of the facility property.

(2) A graphical representation, such as an aerial photograph or site layout maps, drawn to an appropriate scale, which contains a legend and compass coordinates, indicating, at a minimum, the following:

(A) All on-site storm water drainage and discharge conveyances, which may include pipes, ditches, swales, and erosion channels, related to a storm water discharge.

(B) Known adjacent property drainage and discharge conveyances, if directly associated with run-off from the facility.

(C) All on-site and known adjacent property water bodies, including wetlands and springs.

(D) An outline of the drainage area for each outfall.

(E) An outline of the facility property, indicating directional flows, via arrows, of surface drainage patterns.

(F) An outline of impervious surfaces, which includes pavement and buildings, and an estimate of the impervious and pervious surface square footage for each drainage area placed in a map legend.

(G) On-site injection wells, as applicable.

(H) On-site wells used as potable water sources, as applicable.

(I) All existing major structural control measures to reduce pollutants in storm water run-off.

(J) All existing and historical underground or aboveground storage tank locations, as applicable.

(K) All permanently designated plowed or dumped snow storage locations.

(L) All loading and unloading areas for solid and liquid bulk materials.

(M) All existing and historical outdoor storage areas for raw materials, intermediary products, final products, and waste materials. Include materials handled at the site that potentially may be exposed to precipitation or runoff, areas where deposition of particulate matter from process air emissions or losses during material-handling activities.

(N) All existing or historical outdoor storage areas for fuels, processing equipment, and other containerized materials, for example, in drums and totes.

(O) Outdoor processing areas.

(P) Dust or particulate generating process areas.

(Q) Outdoor assigned waste storage or disposal areas.

(R) Pesticide or herbicide application areas.

(S) Vehicular access roads.

(T) Identify any storage or disposal of wastes such as spent solvents and baths, sand, slag and dross; liquid storage tanks and drums; processing areas including pollution control equipment (e.g., baghouses); and storage areas of raw material such as coal, coke, scrap, sand, fluxes, refractories, or metal in any form. In addition, indicate where an accumulation of significant amounts of particulate matter could occur from such sources as furnace or oven emissions, losses from coal and coke handling operation, etc., and could result in a discharge of pollutants.

(U) The mapping of historical locations is only required if the historical locations have a reasonable potential for storm water exposure to historical pollutants.

(3) An area site map that indicates:

(A) The topographic relief or similar elevations to determine surface drainage patterns;

(B) The facility boundaries;

(C) All receiving waters; and

(D) All known drinking water wells; and

Includes at a minimum, the features in clauses (A), (C), and (D) within a one-fourth (1/4) mile radius beyond the property boundaries of the facility. This map must be to scale and include a legend and compass coordinates.

(4) A narrative description of areas that generate storm water discharges exposed to industrial activity including descriptions for any existing or historical areas listed in subdivision 2.b.(2)(J) through (T) of this Part, and any other areas thought to generate storm water discharges exposed to industrial activity. The narrative descriptions for each identified area must include the following:

(A) Type and typical quantity of materials present in the area.

(B) Methods of storage, including presence of any secondary containment measures.

(C) Any remedial actions undertaken in the area to eliminate pollutant sources or exposure of storm water to those sources. If a corrective action plan was developed, the type of remedial action and plan date shall be referenced.

(D) Any significant release or spill history dating back a period of three (3) years from the effective date of this permit, in the identified area, for materials spilled outside of secondary containment structures and impervious surfaces in excess of their reportable quantity, including the following:

i. The date and type of material released or spilled.

ii. The estimated volume released or spilled.

iii. A description of the remedial actions undertaken, including disposal or treatment.

Depending on the adequacy or completeness of the remedial actions, the spill history shall be used to determine additional pollutant sources that may be exposed to storm water. In subsequent permit terms, the history shall date back for a period of five (5) years from the date of the permit renewal application.

(E) Where the chemicals or materials have the potential to be exposed to storm water discharges, the descriptions for each identified area must include a risk identification analysis of chemicals or materials stored or used within the area. The analysis must include the following:

i. Toxicity data of chemicals or materials used within the area, referencing appropriate material safety data sheet information locations.

ii. The frequency and typical quantity of listed chemicals or materials to be stored within the area.

iii. Potential ways in which storm water discharges may be exposed to listed chemicals and materials.

iv. The likelihood of the listed chemicals and materials to come into contact with water.

(5) A narrative description of existing and planned management practices and measures to improve the quality of storm water run-off entering a water of the state. Descriptions must be created for existing or historical areas listed in subdivision 2.b.(2)(J) through (T) and any other areas thought to generate storm water discharges exposed to industrial activity. The description must include the following:

(A) Any existing or planned structural and nonstructural control practices and measures.

(B) Any treatment the storm water receives prior to leaving the facility property or entering a water of the state.

(C) The ultimate disposal of any solid or fluid wastes collected in structural control measures other than by discharge.

(6) Describe areas that due to topography, activities, or other factors have a high potential for significant soil erosion.

(7) Document the location of any storage piles containing salt used for deicing.

(8) Information or other documentation required under subsection (d) of this plan.

(9) The results of storm water monitoring. The monitoring data must include completed field data sheets, chain-of-custody forms, and laboratory results. If the monitoring data are not placed into the facility's SWPPP, the on-site location for storage of the information must be reference in the SWPPP.

(10) Drainage Area Site Map. Document in your SWPPP the locations of any of the following activities or sources that may be exposed to precipitation or surface runoff: storage tanks, scrap yards, and general refuse areas; short- and long-term storage of general materials (including but not limited to

supplies, construction materials, paint equipment, oils, fuels, used and unused solvents, cleaning materials, paint, water treatment chemicals, fertilizer, and pesticides); landfills and construction sites; and stock pile areas (e.g., coal or limestone piles).

(11) Documentation of Good Housekeeping Measures. You must document in your SWPPP the good housekeeping measures implemented to meet the effluent limits in Part I.D.4 of this NPDES permit.

c. Non-Storm water Discharges – You must document that you have evaluated for the presence of non-storm water discharges not authorized by an NPDES permit. Any non-storm water discharges have either been eliminated or incorporated into this permit. Documentation of non-storm water discharges shall include:

(1) A written non-storm water assessment, including the following:

(A) A certification letter stating that storm water discharges entering a water of the state have been evaluated for the presence of illicit discharges and non-storm water contributions.

(B) Detergent or solvent-based washing of equipment or vehicles that would allow washwater additives to enter any storm water only drainage system shall not be allowed at this facility unless appropriately permitted under this NPDES permit.

(C) All interior maintenance area floor drains with the potential for maintenance fluids or other materials to enter storm water only storm sewers must be either sealed, connected to a sanitary sewer with prior authorization, or appropriately permitted under this NPDES permit. The sealing, sanitary sewer connecting, or permitting of drains under this item must be documented in the written non-storm water assessment program.

(D) The certification shall include a description of the method used, the date of any testing, and the on-site drainage points that were directly observed during the test.

d. General Requirements – The SWPPP must meet the following general requirements:

(1) The plan shall be certified by a qualified professional. The term qualified professional means an individual who is trained and experienced in water treatment techniques and related fields as may be demonstrated by state registration, professional certification, or completion of course work that enable the individual to make sound, professional judgments regarding storm water control/treatment and monitoring, pollutant fate and transport, and drainage planning.

(2) The plan shall be retained at the facility and be available for review by a representative of the Commissioner upon request. IDEM may provide access to portions of your SWPPP to the public.

(3) The plan must be revised and updated as required. Revised and updated versions of the plan must be implemented on or before three hundred sixty-five (365) days from the effective date of this permit. The Commissioner may grant an extension of this time frame based on a request by the person showing reasonable cause.

(4) If the permittee has other written plans, required under applicable federal or state law, such as operation and maintenance, spill prevention control and countermeasures (SPCC), or risk contingency plans, which fulfill certain requirements of an SWPPP, these plans may be referenced, at the permittee's discretion, in the appropriate sections of the SWPPP to meet those section requirements.

(5) The permittee may combine the requirements of the SWPPP with another written plan if:

(A) The plan is retained at the facility and available for review;

(B) All the requirements of the SWPPP are contained within the plan; and

(C) A separate, labeled section is utilized in the plan for the SWPPP requirements.

F. CHRONIC BIOMONITORING PROGRAM 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 40 CFR 136.3 (Tables IA and II) by adding testing method 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 (TRE) which is only required if the effluent demonstrated toxicity, as described in section 1.f.

1. Whole Effluent Toxicity Tests

Within 90 days of the effective date of the permit, the permittee shall initiate the series of bioassay tests described below to monitor the toxicity of the discharge from Outfall(s). The permittee shall continue the bioassay tests described below to monitor the toxicity of the discharge from Outfall 002. If toxicity is demonstrated as defined under section 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 required deviation from the specified methods shall first be approved by the IDEM's Permit Branch.

(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 7-day Daphnid (*Ceriodaphnia dubia*) Survival and Reproduction Test and a 7-day Fathead Minnow (*Pimephales promelas*) Larval Survival and Growth Test on samples of 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 dubia* 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 7-day old 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 taken 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 test as outlined in section f.3. below. The analysis detailed under Part I.A. should be conducted for the effluent sample. Chemical analysis must comply with approved EPA test methods.

d. Testing Frequency and Duration

The chronic toxicity test specified in section b. above shall be conducted at least once annually for the duration of the permit. After

three tests have been completed, and if no toxicity is demonstrated, as defined in section f. below, the permittee may reduce the number of species tested to only include the most sensitive to the toxicity in the effluent. In the absence of toxicity with either species in the annual testing for three (3) consecutive tests, sensitive species will be selected based on frequency and failure of whole effluent toxicity tests with one or the other species in the immediate past.

If toxicity is demonstrated as defined under section f., 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, October 2002, Section 10 (Report Preparation). The completed report for each test shall be submitted to the Compliance Data Section of IDEM no later than 60 days after completion of the test.

In lieu of mailing reports, reports may be submitted to IDEM electronically as an e-mail attachment. E-mails should be sent to wwreports@idem.in.gov.

(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 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*, respectively.

(2) Chronic toxicity will be demonstrated if the effluent is observed to have exceeded 16.0 TU_c (chronic toxic units) for *Ceriodaphnia dubia* or *Pimephales promelas.*

(3) If toxicity is found in any of the tests as specified above, a confirmation toxicity test using the specified methodology and same test species shall be conducted within two weeks of the completion of the failed test to confirm results. During the sampling for any confirmation test 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, including any and all confirmation tests, 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/TIE are being conducted.

g. Definitions

(1) TU_c is defined as 100/NOEC or $100/IC_{25}$, where the NOEC or IC_{25} are expressed as a percent effluent in the test medium.

(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 (effluent) 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 in Part 1, section f. above.

a. Development of TRE Plan

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

(1) Methods for Aquatic Toxicity Identification Evaluations:

Phase I Toxicity Characteristics 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) Toxicity Identification Evaluation: Characterization of Chronically Toxic Effluents, Phase I. EPA/600/6-91/005F, May 1992.

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

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

b. Conduct the Plan

Within 30 days after the submission 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, Office of Water Quality of the IDEM 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, Office of Water Quality of the IDEM, 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 above and reduce the toxicity to acceptable levels as soon as possible, but no later than three years after the date of determination of toxicity.

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 may reduce the number of species tested to only include the species demonstrated to be most sensitive to the toxicity in the effluent, (see section 1.d. above for more specifics on this topic), and conduct chronic tests quarterly for the duration of the permit.

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

f. In lieu of mailing reports, reports may be submitted to IDEM electronically via e-mail. E-mails should be sent to wwreports@idem.in.gov.

G. ACUTE BIOMONITORING PROGRAM 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 must be prohibited. In support of this policy the U.S. EPA in 1995 amended 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 (TRE) which is only required if the effluent demonstrated toxicity, as described in paragraph f.

1. Whole Effluent Toxicity Tests

Within 90 days of the effective date of the permit, the permittee shall initiate the series of bioassay tests described below to monitor the toxicity of the discharge from Outfall(s). The permittee shall perform the bioassay tests described below to monitor the toxicity of the discharge from Internal Outfall 401. If toxicity is demonstrated as defined under section 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 Methods for Measuring the Acute Toxicity of Effluents and Receiving Waters to Freshwater and Marine Organisms, Fifth Edition, EPA-821-R-02-012, October 2002, or most recent update.

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

(3) The determination of effluent toxicity shall be made in accordance with the Data Analysis general procedures as outlined in Section 11, "Acute Toxicity Data Analysis" of Methods for Measuring the Acute Toxicity of Effluents and Receiving Waters to Freshwater and Marine Organisms, Fifth Edition, EPA-821-R-02-012, October 2002.

b. Types of Bioassay Tests

(1) The permittee shall conduct a 96-hour definitive static-renewal LC_{50} bioassay using Fathead Minnow (Pimephales promelas). The test shall be conducted on a 24-hour composite sample of the final effluent. All test solutions shall be renewed daily. On day three, at the end of 48 hours test duration, a second 24-hour composite sample of the effluent shall be used to renew the test solutions.

(2) The permittee shall conduct a 48-hour definitive static renewal LC_{50} bioassay using *Ceriodaphnia dubia* (*Daphnid*) and *Daphnia pulex* (*Daphnid*). The tests shall be conducted on a 24-hour composite sample of final effluent. All test solutions shall be renewed daily.

(3) If additional toxicity tests are needed, the permittee shall conduct a definitive static-renewal LC_{50} bioassay using another

suitable species, representative of the aquatic community of the receiving stream, from the list of recommended in Section 6, page 27, and in Appendix B, page 238 of Methods for Measuring the Acute Toxicity of Effluents and Receiving Waters to Freshwater and Marine Organisms, Fifth Edition, EPA-821-R-02-012, October 2002. The test shall be conducted on a 24-hour composite sample of final effluent. All test solutions shall be renewed daily. If the length of the test is greater than 48-hours, a second 24-hour composite sample of the effluent collected on the second day of the test shall be used to renew the test solutions on day three.

c. Effluent Sample Collection and Chemical Analysis

(1) Samples taken for the purposes of Whole Effluent Toxicity Testing will be at a point that is representative of the effluent 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 analysis, especially the sample taken for the repeat or confirmation test as outlined in section f.2. below. The analysis detailed under Part I.A.3 should be conducted for the effluent sample. Chemical analysis must comply with approved EPA test methods.

d. Testing Frequency and Duration

The acute toxicity tests with the three (3) species identified in section b above shall initially be conducted daily whenever there is a discharge from Internal Outfall 401. After three (3) tests have been completed and provided no toxicity is shown, the permittee may reduce the number of species tested to only include the species demonstrated to be the most sensitive to the toxicity in the effluent. See Section 2.e below on Post-TRE monitoring for discussion and selection of the most sensitive species.

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

e. Reporting

(1) Results shall be reported according to Methods for Measuring the Acute Toxicity of Effluents and Receiving Waters to Freshwater and Marine Organisms, Fifth Edition, EPA-821-R-02-012, Section 12, "Report Preparation". The completed report for each test shall be submitted to the Compliance Data Section of IDEM no later than 60 days after completion of the test.

In lieu of mailing reports, reports may be submitted to IDEM electronically as an e-mail attachment. E-mails should be sent to wwreports@idem.in.gov.

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

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, Daphnia puilex,* or *Pimephales promelas*, respectively.

(2) If toxicity is found in any of the tests specified above, a confirmation acute toxicity test using the specified methodology and same test species shall be conducted within two weeks of the completion of the failed test to confirm results. During the sampling for any confirmation test 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 consecutive acute tests, including any and all confirmation tests, 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 by IDEM) while the TRE/TIE are being conducted.

g. Definitions

TUa 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.

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 Part 1, section f. above.

a. Development of TRE Plan

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

(1) Methods for Aquatic Toxicity Identification Evaluations:

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

(3) Toxicity Reduction Evaluation Protocol for Municipal Wastewater Treatments Plants (EPA/833-B-99-022) August 1999.

b. Conduct the Plan

Within 30 days after the submission of the TRE plan to the 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, Office of Water Quality of the IDEM 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, Office of Water Quality of the IDEM 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 above, and reduce the toxicity to acceptable levels as soon as possible but no later than three years after the date of determination of toxicity.

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

After the TRE, the permittee shall conduct monthly toxicity tests with the three species for a period of six months. After three tests have been completed and provided no toxicity is shown, the permittee may reduce the number of species tested to only include the species demonstrated to be most sensitive to the toxicity in the effluent. After the first six tests have been completed and provided no toxicity is shown, acute toxicity tests shall be conducted every six months thereafter, for the remainder of the permit.

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

The toxicity tests shall be conducted in accordance with the procedures under Part 1, "Whole Effluent Toxicity Testing" above.

f. In lieu of mailing reports, reports may be submitted to IDEM electronically via e-mail. E-mails should be sent to wwreports@idem.in.gov.

H. REOPENING CLAUSES

This permit may be modified, or alternately, revoked and reissued, after public notice and opportunity for hearing:

1. to comply with any applicable effluent limitation or standard issued or approved under 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.

2. to incorporate any of the reopening clause provisions cited at 327 IAC 5-2-16.

3. to include whole effluent toxicity limitations or to include limitations for specific toxicants if the results of the biomonitoring and/or the TRE study indicate that such limitations are necessary to meet Indiana Water Quality Standards.

4. to include a case-specific Limit of Detection (LOD) and/or Limit of Quantitation (LOQ). The permittee must demonstrate that such action is warranted in accordance with the procedures specified under Appendix B, 40 CFR Part 136, using the most sensitive analytical methods approved by EPA under 40 CFR Part 136, or approved by the Commissioner.

5. to comply with any applicable standards, regulations and requirements issued or approved under section 316(b) of the Clean Water Act. The required studies and information collection activities may take 36 months or longer to complete.

6. to delete or modify effluent limitations for gasification wastewater contained in the permit that are based on 40 CFR 423.13(j) as established by Effluent Limitation Guidelines for the Steam Electric Generating Point Source Category published in the Federal Register at 80 FR 67838 (November 3, 2015) for the application of best available technology economically achievable (BAT) to such wastewater ("Steam Electric ELGs"), if the Steam Electric ELGs are stayed or vacated and remanded by order of a federal court as a result of a judicial review proceeding concerning the Steam Electric ELGs or are otherwise stayed or suspended by action of the EPA Administrator.

7. to extend the date set in the permit on which effluent limitations for gasification wastewater contained in the permit that are based on 40 CFR

423.13(j) of the Steam Electric ELGs are to become effective and enforceable to permittee's facility to a date not later than December 31, 2023, if adequate justification is submitted.

8. to revise effluent limitations for gasification wastewater contained in the permit based on the Steam Electric ELGs to incorporate:

   a. revisions to the Steam Electric ELGs, including but not limited to revisions resulting in less stringent effluent limitations, whether resulting from a judicial review proceeding concerning these regulations or other judicial proceedings or administrative actions; or

   b. a fundamentally different factor variance from the Steam Electric ELGs concerning gasification wastewaters.

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 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 an application for renewal of this permit in accordance with 327 IAC 5-2-8(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. Pursuant to 327 IAC 5-3-2(a)(2), 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.

Under the terms of the proposed Federal E-Reporting Rule, the permittee may be required to submit its application for renewal electronically in the future.

4. Permit 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; and

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.

5. 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 a permanent reduction or elimination of any discharge controlled by the permit, e.g., plant closure, termination of discharge by connection to a POTW, a change in state law that requires the reduction or elimination of the discharge, or information indicating that the permitted 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.

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

6. 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 invasion of other private 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.

7. 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.

8. 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.

9. 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.

10. 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 Environmental Rules 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 performed under IC 13-14-2-2 commits a class C infraction.

Pursuant to IC 13-30-10-1.5(k), a person who willfully or recklessly violates any NPDES permit condition or filing requirement, any applicable standards or limitations of IC 13-18-3-2.4, IC 13-18-4-5, IC 13-18-8, IC 13-18-9, IC 13-18-10, IC 13-18-12, IC 13-18-14, IC 13-18-15, or IC 13-18-16, or who knowingly makes any false material statement, representation, or certification in any NPDES form, notice, or report commits a Class C misdemeanor.

Pursuant to IC 13-30-10-1.5(l), an offense under IC 13-30-10-1.5(k) is a Class D felony if the offense results in damage to the environment that renders the environment unfit for human or vertebrate animal life. An offense under IC 13-30-10-1.5(k) is a Class C felony if the offense results in the death of another person.

11. Penalties for Tampering or Falsification

In accordance with 327 IAC 5-2-8(9), the permittee shall comply with monitoring, recording, and reporting requirements of this permit. The Clean Water Act, as well as IC 13-30-10-1, provides that any person who knowingly or intentionally (a) destroys, alters, conceals, or falsely certifies a record that is required to be maintained under the terms of a permit issued by the department; and may be used to determine the status of compliance, (b) renders inaccurate or inoperative a recording device or a monitoring device required to be maintained by a permit

issued by the department, or (c) falsifies testing or monitoring data required by a permit issued by the department commits a Class B misdemeanor.

12. 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.

13. Wastewater treatment plant and certified operators

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.

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 operator" 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.

14. Construction Permit

In accordance with IC 13-14-8-11.6, a discharger is not required to obtain a state permit for the modification or construction of a water pollution treatment or control facility if the discharger has an effective NPDES permit.

If the discharger modifies their existing water pollution treatment or control facility or constructs a new water pollution treatment or control facility for the treatment or control of any new influent pollutant or increased levels of any existing pollutant, then, within thirty (30) days after commencement of operation, the discharger shall file with the Department of Environment Management a notice of installation for the additional pollutant control equipment and a design summary of any modifications.

The notice and design summary shall be sent to the Office of Water Quality, Industrial NPDES Permits Section, 100 North Senate Avenue, Indianapolis, IN 46204-2251.

15. Inspection and Entry

In accordance with 327 IAC 5-2-8(7), 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.

16. 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. Proper Operation and Maintenance

The permittee shall at all times maintain in good working order and efficiently operate all facilities and systems (and related appurtenances) for the collection and treatment which are installed or used by the permittee and which are necessary for achieving compliance with the terms and conditions of this permit in accordance with 327 IAC 5-2-8(8).

Neither 327 IAC 5-2-8(8), 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.

2. Bypass of Treatment Facilities

Pursuant to 327 IAC 5-2-8(11):

a. Terms as defined in 327 IAC 5-2-8(11)(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. The permittee may allow a bypass to occur that does not cause a violation of the effluent limitations in the permit, but only if it is also for essential maintenance to assure efficient operation. These bypasses are not subject to the provisions of Part II.B.2.c., e, and f of this permit.

c. Bypasses, as defined in (a) above, are prohibited, and the Commissioner may take enforcement action against a permittee for bypass, unless the following occur:

(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.e; or

(4) The condition under Part II.B.2.b above is met.

d. 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.

e. 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 an unanticipated bypass that exceeds any effluent limitations in the permit within 24 hours of becoming aware of the bypass noncompliance. 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 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 e-mail submittal is provided 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-mails should be sent to wwreports@idem.in.gov.

f. 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.c. The Commissioner may impose any conditions determined to be necessary to minimize any adverse effects.

3. Upset Conditions

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

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 section, 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 properly operated;

(3) The permittee complied with any remedial measures required under Part II.A.2; and

(4) The permittee submitted notice of the upset as required in the "Twenty-Four Hour 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. The discharge of pollutants in treated wastewater is allowed in compliance with the applicable effluent limitations in Part I. of this permit.

C. REPORTING REQUIREMENTS

1. Planned Changes in Facility or Discharge

Pursuant to 327 IAC 5-2-8(10)(F), the permittee shall give notice to the Commissioner as soon as possible of any planned physical alterations or additions to the permitted facility. In this context, permitted facility refers to a point source discharge, not a wastewater treatment facility. Notice is required only when either of the following applies:

a. The alteration or addition may meet one of the criteria for determining whether the facility is a new source as defined in 327 IAC 5-1.5.

b. The alteration or addition could significantly change the nature of, or increase the quantity of, pollutants discharged. This notification applies to pollutants that are subject neither to effluent limitations in Part I.A. nor to notification requirements in Part II.C.9. of this permit.

Following such notice, the permit may be modified to revise existing pollutant limitations and/or to specify and limit any pollutants not previously limited.

2. Monitoring Reports

Pursuant to 327 IAC 5-2-8(9) and 327 IAC 5-2-13 through 15, monitoring results shall be reported at the intervals and in the form specified in "Monthly Reporting", Part I.C.2.

3. Twenty-Four Hour Reporting Requirements

Pursuant to 327 IAC 5-2-8(10)(C), the permittee shall orally report to the Commissioner information on the following types of noncompliance within 24 hours from the time permittee becomes aware of such noncompliance. If the noncompliance meets the requirements of item b (Part II.C.3.b) or 327 IAC 2-6.1, then the report shall be made within those prescribed time frames. However, under 327 IAC 2-6.1-3(1), when the constituents of the discharge that is in noncompliance 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 noncompliance 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 noncomplying circumstances;

c. Any upset (as defined in Part II.B.3 above) that causes an exceedance of any effluent limitation in the permit;

d. Violation of a maximum daily discharge limitation for any of the following toxic pollutants: copper, cadmium, selenium, zinc, mercury, and free cyanide.

The permittee can make the oral reports by calling (317)232-8670 during regular business hours or by calling (317) 233-7745 ((888)233-7745 toll free in Indiana) during non-business hours. A written submission shall also be provided within 5 days of the time the permittee becomes aware of the circumstances. 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 and eliminate the noncompliance and prevent its recurrence. The Commissioner may waive the written report on a case-by-case basis if the oral report has been received within 24 hours. Alternatively the permittee may submit a "Bypass/Overflow Report" (State Form 48373) or a "Noncompliance 24-Hour Notification Report" (State Form 54215), whichever is appropriate, to IDEM at (317) 232-8637 or wwreports@idem.in.gov. If a complete fax or e-mail submittal is sent within 24 hours of the time that the permittee became aware of the occurrence, then the fax report will satisfy both the oral and written reporting requirements.

Upon its effectiveness, the proposed Federal E-Reporting Rule will require these reports to be submitted electronically.

4. Other Compliance/Noncompliance Reporting

Pursuant to 327 IAC 5-2-8(10)(D), the permittee shall report any instance of noncompliance not reported under the "Twenty-Four Hour Reporting Requirements" in Part II.C.3, or any compliance schedules at the time the pertinent Discharge Monitoring Report is submitted. The report shall contain the information specified in Part II.C.3;

The permittee shall also give advance notice to the Commissioner of any planned changes in the permitted facility or activity which may result in noncompliance with permit requirements; and

All 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 14 days following each schedule date.

Upon its effectiveness, the proposed Federal E-Reporting Rule will require these reports to be submitted electronically.

5. Other Information

Pursuant to 327 IAC 5-2-8(10)(E), where the permittee becomes aware of a failure to submit any relevant facts or submitted incorrect information in a permit application or in any report, 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(14):

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 responsible corporate officer 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 policymaking or decision 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 the 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 government body or any agency or political subdivision thereof: by either a principal executive officer or ranking elected official.

(4) Under the proposed Federal E-Reporting Rule, a method will be developed for submittal of all affected reports and documents using electronic signatures that is compliant with the Cross-Media Electronic Reporting Regulation (CROMERR). Enrollment and use of NetDMR currently provides for CROMERR-compliant report submittal.

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 a 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 Part II.C.6. 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(14) 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, 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. Changes in Discharge of Toxic Substances

Pursuant to 40 CFR 122.42(a)(1), 40 CFR 122.42(a)(2), and 327 IAC 5-2-9, the permittee shall notify the Commissioner as soon as it knows or has reason to believe:

a. That any activity has occurred or will occur which would result in the discharge, on a routine or frequent basis, of any pollutant identified as toxic pursuant to Section 307(a) of the Clean Water Act which is not limited in the permit, if that discharge will exceed the highest of the following "notification levels."

(1) One hundred micrograms per liter (100µg/l);

(2) Two hundred micrograms per liter (200 µg/l) for acrolein and acrylonitrile; five hundred micrograms per liter (500µg/l) for 2,4-dinitrophenol and 2-methyl-4,6-dinitophenol; and one milligram per liter (1mg/l) for antimony;

(3) Five (5) times the maximum concentration value reported for that pollutant in the permit application in accordance with 40 CFR 122.21(g)(7); or

(4) A notification level established by the Commissioner on a case-by-case basis, either at his own initiative or upon a petition by the permittee. This notification level may exceed the level specified in subdivisions (1), (2), or (3) but may not exceed the level which can be achieved by the technology-based treatment

requirements applicable to the permittee under the CWA (see 327 IAC 5-5-2).

b. That any activity has occurred or will occur which would result in any discharge, on a non-routine or infrequent basis, of a toxic pollutant which is not limited in the permit, if that discharge will exceed the highest of the following "notification levels":

(1) Five hundred micrograms per liter (500 µg/l);

(2) One milligram per liter (1 mg/l) for antimony;

(3) Ten (10) times the maximum concentration value reported for that pollutant in the permit application in accordance with Sec. 122.21(g)(7).

(4) A notification level established by the Commissioner on a case-by-case basis, either at his own initiative or upon a petition by the permittee. This notification level may exceed the level specified in subdivisions (1), (2), or (3) but may not exceed the level which can be achieved by the technology-based treatment requirements applicable to the permittee under the CWA (see 327 IAC 5-5-2).

c. That it has begun or expects to begin to use or manufacture, as an intermediate or final product or byproduct, any toxic pollutant which was not reported in the permit application under 40 CFR 122.21(g)(9).

PART III
Other Requirements

A. Thermal Effluent Requirements
There are no 316(a) Alternate Thermal Effluent Limitations associated with this permit. Temperature requirements are found in Part I.A.1 of this permit.

B. Polychlorinated Biphenyl
There shall be no discharge of polychlorinated biphenyl (PCBs) compounds such as those commonly used for transformer fluid.

Many electrical transformers manufactured prior to 1978 contained PCBs. Therefore, in order to determine compliance with the PCB prohibition, the permittee shall provide the following PCB* data for Outfall 002 for the next permit renewal. As part of this renewal, the facility provided data that fulfills the requirement for this permit cycle.

Parameter	Test Method	LOD	LOQ
PCBs*	608	0.1 ug/l	0.3 ug/l

*PCB-1242, PCB-1254, PCB-1221, PCB-1232, PCB-1248, PCB-1260, and PCB-1016

C. Intake Screen Wash

The discharge of Intake Screen Backwash shall meet the Narrative Water Quality Standards contained in Part I.B. of the permit.

D. The facility owns an intake structure on the West Fork of the White River. This intake structure was utilized as a cooling water intake structure (CWIS) at the facility (Legacy Station) prior to the retirement of this facility in 2013 for the purpose of providing cooling water for one-through non-contact cooling. The Station currently obtains its service water, including makeup water for the closed cycle cooling water system, from two (2) subsurface groundwater collector wells located adjacent to the West Fork of the White River. The Station does not withdraw surface water from a water of the United States for cooling water purposes. Since intake structure 801 is only operated for the purpose of collecting fire protection water for the facility as needed, and the Station does not withdraw surface water from a water of the United States for cooling water purposes, Section 316(b) of the federal Clean Water Act (33 U.S.C. sections 1326) is not applicable to the facility's intake structure at this time. Intake Structure 801 shall remain in service only for the purpose of collecting fire protection water for the facility as needed. In the future, if the permittee decides to operate the intake structure 801 for the purpose of providing cooling water for the Stations operations, the permittee shall submit all the applicable requirements of the Section 316(b) of the federal Clean Water Act (33 U.S.C. sections 1326) with the permit modification application to IDEM and obtain a modification to its current

NPDES permit at the time, prior to withdrawing from water of the United States for cooling water purposes. The IGCC Station is prohibited from operating the existing intake structure for cooing water purposes without prior approval from IDEM.

Water Resources
ENVIRONMENTAL QUALITY

PAT MCCRORY
Governor

DONALD R. VAN DER VAART
Secretary

S. JAY ZIMMERMAN
Director

September 9, 2016

Mr. Harry Sideris, Senior Vice President
Environmental, Health and Safety
Duke Energy Carolinas, LLC
Mail Code EC13K
P.O. Box 1006
Charlotte, North Carolina 28201-1006

Subject: Issuance of NPDES Permit
Permit NC0004987
Marshall Steam Station
Catawba County
Facility Class I

Dear Mr. Sideris:

The Division of Water Resources is forwarding herewith the Final NPDES permit for Riverbend Steam Station. This permit renewal is issued pursuant to the requirements of North Carolina General Statute 143-215.1 and the Memorandum of Agreement between North Carolina and the U.S. Environmental Protection Agency dated October 15, 2007 (or as subsequently amended).

A public hearing was held on June 22, 2016 in Hickory seeking comments on the Draft permit. This Final permit incorporates recommendations of the DWR Hearing Officer and EPA as well as other changes:

- Clarifying language was added to the permit in Section A. (2.)/Note 2 to state that continuous monitoring of Total Suspended Solids is only required when decanting via pumps.
- Clarifying language was added to the permit in Section A. (2.) to specify that limits and conditions in Section A. (3.) of the permit apply when water in the ash settling basin is lowered below the three feet trigger mark.
- Clarifying language was added to the permit in Section A. (2.) to specify that the zero discharge limits on fly ash and bottom ash transport water only apply to fly ash and bottom ash transport water generated after November 1, 2018 and January 31, 2021 accordingly.
- Section A. (7.) was corrected to include an addition of a Note 4 superscript to the total mercury limit to clarify that limits are effective on January 31, 2021.
- Section A. (17.) was amended to include a separate IWC for dewatering phase toxicity testing.
- The Groundwater Monitoring Plan attachment was amended to include the following clarifying language: "3(h). The provisions of sections 3(f) and 3(g) apply only to the sampling events described in 3(b) above. The reporting requirements for any sampling events other than those described in 3(b) above shall be in accordance with the general provisions of 15A NCAC 02L."
- A Special Condition entitled "Domestic Wastewater Treatment Plan" was added to the permit to address the EPA comment (Please see Special Condition A. (32.)).
- The Daily Maximum limit for TSS was reduced to 50.0 mg/L for Outfall 002 to meet the requirements of 40 CFR 423.

- The limits for TSS and Oil and Grease were added to Outfall 002A and 002B to meet the requirements of 40 CFR 423.
- A Special Condition A. (30.) was modified to address the EPA concern regarding the permitting of the newly identified seeps and locations of the instream sampling for compliance with the water quality standards.
- The limits for BOD and Fecal Coliforms were added to Outfall 002 to address the EPA comment.
- The footnote describing the effluent limitations for Turbidity was modified to better address the state turbidity standard (Outfall 002).
- The monitoring frequency for Oil and Grease was increased to Monthly (Outfall 002) to address the EPA comment.
- The Plan for Identification of New Discharges was added to the permit to address the EPA comment.
- The Seep Pollutant Analysis Special Condition (Please see A. (30.)) was modified based on the discussion with the US Army Corps of Engineers.
- The additional decanting conditions for closing ash ponds were added to the permit to address the EPA comment.

If any parts, measurement frequencies, or sampling requirements contained in this permit are unacceptable to you, you have the right to an adjudicatory hearing upon written request within thirty (30) days following receipt of this letter. This request must be in the form of a written petition, conforming to Chapter 150B of the North Carolina General Statutes, and filed with the office of Administrative Hearings, 6714 Mail Service Center, Raleigh, North Carolina 27699-6714. Unless such a demand is made, this permit shall be final and binding.

Please take notice that this permit is not transferable except after notice to the Division of Water Resources. The Division may require modification or revocation and reissuance of the permit. This permit does not affect the legal requirements to obtain other permits which may be required by the Division of Water Resources, the Division of Land Resources, the Coastal Area Management Act, or any other federal or local governmental permit.

If you have any questions on this permit, please contact Sergei Chernikov at 919-807-6386.

Sincerely,

S. Jay Zimmerman, P.G.
Director, Division of Water Resources

Hardcopy: Central Files,
NPDES Files
Mooresville Regional Office, Water Quality

E-copy: US EPA, Region IV
Aquatic Toxicology Unit

STATE OF NORTH CAROLINA
DEPARTMENT OF ENVIRONMENTAL QUALITY
DIVISION OF WATER RESOURCES

PERMIT

TO DISCHARGE WASTEWATER UNDER THE

NATIONAL POLLUTANT DISCHARGE ELIMINATION SYSTEM

In compliance with the provisions of North Carolina General Statute 143-215.1, other lawful standards and regulations promulgated and adopted by the North Carolina Environmental Management Commission, and the Federal Water Pollution Control Act, as amended,

Duke Energy Carolinas, LLC

is hereby authorized to discharge wastewater from a facility located at

Marshall Steam Station
At the intersection of NC Highway 150 and NCSR 1841
Terrell
Catawba County

to receiving waters designated as the Catawba River (Lake Norman) in the Catawba River Basin in accordance with effluent limitations, monitoring requirements, and other applicable conditions set forth in Parts I, II, and III hereof.

This permit shall become effective October 1, 2016.

This permit and authorization to discharge shall expire at midnight on September 30, 2021.

Signed this day September 9, 2016.

S. Jay Zimmerman P.G., Director
Division of Water Resources
By Authority of the Environmental Management Commission

SUPPLEMENT TO PERMIT COVER SHEET

All previous NPDES Permits issued to this facility, whether for operation or discharge are hereby revoked, and as of this issuance, any previously issued permit bearing this number is no longer effective. Therefore, the exclusive authority to operate and discharge from this facility arises under the permit conditions, requirements, terms, and provisions included herein.

Duke Energy Carolinas, LLC is hereby authorized to:

1. Continue to discharge:
   - Outfall 001: once-through cooling water and intake screen backwash
   - Outfall 002: treated wastewater (consisting of metal cleaning wastes, coal pile runoff, ash transport water, domestic wastewater, storm water, low volume wastes, and FGD wet scrubber wastewater) from the ash settling basin
   - Outfalls 002A and 002B: yard sump overflows
   - Internal Outfall 003: non-contact cooling water from the induced draft fan control house to intake for cooling water pumps
   - Internal Outfall 004: treated FGD wet scrubber wastewater to the ash settling basin
   - Seep Outfalls 101 and 102: 2 potentially contaminated groundwater seeps

   From a facility located at Duke Energy's Marshall Steam Station at the intersection of NC Highway 150 and NCSR 1841 in Terrell, Catawba County;

2. Discharge from said treatment works at the locations specified on the attached map into the Catawba River (Lake Norman) which is classified WS-IV and B CA waters in the Catawba River Basin.

PART I

A. (1.) Effluent Limitations and Monitoring Requirements (Outfall 001)
[15A NCAC 02B .0400 et seq., 02B .0500 et seq.]

During the period beginning on the effective date of this permit and lasting until expiration, the Permittee is authorized to discharge from **Outfall 001 (once-through cooling water).** Such discharges shall be limited and monitored[2] by the Permittee as specified below:

EFFLUENT CHARACTERISTICS	DISCHARGE LIMITATIONS		MONITORING REQUIREMENTS		
	Monthly Average	**Daily Maximum**	**Measurement Frequency**	**Sample Type**	**Sample Location**
Flow, MGD	Monitor & Report		Daily	Pump logs or similar readings	Effluent
Temperature (November 1 - June 30)	33.3 °C		Daily	Grab	Effluent
Temperature (July 1 - October 31)	34.4 °C		Daily	Grab	Effluent
Free Available Chlorine[1]	0.2 mg/L	0.5 mg/L	Daily	Grab	Effluent

NOTES:

1 Once-through cooling water shall not be chlorinated. Should the facility wish to chlorinate once-through cooling water, Division permission shall be obtained prior to commencement of chlorination. The monitoring requirement and effluent limitations only apply if chlorination is commenced.

2 Starting on December 21, 2016, begin submitting Discharge Monitoring Reports electronically using NC DWR's eDMR application system. Please See Special Condition A. (31.).

There shall be no discharge of floating solids or visible foam in other than trace amounts.

Based upon studies conducted by the permittee and submitted to the Division, it has been determined pursuant to Section 316(a) of the Clean Water Act that the thermal component of the discharge assures the protection and propagation of a balanced, indigenous population of shellfish, fish and wildlife in the receiving water.

A. (2.) Effluent Limitations and Monitoring Requirements (Outfall 002 – normal operation/decanting)
[15A NCAC 02B .0400 et seq., 02B .0500 et seq.]

During the period beginning on the effective date of this permit and lasting until expiration, the Permittee is authorized to discharge from **Outfall 002 (ash settling basin discharge - decanting the free water above the settled ash layer that does not involve mechanical disturbance of the ash)**. Such discharges shall be limited and monitored[4] by the Permittee as specified below:

EFFLUENT CHARACTERISTICS	DISCHARGE LIMITATIONS		MONITORING REQUIREMENTS		
	Monthly Average	**Daily Maximum**	**Measurement Frequency**	**Sample Type**	**Sample Location[1]**
Flow, MGD	Monitor & Report		Weekly	Pump logs or similar readings	Effluent
Oil and Grease	9.0 mg/L	12.0 mg/L	Monthly	Grab	Effluent
Total Suspended Solids[2]	20.0 mg/L	50.0 mg/L	Monthly	Grab	Effluent
BOD, 5-day, 20° C [2]	30.0 mg/L	45.0 mg/L	Monthly	Grab	Effluent
Fecal Coliform (geo. mean)	200/100 mL	400/100 mL	Monthly	Grab	Effluent
Total Arsenic, µg/L			Weekly	Grab	Effluent
Total Copper	1.0 mg/L[3]	1.0 mg/L[3]	Weekly	Grab	Effluent
Total Iron	1.0 mg/L[3]	1.0 mg/L[3]	Weekly	Grab	Effluent
Total Mercury[6]			Weekly	Grab	Effluent
Total Selenium, µg/L			Weekly	Grab	Effluent
Turbidity[5], NTU			Monthly	Grab	Effluent
Nitrate/nitrite as N, mg/L			Quarterly	Grab	Effluent
Bromide, mg/L			Monthly	Grab	Effluent
Total Hardness, mg/L			Monthly	Grab	Effluent
Total Nitrogen (NO_2+NO_3+TKN), mg/L	Monitor & Report		Quarterly	Grab	Effluent
Total Phosphorus, mg/L	Monitor & Report		Quarterly	Grab	Effluent
Chronic Toxicity	See Part I, Section A. (17.)		Monthly	Grab	Effluent
pH[7]	Between 6.0 and 9.0 Standard Units		Monthly	Grab	Effluent

NOTES:

1 Effluent sampling shall be conducted at the discharge from the ash settling basin prior to mixing with any other waste stream(s).

2 The facility shall continuously monitor TSS concentration when the decanting process commences and the decanting pump shall be shutoff automatically when the one half of the Daily Maximum limit (15 minutes average) is exceeded. Pumping will be allowed to continue if interruption might result in a dam failure or damage. The continuous TSS monitoring only required when the pumps are employed for decanting.

3 The limits for total copper and total iron only apply when chemical metal cleaning wastewaters are being discharged.

4 Starting on December 21, 2016, begin submitting Discharge Monitoring Reports electronically using NC DWR's eDMR application system. Please See Special Condition A. (31.)..

5 The net turbidity shall not exceed 50 NTU using a grab sample and measured by the difference between the effluent turbidity and the background turbidity. The sample for the

background turbidity shall be taken at point in the receiving waterbody upstream of the discharge location, and the background turbidity and the effluent turbidity samples shall be taken within the same 24 hour period.
NTU - Nephelometric Turbidity Unit.

6 The facility shall use EPA method 1631E.

7 The facility shall continuously monitor pH when the decanting process commences and the decanting pump shall be shutoff automatically when 15 minutes running average pH falls below 6.1 standard units or rises above 8.9 standard units. Pumping will be allowed to continue if interruption might result in a dam failure or damage.

There shall be no discharge of floating solids or visible foam in other than trace amounts.

The facility is allowed to drawdown the wastewater in the ash pond to no less than three feet above the ash.

The level of water in the ash pond should not be lowered more than 1 ft/week, unless approved by the DEQ Dam Safety Program.

The facility shall use a floating pump station with free water skimmed from the basin surface using an adjustable weir.

By November 1, 2018 there shall be no discharge of pollutants in fly ash transport water. This requirement only applies to fly ash transport water generated after November 1, 2018.

By January 31, 2021 there shall be no discharge of pollutants in bottom ash transport water. This requirement only applies to bottom ash transport water generated after January 31, 2021.

The limits and conditions in Section A. (3.) of the permit apply when water in the ash settling basin is lowered below the three feet trigger mark.

The facility shall notify DWR Complex NPDES Permitting Unit and DWR Mooresville Regional Office seven calendar days prior to the commencement of the decanting.

When the facility commences the ash pond/ponds decommissioning process, the facility shall treat the wastewater discharged from the ash pond/ponds by the physical-chemical treatment facilities.

A. (3.) Effluent Limitations and Monitoring Requirements (Outfall 002 – dewatering phase)
[15A NCAC 02B .0400 et seq., 02B .0500 et seq.]

During the period beginning on the effective date of this permit and lasting until expiration, the Permittee is authorized to discharge from **Outfall 002 Ash Settling Basin Discharge (Dewatering – removing the interstitial water)**. Such discharges shall be limited and monitored[4] by the Permittee as specified below:

EFFLUENT CHARACTERISTICS	DISCHARGE LIMITATIONS		MONITORING REQUIREMENTS		
	Monthly Average	**Daily Maximum**	**Measurement Frequency**	**Sample Type**	**Sample Location[1]**
Flow		1.0 MGD	Weekly	Pump logs or similar readings	Effluent
Oil and Grease	9.0 mg/L	12.0 mg/L	Monthly	Grab	Effluent
Total Suspended Solids[2]	20.0 mg/L	50.0 mg/L	Monthly	Grab	Effluent
Total Arsenic	397.1 µg/L	11,121 µg/L	Weekly	Grab	Effluent
Total Copper	1.0 mg/L[3]	1.0 mg/L[3]	Weekly	Grab	Effluent
Total Iron	1.0 mg/L[3]	1.0 mg/L[3]	Weekly	Grab	Effluent
BOD, 5-day, 20° C [2]	30.0 mg/L	45.0 mg/L	Monthly	Grab	Effluent
Fecal Coliform (geo. mean)	200/100 mL	400/100 mL	Monthly	Grab	Effluent
Total Mercury[6]			Weekly	Grab	Effluent
Total Selenium, µg/L			Weekly	Grab	Effluent
Turbidity[5], NTU			Monthly	Grab	Effluent
Nitrate/nitrite as N, mg/L			Quarterly	Grab	Effluent
Bromide, mg/L			Monthly	Grab	Effluent
Total Hardness, mg/L			Monthly	Grab	Effluent
Total Nitrogen (NO_2+NO_3+TKN), mg/L	Monitor & Report		Quarterly	Grab	Effluent
Total Phosphorus, mg/L	Monitor & Report		Quarterly	Grab	Effluent
Chronic Toxicity	See Part I, Section A. (17.)		Monthly	Grab	Effluent
pH[7]	Between 6.0 and 9.0 Standard Units		Monthly	Grab	Effluent

NOTES:

1 Effluent sampling shall be conducted at the discharge from the ash settling basin prior to mixing with any other waste stream(s).

2 The facility shall continuously monitor TSS concentration when the dewatering process commences and the dewatering pump shall be shutoff automatically when the one half of the Daily Maximum limit (15 minutes average) is exceeded. Pumping will be allowed to continue if interruption might result in a dam failure or damage.

3 The limits for total copper and total iron only apply when chemical metal cleaning wastewaters are being discharged.

4 Starting on December 21, 2016, begin submitting Discharge Monitoring Reports electronically using NC DWR's eDMR application system. Please See Special Condition A. (31.).

5 The net turbidity shall not exceed 50 NTU using a grab sample and measured by the difference between the effluent turbidity and the background turbidity. The sample for the background turbidity shall be taken at point in the receiving waterbody upstream of

the discharge location, and the background turbidity and the effluent turbidity samples shall be taken within the same 24 hour period.
NTU - Nephelometric Turbidity Unit.

6 The facility shall use EPA method 1631E.

7 The facility shall continuously monitor pH when the dewatering process commences and the dewatering pump shall be shutoff automatically when 15 minutes running average pH falls below 6.1 standard units or rises above 8.9 standard units. Pumping will be allowed to continue if interruption might result in a dam failure or damage.

There shall be no discharge of floating solids or visible foam in other than trace amounts.

The level of water in the ash pond should not be lowered more than 1 ft/week, unless approved by the DEQ Dam Safety Program.

By November 1, 2018 there shall be no discharge of pollutants in fly ash transport water. This requirement only applies to fly ash transport water generated after November 1, 2018.

By January 31, 2021 there shall be no discharge of pollutants in bottom ash transport water. This requirement only applies to bottom ash transport water generated after January 31, 2021.

When the facility commences the ash pond/ponds decommissioning process, the facility shall treat the wastewater discharged from the ash pond/ponds by the physical-chemical treatment facilities.

A. (4.) Effluent Limitations and Monitoring Requirements (Outfall 002A)
[15A NCAC 02B .0400 et seq., 02B .0500 et seq.]

During the period beginning on the effective date of this permit and lasting until expiration, the Permittee is authorized to discharge from **Outfall 002A (yard sump #1 overflows).** Such discharges shall be limited and monitored[2] by the Permittee as specified below:

EFFLUENT CHARACTERISTICS	DISCHARGE LIMITATIONS		MONITORING REQUIREMENTS		
	Monthly Average	**Daily Maximum**	**Measurement Frequency**	**Sample Type**	**Sample Location[1]**
Flow, MGD			Per discharge event	Estimate	Effluent
pH	Between 6.0 and 9.0 Standard Units		Per discharge event	Grab	Effluent
Total Suspended Solids	30.0 mg/L	100.0 mg/L	Per discharge event	Grab	Effluent
Oil and Grease	15.0 mg/L	20.0 mg/L	Per discharge event	Grab	Effluent
Total Iron, mg/L			Per discharge event	Grab	Effluent

NOTES:
1 Effluent samples shall be collected at a point upstream of the discharge to the Catawba River.
2 Starting on December 21, 2016, begin submitting Discharge Monitoring Reports electronically using NC DWR's eDMR application system. Please See Special Condition A. (31.).

There shall be no discharge of floating solids or visible foam in other than trace amounts.

All flows shall be reported on monthly DMRs. Should no flow occur during a given month, the words "No Flow" shall be clearly written on the front of the DMR. All samples shall be of a representative discharge.

A. (5.) Effluent Limitations and Monitoring Requirements (Outfall 002B)
[15A NCAC 02B .0400 et seq., 02B .0500 et seq.]

During the period beginning on the effective date of this permit and lasting until expiration, the Permittee is authorized to discharge from **Outfall 002B (yard sump #2 overflows).** Such discharges shall be limited and monitored[2] by the Permittee as specified below:

EFFLUENT CHARACTERISTICS	DISCHARGE LIMITATIONS		MONITORING REQUIREMENTS		
	Monthly Average	**Daily Maximum**	**Measurement Frequency**	**Sample Type**	**Sample Location[1]**
Flow, MGD			Per discharge event	Estimate	Effluent
pH	Between 6.0 and 9.0 Standard Units		Per discharge event	Grab	Effluent
Total Suspended Solids	30.0 mg/L	100.0 mg/L	Per discharge event	Grab	Effluent
Oil and Grease	15.0 mg/L	20.0 mg/L	Per discharge event	Grab	Effluent
Total Iron, mg/L			Per discharge event	Grab	Effluent

NOTES:
1 Effluent samples shall be collected at a point upstream of the discharge to the Catawba River.
2 Starting on December 21, 2016, begin submitting Discharge Monitoring Reports electronically using NC DWR's eDMR application system. Please See Special Condition A. (31.).

There shall be no discharge of floating solids or visible foam in other than trace amounts.

All flows shall be reported on monthly DMRs. Should no flow occur during a given month, the words "No Flow" shall be clearly written on the front of the DMR. All samples shall be of a representative discharge.

A. (6.) Effluent Limitations and Monitoring Requirements (Internal Outfall 003)
[15A NCAC 02B .0400 et seq., 02B .0500 et seq.]

During the period beginning on the effective date of this permit and lasting until expiration, the Permittee is authorized to discharge from **Internal Outfall 003 (non-contact cooling water from the induced draft fan control house).** Such discharges shall be limited and monitored[2] by the Permittee as specified below:

EFFLUENT CHARACTERISTICS	DISCHARGE LIMITATIONS		MONITORING REQUIREMENTS		
	Monthly Average	**Daily Maximum**	**Measurement Frequency**	**Sample Type**	**Sample Location**
Flow, MGD			Semi-annually	Estimate	Effluent
Temperature, ^{0}C			Semi-annually	Grab	Effluent
Total Residual Chlorine[1], µg/L			Semi-annually	Grab	Effluent
Free Available Chlorine[1]	0.2 mg/L	0.5 mg/L	Semi-annually	Grab	Effluent
pH	Between 6.0 and 9.0 Standard Units		Semi-annually	Grab	Effluent

NOTES:

1 Monitoring requirements apply only if chlorine is added to the cooling water. Neither free available chlorine nor total residual chlorine may be discharged from any unit for more than two hours in any one day and not more than one unit in any plant may discharge free available chlorine or total residual chlorine at any one time.

2 Starting on December 21, 2016, begin submitting Discharge Monitoring Reports electronically using NC DWR's eDMR application system. Please See Special Condition A. (31.).

There shall be no discharge of floating solids or visible foam in other than trace amounts.

Limitations shall be met at the discharge point.

A. (7.) Effluent Limitations and Monitoring Requirements (Internal Outfall 004)
[15A NCAC 02B .0400 et seq., 02B .0500 et seq.]

During the period beginning on the effective date of this permit and lasting until expiration, the Permittee is authorized to discharge from **Internal Outfall 004 (treated FGD wet scrubber wastewater to ash settling basin).** Such discharges shall be limited and monitored[2] by the Permittee as specified below:

EFFLUENT CHARACTERISTICS	DISCHARGE LIMITATIONS		MONITORING REQUIREMENTS		
	Monthly Average	**Daily Maximum**	**Measurement Frequency**	**Sample Type**	**Sample Location[1]**
Flow, MGD	Monitor & Report		Monthly	Pump logs or similar readings	Effluent
Total Arsenic	8.0 µg/L[4]	11.0 µg/L[4]	Quarterly	Grab	Effluent
Total Mercury[3], ng/L	356.0 ng/L[4]	788.0 ng/L[4]	Quarterly	Grab	Effluent
Total Selenium	12.0 µg/L[4]	23.0 µg/L[4]	Quarterly	Grab	Effluent
Nitrate/nitrite as N	4.4 mg/L[4]	17.0 mg/L[4]	Quarterly	Grab	Effluent
pH	Between 6.0 and 9.0 Standard Units		Quarterly	Grab	Effluent

NOTES:

1 Sample Location: E - Effluent samples shall be collected from the constructed wetland prior to discharge to the ash settling basin.
2 Starting on December 21, 2016, begin submitting Discharge Monitoring Reports electronically using NC DWR's eDMR application system. Please See Special Condition A. (31.).
3 The facility shall use EPA method 1631E.
4 The TBEL limits shall become effective on January 31, 2021. This time period is provided in order for the facility to budget, design, and construct the treatment system. The facility shall monitor these parameters even before the limits become effective.

All flows shall be reported on monthly DMRs. Should no flow occur during a given month, the words "No Flow" shall be clearly written on the front of the DMR. All samples shall be of a representative discharge.

A. (8.) Effluent Limitations and Monitoring Requirements (Outfall 101)

[15A NCAC 02B .0400 et seq., 02B .0500 et seq.]

During the period beginning on the effective date of this permit and lasting until expiration, the Permittee is authorized to discharge from outfall 101 – Seep Discharge. Such discharges shall be limited and monitored[1] by the Permittee as specified below:

EFFLUENT CHARACTERISTICS	DISCHARGE LIMITATIONS		MONITORING REQUIREMENTS		
	Monthly Average	Daily Maximum	Measurement Frequency[2]	Sample Type	Sample Location
Flow, MGD			Monthly/Quarterly	Estimate	Effluent
pH[3]			Monthly/Quarterly	Grab	Effluent
TSS	30.0 mg/L	100.0 mg/L	Monthly/Quarterly	Grab	Effluent
Oil and Grease	15.0 mg/L	20.0 mg/L	Monthly/Quarterly	Grab	Effluent
Fluoride, µg/L			Monthly/Quarterly	Grab	Effluent
Total Mercury[4], ng/L			Monthly/Quarterly	Grab	Effluent
Total Barium, mg/L			Monthly/Quarterly	Grab	Effluent
Total Iron, µg/L			Monthly/Quarterly	Grab	Effluent
Total Manganese, µg/L			Monthly/Quarterly	Grab	Effluent
Total Zinc, µg/L			Monthly/Quarterly	Grab	Effluent
Total Arsenic, µg/L			Monthly/Quarterly	Grab	Effluent
Total Cadmium, µg/L			Monthly/Quarterly	Grab	Effluent
Total Chromium, µg/L			Monthly/Quarterly	Grab	Effluent
Total Copper, µg/L			Monthly/Quarterly	Grab	Effluent
Total Lead, µg/L			Monthly/Quarterly	Grab	Effluent
Total Nickel, µg/L			Monthly/Quarterly	Grab	Effluent
Total Selenium, µg/L			Monthly/Quarterly	Grab	Effluent
Nitrate/nitrite as N, mg/L			Monthly/Quarterly	Grab	Effluent
Sulfates, mg/L			Monthly/Quarterly	Grab	Effluent
Chlorides, mg/L			Monthly/Quarterly	Grab	Effluent
TDS, mg/L			Monthly/Quarterly	Grab	Effluent
Total Hardness, mg/L			Monthly/Quarterly	Grab	Effluent
Temperature, ^{0}C			Monthly/Quarterly	Grab	Effluent
Conductivity, µmho/cm			Monthly/Quarterly	Grab	Effluent

Notes:

1. Starting on December 21, 2016, begin submitting Discharge Monitoring Reports electronically using NC DWR's eDMR application system. Please See Special Condition A. (31.).
2. The facility shall conduct monthly sampling from the effective date of the permit. After one year from the effective date of the permit the monitoring will be reduced to quarterly
3. The pH shall not be less than 6.0 standard units nor greater than 9.0 standard units.
4. The facility shall use EPA method 1631E.

If the facility is unable to obtain a seep sample due to the dry or low flow conditions preventing the facility from obtaining a representative sample, then "no flow" should be reported on the DMR. This requirement is established in the Section D of the Standard Conditions and 40 CFR 122.41 (j).

There shall be no discharge of floating solids or visible foam in other than trace amounts.

A. (9.) Effluent Limitations and Monitoring Requirements (Outfall 102)

[15A NCAC 02B .0400 et seq., 02B .0500 et seq.]

During the period beginning on the effective date of this permit and lasting until expiration, the Permittee is authorized to discharge from outfall 102 – Seep Discharge. Such discharges shall be limited and monitored[1] by the Permittee as specified below:

EFFLUENT CHARACTERISTICS	DISCHARGE LIMITATIONS		MONITORING REQUIREMENTS		
	Monthly Average	Daily Maximum		Monthly Average	Daily Maximum
Flow, MGD			Monthly/Quarterly	Estimate	Effluent
pH[3]			Monthly/Quarterly	Grab	Effluent
TSS	30.0 mg/L	100.0 mg/L	Monthly/Quarterly	Grab	Effluent
Oil and Grease	15.0 mg/L	20.0 mg/L	Monthly/Quarterly	Grab	Effluent
Fluoride, mg/L			Monthly/Quarterly	Grab	Effluent
Total Mercury[4], ng/L			Monthly/Quarterly	Grab	Effluent
Total Barium, mg/L			Monthly/Quarterly	Grab	Effluent
Total Iron, mg/L			Monthly/Quarterly	Grab	Effluent
Total Manganese, µg/L			Monthly/Quarterly	Grab	Effluent
Total Zinc, µg/L			Monthly/Quarterly	Grab	Effluent
Total Arsenic, µg/L			Monthly/Quarterly	Grab	Effluent
Total Cadmium, µg/L			Monthly/Quarterly	Grab	Effluent
Total Chromium, µg/L			Monthly/Quarterly	Grab	Effluent
Total Copper, µg/L			Monthly/Quarterly	Grab	Effluent
Total Lead, µg/L			Monthly/Quarterly	Grab	Effluent
Total Nickel, µg/L			Monthly/Quarterly	Grab	Effluent
Total Selenium, µg/L			Monthly/Quarterly	Grab	Effluent
Nitrate/nitrite as N, mg/L			Monthly/Quarterly	Grab	Effluent
Sulfates, mg/L			Monthly/Quarterly	Grab	Effluent
Chlorides, mg/L			Monthly/Quarterly	Grab	Effluent
TDS, mg/L			Monthly/Quarterly	Grab	Effluent
Total Hardness, mg/L			Monthly/Quarterly	Grab	Effluent
Temperature, ^{0}C			Monthly/Quarterly	Grab	Effluent
Conductivity, µmho/cm			Monthly/Quarterly	Grab	Effluent

Notes:

1. Starting on December 21, 2016, begin submitting Discharge Monitoring Reports electronically using NC DWR's eDMR application system. Please See Special Condition A. (31.).
2. The facility shall conduct monthly sampling from the effective date of the permit. After one year from the effective date of the permit the monitoring will be reduced to quarterly
3. The pH shall not be less than 6.0 standard units nor greater than 9.0 standard units.
4. The facility shall use EPA method 1631E.

If the facility is unable to obtain a seep sample due to the dry or low flow conditions preventing the facility from obtaining a representative sample, then "no flow" should be reported on the DMR. This requirement is established in the Section D of the Standard Conditions and 40 CFR 122.41 (j).

There shall be no discharge of floating solids or visible foam in other than trace amounts.

A. (10.) ADDITIONAL CONDITIONS AND DEFINITIONS

1. EPA methods 200.7 or 200.8 (or the most current versions) shall be used for analyses of all metals except for total mercury (EPA Method 1631E).
2. All effluent samples for all external outfalls shall be taken at the most accessible location after the final treatment but prior to discharge to waters of the U.S. (40 CFR 122.41(j)).
3. The term *low volume waste sources* means wastewater from all sources except those for which specific limitations are otherwise established in this part (40 CFR 423.11 (b)).
4. The term *chemical metal cleaning waste* means any wastewater resulting from cleaning any metal process equipment with chemical compounds, including, but not limited to, boiler tube cleaning (40 CFR 423.11 (c)).
5. The term *metal cleaning waste* means any wastewater resulting from cleaning [with or without chemical cleaning compounds] any metal process equipment including, but not limited to, boiler tube cleaning, boiler fireside cleaning, and air preheater cleaning (40 CFR 423.11 (d)).
6. For all outfalls where the flow measurement is to be "estimated" the estimate can be done by using calibrated V-notch weir, stop-watch and graduated cylinder, or other method approved by the Division.
7. The term "FGD wet scrubber wastewater" means wastewater resulting from the use of the flue-gas desulfurization wet scrubber.

A. (11.) TOXICITY RE-OPENER CONDITION

This permit shall be modified, or revoked and reissued to incorporate toxicity limitations and monitoring requirements in the event toxicity testing or other studies conducted on the effluent or receiving stream indicate that detrimental effects may be expected in the receiving stream as a result of this discharge.

A. (12.) APPLICABLE STATE LAW (STATE ENFORCEABLE ONLY)

The facility shall meet the requirements of Senate Bill 729 (Coal Ash Management Act). This permit may be reopened to include new requirements imposed by Senate Bill 729.

A. (13.) POLYCHLORINATED BIPHENYL COMPOUNDS

There shall be no discharge of polychlorinated biphenyl compounds such as those commonly used for transformer fluid.

A. (14.) BIOCIDE CONDITION

The permittee shall not use any biocides except those approved in conjunction with the permit application. The permittee shall notify the Director in writing not later than ninety (90) days prior to instituting use of any additional biocide used in cooling systems which may be toxic to aquatic life other than those previously reported to the Division of Water Resources. Such notification shall include completion of Biocide Worksheet Form 101 and a map locating the discharge point and receiving stream. Completion of Biocide Worksheet Form 101 is not necessary for those outfalls containing toxicity testing. Division approval is not necessary for the introduction of new biocides into outfalls currently tested for whole effluent toxicity.

A. (15.) INTAKE SCREEN BACKWASH
Continued intake screen backwash discharge and overflow from the settling basin are permitted without limitations or monitoring requirements.

A. (16.) BEST MANAGEMENT PRACTICES
It has been determined from information submitted that the plans and procedures in place at Marshall Steam Station are equivalent to that of a Best Management Practice (BMP).

A. (17.) CHRONIC TOXICITY PASS/FAIL PERMIT LIMIT – OUTFALL 002
[15A NCAC 02B .0200 et seq.]

The effluent discharge shall at no time exhibit observable inhibition of reproduction or significant mortality to ***Ceriodaphnia dubia*** at an effluent concentration of 23.0% for decanting and 2.6% for dewatering.

The permit holder shall perform at a minimum, *monthly* monitoring using test procedures outlined in the "North Carolina *Ceriodaphnia* Chronic Effluent Bioassay Procedure," Revised December 2010, or subsequent versions or "North Carolina Phase II Chronic Whole Effluent Toxicity Test Procedure" (Revised- December 2010) or subsequent versions. Effluent sampling for this testing must be obtained during representative effluent discharge and shall be performed at the NPDES permitted final effluent discharge below all treatment processes.

If the monthly test procedure results in a failure or ChV below the permit limit, then multiple-concentration testing shall be performed at a minimum, in each of the two following months as described in "North Carolina Phase II Chronic Whole Effluent Toxicity Test Procedure" (Revised-December 2010) or subsequent versions.

All toxicity testing results required as part of this permit condition will be entered on the Effluent Discharge Monitoring Form (MR-1) for the months in which tests were performed, using the parameter code **TGP3B** for the pass/fail results and **THP3B** for the Chronic Value. Additionally, DWR Form AT-3 (original) is to be sent to the following address:

Attention: North Carolina Division of Water Resources
Water Sciences Section/Aquatic Toxicology Branch
1623 Mail Service Center
Raleigh, North Carolina 27699-1623

Completed Aquatic Toxicity Test Forms shall be filed with the Water Sciences Section no later than 30 days after the end of the reporting period for which the report is made.

Test data shall be complete, accurate, include all supporting chemical/physical measurements and all concentration/response data, and be certified by laboratory supervisor and ORC or approved designate signature. Total residual chlorine of the effluent toxicity sample must be measured and reported if chlorine is employed for disinfection of the waste stream.

Should there be no discharge of flow from the facility during a month in which toxicity monitoring is required, the permittee will complete the information located at the top of the aquatic toxicity (AT) test form indicating the facility name, permit number, pipe number, county, and the month/year of the report with the notation of "No Flow" in the comment area of the form. The report shall be submitted to the Water Sciences Section at the address cited above.

Should the permittee fail to monitor during a month in which toxicity monitoring is required, monitoring will be required during the following month. Assessment of toxicity compliance is based on the toxicity testing month.

Should any test data from this monitoring requirement or tests performed by the North Carolina Division of Water Resources indicate potential impacts to the receiving stream, this permit may be re-opened and modified to include alternate monitoring requirements or limits.

NOTE: Failure to achieve test conditions as specified in the cited document, such as minimum control organism survival, minimum control organism reproduction, and appropriate environmental controls, shall constitute an **invalid test** and will require immediate follow-up testing to be completed no later than the last day of the month following the month of the initial monitoring.

A. (18.) ASH SETTLING BASIN

Beginning on the effective date of this permit and lasting until expiration, there shall be no discharge of plant wastes to the ash pond unless the permittee provides and maintains at all times a minimum free water volume equivalent to the sum of the maximum 24-hour plant discharges plus all direct rainfall and all runoff flows to the pond resulting from a 10-year, 24-hour rainfall event, when using a runoff coefficient of 1.0.

During the term of the permit, the permittee shall remove settled material from the ponds or otherwise enlarge the available storage capacities in order to maintain the required minimum volumes at all times. Annually the permittee shall determine and report to the permit issuing authority: (1) the actual free water volume of the ash pond, (2) physical measurements of the dimensions of the free water volume in sufficient detail to allow validation of the calculated volume, and (3) a certification that the required volume is available with adequate safety factor to include all solids expected to be deposited in the ponds for the following year. Any changes to plant operations affecting such certification shall be reported to the Director within five days.

NOTE: In the event that adequate volume has been certified to exist for the term of the permit, periodic certification is not needed.

A. (19.) CHEMICAL METAL CLEANING WASTES

It has been demonstrated that under certain conditions it is possible to reduce the concentration of metals in boiler cleaning wastes in the range of 92 to 99+ percent by treatment in ash ponds. Because of dilution problems, and the existence of boundary interface layers at the extremities of the plume, it is difficult to prove beyond doubt that the quantity of iron and copper discharged will always be less than one milligram per liter times the flow of metal cleaning when treated in this manner.

The application of physical/chemical methods of treating wastes has also been demonstrated to be effective in the treatment of metal cleaning wastes. However, the effectiveness of ash pond treatment should be considered in relation to the small differences in effluent quality realized between the two methods.

It has been demonstrated that the presence of ions of copper, iron, nickel, and zinc in the ash pond waters was not measurably increased during the ash pond equivalency demonstration at the Duke Energy's Marshall Steam Station. Therefore, when the following conditions are implemented during metal cleaning procedures, effective treatment for metals can be obtained at this facility:

(1) Large ash basin providing potential reaction volumes.
(2) Well-defined shallow ash delta near the ash basin influent.
(3) Ash pond pH of no less than 6.5 prior to metal cleaning waste addition.
(4) Four days retention time in ash pond with effluent virtually stopped.
(5) Boiler volume less than 86,000 gallons.
(6) Chemicals for cleaning to include only one or more of the following:
   (a) Copper removal step- sodium bromate, $NaBrO_3$; ammonium carbonate, $(NH_4)2CO_3$; and ammonium hydroxide, NH_4OH.
   (b) Iron removal step-hydrochloric acid, HCl; and ammonium bifluoride, $(NH_4)BF_2$ and proprietary inhibitors.
(7) Maximum dilution of wastes before entering ash pond 6 to 1.
(8) After treatment of metal cleaning wastes, if monitoring of basin effluents as required by the permit reveals discharges outside the limits of the permit, the permittee will re-close the basin discharge, conduct such in-basin sampling as necessary to determine the cause of nonconformance, will take appropriate corrective actions, and will file a report with EPA including all pertinent data.

A. (20.) FLOATING MATERIALS

The Permittee shall report all visible discharges of floating materials, such as an oil sheen, to the Director when submitting DMRs.

A. (21.) CHEMICAL DISCHARGES

Discharge of any product registered under the Federal Insecticide, Fungicide, and Rodenticide Act to any waste stream which may ultimately be released to lakes, rivers, streams or other waters of the United States is prohibited unless specifically authorized elsewhere in this permit. Discharge of chlorine from the use of chlorine gas, sodium hypochlorite, or other similar chlorination compounds for disinfection in plant potable and service water systems and in sewage treatment is authorized. Use of restricted use pesticides for lake management purposes by applicators licensed by the N.C. Pesticide Board is allowed.

A. (22.) PRIORITY POLLUTANT ANALYSIS – OUTFALL 002

The Permittee shall conduct a priority pollutant analysis (in accordance with 40 CFR Part 136) once per permit cycle at outfall 002 and submit the results with the application for permit renewal.

A. (23.) WAIVERS
Nothing contained in this permit shall be construed as a waiver by permittee or any right to a hearing it may have pursuant to State or Federal laws or regulations.

A. (24.) GROUNDWATER MONITORING WELL CONSTRUCTION AND SAMPLING (STATE ENFORCEABLE ONLY)
The permittee shall conduct groundwater monitoring to determine the compliance of this NPDES permitted facility with the current groundwater standards found under 15A NCAC 2L .0200. The monitoring shall be conducted in accordance with the Sampling Plan approved by the Division. See Attachment 1.

A. (25.) STRUCTURAL INTEGRITY INSPECTIONS OF ASH POND DAM
The facility shall meet the dam design and dam safety requirements per 15A NCAC 2K.

A. (26.) CLEAN WATER ACT SECTION 316(a) THERMAL VARIANCE
The thermal variance granted under Section 316(a) terminates on expiration of this NPDES permit. Should the permittee wish a continuation of its 316(a) thermal variance beyond the term of this permit, reapplication for such continuation shall be submitted in accordance with 40 CFR Part 125, Subpart H and Section 122.21(1) (6) not later than 180 days prior to permit expiration. Reapplication shall include a basis for continuation such as a) plant operating conditions and load factors are unchanged and are expected to remain so for the term of the reissued permit; b) there are no changes to plant discharges or other discharges in the plant site area which could interact with the thermal discharges; and c) there are no changes to the biotic community of the receiving water body which would impact the previous variance determination.

The next 316(a) studies shall be performed in accordance with the Division of Water Resources approved plan. The temperature analysis and the balanced and indigenous study plan shall conform to the specifications outlined in 40 CFR 125 Subpart H, the EPA's Draft 316(a) Guidance Manual, dated 1977, and the Region 4 letter to NCDENR, dated June 3, 2010. EPA shall be provided an opportunity to review the plan prior to the commencement of the study.

Copies of all the study plans, study results, and any other applicable materials should be submitted to:

1) Electronic Version Only (pdf and CD)
   Division of Water Resources
   WQ Permitting Section - NPDES
   1617 Mail Service Center
   Raleigh, NC 27699-1617
2) Electronic Version (pdf and CD) and Hard Copy
   Division of Water Resources
   Water Sciences Section
   1621 Mail Service Center
   Raleigh, NC 27699-1621

A. (27.) CLEAN WATER ACT SECTION 316 (B)
The permittee shall comply with the Cooling Water Intake Structure Rule per 40 CFR 125.95. The permittee shall submit all the materials required by the Rule with the next renewal application.

A. (28.) FISH TISSUE MONITORING NEAR ASH POND DISCHARGE – OUTFALL 002
The facility shall conduct fish tissue monitoring annually and submit the results with the NPDES permit renewal application. The objective of the monitoring is to evaluate potential uptake of pollutants by fish tissue near the Ash Pond discharge. The parameters analyzed in fish tissue shall be arsenic, selenium, and mercury. The monitoring shall be conducted in accordance with the Sampling Plan approved by the Division.

A. (29.) INSTREAM MONITORING
The facility shall conduct semiannual instream monitoring (approximately one mile upstream and approximately one mile downstream of the ash pond discharge) for arsenic, selenium, mercury (method 1631E), chromium, lead, cadmium, copper, zinc, bromide, total hardness, and total dissolved solids (TDS). Instream monitoring should be conducted at the stations that have already been established through the BIP monitoring program. The monitoring results shall be submitted with the NPDES permit renewal application.

A. (30.) DISCHARGE FROM SEEPAGE
Existing Discharges from Seepage
The facility identified 2 non-engineered discharges from seepage from the ash settling basin. The locations of the seeps are identified below and are depicted on the map attached to the permit.

Table 1. Discharge Coordinates and Assigned Outfall Numbers

Discharge ID	Latitude	Longitude	Outfall number
S-1	35°36'71"	80°57'62"	101
S-2	35°42'56"	80°21'56"	102

The outfall for these discharges is through an effluent channel meeting the requirements in 15A NCAC 2B .0228. Within 180 days of the effective date of this permit, the permittee shall demonstrate, through in-stream sampling meeting the requirements of condition A. (29.), that the water quality standards in the receiving stream are not contravened.

Discharges from Seepage Identified After Permit Issuance
The facility shall comply with the "Plan for Identification of New Discharges" as contained in Attachment 2. For any discharge identified pursuant to this Plan, the facility shall, within 90 days of the seep discovery, determine if the discharge seep meets the state water quality standards established in 15A NCAC 2B .0200 and submit the results of this determination to the Division. If the standards are not contravened, the facility shall conduct monitoring for the parameters specified in A. (8.).

If any of the water quality standards are exceeded, the facility shall be considered in violation until one of the options below is fully implemented:

1) Submit a complete application for 404 Permit (within 30 days after determining that a water quality standards is exceeded) to pump the seep discharge to one of the existing outfalls, install a pipe to discharge the seep to the Catawba River, or install an *in-situ* treatment system. After the 404 Permit is obtained, the facility shall complete the installation of the pump, pipe, or treatment system within 180 days from the date of the 404 permit receipt and begin pumping/discharging or treatment.
2) Demonstrate through modeling that the decanting and dewatering of the ash basin will result in the elimination of the seep. The modeling results shall be submitted to the Division within 120 days from the date of the seep discovery. Within 180 days from the completion of the dewatering the facility shall confirm that the seep flow ceased. If the seep flow continues, the facility shall choose one of the other options in this Special Condition.
3) Demonstrate that the seep is discharging through the designated "Effluent Channel" and the water quality standards in the receiving stream are not contravened. This demonstration should be submitted to the Division no later than 180 days from the date of the seep discovery. The "Effluent Channel" designation should be established by the DEQ Regional Office personnel prior to the issuance of the permit. This permit shall be reopened for cause to include the "Effluent Channel" in a revised permit.

All effluent limits, including water quality-based effluent limits, remain applicable notwithstanding any action by the Permittee to address the violation through one of the identified options, so that any discharge in exceedance of an applicable effluent limit is a violation of the Permit as long as the seep remains flowing.

New Identified Seeps

If new seeps are identified, the facility shall follow the procedures outlined above. The deadlines for new seeps shall be calculated from the date of the seep discovery. The new identified seep are not permitted until the permit is modified and the new seep included in the permit and the new outfall established for the seep.

A. (31.) ELECTRONIC REPORTING OF DISCHARGE MONITORING REPORTS

[G.S. 143-215.1(b)]

Federal regulations require electronic submittal of all discharge monitoring reports (DMRs) and program reports and specify that, if a state does not establish a system to receive such submittals, then permittees must submit monitoring data and reports electronically to the Environmental Protection Agency (EPA). The final NPDES Electronic Reporting Rule was adopted and became effective on December 21, 2015.

NOTE: This special condition supplements or supersedes the following sections within Part II of this permit (*Standard Conditions for NPDES Permits*):

- Section B. (11.) Signatory Requirements
- Section D. (2.) Reporting

- Section D. (6.) Records Retention
- Section E. (5.) Monitoring Reports

1. **Reporting Requirements [Supersedes Section D. (2.) and Section E. (5.) (a)]**

Effective **December 21, 2016**, the permittee shall report discharge monitoring data electronically using the NC DWR's Electronic Discharge Monitoring Report (eDMR) internet application.

Monitoring results obtained during the previous month(s) shall be summarized for each month and submitted electronically using eDMR. The eDMR system allows permitted facilities to enter monitoring data and submit DMRs electronically using the internet. Until such time that the state's eDMR application is compliant with EPA's Cross-Media Electronic Reporting Regulation (CROMERR), permittees will be required to submit all discharge monitoring data to the state electronically using eDMR and will be required to complete the eDMR submission by printing, signing, and submitting one signed original and a copy of the computer printed eDMR to the following address:

NC DEQ / Division of Water Resources / Water Quality Permitting Section
ATTENTION: Central Files
1617 Mail Service Center
Raleigh, North Carolina 27699-1617

If a permittee is unable to use the eDMR system due to a demonstrated hardship or due to the facility being physically located in an area where less than 10 percent of the households have broadband access, then a temporary waiver from the NPDES electronic reporting requirements may be granted and discharge monitoring data may be submitted on paper DMR forms (MR 1, 1.1, 2, 3) or alternative forms approved by the Director. Duplicate signed copies shall be submitted to the mailing address above. See "How to Request a Waiver from Electronic Reporting" section below.

Regardless of the submission method, the first DMR is due on the last day of the month following the issuance of the permit or in the case of a new facility, on the last day of the month following the commencement of discharge.

Starting on **December 21, 2020**, the permittee must electronically report the following compliance monitoring data and reports, when applicable:

- Sewer Overflow/Bypass Event Reports;
- Pretreatment Program Annual Reports; and
- Clean Water Act (CWA) Section 316(b) Annual Reports.

The permittee may seek an electronic reporting waiver from the Division (see "How to Request a Waiver from Electronic Reporting" section below).

2. **Electronic Submissions**

In accordance with 40 CFR 122.41(l)(9), the permittee must identify the initial recipient at the time of each electronic submission. The permittee should use the EPA's website resources to identify the initial recipient for the electronic submission.

Initial recipient of electronic NPDES information from NPDES-regulated facilities means the entity (EPA or the state authorized by EPA to implement the NPDES program) that is the designated entity for receiving electronic NPDES data [see 40 CFR 127.2(b)].

EPA plans to establish a website that will also link to the appropriate electronic reporting tool for each type of electronic submission and for each state. Instructions on how to access and use the appropriate electronic reporting tool will be available as well. Information on EPA's NPDES Electronic Reporting Rule is found at: http://www2.epa.gov/compliance/final-national-pollutant-discharge-elimination-system-npdes-electronic-reporting-rule.

Electronic submissions must start by the dates listed in the "Reporting Requirements" section above.

3. How to Request a Waiver from Electronic Reporting

The permittee may seek a temporary electronic reporting waiver from the Division. To obtain an electronic reporting waiver, a permittee must first submit an electronic reporting waiver request to the Division. Requests for temporary electronic reporting waivers must be submitted in writing to the Division for written approval at least sixty (60) days prior to the date the facility would be required under this permit to begin submitting monitoring data and reports. The duration of a temporary waiver shall not exceed 5 years and shall thereupon expire. At such time, monitoring data and reports shall be submitted electronically to the Division unless the permittee re-applies for and is granted a new temporary electronic reporting waiver by the Division. Approved electronic reporting waivers are not transferrable. Only permittees with an approved reporting waiver request may submit monitoring data and reports on paper to the Division for the period that the approved reporting waiver request is effective.

Information on eDMR and the application for a temporary electronic reporting waiver are found on the following web page:

http://deq.nc.gov/about/divisions/water-resources/edmr

4. Signatory Requirements [Supplements Section B. (11.) (b) and Supersedes Section B. (11.) (d)]

All eDMRs submitted to the permit issuing authority shall be signed by a person described in Part II, Section B. (11.)(a) or by a duly authorized representative of that person as described in Part II, Section B. (11.)(b). A person, and not a position, must be delegated signatory authority for eDMR reporting purposes.

For eDMR submissions, the person signing and submitting the DMR must obtain an eDMR user account and login credentials to access the eDMR system. For more information on North Carolina's eDMR system, registering for eDMR and obtaining an eDMR user account, please visit the following web page:

http://deq.nc.gov/about/divisions/water-resources/edmr

Certification. Any person submitting an electronic DMR using the state's eDMR system shall make the following certification [40 CFR 122.22]. NO OTHER STATEMENTS OF CERTIFICATION WILL BE ACCEPTED:

"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 fines and imprisonment for knowing violations."

5. Records Retention [Supplements Section D. (6.)]

The permittee shall retain records of all Discharge Monitoring Reports, including eDMR submissions. These records or copies shall be maintained for a period of at least 3 years from the date of the report. This period may be extended by request of the Director at any time [40 CFR 122.41].

A. (32.) DOMESTIC WASTEWATER TREATMENT PLANT

The domestic wastewater treatment plant shall be properly operated and maintained to ensure treatment of domestic wastewater to secondary levels.

Attachment 1

GROUNDWATER MONITORING PLAN

The permittee shall conduct groundwater monitoring as may be required to determine the compliance of this NPDES permitted facility with the current groundwater Standards found under 15A NCAC 2L .0200.

1. WELL CONSTRUCTION
   a. Monitoring wells shall be constructed in accordance with 15A NCAC 02C .0108 (Standards of Construction for Wells Other than Water Supply) and any other jurisdictional laws and regulations pertaining to well construction.
   b. Monitoring wells must be constructed by a North Carolina Certified Well Contractor, the property owner, or the property lessee according to General Statutes 87-98.4. If the construction is not performed by a certified well contractor, the property owner or lessee, provided they are a natural person, must physically perform the actual well construction activities.
   c. Within 30 days of completion of well construction, a completed Well Construction Record (Form GW-1) must be submitted for each compliance monitoring well to Division of Water Resources, Water Quality Regional Operations Section (WQROS), 1636 Mail Service Center, Raleigh, NC 27699-1636.
   d. The Mooresville Regional Office, telephone number (704) 663-1699, shall approve the location of new compliance monitoring wells prior to installation. The regional office shall be notified at least 48 hours prior to the construction of any compliance monitoring well and such notification to the WQROS regional supervisor shall be made from 8:00 a.m. until 5:00 p.m. on Monday through Friday, excluding State Holidays.
   e. All monitoring wells shall be regularly maintained. Such maintenance shall include ensuring that the well caps are rust-free and locked at all times, the outer casing is upright and undamaged, and the well does not serve as a conduit for contamination.
   f. If the Permittee intends to abandon a compliance monitoring well either temporarily or permanently, the Permittee shall justify the abandonment and request approval from the WQROS Regional Office within 30 business days prior to initiating abandonment procedures.
   g. Monitoring wells shall be abandoned in accordance with 15A NCAC 02C .0113 (Abandonment of Wells). Within 30 days of completion of well abandonment, a completed Well Abandonment Record (Form GW-30) must be submitted for each monitoring well to WQROS, 1636 Mail Service Center, Raleigh, NC 27699-1636.
2. MAPS
   a. Updated maps shall be provided within 60 days when any of the following occur:
      i. Compliance monitoring wells are added or deleted from the plan.

ii. The facility operation changes that would require a change in the waste boundary, compliance boundary, or property line.

b. If the map is updated, the Permittee shall submit two original copies of a site map with an appropriate scale to easily identify all features overlaid on the most recent aerial photograph. At a minimum, the map shall include the following information:

i. The location and identity of each monitoring well.

ii. The location of major components of the waste disposal system.

iii. The location of property boundaries within 500 feet of the disposal areas.

iv. The elevation of the top of the well casing (i.e., measuring point) relative to a common datum.

vi. The depth of water below the measuring point at the time the measuring point is established.

vii. The location of compliance boundary.

viii. The date the map is prepared and/or revised.

ix. Topographic contours in no more than ten (10) foot intervals. For areas of high relief, 20 foot intervals shall be acceptable.

c. The map and any supporting documentation shall be sent to the WQROS, 1636 Mail Service Center, Raleigh, NC 27699-1636.

3. GROUNDWATER SAMPLING AND COMPLIANCE.

a. The compliance boundary for the disposal system shall be specified in accordance with 15A NCAC 02L .0107(a) or (b) dependent upon the date permitted. An exceedance of groundwater standards at or beyond the compliance boundary is subject to remediation action according to 15A NCAC 02L .0106(c) or (d) as well as enforcement actions in accordance with North Carolina General Statute 143-215.6A through 143-215.6C.

b. Monitoring wells shall be sampled after construction and thereafter at the frequencies and for the parameters as specified in Part 4 of this plan. All maps, well construction forms, well abandonment forms and monitoring data shall refer to the permit number and the well nomenclature.

c. Per 15A NCAC 02H .0800, a Division certified laboratory shall conduct all laboratory analyses for the required effluent, groundwater or surface water parameters.

d. The measurement of water levels shall be made prior to purging the wells. The depth to water in each well shall be measured from the surveyed point on the top of the casing.

e. The measuring points (top of well casing) of all monitoring wells shall be surveyed to provide the relative elevation of the measuring point for each monitoring well. The measuring points (top of casing) of all monitoring wells shall be surveyed relative to a common datum.

f. Two copies of the monitoring well sampling shall be submitted on a Compliance Monitoring Form (GW-59CCR), and received no later than 60 days from the sampling date. Copies of the laboratory analyses shall be kept on site, and made available upon request.

The Compliance Monitoring Form (GW-59CCR) shall include this permit number and the appropriate well identification number. The Compliance Monitoring Forms (GW-59CCR) shall be submitted to the Division of Water Resources Information Processing Unit, 1617 Mail Service Center, Raleigh, North Carolina 27699-1617

g. For groundwater samples that exceed the ground water quality standards in 15A NCAC 02L .0202, the Regional Office shall be contacted within 30 days after submission of the groundwater monitoring form; an evaluation may be required to determine the impact of the waste disposal activities. Failure to do so may subject the permittee to a Notice of Violation, fines, and/or penalties.

h. The provisions of sections 3(f) and 3(g) apply only to the sampling events described in 3(b) above. The reporting requirements for any sampling events other than those described in 3(b) above shall be in accordance with the general provisions of 15A NCAC 02L.

4. MONITORING WELLS, PARAMETERS, AND SAMPLING FREQUENCY.

a. Laboratory methods shall be EPA approved and sufficient to detect constituent quantities at or below their individual 15A NCAC 02L groundwater standards.

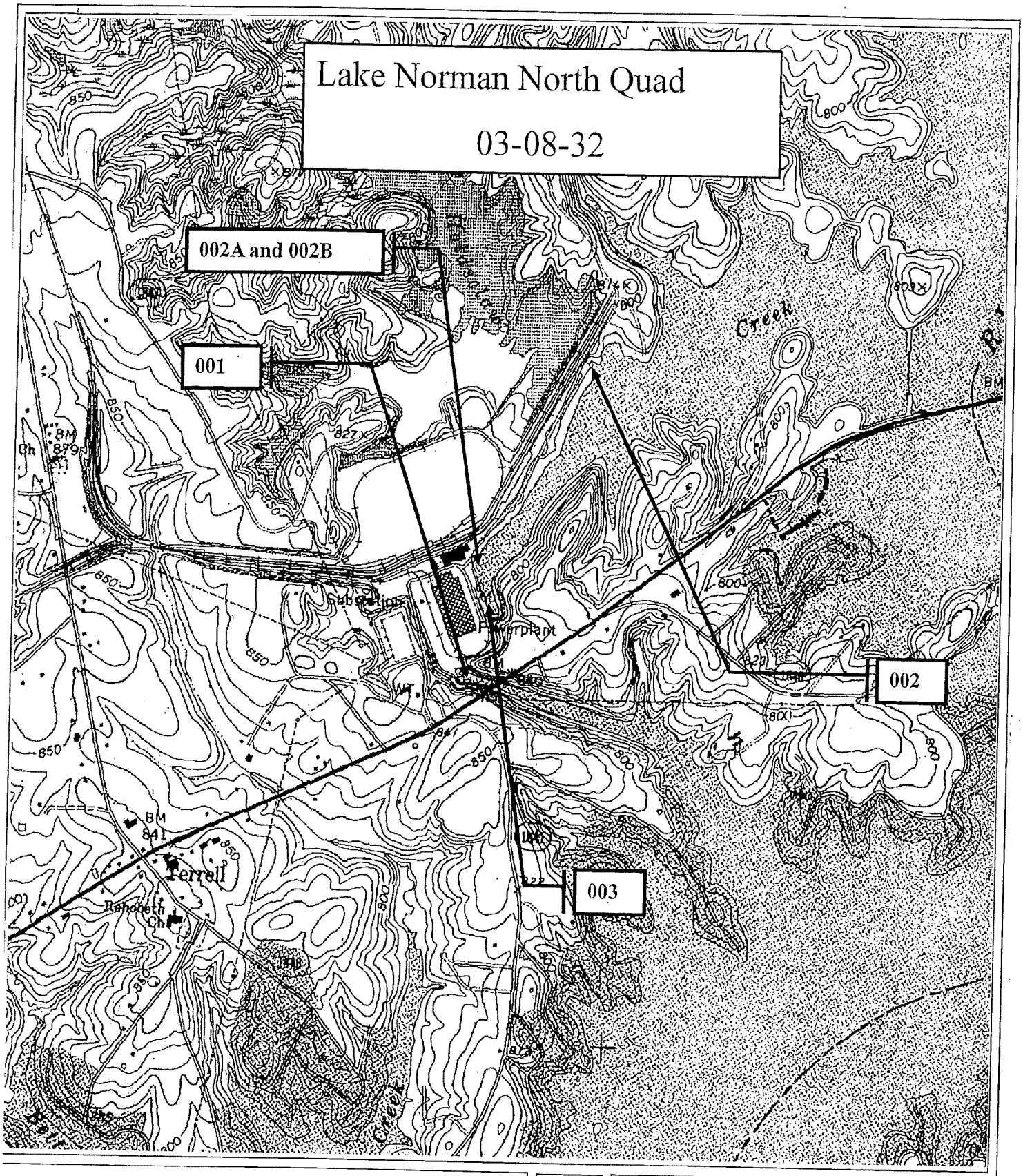
b. The following chart contains the compliance monitoring wells to be sampled, the parameters to be sampled, and the frequency in which the samples shall be collected.

MONITORING WELLS	*PARAMETERS*				*FREQUENCY*
MW-4, MW-4D, MW-10S, MW-10D, MW-11S, MW-11D, MW-12S, MW-12D, MW-13S, MW-13D, MW-14S, MW-14D	*Laboratory Parameters*				**February, June, October**
	Aluminum	*Antimony*	*Arsenic*	*Barium*	
	Beryllium	*Boron*	*Cadmium*	*Calcium*	
	Cobalt	*Chromium*	*Copper*	*Iron*	
	Lead	*Magnesium*	*Manganese*	*Molybdenum*	
	Mercury	*Nickel*	*Potassium*	*Selenium*	
	Sodium	*Strontium*	*Thallium*	*Vanadium*	
	Zinc	*Chloride*	*Sulfate*	*Alkalinity*	
	Bicarbonate	*Carbonate*	*Total Dissolved Solids*	*Total Suspended Solids*	
	Field Parameters				
	Turbidity	*pH*	*Temperature*	*Specific Conductance*	
	Dissolved Oxygen	*Oxidation Reduction Potential*	*Water level*		

Attachment 2

Plan for Identification of New Discharges (State Enforceable Only)

http://deq.nc.gov/about/divisions/water-resources/water-resources-hot-topics/dwr-coal-ash-regulation/duke-energy-npdes-permits-for-facilities-with-coal-ash-ponds/duke-energy-npdes-modifications-renewals



Outfall Information

Outfall #:	001
Receiving Stream:	Catawba River
Latitude:	35°35'43"
Longitude:	80°57'52"

Outfall #:	002A and 002B
Receiving Stream:	Catawba
Latitude:	35°35'51"
Longitude:	80°57'36"
Longitude for 002B:	80°57'34"

Outfall #:	002
Receiving Stream:	Catawba River
Latitude:	35°36'21"
Longitude:	80°57'35"

Outfall #:	003
Receiving Stream:	Catawba River
Latitude:	35°35'52"
Longitude:	80°57'47"

North

Facility Location

Duke Power Corporation
NC0004987
Marshall Steam Station

STATE OF MISSOURI

DEPARTMENT OF NATURAL RESOURCES

MISSOURI CLEAN WATER COMMISSION

MISSOURI STATE OPERATING PERMIT

In compliance with the Missouri Clean Water Law, (Chapter 644 R.S. Mo. as amended, hereinafter, the Law), and the Federal Water Pollution Control Act (Public Law 92-500, 92nd Congress) as amended,

Permit No.	MO-0000353
Owner:	Ameren Missouri
Address:	1901 Chouteau Avenue, P.O. Box 66149, MC-602, St. Louis, MO 63166-6149
Continuing Authority:	same as above
Address:	same as above
Facility Name:	Ameren Missouri Sioux Energy Center
Facility Address:	8501 North State Route 94, West Alton, MO 63386-1009
Legal Description:	see pages two and three; St. Charles Co.
UTM Coordinates:	see pages two and three
Receiving Stream:	see pages two and three
First Classified Stream and ID:	see pages two and three
USGS Basin & Sub-watershed No.:	see pages two and three

is authorized to discharge from the facility described herein, in accordance with the effluent limitations and monitoring requirements as set forth herein:

FACILITY DESCRIPTION

This facility is a power generating facility primarily involved in the production and sale of electricity from coal. See pages two and three for outfall descriptions. This facility does not require a certified wastewater operator.

(continued below)

This permit authorizes only wastewater and stormwater discharges under the Missouri Clean Water Law and the National Pollutant Discharge Elimination System; it does not apply to other regulated areas. This permit may be appealed in accordance with Sections 640.013, 621.250, and 644.051.6 of the Law.

April 1, 2017
Effective Date

Steven Feeler, Acting Director, Division of Environmental Quality

March 31, 2022
Expiration Date

David J. Lamb, Acting Director, Water Protection Program

FACILITY DESCRIPTION (CONTINUED)

OUTFALL #001 – Power Plant – SIC # 4911, NAICS # 221112
Non-contact cooling water; Unit 1 and 2 condensers, condensate coolers, jacket water coolers

Legal Description:	Landgrant 1838, St. Charles County
UTM Coordinates:	X = 734877, Y = 4311058
Receiving Stream:	Mississippi River, Mile 209.5
First Classified Stream and ID:	Upper Mississippi River (P) (3700)
USGS Basin & Sub-watershed No.:	City of Alton-Mississippi River - 07110009-0402
Design Flow:	724.3 MGD
Average Flow:	645 MGD

OUTFALL #002 – Power Plant – SIC # 4911
Ash pond #1; bottom ash system, combined drain sump, bottom ash system overflow, sewage treatment plant (Outfall #02A), boiler drain line, exciter & control room HVAC cooling tower, precipitation

Legal Description:	Landgrant 1838, St. Charles County
UTM Coordinates:	X = 734273, Y = 4310597
Receiving Waterbody:	Poeling Lake
First Classified Stream and ID:	Mississippi River (P) (3700)
USGS Basin & Sub-watershed No.:	Marais Temps Clair-Mississippi River - 07110009-0401
Design Flow:	15.8 MGD
Average Flow:	3.8 MGD

OUTFALL #02A – Power Plant – SIC # 4911
Package Sewage Treatment Plant (flow equalization, extended aeration, activated sludge, sludge holding tank; sludge removed by contract hauler)

Legal Description:	Landgrant 1838, St. Charles County
UTM Coordinates:	X = 735053, Y = 4310953
Receiving Waterbody:	Poeling Lake
First Classified Stream and ID:	Mississippi River (P) (3700)
USGS Basin & Sub-watershed No.:	Marais Temps Clair-Mississippi River - 07110009-0401
Design Flow:	0.039 MGD
Average Flow:	0.013 MGD

OUTFALL #003 – Power Plant – SIC # 4911
Combined drain sump-emergency overflow. Discharges from this outfall is not authorized, and shall be subject to 40 CFR 122.41(m) and reported according to 40 CFR 122.41(m)(3)(i) & (ii).

Legal Description:	Landgrant 1838, St. Charles County
UTM Coordinates:	X = 734884, Y = 4310982
Receiving Stream:	Mississippi River (P)
First Classified Stream and ID:	Mississippi River (P) (3700)
USGS Basin & Sub-watershed No.:	City of Alton-Mississippi River - 07110009-0402
Design Flow:	3.48 MGD
Average Flow:	0 MGD

OUTFALL #004 – Stormwater
Stormwater, discharges in to the cooling water intake structure canal

Legal Description:	Landgrant 1838, St. Charles County
UTM Coordinates:	X = 734711, Y = 4310878
Receiving Stream:	Mississippi River (P)
First Classified Stream and ID:	Mississippi River (P) (3700)
USGS Basin & Sub-watershed No.:	Marais Temps Clair-Mississippi River - 07110009-0401
Actual Flow:	dependent upon precipitation
Area of Impervious Surface:	0.2 acres
Total Drainage Area:	0.6 acres

(continued below)

FACILITY DESCRIPTION (CONTINUED)

OUTFALL #005 – Stormwater
Stormwater, roadway south of facility between south ash pond and Poeling Lake

Legal Description:	Landgrant 1838, St. Charles County
UTM Coordinates:	X = 734408, Y = 4310020
Receiving Waterbody:	Poeling Lake
First Classified Stream and ID:	Mississippi River (P) (3700)
USGS Basin & Sub-watershed No.:	Marais Temps Clair-Mississippi River - 07110009-0401
Actual Flow:	dependent upon precipitation
Area of Impervious Surface:	0.05 acres
Total Drainage Area:	0.2 acres

OUTFALL #006 – Power Plant – SIC # 4911
Ash pond #2; flue gas conditioning heat exchanger, coal handling sumps, air heater wash, economizer ash system, precipitator ash removal system, precipitator pad sumps, regeneration wastes, char hopper, precipitation, decanting, dewatering

Legal Description:	Landgrant 1838, St. Charles County
UTM Coordinates:	X = 734716, Y = 4310212
Receiving Waterbody:	Poeling Lake
First Classified Stream and ID:	Mississippi River (P) (3700)
USGS Basin & Sub-watershed No.:	Marais Temps Clair-Mississippi River - 07110009-0401
Design Flow:	10.8 MGD
Average Flow:	4.6 MGD

OUTFALL #007 – Power Plant – SIC # 4911
Emergency overflow structure for no-discharge recycle pond. Discharges from this outfall is not authorized, and shall be subject to 40 CFR 122.41(m) and reported according to 40 CFR 122.41(m)(3)(i) & (ii).

Legal Description:	Landgrant 1838, St. Charles County
UTM Coordinates:	X = 734392, Y = 4309811
Receiving Waterbody:	discharge would exit the western side of the recycle pond and enter an agricultural field; then would likely travel south until meeting Dwiggins Road; likely it would travel under Dwiggins Road and the rail road tracks at the jurisdictional seep then would follow general field drainage patterns south to the Missouri River.
First Classified Stream and ID:	Missouri River (P) (1604)
USGS Basin & Sub-watershed No.:	Outlet Missouri River - 10300200-0804
Design Flow:	1378 MGD
Average Flow:	0 MGD

PERMITTED FEATURE #008 – Power Plant – SIC # 4911
Intake structure (new feature this permit)

Legal Description:	Landgrant 1838, St. Charles County
UTM Coordinates:	X = 734711, Y = 4310878
Withdrawing Stream:	Upper Mississippi River (P) (3700) at mile 209.5
USGS Basin & Sub-watershed No.:	Marais Temps Clair-Mississippi River - 07110009-0401
Withdrawal:	202,201,000,000 gallons in 2014 (202,201 MGD)

A. EFFLUENT LIMITATIONS AND MONITORING REQUIREMENTS

OUTFALL #001 *Cooling Water*	**TABLE A-1** **INTERIM EFFLUENT LIMITATIONS AND MONITORING REQUIREMENTS**					
The permittee is authorized to discharge from outfall(s) with serial number(s) as specified in the application for this permit. The interim effluent limitations shall become effective on **April 1, 2017** and remain in effect through **March 31, 2019**. Such discharges shall be controlled, limited and monitored by the permittee as specified below:						
EFFLUENT PARAMETERS	UNITS	INTERIM EFFLUENT LIMITATIONS			MONITORING REQUIREMENTS	
		DAILY MAXIMUM	WEEKLY AVERAGE	MONTHLY AVERAGE	MEASUREMENT FREQUENCY	SAMPLE TYPE
PHYSICAL						
Flow	MGD	*		*	daily	24 hr. total
Thermal Discharge	Btu/hr	5.5×10^9		*	daily	calculation
Effluent Flow (Q_e)	cfs	*		*	daily	measured
Effluent Temperature (T_e)	°F	*		*	daily	measured
Stream Flow (Q_s)	cfs	*		*	daily	measured
Stream Temperature (T_s)	°F	*		*	daily	measured
ΔT (Note 3)	°F	*		*	daily	calculation
T_{emz} (Note 4)	°F	*		*	daily	calculation
Time of Deviation-Month (Note 4)	hours			*	monthly	calculation
MONITORING REPORTS SHALL BE SUBMITTED MONTHLY; THE FIRST REPORT IS DUE MAY 28, 2017. THERE SHALL BE NO DISCHARGE OF FLOATING SOLIDS OR VISIBLE FOAM IN OTHER THAN TRACE AMOUNTS.						
Total Time of Deviation (Note 4)	hours/year	*			yearly sum	calculation
MONITORING REPORTS SHALL BE SUBMITTED YEARLY; THE FIRST REPORT IS DUE JANUARY 28, 2018. THERE SHALL BE NO DISCHARGE OF FLOATING SOLIDS OR VISIBLE FOAM IN OTHER THAN TRACE AMOUNTS.						

* Monitoring requirement only.

A. EFFLUENT LIMITATIONS AND MONITORING REQUIREMENTS (CONTINUED)

OUTFALL #001 *Cooling Water*	TABLE A-2 FINAL EFFLUENT LIMITATIONS AND MONITORING REQUIREMENTS					
The permittee is authorized to discharge from outfall(s) with serial number(s) as specified in the application for this permit. The final effluent limitations shall become effective on **April 1, 2019** and remain in effect until expiration of the permit. Such discharges shall be controlled, limited and monitored by the permittee as specified below:						
EFFLUENT PARAMETERS	UNITS	FINAL EFFLUENT LIMITATIONS			MONITORING REQUIREMENTS	
		DAILY MAXIMUM	WEEKLY AVERAGE	MONTHLY AVERAGE	MEASUREMENT FREQUENCY	SAMPLE TYPE
PHYSICAL						
Flow	MGD	*		*	daily	24 hr. total
Effluent Flow (Q_e)	cfs	*		*	daily	measured
Effluent Temperature (T_e)	°F	*		*	daily	measured
Stream Flow (Q_s)	cfs	*		*	daily	measured
Stream Temperature (T_s)	°F	*		*	daily	measured
ΔT (Note 3)	°F	5		*	daily	calculation
T_{cap} (Note 4)						
January	°F	45		*	daily	calculation
February	°F	45		*	daily	calculation
March	°F	57		*	daily	calculation
April	°F	68		*	daily	calculation
May	°F	78		*	daily	calculation
June	°F	86		*	daily	calculation
July	°F	88		*	daily	calculation
August	°F	88		*	daily	calculation
September	°F	86		*	daily	calculation
October	°F	75		*	daily	calculation
November	°F	65		*	daily	calculation
December	°F	52		*	daily	calculation
T_{dev} (Note 4)						
January	°F	48		*	daily	calculation
February	°F	48		*	daily	calculation
March	°F	60		*	daily	calculation
April	°F	71		*	daily	calculation
May	°F	81		*	daily	calculation
June	°F	89		*	daily	calculation
July	°F	91		*	daily	calculation
August	°F	91		*	daily	calculation
September	°F	89		*	daily	calculation
October	°F	78		*	daily	calculation
November	°F	68		*	daily	calculation
December	°F	55		*	daily	calculation
Time of Deviation-Month (Note 4)	hours			*	monthly	calculation
MONITORING REPORTS SHALL BE SUBMITTED MONTHLY; THE FIRST REPORT IS DUE MAY 28, 2019. THERE SHALL BE NO DISCHARGE OF FLOATING SOLIDS OR VISIBLE FOAM IN OTHER THAN TRACE AMOUNTS.						
Total Time of Deviation (Note 4)	hours/year	438			yearly sum	calculation
MONITORING REPORTS SHALL BE SUBMITTED YEARLY; THE FIRST REPORT IS DUE JANUARY 28, 2020. THERE SHALL BE NO DISCHARGE OF FLOATING SOLIDS OR VISIBLE FOAM IN OTHER THAN TRACE AMOUNTS.						

* Monitoring requirement only.

A. EFFLUENT LIMITATIONS AND MONITORING REQUIREMENTS (CONTINUED)

OUTFALL #001 *Cooling Water*	TABLE A-3 FINAL EFFLUENT LIMITATIONS AND CONDITIONAL MONITORING REQUIREMENTS					
The permittee is authorized to discharge from outfall(s) with serial number(s) as specified in the application for this permit. The final effluent limitations shall become effective on **April 1, 2017** and remain in effect until expiration of the permit. Testing for the following parameters will occur concurrently of each use of chlorine or biocides. Such discharges shall be controlled, limited and monitored by the permittee as specified below:						
EFFLUENT PARAMETERS	UNITS	FINAL EFFLUENT LIMITATIONS			MONITORING REQUIREMENTS	
		DAILY MAXIMUM	WEEKLY AVERAGE	MONTHLY AVERAGE	MEASUREMENT FREQUENCY	SAMPLE TYPE
CONDITIONAL MONITORING						
Chlorine, Free Available ǂ	µg/L	500		200	conditional	grab
Chlorine, Total Residual ǂ	µg/L	200			conditional	grab
Whole Effluent Toxicity, Acute ǂ See Special Condition #C19	TU_a	*			conditional	grab
MONITORING REPORTS SHALL BE SUBMITTED NO MORE THAN 30 DAYS FROM USE OF BIOCIDES OR CHLORINE PRODUCTS THERE SHALL BE NO DISCHARGE OF FLOATING SOLIDS OR VISIBLE FOAM IN OTHER THAN TRACE AMOUNTS.						
Yearly Chlorine & Biocide/. Molluskicide. Report ǂ See Special Condition #C22					report	report
Yearly SOC Report					report	report
REPORTS SHALL BE SUBMITTED YEARLY; THE FIRST REPORT IS DUE JANUARY 28, 2018.						

ǂ (a) To comply with yearly reporting, each year, even if chlorine or biocides/.molluskicides. are not used, the facility will submit a short report to the St. Louis Regional Office. The report must detail each chemical used, the dosing concentration, and the time applied to the system. The facility must sample for free available chlorine and total residual chlorine upon every occasion (daily, concurrently) of chlorine use. The facility is not required to sample for chlorine if the biocide/.molluskicide. used is not chlorine based. The facility has no plans to use chlorine-based agents in the once-through system but limitations remain in the permit.
(b) The facility must collect a sample for WET testing if any biocide/.molluskicide. is used. The facility believes they will add molluskicide once per year.
(c) See also special condition #3 limiting chlorine discharges.

* Monitoring requirement only.

A. EFFLUENT LIMITATIONS AND MONITORING REQUIREMENTS (CONTINUED)

OUTFALLS #002 & #006 *Ash Ponds*	TABLE A-4 FINAL EFFLUENT LIMITATIONS AND MONITORING REQUIREMENTS					
The permittee is authorized to discharge from outfall(s) with serial number(s) as specified in the application for this permit. The final effluent limitations shall become effective on **April 1, 2017** and remain in effect until expiration of the permit. Such discharges shall be controlled, limited and monitored by the permittee as specified below:						
EFFLUENT PARAMETERS	UNITS	FINAL EFFLUENT LIMITATIONS			MONITORING REQUIREMENTS	
		DAILY MAXIMUM	WEEKLY AVERAGE	MONTHLY AVERAGE	MEASUREMENT FREQUENCY	SAMPLE TYPE
PHYSICAL						
Flow	MGD	*		*	once/week	24 hr. total
CONVENTIONAL						
Oil & Grease	mg/L	15		10	once/month	grab
pH (Note 1)	SU	6.5 to 9.0		6.5 to 9.0	once/week	grab
Total Suspended Solids (Actual)	mg/L	*		*	once/week	grab
Net Total Suspended Solids	mg/L	100		30	once/week	grab
MONITORING REPORTS SHALL BE SUBMITTED MONTHLY; THE FIRST REPORT IS DUE MAY 28, 2017. THERE SHALL BE NO DISCHARGE OF FLOATING SOLIDS OR VISIBLE FOAM IN OTHER THAN TRACE AMOUNTS.						
CONVENTIONAL						
Cyanide Amenable to Chlorination	µg/L	*			once/quarter ◊	grab
METALS						
Aluminum, Total Recoverable	µg/L	*			once/quarter ◊	grab
Arsenic, Total Recoverable	µg/L	*			once/quarter ◊	grab
Boron, Total Recoverable	µg/L	*			once/quarter ◊	grab
Chromium VI, Dissolved	µg/L	*			once/quarter ◊	grab
Iron, Total Recoverable	µg/L	*			once/quarter ◊	grab
Molybdenum, Total Recoverable	µg/L	*			once/quarter ◊	grab
Selenium, Total Recoverable	µg/L	*			once/quarter ◊	grab
Titanium, Total Recoverable	µg/L	*			once/quarter ◊	grab
NUTRIENTS						
Ammonia as N	mg/L	*			once/quarter ◊	grab
Kjeldahl Nitrogen, Total (TKN)	mg/L	*			once/quarter ◊	grab
Nitrate plus Nitrite as Nitrogen (N)	mg/L	*			once/quarter ◊	grab
Nitrogen, Total (TN)	mg/L	*			once/quarter ◊	grab
Phosphorus, Total (TP)	mg/L	*			once/quarter ◊	grab
OTHER						
Chloride	mg/L	*			once/quarter ◊	grab
Fluoride	mg/L	*			once/quarter ◊	grab
Sulfate	mg/L	*			once/quarter ◊	grab
Sulfate plus Chloride	mg/L	*			once/quarter ◊	grab
MONITORING REPORTS SHALL BE SUBMITTED QUARTERLY; THE FIRST REPORT IS DUE JULY 28, 2017. THERE SHALL BE NO DISCHARGE OF FLOATING SOLIDS OR VISIBLE FOAM IN OTHER THAN TRACE AMOUNTS.						
Whole Effluent Toxicity, Chronic See Special Condition #C19	TU_c	*			once/year	grab
MONITORING REPORTS SHALL BE SUBMITTED YEARLY; THE FIRST REPORT IS DUE JANUARY 28, 2018. THERE SHALL BE NO DISCHARGE OF FLOATING SOLIDS OR VISIBLE FOAM IN OTHER THAN TRACE AMOUNTS.						

* Monitoring requirement only.

Note 1: The facility will report the minimum and maximum values; pH is not to be averaged.

A. EFFLUENT LIMITATIONS AND MONITORING REQUIREMENTS (CONTINUED)

INTERNAL MONITORING POINT #02A *Domestic Wastewater*	TABLE A-5 INTERIM EFFLUENT LIMITATIONS AND MONITORING REQUIREMENTS					
The permittee is authorized to discharge from outfall(s) with serial number(s) as specified in the application for this permit. The interim effluent limitations shall become effective on **April 1, 2017** and remain in effect through **March 31, 2019**. Such discharges shall be controlled, limited and monitored by the permittee as specified below:						
EFFLUENT PARAMETERS	UNITS	INTERIM EFFLUENT LIMITATIONS			MONITORING REQUIREMENTS	
		DAILY MAXIMUM	WEEKLY AVERAGE	MONTHLY AVERAGE	MEASUREMENT FREQUENCY	SAMPLE TYPE
PHYSICAL						
Flow	MGD	*		*	once/quarter	24 hr. total
CONVENTIONAL						
Biochemical Oxygen Demand$_5$	mg/L	45		30	once/quarter	grab
E. coli (Note 2)	#/100 mL	*		*	once/quarter	grab
pH (Note 1)	SU	6.0 to 9.0		6.0 to 9.0	once/quarter	grab
Total Suspended Solids	mg/L	45		30	once/quarter	grab
MONITORING REPORTS SHALL BE SUBMITTED QUARTERLY; THE FIRST REPORT IS DUE JULY 28, 2017. THERE SHALL BE NO DISCHARGE OF FLOATING SOLIDS OR VISIBLE FOAM IN OTHER THAN TRACE AMOUNTS.						

INTERNAL MONITORING POINT #02A *Domestic Wastewater*	TABLE A-6 FINAL EFFLUENT LIMITATIONS AND MONITORING REQUIREMENTS					
The permittee is authorized to discharge from outfall(s) with serial number(s) as specified in the application for this permit. The final effluent limitations shall become effective on **April 1, 2019** and remain in effect until expiration of the permit. Such discharges shall be controlled, limited and monitored by the permittee as specified below:						
EFFLUENT PARAMETERS	UNITS	FINAL EFFLUENT LIMITATIONS			MONITORING REQUIREMENTS	
		DAILY MAXIMUM	WEEKLY AVERAGE	MONTHLY AVERAGE	MEASUREMENT FREQUENCY	SAMPLE TYPE
PHYSICAL						
Flow	MGD	*		*	once/quarter	24 hr. total
CONVENTIONAL						
Biochemical Oxygen Demand$_5$	mg/L	45		30	once/quarter	grab
E. coli (Note 2)	#/100 mL	630		126	once/quarter	grab
pH (Note 1)	SU	6.0 to 9.0		6.0 to 9.0	once/quarter	grab
Total Suspended Solids	mg/L	45		30	once/quarter	grab
MONITORING REPORTS SHALL BE SUBMITTED QUARTERLY; THE FIRST REPORT IS DUE JULY 28, 2019. THERE SHALL BE NO DISCHARGE OF FLOATING SOLIDS OR VISIBLE FOAM IN OTHER THAN TRACE AMOUNTS.						

* Monitoring requirement only.

Note 1: The facility will report the minimum and maximum values; pH is not to be averaged.

Note 2: The quarterly average for *E. coli* is expressed as a geometric mean; sample only during the recreational season from April 1 through October 31; quarterly samples required; a sample in October will be required.

A. EFFLUENT LIMITATIONS AND MONITORING REQUIREMENTS (CONTINUED)

OUTFALLS #003 *Emergency Discharge from Sump*	TABLE A-7 FINAL EFFLUENT LIMITATIONS AND MONITORING REQUIREMENTS				
The permittee is not authorized to discharge from outfall(s) with serial number(s) as specified in the application for this permit. The final effluent limitations shall become effective on **April 1, 2017** and remain in effect until permit expiration. Any discharges shall be controlled, limited and monitored by the permittee as specified below:					
EFFLUENT PARAMETERS	UNITS	FINAL EFFLUENT LIMITATIONS			MONITORING REQUIREMENTS	
		DAILY MAXIMUM	WEEKLY AVERAGE	MONTHLY AVERAGE	MEASUREMENT FREQUENCY	SAMPLE TYPE
PHYSICAL						
Flow	MGD	*			once/day/discharge	24 hr. total
CONVENTIONAL						
Oil & Grease	mg/L	*			once/day/discharge	grab
pH (Note 1)	SU	*			once/day/discharge	grab
Total Suspended Solids	mg/L	*			once/day/discharge	grab
NUTRIENTS:						
Nitrogen, Total (TN)	mg/L	*			once/day/discharge	grab
Phosphorus, Total (TP)	mg/L	*			once/day/discharge	grab
OTHER						
Chloride	mg/L	*			once/day/discharge	grab
Hardness	mg/L	*			once/day/discharge	grab
Sulfate	mg/L	*			once/day/discharge	grab
Sulfate plus Chloride	mg/L	*			once/day/discharge	grab
MONITORING REPORTS SHALL BE SUBMITTED NO MORE THAN 30 DAYS FROM DATE OF DISCHARGE; THERE SHALL BE NO DISCHARGE OF FLOATING SOLIDS OR VISIBLE FOAM IN OTHER THAN TRACE AMOUNTS.						

* Monitoring requirement only.

Note 1: The facility will report the minimum and maximum values; pH is not to be averaged.

A. EFFLUENT LIMITATIONS AND MONITORING REQUIREMENTS (CONTINUED)

OUTFALLS #007 *Emergency Discharge*	**TABLE A-8 INTERIM EFFLUENT LIMITATIONS AND MONITORING REQUIREMENTS**					
The permittee is not authorized to discharge from this outfall. The final effluent limitations shall become effective on **April 1, 2017** and remain in effect until **October 31, 2018**. Discharges shall be limited and monitored by the permittee as specified below:						
EFFLUENT PARAMETERS	UNITS	INTERIM EFFLUENT LIMITATIONS			MONITORING REQUIREMENTS	
		DAILY MAXIMUM	WEEKLY AVERAGE	MONTHLY AVERAGE	MEASUREMENT FREQUENCY	SAMPLE TYPE
PHYSICAL						
Flow	MGD	*			once/day/discharge	24 hr. total
CONVENTIONAL						
Oil & Grease	mg/L	*			once/day/discharge	grab
pH (Note 1)	SU	*			once/day/discharge	grab
Total Suspended Solids	mg/L	*			once/day/discharge	grab
FGD WASTEWATER ELG						
Arsenic, Total	µg/L	*		*	once/day/discharge	grab
Mercury, Total	ng/L	*		*	once/day/discharge	grab
Selenium, Total	µg/L	*		*	once/day/discharge	grab
Nitrate/Nitrite as N	mg/L	*		*	once/day/discharge	grab
NUTRIENTS:						
Nitrogen, Total (TN)	mg/L	*			once/day/discharge	grab
Phosphorus, Total (TP)	mg/L	*			once/day/discharge	grab
OTHER						
Chloride	mg/L	*			once/day/discharge	grab
Hardness	mg/L	*			once/day/discharge	grab
Sulfate	mg/L	*			once/day/discharge	grab
Sulfate plus Chloride	mg/L	*			once/day/discharge	grab
MONITORING REPORTS SHALL BE SUBMITTED NO MORE THAN 30 DAYS FROM DATE OF DISCHARGE; THERE SHALL BE NO DISCHARGE OF FLOATING SOLIDS OR VISIBLE FOAM IN OTHER THAN TRACE AMOUNTS.						

* Monitoring requirement only.

Note 1: The facility will report the minimum and maximum values; pH is not to be averaged.

A. EFFLUENT LIMITATIONS AND MONITORING REQUIREMENTS (CONTINUED)

OUTFALLS #007 *Emergency Discharge*	**TABLE A-9 FINAL EFFLUENT LIMITATIONS AND MONITORING REQUIREMENTS**					
The permittee is not authorized to discharge from this outfall. The final effluent limitations shall become effective on **November 1, 2018** and remain in effect until expiration of the permit. Discharges shall be limited and monitored by the permittee as specified below:						
EFFLUENT PARAMETERS	UNITS	FINAL EFFLUENT LIMITATIONS			MONITORING REQUIREMENTS	
		DAILY MAXIMUM	WEEKLY AVERAGE	MONTHLY AVERAGE	MEASUREMENT FREQUENCY	SAMPLE TYPE
PHYSICAL						
Flow	MGD	*			once/day/discharge	24 hr. total
CONVENTIONAL						
Oil & Grease	mg/L	*			once/day/discharge	grab
pH (Note 1)	SU	*			once/day/discharge	grab
Total Suspended Solids	mg/L	*			once/day/discharge	grab
FGD WASTEWATER ELG						
Arsenic, Total	µg/L	11		8	once/day/discharge	grab
Mercury, Total	ng/L	788		356	once/day/discharge	grab
Selenium, Total	µg/L	23		12	once/day/discharge	grab
Nitrate/Nitrite as N	mg/L	17.0		4.4	once/day/discharge	grab
NUTRIENTS						
Nitrogen, Total (TN)	mg/L	*			once/day/discharge	grab
Phosphorus, Total (TP)	mg/L	*			once/day/discharge	grab
OTHER						
Chloride	mg/L	*			once/day/discharge	grab
Sulfate	mg/L	*			once/day/discharge	grab
Sulfate plus Chloride	mg/L	*			once/day/discharge	grab
MONITORING REPORTS SHALL BE SUBMITTED NO MORE THAN 30 DAYS FROM DATE OF DISCHARGE; THERE SHALL BE NO DISCHARGE OF FLOATING SOLIDS OR VISIBLE FOAM IN OTHER THAN TRACE AMOUNTS.						

* Monitoring requirement only.

Note 1: The facility will report the minimum and maximum values; pH is not to be averaged.

A. EFFLUENT LIMITATIONS AND MONITORING REQUIREMENTS (CONTINUED)

* Monitoring requirement only.

Note 1: The facility will report the minimum and maximum values; pH is not to be averaged.

Note 2: The quarterly average for *E. coli* is expressed as a geometric mean; sample only during the recreational season from April 1 through October 31; quarterly samples required; a sample in October will be required.

Note 3: $\Delta T = [((Q_s/4)T_s + Q_eT_e) / ((Q_s/4) + Q_e)] - T_s$

Where:

ΔT	the change in temperature in °F at the edge of the thermal mixing zone
$Q_s/4$	the receiving stream flow in cfs divided by 4
Q_e	effluent flow in cfs
T_s	measured stream temperature
T_e	measured temperature of effluent

Note 4: To calculate the temperature of the stream at the edge of the mixing zone, the facility will use the following equation: Designated as T_{emz} in the equation below, the facility can determine compliance with T_{dev}, T_{cap}, and percent time deviation allowance.

$T_{emz} = [((Q_s/4)T_s + Q_eT_e) / ((Q_s/4) + Q_e))]$

Where:

T_{emz}	the temperature of the receiving stream at the edge of the thermal mixing zone
$Q_s/4$	the receiving stream flow in cfs divided by 4
Q_e	effluent flow in cfs
T_s	measured stream temperature
T_e	measured temperature of effluent

Temperature cap (designated as T_{cap} in Table A-2 of the permit) is the effluent temperature limitation applicable in the receiving stream at the edge of the thermal mixing zone. It may be exceeded for no more than 5% of the year (438 hours).

Temperature deviation (designated as T_{dev} in Table A-2 of the permit) is the maximum effluent temperature limit at the edge of the thermal mixing zone which may not be exceeded. MoCWIS is set up to receive one value for the thermal limitations for each month. The facility will violate the thermal limit if the value entered in MoCWIS is above the T_{dev} value for the month.

Percent Time Deviation Allowance: Missouri's Water Quality Standards allows permittees to exceed their applicable T_{cap} criteria (but not the T_{dev} criteria) for 5% of the year in Zone 1B along the Mississippi River. The time of deviation allowance shall be tracked in hours per year <u>any</u> time their calculated temperature values exceeds the month's daily maximum T_{cap} effluent limit. The permittee is required to monitor and report the total monthly exceedance time (not an average).

a) If T_{emz} is less than T_{cap}, then the permittee records "0" hours deviation.
b) Any time T_{emz} is above T_{cap} then the facility reports the number of hours of deviation.
c) The permittee shall report on January 28th of each year the total number of hours the facility exceeded their temperature cap effluent limits for the entire year.

A violation occurs if:

a. The percent time deviation allowance is above 5% (438 hours) for the calendar year; and/or
b. The T_{emz} value reported is above the T_{dev} monthly limitation.

◊ Quarterly sampling

MINIMUM QUARTERLY SAMPLING REQUIREMENTS			
QUARTER	MONTHS	EFFLUENT PARAMETERS	REPORT IS DUE
First	January, February, March	Sample at least once during any month of the quarter; an *E. coli* sample is not required this quarter	April 28th
Second	April, May, June	Sample at least once during any month of the quarter	July 28th
Third	July, August, September	Sample at least once during any month of the quarter	October 28th
Fourth	October, November, December	Sample at least once during any month of the quarter; for *E. coli*, a sample must be collected in October	January 28th

B. STANDARD CONDITIONS

In addition to specified conditions stated herein, this permit is subject to the attached Part I standard conditions dated August 1, 2014, and hereby incorporated as though fully set forth herein.

C. SPECIAL CONDITIONS

1. This permit may be reopened and modified, or alternatively revoked and reissued, to:
   (a) Comply with any applicable effluent standard or limitation issued or approved under Sections 301(b)(2)(C) and (D), 304(b)(2), and 307(a) (2) of the Clean Water Act, if the effluent standard or limitation so issued or approved:
      (1) contains different conditions or is otherwise more stringent than any effluent limitation in the permit; or
      (2) controls any pollutant not limited in the permit.
   (b) Incorporate new or modified effluent limitations or other conditions, if the result of a waste load allocation study, toxicity test or other information indicates changes are necessary to assure compliance with Missouri's Water Quality Standards.
   (c) Incorporate new or modified effluent limitations or other conditions if, as the result of a watershed analysis, a Total Maximum Daily Load (TMDL) limitation is developed for the receiving waters which are currently included in Missouri's list of waters of the state not fully achieving the state's water quality standards, also called the 303(d) list.

   The permit as modified or reissued under this paragraph shall also contain any other requirements of the Clean Water Act then applicable.

2. All outfalls and permitted features must be clearly marked in the field. The permittee will have 180 days from date of issuance to place signs on newly identified permitted features, Outfall #007, and Permitted Feature #008.

3. 40 CFR 423.13(c)(2): "Neither free available chlorine nor total residual chlorine may be discharged from any unit for more than two hours in any one day and not more than one unit in any plant may discharge free available or total residual chlorine at any one time unless the utility can demonstrate to the [state] the units in a particular location cannot operate at or below this level of chlorination."

4. 40 CFR 125.98(b)(1): "Nothing in this permit authorizes take for the purposes of a facility's compliance with the Endangered Species Act."

5. 40 CFR 423.13(a): There shall be no discharge of polychlorinated biphenyl compounds (PCBs) such as those commonly [historically] used for transformer fluid.

6. Water Quality Standards
   (a) To the extent required by law, discharges to waters of the state shall not cause a violation of water quality standards rule under 10 CSR 20-7.031, including both specific and general criteria.
   (b) General Criteria. The following general water quality criteria shall be applicable to all waters of the state at all times including mixing zones. No water contaminant, by itself or in combination with other substances, shall prevent the waters of the state from meeting the following conditions:
      (1) Waters shall be free from substances in sufficient amounts to cause the formation of putrescent, unsightly or harmful bottom deposits or prevent full maintenance of beneficial uses;
      (2) Waters shall be free from oil, scum and floating debris in sufficient amounts to be unsightly or prevent full maintenance of beneficial uses;
      (3) Waters shall be free from substances in sufficient amounts to cause unsightly color or turbidity, offensive odor or prevent full maintenance of beneficial uses;
      (4) Waters shall be free from substances or conditions in sufficient amounts to result in toxicity to human, animal or aquatic life;
      (5) There shall be no significant human health hazard from incidental contact with the water;
      (6) There shall be no acute toxicity to livestock or wildlife watering;
      (7) Waters shall be free from physical, chemical or hydrologic changes that would impair the natural biological community;
      (8) Waters shall be free from used tires, car bodies, appliances, demolition debris, used vehicles or equipment and solid waste as defined in Missouri's Solid Waste Law, section 260.200, RSMo, except as the use of such materials is specifically permitted pursuant to section 260.200-260.247.

C. SPECIAL CONDITIONS (CONTINUED)

7. Changes in Discharges of Toxic Pollutant
In addition to the reporting requirements under §122.41(1), all existing manufacturing, commercial, mining, and silvicultural dischargers must notify the Director as soon as they know or have reason to believe:
   (a) That an activity has occurred or will occur which would result in the discharge, on a routine or frequent basis, of any toxic pollutant which is not limited in the permit, if that discharge will exceed the highest of the following notification levels:
      (1) One hundred micrograms per liter (100 µg/L);
      (2) Two hundred micrograms per liter (200 µg/L) for acrolein and acrylonitrile;
      (3) Five hundred micrograms per liter (500 µg/L) for 2,4-dinitrophenol and for 2-methyl-4, 6-dinitrophenol;
      (4) One milligram per liter (1 mg/L) for antimony;
      (5) Five (5) times the maximum concentration value reported for the pollutant in the permit application in accordance with 40 CFR 122.21(g)(7); or
      (6) The notification level established by the department in accordance with 40 CFR 122.44(f).
   (b) That any activity has occurred or will occur which would result in any discharge, on a non-routine or infrequent basis, of a toxic pollutant which is not limited in the permit, if that discharge will exceed the highest of the following "notification levels":
      (1) Five hundred micrograms per liter (500 µg/l);
      (2) One milligram per liter (1 mg/L) for antimony;
      (3) Ten (10) times the maximum concentration value reported for that pollutant in the permit application in accordance with §122.21(g)(7).
      (4) The level established by the Director in accordance with §122.44(f).

8. Report as no-discharge when a discharge does not occur during the report period.

9. Reporting of Non-Detects
   (a) An analysis conducted by the permittee or their contracted laboratory shall be conducted in such a way that the precision and accuracy of the analyzed result can be enumerated.
   (b) The permittee shall not report a sample result as "Non-Detect" without also reporting the detection limit of the test. Reporting as "Non-Detect" without also including the detection limit will be considered failure to report, which is a violation of this permit.
   (c) The permittee shall report the "Non-Detect" result using the less than sign and the minimum detection limit (e.g. <10).
   (d) Where the permit contains a Minimum Level (ML) and the permittee is granted authority in the permit to report zero in lieu of the < ML for a specified parameter (conventional, priority pollutants, metals, etc.), then zero (0) is to be reported for that parameter.
   (e) See Standard Conditions Part I, Section A, #4 regarding proper detection limits used for sample analysis.
   (f) When calculating monthly averages, one-half of the minimum detection limit (MDL) should be used instead of a zero. Where all data are below the MDL, the "<MDL" shall be reported as indicated in item (C).

10. It is a violation of the Missouri Clean Water Law to fail to pay fees associated with this permit (644.055 RSMo).

11. Any pesticide discharge from any point source shall comply with the requirements of Federal Insecticide, Fungicide and Rodenticide Act, as amended (7 U.S.C. 136 *et. seq.*) and the use of such pesticides shall be in a manner consistent with its label.

12. The purpose of the SWPPP and the BMPs listed herein is the prevention of pollution of waters of the state. A deficiency of a BMP means it was not effective in preventing pollution [10 CSR 20-2.010(56)] of waters of the state, and corrective actions means the facility took steps to eliminate the deficiency.

C. SPECIAL CONDITIONS (CONTINUED)

13. The facility's SIC codes found in 40 CFR 122.26(b)(14) and/or 10 CSR 20-6.200(2) indicate they shall implement a SWPPP which must be prepared and implemented upon permit issuance. The SWPPP must be kept on-site and should not be sent to the department unless specifically requested. The SWPPP must be reviewed and updated every five (5) years or as site conditions change (see Rationale and Derivation: antidegradation analysis, and SWPPP in the fact sheet). The permittee shall select, install, use, operate, and maintain the Best Management Practices prescribed in the SWPPP in accordance with the concepts and methods described in: *Developing Your Stormwater Pollution Prevention Plan, A Guide for Industrial Operators*, (EPA 833-B-09-002) published by the EPA in February 2009 (www.epa.gov/npdes/pubs/industrial_swppp_guide.pdf). In addition to areas with industrial exposure, the facility must include the barge area, the road intended to transport dry-handled ash to the utility waste landfill, the railroad, outfall #004, and outfall #005 in the SWPPP. The SWPPP must include:
    (a) A listing of specific contaminants and their control measures (or BMPs) and a narrative explaining how BMPs are implemented to control and minimize the amount of contaminants potentially entering stormwater. The BMPs should be designed to treat the stormwater up to the 10 year, 24 hour rain event.
    (b) For new, altered, or expanded stormwater discharges, the SWPPP shall identify reasonable and effective BMPs while accounting for environmental impacts of varying control methods. The antidegradation analysis must document why no discharge or no exposure options are not feasible. The selection and documentation of appropriate control measures shall serve as an alternative analysis of technology and fulfill the requirements of antidegradation [10 CSR 20-7.031(3)]. Failure to implement and maintain the chosen BMP is a permit violation. For further guidance, consult the antidegradation implementation procedure at http://dnr.mo.gov/env/wpp/docs/AIP050212.pdf .
    (c) The SWPPP must include a schedule for once per month site inspections and brief written reports. The inspection report must include precipitation information for the entire period since last inspection, as well as observations and evaluations of BMP effectiveness. Throughout coverage under this permit, the facility must perform ongoing SWPPP review and revision to incorporate any site condition changes.
        i. Operational deficiencies must be corrected within seven (7) calendar days.
        ii. Minor structural deficiencies must be corrected within fourteen (14) calendar days.
        iii. Major structural deficiencies must be reported to the regional office within seven (7) days of discovery. The initial report shall consist of the deficiency noted, the proposed remedies, the interim or temporary remedies (including the general timing of the placement of the interim measures), and an estimate of the timeframe needed to wholly complete the repairs or construction. The permittee will work with the regional office to determine the best course of action, including but not limited to temporary structures to control stormwater runoff. The facility shall correct the major structural deficiency as soon as reasonably achievable.
        iv. All actions taken to correct the deficiencies shall be included with the written report, including photographs.
        v. Inspection reports must be kept on site with the SWPPP and maintained for a period of five (5) years. These must be made available to department and EPA personnel upon request.
    (d) A provision for designating an individual to be responsible for environmental matters.
    (e) A provision for providing training to all personnel involved in material handling and storage, and housekeeping of maintenance and cleaning areas. Proof of training shall be submitted on request of the department.

C. SPECIAL CONDITIONS (CONTINUED)

14. Permittee shall adhere to the following minimum Best Management Practices (BMPs):
    (a) Prevent the spillage or loss of fluids, oil, grease, fuel, etc. from vehicle maintenance, equipment cleaning, or warehouse activities and thereby prevent the contamination of stormwater from these substances.
    (b) Provide collection facilities and arrange for proper disposal of waste products including but not limited to petroleum waste products, and solvents.
    (c) Store all paint, solvents, petroleum products and petroleum waste products (except fuels), and storage containers (such as drums, cans, or cartons) so these materials are not exposed to stormwater or provide other prescribed BMPs such as plastic lids and/or portable spill pans to prevent the commingling of stormwater with container contents. Commingled water may not be discharged under this permit. Provide spill prevention control, and/or management sufficient to prevent any spills of these pollutants from entering waters of the state. Any containment system used to implement this requirement shall be constructed of materials compatible with the substances contained and shall also prevent the contamination of groundwater.
    (d) Provide good housekeeping practices on the site to keep trash from entry into waters of the state.
    (e) Provide sediment and erosion control sufficient to prevent or control sediment loss off of the property. This could include the use of straw bales, silt fences, or sediment basins, if needed, to comply with effluent limits or benchmarks.
    (f) Ensure adequate provisions are provided to prevent surface water intrusion into the storage basin, to divert stormwater runoff around the storage basin, and to protect embankments from erosion.

15. To protect the general criteria found at 10 CSR 20-7.031(4), before releasing water accumulated in secondary containment areas which contain petroleum products, it must be examined for hydrocarbon odor and presence of sheen. If the presence of odor or sheen is indicated, the water shall be treated using an appropriate method or disposed of in accordance with legally approved methods, such as being sent to a wastewater treatment facility. Following treatment, the water shall be tested for oil and grease, benzene, toluene, ethylbenzene, and xylene using 40 CFR part 136 methods. All pollutant levels must be below the most protective, applicable standards for the receiving stream, found in 10 CSR 20-7.031 Table A. Records of all testing and treatment of water accumulated in secondary containment shall be stored in the SWPPP to be available on demand to DNR and EPA personnel.

16. Release of a hazardous substance must be reported to the department in accordance with 10 CSR 24-3.010. A record of each reportable spill shall be retained with the SWPPP and made available to the department upon request.

17. Impingement and Entrainment: CWA§ 316(b) Cooling Water Intake Structure
    (a) The facility is required to continue operating in a manner minimizing impingement and entrainment until the permittee has submitted the renewal application required in 40 CFR 122.21 and 40 CFR 125 Subpart J and best technology available is established in accordance with Clean Water Act §316(b) regulations. CWA § 316(b) regulations require modifications to reduce impingement and entrainment caused by intake structures.
    (b) The facility shall follow 40 CFR 122.21 and 40 CFR 125 Subpart J regulations regarding reduction in impingement and entrainment and performing their associated studies.
    (c) The facility shall submit annual status reports by February 28 each year, detailing the progress of the previous year.
    (d) Six months prior to permit expiration, the facility shall submit their application for 316(b) detailing the results of the biomonitoring studies and the selected path forward for implementing impingement and entrainment modifications at the intake structure.
    (e) This permit may be reopened and modified, or alternatively, revoked and reissued to incorporate new or modified requirements applicable to existing cooling water intake structures under Section 316(b) of the Clean Water Act. In the event it is necessary for this permit to be reopened and modified, or alternatively revoked and reissued, permittee shall comply with any such new or modified requirements or standards applicable to existing cooling water intake structures under §316(b) of the Clean Water Act.

C. SPECIAL CONDITIONS (CONTINUED)

18. Groundwater Monitoring Program: The permittee shall implement an effective groundwater monitoring program designed to determine if the coal ash impoundments have/had an impact on groundwater quality. The monitoring system must be capable of comparing up-gradient to down-gradient water quality in the first continuous water-bearing zone beneath the impoundment. The monitoring system must be based upon a thorough hydrogeological characterization of the impoundment area that determines the appropriate hydrostratigraphic unit to monitor, its groundwater gradient(s) and any seasonal variations in its gradient(s). Any hydrogeological characterization conducted for the design of the groundwater monitoring program shall be approved by the department's Missouri Geological Survey and must be conducted under the guidance of a geologist registered in the State of Missouri. The number of monitoring wells required for the groundwater monitoring program shall be based on site-specific hydrogeologic conditions and sufficient for effective monitoring of the site. To complete the following work plans and reports, the Water Protection Program recommends using applicable portions of the document issued by the Missouri Geological Survey (MGS), dated December 10, 2010 (or newer), *(Draft) Guidance for Conducting a Detailed Hydrogeologic Site Characterization and Designing a Groundwater Monitoring Program* as guidance. The plans shall be submitted as two hard copies and one electronic copy to the Missouri Department of Natural Resources central office: The Water Protection Program at P.O. Box 176, Jefferson City MO 65102-9920. In order to accomplish this, the permittee shall:
   (a) By 6 months from the date of issuance of this permit (or sooner), submit a Site Characterization Workplan to the Central Office for approval.
   (b) By 27 months from the date of issuance of this permit (or sooner) submit a Site Characterization Report detailing the findings from completion of the Site Characterization Workplan to the Central Office for verification of conclusions.
   (c) By 30 months from the date of issuance of this permit (or sooner) submit a draft Groundwater Monitoring, Sampling, and Analysis Plan (GMSAP) to the Central Office for approval.
   (d) By 36 months from the date of issuance of this permit (or sooner) submit a final Groundwater Monitoring, Sampling, and Analysis Plan (GMSAP) to the Central Office for approval. The design of the groundwater monitoring network should be approved by the department prior to installation. However, if installation occurs prior to approval, the WPP and MGS reserves the right to insist on additional wells or changes to the network.
   (e) By 48 months from the date of issuance of this permit (or sooner) have all elements of the GMSAP fully implemented. The facility shall collect groundwater quality samples at a discrete interval (usually quarterly) which must demonstrate each sample is independent and representative of the groundwater being monitored. A minimum of 8 groundwater quality samples must be collected prior to the expiration of the permit.

19. Whole Effluent Toxicity (WET) Tests shall be conducted as follows:
   - For outfall #001 (acute test), the AEC is 66%; the dilution series is 83%, 66%, 53%, 42%, and 34%.
   - WET tests on outfall #001 must be conducted concurrently of biocide use.
   - For outfalls #002, and #006 (chronic tests), the AEC is 100%; the dilution series is: 100%, 50%, 25%, 12.5%, and 6.25%.

   Acute Whole Effluent Toxicity (WET) tests shall be conducted as follows: (Outfall #001)
   (a) Freshwater Species and Test Methods: Species and short-term test methods for estimating the acute toxicity of NPDES effluents are found in the most recent edition of *Methods for Measuring the Acute Toxicity of Effluents and Receiving Waters to Freshwater and Marine Organisms* (EPA/821/R-02/012; Table IA, 40 CFR Part 136). The permittee shall concurrently conduct 48-hour, static, non-renewal toxicity tests with the following species:
      - The fathead minnow, *Pimephales promelas* (Acute Toxicity EPA Test Method 2000.0).
      - The daphnid, *Ceriodaphnia dubia* (Acute Toxicity EPA Test Method 2002.0).
   (b) Chemical and physical analysis of the upstream control sample and effluent sample shall occur immediately upon being received by the laboratory, prior to any manipulation of the effluent sample beyond preservation methods consistent with federal guidelines for WET testing that are required to stabilize the sample during shipping. Where upstream receiving water is not available or known to be toxic, other approved control water may be used.
   (c) Test conditions must meet all test acceptability criteria required by the EPA Method used in the analysis.
   (d) All chemical and physical analysis of the effluent sample performed in conjunction with the WET test shall be performed at the 100% effluent concentration.
   (e) All chemical analyses shall be performed and results shall be recorded in the appropriate field of the report form. The parameters for chemical analysis include Temperature (°F), pH (SU), Conductivity (µmohs/cm), Dissolved Oxygen (mg/L), Total Residual Chlorine (µg/L), free available chlorine (µg/L), total alkalinity (mg/L), and total hardness (mg/L).
   (f) The facility must submit a full laboratory report for all toxicity testing. The report must include a quantification of acute toxic units ($TU_a = 100/LC_{50}$) reported according to the test methods manual chapter on report preparation and test review. The Lethal Concentration 50 Percent (LC_{50}) is the effluent concentration that would cause death in 50 percent of the test organisms at a specific time.

C. SPECIAL CONDITIONS (CONTINUED)

Chronic Whole Effluent Toxicity (WET) tests shall be conducted as follows: (Outfalls #002 and #006)

(a) Freshwater Species and Test Methods: Species and short-term test methods for estimating the acute toxicity of NPDES effluents are found in the most recent edition of *Short-term Methods for Estimating the Chronic Toxicity of Effluents and Receiving Waters to Freshwater Organisms (EPA/821/R-02/013; Table IA, 40 CFR Part 136)*. The permittee shall concurrently conduct 7-day, static, renewal toxicity tests with the following species:
   - The fathead minnow, *Pimephales promelas* (Survival and Growth Test Method 1000.0).
   - The daphnid, *Ceriodaphnia dubia* (Survival and Reproduction Test Method 1002.0).

(b) Chemical and physical analysis of the upstream control sample and effluent sample shall occur immediately upon being received by the laboratory, prior to any manipulation of the effluent sample beyond preservation methods consistent with federal guidelines for WET testing that are required to stabilize the sample during shipping. Where upstream receiving water is not available or known to be toxic, other approved control water may be used.

(c) Test conditions must meet all test acceptability criteria required by the EPA Method used in the analysis.

(d) All chemical and physical analysis of the effluent sample performed in conjunction with the WET test shall be performed at the 100% effluent concentration.

(e) All chemical analyses shall be performed and results shall be recorded in the appropriate field of the report form. The parameters for chemical analysis are: Temperature (°F), pH (SU), Conductivity (µmohs/cm), Dissolved Oxygen (mg/L), Total Residual Chlorine (mg/L), Sulfates Plus Chlorides (mg/L), and Total Hardness (mg/L).

(f) The facility must submit a full laboratory report for all toxicity testing. The report must include a quantification of chronic toxic units (TUc = 100/IC25) reported according to the *Methods for Measuring the Chronic Toxicity of Effluents and Receiving Waters to Freshwater and Marine Organisms* chapter on report preparation and test review. The 25 percent Inhibition Effect Concentration (IC25) is the toxic or effluent concentration that would cause 25 percent reduction in mean young per female or in growth for the test populations.

20. Substances regulated by federal law under the Resource Conservation and Recovery Act (RCRA) and Comprehensive Environmental Response, Compensation, and Liability Act (CERCLA), that are transported, stored, or used for maintenance, cleaning or repair, shall be managed according to RCRA and CERCLA. Ameren is exempt from Clean Water Act, Section 311, reporting for sodium hydroxide, sodium hypochlorite, sulfuric acid and hydrazine as per 40 CFR 117.12.

21. The facility shall not discharge chemical metal cleaning wastes [40 CFR 423.13(e)] to waters of the state.

22. The facility shall submit a report characterizing the use of chlorine and biocides in the cooling system of the plant. The report will be submitted to the St. Louis Regional Office. See address below. A report will be required yearly even in the absence of chlorine/biocide use. The report will describe the quantity, duration, WET test results, and final concentration values of any sampling as required by Table A-3 and accompanying notes.

23. 40 CFR 423.13(h)(1)(i) and (k)(1)(i): The facility shall not discharge ash transport water [40 CFR 423.11(p)] which is not legacy wastewater as soon as possible; and shall not discharge ash transport water on or after May 1, 2021. Legacy wastewater [FR Vol. 80 No. 212: 11/3/2015; preamble p. 67854, sec. VIII. C. 8.] is any bottom ash transport water, fly ash transport water, and FGD wastewater generated before May 1, 2021.

C. SPECIAL CONDITIONS (CONTINUED)

24. Electronic Discharge Monitoring Report (eDMR) Submission System
    (a) Discharge Monitoring Reporting Requirements. The permittee must electronically submit compliance monitoring data via the eDMR system. In regards to Standard Conditions Part I, Section B, #7, the eDMR system is currently the only Department approved reporting method for this permit.
    (b) Programmatic Reporting Requirements. The following reports (if required by this permit) must be electronically submitted as an attachment to the eDMR system until such a time when the current or a new system is available to allow direct input of the data:
        (1) Schedule of Compliance Progress Reports;
        (2) CWA Section 316(b) Annual Reports; and
        (3) Any additional report required by the permit excluding bypass reporting.
        After such a system has been made available by the department, required data shall be directly input into the system by the next report due date.
    (c) Other actions. The following shall be submitted electronically after such a system has been made available by the department:
        (1) General Permit Applications/Notices of Intent to discharge (NOIs);
        (2) Notices of Termination (NOTs);
        (3) No Exposure Certifications (NOEs);
    (d) Electronic Submissions. To access the eDMR system, use the following link in your web browser: https://edmr.dnr.mo.gov/edmr/E2/Shared/Pages/Main/Login.aspx.

D. SCHEDULE OF COMPLIANCE

Schedules of compliance are allowed under 40 CFR 122.47. The facility shall attain compliance with final effluent limitations established in this permit as soon as reasonably achievable:

1. The facility shall attain compliance with final effluent limitations for temperature at outfall #001 as soon as reasonably achievable or no later than two years from the effective date.

2. The facility shall attain compliance with final effluent limitations for *E. coli* at outfall #02A as soon as reasonably achievable or no later than two years from the effective date.

3. The permittee shall submit interim progress reports detailing progress made in attaining compliance with the final effluent limits every calendar year. The first report is due January 28, 2018.

Please submit progress reports via the Electronic Discharge Monitoring Report (eDMR) Submission System.

MISSOURI DEPARTMENT OF NATURAL RESOURCES
FACT SHEET
FOR THE PURPOSE OF RENEWAL
OF
MO-0000353
AMEREN MISSOURI – SIOUX ENERGY CENTER

The Federal Water Pollution Control Act ("Clean Water Act" Section 402 Public Law 92-500 as amended) established the National Pollution Discharge Elimination System (NPDES) permit program. This program regulates the discharge of pollutants from point sources into the waters of the United States, and the release of stormwater from certain point sources. All such discharges are unlawful without a permit (Section 301 of the "Clean Water Act"). After a permit is obtained, a discharge not in compliance with all permit terms and conditions is unlawful. Missouri State Operating Permits (MSOPs) are issued by the Director of the Missouri Department of Natural Resources (Department) under an approved program, operating in accordance with federal and state laws (Federal "Clean Water Act" and "Missouri Clean Water Law" Section 644 as amended). MSOPs are issued for a period of five (5) years unless otherwise specified for less.

As per [40 CFR Part 124.8(a)] and [10 CSR 20-6.020(1)2.] a factsheet shall be prepared to give pertinent information regarding the applicable regulations, rationale for the development of effluent limitations and conditions, and the public participation process for the Missouri State Operating Permit (MSOP or operating permit) listed below. A factsheet is not an enforceable part of an operating permit.

Part I. FACILITY INFORMATION

Facility Type:	Major Categorical Industry
Facility SIC Code(s):	4911
Facility NAICS Code:	221112
Application Date:	10/20/2008
Expiration Date:	05/15/2009
Last Inspection:	01/28/2015 - in compliance

FACILITY DESCRIPTION:
The Sioux Energy Center is a power generating facility primarily involved in the generation and sale of electricity. As one of four Ameren owned coal-fired power plants in Missouri, it is currently the only one with air scrubbers installed. Located on the south shore (descending bank) of the Mississippi River between mile 209 and 210, the facility powers two coal fired electrical generating units. Nameplate generating capacity is 1099 megawatts (MW). Sioux is a two-unit, 986-megawatt coal-fired power plant, which was completed in 1968. Each boiler is equipped with 10 cyclone burners-essentially a 10-foot diameter barrel into which crushed coal and air are introduced. This process requires less equipment and less horsepower to crush the coal, versus grinding the coal into the consistency of talcum powder as is done with other types of boilers. Combustion occurs in a swirling motion within the cyclone burners; in more conventional boilers, pulverized coal is blown into the main furnace along with air and burned in suspension in the furnace. The plant's boilers are more efficiency than conventional boilers because they operated at a higher pressure (supercritical). Sioux's air permit allows them to burn in excess of 20,000 tons of tire chips annually, the equivalent of 25,000 tons of coal per year, providing electricity for more than 4,000 residential customers. This would consume more than 2.5 million discarded used tires a year if they choose to use this fuel source. Sioux's maximum burn is 12,000 tons of coal over 24 hours, about 3.0 million tons of coal annually. Construction of the scrubbers for each generating unit began in 2006. As hot flu gas passes through each scrubber, a slurry of crushed limestone and water is sprayed into it. The limestone in the slurry reacts with sulfur in the flue gas, creating synthetic gypsum - an inert material captured and stored in the new landfill on plant property. Gypsum is the main component of wallboard.

The facility operates a coal terminal port facility (barge unloading station) located at mile 209.6 on the right descending bank of the Upper Mississippi River approximately 3 miles below Portage De Sioux and 9 miles above Lock and Dam No. 26. A series of 60-inch conveyors extend to a storage area in rear: one 1,242-foot and one 693-foot, each with capacity for 3,000 tons per hour or total capacity for 430,000 tons. Coal delivered by barge is deposited via dry conveyor 1,255 feet to the coal pile on the northeastern side of the facility.

PERMITTED FEATURES TABLE:

FEATURE	AVERAGE FLOW (MGD)	DESIGN FLOW (MGD)	TREATMENT LEVEL	EFFLUENT TYPE
#001	78.0	85.6	none	condensate coolers
	540.0	607.9		unit 1 and 2 condensers
	27.0	30.8		jacket water coolers
	645.0	**724.3**		TOTAL
#002	1.24	4.38	(Ash Pond #1) sedimentation and neutralization	combined drain sump
	2.47	5.183		bottom ash removal system
	0	2.59		bottom ash system overflow
	0.013	0.039		domestic sewage
	0.003	0.004		exciter & control room HVAC
	0	0.032		unit 2 boiler drain line
	0.078	3.38		stormwater
	3.8	**15.8**		TOTAL
#02A	0.013	0.039	activated sludge	domestic wastewater
#003	0	3.48	none	emergency discharge of combined drain sump
#006	0.003	0.025	(Ash Pond #2) sedimentation and neutralization	flue gas conditioning heat exchanger
	0.003	0.025		coal handling sumps
	0	2.3		air heater wash
	0	1.10		economizer ash system
	3.35	2.81		precipitator ash removal system
	0	0.072		precipitator pad sumps
	0.067	0.2		regeneration wastes
	0.864	0.864		char hopper
	0.317	5.42		precipitation
	4.6	**10.8**		TOTAL
#007	0	1378	none	UWL recycle pond
#008	675.6	755.5	intake	intake

PERMITTED FEATURES, DESCRIPTIONS, AND SUPPLEMENTARY INFORMATION:
The facility's NPDES permit contains seven designated and permitted features; each described below.

OUTFALL #001 – NON-CONTACT ONCE-THROUGH COOLING WATER
Outfall #001 is the discharge from the once-through cooling water system. Water is withdrawn from the Mississippi River, passed through condensers and other heat exchanges, and returned to the river. Portions of the cooling water system are intermittently treated with biocides. The treated water is used to lubricate the circulating water pump bearings within the intake structure. This lube water mixes with the normal pump flow and is a component of the discharge. The total flow of this treated water is about 80 gpm. Wastewater sources of outfall #001 are once-through cooling water, circulating water pumps for unit 1 condenser, unit 2 condenser, condensate coolers, and jacket water coolers. See *Part III Rationale and Derivation of Permit Limits and Conditions; Impingement and Entrainment at CWIS; CWA § 316(b).*

Macroinvertebrate Control:
Sioux power plant has a monitoring program to detect the presence and growth of zebra mussels within systems vulnerable to fouling. Currently, biocide treatments are not scheduled but occur before fouling occurs. While various approaches have been considered and evaluated, the facility's currents strategy consists of molluskicide treatment of intake structure cells, auxiliary coolers (condensate, condenser, and jacket water coolers), and high and low pressure untreated (raw) water systems, using one of the following commercial chemical products or their equivalents:

GE-Betz Spectrus CT 1300, dosed at 5-10 ppm; or
Calgon H-130, dosed at approx. 5 ppm; or
Buckman Laboratories Bulab 6086, dosed at 5-10 ppm.

To comply with yearly reporting, each year, even if chlorine or biocides/molluskicides are not used, the facility will submit a short report to the St. Louis Regional Office. The report must detail each chemical used, the dosing concentration, and the time applied to the system. The facility must sample for free available chlorine, total residual chlorine, and whole effluent toxicity, on a conditional schedule. The facility is not required to sample for chlorine if the biocide/molluskicide used is not chlorine based; however, the facility must still collect a sample for WET testing if any biocide/molluskicide is used.

OUTFALL #002 – ASH POND #1 (OLD ASH POND)
Outfall #002 is the discharge from one of the plant's two wastewater treatment ponds containing bottom ash and fly ash. The pond was commissioned in 1967. This unit is 47 acres with a maximum height above grade of 27 feet. The total storage capacity is 2,100 acre-feet. The volume of ash stored is approximately 1,859 acre-feet.

Ash pond #1 provides treatment for bottom ash (boiler slag), low volume wastes, sewage treatment plant effluent, control room and exciter HVAC cooling tower, and stormwater runoff. Combined drain sump sources are: Unit 1 and 2 conditioner vacuum cooling, vacuum priming pumps seal water, floor drains, turbine room sump, flue gas conditioning heat exchanger, soot blowing traps, units 1 boiler drain line, domestic sewage, yard drains, control room cooler, Exciter HVAC cooler, HVAC cooling tower, unit 1 bottom ash removal system overflow, and finally, reject and backwash from the ultrafiltration system and the reverse osmosis system. The HVAC system is only used when building cooling is needed from late spring through early fall. The discharges are to Poeling Lake, a non-classified waterbody therefore no toxics mixing is afforded.

INTERNAL MONITORING POINT (IMP) #02A – SEWAGE TREATMENT PLANT
This is the discharge from the extended aeration package sewage treatment plant. Domestic wastewater throughout the facility is processed in the STP, prior to discharge into ash pond #1, then discharged to waters of the state through outfall #002. Sludge is removed by a contract hauler.

OUTFALL #003 – EMERGENCY OVERFLOW FROM THE COMBINED DRAIN SUMP
This outfall is an emergency discharge point for the combined drain sump (CDS). During normal operations, the CDS collects various low volume waste streams from the plant for transfer to ash pond #1 (outfall #002). During emergency conditions, a manually operated valve may be opened to allow discharge from the CDS to outfall #003. See outfall #002 under combined drain sump for sources of the wastewater. This outfall did not discharge in the last five years. Daily maximums and monthly averages are required under 40 CFR 122.45(d)(1) for continuous discharges not from a POTW. However, the facility has stated this is an emergency discharge outfall therefore will only receive daily monitoring requirements. Monitoring will occur each day the facility discharges. Monitoring is unscheduled therefore the facility need only report those days when the outfall discharges. Monitoring for precipitation is inappropriate for these outfalls. To discharge via outfall #003, a valve (which is normally closed) must be opened, which would only occur in response to critical (and unexpected) system failure(s).

OUTFALL #006 – ASH POND #2 (NEW ASH POND)
Outfall #006 is the discharge from the plant's second wastewater treatment pond. This pond was commissioned in 1994. This unit is 60 acres with a maximum height of 22 feet. The total storage capacity is 960 acre-feet. The volume of ash stored is approximately 376 acre-feet. Low volume waste sources and subsystems include: track hopper spray system, coal handling sumps, flue gas conditioning heat exchanger, precipitator pad sump pumps, precipitator ash removal system, precipitator pad sumps, air heater wash sump, economizer ash removal system, chemical lab drains, low pressure raw water pumps, unit 2 boiler drain line, condensate polisher, demineralizer regeneration wastes, char hopper, and stormwater. Ash pond #2 provides treatment for fly ash, economizer ash, low volume wastes, and stormwater runoff. The ash pond effluent pH is continuously monitored during discharge. As necessary, carbon dioxide is injected into the discharge line to lower effluent pH. The system is equipped with an alarm system which alerts personnel of low pond elevation, pH out of range, and pH monitor failure. The discharges are to Poeling Lake, a non-classified waterbody therefore no toxics mixing is afforded. The ash pond also receives runoff from the northeast transformer pad.

OUTFALL #007 – DECANT RECYCLE POND EMERGENCY OVERFLOW
This outfall is identified per DNR NPDES Construction Permit 22-7667 and represents the emergency overflow from the no-discharge recycle pond. The recycle pond receives stormwater and decants water from the on-site gypsum stack and utility waste landfill. The emergency overflow functions to protect the integrity of the recycle pond berms per Dam Safety regulations. The facility has asked this outfall be removed from the permit. The permit writer has used best professional judgment to leave the outfall in the permit. Should wastewater discharge from this outfall, the permittee will be required to sample several parameters. Discharge is not rainfall dependent. The elevation is maintained through pumps and controls (automatic and/or manual). The pond elevation is continuously monitored, so rainfall monitoring provides no real indication of potential or actual discharge via this outfall.

The utility waste landfill (UWL) was constructed on 212 acres just south of the power plant. The UWL does not occupy the entire acreage. From 1959 through 1973 the area was designated as agricultural lands. From 1973 to 1999, the area was designated flood plain. In 1999, the area was rezoned to describe the lands better as agricultural with floodway fringe and density floodway overlay districts. Because of this floodway designation, a 100 foot buffer strip is required on all four sides of the UWL and the maximum height is 525 feet above sea level. Ground levels at the site are about 420 feet above sea level. The area was re-zoned on May 30, 2006 to solid waste disposal district with floodway fringe and density floodway overlay by the St. Charles County Planning and Zoning Commission prior to construction commencing.

The pond was designed with a two foot thick compacted clay liner with a maximum permeability of 1×10^{-7} cm/sec hydraulic conductivity. The clay liner was overlain with an 80 millimeter thick high-density polyethylene (HDPE) liner. The recycle pond

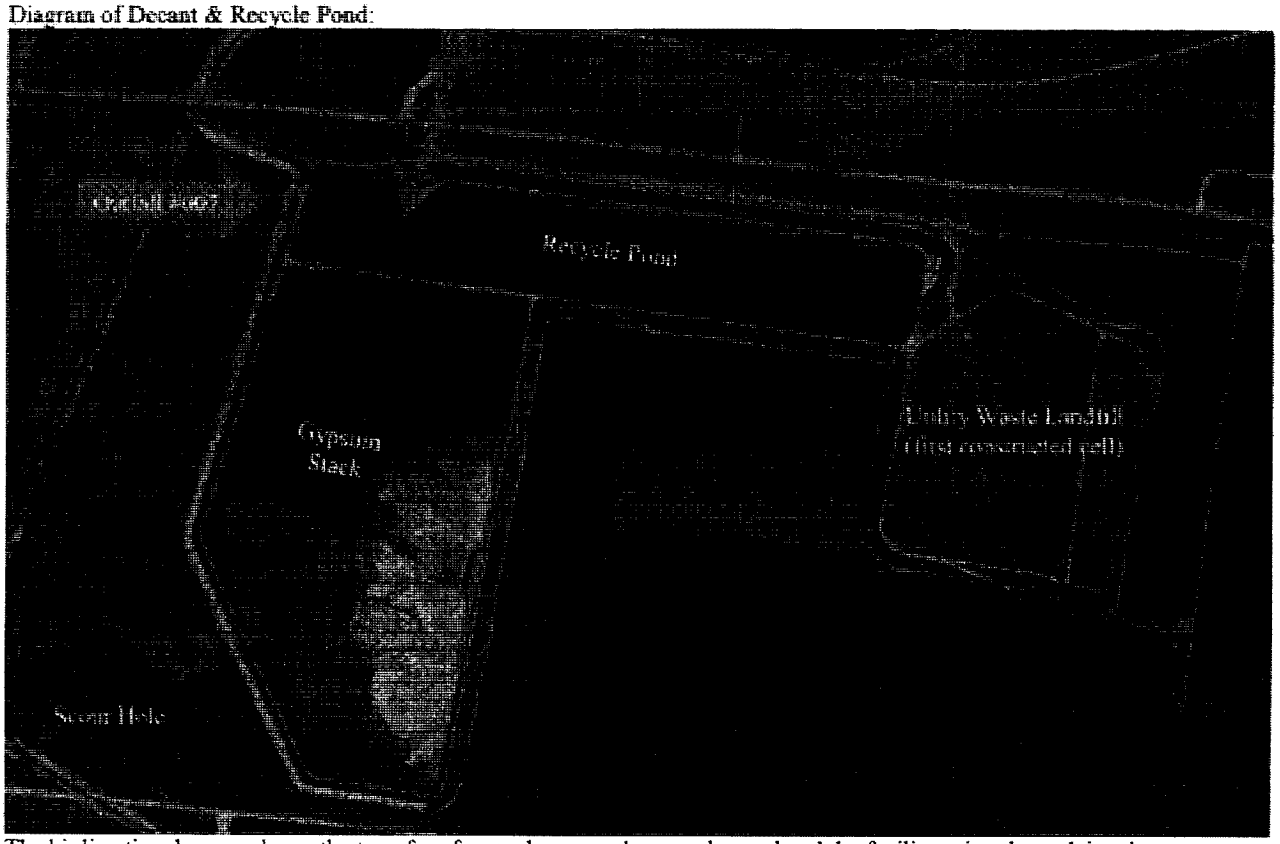
operates in a closed loop manner. The slurry line from the wet flue gas desulphurization (WFGD) deposits the slurry to the recycle gypsum stack. The stack of gypsum presses out the water which decants to the recycle pond. When the gypsum stack has met the maximum height or filled the stack basin, the solids are transferred to the utility waste landfill. From the UWL, the recycle pond receives decant water, consolidation water and stormwater runoff. The water contained in the recycle pond sump is returned to the WFGD scrubber to be used again. Three adjacent 6-foot wide by 3-foot tall box culverts are designed to convey water from the perimeter ditch of the UWL into the recycle pond. The pond has been designed to the 100 year-1 hour storm event which is 3.3 inches of rain for this site.

With both WFGD scrubber units running, approximately 970 gallons per minute (gpm) [1.39 MGD or 2.16 cfs] of slurry is pumped to the UWL. A portion of the process water is lost with the deposition of the waste. The maximum process water flow of 970 gpm is a small flow in the perimeter ditch which is sized for a maximum flow of about 100 cfs at the culverts. In the recycle pond, the storage requirement of 970 gpm is about half of the design volume (123 acre-feet) and is set aside for process management. Water in the recycle pond is pumped back to the plant's WFGD scrubber system to be reused. The leachate collection system wastewater is also reused in the wet scrubber system. Water can be pumped between the recycle pond and the gypsum stack area to equalize flows if needed to regulate stormwater.

FGD wastes accumulate at rates according to the power generated at the facility and the type of coal used to power the facility. When using low sulfur coal (as compared to Eastern Illinois coal which has a much higher sulfur content) less gypsum is produced, about one-tenth of higher sulfur coal. The more power generated at the facility, the more exhaust is produced, consequently the wet scrubbers must clean more air, and hence more gypsum is produced.

Any discharges from this outfall will, according to the Geohydrologic Evaluation of Liquid Waste Treatment Site (project #21407; 05/03/2007), eventually discharge to the Missouri River, a classified "P" stream. The report also indicated there were likely not any sinkholes in this area. Prior to reaching the Missouri River, the wastewater may encounter a jurisdictional scour hole, as identified by the United States Army Corps of Engineers (USACE). The wetland is located at the southwest corner of the utility waste landfill at 734176 meters north, and 4309239 meters east in UTM Zone 15. The scour hole was created during the flood of 1993.

Diagram of Decant & Recycle Pond:



The bi-directional arrow shows the transfer of water between the recycle pond and the facility using the reclaimed water.

Daily maximums and monthly averages are required under 40 CFR 122.45(d)(1) for continuous discharges not from a POTW. However, the facility has stated this is an emergency discharge outfall therefore will receive daily monitoring requirements occurring each day the facility discharges. Monitoring is unscheduled hence the facility need only report those days when the outfall discharges. The facility did not undergo an antidegradation analysis, partly because the permit renewal was submitted prior to Missouri requiring an official antidegradation review on new discharges. Secondly, the outfall is emergency discharge only, therefore, it is in itself a violation to discharge.

PERMITTED FEATURE (PF) #008 – COOLING WATER INTAKE STRUCTURE (CWIS)

Due to newly promulgated regulations regarding impingement and entrainment at cooling water intake structures, the department has determined identifying each structure is germane. The water is withdrawn from the river through a 0.32 mile (1,623 foot) long canal. Water first passes through a trash gate, into the cement-lined intake well, through the intake screens and is extracted by the circulating water pumps. Water is divided and then transferred to the Unit 1 condenser, Unit 2 condenser, condensate coolers, jacket water coolers, Unit 1 and 2 conditioner vacuum cooling, high pressure raw water pumps, and low pressure raw water pumps. Outfall #004 discharges to the CWIS.

This facility is required by the Clean Water Act § 316(b) to provide information, data, and summaries to the department regarding fish and shellfish impingement and entrainment at the next permit renewal. See *Part III Rationale and Derivation of Effluent Limits and Permit Conditions; Impingement and Entrainment.* Also see special condition # 17 for the permit requirements. Establishment of this permitted feature is required to track submissions required by the rule.

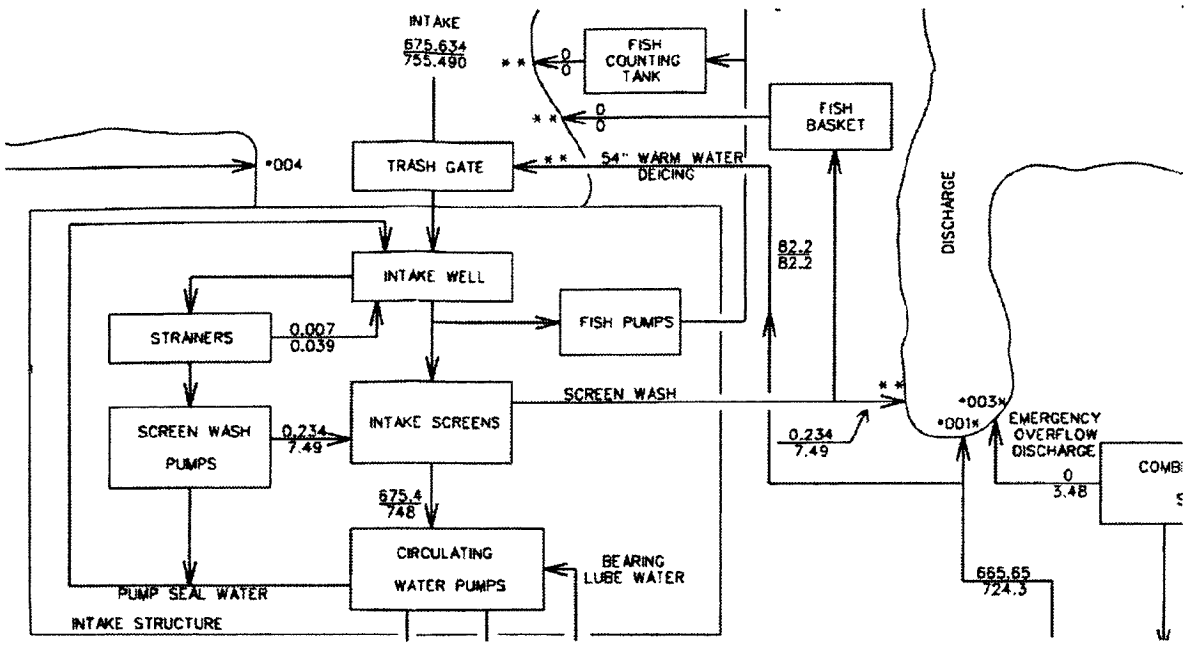
Return of River Water:

The Sioux Power Plant has four points at which Mississippi River water is returned to the Mississippi River and are not designated as outfalls. These outfalls are all subject to the general criteria found at 10 CSR 20-7.031(4) and may not violate narrative water quality criteria such as causing a color change or increase in turbidity. All are associated with the plant intake structure; none of the following sources have been determined to add pollutants to the Mississippi River:

- Deicing line: this line is an alternative routing for a portion of the flow through Outfall #001 (non-contact cooling water). During winter months (as ambient temperature may dictate), a portion of this outfall is diverted through the deicing line and is discharged at the face of the intake structure to prevent ice formation on the intake screens and trash racks. This system may also be used infrequently, throughout the year for other operational needs.
- Fish pump: this system was designed to reduce fish impingement on the intake screens. When operating, water and fish from in front of the screens is pumped from the intake structure and returned to the river just downstream of the intake canal.
- Fish basket and fish counting tank: a return of river water used to wash traveling screens at the intake. Water from the intake screen and fish counting tank is released into the cooling water discharge canal.

Intake Water Use Diagram:

The following diagram shows how water at the intake is used. In the diagram "**" is a return of river water. See *Part III: Rationale and Derivation of Permit Limits and Conditions; Impingement and Entrainment at CWIS; CWA §316(b).*



Major Water User:
The facility is registered as a major water user, No. 42244946. The facility withdrew 202,201,000,000 gallons (202.2 billion gallons) from the Mississippi River in 2014. Much of the water is returned to the river through outfall #001. The facility used no groundwater.

STORMWATER DISCHARGES

- The facility also has two designated stormwater outfalls and three locations where designated outfalls are not required. The majority of the stormwater on site is discharged through outfalls #002 and #006, the ash pond outfalls. Outfalls #002 and #006 are considered process water and are regulated as such.
- Other stormwater discharges (such as from roadways and the rail loop) are vegetated areas or are sheet flow. This permit will not require any additional sampling however, inclusion in the SWPPP and BMP monitoring is required. Should the discharges change in any manner impacting waters of the state from industrial activity, the facility must report changes to the department and, if required, submit an application for permit modification per 10 CSR 20-6.010(8)(A)9.
- The permittee has asked outfalls #004 and #005 be removed from the permit. In the past, the facility has not had to perform any monitoring at these outfalls. The previous permit only identified these outfalls by number and stated "these outfalls still exist but are not currently being monitored due to implementation of best management practices and minimal risk to waters of the state." See below.

OUTFALL #004 – STORMWATER RUNOFF WITHIN INTAKE CANAL

This outfall is representative of various similar channel erosion conduits along the plant's intake canal. The facility has not been required to perform analytical monitoring at this outfall in the last permit. Roof drains from the intake structure and a small storage building are also within this drainage area. Large rock and gravel have been placed in the ditches to control excess erosion. Stormwater runoff from this area is discharged directly into the intake canal, through the cooling water system, and back to the Mississippi River. The drainage area ground cover is a combination of heavily vegetated and graveled zones. Drainage to this outfall is separate from primary portions of the plant. BMPs are implemented to prevent contamination of stormwater runoff and ensure appropriate and timely responses to spills and other unanticipated events.
Intake Canal and Water Course Diagram:

Outfall #004 determination: The permit writer has determined the permittees request to continue not sampling this outfall is appropriate and this permit will not require analytical monitoring of the outfall. The above photo shows an overlay of the elevation contour lines for the site. The light blue line shows elevation 420. An 11 acre area of impervious surface was measured (areas in white and within the 420 foot boundary). Industrial water runoff will flow towards the southwest and into the ash pond because of established berms around the northern portion of the facility. The canal is bermed and any stormwater runoff within the canal area will be utilized by the intake for the cooling water, used throughout the cooling system, then discharged to the Mississippi River. EPA's

Interim Permitting Approach for Water Quality-Based Effluent Limitations in Storm Water Permits, (EPA 833-D-96-001), states "If the permitting authority determines that, through implementation of appropriate BMPs required by the NPDES storm water permit, the discharges have the necessary controls to provide for attainment of WQS and any technology-based requirements, additional controls need not be included in the permit". The BMPs included in the SWPPP are appropriate controlling mechanisms for this discharge.

OUTFALL #005 – STORMWATER RUNOFF FROM ROADWAY

This outfall is representative of several similar discharges along the plant access road to State Highway 94. Stormwater runoff from the paved access road and the narrow gravel lined drainage swale between the access road and the railroad tracks is discharged from corrugated pipes placed beneath the rail line. Several of these pipes drain to a low lying area bordered by the elevated plant access road and Highway 94, effectively forming a basin. The basin then drains via a single pipe to a small Mississippi River backwater pond identified as Poeling Lake. BMPs are implemented to help prevent contamination of stormwater runoff and ensure appropriate and timely responses to spills and other unanticipated events and this area must be included in the SWPPP.

Outfall #005 determination: Outfall #005 appears to continue to have no industrial exposure. The drainage area is minimal. The permit writer has concluded a *de minimis* determination is acceptable and the BMPs included in the SWPPP are appropriate for this discharge.

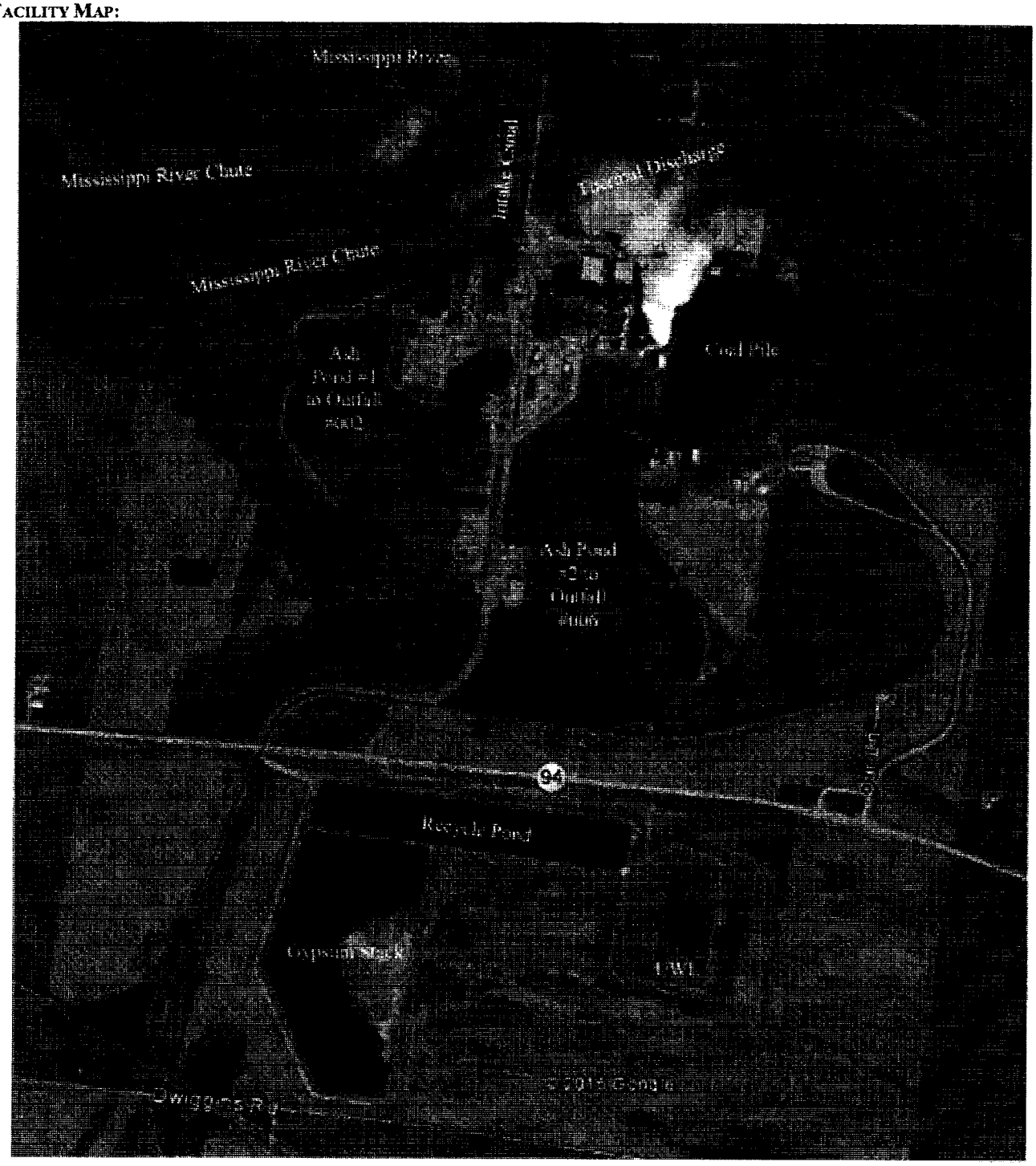
RAIL SPUR STORMWATER RUNOFF

Additional drainage pipes are buried beneath the railroad tracks on the company owned rail spurs connecting the track loop (on the plant site) to the Burlington Northern Railroad. These are similar to those identified as outfall #005. However these pipes drain to adjacent farm fields, located behind flood control levees, and is therefore not considered to be a point source discharge to waters of the state. The discharge has been determined to be *de minimis* but must still be covered by the SWPPP.

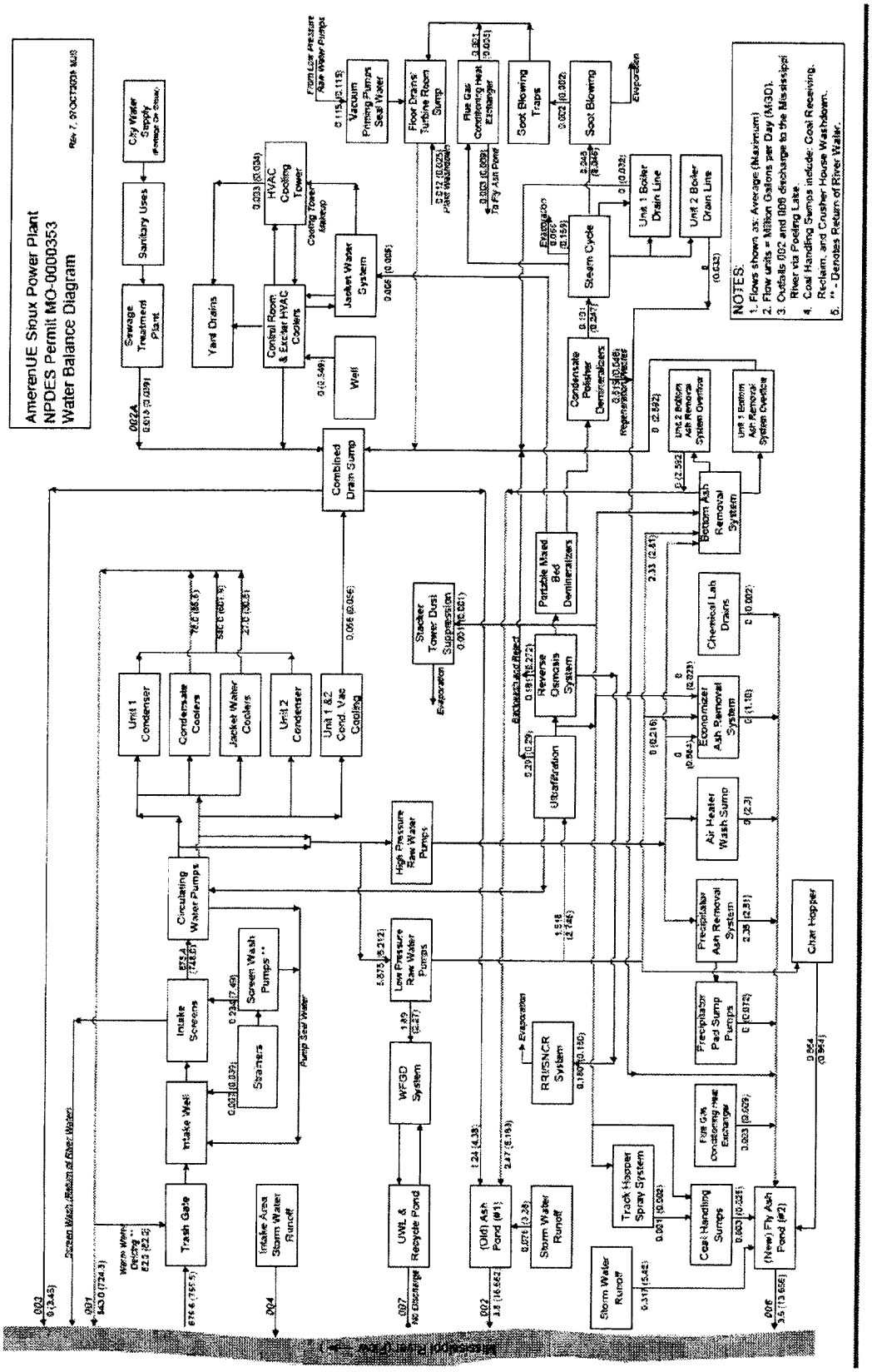
BARGE UNLOADING FACILITY

During barge unloading operations, stormwater accumulated at the barge unloading facility is directed to a spare storage barge. As necessary, stormwater from this spare barge is removed by a vacuum truck and transported to the coal storage area. There is no designated outfall for the barge unloading facility however this portion of the facility must be covered by the SWPPP.

FACILITY MAP:



WATER BALANCE DIAGRAM:



ASH MANAGEMENT UNITS:

Management Unit	Year Commissioned	Surface Area (acres)	Total Storage capacity (acre-ft)	Volume of Stored Ash (acre-ft)	Maximum Height of Unit (ft)	Liner
Fly Ash Pond	1994	~ 60	960	376	22	Yes
Bottom Ash Pond	1967	~ 47	2,100	1,859	27	No
Landfill	2010	~ 58	unknown	unknown	unknown	Yes

FACILITY PERFORMANCE HISTORY & COMMENTS:
The electronic discharge monitoring reports were reviewed for the last five years. An inspection was completed on January 28, 2015; the facility was in compliance.

The following table shows the permit exceedances from December 2010 to August 2016.

PF No.	Monitoring Period	Parameter Description	Monitoring Location	Units	Limit	Limit	Reported Value	Limit	Limit	Reported Value
006	09/30/2013	Total Suspended Solids (TSS)	Effluent Net	mg/L	30	Monthly Avg.	75.0	100	Daily Max.	375.0
02A	11/30/2015	Total Suspended Solids (TSS)	End of Pipe	mg/L	30	Monthly Avg.	73	45	Weekly Avg.	111
02A	05/31/2012	Total Suspended Solids (TSS)	End of Pipe	mg/L	30	Monthly Avg.	42	45	Weekly Avg.	50
02A	11/30/2011	Total Suspended Solids (TSS)	End of Pipe	mg/L	30	Monthly Avg.	26.0	45	Weekly Avg.	51.0

Outfall #006 is ash pond #2; technology based net limitations.
Outfall #02A is the wastewater treatment facility; technology based limitations.

COMBUSTION CONTROL EQUIPMENT:
Currently, two systems are operable to reduce air emissions from the two Sioux Power Plant boilers and are summarized below.

- *Wet Flue Gas Desulphurization:* The WFGD functions to reduce SO_x emissions via absorption with limestone. See *Environmental Projects* in this part.
- *Rich Reagent Injection & Selective Non-Catalytic Reduction (RRI-SNCR):* RRI-SNCR equipment was installed during November 2006 at the Sioux Power Plant. The Purpose of the RRI-SNCR systems is to reduce the emission of NO_x to the atmosphere from Sioux boilers 1 and 2. The installation of the RRI-SNCR systems was part of Ameren's plan to comply with new air pollution control regulations. The RRI and SNCR function to convert NO_x in the boiler into nitrogen by injecting a urea solution into each of the two Sioux Power Plant boilers. Upon completion of modifications for the Unit 1 RRI-SNCR system, both boilers will have 30 RRI injection ports at five different boiler elevations and 9 SNCR injection ports at two different boiler elevations.

ENVIRONMENTAL PROJECTS:

- Ash Sales: The facility produces approximately 100,000 tons of bottom ash (boiler slag) and 40,000 tons of fly ash per year. Boiler slag is reclaimed from the pond and utilized as blasting grit and as roofing shingle material. Approximately 65,000 tons per year are provided to these markets. Fly ash was reused as structural fill for a limestone haul road and was also used for construction of the on-site utility waste landfill.
- Wetlands Development: The facility has conveyed and deeded about 25 acres of the plant property bordering the Mississippi River for wetland preservation. This land contains bottomland hardwood trees.
- Combustion Control Equipment:
  - Wet Flue Gas Desulphurization (WFGD):
    - Raw Water Treatment Plant: Constructed to provide cleaner Mississippi River water to plant processes. The plant membrane filters, then ultrafiltration, then reverse osmosis. Chlorine is used in the RO treatment to prevent scaling. The treatment waste is discharged through outfall #002. The facility provided 56 points of data which showed outfall #002 had below the detection limit (ML 130 µg/L) of total residual chlorine.
    - WFGD Limestone Storage: The facility constructed two storage domes on the eastern side of the facility to contain powdered limestone for the system.
    - Utility Waste Landfill: The facility has constructed a UWL south of the generating station on the south side of Highway 94. The UWL has a 183.5 acre "wet gypsum stack" with decant water directed to a recycle pond. The department regulates the gypsum stack through the solid waste program.
      Gypsum Slurry containing about 20% solids is pumped from the WFGD system to the gypsum stack where the solids separate out and remain in the stack. Decant water flows to the recycle pond which functions to control surge volumes

and contain gypsum stack stormwater runoff. Water from the recycle pons is returned for reuse by the WFGD system. The construction permit 22-7667 was issued on August 5, 2008.

- Rich Reagent Injection and Selective Non-Catalytic Reduction (RRI-SNCR): RRI-SNCR equipment was replaced in November of 2006. These systems reduce emission of nitrogen oxides (NOx) to the atmosphere from boilers 1 and 2.The systems convert NOx into nitrogen by injecting urea into ports in the boiler. Urea injection concentrations vary between 10 and 50%. Some urea injected into the boiler does not react fully with the NOx and results in excess ammonia ("slip") and ultimately ammonia can be discharged to the ash ponds. Use of the RRI-SNCR equipment is dependent upon several factors. The specific NOx controls were implemented in response to the Missouri NOx Budget Trading Program regulations during ozone season (May through September) and additional Missouri air regulations necessary to comply with the federal Clean Air Interstate Rule (CAIR). Since inception, the CAIR regulations have been vacated. Urea usage rates are highly variable but a maximum usage rate is 30,000 gallons of 50% aqueous urea per day. The fly ash pond (outfall #006) is then estimated to mass load at about 3 to 25 pounds per hour.

- Intake Pump Replacement: The four intake pumps at the cooling water intake structure were replaced with four higher capacity intake pumps to provide make-up water for the WFGD system. The previous four pumps were each rated at 116,650 gallons per minute (GPM). They were replaced with 130,000 GPM pumps. The facility has determined thermal discharge will not be changed with this increase.
- Utility Waste Landfill and Recycle Pond: Construction permit # 22-7667 effective August 5, 2008 and expired August 4, 2010 allowed construction of a no-discharge recycle pond and utility waste landfill. This created outfall #007 as an emergency discharge (no allowed discharge) for safety purposes. The WFGD system is designed to operate with a maximum of 50,000 mg/L of chlorides therefore this system cannot direct discharge to waters of the state without violating water quality standards. The UWL consists of a 183.5 acre "wet gypsum stack" with decant water directed to a "recycle pond".

CHEMICAL USAGE & SIGNIFICANT MATERIALS STORED ON SITE:
The following table outlines the chemicals and materials used or stored at the facility and how each chemical is controlled or limited through the permit.

CHEMICAL/MATERIAL	USES/STORAGE	DISCHARGE	PERMIT CONTROL
Aluminum Chlorohydrate (50%)	Used as a coagulant in raw water treatment; usage of 5,000 gallons/year; stored in a 5,000 gallon tank located at the raw water treatment plant. There is a containment structure for this tank.	ash pond #1 (outfall #002)	WET testing
Ammonium Hydroxide (28% as NH4OH)	Used as a boiler treatment chemical in makeup water and for condensate polisher regenerations; usage: 202,000 lbs/year; stored in a 5,800 gallon above ground tank. Plant procedures limit total inventory to less than 3,000 gallons.	ash pond #1 (outfall #002) via the combined drain sump	ammonia as N monitoring, WET testing
Anticorrosion Chemical (Quality Water Treatment 1590, or equivalent)	used for corrosion control in the Control Room HVAC cooling tower; usage of 600 gallons/year	ash pond #1 (outfall #002)	WET testing
GE-Betz Hypersperse MDC 220, or equivalent	used as an antiscalant in raw water treatment; usage of 5,000 gallons/year	ash pond #1 (outfall #002)	WET testing
GEBetz NX1106 and NX1103, or equivalent	biocide used to control jacket water quality; usage of 135 gallons/year	ash pond #1 (outfall #002) via the combined drain sump	WET testing
Boiler Chemical Cleaning	Occurs approximately every six years. Boiler chemical cleaning wastes are not discharged but are thermally treated at the plant by injecting them into an operating boiler. Boilers are cleaned with a solution of formic and hydroxyacetic acids. The chemicals are brought on site in portable tanks. The boiler cleaning wastewater is stored in a 50,000 gallon tank, until it is thermally treated in an operating boiler.	no discharge	special condition #22
Bromine (Quality Water Treatment 2130, or equivalent)	used for bacteriological control in the control room HVAC cooling tower; usage of 30 gallons/year	ash pond #1 (outfall #002)	WET testing
Carbon dioxide	used for neutralization of ash pond #2 effluent and as an inert gas in generator systems; usage of 305,900 lbs/year; liquid carbon dioxide is stored in two tanks: a 12,000 pound capacity tank in the plant's gas tank and a 52,000-pound capacity tank at the fly ash pond discharge structure	outfall #006	pH limits
Chlorine tablets (Quality Water Treatment T30, or equivalent)	used for bacteriological control in the Control Room HVAC cooling tower; usage of 1 pail/year	ash pond #1 (outfall #002)	WET testing

CHEMICAL/MATERIAL	USES/STORAGE	DISCHARGE	PERMIT CONTROL
Citric Acid	a low pH reverse osmosis cleaning chemical in raw water treatment; 24 gallons/year	discharged to ash pond #1 (outfall #002)	pH limits, WET testing
Citric Acid (50%)	low pH Ultrafiltration Membrane cleaning chemical in raw water treatment; usage of 1,000 gallons/year	ash pond #1 (outfall #002)	pH limitations
Coal	fuel to generate electricity; stored outside uncovered; delivered by train, truck, or barge and unloaded at the coal receiving area stormwater runoff	outfall #006	ELG; SWPPP
Coal Dust Suppression Agents & Coal Treatment Chemicals	treat coal or coal combustion systems; Benetech products; BT-205W (5,000 gallons/year), BT-415 or 515 (45,000 gallons/year) and BT100F2 (61,000 gallons/year); surfactants – all are used for coal dust suppression These can be used in coal handling systems; small amount of these products may be discharged from the ash ponds; three dust suppressant products are stored on site, in five above ground tanks located near the crusher house and coal receiving hoppers. Each tank sits within a concrete retention berm which is designated to hold the entire contents of the tank. Deliveries are made directly to the tanks.	outfalls #002 and #006	WET testing; narrative conditions; SWPPP
Coal Freeze Conditioning Agents	Applied to coal (at the point of shipment) during severe winter weather; consist of various mixtures of ethylene glycol, diethylene glycol, propylene glycol, calcium chloride, and/or sodium chloride. When used, freeze-conditioning agents are applied at a rate of approx. 2 pints per ton of coal. Freeze-conditioning agents may also be used in the coal handling systems at Sioux Plant. Ethylene glycol solutions (50%) – used as an antifreeze agent on coal and as a coolant in mobile equipment; usage of 12,000 lbs/yr.	outfall #002	WET testing
Ethylene Glycol	stored in 55-gallon drums. It is mixed 50/50 with water and used as an anti-slip agent on coal conveyors	outfall #002	WET testing
Ferric Sulfate Solution (45%)	used as a precipitating agent in raw water treatment; infrequent usage	ash pond #1 (outfall #002)	iron monitoring
Fuel Oil	stored in two above ground tanks, with 30,000 and 15,000 gallon capacities. They are located within earthen dikes, which are designated to hold 33,000 and 16,500 gallons respectively. Fuel oil is loaded directly into the tanks. Note at times, there are also one to three railroad car tankers on site, with a holding capacity of 21,000 gallons each	no discharge; outfall #002, barge dock, stormwater outfalls	oil and grease limitations, SWPPP, OPA*
High pH Reverse Osmosis Cleaning Chemical (GE-Betz AK110, or equivalent)	used as a high pH RO cleaning chemical in raw water treatment; usage of 3,600 lbs/year	ash pond #1 (outfall #002)	pH limitations
Hydrogen Gas	stored in two high-pressure cylinder located in the plant's gas yard and a 52,000 pound capacity tank at the fly ash pond discharge structure.	n/a (volatilization upon release)	n/a
Laboratory Reagents	lab drains which may include spent reagents; only trace levels are anticipated CHEMICAL / CAS NUMBER Methylene chloride / 75-09-2 Tetrachloroethylene / 127-18-4 Toluene / 108-88-3 Trichloroethane / 71-55-6 Trichloroethene / 79-01-6 Methyl chloride / 74-87-3 Ethyl benzene / 100-41-4	ash pond #2 (outfall #006)	WET testing
Lime (Calcium Oxide)	used in raw water treatment; infrequent usage	ash pond #1 (outfall #002)	pH limitations
Nitrogen, Liquid	Stored in a high-pressure cylinder located in the plant's gas yard, with a total capacity of approx. 10,600 pounds.	n/a (volatilization upon release)	ammonia as N monitoring
Petroleum (Pet) Coke	supplemental fuel; the facility may use up to a 15% feed rate of pet coke; stored on a portion of the coal pile; not currently used by the facility as supplemental fuel; none stored at this time	outfall #002	WET testing
Phosphoric Acid (75%)	used as a low pH Reverse Osmosis cleaning in raw water treatment; usage of 24 gallons/year	discharged to ash pond #1 (outfall #002)	pH limitations, WET testing

CHEMICAL/MATERIAL	USES/STORAGE	DISCHARGE	PERMIT CONTROL
Polymer	settling agent in raw water treatment; infrequent usage	ash pond #2 (outfall #006)	WET testing; Standard Conditions Part I
Propylene Glycol Solution (50%)	source is from residuals in piping; usage of approx. 25 gallons/year	ash pond #1 (outfall #002)	WET testing
Reverse Osmosis Biocide (GE-Betz BioMate MBC 2881, or equivalent)	used as an RO system biocide chemical in raw water treatment; usage of 500 gallons/year	ash pond #1 (outfall #002)	WET testing
Sodium Bisulfite (43%)	used as a neutralizing agent in raw water treatment; usage of 5,000 gallons/year	ash pond #1 (outfall #002)	pH limitations
Sodium Chloride	Used to brine-treat demineralizer anion resin; infrequent usage; stored in several plant areas during winter months. It is used on roadways, sidewalks and parking lots for deicing, as required.	ash pond #1 (outfall #002)	chloride monitoring
Sodium Hydroxide (solid)	jacket water system additive; usage of 1,100 lbs/year	ash pond #1 (outfall #002) via the combined drain sump	pH limitations
Sodium Hydroxide Solution (50%)	used for raw water treatment and polisher demineralizer regeneration (alternatively to neutralize Ash Pond #1) – usage of 2,310 lbs/year; stored in a 4,000-gallon tank located at the raw water treatment plant	ash pond #1 and #2 (outfalls #002 and #006)	pH limitations
Sodium Hypochlorite Solution (10%)	used as a disinfectant in raw water treatment; usage of 12,000 gallons/year	ash pond #1 (outfall #002)	pH limitations
Sodium Molybdate Dehydrate (practical grade)	jacket water system chemical additive; 20,000 lbs/year	ash pond #1 (outfall #002) via the combined drain sump	WET testing
Sodium Tolytriazole Solution (50%)	jacket water system chemical additive; usage of 500 gallons/year	ash pond #1 (outfall #002) via the combined drain sump	WET testing
Sulfur, Molten	stored in a 70 ton tank located south of the Power Building	no discharge	WET testing
Sulfuric Acid (93%)	raw water treatment and polisher regeneration (alternatively to neutralize ash pond #1); usage of 6,485 lbs/year; stored in a 15,000-gallon above ground tank; there is a concrete retaining basin under the tank for containment in the event of a spill; there is also a 300-gallon tank located at the raw water treatment plant	discharged to ash pond #1 and #2	pH limits, WET testing
Tires, Shredded	alternative fuel; stored outside in an uncovered area; discarded tires are burned to recover the energy and reduce coal fuel consumption; the maximum storage is 1,000 tons; not currently used as alternative fuel; none stored at this time	outfall #002	WET testing
Transformers	Oil filed transformers are located on site; oil is used for cooling and insulation. These transformers have drains dischargeing to the combined drain sump.	outfall #002 (bottom ash pond)	oil and grease limitations
Unleaded Gasoline	stored in a UL-Listed 1,000-gallon above ground storage tank	no discharge	special condition #15, OPA*
Urea Liquor (50%)	stored in a 400,000 gallon tank with secondary containment	no discharge	ammonia as N monitoring
Used Oil	Non-electrical & electrical waste oil are stored in a 4,000 gallon tank located immediately southeast of the Unit 2 stack. This tank and its transfer equipment are located within a concrete dike of sufficient volume to contain a complete loss of the oil and solvent mixture, plus substantial rainfall.	no discharge	oil and grease limitations; special condition #15, OPA*

* OPA = Oil Pollution Act of 1990; any discharge of petroleum products to waters of the United States is prohibited and any amount spilled into such waters must be reported to the Coast Guard's National Response Center immediately upon discovery.

Part II. RECEIVING STREAM INFORMATION

APPLICABLE DESIGNATIONS OF WATERS OF THE STATE:

✓ As per Missouri's Effluent Regulations [10 CSR 20-7.015(1)(B)], the waters of the state are divided into the following seven categories. Each category lists effluent limitations for specific parameters, which are presented in each outfall's Effluent Limitation Table and further discussed in the Derivation & Discussion of Limits section.

Missouri or Mississippi River:	☒
Lake or Reservoir:	☒
Losing:	☐
Metropolitan No-Discharge:	☐
Special Stream:	☐
Subsurface Water:	☐
All Other Waters:	☒

RECEIVING WATER BODY'S WATER QUALITY:

- The Mississippi River is the major river located just north of the facility. Once-through cooling water discharges directly to this river from outfall #001.
- Poeling Lake is the first receiving waterbody for several of the outfalls. See the waterbody table on the following page in this section. This lake is not classified but general water quality criteria [10 CSR 20-7.031(4)] apply. There are no concurrent biological or water quality data available for this lake.
- The Missouri River was identified as the discharge point for the utility waste landfill's recycle pond emergency overflow discharge; outfall #007.

303(D) LIST:

Section 303(d) of the federal Clean Water Act requires each state identify waters not meeting water quality standards and for which adequate water pollution controls have not been required. Water quality standards protect such beneficial uses of water as whole body contact (such as swimming), maintaining fish and other aquatic life, and providing drinking water for people, livestock and wildlife. The 303(d) list helps state and federal agencies keep track of impaired waters but not addressed by normal water pollution control programs. http://dnr.mo.gov/env/wpp/waterquality/303d/303d.htm

✓ Not applicable; The Mississippi River was listed on the 2002 Missouri 303(d) list for chlordane and PCBs. It was removed from the 303(d) List when a TMDL was approved. The TMDL is still effective.

✓ The Missouri River is listed on the 2016 CWA §303(d) for *E. coli*. The facility is not considered a source of the impairment as domestic wastewater is discharged to the Mississippi.

TOTAL MAXIMUM DAILY LOAD (TMDL):

A TMDL is a calculation of the maximum amount of a given pollutant a body of water can absorb before its water quality is affected; hence, the purpose of a TMDL is to determine the pollutant loading a specific waterbody can assimilate without exceeding water quality standards. If a water body is determined to be impaired as listed on the 303(d) list, then a watershed management plan will be developed which shall include the TMDL calculation. http://dnr.mo.gov/env/wpp/tmdl/

✓ This facility may be considered a source of, or had the potential to contribute to PCB pollution listed in the 2002 TMDL for the Mississippi River and the 2006 TMDL for the Missouri River. In 1991, the facility noted they cleaned up PCB contaminated soil from between the air heater wash basin and the road as a result of previous releases of transformer oil. The facility was not specifically mentioned in either TMDL therefore there are no wasteload associations.

- PCBs were used in transformer oil because of their excellent heat dispersion capabilities. On August 25, 1982, EPA issued a final rule governing the use and servicing of electrical equipment containing PCBs (47 FR 37342). This final rule was issued as a result of the Court's decision to strike down the May 1979 rule's classification of transformers, capacitors, and electromagnets as "totally enclosed." In the August 25, 1982 rule, EPA authorized the use of electrical equipment containing PCBs with certain conditions and restrictions intended to minimize human and environmental exposures to PCBs. On October 21, 1982, EPA issued part one of a two-part rule to address the 50 ppm regulatory cutoff (47 FR 46980). This final rule addressed closed and controlled waste manufacturing processes. EPA submitted a plan to the Court on November 1, 1982, that requested a further extension of the stay of mandate for the 50 ppm cutoff and presented plans for the completion of the rulemaking on this issue. (The October 21, 1982 rule was superseded later by the "Uncontrolled PCB's Rule" issued on July 10, 1984.). Since then, utilities have been retrofitting all transformers and filling with mineral oil which does not contain PCBs. It is unknown if Sioux has any remaining transformers which may have PCBs or if spills of PCBs occurred on site.

WATERBODY TABLE:

OUTFALL	WATERBODY NAME	CLASS	WBID	DESIGNATED USES*	DISTANCE TO SEGMENT	12-DIGIT HUC
#001	Mississippi River	P	3700	DWS, HHP (HHF), IND, IRR, LWP (LWW), SCR, WBC-A, WWH (AQL)	0.0 mi	07110009-0402 City of Alton-Mississippi River
#002	Poeling Lake	n/a	n/a	GEN	0.0	07110009-0401 Marais Temps Clair-Mississippi River
	Tributary to the Mississippi River (8-20-13 MUDD V1.0)	C	3960	IRR, LWP (LWW), SCR, WWH (AQL)	0.2 mi	
#02A	Poeling Lake via Outfall #002	n/a	n/a	GEN	0.0 mi	
	Backwater chutes of the Mississippi River	C	3960	DWS, HHP (HHF), IND, IRR, LWP (LWW), SCR, WBC-A, WWH (AQL)	0.2 mi	
#003	Mississippi River	P	3700	DWS, HHP (HHF), IND, IRR, LWP (LWW), SCR, WBC-A, WWH (AQL)	0.0 mi	07110009-0402 City of Alton-Mississippi River
#004	Mississippi River	P	3700	DWS, HHP (HHF), IND, IRR, LWP (LWW), SCR, WBC-A, WWH (AQL)	0.0 mi	07110009-0401 Marais Temps Clair-Mississippi River
#005	Poeling Lake	n/a	n/a	GEN	0.0 mi	
	Backwater chutes of the Mississippi River	C	3960	DWS, HHP (HHF), IND, IRR, LWP (LWW), SCR, WBC-A, WWH (AQL)	0.6 mi	
#006	Poeling Lake	n/a	n/a	GEN	0.0 mi	
	Backwater chutes of the Mississippi River	C	3960	DWS, HHP (HHF), IND, IRR, LWP (LWW), SCR, WBC-A, WWH (AQL)	0.6 mi	
#007	Tributary to Jurisdictional Scour Hole	n/a	n/a	GEN	0.3 mi	10300200-0804 Outlet Missouri River
	Missouri River	P	1604	DWS, HHP (HHF), IND, IRR, LWP (LWW), SCR, WBC-B, WWH (AQL)	0.7 mi	
#008	Mississippi River	P	3700	DWS, HHP (HHF), IND, IRR, LWP (LWW), SCR, WBC-A, WWH (AQL)	0.0 mi	07110009-0401 Marais Temps Clair-Mississippi River

n/a not applicable
WBID = Waterbody IDentification: Missouri Use Designation Dataset 8-20-13 MUDD V1.0 data can be found as an ArcGIS shapefile on MSDIS at ftp://msdis.missouri.edu/pub/Inland_Water_Resources/MO_2014_WQS_Stream_Classifications_and_Use_shp.zip.
* As per 10 CSR 20-7.031 Missouri Water Quality Standards, the department defines the Clean Water Commission's water quality objectives in terms of "water uses to be maintained and the criteria to protect those uses." The receiving stream and 1st classified receiving stream's beneficial water uses to be maintained are in the receiving stream table in accordance with [10 CSR 20-7.031(1)(C)].

Uses which may be found in the receiving streams table, above:
10 CSR 20-7.031(1)(C)1.:
AQL = Protection of aquatic life (Current narrative use(s) are defined to ensure the protection and propagation of fish shellfish and wildlife, which is further subcategorized as: WWH = Warm Water Habitat; CLH = Cool Water Habitat; CDH = Cold Water Habitat; EAH = Ephemeral Aquatic Habitat; MAH = Modified Aquatic Habitat; LAH = Limited Aquatic Habitat. This permit uses AQL effluent limitations in 10 CSR 20-7.031 Table A for all habitat designations unless otherwise specified.)
10 CSR 20-7.031(1)(C)2.: Recreation in and on the water
WBC = Whole Body Contact recreation where the entire body is capable of being submerged.
WBC-A = Whole body contact recreation supporting swimming uses and has public access;
WBC-B = Whole body contact recreation supporting swimming;
SCR = Secondary Contact Recreation (like fishing, wading, and boating).
10 CSR 20-7.031(1)(C)3. to 7.:
HHP (formerly HHF) = Human Health Protection as it relates to the consumption of fish;
IRR = Irrigation for use on crops utilized for human or livestock consumption;
LWW = Livestock and wildlife watering (Current narrative use is defined as LWP = Livestock and Wildlife Protection);
DWS = Drinking Water Supply;
IND = Industrial water supply
10 CSR 20-7.031(1)(C)8-11.: Wetlands (10 CSR 20-7.031 Table A currently does not have corresponding habitat use criteria for these defined uses)
WSA = Storm- and flood-water storage and attenuation; WHP = Habitat for resident and migratory wildlife species;
WRC = Recreational, cultural, educational, scientific, and natural aesthetic values and uses; WHC = Hydrologic cycle maintenance.
10 CSR 20-7.031(6): GRW = Groundwater

RECEIVING STREAM LOW-FLOW VALUES:

OUTFALL	RECEIVING STREAM (C, P)	LOW-FLOW VALUES (CFS)		
		1Q10	7Q10	30Q10
#001	Mississippi River (P)	18,287	23,385	28,180

To calculate 7Q10, values were obtained 01/01/1970 to 05/31/2015 from 1) Mississippi river at Keokuk Iowa (USGS 05474500) and 2) the Fox River at Wayland, MO (USGS 05495000) and 3) the Des Moines River at St. Francisville, MO (USGS 05490600) and 4) the Illinois River by Valley City, IL (USGS 05586100) were added together as these flows enter the Mississippi River upstream of the facility.

MIXING CONSIDERATIONS TABLE: MISSISSIPPI RIVER (CLASS P)

MIXING ZONE (CFS) (CHRONIC) [10 CSR 20-7.031(5)(A)4.B.(II)(a)]			ZONE OF INITIAL DILUTION (CFS) (ACUTE) [10 CSR 20-7.031(5)(A)4.B.(II)(b)]		
1Q10	7Q10	30Q10	1Q10	7Q10	30Q10
4571 cfs	5846 cfs	7045 cfs	457 cfs	585 cfs	705 cfs

ZID cannot be more than 10 times the facility design flow. (DF_{cfs} = 1121 CFS)

STREAM MIXING CONSIDERATIONS FOR OUTFALLS #003, #004, AND #007:
Zone of Initial Dilution: Not Allowed [10 CSR 20-7.031(5)(A)4.B.(I)(b)]
Mixing Zone: Not Allowed [10 CSR 20-7.031(5)(A)4.B.(I)(a)]

LAKE MIXING CONSIDERATIONS FOR OUTFALLS #002, #02A, #005, AND #006:
Zone of Initial Dilution: Not Allowed [10 CSR 20-7.031(5)(A)4.B.(IV)(b)]
Mixing Zone: Not allowed [10 CSR 20-7.031(5)(D) and (E)]

THERMAL MIXING CONSIDERATIONS:
The facility is subject to thermal limitations and is allowed mixing considerations per 10 CSR 20-7.031(5)(D)(5) & (6). See *Part V Effluent Limit Determination; Derivation and Discussion of Limits; Outfall #001.*

RECEIVING STREAM MONITORING REQUIREMENTS:

- The department is establishing temperature limits for outfall #001, once through cooling water. This necessitates the facility determine stream temperature and velocity. The department does not specify how the facility is to do this, but the information obtained must be reliable and scientifically supportable.
- The facility is to perform biological studies to monitor for impingement and entrainment. The department also does not dictate the exact methods or sites where these studies are to be performed. See *Part III: Rationale and Derivation of Permit Limits and Condition; Impingement and Entrainment at CWIS; CWA § 316(b).*

Part III. RATIONALE AND DERIVATION OF PERMIT LIMITS AND CONDITIONS

ALTERNATIVE EVALUATIONS FOR NEW FACILITIES:
As per [10 CSR 20-7.015(4)(A)], discharges to losing streams shall be permitted only after other alternatives including land application, discharges to a gaining stream and connection to a regional wastewater treatment facility have been evaluated and determined to be unacceptable for environmental and/or economic reasons.

✓ Not applicable; the facility does not discharge to a losing stream as defined by [10 CSR 20-2.010(36)] & [10 CSR 20-7.031(1)(N)], or is an existing facility.

ANTI-BACKSLIDING:
A provision in the Federal Regulations [CWA §303(d)(4); CWA §402(c); 40 CFR Part 122.44(I)] requires a reissued permit to be as stringent as the previous permit with some exceptions.

✓ All limits in this operating permit are at least as protective as those previously established; therefore, backsliding does not apply.
✓ Limitations in this operating permit for the reissuance of this permit conform to the anti-backsliding provisions of Section 402(o) of the Clean Water Act, and 40 CFR Part 122.44.
✓ Material and substantial alterations or additions to the permitted facility occurred after permit issuance which justify the application of a less stringent effluent limitation.
  - The facility has indicated two outfalls are emergency discharges. Outfall #003 was permitted in the previous permit with daily and monthly limits for TSS, O&G, and pH. These limits have been removed as it is a violation of this permit to discharge from these outfalls under 40 CFR 122.41(m) and reported according to 40 CFR 122.41(m)(3)(i) & (ii). The receiving waterbody is still protected using these measures. Outfall #007 is newly established therefore no backsliding has occurred.
✓ The Department determined technical mistakes or mistaken interpretations of law were made in issuing the permit under section 402(a)(1)(b).
  - This permit changes WET test requirements for the facility from a pass/fail requirement to monitoring only for toxic units. This change reflects modifications to Missouri's Effluent Regulation found at 10 CSR 20-7.015. 40 CFR 122.44(d)(1)(ii) requires the department to establish effluent limitations controlling all parameters which have the reasonable potential to cause or contribute to an excursion above any state water quality standard, including state narrative criteria. The previous permit imposed a pass/fail limitation without collecting sufficient data to make a reasonable potential determination. Furthermore, the method of reporting associated with the pass/fail limitation prevented the department from gathering the data necessary to make an analytical finding of reasonable potential. Implementation of the toxic unit monitoring requirement will allow the department to produce numeric criteria in accordance with water quality standards established under §303 of the CWA.
  - This permit removes the special condition C.4. "Discharge of wastewater from this facility must not alone or in combination with other sources cause the receiving stream to violate the following (a) Water temperatures and temperature differentials specified in Missouri water quality standards shall be met." The department has determined this statement was not enforceable as written and was capriciously enacted.

ANTIDEGRADATION:
In accordance with Missouri's Water Quality Standard [10 CSR 20-7.031(2)], the Department is to document by means of Antidegradation Review the use of a water body's available assimilative capacity is justified. Degradation is justified by documenting the socio-economic importance of a discharging activity after determining the necessity of the discharge.

✓ Renewal; no degradation proposed and no further review necessary.

BENCHMARKS:
When a permitted feature or outfall consists of only stormwater, a benchmark may be implemented at the discretion of the permit writer. Benchmarks require the facility to monitor, and if necessary, replace and update stormwater control measures. Benchmark concentrations are not effluent limitations. A benchmark is a technology-based threshold. A benchmark exceedance, therefore, is not a permit violation; however, failure to take corrective action is a violation of the permit. Benchmark monitoring data is used to determine the overall effectiveness of control measures and to assist the permittee in knowing when additional corrective actions may be necessary to comply with the technology based effluent limitations (TBEL).

Because of the fleeting nature of stormwater discharges, the department, under the direction of EPA guidance, has determined monthly averages are capricious measures of stormwater discharges. The *Technical Support Document for Water Quality Based Toxics Control* (EPA/505/2-90-001; 1991) Section 3.1 indicates most procedures within the document apply only to water quality based approaches, not end-of-pipe technology-based controls. Hence, stormwater outfalls will only contain a maximum daily limit (MDL), benchmark, or monitoring requirement determined by the site specific conditions including the receiving water's current quality. While inspection of the stormwater BMPs occurs monthly, facilities with no compliance issues are usually expected to sample stormwater quarterly.

Numeric benchmark values are based on other stormwater permits including the Environmental Protection Agency's (EPA's) *Multi-Sector General Permit For Stormwater Discharges Associated With Industrial Activity* (MSGP) or water quality standards. Because precipitation events are sudden and momentary, benchmarks based on state or federal standards or recommendations use the Criteria Maximum Concentration (CMC) value, or acute standard. The CMC is the estimate of the highest concentration of a material in surface water to which an aquatic community can be exposed briefly without resulting in an unacceptable effect. The CMC for aquatic life is intended to be protective of the vast majority of the aquatic communities in the United States.

✓ Not applicable; this facility has stormwater-only outfalls but there are no benchmark constraints.

BIOSOLIDS & SEWAGE SLUDGE:

Biosolids are solid materials resulting from domestic wastewater treatment that meet federal and state criteria for beneficial uses (i.e. fertilizer). Sewage sludge is solids, semi-solids, or liquid residue generated during the treatment of domestic sewage in a treatment works; including but not limited to, domestic septage; scum or solids removed in primary, secondary, or advanced wastewater treatment process; and a material derived from sewage sludge. Sewage sludge does not include ash generated during the firing of sewage sludge in a sewage sludge incinerator or grit and screening generated during preliminary treatment of domestic sewage in a treatment works. Additional information regarding biosolids and sludge is located at the following web address: http://extension.missouri.edu/main/DisplayCategory.aspx?C=74, items WQ422 through WQ449.

✓ Not applicable; this condition is not applicable to the permittee for this facility.

COAL COMBUSTION RESIDUALS (CCR):

Coal Combustion Residuals (CCR), often referred to as coal ash, are currently considered solid waste, not hazardous waste, under an amendment to RCRA, the Resource Conservation and Recovery Act. Coal ash is residue from the combustion of coal in power plants and compounds captured by pollution control technologies, like precipitators or scrubbers. Potential environmental concerns from coal ash pertain to pollution from impoundments and landfills leaching into groundwater and structural failures of impoundments.

The US EPA is promulgating the first-ever national rules to ensure the safe disposal and management of coal ash from coal-fired power plants under the nation's primary law for regulating solid waste, the Resource Conservation and Recovery Act (RCRA) under Subtitle D. EPA published the final rule on April 17, 2015 in the Federal Register. http://www2.epa.gov/coalash/coal-ash-rule. The department is currently reviewing the rule.

While the rule mentioned above is geared towards solid waste, the water protection program has begun to consider implications to groundwater of the state. Studies on which the rule is based indicate impacts occur to groundwater when ponds are unlined or not adequately lined. This permit does not regulate the fate of coal ash, this operating permit contains a special condition to address concerns regarding ash ponds/impoundments at this facility and their potential to impact groundwater. Missouri Water Quality Standard 10 CSR 20-7.031(5)(A) states, "Water contaminants shall not cause or contribute to exceedances of Table A, groundwater limits in aquifers and caves..." The established special condition will allow the department to (1) determine if groundwater is being impacted from either the coal ash impoundments, and (2) establish controls, limits, management strategies, and/or groundwater cleanup criteria. See *Groundwater Monitoring* below.

Assessment:

On September 30, 2010, the United States Environmental Protection Agency and its engineering contractors conducted a CCR site assessment at the Sioux Power Plant. The purpose of the visit was to assess the structural stability of the impoundments or other similar management units containing "wet" handled CCRs. Due to newly promulgated regulations for CCR, the facility is moving to a dry handling system of CCR disposal.

COMPLIANCE AND ENFORCEMENT:

Enforcement is the action taken by the Water Protection Program (WPP) to bring an entity into compliance with the Missouri Clean Water Law, its implementing regulations, and/or any terms and conditions of an operating permit. The primary purpose of the enforcement activity in the WPP is to resolve violations and return the entity to compliance.

✓ Not applicable; the permittee/facility is not currently under Water Protection Program enforcement action.

EFFLUENT LIMITATION GUIDELINE:

Effluent Limitation Guidelines, or ELGs, are found at 40 CFR 400-499. These are limitations established by the EPA based on the SIC code and the type of work a facility is conducting. Most ELGs are for process wastewater and some address stormwater. All are technology based limitations which must be met by the applicable facility at all times.

✓ The new Steam Electrical Power Generating Point Sources [40 CFR Part 423] ELG became effective on January 4, 2016 and is incorporated herein.

✓ The facility has an associated Effluent Limit Guideline (ELG) which is applicable to the wastewater and stormwater discharge at this facility. The following table shows the limits in the ELG at 40 CFR 423. Should water-quality derived effluent limits be more protective of the receiving water's quality, the WQS will be used as the limiting factor.

✓ BPT is best practicable control technology applicable to all facilities at all times; 423.12

✓ BAT is best available technology economically achievable applicable to this facility; 423.13
✓ 40 CFR 423.13(g)(1)(i) is best available technology (BAT) for FGD scrubber wastewater and becomes effective on November 1, 2018

PARAMETER	40 CFR 423	DAILY MAXIMUM	MONTHLY AVERAGE
Arsenic, Total	BAT – FGD Wastewater	11 µg/L	8 µg/L
Chlorine, Free Available	BPT – Cooling Tower Blowdown BPT – Once Through Cooling Water BAT – Once Through Cooling Water <25 MW	0.5 mg/L	0.2 mg/L
Chlorine, Total Residual	BAT – Once Through Cooling Water BPT – Once Through Cooling Water >25 MW	0.2 mg/L	n/a
Chromium	BAT – Cooling Tower Blowdown	0.2 mg/L	0.2 mg/L
Copper	BPT – Metal Cleaning Wastes	1 mg/L	1 mg/L
Iron	BPT – Metal Cleaning Wastes	1 mg/L	1 mg/L
Mercury	BAT – FGD Wastewater	0.788 µg/L	0.356 µg/L
Nitrate plus Nitrite as N	BAT – FGD Wastewater	17.0 mg/L	4.4 mg/L
Oil and Grease	BPT – Low volume wastes, ash transport water, metal cleaning wastes	20 mg/L	15 mg/L
Selenium	BAT – FGD Wastewater	23 µg/L	12 µg/L
Total Suspended Solids (TSS)	BPT – Low volume wastes, ash transport water, metal cleaning wastes BPT – Coal Pile Runoff	100 mg/L 50 mg/L	30 mg/L -
Zinc	BAT – Cooling Tower Blowdown	1 mg/L	1 mg/L

✓ The new rule defines bottom ash transport water, fly ash transport water, and FGD scrubber wastes as wastewaters which cannot be discharged after December 21, 2023. Interim targets require the department to use the November 1, 2018 date if the facility already has the capabilities of transporting ash using dry handling methods and requiring zero liquid discharge of FGD wastes. See special condition #23. The facility will cease discharging ash sluice wastewater on or before May 1, 2021.

The facility is preparing to close the ash ponds in accordance with 40 CFR 257. The facility submitted the timeline below. See special condition #C.23. Replacement Wastewater Treatment Device – Tentative Schedule:

DATES	SCHEDULED ITEM
November 2015 – January 2018	preliminary engineering design
February 2018	submit NPDES construction and modification package to DNR
February 2019 – April 2021	construction permits issued and initial operations performed
May 2021	commence operations of all new ash and wastewater management facilities

See also *Part III Rationale and Derivation of Permit Limits and Conditions: Coal Combustion Residuals (CCR)*, and *Groundwater Monitoring*.

FLUE GAS DESULFURIZATION (FGD):
Sioux Generating Station has FGD scrubbers on the air stacks. The FGD scrubbers are wet scrubbers which remove up to 90% of the oxides of sulfur (SO_x) emissions from the air. This feature sends the wastewater to the gypsum stack onsite. The main components of the wastewater associated with FGD is an alkaline slurry made up of lime, limestone, or sodium hydroxide; the wastewater also contains the sulfur removed from the air. Both units have scrubbers. FGD wastewater is limited in the new effluent limit guideline for the steam-electric point source category. Limits become effective on November 1, 2018.

GROUNDWATER MONITORING:
Groundwater is a water of the state according to 10 CSR 20-7.015(7) and 10 CSR 20-7.031(6) and must be protected accordingly.
✓ Applicable.

While the state does not have explicit regulation requirements pertaining to groundwater monitoring for coal fired power plant facilities, groundwater is considered a "water of the state" and therefore, it is within the department's authority to consider groundwater when issuing permits. Both lined and unlined ash ponds will be evaluated to determine potential impacts to groundwater. As additional permits for coal-fired power plants with surface impoundments for CCR's are renewed, all will be evaluated for the need for similar requirements and further characterization of the ash ponds and their toxicity. Much of the information about leachates entering groundwater is obtained from the department's Solid Waste Management Program (10 CSR 80-11.010) for utility waste landfills and documents authored by the EPA and the Electric Power Research Institute (EPRI).

The adequacy of a groundwater monitoring program depends greatly on the quality of the detailed hydrogeologic site characterization used to design the program. Only after a complete understanding of the underlying geology and hydrology has been achieved, can the implementation of a groundwater monitoring program begin. The time schedule provided in the permit is to provide time for the utility companies, their consultants, and the department to evaluate and develop a groundwater monitoring plan which is correct for the site-specific conditions of each coal ash pond. Additionally, this time frame is striving to mirror the federal rule regarding in-situ CCR in impoundments.

A groundwater monitoring plan is required to be developed and implemented to examine potential discharges to groundwater from the former and existing ash ponds. The department envisions samples collected quarterly at the UWL for RCRA monitoring to suffice for groundwater monitoring of the UWL portion of the facility. However, groundwater monitoring is being implemented on the ash pond areas as the department wishes to explore any impacts the unlined/inadequately lined ash ponds exhibit in the groundwater. The groundwater monitoring plan should describe not only the groundwater monitoring program, but also the strategy for effectively monitoring groundwater at the facility. The plan typically details the standard operation and procedures related to field sampling, laboratory analysis, and data presentation. Groundwater investigations will include an intrusive field program that involves drilling, hydrological monitoring, and groundwater sampling. The magnitude of such investigations is a function of the size and complexity of the facility.

In this permit renewal, the facility is being required to work with the Missouri Geological Survey to establish a groundwater monitoring program having the capacity to observe and characterize groundwater movement and potential contamination, and determines the proper location and installation of monitoring wells to fully characterize any areas currently or formerly holding ash—both open and closed, or out of use. Monitoring will occur upgradient and downgradient of the ash ponds (or former ash ponds, capped, or not capped) in multiple locations. The department does not consider closure or inactivity per the new CCR regulations as a method of relieving or dismissing of these groundwater monitoring conditions.

The facility can expect to submit quarterly data for the following constituents (at a minimum):

Metals	Metals (continued)	Organics
Aluminum	Lead	Sulfate, as SO_4
Antimony	Lithium	Total Organic Carbon (TOC)
Arsenic	Magnesium	Total Organic Halogens (TOX)
Barium	Manganese	Field Parameters
Beryllium	Mercury	pH
Boron	Molybdenum	Specific conductance
Cadmium	Nickel	Oxidation/Reduction Potential (ORP)
Chromium III	Selenium	Radionuclides
Chromium VI	Silver	Radium 226 (^{226}Ra)
Cobalt	Sodium	Radium 228 (^{228}Ra)
Copper	Thallium	Other
Iron	Zinc	Chemical Oxygen Demand (COD)
		Chloride
		Fluoride
		Hardness, as $CaCO_3$
		Total Dissolved Solids (TDS)

Parameters for consideration in the development of the monitoring plan are based on EPA's *Characterization of Coal Combustion Residues from Electric Utilities – Leaching and Characterization Data*, the new CCR rule at 40 CFR 257 appendices III and IV, and 10 CSR 80-11.

Any hydrogeologic evaluation and groundwater data collection completed prior to the issuance of the NPDES permit and the approval of a detailed site investigation will be voluntary as it pertains to the NPDES permit.

This permit is to comply with the requirements in RSMo 644.143 and to establish a long term approach and stewardship of the site and the beneficial uses of the groundwater on this site. 40 CFR 257 is a self-implementing rule and covered under RCRA; this permit does not implement the federal CCR rule. This permit does not shield a facility from the CCR requirements. Compliance with the terms and conditions of this permit identical to or more stringent than the requirements in the federal CCR rule may constitute compliance with the federal CCR rule although not guaranteed.

The department realizes there are two different timelines associated with this permit for groundwater monitoring. One is driven solely by the effective date of 40 CFR 257, where the permittee will publish the results from eight statistically independent groundwater samples accurately representing background water quality and the quality of the groundwater surrounding the ash ponds pursuant to 40 CFR 257.93. The other is solely water protection program requirements and the permittee will be required to report that data to the water protection program. While the two have different dates and reporting requirements, the department will allow, if appropriate, the same monitoring well network and quarterly sampling data to be used for the two different requirements. All investigations and reports for the water protection program must be approved by the water protection program and Missouri Geological Survey. Any data gathered by the facility prior to WPP approval may or may not be acknowledged as appropriate monitoring. Data and submittals driven by 40 CFR 257 are not approved by the water protection program.

IMPINGEMENT AND ENTRAINMENT AT CWIS; CWA § 316(b):
The Clean Water Act (CWA) Section 316(b) provides for protection of aquatic life from cooling water intake structures (CWIS) where the facility withdraws more than 2 MGD. Sioux can withdraw over 125 MGD of water from the Missouri River therefore is subject to all impingement and entrainment studies and reviews as promulgated in 40 CFR 122.21(r) *et seq.* and 40 CFR Subpart J. The facility is expected to submit all new studies and required information with the application materials six months prior to expiration of the permit. The facility should refer to https://www.epa.gov/sites/production/files/2015-04/documents/cooling-water_esa-instructional-memo_12-11-2014.pdf for additional information.

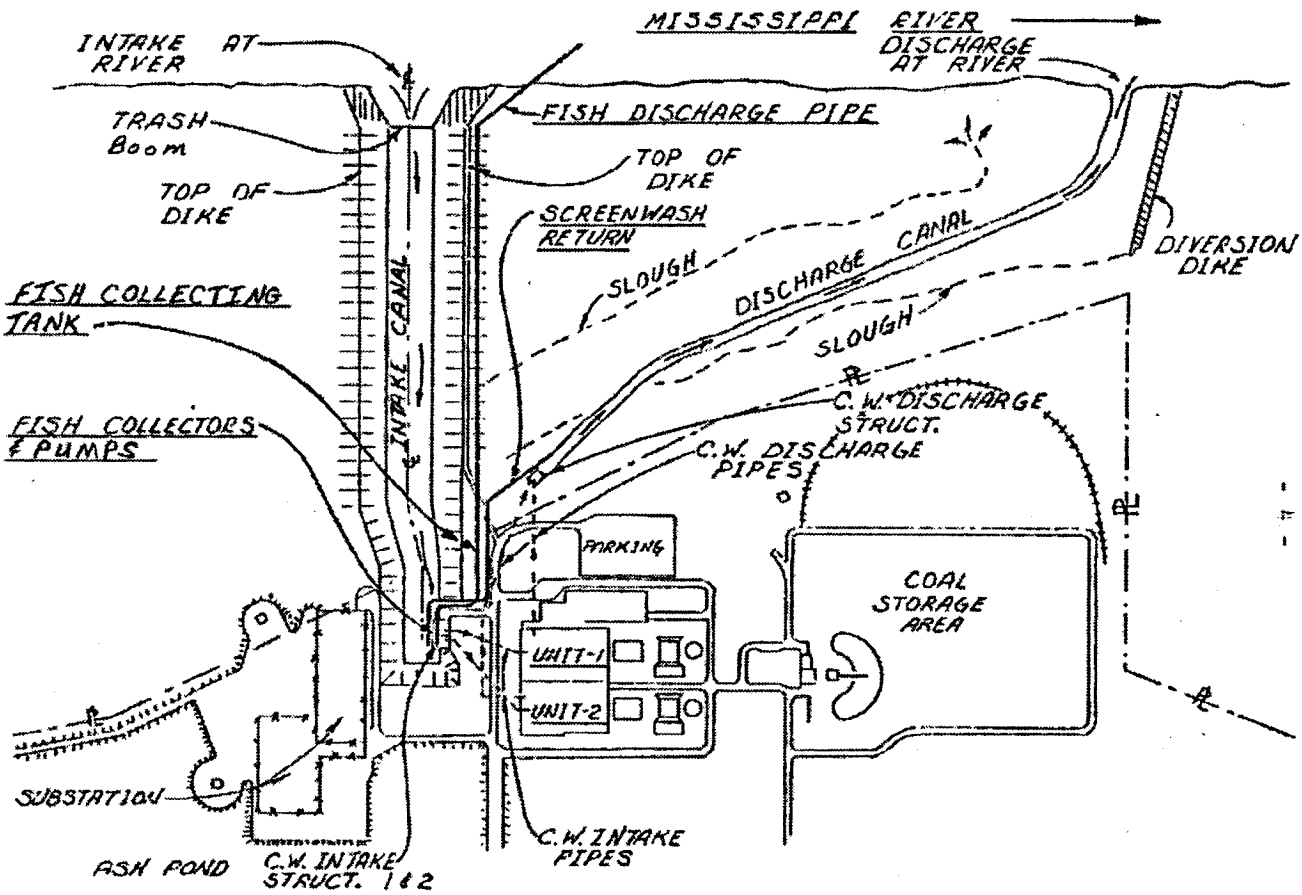
COOLING WATER INTAKE STRUCTURE REQUIREMENTS:
The intake structure at Sioux is located at the end of 1,600-foot long intake canal that extends south from the Mississippi River. In 1980, a fish pump was installed to reduce impingement associated with the plant's intake system. Openings in the face of the structure are protected with "bar racks" to exclude large debris. To enter the intake pump bays, water must pass through conventional traveling screens, which consist of horizontal metal panels faced with 3/8" mesh openings. The panels rotate (vertically) based on either manual timer settings or differential pressure across the screen (which is affected by debris loading). In 1980 a fish pump system was installed to remove fish from the area between the bar racks and travelling screens, and transfer them to the River, downstream of the intake canal. The system ceased operations in 1997. Correspondence dating from 1999 through 2000, with DNR and USEPA Region 7, document the justification and decision to discontinue its use.

FISH RETURN SYSTEM:
In 1983, the facility supplied to the department an *Evaluation of the Sioux Power Plant Fish Return System*. This document describes how the fish return system (FRS) was being used at the facility and how the fish return system was selected to satisfy Best Available Technology (BAT) requirement at that time (1977). The FRS fish collectors are mounted horizontally in each screen's well facing the traveling screens. The fish and water are pumped at a rate of 1,678 gallons per minute (2.4 MGD) back to the Mississippi River. The pipe is a 16 inch diameter polyethylene pipe and must travel approximately 1,700 feet to get back to the Mississippi River. The fish are placed about 10 feet below the surface of the water just downstream of the intake structure. The following diagram shows the design of the fish return system as installed in the 1980s.

The Department approved the Sioux fish pump system in August 1977 as satisfactory meeting the requirement of Section 316(b) of the federal Clean Water Act at that time. With the exception of the intake pumps and fish return system operation as discussed below, there have been no significant changes to the intake structure since this approval.

Impingement monitoring was conducted for 52 consecutive weeks during 2005-2006.

(see diagram next page)



INITIAL I&E ASSESSMENT:

In March and December of 1981, 35,398 fish were collected. This covered 12 families and 30 species. 46% of the fish were recovered by the FRS, but 54% were impinged upon the screens. Gizzard shad was the most frequently collected species at 93%. Unfortunately, one shovelnose sturgeon was collected and did not survive the FRS. The study also noted high seasonal variability. The study did not indicate any mussels, or any other organism type was impinged or entrained, but only included cordate aquatic gill-bearing fish.

REASSESSMENTS:

- During a previous NPDES permit submittal process, the company expressed an interest in providing the State with additional information to reassess the need for continued operation of the fish return system. This action was prompted by a re-examination of fishery data by the company and consideration of the need for a major overhaul of the fish return system components to support continued operation. Subsequent to this request, DNR required the company to submit a report by September 1, 1999. The purpose of this report was to reassess the conclusions of the original 316(b) study regarding fish impingement through a re-evaluation of previous 316(b) studies, supplemented with more recent data generated by Ameren and various other sources. The intention of the request was narrowly focused to have the department either reaffirm the need for continued operation of the fish return system, or make an affirmative determination that the existing intake design reflects best technology for minimizing adverse environmental impact, less the fish return system.
- On August 25, 1999, the company submitted a report titled *A Re-Evaluation of Water Intake Impingement Impacts at the Ameren Sioux Power Plant* to DNR. In this report, the company based its conclusion of "no adverse impact" on three major points:
  1. Various facts and data provide justification to discount any adverse impact associated with the high impingement rates for gizzard shad;
  2. Impingement of important commercial and recreational fish are relatively low, and
  3. Long-term fishery data supports the conclusion that a healthy community exists in Pool 26.

- In late January 2000, the company received a letter from USEPA Region 7 which approved generalized comments in the report. The company formally responded to USEPA's comments in correspondence dated July 14, 2000. No further comments or determinations were received by the company following the response.

- On July 16, 2004, the 316(b) Phase II Rulemaking was published in the Federal Register and became effective on September 14, 2004. Several actions were taken in accordance with the currently suspended USEPA 316(b) Phase II rulemaking. A "Proposal for Information Collection" was submitted and approved by the DNR for conducting an updated assessment of impingement mortality at the Sioux Power Plant cooling water intake structure. This new data collected served to reaffirm historic impingement mortality studies. The 2005-2006 study concluded that nearly 98% of the data organisms collected were gizzard shad and drum. The 1974-1975 study concluded that 99% of the organisms collected were gizzard and drum.
- The Phase II rulemaking also required submittal of a "Comprehensive Demonstration Study" that would provide the measures to be used for compliance with the currently suspended Phase II rulemaking performance standards. These measures were to include an appropriate range of technologies, operational, and/or restoration components; subject to cost-cost and/or cost-benefit criteria and the potential procurement of a site-specific standard, in accordance with the Phase II rulemaking. Due to the suspension of the Phase II rulemaking, the impingement mortality study was the only task completed as all other activities associated with the Comprehensive Demonstration Study were terminated.

OPERATIONAL OPTIMIZATION:
There is the capacity for potentially minor design and operational changes which would optimize the current technology and could reduce impingement mortality that the Ameren should evaluate and implement, if found to be effective. These design and operational changes may include the following:
- Recirculate warm water to the intake structure only when necessary to prevent ice formation.
- Scheduled plant outages should be timed to the extent possible to coincide with periods of greatest impingement.
- Operate screens continuously and at high speed during periods when impingement is greatest.
- Shape fish buckets or baskets to minimize hydrodynamic turbulence within the bucket or basket. Use smooth-woven screen mesh in the buckets or baskets to minimize descaling.
- Evaluate whether the high pressure and low pressure washes can be operated at lower pressures to reduce damage and stress to fish while not interfering with plant operations.
- Optimize location of screen wash sprays to provide a more gentle fish transfer from screen to fish return trough.
- Minimize turbulence in the fish return system.

NEW 316(b) REQUIREMENTS:
To meet the newly promulgated CWA §316(b) requirements, the facility will be required to meet one of the identified impingement BTA technologies, however as the facility withdraws more than 125 MGD for cooling water needs, will also need to address entrainment. The implementation of impingement technology is delayed until the required entrainment studies are complete. The applicability can be found in 40 CFR 122.21 (r)(1) studies include:

a. **Source Water Physical Data Report : 40 CFR 122.21(r)(2)** This report requires a description and scaled drawings showing the physical configuration of the water body, including areal dimensions, depths, and temperature regimes, identification and characterization of the source waterbody's hydrological and geomorphological features, estimate the intake's area of influence within the waterbody and locational maps.
b. **Cooling Water Intake Structure Data Report, 40 CFR 122.21(r)(3):** This report requires information on the design of the intake structure and its location in the water column. It includes design intake flows, daily hours of operation, number of days of the year in operation and seasonal changes, if applicable; a flow distribution and water balance diagram that includes all sources of water to the facility, recirculating flows, and discharges, and engineering drawings of the cooling water intake structure.
c. **Source Water Baseline Biological Characterization Data Report, 40 CFR 122.21(r)(4):** This report characterizes the biological community in the vicinity of the cooling water intake structure.
d. **Cooling Water System Data Report, 40 CFR 122.21(r)(5):** This report provides information on the operation of the cooling water system including descriptions of reductions in water withdrawals, recycled water, proportion of the source waterbody withdrawn.
e. **Chosen Method of Compliance with Impingement Mortality Standard, 40 CFR 122.21(r)(6).** Ameren must identify their chosen compliance method and if applicant chooses to comply with a technology option that requires the Impingement Technology Optimization Study, the study must be submitted.
f. **Performance Studies, 40 CFR 122.21(r)(7):** This rule section requires a summary of biological survival studies conducted at the facility and a summary of any conclusions or results, including; site-specific studies addressing technology efficacy, entrainment survival, and other impingement and entrainment mortality studies. If using data more than 10 years old, applicant must explain why the data is still relevant and representative.
g. **Operational Status, 40 CFR 122.21(r)(8):** The operational status report includes descriptions of each unit's operating status including age of the unit, capacity utilization for the previous 5 years, and any major upgrades completed within the last 15 years, including boiler replacement, condenser replacement, turbine replacement, and fuel change.
h. **Entrainment Characterization Study, 40 CFR 122.21(r)(9)**:Facilities that withdraw 125 MGD or more must develop for submission to the Director that includes 2 years of entrainment data. Entrainment Data Collection Method must identify and document the data collection period and frequency; identify all organisms collected to lowest taxon possible of all life stages of fish that are in the vicinity of the intake structure; identify threatened or endangered species, identify and document how the location of the intake structure in the waterbody are accounted for in data collection. The Biological Entrainment Characterization

must describe all life stages including a description of their abundance and their temporal and spatial characteristics in the vicinity of the intake structure, based on sufficient data to characterize annual, seasonal, and diel variation in entrainment including variations related to climate, weather difference, feeding, and water column migration; may include historical data that is representative of the current operation of the facility; identification of all life stages of fish must represent both motile and non-motile life stages Analysis and Support Documentation of current entrainment of all life stages, may include historical data that is representative of current operation of the facility and of biological conditions at the site. Data to support the calculations must be collected during period of representative operational flows and flows associated with data collection must be documented. The method for determining latent mortality along with specific organism mortality or survival must be identified; the facility must identify and document all assumptions and calculation to determine total entrainment, along with all methods and QA/QC procedures.

i. **Comprehensive Technical Feasibility and Cost Evaluation Study, 40 CFR 122.21(r)(10):** Facilities that withdraw 125 MGD or more must develop for submission an engineering study of the technical feasibility and costs of entrainment technology options. Technical Feasibility must include closed cycle recirculation discussion, fine mesh screens with mesh size of 2 mm or smaller, water reuse or alternate sources of cooling water; description of all technologies and operational measures considered; land availability, including evaluation of adjacent and acres potentially available due to generating unit retirements, potential repurposing of areas devoted to ponds, coal piles, rail yards, transmission yards, and parking lots; discussion of available sources of process water, grey water, wastewater, reclaimed water or other waters of appropriate quantity and quality; and documentation of factors other than cost that may make a candidate technology impractical or infeasible. The cost evaluations must include estimates for all technologies considered; must be adjusted to estimate social costs; all costs must be represented in net present value and annual value; cost clearly labeled as compliance or social costs; separately discuss facility level costs and social costs; compliance costs are calculated after-tax, include administrative costs, permit costs, any outages, downtime; and social costs adjustment includes Director's administrative cost.

j. **Benefits Valuation Study, 40 CFR 122.21(r)(11):** Facilities withdrawing 125 MGD or more must develop an evaluation of the entrainment technology and operational measure benefits. Each category of benefit must be described narratively and benefits should be quantified in physical or biological units and monetized using appropriate economic valuation methods. Must use the Entrainment Characterization Study. Benefit Valuation Study must include: incremental changes in number of individual fish lost due to impingement mortality and entrainment for all life stages; description of basis for any estimates of changes in the stock size or harvest levels of commercial and recreational fish; description of basis for any monetized values assigned to changes in the stock size of commercial and recreational fish, and to any other ecosystem or non-use benefits; discussion of mitigation efforts completed before October 2014; discussion with quantification and monetization, where possible any other benefits expected to accrue, including improvements for mammals, birds, other organisms and aquatic habitats; and discussion of benefits expected to result from reductions in thermal discharges from entrainment technologies (closed-cycle cooling).

k. **Non-Water Quality Impacts Assessment, 40 CFR 122.21(r)(12):** Facilities that withdraw 125 MGD or more must develop for submission to the Director a detailed site-specific discussion of changes in non-water quality environmental and other impacts attributed to each technology and operational measure, both increases and decreases. Must include discussion of estimate in change in energy consumption, estimate of air pollutant emissions and of human health environmental impacts, estimates in change in noise, discussion of impacts to safety, including potential plumes, icing and availability of emergency cooling water, discussion of facility reliability, impacts to production based on process unit, reliability due to cooling water availability; significant changes in consumption of water, including comparison of evaporative losses of both once through and closed cycle recirculation, documentation of impacts attributable to changes in water consumption, and discussion of all attempts to mitigate each of these factors.

l. **Additional measures to protect federally listed threatened and endangered species and designated critical habitat, 40 CFR 125.94(g).** The Director may establish additional permit control measures, monitoring requirements, reporting requirements than the minimum established to minimize incidental take, reduce or remove detrimental effects, or such control measures may include measures identified by the US Fish and Wildlife Field Office during their 60 day review. When the Director requires additional measures for federally listed species, monitoring is required, 40 CFR 125.96(g) and may require additional studies and monitoring if threatened or endangered species identified in the vicinity of the intake, 40 CFR 125.98(d).

m. **Peer Review, 40 CFR 122.21(r)(13):** The Non-Water Quality Impacts Assessment, Benefits Valuation Study, and Comprehensive Technical Feasibility and Cost Evaluation Study require peer review. Facility must submit the studies for external peer review. Facility selects the peer reviewers and must notify the Department in advance of the peer review. The Director can disapprove a peer reviewer or require additional peer reviewers. The Director may confer with EPA, US Fish and Wildlife, MDC, and PSC to determine which peer review comments must be addressed. Ameren must provide an explanation for any significant reviewer comment not accepted.

INDUSTRIAL SLUDGE:

Industrial sludge is solids, semi-solids, or liquid residue generated during the treatment of industrial process wastewater in a treatment works; including but not limited to, scum or solids removed in primary, secondary, or advanced wastewater treatment process; scum and solids filtered from water supplies and backwashed; and a material derived from industrial sludge.

✓ Not applicable; this condition is not applicable to the permittee for this facility.

INTAKE WATER CREDIT (NET LIMITS):
In accordance with federal regulation 40 CFR 122.45(g), pollutants in intake water (1) technology-based effluent limitations or standards shall be adjusted to reflect credit for pollutants in the discharge's intake water if: (i) the applicable effluent limitations and standards contained in 40 CFR subchapter N specifically provide they shall be applied on a net basis; or (ii) the discharger demonstrates the control system it proposes or uses to meet applicable technology-based limitations and standards would, if properly installed and operated, meet the limitations and standards in the absence of pollutants in the intake waters. (2) Credit for generic pollutants such as biochemical oxygen demand (BOD) or total suspended solids (TSS) should not be granted unless the permittee demonstrates that the constituents of the generic measure in the effluent are substantially similar to the constituents of the generic measure in the intake water or unless appropriate additional limits are placed on process water pollutants either at the outfall or elsewhere. (3) Credit shall be granted only to the extent necessary to meet the applicable limitation or standard, up to a maximum value equal to the influent value. Additional monitoring may be necessary to determine eligibility for credits and compliance with permit limits. (4) Credit shall be granted only if the discharger demonstrates that the intake water is drawn from the same body of water into which the discharge is made. The Director may waive this requirement if [the state] finds no environmental degradation will result. (5) Credits do not apply to the discharge of raw water clarifier sludge generated from the treatment of intake water.

- ✓ Applicable. Water used in processing ash is withdrawn from the Mississippi River, traverses through outfall #002 (ash pond #1) or outfall #006 (ash pond #2) and then is discharged to Poeling Lake which then discharges to backwater chutes of the Mississippi River. Per 40 CFR 122.45(g)(4), the director may waive identical-waterbody requirements as the facility has made a demonstration the net TSS credits will not negatively impact Poeling Lake. In the previous permit, the department allowed net total suspended solids at outfalls #002 and #006; this permit will do the same.
- ✓ The newly approved MUDD dataset erroneously identifies Mississippi backwater chutes as "C" (WBID #3960) streams therefore the first classified stream for outfalls #002, #02A, and #006 is actually the Mississippi River.
- ✓ To allow a net limit, the facility must provide a justification for being allowed net limitations when the discharge is not to the same stream (although in this case it is to the same classified stream). The facility has presented information that additional degradation is not occurring on Poeling Lake due to net limitations. The submitted rationale complies with 40 CFR 122.45(g).
- ✓ Characteristics of Poeling Lake include a very small drainage area and raised berms to the east of the lake. Also, the lake is not in 10 CSR 20-7.031 Table G. If the facility no longer discharges through outfall #002 and/or #006, it is likely the lake would be completely dry during drought conditions. Conversely, as evidenced by satellite imagery (1/1/2016, 1/4/2016; Google Earth) Poeling Lake is inundated by flood waters of the Mississippi and Missouri Rivers.
- ✓ There are no water quality limits for TSS; the discharge to the lake is not new or expanded (no antidegradation review is required), and fish kills have not been reported at this location indicating the waterbody does not cause toxicity.
- ✓ The ash basins will be closed in the next 2 to 4 years therefore the discharge from outfalls #002 and #006 will completely eliminate ash sluice water.

REASONABLE POTENTIAL ANALYSIS (RPA):
Federal regulation [40 CFR Part 122.44(d)(1)(i)] requires effluent limitations for all pollutants that are or may be discharged at a level that will cause or have the reasonable potential (RP) to cause or contribute to an in-stream excursion above narrative or numeric water quality standard (WQS). In accordance with [40 CFR Part 122.44(d)(1)(iii)] if the permit writer determines that any give pollutant has the reasonable potential to cause, or contribute to an in-stream excursion above the WQS, the permit must contain effluent limits for that pollutant.

- ✓ Not applicable; the Reasonable Potential Analysis typically conducted per (TSD, EPA/505/2-90-001, Section 3.3.2). was not completed due to the following reasons:
  - Outfall #001: this outfall pertains to thermal discharge. Temperature data was reviewed for the past five years; however, there is no TSD method to determine RP for temperature data. The permit writer has determined the facility does have reasonable potential to exceed Mississippi temperature allowances.
  - Outfall #002 & #006: ash ponds receive "net" total suspended solids; there is no water quality standard for TSS applicable to this wastestream at this outfall. The ash pond outfalls have been monitoring for sulfates. However, Missouri's water quality standards are written with the sum of sulfates plus chlorides. No analytical RP was performed; the permit writer used best professional judgment to determine the facility may have RP for sulfates as it is a parameter of concern for the industry. Whole Effluent Toxicity tests were performed once per year at a 10% allowable effluent concentration. However, the permit writer has determined the outfalls discharge to a lake which cannot allow any toxic mixing considerations therefore no dilution should have been considered for WET testing. The permit writer has used best professional judgment to determine WET testing is still warranted.
  - Outfall #02A: This outfall contains technology-based effluent limits, no RPA is warranted. The parameters on this outfall must remain regardless of RP.
  - Emergency outfalls #003 & #007: The permit writer has determined the emergency outfalls are non-discharging structures therefore no RP technically exists. However, should these outfalls discharge, certain parameters must be sampled.
  - Stormwater outfalls: RP using an analytical RPA for stormwater is not advised because the TSD is for continuously discharging facilities per section 3.1 of EPA/505/2-90-001; not for end-of-pipe technology based controls.

SANITARY SEWER OVERFLOWS (SSO) AND INFLOW AND INFILTRATION (I&I):
Sanitary Sewer Overflows (SSOs) are defined as untreated sewage releases and are considered bypassing under state regulation [10 CSR 20-2.010(11)] and should not be confused with the federal definition of bypass. SSOs result from a variety of causes including blockages, line breaks, and sewer defects that can either allow wastewater to backup within the collection system during dry weather conditions or allow excess stormwater and groundwater to enter and overload the collection system during wet weather conditions. SSOs can also result from lapses in sewer system operation and maintenance, inadequate sewer design and construction, power failures, and vandalism. SSOs include overflows out of manholes, cleanouts, broken pipes, and other into waters of the state and onto city streets, sidewalks, and other terrestrial locations.

Inflow and Infiltration (I&I) is defined as unwanted intrusion of stormwater or groundwater into a collection system. This can occur from points of direct connection such as sump pumps, roof drain downspouts, foundation drains, and storm drain cross-connections or through cracks, holes, joint failures, faulty line connections, damaged manholes, and other openings in the collection system itself. I&I results from a variety of causes including line breaks, improperly sealed connections, cracks caused by soil erosion/settling, penetration of vegetative roots, and other sewer defects. In addition, excess stormwater and groundwater entering the collection system from line breaks and sewer defects have the potential to negatively impact the treatment facility.

Missouri RSMo §644.026.1.(13) mandates the department issue permits for discharges of water contaminants into the waters of this state, and also for the operation of sewer systems. Such permit conditions shall ensure compliance with all requirements as established by sections 644.006 to 644.141. Standard Conditions Part I, referenced in the permit, contains provisions requiring proper operation and maintenance of all facilities and systems of treatment and control. Missouri RSMo §644.026.1.(15) instructs the department to require proper maintenance and operation of treatment facilities and sewer systems and proper disposal of residual waste from all such facilities. To ensure that public health and the environment are protected, any noncompliance which may endanger public health or the environment must be reported to the department within 24 hours of the time the permittee becomes aware of the noncompliance. Standard Conditions Part I, referenced in the permit, contains the reporting requirements for the permittee when bypasses and upsets occur. The permit also contains requirements for permittees to develop and implement a program for maintenance and repair of the collection system. The permit requires that the permittee submit an annual report to the department for the previous calendar year that contains a list of all SSOs and building backups (locations, features of collection system where the SSO/building backup occurred, volumes, durations, receiving stream, causes, mitigation efforts, and actions to prevent reoccurrences), a summary of efforts taken by the permittee to locate and eliminate sources of excess I&I, a summary of general maintenance and repairs to the collection system, and a summary of any planned maintenance and repairs to the collection system for the upcoming calendar year.

- ✓ This facility is not required to develop or implement a program for maintenance and repair of the collection system; however, it is a violation of Missouri state environmental laws and regulations to allow untreated domestic wastewater to discharge to waters of the state.

SCHEDULE OF COMPLIANCE (SOC):
A schedule of remedial measures included in a permit, including an enforceable sequence of interim requirements (actions, effluent limits, operations, or milestone events) leading to compliance with the Missouri Clean Water Law, its implementing regulations, and/or the terms and conditions of an operating permit. SOCs are allowed under 40 CFR 122.47 providing certain conditions are met.

- ✓ Applicable; the time given for effluent limitations of this permit listed under Interim Effluent Limitation and Final Effluent Limitations were established in accordance with [10 CSR 20-7.031(12)]. The facility has been given a schedule of compliance to meet final effluent limits for temperature at outfall #001. Previous permit limits instituted thermal discharge as an internal energy increase and was reported in btu/hr (British Thermal Units). However, Missouri water quality standards are written to consider the temperature of the receiving stream and the actual discharge of the effluent. Temperature is considered a water contaminant per 10 CSR 20-7.031(5)(D) and must be regulated as such.

SECONDARY CONTAINMENT STRUCTURES SPECIAL CONDITION:
The previous permit's special conditions required sampling of total petroleum hydrocarbons (TPH) under the decision model to discharge stormwater having a sheen in secondary containment. The special condition has been revised in all permits beginning in 2015 to include oil and grease and BTEX (benzene, toluene, ethylbenzene, and xylene) sampling of the potentially contaminated stormwater in secondary containment. This change was due to 1) no water quality standards for TPH; and 2) there are no approved methods found in 40 CFR 136 for TPH. The facility need only sample for these constituents prior to release when a sheen or petroleum odor is present.

SPILL REPORTING:
Per 10 CSR 24-3.010, any emergency involving a hazardous substance must be reported to the department's 24 hour Environmental Emergency Response hotline at (573) 634-2436 at the earliest practicable moment after discovery. The department may require the submittal of a written report detailing measures taken to clean up a spill. These reporting requirements apply whether or not the spill results in chemicals or materials leaving the permitted property or reaching waters of the state. This requirement is in addition to the noncompliance reporting requirement found in Standard Conditions Part I. http://dnr.mo.gov/env/esp/spillbill.htm

STORMWATER POLLUTION PREVENTION PLAN (SWPPP):
In accordance with 40 CFR 122.44(k), Best Management Practices (BMPs) must be used to control or abate the discharge of pollutants when: 1) Authorized under section 304(e) of the Clean Water Act (CWA) for the control of toxic pollutants and hazardous substances from ancillary industrial activities; 2) Authorized under section 402(p) of the CWA for the control of stormwater discharges; 3) Numeric effluent limitations are infeasible; or 4) the practices are reasonably necessary to achieve effluent limitations and standards or to carry out the purposes and intent of the CWA. In accordance with the EPA's *Developing Your Stormwater Pollution Prevention Plan, A Guide for Industrial Operators*, (Document number EPA 833-B-09-002) [published by the United States Environmental Protection Agency (USEPA) in February 2009], BMPs are measures or practices used to reduce the amount of pollution entering waters of the state from a permitted facility. BMPs may take the form of a process, activity, or physical structure. Additionally in accordance with the Stormwater Management, a SWPPP is a series of steps and activities to 1) identify sources of pollution or contamination, and 2) select and carry out actions which prevent or control the pollution of storm water discharges.

A SWPPP must be prepared by the permittee if the SIC code is found in 40 CFR 122.26(b)(14) and/or 10 CSR 20-6.200(2). A SWPPP may be required of other facilities where stormwater has been identified as necessitating better management. The purpose of a SWPPP is to comply with all applicable stormwater regulations by creating an adaptive management plan to control and mitigate stream pollution from stormwater runoff. Developing a SWPPP provides opportunities to employ appropriate BMPs to minimize the risk of pollutants being discharged during storm events. The following paragraph outlines the general steps the permittee should take to determine which BMPs will work to achieve the benchmark values or limits in the permit. This section is not intended to be all encompassing or restrict the use of any physical BMP or operational and maintenance procedure assisting in pollution control. Additional steps or revisions to the SWPPP may be required to meet the requirements of the permit.

Areas which should be included in the SWPPP are identified in 40 CFR 122.26(b)(14). Once the potential sources of stormwater pollution have been identified, a plan should be formulated to best control the amount of pollutant being released and discharged by each activity or source. This should include, but is not limited to, minimizing exposure to stormwater, good housekeeping measures, proper facility and equipment maintenance, spill prevention and response, vehicle traffic control, and proper materials handling. Once a plan has been developed the facility will employ the control measures determined to be adequate to achieve the benchmark values discussed above. The facility will conduct monitoring and inspections of the BMPs to ensure they are working properly and re-evaluate any BMP not achieving compliance with permitting requirements. For example, if sample results from an outfall show values of TSS above the benchmark value, the BMP being employed is deficient in controlling stormwater pollution. Corrective action should be taken to repair, improve, or replace the failing BMP. This internal evaluation is required at least once per month but should be continued more frequently if BMPs continue to fail. If failures do occur, continue this trial and error process until appropriate BMPs have been established.

For new, altered, or expanded stormwater discharges, the SWPPP shall identify reasonable and effective BMPs while accounting for environmental impacts of varying control methods. The antidegradation analysis must document why no discharge or no exposure options are not feasible. The selection and documentation of appropriate control measures shall serve as an alternative analysis of technology and fulfill the requirements of antidegradation [10 CSR 20-7.031(3)]. Failure to implement and maintain the chosen BMP is a permit violation. For further guidance, consult the antidegradation implementation procedure (http://dnr.mo.gov/env/wpp/docs/AIP050212.pdf).

Alternative Analysis (AA) evaluation of the BMPs is a structured evaluation of BMPs that are reasonable and cost effective. The AA evaluation should include practices that are designed to be: 1) non-degrading; 2) less degrading; or 3) degrading water quality. The glossary of AIP defines these three terms. The chosen BMP will be the most reasonable and effective management strategy while ensuring the highest statutory and regulatory requirements are achieved and the highest quality water attainable for the facility is discharged. The AA evaluation must demonstrate why "no discharge" or "no exposure" is not a feasible alternative at the facility. This structured analysis of BMPs serves as the antidegradation review, fulfilling the requirements of 10 CSR 20-7.031(3) Water Quality Standards and *Antidegradation Implementation Procedure* (AIP), Section II.B.

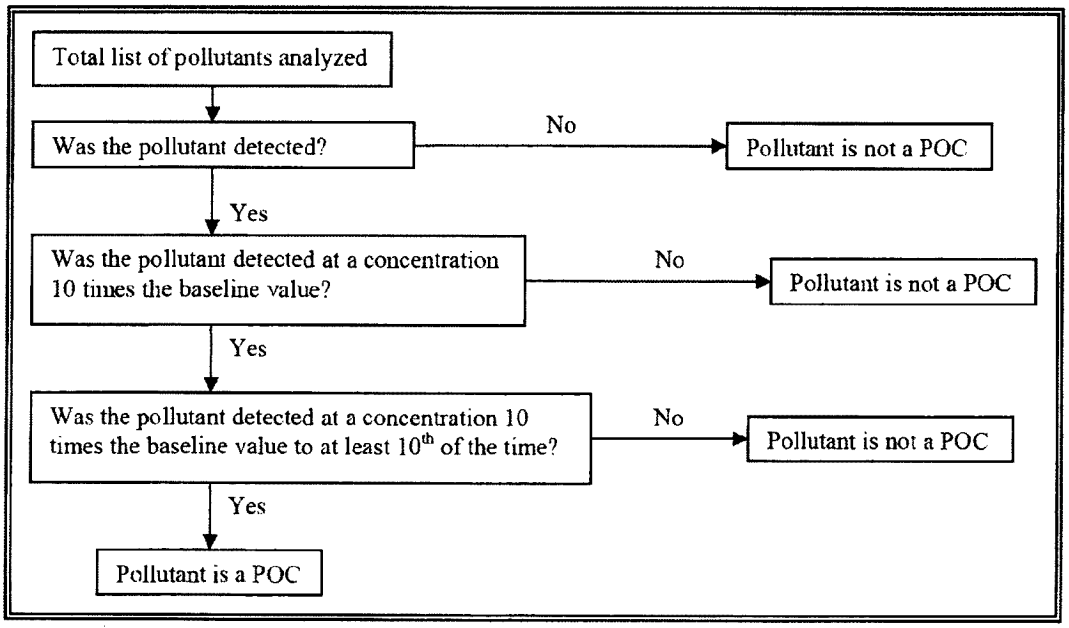
If parameter-specific numeric exceedances continue to occur and the permittee feels there are no practicable or cost-effective BMPs which will sufficiently reduce a pollutant concentration in the discharge to the benchmark values established in the permit, the permittee can submit a request to re-evaluate the benchmark values. This request needs to include 1) a detailed explanation of why the facility is unable to comply with the permit conditions and unable to establish BMPs to achieve the benchmark values; 2) financial data of the company and documentation of cost associated with BMPs for review and 3) the SWPPP, which should contain adequate documentation of BMPs employed, failed BMPs, corrective actions, and all other required information. This will allow the department to conduct a cost analysis on control measures and actions taken by the facility to determine cost-effectiveness of BMPs. The request shall be submitted in the form of an operating permit modification; the application is found at: http://dnr.mo.gov/forms/index.html.

✓ Applicable; a SWPPP shall be developed and implemented for this facility.

TECHNOLOGY-BASED EFFLUENT LIMITATIONS (TBEL):
One of the major strategies of the Clean Water Act (CWA) in making "reasonable further progress toward the national goal of eliminating the discharge of all pollutants" is to require effluent limitations based on the capabilities of the technologies available to control those discharges. Technology-based effluent limitations (TBELs) aim to prevent pollution by requiring a minimum level of effluent quality attainable using demonstrated technologies for reducing discharges of pollutants or pollution into the waters of the United States. TBELs are developed independently of the potential impact of a discharge on the receiving water, which is addressed through water quality standards and water quality-based effluent limitations (WQBELs). The NPDES regulations at Title 40 of the Code of Federal Regulations (CFR) 125.3(a) require NPDES permit writers to develop technology-based treatment requirements, consistent with CWA § 301(b) and § 402(a)(1), represent the minimum level of control that must be imposed in a permit. The regulation also indicates that permit writers must include in permits additional or more stringent effluent limitations and conditions, including those necessary to protect water quality. Regardless of the technology chosen to be the basis for limitations, the facility is not required to install the technology, only to meet the established TBEL.

Case-by-case TBELs are developed pursuant to CWA section 402(a)(1), which authorizes the administrator to issue a permit meeting either, 1) all applicable requirements developed under the authority of other sections of the CWA (e.g., technology-based treatment standards, water quality standards) or, 2) before taking the necessary implementing actions related to those requirements, "such conditions as the administrator determines are necessary to carry out the provisions of this Act." The regulation at §125.3(c)(2) specifically cite this section of the CWA, stating technology-based treatment requirements may be imposed in a permit "on a case-by-case basis under section 402(a)(1) of the Act, to the extent that EPA-promulgated effluent limitations are inapplicable." Further, §125.3(c)(3) indicates "where promulgated effluent limitations guidelines only apply to certain aspects of the discharger's operation, or to certain pollutants, other aspects or activities are subject to regulation on a case-by-case basis to carry out the provisions of the act." When establishing case-by-case effluent limitations using best professional judgment, the permit writer should cite in the fact sheet or statement of basis both the approach used to develop the limitations, discussed below, and how the limitations carry out the intent and requirements of the CWA and the NPDES regulations.

Baselines to determine contaminants of concern are found in the *Development Document for Effluent Limitations Guidelines and Standards for the Centralized Waste Treatment Industry – Final* (EPA 821-R-00-020; August 2000). The baselines represent the treatable concentration of model technology which would effectually treat a pollutant. Chapter 6 Table 6-1 directs the permit writer to multiply the baseline by ten to determine if the parameter is a pollutant of concern. The following table determines the parameters for which a TBEL must be considered; baseline values are retrieved from chapter six.



When developing TBELs for industrial facilities, the permit writer must consider all applicable technology standards and requirements for all pollutants discharged above baseline level. Without applicable effluent guidelines for the discharge or pollutant, permit writers must identify any needed TBELs on a case-by-case basis, in accordance with the statutory factors specified in CWA sections 301(b)(2) and 304(b). The site-specific TBELs reflect the BPJ of the permit writer, taking into account the same statutory factors EPA would use in promulgating a national effluent guideline regulation, but they are applied to the circumstances relating to the applicant. The permit writer also should identify whether state laws or regulations govern TBELs and might require more stringent performance

standards than those required by federal regulations. In some cases, a single permit could have TBELs based on effluent guidelines, best professional judgment, state law, and WQBELs based on water quality standards.

For BPT requirements (all pollutants)
- The age of equipment and facilities involved*
- The process(es) employed*
- The engineering aspects of the application of various types of control techniques*
- Process changes*
- Non-water quality environmental impact including energy requirements*
- The total cost of application of technology in relation to the effluent reduction benefits to be achieved from such application

For BCT requirements (conventional pollutants)
- All items in the BPT requirements indicated by an asterisk (*) above
- The reasonableness of the relationship between the costs of attaining a reduction in effluent and the derived effluent reduction benefits
- The comparison of the cost and level of reduction of such pollutants from the discharge of POTWs to the cost and level of reduction of such pollutants from a class or category of industrial sources

For BAT requirements (toxic and non-conventional pollutants)
- All items in the BPT requirements indicated by an asterisk (*) above
- The cost of achieving such effluent reduction

Best Practicable Control Technology Currently Available (BPT) is the first level of technology-based effluent controls for direct dischargers and it applies to all types of pollutants (conventional, nonconventional, and toxic). The Federal Water Pollution Control Act (FWPCA) amendments of 1972 require when EPA establishes BPT standards, it must consider the industry-wide cost of implementing the technology in relation to the pollutant-reduction benefits. EPA also must consider the age of the equipment and facilities, the processes employed, process changes, engineering aspects of the control technologies, non-water quality environmental impacts (including energy requirements), and such other factors as the EPA Administrator deems appropriate [CWA §304(b)(1)(B)]. Traditionally, EPA establishes BPT effluent limitations on the basis of the average of the best performance of well-operated facilities in each industrial category or subcategory. Where existing performance is uniformly inadequate, BPT may reflect higher levels of control than currently in place in an industrial category if the agency determines the technology can be practically applied. See CWA sections 301(b)(1)(A) and 304(b)(1)(B). Because the EPA has not promulgated TBELs for the pollutants identified as POCs, the permit writer follows the same format to establish site-specific TBELs. Although the numerical effluent limitations and standards are based on specific processes or treatment technologies to control pollutant discharges, EPA does not require dischargers to use these technologies. Individual facilities may meet the numerical requirements using whatever types of treatment technologies, process changes, and waste management practices they choose.

For each parameter, group of parameters, or outfall treatment process, the facility will summarize the relevant factors below in facility-specific (or waste-stream specific) case-by-case TBEL development. The permittee will supply the required information to the department so a technology based effluent limitation can be applied in the permit if applicable.
- ✓ Applicable; this operating permit has identified TBELs.
- ✓ Some TBELs are governed by an ELG.

TEMPERATURE: 316(a) COOLING WATER INTAKE STRUCTURE REQUIREMENTS:
The Sioux Plant cooling water discharge and the thermal plume were studied extensively during the late 1970s and early 1980s. The discharge is a wide mouth, low velocity outlet into an open channel connected to the Mississippi River. During normal river stage, the river is approx. 3,200 feet wide at this location and is lacustrine (pool-like), due to the Corps of Engineers' Lock and Dam 26 (at Alton). Neither plant operations nor river flow conditions have changed significantly since the original studies were performed, thus the facility does not contemplate revision of the 316(a) studies; however the results of the required 316(b) studies and changes to the river may cause a reevaluation of the studies or additional studies. See *Part V Effluent Limits Determination; outfall #001; TBEL determination* and *Part III Rationale and Derivation of Permit Limits and Conditions; 316(b) requirements.*

VARIANCE:
As per the Missouri Clean Water Law § 644.061.4, variances shall be granted for such period of time and under such terms and conditions as shall be specified by the commission in its order. The variance may be extended by affirmative action of the commission. In no event shall the variance be granted for a period of time greater than is reasonably necessary for complying with the Missouri Clean Water Law §§644.006 to 644.141 or any standard, rule or regulation promulgated pursuant to Missouri Clean Water Law §§644.006 to 644.141.
- ✓ Not applicable; this operating permit is not drafted under premises of a petition for variance.

WASTELOAD ALLOCATIONS (WLA) FOR LIMITS:
As per [10 CSR 20-2.010(78)], the WLA is the amount of pollutant each discharger is allowed to release into a given stream after the department has determined total amount of pollutant that may be discharged into that stream without endangering its water quality.

✓ Applicable; wasteload allocations were calculated where relevant using water quality criteria or water quality model results and by applying the dilution equation:

$$C = \frac{(Cs \times Qs) + (Ce \times Qe)}{(Qe + Qs)}$$ (EPA/505/2-90-001, Section 4.5.5)

Where C = downstream concentration
Cs = upstream concentration
Qs = upstream flow
Ce = effluent concentration
Qe = effluent flow

- Acute wasteload allocations (daily maximum limits) were determined using applicable water quality criteria (CMC: criteria maximum concentration) and stream volume of flow at the edge of the zone of initial dilution (ZID).
- Chronic wasteload allocations (monthly average limits) were determined using applicable chronic water quality criteria (CCC: criteria continuous concentration) and stream volume of flow at the edge of the mixing zone (MZ).
- Water quality based daily maximum (MDL) and monthly average (AML) effluent limitations were calculated using methods and procedures outlined in USEPA's *Technical Support Document For Water Quality-based Toxics Control* or "TSD" (EPA/505/2-90-001; March 1991).
- Number of Samples "n": In accordance with the TSD for water quality-based permitting, effluent quality is determined by the underlying distribution of daily values, which is determined by the Long Term Average (LTA) associated with a particular Wasteload Allocation (WLA) and by the Coefficient of Variation (CV) of the effluent concentrations. Increasing or decreasing the monitoring frequency does not affect this underlying distribution or treatment performance which should be, at a minimum, targeted to comply with the values dictated by the WLA. Therefore, it is recommended that the actual planned frequency of monitoring normally be used to determine the value of "n" for calculating the AML. However, in situations where monitoring frequency is once per month or less, a higher value for "n" must be assumed for AML derivation purposes. Thus, the statistical procedure being employed using an assumed number of samples is "n = 4" at a minimum. For Total Ammonia as Nitrogen, "n = 30" is used.

WLA MODELING:
Permittees may submit site specific studies to better determine the site specific wasteload allocations applied in permits.

✓ Not applicable; a WLA study was either not submitted or determined not applicable by Department staff.

WATER QUALITY STANDARDS:
Per [10 CSR 20-7.031(4)], general criteria shall be applicable to all waters of the state at all times including mixing zones. Additionally, [40 CFR 122.44(d)(1)] directs the Department to establish in each NPDES permit to include conditions to achieve water quality established under Section 303 of the Clean Water Act, including State narrative criteria for water quality.

WHOLE EFFLUENT TOXICITY (WET) TEST:
A WET test is a quantifiable method of determining if a discharge from a facility may be causing toxicity to aquatic life by itself, in combination with or through synergistic responses when mixed with receiving stream water.

✓ Applicable; under the federal Clean Water Act (CWA) §101(a)(3), requiring WET testing is reasonably appropriate for site-specific Missouri State Operating Permits for discharges to waters of the state issued under the National Pollutant Discharge Elimination System (NPDES). WET testing is also required by 40 CFR 122.44(d)(1). WET testing ensures that the provisions in the 10 CSR 20-6.010(8)(A)7. and the Water Quality Standards 10 CSR 20-7.031(4)(D),(F),(G),(I)2.A & B are being met. Under [10 CSR 20-6.010(8)(A)4], the department may require other terms and conditions that it deems necessary to assure compliance with the Clean Water Act and related regulations of the Missouri Clean Water Commission. In addition the following MCWL apply: §§§644.051.3 requires the Department to set permit conditions that comply with the MCWL and CWA; 644.051.4 specifically references toxicity as an item we must consider in writing permits (along with water quality-based effluent limits, pretreatment, etc…); and 644.051.5 is the basic authority to require testing conditions. WET test will be required by all facilities meeting the following criteria:

☒ Facility is a designated a Major

Part IV. 2013 WATER QUALITY CRITERIA FOR AMMONIA

Upcoming changes to the Water Quality Standard for ammonia may require significant upgrades to wastewater treatment facilities.

On August 22, 2013, the U.S. Environmental Protection Agency (EPA) finalized new water quality criteria for ammonia, based on toxicity studies of mussels and gill breathing snails. Missouri's current ammonia criteria are based on toxicity testing of several species, but did not include data from mussels or gill breathing snails. Missouri is home to 69 of North America's mussel species, which are spread across the state. According to the Missouri Department of Conservation nearly two-thirds of the mussel species in Missouri are considered to be "of conservation concern". Nine species are listed as federally endangered, with an additional species currently proposed as endangered and another species proposed as threatened.

The adult forms of mussels that are seen in rivers, lakes, and streams are sensitive to pollutants because they are sedentary filter feeders. They vacuum up many pollutants with the food they bring in and cannot escape to new habitats, so they can accumulate toxins in their bodies and die. But very young mussels, called glochidia, are exceptionally sensitive to ammonia in water. As a result of a citizen suit, the EPA was compelled to conduct toxicity testing and develop ammonia water quality criteria that would be protective if young mussels may be present in a waterbody. These new criteria will apply to any discharge with ammonia levels that may pose a reasonable potential to violate the standards. Nearly all discharging domestic wastewater treatment facilities (cities, subdivisions, mobile home parks, etc.), as well as certain industrial and stormwater dischargers with ammonia in their effluent, will be affected by this change in the regulations.

When new water quality criteria are established by the EPA, states must adopt them into their regulations in order to keep their authorization to issue permits under the National Pollutant Discharge Elimination System (NPDES). States are required to review their water quality standards every three years, and if new criteria have been developed they must be adopted. States may be more protective than the Federal requirements, but not less protective. Missouri does not have the resources to conduct the studies necessary for developing new water quality standards, and therefore our standards mirror those developed by the EPA; however, we will utilize any available flexibility based on actual species of mussels that are native to Missouri and their sensitivity to ammonia.

Many treatment facilities in Missouri are currently scheduled to be upgraded to comply with the current water quality standards. But these new ammonia standards may require a different treatment technology than the one being considered by the permittee. It is important that permittees discuss any new and upcoming requirements with their consulting engineers to ensure that their treatment systems are capable of complying with the new requirements. The Department encourages permittees to construct treatment technologies that can attain effluent quality that supports the EPA ammonia criteria.

Ammonia toxicity varies by temperature and by pH of the water. Assuming a stable pH value, but taking into account winter and summer temperatures, Missouri includes two seasons of ammonia effluent limitations. Effluent limitations in this permit would be:

Summer – 3.6 mg/L daily maximum, 1.4 mg/L monthly average
Winter – 7.5 mg/L daily maximum, 2.9 mg/L monthly average

Under the new EPA criteria, where mussels of the family Unionidae are present or expected to be present, the estimated effluent limitations for a facility in a location such as this that discharges to a receiving stream with no mixing consideration listed in Part V of the Fact Sheet will be:

Summer – 1.7 mg/L daily maximum, 0.6 mg/L monthly average.
Winter – 5.6 mg/L daily maximum, 2.1 mg/L monthly average.

Actual effluent limits will depend in part on the actual performance of the facility.

Operating permits for facilities in Missouri must be written based on current statutes and regulations. Therefore permits will be written with the existing effluent limitations until the new standards are adopted. To aid permittees in decision making, an advisory will be added to permit Fact Sheets notifying permittees of the expected effluent limitations for ammonia. When setting schedules of compliance for ammonia effluent limitations, consideration will be given to facilities that have recently constructed upgraded facilities to meet the current ammonia limitations. For more information on this topic feel free to contact the Missouri Department of Natural Resources, Water Protection Program, Water Pollution Control Branch, Operating Permits Section at (573) 751-1300.

Part V. EFFLUENT LIMITS DETERMINATION

- Effluent limitations, benchmarks, and permit conditions derived and established in the below effluent limitations tables are based on current operations of the facility. Future permit action due to facility modification may contain new operating permit terms and conditions that supersede the terms and conditions, including effluent limitations, of this operating permit.
- Daily maximums and monthly averages are required under 40 CFR 122.45(d)(1) for continuous discharges not from a POTW.
- The nearest drinking water intake is located at St. Louis. Therefore the drinking water (DW) use is in effect and DW limits may apply if they are more stringent and applicable than other uses' limits.
- Technology based limitations apply to this facility.

OUTFALL #001: ONCE-THROUGH COOLING WATER

The minimum frequency the department is allowed to apply sampling requirements for a facility is yearly per 40 CFR 122.44(i)(iv)(A)(2). Table A-3 in the permit describes conditional sampling. Each year, even if chlorine or biocides are not used, to comply with yearly reporting, the facility will submit a short report to the St. Louis Regional Office. The facility must collect samples and analyze for free available chlorine, total residual chlorine, upon every occasion (daily, concurrently) of chlorine use. The facility is not required to sample for chlorine if the biocide used is not chlorine based. However, the facility must still collect a sample for WET testing (daily, concurrently) upon biocide/molluskicide use.

EFFLUENT LIMITATIONS TABLE:

PARAMETERS	UNIT	BASIS FOR LIMITS	DAILY MAX	MONTHLY AVG.	PREVIOUS PERMIT LIMITS	MINIMUM SAMPLING FREQUENCY	MINIMUM REPORTING FREQ.	SAMPLE TYPE
PHYSICAL								
FLOW	MGD	1	*	*	SAME	DAILY	MONTHLY	24 HR. TOT
THERMAL DISCHARGE	BTU/HR	1, 6	5.50×10^9	*	I, SAME	DAILY	MONTHLY	GRAB
EFFLUENT FLOW (Q_E)	cfs	6	*	*	NEW	DAILY	MONTHLY	MEAS.
EFFLUENT TEMPERATURE (T_E)	°F	6	*	*	NEW	DAILY	MONTHLY	MEAS.
STREAM FLOW (Q_S)	cfs	6	*	*	NEW	DAILY	MONTHLY	MEAS.
STREAM TEMPERATURE (T_S)	°F	6	*	*	NEW	DAILY	MONTHLY	MEAS.
ΔT (NOTE 3)	°F	1, 6	*	*	I, NEW	DAILY	MONTHLY	CALC.
ΔT (NOTE 3)	°F	1, 2, 3	5	*	F, NEW	DAILY	MONTHLY	CALC.
T_{CAP} JANUARY (NOTE 4)	°F	1, 2, 3	45	*	F, NEW	DAILY	MONTHLY	CALC.
T_{DEV} JANUARY (NOTE 4)	°F	1, 2, 3	48	*	F, NEW	DAILY	MONTHLY	CALC.
T_{CAP} FEBRUARY (NOTE 4)	°F	1, 2, 3	45	*	F, NEW	DAILY	MONTHLY	CALC.
T_{DEV} FEBRUARY (NOTE 4)	°F	1, 2, 3	48	*	F, NEW	DAILY	MONTHLY	CALC.
T_{CAP} MARCH (NOTE 4)	°F	1, 2, 3	57	*	F, NEW	DAILY	MONTHLY	CALC.
T_{DEV} MARCH (NOTE 4)	°F	1, 2, 3	60	*	F, NEW	DAILY	MONTHLY	CALC.
T_{CAP} APRIL (NOTE 4)	°F	1, 2, 3	68	*	F, NEW	DAILY	MONTHLY	CALC.
T_{DEV} APRIL (NOTE 4)	°F	1, 2, 3	71	*	F, NEW	DAILY	MONTHLY	CALC.
T_{CAP} MAY (NOTE 4)	°F	1, 2, 3	78	*	F, NEW	DAILY	MONTHLY	CALC.
T_{DEV} MAY (NOTE 4)	°F	1, 2, 3	81	*	F, NEW	DAILY	MONTHLY	CALC.
T_{CAP} JUNE (NOTE 4)	°F	1, 2, 3	86	*	F, NEW	DAILY	MONTHLY	CALC.
T_{DEV} JUNE (NOTE 4)	°F	1, 2, 3	89	*	F, NEW	DAILY	MONTHLY	CALC.
T_{CAP} JULY (NOTE 4)	°F	1, 2, 3	88	*	F, NEW	DAILY	MONTHLY	CALC.
T_{DEV} JULY (NOTE 4)	°F	1, 2, 3	91	*	F, NEW	DAILY	MONTHLY	CALC.
T_{CAP} AUGUST (NOTE 4)	°F	1, 2, 3	88	*	F, NEW	DAILY	MONTHLY	CALC.
T_{DEV} AUGUST (NOTE 4)	°F	1, 2, 3	91	*	F, NEW	DAILY	MONTHLY	CALC.
T_{CAP} SEPTEMBER (NOTE 4)	°F	1, 2, 3	86	*	F, NEW	DAILY	MONTHLY	CALC.
T_{DEV} SEPTEMBER (NOTE 4)	°F	1, 2, 3	89	*	F, NEW	DAILY	MONTHLY	CALC.
T_{CAP} OCTOBER (NOTE 4)	°F	1, 2, 3	75	*	F, NEW	DAILY	MONTHLY	CALC.
T_{DEV} OCTOBER (NOTE 4)	°F	1, 2, 3	78	*	F, NEW	DAILY	MONTHLY	CALC.
T_{CAP} NOVEMBER (NOTE 4)	°F	1, 2, 3	65	*	F, NEW	DAILY	MONTHLY	CALC.

PARAMETERS	UNIT	BASIS FOR LIMITS	DAILY MAX	MONTHLY AVG.	PREVIOUS PERMIT LIMITS	MINIMUM SAMPLING FREQUENCY	MINIMUM REPORTING FREQ.	SAMPLE TYPE
T_{DEV} NOVEMBER (NOTE 4)	°F	1, 2, 3	68	*	F, NEW	DAILY	MONTHLY	CALC.
T_{CAP} DECEMBER (NOTE 4)	°F	1, 2, 3	52	*	F, NEW	DAILY	MONTHLY	CALC.
T_{DEV} DECEMBER (NOTE 4)	°F	1, 2, 3	55	*	F, NEW	DAILY	MONTHLY	CALC.
TIME OF DEVIATION-MONTH (NOTE 4)	hours	6	*	*	I, NEW	DAILY	MONTHLY	CALC.
TOTAL TIME OF DEVIATION (NOTE 4)	hours	1, 3	*	*	I, NEW	DAILY	YEARLY	CALC.
TOTAL TIME OF DEVIATION (NOTE 4)	hours	1, 2, 3	438 HRS/YR	*	F, NEW	DAILY	YEARLY	CALC.
CONVENTIONAL								
CHLORINE, FREE AVAILABLE	µg/L	1	500	200	NEW	COND.	COND.	GRAB
CHLORINE, TOTAL RESIDUAL	µg/L	1	200	-	NEW	COND.	COND.	GRAB
OTHER								
WET TEST ACUTE	TUa	1, 3, 8	*	-	PASS/FAIL	COND.	COND.	GRAB

* - monitoring requirement only
I = interim limit
F = final limit
new - parameter not in previous permit
calc. – calculation
meas. – measured
cond. – conditional

Basis for Limitations Codes:

1. State or Federal Regulation/Law
2. Water Quality Standard (includes RPA)
3. Water Quality Based Effluent Limits
4. Antidegradation Review/Policy
5. Water Quality Model
6. Best Professional Judgment
7. TMDL or Permit in lieu of TMDL
8. WET Test Policy

Note 3: $\Delta T = [((Q_s/4)T_s + Q_eT_e) / ((Q_s/4) + Q_e)] - T_s$

Where:

ΔT the change in temperature in °F at the edge of the thermal mixing zone
$Q_s/4$ the receiving stream flow in cfs divided by 4
Q_e effluent flow in cfs
T_s measured stream temperature
T_e measured temperature of effluent

Note 4: To calculate the temperature of the stream at the edge of the mixing zone, the facility will use the following equation: Designated as T_{emz} in the equation below, the facility can determine compliance with T_{dev}, T_{cap}, and percent time deviation allowance.

$T_{emz} = [((Q_s/4)T_s + Q_eT_e) / ((Q_s/4) + Q_e))]$

Where:

T_{emz} the temperature of the receiving stream at the edge of the thermal mixing zone
$Q_s/4$ the receiving stream flow in cfs divided by 4
Q_e effluent flow in cfs
T_s measured stream temperature
T_e measured temperature of effluent

Temperature cap (designated as T_{cap} in Table A-2 of the permit and the Effluent Limitations Table of the fact sheet) is the effluent temperature in the receiving stream at the edge of the thermal mixing zone. It may be exceeded for no more than 5% of the year (438 hours).

Temperature deviation (designated as T_{dev} in Table A-2 of the permit and the Effluent Limitations Table of the fact sheet) is the maximum effluent temperature limit applicable in the receiving stream at the edge of the thermal mixing zone which may not be exceeded. MoCWIS is set up to receive one value for the thermal limitations for each month. The facility will violate the thermal limit if the value entered in MoCWIS is above the T_{dev} value for the month.

Percent Time Deviation Allowance: Missouri's Water Quality Standards allows permittees to exceed their applicable T_{cap} criteria (but not the T_{dev} criteria) for 5% of the year in Zone 1B along the Mississippi River. The time of deviation allowance shall be tracked in hours per year <u>any</u> time their calculated temperature values exceed a specific month's daily maximum T_{cap} effluent limit. The permittee is required to monitor and report the total monthly exceedance time.

a) If T_{emz} is less than T_{cap} then the permittee records "0" hours deviation.
b) Any time T_{emz} is above T_{cap} then the facility reports the number of hours of deviation.
c) The permittee shall report on January 28th of each year the total number of hours the facility exceeded their temperature cap effluent limits for the entire year.

A violation occurs if:

a. The percent time deviation allowance is above 5% (438 hours) for the calendar year; and/or
b. The T_{emz} value reported is above the T_{dev} limitation.

DERIVATION AND DISCUSSION OF LIMITS:

PHYSICAL:

The facility reported color was believed absent. No additional sampling will be required at this time.

<u>Flow</u>

In accordance with [40 CFR Part 122.44(i)(1)(ii)] the volume of effluent discharged from each outfall is needed to assure compliance with permitted effluent limitations. If the permittee is unable to obtain effluent flow, then it is the responsibility of the permittee to inform the department, which may require the submittal of an operating permit modification. The facility will report the total flow in millions of gallons per day (MGD).

<u>Temperature</u>

The department considered thermal discharge a pollutant of concern for this facility as is required by the CWA. While water quality standards exist, the department must also formulate a review of the technology, limitations associated with that technology, the age of the equipment, and the processes involved at the facility. Please see both sections below; Water Quality Limitations and Technology Based Effluent Limitations.

WATER QUALITY LIMITATIONS:

In accordance with 10 CSR 20-7.031(5)(D)5. water contaminant sources shall not cause or contribute to Mississippi River temperature in excess of the temperatures listed in the effluent limitations table. The facility is located between Lock and Dam No. 25 and Lock and Dam No. 26, therefore the facility is in Zone 1B. Missouri's WQS temperature criteria [10 CSR 20-7.031(5)(D)1. through (5)(D)6.] establish two main areas of compliance for all habitats. The first compliance requirement deals with the change of temperature in degrees Fahrenheit stated as delta temperature (or ΔT). The second compliance requirement deals with the result of a calculation of the receiving stream's temperature not to exceed (T_{dev}) at the edge of the thermal mixing zone.

Missouri's WQS temperature criteria for warm water habitats (WWH) [10 CSR 20-7.031(5)(D)1.] establishes thermal discharges cannot cause a change in the receiving stream's temperature (ΔT) of more than five (5) degrees and a T_{cap} of 90°F. Missouri's WQS establishes specific T_{cap} values for discharges to the Mississippi River in [10 CSR 20-7.031(5)(D)5.] to which this facility applies. The regulation also establishes a percent, in time, deviation allowance from the established T_{cap} for the Mississippi River as well as a maximum temperature not to exceed (T_{dev}) of T_{cap} +3°F.

Both compliance requirements (ΔT and $T_{cap/dev}$) are to be established at the edge of the thermal mixing zone (designated as T_{emz}). Thermal mixing zones are established on permanent (P) streams or other streams where available. Mixing zone regulations are contained in [10 CSR 20-7.031(5)(D)6.]. Streams with no mixing considerations must meet ΔT and T_{cap} at the end of the pipe. Similar to Missouri's WQS's toxic mixing considerations which use low-flow considerations (i.e. 7Q10), the temperature regulations require the department establish a thermal mixing zone limited to either 25% of the cross-sectional area or 25% volume of a river. This approach assumes the receiving water is able to consume 100% of the heat energy being discharged. Volume of discharge (for the river and the facility) is measured in cubic feet per second (ft^3/sec, or cfs). Typically discharge is obtained from a nearby upstream United States Geological Survey (USGS) or United States Army Corps of Engineers (USACE) gauging station. If there is a significant distance from the facility to the nearest upstream gauging station, it may be in the best interest of the permittee to fund a new gauging station. Additionally, the department will only use gauging station data as a viable

source of receiving stream flow. Meaning effluent flows from other point sources may not be considered (i.e. added) to the flow determination. If there is a near-by gauging station downstream of the facility, then the permittee can use this data but must subtract their daily effluent discharge from the receiving stream flow. The department may also have the permittee subtract other inputs as necessary.

There are no regulatory requirements to determine a monthly average value for temperature as the regulations are written as short-term maximums. However, the department has determined reporting monthly average for T_{cap} (T_{dev} if applicable) and ΔT to be an important measure of trends.

Meanings of Equations and Variables:
Variables and calculations which may be included in this permit are described as follows. Not all variables will be used in all calculations.

- **Q_e** is effluent flow and reported in cubic feet per second ("ft^3/sec" or cfs).
- **Q_s** is the ambient up-stream stream flow in cfs. It is the department's expectation the permittee will obtain the Q_s data from an appropriate and nearest upstream United States Geological Survey (USGS) or United States Army Corps of Engineers (USACE) gauging stations.
- **T_s** is the upstream in-stream temperature and reported in °F. For most facilities, the ambient stream temperature should be used. However, temperature at the intake may also be used to determine T_s. The permittee only need inform the department which temperature they are using. Additional justification may be required if the facility is using intake temperature and recirculation water is used for cleaning fish screens or melting ice. The permittee must accurately calculate compliance with the receiving stream's temperature at the edge of the thermal mixing zone.
- **T_e** is the effluent temperature and reported in °F. This is a direct measure of the temperature of the effluent.
- **ΔT** is the calculation of the amount of change in temperature, as compared to the upstream temperature, at the edge of the allowed thermal mixing zone.
- **T_{emz}** is the calculation of the receiving stream's temperature at the edge of the allowed thermal mixing zone.
- **T_{cap}** and **T_{dev}** are thermal compliance points for the facility.

Compliance Determination with ΔT°F for a Warm Water Habitat:
Missouri's WQS temperature criteria [10 CSR 20-7.031(5)(D)1.] establishes point sources discharging thermal pollution to WWH streams in Missouri shall not raise or lower the temperature of the receiving stream by 5°F. Because this is a WQS, these criteria can be applied at the edge of the thermal mixing zone. In the determination of compliance with the temperature criteria of ΔT, several variables must be obtained as described below. The following calculation determines compliance with the Δ5°F. If the ΔT is greater than 5°F, the facility is in non-compliance. All facilities are subject to the ΔT requirement unless there is no upstream available for measuring.

Compliance Determination with Mississippi River Temperature Cap Criteria:
Missouri WQS temperature criteria [10 CSR 20-7.031(5)(D)5.] establishes point sources discharging to the Mississippi River shall not cause or contribute to the receiving stream's temperature in excess of a monthly temperature criteria. The methodology for the determination of compliance is similar to the T_{cap} for 90°F established above. However, the fundamental difference is the monthly temperature not to be exceeded. Thus, the criteria are established per calendar month and per Mississippi River Zone, as follows:

Month	Mississippi River USGS Zone Temperatures			
	Zone 1A (Area A) or Zone 1B (Area B)		Zone 2 (Area C)	
	T_{cap} in °F	*Temperature Deviation T_{dev}* in °F	T_{cap} in °F	*Temperature Deviation T_{dev}* in °F
January	45	48	50	53
February	45	48	50	53
March	57	60	60	63
April	68	71	70	73
May	78	81	80	83
June	86	89	87	90
July	88	91	89	92
August	88	91	89	92
September	86	89	87	90
October	75	78	78	81
November	65	68	70	73
December	52	55	57	60

Area A = USGS Zone 1A: Des Moines River to Lock and Dam No. 25.
Area B = USGS Zone 1B: Lock and Dam No. 25 to Lock and Dam No. 26.
Area C = USGS Zone 2: Lock and Dam No. 26 to the Missouri-Arkansas state line.

Compliance Determination with Mississippi River Deviation Allowance Criteria:
Compliance with deviation allowances are a two-step process established at [10 CSR 20-7.031(5)(D)5.]. First, the facility calculates the temperature at the edge of the mixing zone [T_{emz}]. If the calculated temperature is below the T_{cap}, the facility is in compliance. If the calculated temperature has exceeded the T_{cap}, then the T_{dev} limit is reviewed. See above table for temperature deviation allowances. $T_{dev} = T_{cap} + 3°F$. For example, a facility located in Area C is discharging their cooling water during the month of January, their T_{cap} limit would be 50°F and their T_{dev} limit would be 53°F. The T_{cap} and T_{dev} calculations are identical (T_{emz}), however, the compliance point (permit limit) is different. The T_{dev} is also called a temperature maximum and is never to be exceeded.

Secondly, if the T_{cap} has been exceeded, the facility must then determine the amount of time the T_{cap} was exceeded. Regardless if the T_{dev} is being exceeded or not, the time (in hours) of T_{cap} exceedance is still reported. The time deviation allowance, based on the USGS Zone, provides a specific aggregate of hours per year a facility can exceed their monthly T_{cap} limit. The site-specific criteria for the Mississippi River allows the permittee to exceed their applicable criteria either 1% of the year for Zone 1A and 2A; and 5% of the year for Zone 1B. It has been determined this percent exceedances allowance should be tracked in hours for a calendar year.

Zone 1A (Area A) and Zone 2 (Area C) is 1% = [(365)(24)(0.01)] = 87.6 hours (87 hours and 36 minutes) allowed per year.
Zone 1B (Area B) is 5% = [(365)(24)(0.05)] = 438 hours allowed per year. The facility is within 1B.

Tracking of time used for percent time deviation allowance, can be captured and tracked via an effluent limit in MoCWIS. Any time a facility exceeds T_{cap} the time deviation allowance "clock" is running. For every episode the permittee uses their available time, the operating permit shall require the permittee submit the time with their monthly discharge monitoring report (DMR) to state they exceeded their T_{cap}.

Permit Record of Thermal Limitations:
The original NPDES operating permit was issued to the Sioux Energy Center (SEC; then called the Sioux Power Plant) on October 3, 1975 with thermal discharge limitations of 109 °F. In December of 1981, the application for renewal stated the permittee could operate better if the limitations were in the form of a heat rejection limitation and requested 4327.0 x10^6 Btu/hr. The subsequent permit issued July 23, 1982 removed the maximum temperature in degrees Fahrenheit requirement and established the alternate effluent limitation of 4.33 x 10^9 Btu/hr. The permit was renewed March 28, 1986 and again July 31, 1987 with the same limitations. In a public notice comment dated December 2, 1992 from the permittee, they requested the thermal discharge limitation be increased by 6% to allow the use of a new method of estimating the thermal discharge from the plant. In the permit issued February 4, 1994, the limit was again changed, and elevated to 4.6 x 10^9 Btu/hr to allow for the new calculation as the water quality based effluent limit, was founded on a revised means of calculating heat rejection from the plant electrical load. According to a water quality review sheet, the department revised the limitations, this time because of "current mixing zone regulations". This equation incorporated mixing for the thermal discharge. The new permit limit applied on January 15, 1999 was 5.50 x 10^9 Btu/hr as it currently stands as the interim limitation before the final effluent limitations based on water quality standards are established in this permit.

Prior to this permit, and in the interim, the facility is maintaining WQS for ΔT by using the following calculation:

$H = Cp * \rho * Q * \Delta T$

Where: H = BTU/hr
Cp = specific heat = 1 BTU/lb°F {water}
ρ = density = 8.345 lb/gal = 62.429 lb/ft^3 {water}
Q = flow rate gal/hr or gal/min * 60 min/hr
ΔT = change or difference in temperature

Re-arranging to calculate ΔT from BTU and flow: $\Delta T = H / [Cp * \rho * Q]$ and revising the units {and restating density in lbs/cu ft, with 1 cu ft = 7.481 gal} is:

ΔT (°F) = [H (BBTU/hr) * 1,000,000,000 BTU/BBTU] ÷ 62.429 (lb/cu ft) * Q (cu ft/sec) * 3600 (sec/hr)* 1 (BTU/ lb °F)

Thus an edge of mixing zone temperature increase can be calculated from:
Q/4 or Q*0.25 {allowing for a mixing zone containing 25% of the stream flow} (in cfs or cu ft/sec)
HR {as reported in the DMR} (in BBTU/hr or BTU * 10^9) (HR = heat rejection)

An edge of mixing zone river temperature can then be calculated: $T_{emz} = \Delta T$ + ambient river T {or intake T to use DMR data}

Example:
7Q10 = 23,385 CFS = /4 = Mixing = 6,846.5 CFS
HR = 5.5 x 10^9 BTU/hr = 5,500,000,000 BTU/hr

ΔT °F = 5,500,000,000 BTU ÷ [(62.429 lb/ft^3) * (6,846.5 ft^3/sec {river discharge}) * (3600 sec/hr) * (1BTU/lb °F)]
= 5,500,000,000 BTU ÷ 1,538,712,535
= 3.574416842 = ΔT = ~3.6 °F at the edge of the mixing zone.
The example shows the ΔT of the facility at low flow conditions. When the facility is reporting the maximum heat rejection, the facility changes the temperature of the discharge by about 3.6 °F. Unfortunately, the above equation does not ensure compliance with T_{emz}.

In April 2009, the department wrote and finalized a white paper describing how permit writers should determine compliance with thermal limitations when mixing considerations are present, as is the method used above demonstrates. Until the white paper was finalized, the department had been searching for an effective method to implement water quality standards for thermal discharges to streams afforded mixing in permits. This permit implements the calculations the facility must perform to derive permit compliance.

Determination of Schedule of Compliance:
The facility will have two years from date of issuance to meet the new water quality based temperature requirements. To comply with the new method of calculating thermal discharge, the facility has indicated they require time to develop, implement, and test new thermal gauges both in stream and in the plant, and new computer software which will allow them to manage the thermal discharge of the facility on a minute-by-minute basis. Until the new software is running, the facility has no way to continuously track temperature at the edge of the mixing zone, which in turn, cannot also track minutes of exceedances of the T_{dev}. The department has chosen to allow time for these upgrades to occur before final limitations are instituted, just as the department would allow a POTW time to upgrade the facility for a pollutant such as ammonia prior to new more restrictive limitations being enacted.

The previous permit special condition C.4.(a) enacted in April 2004 noted "water temperatures and temperature differentials specified in Missouri water quality standards shall be met." This special condition, while on the surface, required the permittee not violate WQS, the permittee was not provided with a basis to determine compliance with WQS. As indicated above, the basis for compliance was determined in 2009 when the department published a thermal compliance white paper.

TECHNOLOGY BASED EFFLUENT LIMITATION CONSIDERATIONS FOR THERMAL DISCHARGES:
Best Available Technology Economically Achievable (BAT or BTA) -- Sec. 304(b)(2) of the CWA 1.1.1.3

In general, BAT effluent limitations guidelines represent the best economically achievable performance of plants in the industrial subcategory or category. The factors considered in assessing BAT include the cost of achieving BAT effluent reductions, the age of equipment and facility involved, the process(es) employed, potential process changes, and non-water quality environmental impacts, including energy requirements. The Agency retains considerable discretion in assigning the weight to be afforded these factors. Unlike BPT limitations, BAT limitations may be based on effluent reductions attainable through changes in a facility's processes and operations. As with BPT, where existing performance is uniformly inadequate, BAT may require a higher level of performance than is currently being achieved based on technology transferred from a different subcategory or category. BAT may be based upon process changes or internal controls, even when such technologies are not common industry practice.

The department must consider six factors when setting case-by-case limitations pursuant to 40 CFR 125.3. These are found under BAT at 40 CFR 125.3(d)(3).

- The age of the equipment
- The process employed
- The engineering aspects of the application of various control techniques
- Process changes
- The cost of achieving such effluent reduction
- Non-water quality environmental impact (including energy requirements)

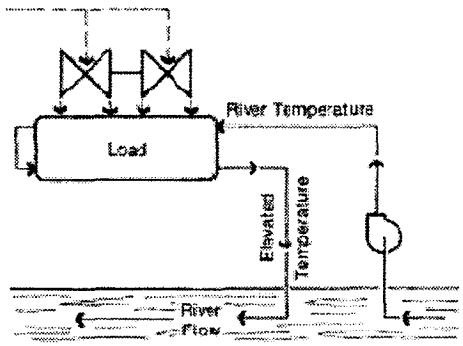
The information below was provided by the facility. The analysis was undertaken by the department to assess a case-by-case technology based effluent limitation ("TBEL") for thermal discharges from the Sioux Energy Center (SEC, or the "facility").

1. Age of Equipment

- The facility has two generating units with a net capability of 986 megawatts (MW). The first unit started operating in 1967 and the second in 1968. The typical annual (gross) generation ranges from four to six million megawatt hours (4,900,000 to 5,500,000 MWHR for 2013-2015).
- The facility was designed as a base load plant with once-through cooling. The original NPDES operating permit was issued on October 3, 1975. See *Part I Facility Information; Outfall #001; Permit Record of Thermal Limitations.*
- The facility's cooling water intake structure was constructed concurrently with the units and is located along the Mississippi River shoreline. The intake structure consists of two cells. one for each unit. Within each cell are 2 bays which each contain a 10-foot wide vertical conventional traveling screen for a total of four traveling screens for the facility. There is an eleven foot wide by 16.5 foot high opening to each bay. At the mouth of the opening are steel trash racks made of bars with 2.625 inch spacing.
- The traveling screens have 3/8 inch woven wire mesh and are operated based on either manual timer settings or differential pressure across the screens (which are affected by debris loading).
- Cooling water is passed through condensers and other heat exchangers and is discharged to the Mississippi River. The water from each of the two units is discharged through a ten foot diameter pipe leading to a single seal well, where the water flows over a weir into an approximately 2200 foot long discharge that empties into the River just upstream of Dresser Island.. A warming line recirculates a portion of the heated water from the seal well back to the intake to prevent ice buildup in the winter.
- The intake structure was originally designed to maximally withdraw 672 million gallons per day (MGD) of water. As noted in the 2008 renewal application, all four pumps were replaced (with completion in 2009) and the revised withdrawal rate is up to approximately 749 MGD. For a three year period ending in December 2015, the average Outfall #001 discharge flow was 637 MGD.

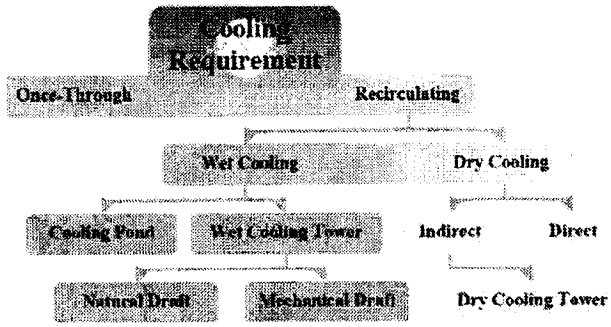
2. Process Employed

- The current process employed is once-through cooling. The cooling water intake structure is located at the end of a 1,600-foot long intake canal that extends south of the Mississippi River. It consists of two cells, one for each unit. Within each cell are 2 bays containing a 10 foot wide vertical conventional traveling screen for a total of four traveling screens for the entire intake. There is an 11 foot wide by 16.5 foot high opening to each bay. At the mouth, there are steel trash racks made of bars with 2.625 inch spacing.
- The heated water from each of the two units is discharged through a ten foot diameter pipe leading to a single seal well, where the water flows over a weir into an approximately 2200 foot long discharge channel that empties into the River just upstream of Dresser Island. A warming line recirculates a portion of the heated water from the seal well back to the intake to prevent ice buildup in the winter. Once through cooling provides the best power plant efficiency of the alternatives as the source water tends to be the lowest temperature heat sink available for most of the year. Below in figure 2[1] is a diagram of how once through cooling works.

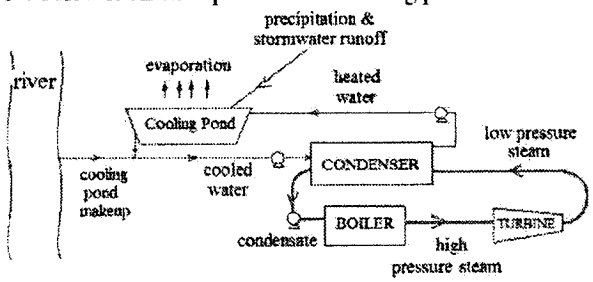


3. Engineering Aspects and Application Of Various Types Of Control Techniques

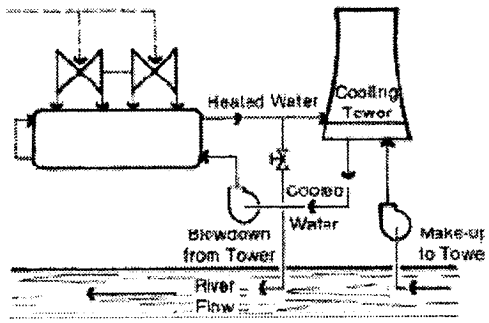
While the potentially available cooling technologies that may be employed at any given facility are generally well established, their suitability and successful application at individual facilities is strongly dependent on the site specific conditions associated with each facility. In figure 3 below, the most common technologies are presented.



- Once-through cooling systems take water from nearby sources, such as the Mississippi River, circulate it through pipes to absorb heat from the steam in systems called condensers, and discharge the then warmer water to the local source. Once-through systems were initially the most common cooling technology because of their simplicity, efficiency, low cost, and the possibility of siting power plants in places with abundant supplies of cooling water. See figure 2 above for how a once-through cooling system operates.
- Cooling ponds typically consist of artificially constructed bodies of water which may be created by damming a natural stream, utilizing an existing impounded body of water, or creating a new impoundment. The condenser water is fed into the cooling pond or lake, cooled through evaporation and then typically recycled to the condenser. While such ponds and lakes are established technologies at Missouri power plants, they have not been established for power plants located in the Missouri and Mississippi River floodplains. Figure 4 below is an example of how a cooling pond works.[2]

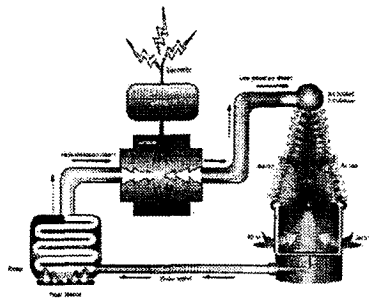


- The most common option available for replacing a once-through cooling system is a closed cycle cooling system (wet or dry).
- Wet closed cycle cooling systems are closed-loop systems designed to minimize the amount of water withdrawn from the river. In a wet closed cycle cooling system, condenser water still exchanges heat with water in a heat exchanger; however the cooling water is recycled between a cooling tower and a heat exchanger. In this system, the cooling water is cooled by evaporating a percentage of the water to the environment and requires make-up water to account for the consumed water. In the case of the Sioux Energy Center, the make-up water would come from the Mississippi River. Wet closed cycle cooling systems consume much more water than once-through cooling systems as the entire energy exchange is through evaporation of the water: a consumptive use;-however wet closed cycle cooling systems withdraw much less water than once through cooling systems. Wet closed cycle cooling systems can use natural draft or mechanical draft to accomplish cooling. Figure 5 below is a wet closed cycle cooling tower system.[3]

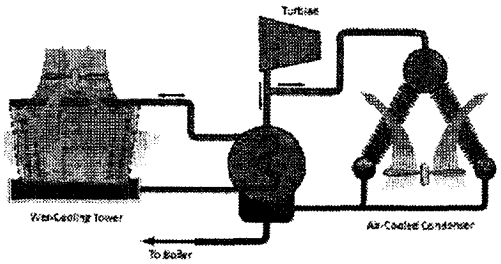


- Dry closed cycle cooling systems rely on air flow in cooling towers rather than water to cool the steam produced during electrical generation. Steam from the boiler is routed through a heat exchanger. Air is blown across the heat exchanger to condense the steam back into liquid, which is then returned to the boiler and is reused. Plants using dry cooling withdraw and consume a small amount of water to maintain and clean the boiler, including replacing boiler water lost through evaporation. Dry cooling has a higher capital cost than wet cooling, reduces the overall efficiency of a power plant, and does not operate effectively

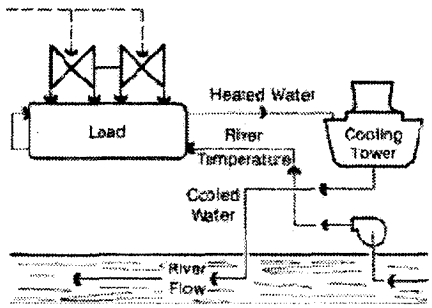
at high temperatures. Installation of dry cooling is more common on new plants. As a potential retrofit to an existing plant, this option presents difficulties. Existing plants originally designed for once-through cooling are equipped with older turbines with much more stringent limitations on exhaust pressure than those for modern turbines designed for use with dry cooling. Figure 6 below is a dry cooling system.[4]



- Hybrid cooling systems are a combination of wet and dry cooling systems. These systems combine two established cooling processes, uses the advantages of dry and wet cooling by reducing water consumption compared to wet cooling, and does not require an air cooled condenser as large as may otherwise be needed. Figure 7 below is a hybrid cooled system.[5]



- Mechanical Chillers operate with heat exchangers and pumps to control the temperature of the discharge. Mechanical chillers work best when the temperature reduction and volume is lower than that which is discharged from the Sioux Energy Center.
- Helper cooling systems transfer heat directly to the atmosphere and supplement an open-cycle cooling system before discharge to the receiving water. This could perhaps be accomplished, at least conceptually, via routing of the plant's heated effluent (before discharge) through a cooling tower or a cooling pond. Figure 8 below is a helper cooling tower system.[6]



4. Process Changes

The consideration of process changes includes changes at the existing facility that could be modified to improve the system. This includes changes from operations and maintenance to a complete retrofit of the entire system.

- Once-through cooling is the technology currently in use. Once-through systems are less expensive to build than closed cycle systems, which have a greater infrastructure requirement (e.g., construction of a cooling tower or cooling pond). Once-through systems consume less water than closed cycle cooling systems. Although once-through cooling systems withdraw a greater amount of water, essentially all of it is returned to the water source.
- Cooling ponds are an established technology in Missouri for plants located in watersheds with small streams that can be dammed to create a cooling pond, such as in Springfield or outside Montrose, MO. Such is not the case in the Mississippi River floodplain. The Mississippi River is controlled by the US Army Corps of Engineers and establishment of a dedicated cooling pond within the River would be incompatible with other uses including navigation and flood control. Other than the Mississippi and Missouri Rivers, there are no other streams located near the power plant large enough to support a cooling pond necessary to serve Sioux's water needs. Creation of a cooling pond would require retrofitting the existing plants piping, controls, and operations. Additional permitting would be required from the department's Water Resources Center and the US Corps of Engineers 401/404 program. Water requirements for pond cooling systems are typically higher than tower systems and are much

more variable, as they can be operated as systems that resemble recirculating closed system and a once-through system which impacts the water withdrawal and consumption rates.

- Closed cycle cooling tower recirculating systems only withdraw enough water needed to maintain the required water level of the system, but they consume water through evaporation. To build a wet or hybrid cooling system, a water treatment plant would need to be constructed to clean the Mississippi River water to be used and recirculated through the plant. The retrofit installation of closed-cycle cooling at a plant originally built with once-through cooling is complex. It is not simply a matter of installing a cooling tower in the existing circulating water system for several reasons. Often the plan is to keep the existing condenser, circulating water flow rate, and as much of the existing circulating water pumps, lines, and intake/discharge structure as possible unchanged. The site-specific considerations are dependent on a number of variables, including:
    1. A suitable location with enough room for the tower must be found on or adjacent to the plant site. This may place the tower far from the turbine hall and require very long circulating water lines. The longer the distance, the higher consumption of energy required to replenish the towers with makeup water.
    2. The discharge head from the circulating water pump must be increased in order to get the water to the top of the cooling tower and to overcome any additional head loss in the new circulating water lines.
    3. This additional head may be obtained by replacing or modifying the existing pump to obtain higher discharge head. This would involve diverting the condenser discharge flow from its current route, installing a new line to the cooling tower and a new return line back to the existing intake. Additionally, new make-up and blowdown lines and pumps would need to be installed as described above for new installations.
    4. The existing inlet and discharge structures will have been designed for much higher flows than will be experienced with the closed-cycle system. This may lead to silting or fouling and will require either they be modified to restrict the flow area or be replaced with smaller, more suitable structures.
    5. With this approach, the pressure in the condenser water boxes and any remaining discharge lines from the existing condenser will be subject to much higher pressure. This may require reinforcement or replacement in order to avoid leakage or damage.
    6. Wet and hybrid cooling systems introduce additional chemicals to the system to prevent fouling and scaling of the system.
    7. While heated water discharges would decrease, additional heat would be released to the atmosphere.
- Mechanical chillers operate with heat exchangers and pumps to control the temperature of the discharge. Mechanical chillers work best when the temperature reduction and volume is lower than what is discharged from Sioux Energy Center. Corrosion protection chemicals would also be required. The installation of mechanical chillers would require energy to operate, still have the large withdrawal of water from the river and would transfer the heat from the water to the atmosphere. Additional concerns with clogging and flooding due the Mississippi River's operation and flow.
- Helper cooling systems supplement an open-cycle cooling system by removing a portion of the heat energy discharged in a plant's effluent and transferring it directly to the atmosphere. Ameren estimated the cost of constructing a helper cooling tower at Labadie and proportionally, would estimate the cost at Sioux to be approximately $93 million per unit. The construction of a helper cooling tower, pond, spray modules, or other technique will still have the impact to aquatic life on the intake structure with impingement and entrainment, it will still have water with high temperature being discharged, it will require retrofits to the existing system resulting in a loss of energy production and it will introduce additional chemicals to the process to prevent fouling and scaling.
- Under CWA§ 316(b) requirements, the facility is required to evaluate the installation of closed cycle cooling for reductions to the impingement and entrainment in the intake structure; however the installation of the closed cycle system would address the discharge of heated water back to the Mississippi River as well.

5. Non-Water Quality Environmental Impacts Including Energy Requirements

All cooling technologies have non-water quality environmental impacts, including impacts to energy requirements. Because impacts at the Sioux Energy Center would entail a retrofit, the non-water quality impacts would include changes to the existing system, which could result in energy production loss.

- Once-through cooling is the existing installed technology. Non-water quality impacts include the impact of the intake and the discharge on aquatic communities. Intake impacts are to be evaluated under CWA Section 316(b).
- Cooling pond construction would entail non-water quality and water quality impacts. Construction of a cooling pond would require retrofitting the existing facility, construction of a pond, which would require the removal of existing farmland and flood control structures.
- Closed-cycle cooling tower construction would require additional land acquisition which would remove farmland from use. Additionally, cooling tower construction would require retrofitting of the intake structure and plant operations. Other anticipated impacts include the necessity to build a water treatment plant to clean the water for usage. Building a water treatment plant similar to what is at Ameren Callaway would introduce additional waste streams and pollutants to be handled and potentially discharged. Cooling tower retrofits will require substantial engineering, design and construction, including replacement of condensers. Cooling tower installations would be anticipated to increase parasitic load requirements and decrease overall Sioux Energy Center efficiency. Closed cycle cooling towers may further require replacement of turbines and other equipment, plus changes in piping and handling methods of waste streams. A retrofitted cooling system of either the wet or dry type would have a

deleterious effect on the plant's net heat rate and generating efficiency. If a wet cooling system, the power requirements will be higher than the current pumping power requirements for the once-through system. This power is used for the additional circulating pumps and for the cooling tower fans and represents power that must be generated but cannot be sold. Also, the plant will operate at a higher backpressure and therefore a higher heat rate with closed cycle cooling, which is more pronounced for a dry system than for a wet system. Closed cycle cooling would also require changes in outages of power from once every three years currently to a more frequent for cleaning and maintenance. Finally, closed cycle cooling would increase the heat released to the atmosphere and a potential increase in greenhouse gases.

- Mechanical chillers operate with heat exchangers and pumps to control the temperature of the discharge. Corrosion protection chemicals would be required and would entail energy to operate. Mechanical chillers would also include large river water withdrawals and the transfer the heat from processed water to the atmosphere. While mechanical chillers are sometimes used elsewhere in the Midwest, the usage at such a large power plant (such as the Labadie Energy Center) on a large river subject to Corps of Engineers jurisdiction, fluctuating river levels and flooding would limit the effectiveness of this technology.
- Helper cooling systems construction would have many of the similar non-water quality impacts as a full closed cycle cooling system, along with the impacts of once-through cooling.

6. Total Cost Of Application Of Technology In Relation To Reduction In Effluent

The total cost of the application of the technology needs to evaluate the costs of the benefits of the reduction in the effluent, the social benefits, the capital and construction costs, the costs in loss generation and electricity to sale, and the overall environmental impact. The overall environmental cost needs to include the cost of additional chemicals, impacts to waste streams being handled, and impacts to the air quality.

- Once through cooling is the installed technology at the facility.
- Cooling pond: Space available and the Mississippi River preclude this as a viable technology for the Sioux Energy Center.
- Cooling towers: While the installation of closed cycle cooling would reduce the discharge of heat load into the water, it would increase the consumption of water; it would have high capital costs and entail the addition of new chemicals, and a new water treatment plant. The costs of these factors must be included to determine the total cost of a complete plant cooling system. Mechanical Chillers: Mechanical chillers operate with heat exchangers and pumps to control the temperature of the discharge. Corrosion protection chemicals would also be required. The installation of mechanical chillers would require energy to operate, still have the large withdrawal of water from the river, would transfer the heat from the water to the atmosphere, additional concerns with clogging, and flooding due the Mississippi River's adjacency.
- Helper cooling systems: Ameren previously extrapolated the cost of constructing a helper cooling tower at Sioux of $93 million (based on estimates developed for Labadie). The construction of a helper cooling system would still impact aquatic life via the intake structure, discharge heated water, require retrofits to the existing system resulting in a loss of net energy production, introduce additional chemicals to the process to prevent fouling and scaling, and put more heat into the atmosphere. At the Brayton Point Power Plant, which is 1500 MW plant (approximately fifty percent larger), the construction cost estimate from 2002 was $98.9 million, with an estimated annual maintenance costs are $300,000 per year. In addition, the Brayton Point estimated combined lost annual generation to be 152,148 MW-hr/year. This consists of 112,875 MW-hr/yr off additional auxiliary power consumption and 39,275 MW-hr/yr of steam turbine operating penalties.[7]

7. Reasonableness Of The Cost Of The Application Of Technology And The Removal Of Effluent

The cooling technologies are established technologies throughout the country; however the construction and establishment of the technology at the Sioux Energy Center requires a detailed engineering evaluation. The reasonableness of the application of the technology needs to account for the ability of the technology to be constructed and used on site and to produce a benefit of removing the parameter of concern (heat). The installation of the technology (or a mix thereof) must be reasonable, in that the solution is logical.

- Once-through cooling is the established and existing technology at the Sioux Energy Center. Once-through cooling has impacts on thermal discharge to the Mississippi River and impacts on impingement and entrainment at the intake. While once-through cooling withdraws high volumes of Mississippi River water, it returns nearly all of those withdrawals to the river.
- A cooling pond is not a reasonable alternative for the Sioux Energy Center as the location is not appropriate and the heat would still be discharged to the environment, just would be recirculated through the pond. Removal of additional farm land from productive use and changes in the flood controls in St. Charles County would not be a supported alternative.
- Closed cycle cooling towers are an established technology that may be feasible at the Sioux Energy Center. Siting conditions must be considered. The installation of closed cycle cooling may reduce the generating capacity of the facility by 4% or more. With closed cycle cooling, more water would be consumed in the process, a water treatment plant would need constructed to clean the water to the level for recirculating, chemicals would be required to prevent fouling and scaling in the towers. Closed cycle cooling may require replacement of turbines and other equipment, plus changes in piping and handling methods of waste streams. Closed cycle cooling would also require changes in outages of power from once every three years currently to a more frequent for cleaning and maintenance. Closed cycle cooling would further increase the heat released to the atmosphere and a potential increase in greenhouse gases.
- Mechanical chillers operate with heat exchangers and pumps to control the temperature of the discharge. Corrosion protection chemicals would also be required. The installation of mechanical chillers would require energy to operate, still have the large

withdrawal of water from the river, would transfer the heat from the water to the atmosphere, addition of concerns with clogging and flooding due the Mississippi River's operation and flow. Concerns cited by the Carroll County, Maryland with using mechanical chillers include air pollution concerns, water quality such as usage of biocides, and noise pollution.

- Helper cooling systems would have the impacts of both closed cycle cooling system and the once through system. While it would reduce the impact of heat into the Mississippi River, it would still require the treatment at the water treatment plant, retrofitting of the system to handle at least partial flow through a cooling tower for recirculation. Additional chemicals to prevent fouling and scaling in the tower. Ameren estimates it would cost approximately $93 million to construct a single helper cooling tower at Sioux. At Brayton Point, there was a high energy penalty with the installation of a helper cooling tower with the loss of annual generation of 152,148 MW-hr/year.[8]
- As part of the renewal and the 316(b) requirements, changes to the intake structure are required and one option required for evaluation is the installation of closed cycle cooling.

8. Comparison Of Cost And Level Of Reduction

Once-through cooling is the existing technology in use. This is what Sioux Energy Center was constructed with and the cost is cost to continue operating and maintaining the system. The level of reduction is what the thermal studies of the 1970s set as the operating conditions is the level of reduction. Under the new 316(b) intake structure rule, the facility will face upgrades to reduce the number of aquatic larval and fish being impinged and entrained on the intake structure.

- Closed cycle cooling towers would reduce the discharge of heat load into the water, but it would increase the consumption of water, it would have high capital costs, addition of new chemicals, and a new water treatment plant. There are additional costs which must be included to determine the total cost of the wet cooling tower as part of a complete plant cooling system. Retrofitting a facility originally designed for once-through cooling to a recirculating cooling system will result in reduced power output from the additional equipment needing to be run, such as pumps and fans, and from the loss of efficiency because the cooling water is generally warmer coming back from a cooling tower than it is from the body of water used by a once-through cooling system. Accordingly, the energy penalty of retrofitting to a recirculating cooling system is the greatest when the power grid is strained the most, during periods of peak summer electric demand. The loss of efficiency and generation capacity means less electricity is available to meet demand or to serve as reliable reserve capacity.[9, 10, 11, 12]
- Mechanical Chillers: The City of Corvallis, Oregon estimated the cost to install mechanical chillers for temperature compliance for 11 MGD would be $35.1 million in 2008. Multiplying this cost to the 749 MGD of Sioux discharge, the cost would be $2.4 billion (749MGD/11MGD*$35.1M). For a 500 MW combined cycle greenfield plant, the cost estimate was $445 million in 2003, so the cost at Sioux at a minimum would be approximately $890 million, if it was a greenfield site plus inflation, retrofitting the existing system and cost of service increases over the last 12 years ($445M*2). The installation of mechanical chillers would require energy to operate, still have the large withdrawal of water from the river, would transfer the heat from the water to the atmosphere, addition of concerns with clogging and flooding due the Mississippi River's operation and flow. Concerns cited by the Carroll County, Maryland with using mechanical chillers include air pollution concerns, water quality such as turbidity and usage of biocides, and noise pollution.[13, 14]
- Helper cooling systems operate in combination of once-through cooling and the closed cycle cooling to reduce the overall heat load to the river. Ameren estimated the cost of constructing a single helper cooling tower at Sioux of $93 million. The construction of a helper cooling tower will still have the impact to aquatic life on the intake structure with impingement and entrainment, it will still have water with elevated temperature being discharged, it will require retrofits to the existing system resulting in a loss of energy production, it will introduce additional chemicals to the process to prevent fouling and scaling, it will put more heat into the atmosphere. At the Brayton Point Power Plant, which is 1500 MW plant (approximately 50% larger than Sioux), the construction cost estimate from 2002 was $98.9 million, with an estimated annual maintenance costs are $300,000 per year. In addition, the Brayton Point estimated combined lost annual generation to be 152,148 MW-hr/year. This consists of 112,875 MW-hr/yr off additional auxiliary power consumption and 39,275 MW-hr/yr of steam turbine operating penalties.

9. Cost Of Achieving Effluent Reduction

- The costs associated with installation of closed cycle cooling to replace an existing once through cooling system are substantial. A comprehensive evaluation of such costs was completed by Maulbetsch Consulting in September 2010.15 That report developed "an estimate of the national cost of retrofitting with closed-cycle cooling systems all electric power plants which had been classified as "Phase II facilities" under Section 316(b) of the Clean Water Act." While the impetus for the Maulbetsch report was an evaluation of technologies which might achieve compliance with Section 316(b) of the Clean Water Act (i.e., requirements governing the intake side of the power plant cooling water process), many of the report findings are equally applicable to evaluation of technologies possibly achieving compliance with Section 316(a) (i.e., requirements governing the discharge side of the power plant cooling water process), and are of consequence to the derivation of a technology based effluent limitation in this instance. In its consideration of over 400 power plants (404 fossil plants and 40 nuclear plants), Maulbetsch found the following:

PLANT TYPE	CAPACITY (MW)	CAPITAL COST (MM$)	DOWNTIME COST (MM$)	TOTAL CAPITAL + DOWNTIME COST (MM$)	TOTAL CAPITAL + DOWNTIME COST (MM$ PER MW)
Nuclear	61,444	19,140	16,955	36,095	0.587
Fossil	265,592	46,020	14,316	60,336	0.227

- Applying the lesser of the above cost estimates to the facility reveals a capital plus downtime cost estimate in the range of $223,000,000 would be incurred due to the installation of a closed cycle cooling system. Of course, site specific conditions at Sioux may result in an actual cost greater than this. Maulbetsch further evaluated the net present value of the additional annual operating and penalty costs would be incurred by a once through cooling facility retrofitted to install closed cycle cooling, and found the following:

PLANT TYPE	ANNUAL OPERATING POWER (MM$)	ANNUAL HEAT RATE PENALTY (MM$)	NET PRESENT VALUE ANNUAL + INITIAL COSTS (MM$)	NET PRESENT VALUE (MM$ PER MW)
Nuclear	220	359	40,162	0.654
Fossil	449	158	64,600	0.243

- Considering these annual costs in addition to the initial costs, results in a total net present value cost of $240,000,000.
- Ameren independently authorized completion of a preliminary assessment of the cost of installing closed loop cooling at its Labadie Energy Center. The assessment found installation of rectangular mechanical draft cooling towers would incur an estimated initial capital cost of approximately $397 M. Installation of natural draft cooling towers was estimated to cost $456M. By extrapolation to Sioux, these estimates would be $159 M and $182 M respectively. Note these costs represent initial costs only and do not include plume abatement (to eliminate icing potential and aesthetic issues) associated with mechanical draft towers. Consequently, they are comparable to the Maulbetsch cost estimates cited above.
- A cost estimate for installation of once through cooling has been prepared for the Merrimack Station Power Plant in Bow, New Hampshire by USEPA. A total present value after tax cash cost of $111,800,000 was determined. The facility includes two electric generating units with nameplate ratings of 350 MW and 120 MW for a total of 470 MW, (The document also cites the facility has "*an electrical output of approximately 478 megawatts.*") and thus a cost of approximately $240,000 per MW. The Sioux facility has a capacity of approximately 2 times the Merrimack Station, and thus the prorated cost applied to Sioux would be approximately $224,000,000. Note the good agreement with the Sioux cost estimates based on the Maulbetsch study.[16, 17]
- The above information suggests the cost to install closed cycle cooling at the facility would be in the range of a quarter of a billion dollars. It could certainly be more. For example, at the Millstone Power Station in Connecticut, the estimated capital cost to install natural draft cooling towers was estimated to be approximately two billion dollars plus additional annual operation and maintenance costs. The Millstone facility has a total capacity of 2113 MW which roughly twice (2.14 times) the capacity of the SEC.[18]
- The above cost estimates provide for complete replacement of the once through cooling system at the SEC. As discussed further above, one alternative to reduce the thermal load to the Mississippi River from the Sioux facility is to install "helper" cooling towers don't eliminate the heated discharge, but rather reduce its temperature before discharge. However, these costs are not insignificant either and approach those of complete replacement of once through cooling. As noted above, Ameren has estimated such a system would cost approximately $93,000,000 per unit at Sioux. Additional costs including lost power generation would have to be added to these estimates. Thus, significant expenditures would need to be incurred for possibly marginal benefit in terms of temperature reduction of the discharge.
- The cost to install mechanical chillers at the SEC would be even greater than those for the installation of closed loop cooling.

Conclusion:

- Technology limitations have not been implemented for this facility in the past.
- The SEC has been in operation for 49 years using a once-through cooling system. In evaluation of the other available technologies which are technically feasible to reduce thermal discharges to the Mississippi River, all such options were found to increase the chemicals in the discharge, release greater heat to the atmosphere, provide operational and maintenance issues, and entail significant costs.
- After applying factors listed above, and considering the technologies and unique circumstances discussed above, the department has determined, based its best professional judgment, a once-through cooling system is the best available technology at this time. Future analysis of impingement and entrainment will include requirements found under CWA §316(b) and may revisit or reverse the BAT judgment should an imbalanced indigenous population of aquatic life be observed at this site.
- The department has concluded that discharging thermal pollution over discharge of additional chemicals is preferred at this time.

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14. Brayton Point NPDES Factsheet Chapter 4: TBEL Determination. http://www.epa.gov/region1/npdes/braytonpoint/pdfs/BRAYTONchapter4.PDF
15. *Closed-Cycle Retrofitting Study: Capital and Performance Cost Estimates*, prepared by Maulbetsch Consulting for EPRI (Palo Alto, CA) et al., Final Report September 2010.
16. *New England Clean Water Act NPDES Permitting Determinations for the Thermal Discharge and Cooling Water Intake Structures at Merrimack Station in Bow, New Hampshire, NPDES Permit No. NH0001465.*
17. Attachment D to 2011 Fact Sheet for Draft NPDES permit, prepared by USEPA New England Region I, September 27, 2011.
18. *Comprehensive Evaluation of Cooling Water System Alternatives at Millstone Power Station (MPS) Final Report*, Project No. 19998242.10400, prepared by URS, August 2012.

CONVENTIONAL POLLUTANTS:

For the purposes of permit renewal, several conventional parameters were sampled. The facility reported biochemical oxygen demand at 4 mg/L. The facility reported chemical oxygen demand at 22 mg/L. The facility reported total organic carbon at 6.6 mg/L. The facility reported Oil and Grease at 2.2 mg/L. The facility reported total suspended solids at 178 mg/L. The permit writer has determined none of the above pollutants are of concern at this outfall. The Mississippi River is inherently turbid and while the once-through cooling water system condenses the water, the concentration of additional solids is negligible. The facility reported total residual chlorine was believed absent. However, the ELG identifies once-thorough cooling water as subject to BPT and BAT regulations for chlorine.

pH

6.5 to 9.0 SU. The Water Quality Standard at 10 CSR 20-7.031(5)(E) states water contaminants shall not cause pH to be outside the range of 6.5 to 9.0 standard pH units.

Chlorine, Free Available

The facility is limited per the ELG at 40 CFR 423.12 for best practicable control technology (BPT) of once through cooling water at 0.5 mg/L daily maximum, and 0.2 mg/L monthly average concentration. The facility is not afforded a schedule of compliance because the EPA has promulgated the ELG and these conditions are subject to all applicable facilities at all times. The facility has stated they infrequently use chlorine as a biocide. The department has considered and approved an "unscheduled" sampling regime.

Chlorine, Total Recoverable

The facility is limited per the ELG at 40 CFR 423.13 for best available technology (BAT) of once through cooling water at 0.2 mg/L daily maximum concentration. The facility is not afforded a schedule of compliance because the EPA has promulgated the ELG and these conditions are subject to all applicable facilities at all times. The facility has stated they infrequently use chlorine as a biocide. The department has considered and approved an "unscheduled" sampling regime.

METALS:

The facility reported any metals found in the once-through cooling water discharge are already present in the river. The permit writer has determined no additional testing of any metals is required at this outfall at this time.

NUTRIENTS:

The facility reported any nutrients found in the once-through cooling water discharge are already present in the river. The permit writer has determined no additional testing of nutrients at this outfall is required at this time.

OTHER:

The facility reported any bromide, Dioxin, fluoride, radioactivity, sulfate, sulfide, sulfite, or surfactants found in the once-through cooling water discharge are already present in the river. The permit writer has determined no additional testing of these parameters is needed at this outfall at this time.

WET Test, Acute

Previous permit limitations were pass/fail; however the department cannot perform RPA on narrative data. The permit writer has determined several biocides including chlorine may be used on the cooling tower therefore WET monitoring is required when the biocides are in use. *See Part VII Administrative Requirements, Public Notice Comments.*

For classified permanent streams, the Allowable Effluent Concentration (AEC)% is determined as follows:

Acute AEC% = $[DF_{cfs} \div (ZID_{7Q10} + DF_{cfs})] \times 100\% = \#\#\ \%$

Acute AEC% = $[1121\ CFS \div (585 + 1121\ CFS)] \times 100\% = 65.7\% \approx 66\%$

10 CSR 20-7.015((9)(L)4.A. states the dilution series must be proportional. Each dilution was determined by multiplying or dividing 0.8 from the AEC and then each consecutive value.

The calculated dilution series for this facility is: 83%, 66%, 53%, 42%, and 34%.

OUTFALLS #002 & #006: ASH PONDS

EFFLUENT LIMITATIONS TABLE:

PARAMETERS OUTFALLS #002 & #006	UNIT	BASIS FOR LIMITS	DAILY MAX	MONTHLY AVG	PREVIOUS PERMIT LIMITS	MINIMUM SAMPLING FREQUENCY	MINIMUM REPORTING FREQUENCY	SAMPLE TYPE
PHYSICAL								
FLOW	MGD	1	*	*	SAME	ONCE/WEEK	ONCE/MONTH	24 HR. TOT
CONVENTIONAL								
CYANIDE-AMENABLE (CATC)	µg/L	1, 3	*	*	NEW	ONCE/QUARTER	ONCE/QUARTER	GRAB
OIL & GREASE	mg/L	1, 3	15	10	20, 15	ONCE/MONTH	ONCE/MONTH	GRAB
pH †	SU	1, 3	6.5 TO 9.0	6.5 to 9.0	6.0 TO 9.0	ONCE/WEEK	ONCE/MONTH	GRAB
TSS (ACTUAL)	mg/L	4	*	*	SAME	ONCE/WEEK	ONCE/MONTH	GRAB
TSS (NET)	mg/L	1	100	30	SAME	ONCE/WEEK	ONCE/MONTH	GRAB
METALS								
ALUMINUM, TOTAL RECOV.	µg/L	1, 2, 3	*	*	NEW	ONCE/QUARTER	ONCE/QUARTER	GRAB
ARSENIC, TOTAL RECOVER.	µg/L	1, 2, 3	*	*	NEW	ONCE/QUARTER	ONCE/QUARTER	GRAB
BORON, TOTAL RECOVER.	µg/L	6, 9	*	*	NEW	ONCE/QUARTER	ONCE/QUARTER	GRAB
CHROMIUM IV, DISSOLVED	µg/L	1, 2, 3	*	*	NEW	ONCE/QUARTER	ONCE/QUARTER	GRAB
IRON, TOTAL RECOVERABLE	µg/L	1, 2, 3	*	*	NEW	ONCE/QUARTER	ONCE/QUARTER	GRAB
MOLYBDENUM, TOTAL REC.	µg/L	6, 9	*	*	NEW	ONCE/QUARTER	ONCE/QUARTER	GRAB
SELENIUM, TOTAL RECOVER.	µg/L	1, 2, 3	*	*	NEW	ONCE/QUARTER	ONCE/QUARTER	GRAB
TITANIUM, TOTAL RECOVER.	µg/L	6, 9	*	*	NEW	ONCE/QUARTER	ONCE/QUARTER	GRAB
NUTRIENTS								
AMMONIA AS N	mg/L	6, 9	*	*	NEW	ONCE/QUARTER	ONCE/QUARTER	GRAB
KJELDAHL NITROGEN (TKN)	mg/L	6, 9	*	*	NEW	ONCE/QUARTER	ONCE/QUARTER	GRAB
NITRATE+ NITRITE AS N	mg/L	6, 9	*	*	NEW	ONCE/QUARTER	ONCE/QUARTER	GRAB
NITROGEN, TOTAL N (TN)	mg/L	1	*	*	NEW	ONCE/QUARTER	ONCE/QUARTER	GRAB
PHOSPHORUS, TOTAL P (TP)	mg/L	1	*	*	NEW	ONCE/QUARTER	ONCE/QUARTER	GRAB
OTHER								
CHLORIDE	mg/L	1, 3	*	*	NEW	ONCE/QUARTER	ONCE/QUARTER	GRAB
FLUORIDE	mg/L	6, 9	*	*	NEW	ONCE/QUARTER	ONCE/QUARTER	GRAB
SULFATES	mg/L	1, 3	*	*	NEW	ONCE/QUARTER	ONCE/QUARTER	GRAB
SULFATES + CHLORIDES	mg/L	1, 3	*	*	NEW	ONCE/QUARTER	ONCE/QUARTER	GRAB
WET TEST, CHRONIC	TUc	8	*	-	PASS/FAIL	ONCE/YEAR	ONCE/YEAR	GRAB

* - Monitoring requirement only
† The facility will report the minimum and maximum pH values; pH is not to be averaged.
NEW - Parameter not established in previous state operating permit
I – interim limits
F – final limits

Basis for Limitations Codes:

1. State or Federal Regulation/Law (incl. ELG)
2. Water Quality Standard (includes RPA)
3. Water Quality Based Effluent Limits
4. Antidegradation Review/Policy
5. Water Quality Model
6. Best Professional Judgment
7. TMDL or Permit in lieu of TMDL
8. WET Test Policy
9. TBEL POC

TBEL POC TABLE:

PARAMETER	Units	Outfall #002	Outfall #006	Baseline	Baseline x 10	POC
FORM C OF APPLICATION FOR PERMIT RENEWAL: PART A						
Biochemical Oxygen Demand	mg/L	4	4	2	20	no
Chemical Oxygen Demand	mg/L	18	10	5	50	no
Total Organic Carbon	mg/L	6	1	1	10	no
Total Suspended Solids	mg/L	54	1	4	40	*

PARAMETER	Units	Outfall #002	Outfall #006	Baseline	Baseline x 10	POC
NUTRIENTS:						
Ammonia as N	**mg/L**	**0.5**	**5.6**	**0.05**	**0.5**	**YES**
Nitrate + Nitrite as N	**mg/L**	**2.0**	**25**	**0.05**	**0.5**	**YES**
Nitrogen, Total N	mg/L	2.2	0.07	none	none	n/a
Phosphorus, Total P	mg/L	<0.01	<0.01	0.01	0.1	no
FORM C OF APPLICATION FOR PERMIT RENEWAL: OTHER						
Bromide	mg/L	11	35	none	none	n/a
Chlorine, Total Residual	mg/L	0.08	0.06	none	none	n/a
Cyanide, Total	µg/L	<50	50	20	200	no
Fecal Coliform (Colony Forming Units/100 mL)	CFU	198	10	none	none	n/a
Fluoride	**mg/L**	**0.3**	**1.9**	**0.1**	**1**	**YES**
Oil and Grease	mg/L	2	2.8	5	50	*
Phenols, Total	µg/L	<5	<5	50	500	no
Sulfate as SO_4^{2-}	mg/L	54	640	none	none	n/a
Sulfide as S^{2-}	mg/L	1.5	1.5	1	10	no
Sulfite as SO_3^{2-}	mg/L	<2	<2	none	none	n/a
Surfactants	mg/L	0.04	0.01	none	none	n/a
METALS (AS TOTAL RECOVERABLE - UNLESS SPECIFIED):						
Aluminum	µg/L	2,800; 1120	400; 418	200	2,000	YES
Antimony	µg/L	<5; <1	<5; <1	20	200	no
Arsenic	µg/L	<5; 1.4	33; 17.1	10	100	no
Barium	µg/L	100; 115	480; 556	200	2,000	no
Beryllium	µg/L	<5; <1	<5; <1	5	50	no
Boron	**µg/L**	**700; 51**	**2,600; 1,890**	**100**	**1,000**	**YES**
Cadmium	µg/L	<5; <0.4	<5; <0.4	5	50	no
Chromium	µg/L	<5; 1.4	22; 14.1	10	100	no
Cobalt	µg/L	<5; 1	<5; 3	50	500	no
Copper	µg/L	5; 1	<5; <1	25	250	no
Iron	**µg/L**	**2,500; 923**	**80; 315**	**100**	**1,000**	**YES**
Lead	µg/L	5; 0.9	<5; 1	50	500	no
Magnesium	µg/L	13,600; 21,500	17,600	5,000	50,000	no
Manganese	µg/L	80; 50	10; 29	15	150	no
Mercury	µg/L	<0.2; <0.2	<0.2; <0.2	0.2	2	no
Molybdenum	**µg/L**	**40; 5**	**280; 154**	**10**	**100**	**YES**
Nickel	µg/L	12; <1	18; 9	40	400	no
Selenium	µg/L	5; 1.3	26; 20.8	5	50	no
Silver	µg/L	12; <0.4	30; <0.4	10	100	no
Thallium	µg/L	6; <1	15; <1	10	100	no
Tin	µg/L	<5; 5	<5; 9	30	300	no
Titanium	**µg/L**	**100; 70**	**7; 34**	**5**	**50**	**YES**
Zinc	µg/L	44; 19	24; 21	20	200	no

* = addressed by 40 CFR 423
< = reported below quantifiable analytical limits

TBEL DETERMINATION FOR POLLUTANTS OF CONCERN FROM THE ASH PONDS AT THE SIOUX ENERGY CENTER:
Following the EPA Permit Writers Manual, six parameters met the criteria for Pollutants of Concern (POCs): ammonia, nitrate/nitrite as nitrogen, fluoride, boron, molybdenum and titanium. These can be divided into two categories, nutrients, and inorganics/trace metals, as discussed below. It is important to note on September 30, 2015, the United States Environmental Protection Agency signed a final rule, revising the Steam Electric Effluent Guidelines (40 CFR Part 423). These regulations will result in substantial changes which, while not explicitly targeting nutrients or the inorganic/trace metal POCs identified for the Sioux Energy Center (SEC), will significantly reduce or eliminate discharges of these parameters.

NUTRIENTS
Discharges of nutrients including ammonia as nitrogen and nitrate/nitrite as nitrogen is an emerging issue for point source dischargers including those to major river systems implicated as contributors to the Gulf of Mexico Hypoxia problem. Additional monitoring, including DNR's Volunteer Early Nutrient Monitoring Program will better define these contributions and thus guide future regulatory development.

Elevated concentrations of these parameters were reported by Ameren in their 2008 NPDES permit renewal application; those processes included two significant sources of ammonia and its degradation byproducts (nitrate/nitrite residuals).

The first of these was the use of ammonium hydroxide in the regeneration of polisher demineralizers (used to purify water used in the plant's steam cycle). While this use is ongoing, Ameren is working to optimize the use of ammonium hydroxide and as part of replacement wastewater treatment systems (as described below) is further evaluating treatment technologies.

The second source was the use of ammonia and urea in exhaust gas treatment systems to reduce nitrous oxide (NOx) emissions. These chemicals were added to the exhaust gas and excess/carryover feeds resulted in residual concentrations in the fly ash sluiced to the ash pond (Outfall #006) for treatment. While these systems (and the feed of these chemicals into exhaust streams) have currently been suspended, they will likely resume, in order to meet NOx emission limits. However, as described below, replacement wastewater treatment systems will eliminate discharges of fly (and bottom) ash transport water, and thus eliminate the discharge of wastewaters containing these chemical associated with NOx controls.

Because these replacement wastewater systems are currently being designed and permitted, development of treatment technologies based on the historic effluent data would be inappropriate. The department has determined elimination of the wastestream is the BAT to eliminate the discharge of nutrients from the facility.

INORGANICS AND TRACE METALS
Analysis of ash indicates elevated concentrations of boron and molybdenum, and to a lesser extent, fluoride and titanium. All are likely associated with coal ash.

The newly revised federal Steam Electric Effluent Guidelines will require the SEC to eliminate the discharge of fly and bottom ash transport water, as soon as possible beginning November 1, 2018 but no later than December 31, 2023. Ameren is currently designing replacement wastewater treatment systems to manage the other (non-ash) wastestreams and has engaged DNR in discussions regarding construction and operating permit implications. The federal Coal Combustion Residual regulations (40 CFR Part 257) will also impact the SEC and likely result in closure of ash ponds within this same time frame.

As stated above, since these replacement wastewater systems are currently being designed and permitted, development of treatment technologies based on the historic effluent data would be inappropriate. Part of the engineering design includes assessment of internal wastestreams which will continue to be treated prior to discharge. These assessments and resulting data will be used to support permit applications to either construct and/or modify operating permits for these facilities. The department has determined elimination of the sluice water wastestream is the BAT to eliminate (or significantly reduce) the discharge of the listed inorganic constituents from the facility in accordance with the overall goal of the NPDES system.

CONCLUSION:
The facility will cease sluicing ash on or before May 1, 2021 thereby eliminating discharge of all of the above TBEL POCs.

DERIVATION AND DISCUSSION OF LIMITS FOR OUTFALLS #002 AND #006:

PHYSICAL:
The permittee reported color was believed absent at these outfalls. The permittee reported temperature associated with summer and winter discharges at these outfalls. The permit writer has determined temperature is not a pollutant of concern at these outfalls.

Flow
In accordance with [40 CFR Part 122.44(i)(1)(ii)] the volume of effluent discharged from each outfall is needed to assure compliance with permitted effluent limitations. If the permittee is unable to obtain effluent flow, then it is the responsibility of the permittee to inform the department, which may require the submittal of an operating permit modification. The facility will report the total flow in millions of gallons per day (MGD). Weekly sampling required; continued from previous permit.

CONVENTIONAL:
The facility reported 4 mg/L at outfall #002, and 4 mg/L at outfall #006 for 5-Day Biochemical Oxygen Demand (BOD_5). The permit writer has determined BOD_5 is not a contaminant of concern at these outfalls. The facility reported 18 mg/L at outfall #002, and 10 mg/L at outfall #006 for chemical oxygen demand (COD). The permit writer has determined COD is not a contaminant of concern at

these outfalls. The facility reported 6 mg/L at outfall #002, and 1.3 mg/L at outfall #006 for total organic carbon (TOC). The permit writer has determined TOC is not a pollutant of concern at these outfalls. The facility reported 198 CFU/100mL at outfall #002, and 10 CFU/100mL at outfall #006 for fecal coliform. While fecal coliform and *E. coli* measure distinctively different organisms, the permit writer sees them as related. There are no water quality standards for fecal coliform, but there are for *E. coli*. See outfall #02A.

Chlorine, Total Residual (TRC)
The facility submitted data from December 13, 2007 through May 8, 2008 showing no detections of TRC from outfall #002. The permit writer has determined no reasonable potential for this parameter. Permit renewal testing showed 0.08 mg/L at outfall #002, and 0.06 mg/L at outfall #006; both significantly below the ML. Because outfall #006 is essentially similar for this parameter, the permit writer has determined no reasonable potential for both outfalls for TRC.

Cyanide, Amenable to Chlorination (CATC)
The permit renewal materials showed total cyanide at <50 µg/L at outfall #002, and at 50 µg/L at outfall #006. The permit writer has determined additional testing is required for CATC. Missouri's water quality standards are for CATC, not total cyanides therefore the cyanides present in the effluent may have been overestimated using the total cyanide testing method. Typically, effluent limits in permits are below the accepted minimum quantification level (ML). The department has determined the current acceptable ML for Cyanide Amenable to Chlorination (CATC) to be 10 µg/L when using SM 4500-CN⁻ G. Cyanides Amenable to Chlorination after Distillation in *Standard Methods for the Examination of Water and Wastewater*, 22nd Edition. The permittee will conduct analyses in accordance with this method, or equivalent, and report actual analytical values. Measured values equal to or greater than the minimum quantification level of 10 µg/L would be considered violations of the permit and values less than the minimum quantification level of 10 µg/L would be considered to be in compliance with the permit limitation. The minimum quantification level does not authorize the discharge of CATC in excess of the effluent limits. However, this permit establishes monitoring only, new requirement this permit, quarterly sampling and reporting.

Oil & Grease
Conventional pollutant, in accordance with 10 CSR 20-7.031 Table A: *Criteria for Designated Uses*; 10 mg/L monthly average (chronic standard). The daily maximum was calculated using the *Technical Support Document for Water Quality-Based Toxics Control* (EPA/505/2-90-001). Section 5.4.2 indicates the waste load allocation can be set to the chronic standard. When the chronic standard is multiplied by 1.5, the daily maximum can be calculated. Hence, 10 * 1.5 = 15 mg/L for the daily maximum. The ELG allows discharge of 20 mg/L daily maximum and 15 mg/L monthly average. However, these limits are not protective enough of the receiving lake therefore water quality limits will be used. Monthly sampling and reporting; continued from previous permit.

pH
Previous permit limits were 6.0 to 9.0, however, these limits are for treatment works treating domestic sewage for streams where mixing considerations are available. The previous limits have been assessed and determined they are not protective of water quality of Poeling Lake. The minimum value from outfall #002 reported in the last five years was 7.2, the maximum is 8.7. The minimum value from outfall #006 in the last five years was 6.6, and the maximum was 8.8 SU. The facility is able to meet the more restrictive permit limits therefore no schedule of compliance is afforded. Weekly sampling continued from previous permit.

Total Suspended Solids (TSS)
The effluent limit guidelines (ELG) for steam electric point source category for fly & bottom ash transport water BPT [40 CFR 423.12(b)(4)] is 100 mg/L daily maximum, and 30 mg/L monthly average. Facility will report total and net. Net limitations allowed; see *Part III Rationale and Derivation of Permit Limits; Intake Credits*. Weekly sampling and reporting; continued from previous permit.

METALS:
The facility tested for all of the metals on Missouri Forms C and D for permit renewal. The following table shows the best professional judgment method to determine which metals should be included in the permit using water quality standards as the guide (this differs from the TBEL POC analysis). Additionally, the facility retested for the parameters where more than one number is below. The permit writer asked the permittee to resample as the testing performed in 2008 when the permit renewal was due is outdated compared to current analytical procedures. The second number below was provided on March 4, 2016 and was used to make the final reasonable potential determination. An "X" means a sample was not collected.

WQBEL DETERMINATION:

METAL, TOTAL RECOVERABLE	OUTFALL #002 µG/L	USE	PRP OUTFALL #002 BEST PROFESSIONAL JUDGEMENT DECISION	OUTFALL #006 µG/L	USE	PRP OUTFALL #006 BEST PROFESSIONAL JUDGEMENT DECISION
Aluminum	**2800, 1120**	**AQL**	**YES**	**400, 418**	**AQL**	**YES**
Antimony	<5, <1	DW	no	<5, <1	DW	no

METAL, TOTAL RECOVERABLE	OUTFALL #002 µG/L	USE	PRP OUTFALL #002 BEST PROFESSIONAL JUDGEMENT DECISION	OUTFALL #006 µG/L	USE	PRP OUTFALL #006 BEST PROFESSIONAL JUDGEMENT DECISION
Arsenic	**<5, 1.4**	**AQL**	**no**	**33, 17.1**	**AQL**	**YES**
Barium	100, 93	DW	no	480, 556	DW	no
Beryllium	<5, <1	AQL	no	<5, <1	AQL	no
Boron	700, 51	IRR	no	2600, 1890	IRR	no*
Cadmium	<5, <0.4	AQL	no	<5, <0.4	AQL	no
Chromium	<5, 1.4	AQL	no	22	AQL	no
Chromium III	X, <10	AQL	no	X, <10	AQL	no
Chromium IV	**X, <5**	**AQL**	**no**	**X, 15**	**AQL**	**YES**
Cobalt	<5, <1	NWQS	no	<5, 3	NWQS	no
Copper	5, 1	AQL	no	<5, <1	AQL	no
Iron	**2500, 923**	**AQL**	**YES**	**80, 315**	**AQL**	**no**
Lead	5, 0.9	AQL	no	<5, 1	AQL	no
Magnesium	1360, 2150	NWQS	no	1760, 2740	NWQS	no
Molybdenum	40, 5	NWQS	no	280, 154	NWQS	no
Manganese	80, 50	NWQS	no	10, 29	NWQS	no
Mercury	<0.2, <0.2	AQL	no	<0.2, <0.2	AQL	no
Nickel	12, <1	AQL	no	18, 9	AQL	no
Selenium	**5, 1.3**	**AQL**	**no**	**26, 20.8**	**AQL**	**YES**
Silver	12, <0.4	AQL	no	30, <0.4	AQL	no
Thallium	6, <1	DW	no	15, <1	DW	no
Tin	<5, 5	NWQS	no	<5, 9	NWQS	no
Titanium	100, 70	NWQS	no	7, 34	NWQS	no
Zinc	44, 19	AQL	no	24, 21	AQL	no

<	Below detection limit (analytical method used showed no legitimate observation above the value reported)
*	See parameter discussion
AQL	Protection of Aquatic Life Water Quality Standard (also known as WWH)
DW:	Drinking Water Quality Standard; the Mississippi River is designated as a drinking water supply
IRR:	Irrigation Water Quality Standard; the newly classified "C" stream is designated as an irrigation water
NWQS:	No applicable Missouri Water Quality Standard (WQS) for the parameter
PRP:	Potential Reasonable Potential
Yes:	Additional sampling required to determine if RP exists
No:	Additional sampling not required. The permit writer has used best professional judgment to determine the values submitted for the purposes of permit renewal are reasonably below the Missouri water quality standards therefore have no RP to violate Missouri WQS.

The facility must use sufficiently sensitive methods as found in 40 CFR 136. No metals were addressed in any permit at either of the ash pond outfalls in the past. All requirements found below are new. All metals found below will be required to sample and report quarterly for each ash pond outfall.

Aluminum, Total Recoverable
10 CSR 20-7.031(4)(D) and (F) are general criteria applicable to all streams. Additional monitoring will determine if reasonable potential exists to cause or contribute to general criteria violations of waters of the state.

Arsenic, Total Recoverable
10 CSR 20-7.031(4)(D) and (F) are general criteria applicable to all streams. Additional monitoring will determine if reasonable potential exists to cause or contribute to general criteria violations of waters of the state.

Boron, Total Recoverable
10 CSR 20-7.031(4)(D) and (F) are general criteria applicable to all streams; however, these protections are only afforded to parameters deemed toxic to aquatic life, watering animals, and humans. Boron has not been identified as a toxic parameter as only an irrigation use exists for surface waters; toxicity to terrestrial plants has not been included in the general criteria protection directive. However, this parameter was identified as a TBEL POC. Additional monitoring will determine if technology based limits are appropriate for this parameter.

Copper, Total Recoverable
The facility does not discharge chemical metal cleaning wastes to waters of the state therefore the BPT ELG 40 CFR 423.12(b)(5) does not apply. The facility does not have reasonable potential to cause an excursion above in-stream water-quality limitations. No monitoring required. See special condition #21.

Chromium, Hexavalent, Dissolved
10 CSR 20-7.031(4)(D) and (F) are general criteria applicable to all streams. The facility must use a sufficiently sensitive analytical method (5 µg/L was used for the renewal application resampling which is an appropriate level) to show the effluent's true concentration is below the water quality standard. Resampling on 1/27/2015 reported 15 µg/L dissolved hexavalent chromium. The acute WQS is 15 µg/L, and the chronic WQS is 10 µg/L. Monthly monitoring will determine if reasonable potential exists to cause or contribute to general criteria violations of waters of the state.

Iron, Total Recoverable
The facility does not discharge chemical metal cleaning wastes to waters of the state therefore the BPT ELG 40 CFR 423.12(b)(5) does not apply. However, the facility may have reasonable potential to cause an excursion above in-stream water-quality limitations and has also been identified as a TBEL POC.

Molybdenum, Total Recoverable
This parameter was identified as a TBEL POC.

Selenium, Total Recoverable
10 CSR 20-7.031(4)(D) and (F) are general criteria applicable to all streams. Monitoring will determine if reasonable potential exists to cause or contribute to general criteria violations of waters of the state.

Titanium, Total Recoverable
This parameter was identified as a TBEL POC.

NUTRIENTS:
The following nutrients will be evaluated quarterly by the permittee. All nutrients are new for this permit.

Ammonia as N
The facility reported 0.5 mg/L at outfall #002, and 5.6 mg/L at outfall #006 for ammonia as nitrogen. The TBEL evaluation has determined Ammonia as N is a pollutant of concern for the facility.

Kjeldahl Nitrogen, Total (TKN)
Added using the permit writer's best professional judgment. TKN is the sum of ammonia-nitrogen plus organically bound nitrogen but does not include nitrate-nitrogen or nitrite-nitrogen. The department is asking the facility to also provide this data.

Nitrate plus Nitrite as Nitrogen
The TBEL evaluation has determined nitrate plus nitrite as N is a pollutant of concern for the facility. The facility reported 2 mg/L at outfall #002, and 25 mg/L at outfall #006.

Nitrogen, Total N (TN)
The facility reported 2.2 mg/L at outfall #002 and 0.07 mg/L at outfall #006 of total nitrogen. Total Nitrogen (TN) is the sum of nitrate-nitrogen (NO_3-N), nitrite-nitrogen (NO_2-N), ammonia-nitrogen (NH_3-N) and organically bonded nitrogen. Per 10 CSR 20-7.015(9)(D)7, nutrient monitoring shall be instituted on a quarterly basis for facilities with a design flow greater than 0.1 MGD.

Phosphorous, Total P (TN)
The facility indicated phosphorus was not present in either outfall. However, per 10 CSR 20-7.015(9)(D)7, nutrient monitoring shall be instituted on a quarterly basis for facilities with a design flow greater than 0.1 MGD.

OTHER:
The facility tested for sulfide, sulfite, and surfactants at these outfalls however, no water quality standards exist for these parameters therefore the permit writer has used best professional judgment to not include these parameters in the permit. The facility sampled for alpha radioactivity and both outfalls showed below detection limits. No RP. The facility sampled for total radium and radium 226, all samples were below detection limits; no RP. The facility reported a non-detect value at outfall #002, and 16.8 pCi/L at outfall #006 for beta radioactivity. The federal primary drinking water standards to which DNR regulations refer at 10 CSR 20-7.03(5)(I) are written in mrem/year. EPA 816-F-00-002 *Implementation Guidance for Radionuclides* describes how β concentration values must be converted to roentgen equivalent man (rem) per year (yr) to determine the cancer causing exposure rate which is how the drinking water standard is written. However, the facility did not supply each isotope of each element which was emitting β radiation therefore the calculation

cannot be completed. However, if the heaviest beta-emitting element (^{40}K) was used to convert 100% of the analytical value into drinking water units, then 16.8 pCi/L * 730 L/y [= standard maximal exposure] * $1.88e^{-5}$ mrem/pCi [of ^{40}K] = 0.23 mrem/year, a value well below the standard of 4 mrem/yr; additional monitoring will not be required at this time.

Quarterly monitoring and reporting is required for all parameters below (except WET testing).

Chloride
The facility has indicated sulfates are present in the discharge; because Missouri water quality standards are written for the inclusion of chloride with sulfates, the facility must monitor for this parameter. New parameter this permit, monthly monitoring and reporting required.

Fluoride
The facility reported fluoride at 0.3 mg/L at outfall #002, and 1.9 mg/L at outfall #006. The TBEL POC analysis has identified this parameter is a POC therefore additional sampling is required. Currently, the discharge does not appear to have reasonable potential to cause or contribute to exceedances of in-stream water quality standards.

Sulfates
The facility reported 54 mg/L at outfall #002, and 640 mg/L at outfall #006. Current water quality standards indicate sulfates must be added to chlorides to determine compliance. The previous permit required monitoring sulfates quarterly; no limits. However, the previous permit writer did not implement the requirement correctly because the sulfate limit is tied to the addition of chlorides.

Sulfates Plus Chlorides
10 CSR 20-7.031(4)(D) and (F) are general criteria applicable to all streams. Additional monitoring will determine if reasonable potential exists to cause or contribute to general criteria violations of waters of the state. The facility will measure sulfates and chlorides individually and report the sum total.

WET Test, Chronic
Yearly monitoring requirement only; monitoring is required to determine if reasonable potential exists for this facility's discharge to exceed water quality standards. Several new toxic parameters have been identified in these effluents therefore WET testing is required. There is no dilution of the receiving waterbody therefore a chronic test is more appropriate than the acute test. A chronic test will better characterize actual in-lake conditions because there is no mixing. Previous permit limits were pass/fail, however, the department has concluded pass/fail requirements cannot effectively measured reasonable potential. The previous permit required yearly testing in January, the permittee may test for WET at any month in this permit however yearly testing is still required, continued from previous permit and in accordance with the department's permit writer's manual.

The chronic allowable effluent concentration (AEC) for facilities discharging to unclassified, Class C, Class P (with default mixing considerations), or lakes [10 CSR 20-7.031(4)(A)4.B.(IV)(b)] is 100%.

The dilution series is standardized as 100%, 50%, 25%, 12.5%, & 6.25%.

The previous permit required only a 10% AEC. As the lake does not provide mixing, this was assuredly a typographical error and should have been 100%. The previous permit limitations also only required a single dilution test. The department's current WET testing policy indicates all WET tests performed shall be of multiple dilution series and thus the permit requirement is amended.

INTERNAL MONITORING POINT #02A: DOMESTIC WASTEWATER

EFFLUENT LIMITATIONS TABLE:

PARAMETERS	UNIT	BASIS FOR LIMITS	DAILY MAX	MONTHLY AVG.	PREVIOUS PERMIT LIMITS	MINIMUM SAMPLING FREQUENCY	MINIMUM REPORTING FREQUENCY	SAMPLE TYPE
PHYSICAL								
FLOW	MGD	1	*	*	*, *	ONCE/QUARTER	ONCE/QUARTER	24 HR. TOT
CONVENTIONAL								
BOD_5	MG/L	1, 2	45	30	45, 30	ONCE/QUARTER	ONCE/QUARTER	GRAB
E. COLI	#/100 ML	1, 6	*	*	1 - NEW	ONCE/QUARTER	ONCE/MONTH	GRAB
E. COLI	#/100 ML	1, 6	630	126	F - NEW	ONCE/QUARTER	ONCE/MONTH	GRAB
PH ǂ	SU	1, 2	6..0 TO 9.0	6.0 TO 9.0	6.0 TO 9.0	ONCE/QUARTER	ONCE/QUARTER	GRAB
TSS	MG/L	1, 2	45	30	45, 30	ONCE/QUARTER	ONCE/QUARTER	GRAB

* Monitoring requirement only
ǂ The facility will report the minimum and maximum pH values; pH is not to be averaged.

Basis for Limitations Codes:

1. State or Federal Regulation/Law
2. Water Quality Standard (includes RPA)
3. Water Quality Based Effluent Limits
4. Antidegradation Review/Policy
5. Water Quality Model
6. Best Professional Judgment
7. TMDL or Permit in lieu of TMDL
8. WET Test Policy

DERIVATION AND DISCUSSION OF LIMITS:

PHYSICAL:

Flow
In accordance with [40 CFR Part 122.44(i)(1)(ii)] the volume of effluent discharged from each outfall is needed to assure compliance with permitted effluent limitations. If the permittee is unable to obtain effluent flow, then it is the responsibility of the permittee to inform the department, which may require the submittal of an operating permit modification. The facility will report the total flow in millions of gallons per day (MGD).

CONVENTIONAL:

Biochemical Oxygen Demand (BOD_5)
Effluent limitations from the previous state operating permit have been revised. Previous limitations: 45 mg/L weekly average; 30 mg/L monthly average. However, daily maximum and monthly average limitations required per 40 CFR 122.45(d); weekly and monthly averages not applicable as this discharge is not from a POTW [40 CFR 122.45(d)(2)]. Technology based limits from 10 CSR 20-7.015 applied as daily maximum 45 mg/L, monthly average 30 mg/L. Water quality limitations are not applicable at this outfall as this is an internal monitoring point.

Escherichia coli (E. coli)
The facility reported 198 CFU/100 mL at outfall #002, and 10 CFU/100 mL at outfall #006 for fecal coliform. While fecal coliform and *E. coli* measure distinctively different organisms, the permit writer sees them as related. There are no water quality standards for fecal coliform, but there are for *E. coli*. Additionally, there are no recreational uses for Poeling Lake, however, Poeling Lake discharges to backwater chutes of the Mississippi River having recreational uses. Because the discharge is within two miles [10 CSR 20-7.015(9)(B)1.D], the facility must sample for this parameter. By the nature of the discharge, reasonable potential exists. Per 10 CSR 20-7.015(9)(D)6.C. the facility must report daily maximums and monthly averages to the department during recreational season. The recreational season is defined as April 1 through October 31 per 10 CSR 20-7.031 Table A.

Averages are to be the geometric mean should the facility sample more than one time per month. The geometric mean is calculated by multiplying all of the data points and then taking the nth root of this product, where n = # of samples collected. For example: Five *E. coli* samples were collected with results of 1, 4, 5, 6, and 10 (#/100 mL). Geometric mean = 5th root of (1)(4)(5)(6)(10) = 5th root of 1,200 = 4.1 #/100 mL.

The facility is currently not equipped to disinfect. The facility will have a two year schedule of compliance to meet water quality limitations for WBC-A which are 630 #/100 mL daily maximum per 10 CSR 20-7.015(9)(B)1.E. and 126 #/100 mL monthly average per 10 CSR 20-7.031 Table A.

pH
6.0 to 9.0 SU; continued from previous permit. Technology based limits at 10 CSR 20-7.015 are protective as this is an internal monitoring point. The facility will measure and report the minimum and maximum values; pH is not to be averaged. Water quality limitations are not applicable at this outfall for this parameter as this is an internal monitoring point.

Total Suspended Solids (TSS)
Effluent limitations from the previous state operating permit have been revised. Previous limitations: 45 mg/L weekly average; 30 mg/L monthly average. However, daily maximum and monthly average limitations required per 40 CFR 122.45(d); weekly and monthly averages not applicable as this discharge is not from a POTW [40 CFR 122.45(d)(2)]. Technology based limits from 10 CSR 20-7.015 applied as daily maximum 45 mg/L, monthly average 30 mg/L. Water quality limitations are not applicable at this outfall as this is an internal monitoring point.

OUTFALL #003 - EMERGENCY DISCHARGE SUMP

EFFLUENT LIMITATIONS TABLE:

PARAMETERS	UNIT	BASIS FOR LIMITS	DAILY MAX	MONTHLY AVG	PREVIOUS PERMIT LIMITS	MINIMUM SAMPLING FREQUENCY	MINIMUM REPORTING FREQUENCY	SAMPLE TYPE
PHYSICAL								
FLOW	MGD	1	*		SAME	ONCE/DAY/DISCHARGE	¤	24 HR. TOT
CONVENTIONAL								
OIL & GREASE	MG/L	1, 6	*		20, 15	ONCE/DAY/DISCHARGE	¤	GRAB
pH ǂ	SU	1, 6	*		6.0-9.0	ONCE/DAY/DISCHARGE	¤	GRAB
TSS	MG/L	1, 6	*		100, 30	ONCE/DAY/DISCHARGE	¤	GRAB
NUTRIENTS								
NITROGEN, TOTAL N (TN)	mg/L	1	*		NEW	ONCE/DAY/DISCHARGE	¤	GRAB
PHOSPHORUS, TOT. P (TP)	mg/L	1	*		NEW	ONCE/DAY/DISCHARGE	¤	GRAB
OTHER:								
CHLORIDES	MG/L	1, 6	*		NEW	ONCE/DAY/DISCHARGE	¤	GRAB
SULFATES	MG/L	1, 6	*		NEW	ONCE/DAY/DISCHARGE	¤	GRAB
CHLORIDE + SULFATE	MG/L	1, 6	*		NEW	ONCE/DAY/DISCHARGE	¤	GRAB

¤ - The facility must report the analytical findings no more than 30 days from the day of discharge.
ǂ The facility will report the minimum and maximum pH values; pH is not to be averaged.
New – new requirement

Basis for Limitations Codes:
1. State or Federal Regulation/Law
2. Water Quality Standard (includes RPA)
3. Water Quality Based Effluent Limits
4. Antidegradation Review/Policy
5. Water Quality Model
6. Best Professional Judgment
7. TMDL or Permit in lieu of TMDL
8. WET Test Policy

DERIVATION AND DISCUSSION OF LIMITS:

PHYSICAL:

Flow
In accordance with [40 CFR Part 122.44(i)(1)(ii)] the volume of effluent discharged from each outfall is needed to assure compliance with permitted effluent limitations. If the permittee is unable to obtain effluent flow, then it is the responsibility of the permittee to inform the department, which may require the submittal of an operating permit modification. The facility will report the total flow in millions of gallons per day (MGD).

CONVENTIONAL:

Oil & Grease
Sampling required when discharging.

pH
Sampling required when discharging.

Total Suspended Solids (TSS)
Sampling required when discharging.

NUTRIENTS:

Nitrogen, Total N (TN)
Per 10 CSR 20-7.015(9)(D)7, nutrient monitoring shall be instituted on a quarterly basis for facilities with a design flow greater than 0.1 MGD.

Phosphorous, Total P (TN)
Per 10 CSR 20-7.015(9)(D)7, nutrient monitoring shall be instituted on a quarterly basis for facilities with a design flow greater than 0.1 MGD.

OTHER:

Chloride
The facility must sample for chlorides when the emergency discharge structure is discharging.

Sulfate
The facility must sample for sulfate when the emergency discharge structure is discharging.

Chlorides Plus Sulfates
The facility must report sulfate plus chloride when the emergency discharge structure is discharging.

OUTFALL #007 - EMERGENCY DISCHARGE RECYCLE POND

EFFLUENT LIMITATIONS TABLE:

PARAMETERS	UNIT	BASIS FOR LIMITS	DAILY MAX	MONTHLY AVG	PREVIOUS PERMIT LIMITS	MINIMUM SAMPLING FREQUENCY	MINIMUM REPORTING FREQUENCY	SAMPLE TYPE
PHYSICAL								
FLOW	MGD	1	*		NEW	ONCE/DAY/DISCHARGE	◻	24 HR. TOT
CONVENTIONAL								
OIL & GREASE	mg/L	1, 6	*		NEW	ONCE/DAY/DISCHARGE	◻	GRAB
pH ǂ	SU	1, 6	*		NEW	ONCE/DAY/DISCHARGE	◻	GRAB
TSS	mg/L	1, 6	*		NEW	ONCE/DAY/DISCHARGE	◻	GRAB
FGD SCRUBBER WASTES:								
ARSENIC, TOTAL	µg/L	1	*	*	I - NEW	ONCE/DAY/DISCHARGE	◻	GRAB
ARSENIC, TOTAL	µg/L	1	11	8	F - NEW	ONCE/DAY/DISCHARGE	◻	GRAB
MERCURY, TOTAL	ng/L	1	*	*	I - NEW	ONCE/DAY/DISCHARGE	◻	GRAB
MERCURY, TOTAL	ng/L	1	788	356	F - NEW	ONCE/DAY/DISCHARGE	◻	GRAB
SELENIUM, TOTAL	µg/L	1	*	*	I - NEW	ONCE/DAY/DISCHARGE	◻	GRAB
SELENIUM, TOTAL	µg/L	1	23	12	F - NEW	ONCE/DAY/DISCHARGE	◻	GRAB
NITRATE/NITRITE AS N	mg/L	1	*	*	I - NEW	ONCE/DAY/DISCHARGE	◻	GRAB
NITRATE/NITRITE AS N	mg/L	1	17.0	4.4	F - NEW	ONCE/DAY/DISCHARGE	◻	GRAB
NUTRIENTS								
NITROGEN, TOTAL (TN)	mg/L	1	*			ONCE/DAY/DISCHARGE	◻	GRAB
PHOSPHORUS, TOT (TP)	mg/L	1	*			ONCE/DAY/DISCHARGE	◻	GRAB
OTHER								
CHLORIDES	mg/L	1, 6	*		NEW	ONCE/DAY/DISCHARGE	◻	GRAB
SULFATES	mg/L	1, 6	*		NEW	ONCE/DAY/DISCHARGE	◻	GRAB
CHLORIDE + SULFATE	mg/L	1, 6	*		NEW	ONCE/DAY/DISCHARGE	◻	GRAB

◻ - The facility must report the analytical findings no more than 30 days from the day of discharge.
ǂ The facility will report the minimum and maximum pH values; pH is not to be averaged.
New – new requirement
I = interim
F = final

Basis for Limitations Codes:

1. State or Federal Regulation/Law
2. Water Quality Standard (includes RPA)
3. Water Quality Based Effluent Limits
4. Antidegradation Review/Policy
5. Water Quality Model
6. Best Professional Judgment
7. TMDL or Permit in lieu of TMDL
8. WET Test Policy

DERIVATION AND DISCUSSION OF LIMITS:

PHYSICAL:

Flow
In accordance with [40 CFR Part 122.44(i)(1)(ii)] the volume of effluent discharged from each outfall is needed to assure compliance with permitted effluent limitations. If the permittee is unable to obtain effluent flow, then it is the responsibility of the permittee to inform the department, which may require the submittal of an operating permit modification. The facility will report the total flow in millions of gallons per day (MGD).

CONVENTIONAL:

Oil & Grease
Sampling required when discharging.

pH
Sampling required when discharging.

Total Suspended Solids (TSS)
Sampling required when discharging.

FGD SCRUBBER WASTES:

Arsenic, Total Recoverable
BAT requirements begin November 11, 2018: 11 µg/L daily maximum, 8 µg/L monthly average. Missouri water quality standards are 20 µg/L monthly average. The technology based limitations are more protective.

Mercury, Total Recoverable
BAT requirements begin November 11, 2018: 788 nanograms/L (ng/L) [0.788 µg/L] daily maximum, 356 ng/L [0.356 µg/L] monthly average. Missouri water quality standards are 2.4 µg/L daily maximum and 0.5 µg/L monthly average. The technology based limitations are more protective.

Selenium, Total Recoverable
BAT requirements begin November 11, 2018: 23 µg/L daily maximum, 12 µg/L monthly average.

Nitrate plus Nitrite as N
BAT requirements begin November 11, 2018: 17.0 mg/L daily maximum, 4.4 mg/L monthly average. There are no Missouri WQS for surface water for this parameter.

NUTRIENTS:

Nitrogen, Total N (TN)
Per 10 CSR 20-7.015(9)(D)7, nutrient monitoring shall be instituted on a quarterly basis for facilities with a design flow greater than 0.1 MGD.

Phosphorous, Total P (TN)
Per 10 CSR 20-7.015(9)(D)7, nutrient monitoring shall be instituted on a quarterly basis for facilities with a design flow greater than 0.1 MGD.

OTHER:

Chloride
The facility must sample for chlorides when the emergency discharge structure is discharging.

Sulfate
The facility must sample for sulfate when the emergency discharge structure is discharging.

Chlorides Plus Sulfates
The facility must report sulfate plus chloride when the emergency discharge structure is discharging.

Part VI. SAMPLING AND REPORTING REQUIREMENTS

Refer to each outfall's derivation and discussion of limits section to review individual sampling and reporting frequencies and sampling type.

ELECTRONIC DISCHARGE MONITORING REPORT (EDMR) SUBMISSION SYSTEM:
The U.S. Environmental Protection Agency (EPA) promulgated a final rule on October 22, 2015, to modernize Clean Water Act reporting for municipalities, industries, and other facilities by converting to an electronic data reporting system. This final rule requires regulated entities and state and federal regulators to use information technology to electronically report data required by the National Pollutant Discharge Elimination System (NPDES) permit program instead of filing paper reports. To comply with the federal rule, the Department is requiring all permittees to begin submitting discharge monitoring data and reports online.

Per 40 CFR 127.15 and 127.24, permitted facilities may request a temporary waiver for up to 5 years or a permanent waiver from electronic reporting from the Department. To obtain an electronic reporting waiver, a permittee must first submit an eDMR Waiver Request Form: http://dnr.mo.gov/forms/780-2692-f.pdf. A request must be made for each facility. If more than one facility is owned or operated by a single entity, then the entity must submit a separate request for each facility based on its specific circumstances. An approved waiver is non-transferable.

The Department must review and notify the facility within 120 calendar days of receipt if the waiver request has been approved or rejected [40 CFR 124.27(a)]. During the Department review period as well as after a waiver is granted, the facility must continue submitting a hard-copy of any reports required by their permit. The Department will enter data submitted in hard-copy from those facilities allowed to do so and electronically submit the data to the EPA on behalf of the facility.

✓ The permittee/facility is currently using the eDMR data reporting system. See special condition #C.24.

✓ Reporting for Thermal and pH Compliance: The facility will report their findings in the eDMR system. Daily measurements are reported in tabular format as an attachment. The facility will report the day with the highest reading in the "daily max" box for each: stream flow, stream temperature, discharge flow, and discharge temperature at end of mixing zone using the calculations provided in the permit.

PERMIT CONDITION (PARAMETER)	DISCHARGE NO.	MOCWIS PARAM. #	MOCWIS PARAMETER NAME	UNITS	LIMIT
Flow	001 T	50050	Flow, in conduit or thru treatment plant	Mgal/d (MGD)	*
Thermal Discharge	001 T	00015	Thermal discharge million btus per hr.	MBTU/hr	5.5
Effluent Flow (Qe) cfs	001 T	78886	Flow, Process water	ft^3/sec (CFS)	*
Effluent Temperature (Te) °F (monitoring location = end of pipe)	001 T	00011	Temperature, Water, deg. F	°F	*
Stream Flow (Qs) cfs (monitoring location = instream)	001 T	74069	Stream Flow – Estimated ≈	cfs	*
Stream Temperature (Ts) °F (monitoring location = instream)	001 T	52240	Temperature, background	°F	*
ΔT °F	001 T	03772	Temp. Diff between Up/Down stream	°F	5
Temz °F (monitoring location = downstream)	001 T	00011	Temperature, Water, deg. F	°F	varies monthly Ϫ
Time of Deviation – Month Tcap may be exceeded 1% of the time (monthly monitoring)	001 T	82577	Month Excursion Time (Hours)	monthly total and year-to-date total (hours)	*
Tcap may be exceeded 1% of the time (yearly limit)	001 Y	82577	Month Excursion Time (Hours)	annual total (hours)	438 hours

≈ While the limit set parameter name says "estimated" the facility may not estimate stream flow and must use an appropriate gaging station to retrieve stream flow values.
Ϫ The compliance point is listed as the Tdev value for each month as such is the value which shall not be exceeded.

SAMPLING FREQUENCY JUSTIFICATION:
Sampling and reporting frequency was generally retained from previous permit. Daily sampling of thermal discharge is required to coincide with other similar facilities. This facility is sampling for newly identified contaminants of concern at the ash ponds therefore monthly sampling is required to determine if the facility will be in compliance with the operating permit in accordance with Appendix

U of Missouri's Water Pollution Control Permit Manual. Sampling frequency for stormwater-only outfalls is typically quarterly even though BMP inspection occurs monthly. The facility may sample more frequently if they need additional data to determine if their best management practices or technology is performing as expected. 40 CFR 122.45(d)(1) indicates all continuous discharges shall be permitted with daily maximum and monthly average limits.

WET Testing schedules and intervals are established in accordance with the department's Permit Writers Manual; Section 5.2 *Effluent Limits/ WET Testing for Compliance Bio-monitoring.*

Chronic Whole Effluent Toxicity

☒ -No less than **Once/Year:**

☒ -Industrial dischargers with toxic parameters in the discharge; which may alter production processes; or facilities which handle large quantities of toxic substances or substances which are toxic in large amounts shall conduct chronic WET test at a frequency of once per year.
Outfall #001: Once through cooling water - will be performed concurrently of biocide use.
Outfalls #002 and #006: Ash ponds - required yearly.

SAMPLING TYPE JUSTIFICATION:

Sampling type was generally continued from the previous permit. The sampling types are representative of the discharges, and are protective of water quality. Discharges with altering effluent should have composite sampling; discharges with uniform effluent can have grab samples. Grab samples are usually appropriate for stormwater. Parameters which must have grab sampling are: pH, ammonia, *E. coli*, total residual chlorine, free available chlorine, hexavalent chromium, dissolved oxygen, total phosphorus, and volatile organic samples. Composite sampling was changed to grab sampling at outfall #02A to match other sampling types throughout the rest of the permit.

Part VII. ADMINISTRATIVE REQUIREMENTS

On the basis of preliminary staff review and the application of applicable standards and regulations, the Department, as administrative agent for the Missouri Clean Water Commission, proposes to issue a permit(s) subject to certain effluent limitations, schedules, and special conditions contained herein and within the operating permit. The proposed determinations are tentative pending public comment.

PERMIT SYNCHRONIZATION:

The Department of Natural Resources is currently undergoing a synchronization process for operating permits. Permits are normally issued on a five-year term, but to achieve synchronization many permits will need to be issued for less than the full five years allowed by regulation. The intent is all permits within a watershed will move through the Watershed Based Management (WBM) cycle together will all expire in the same fiscal year. http://dnr.mo.gov/env/wpp/cpp/docs/watershed-based-management.pdf. This will allow further streamlining by placing multiple permits within a smaller geographic area on public notice simultaneously, thereby reducing repeated administrative efforts. This will also allow the department to explore a watershed based permitting effort at some point in the future. Renewal applications must continue to be submitted within 180 days of expiration, however, in instances where effluent data from the previous renewal is less than three years old, data may be re-submitted to meet the requirements of the renewal application. If the permit provides a schedule of compliance for meeting new water quality based effluent limits beyond the expiration date of the permit, the time remaining in the schedule of compliance will be allotted in the renewed permit.

✓ *Because of the time required by the permit to conduct studies according to new CWA § 316(b) regulations, the permit will be issued for a full five year term.*

PUBLIC NOTICE:
The Department shall give public notice a draft permit has been prepared and its issuance is pending. http://dnr.mo.gov/env/wpp/permits/pn/index.html Additionally, public notice will be issued if a public hearing is to be held because of a significant degree of interest in and water quality concerns related to a draft permit. No public notice is required when a request for a permit modification or termination is denied; however, the requester and permittee must be notified of the denial in writing. The Department must issue public notice of a pending operating permit or of a new or reissued statewide general permit. The public comment period is the length of time not less than 30 days following the date of the public notice which interested persons may submit written comments about the proposed permit.
For persons wanting to submit comments regarding this proposed operating permit, then please refer to the Public Notice page located at the front of this draft operating permit. The Public Notice page gives direction on how and where to submit appropriate comments.

The first Public Notice period for this operating permit was from 9/2/2016 to 10/3/2016.

PUBLIC NOTICE COMMENTS:

Letter #1

Comment 1
DNR's BAT determination is unlawful. The fact sheet for the draft permit documents the elements that DNR considered as it conducted a TBEL analysis for thermal discharges at Sioux. DNR concluded in its best professional judgment a once through cooling system represents BAT. This is a surprising result given the explicit charge of the CWA to eliminate all polluting discharges as well as the clear instruction that the BAT standard should focus on the best performer in the industry.

DNR's TBEL determination superficially considers the relevant factors while quickly devolving into a misguided cost-benefit analysis contrasting once-through cooling with closed cycle cooling. While DNR is correct to consider the cost of compliance, there exists no legal charge to conduct a cost-benefit analysis. To the contrary, whereas the less protective best practicable control technology currently available (BPT) standard that was in place in the early years of the CWA required a consideration of cost in relation to effluent reduction benefits, the BAT standard simply lists cost among several other factors. Indeed, DNR's fact sheet identifies the proper relationship between cost and benefit as it pertains to various types of analyses. Specifically, the consideration of cost plays a lesser role in conducting BAT determinations than with other analyses. It is perplexing then that DNR proceeds to misapply the BAT requirements.

The fact sheet correctly identified closed-cycle cooling as the most common option available and an established technology that may be feasible for replacing the antiquated once-through cooling systems at Sioux. Aside from admitting that closed cycle cooling would reduce the discharge of heat load in the water –which is legally required solution to Sioux's thermal pollution problem – the remaining purported BAT analysis reads as a list of hurdles to closed-cycle cooling implementation. For instance, DNR states that closed-cycle cooling would increase the consumption of water; it would have a high capital costs and entail the addition of new chemicals, and a new water treatment plant. There is no discussion of the best performing technology applied at Sioux, would remedy the thermal pollution problem. There is no calculation of the extent to which thermal pollution would be reduced or eliminated from outfall #001 by application of alternative technologies. DNR's inappropriate and poorly executed cost analysis is mislabeled a BAT analysis. Regrettably, it is heavy on the purported cost of closed cycle cooling and bereft of its many benefits, it quantifies costs but fails to quantify pollution-reduction benefits, and it does not come close to complying with the CWA.

DNR must set permit limits for outfall #001 based on bona fide assessment of BAT. DNR must issue a revised draft NPDES permit subject to public notice and comment that describes and documents a legally sufficient BAT analysis to reduce thermal pollution from the antiquated once-through cooling system currently employed at Sioux.

Response 1
The permit writer determined the BAT at this time for the facility is once-through cooling. Nowhere in the regulations is a permit writer required to promote closed cycle cooling if it is not warranted at the site. When the facility has completed the required studies in accordance with CWA § 316(b) requirements, the permit writer may make a different conclusion if the facility has contributed to an imbalanced indigenous population of aquatic life.

Comment 2
DNR's four year schedule of compliance is unlawful. As a general rule, the CWA required that discharges comply immediately with all TBELs in furtherance of the statute's goal that all discharges of pollution ultimately be eliminated. EPA's CWA regulations therefore prohibit EPA from granting a discharger a schedule for coming into compliance where the statutory deadline has been passed; even where this is not the case, a compliance schedule cannot be issued when the water quality standards to be met are more than three years old. To obtain such a compliance schedule, the permittee must establish that such a schedule is necessary-that the standard could not otherwise be met- and even then, the permittee must achieve compliance as soon as possible.

DNR has a history of increasing thermal limits at Sioux's outfall #001. The original operating permit included a limit of 109 °F. In 1981, Ameren decided that it could operate Sioux better with a hear rejection limit of 4327.0 x 106 Btu/hr. DNR consented to this request and issued a permit in 1982 with a heat rejection limit of 4.33 x 10^9 Btu/hr. Two permit cycles followed with this same limit, until the limit was raised again in 1992 to 4.6 x 10^9 Btu/hr. In 1999, the thermal limit was elevated once more to 5.50 x 10^9 Btu/hr which remains the current metric.

DNR's fact sheet attempts to justify the schedule of compliance by stating that prior permit limits (and the interim limits in the draft) are stated in Btus/hr while the final permit limits are stated as temperature limits reflecting the applicable water quality standards. However, Sioux's existing permit already requires it to comply with the state's water quality standards. Thus, removing this requirement and replacing it with a four-year extension to come into compliance with water quality standards violates the anti-backsliding requirement of the CWA.

Ameren is a sophisticated utility. It knows what the water quality standards are, it knows how to meet them, and it should already be meeting them. Ameren's NPDES renewal application did not seek an extension and the fact sheet does not specify why the extension is necessary. Simply put, another four-year extension for Sioux to come into compliance with WQS is far too long.

DNR must eliminate the four-year extension for Sioux to meet the already applicable water quality standard.

Response 2
The department has reviewed additional information related to the thermal discharge at the facility and revised the SOC to allow for a two year SOC for thermal compliance. The previous permit's calculations consisted of measuring temperature on the intake condensers and measuring the temperature on the discharge condensers. This is a simple subtraction calculation to determine discharge BTUs.

In December 2016 following a meeting with the permit writer, the facility submitted a request to change the SOC a two year SOC citing that they believe it will take 24 months to design, permit, construct, and validate the instrumentation and procedures to comply with the limitation. This includes the amount of time required to install river and end of pipe monitoring gauges and software which will be used in real-time in the control room to determine compliance with WQS. Currently, the thermocouples installed at the facility measure temperatures which may not accurately represent the actual river temperature and the actual discharge temperature.

In reviewing the previous narrative permit condition which required compliance with the thermal water quality standard (WQS) it is apparent that the department was in error in placing such a condition related to WQS compliance in the permit. 40 CFR 122.44(d)(1)(iii) requires that in instances were reasonable potential (RP) to cause or contribute to an exceedance of a water quality standard exists, a numeric limitation must be included in the permit. The previous permit included a numeric BTU limitation to address the change in river temperature RP. The previous permit did not include a numeric limitation to address RP for the temperature cap. A narrative blanket expression of WQS compliance where RP exists is clearly in conflict of 40 CFR 122.44(d)(1)(iii). For this reason the narrative WQS compliance condition has been removed from the permit. Furthermore the draft permit requires compliance with a numeric temperature cap limitation given RP exists to exceed the temperature cap criteria beyond the allowable mixing zone.

Comment 3
The draft permit fails to eliminate the discharge of fly ash and bottom ash at outfalls #002 and #006.

The fact sheet for the draft permit states that: the newly revised federal Steam Electric Guidelines will require [Sioux] to eliminate the discharge of fly and bottom ash transport water as soon as possible beginning November 1, 2018 but no later than December 31, 2023. Ameren is currently designing wastewater treatment systems to manage the other (non-ash) wastestreams and has engaged DNR in discussions regarding construction and operating permit implications.

Although an accurate partial description of the revised ELGs as applied to Sioux, the fact sheet is unenforceable. The draft permit does not comply with the revised ELGs because they are not incorporated into the permit. The permit must be amended to explicitly incorporate the revised ELGs.

Outfalls #002 and #006 discharge ash transport wastewater. The revised ELG explicitly prohibits discharges of this transport water at Sioux. Although the fact sheet mentions discussions between DNR and Ameren regarding the elimination of fly and bottom ash transport water, the draft permit fails to incorporate both a deadline and a limit. To comply with the revised ELGs, DNR must endure that the final permit explicitly requires the elimination of bottom and fly ash transport water by November 1, 2018.

Response 3
The facility has determined May 1, 2021 or before would be the final sluice date. The date was approved by the department and has been incorporated as special condition #C.23 of the permit.

Comment 4
The draft permit failed to establish limits on FGD wastewater at Sioux. DNR must establish limits on FGD wastewater at outfall #007. Outfall #007 is designated as the emergency overflow from Sioux's no-discharge recycle pond, which includes FGD slurry. Pursuant to the revised ELGs, discharges of FGD wastewater from existing FGD systems are subject to limits for arsenic, mercury, selenium, and nitrogen. Accordingly, any discharges – including during an emergency – must be subject to these limits. Although the fact sheet recognizes that the revised ELGs impose limits on FGD wastewater effective November 1, 2018, the draft permit does not incorporate those limits. To comply with the revised ELGs, DNR must explicitly describe in the final permit the arsenic, mercury, selenium, and nitrogen limits applicable beginning November 1, 2018 at outfall #007.

Response 4
The purpose of the National Pollution Discharge Elimination System (NPDES) program is elimination of all sources of pollutants. By disallowing discharge of this outfall, the department has effectively controlled for the pollutants listed in the effluent limit guideline (ELG) more effectively than allowing discharge with limitations. Regardless, to comply with the spirit of the ELG, the limitations were added to the outfall even though no-discharge is more stringent than numeric effluent limitations.

Letter #2

Comment 1
The draft permit substantially changes the (final) monitoring parameters and methods to be used to assess compliance with Missouri's thermal water quality standards. It contains two provisions regarding the thermal effluent from the Center's once-through cooling water system. The first is the establishment of "interim Effluent Limitations" which continue the existing heat rejection limits for a period of up to four years. This time is provided in conjunction with a requirement that we implement changes necessary to achieve the "Final Effluent Limitations" and monitor compliance with Missouri's thermal water quality standards, applicable to Mississippi River Zone 1B per 10 CSR 20-7.031(5)(D).

The draft permit contains simple dilution formulas to be used to calculate the temperature and change in temperature at the edge of the mixing zone to assess compliance with the final limits. Facing similar criteria in prior draft permits for other Ameren Energy Centers, we raised concerns regarding our ability to maintain compliance (particularly during periods of high demand) when circumstances beyond the facility's control such as when ambient stream temperatures are very close to or exceed the monthly limits specific in the water quality standards.

At this time, we believe the Sioux Energy Center (SEC) will routinely and consistently achieve compliance using the formulas provided in the permit within the normal variability of ambient stream flows and temperatures. However, during extreme conditions our ability to operate could be impacted and in such circumstances Ameren reserves the right to seek a provisional variance from the Agency as provided by Missouri law. In addition, Ameren may seek DNR's approval of alternative measures of compliance including use of site specific thermal plume models, or other mechanisms as may be available. In addition, we may work with the Department to implement an alternative thermal discharge compliance equation, based on modeling that would more precisely calculate the change in temperature (ΔT) and temperature (T_{emz}) at the edge of the mixing zone. Ameren intends to utilize some or all of the time allowed under the interim limits, to develop appropriate monitoring methods and assess challenges posed by extreme ambient conditions as may occur during this period. The required annual report will provide the Department with details regarding compliance with the final outfall #001 limitations.

Response 1
The department does not dictate how the facility is to use the time within the schedule of compliance (SOC), however, the facility must meet the final effluent limitations when required or as soon as possible. The SOC was changed to a two year schedule as outlined in an email dated 12/9/2016.

Comment 2
Ameren believes the annual chronic WET test requirement for outfall #001 (cooling water) as listed on the tables and special condition #19 may not be necessary. Further, the required methods may not yield representative samples of the discharge during the planned molluskicide treatment of the intake bays. During the annual treatment, the intake bays are closed and isolated prior to adding molluskicide. The treatment is completed on a weekend as the plant has to be de-rated. Two air lances provide mixing within the bays. After approximately 8 hours, the intake bays are opened and pumped through the system at near 500,000 gpm. Outfall #001 samples collected following treatment are <0.05 ppm of the product (GE Spectrus CT 1300). Since the intake bay flow rates are extremely high and the molluskicide volumes and concentrations are relatively low, it would be unlikely to collect a representative sample (chronic WETs require multi day grabs) containing residual molluskicide present from outfall #001.

Response 2
The permit writer has considered the method by which molluskicides are used and has changed the type of test from chronic to single-grab acute.

Comment 3
Special condition 12 requires development and implementation of a stormwater pollution prevention plan and provides details regarding the scope and conditions. Under paragraph 13(c) it noted the plan must include a schedule for once per month inspections. We believe this is much more frequent than necessary and would create an administrative burden without commensurate benefits necessary to maintain appropriate controls. We note that SWPPP obligations for recently issued permit for Ameren's Callaway and Labadie Energy Centers, specify quarterly inspections instead. We ask the SEC permit be revised to be consistent with these and allow for a quarterly schedule.

Response 3
The department has determined monthly inspections are necessary for facilities discharging to waters of the state and the standard template language was changed accordingly. With a site as complex as this one, the permit writer has kept the frequency at monthly.

Additionally the following changes have been made to the permit draft since the public notice.

- It was determined the facility's outfall #02A is applicable to *E. coli* limitations because the nature of the discharge infers RP. The facility will have a 2-year SOC to install UV treatment as no treatment currently exists on site for bacteria. This change requires a second public notice.
- Outfall #001 permit table units were changed from mg/L to µg/L for free available chlorine
- Fact sheet permitted features table of flows was changed to add total flow correctly for outfall #006
- Low flow values were recalculated to include the Illinois River
- Weekly averages for domestic wastewater were commuted to daily maximums as only POTWs are afforded this concession.

The second Public Notice period for this operating permit was from 2/20/2017 through 3/20/2017.

One letter was received:

Comment 1
Essentially same as Comment 1 in Letter #2 for PN #1.

Response 1
The department has determined the standard equation is currently representative of this facility's discharge and the facility may submit for review, through permit modification, an alternate equation or modeling to revise the permit conditions.

Comment 2
Special condition #23 has the incorrect date for legacy wastewater.

Response 2
Special condition #23 was edited to reflect the correct legacy wastewater date of May 1, 2021.

Comment 3
The SOC compliance date for outfall #001 was listed as 4 years. Tables A-1, A-2, and fact sheet list the SOC for outfall #001 as 2 years.

Response 3
Typographical errors were corrected regarding the SOC timeframe (changed four to two) in section D of the permit. Public notice is not required as text in section A of the permit and the fact sheet clearly indicate it is a two year SOC.

Comment 4
The facility noted the last sentence of paragraph two on page three of outfall #007's discussion was removed as it was misleading and not entirely correct.

Response 4
The sentence was removed.

Comment 5
The facility noted the fact sheet's section entitled "Ash Impoundment Closures" was not labeled correctly and would be better suited in the ELG compliance section. Also, the dates supplied are tentative (except for the final sluice date).

Response 5
The section entitled "Ash Impoundment Closures" was moved to the ELG compliance section and labeled as tentative. Special condition #23 remains for the final sluice date.

Additionally the following changes have been made to the permit draft since the public notice.

- Outfall #007 fact sheet Effluent Limitations Table –total recoverable selenium; changed to reflect ELG values as WQ RP not established. Effluent limitation table A-8 for outfall #007 was correct.
- A section was added under "Part VI: Sampling and Reporting Requirements" to assist the permittee is entering the required information into eDMR.

None of these changes require an additional public notice.

DATE OF FACT SHEET: MARCH 21, 2017
COMPLETED BY:
PAM HACKLER, ENVIRONMENTAL SCIENTIST
MISSOURI DEPARTMENT OF NATURAL RESOURCES
WATER PROTECTION PROGRAM
OPERATING PERMITS SECTION - INDUSTRIAL UNIT
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Eric J. Holcomb
Governor

Bruno Pigott
Commissioner

VIA ELECTRONIC MAIL March 28, 2017

Mr. Wayne Games, VP of Power Supply
SIGECO F.B. Culley Generating Station
P.O. Box 209
Evansville, IN 47702

Dear Mr. Games:

Re: Final Permit No. IN0002259
SIGECO F.B. Culley Generating Station
Newburgh, IN Warrick County

Your application for a National Pollutant Discharge Elimination System (NPDES) permit for authorization to discharge into the waters of the State of Indiana has been processed in accordance with Section 402 and 405 of the Federal Water Pollution Control Act, as amended (33 U.S.C. 1251, et seq.), and IC 13-15, IDEM's permitting authority. All discharges from this facility shall be consistent with the terms and conditions of this permit.

One condition of your permit requires periodic reporting of several effluent parameters. You are required to submit both federal discharge monitoring reports (DMRs) and state Monthly Monitoring Reports (MMRs) on a routine basis. The MMR form can be found on IDEM's web site at http://www.in.gov/idem/cleanwater/2396.htm.

Once you are on this page, select the "IDEM Forms" page and locate the "Monthly Monitoring Report (MMR) for Industrial Discharge Permits-30530" under the Wastewater Facilities heading. We recommend selecting the "XLS" version because it will complete all of the calculations when you enter the data.

All NPDES permit holders are required to submit their monitoring data to IDEM using NetDMR. Please contact Rose McDaniel at (317) 233-2653 or Helen Demmings at (317) 232-8815 if you would like more information on NetDMR. Information is also available on our website at http://IN.gov/idem/cleanwater/2422.htm.

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 subject the permittee to criminal or civil penalties. (See Part II A.2.) It is therefore urged that your office and treatment operator understand this part of the permit.

A response to the comments contained in the letters dated January 12, 2017, from Tony Mendoza of the Sierra Club and February 13, 2017 from Angela Casbon-Scheller of Vectren Corporation, pertaining to the draft NPDES permit is contained in the Post Public Notice Addendum. The Post Public Notice Addendum is located at the end of the Fact Sheet.

It should also be noted that any 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 filing a petition for administrative review with the Office of Environmental Adjudication (OEA) within fifteen (15) days of the emailing of an electronic copy of this letter or within eighteen (18) days of the mailing of this letter by filing at the following addresses:

Director
Office of Environmental Adjudication
Indiana Government Center North
Room 501
100 North Senate Avenue
Indianapolis, Indiana 46204

Commissioner
Indiana Department of Environmental Management
Indiana Government Center North
Room 1301
100 North Senate Avenue
Indianapolis, Indiana 46204

If you have any questions concerning the permit, please contact Jennifer Carlino at 317/232-8702 or Jcarlino@idem.in.gov. Questions concerning appeal procedures should be directed to the Office of Environmental Adjudication, at 317/232-8591.

Sincerely,

Paul Novak

Paul Novak, Chief
Permits Branch
Office of Water Quality

Enclosures
cc: U.S. EPA, Region V
Warrick County Health Department
Lisa Messinger, Vectren Corporation
Angela Casbon-Scheller, Vectren Corporation

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"), and IDEM's authority under IC 13-15,

VECTREN CORPORATION
SIGECO F.B. CULLEY GENERATING STATION

is authorized to discharge from the steam electric generating facility that is located at 3700 Darlington Road in Newburgh, Indiana, to receiving waters identified as the Ohio River in accordance with effluent limitations, monitoring requirements, and other conditions set forth in Parts I, I, III and IV hereof. This permit may be revoked for the nonpayment of applicable fees in accordance with IC 13-18-20.

Effective Date: May 1, 2017

Expiration Date: April 30, 2022

In order to receive authorization to discharge beyond the date of expiration, the permittee shall submit such information and forms as are required by the Indiana Department of Environmental Management no later than 180 days prior to the date of expiration.

Issued March 28, 2017, for the Indiana Department of Environmental Management.

Paul Novak, Chief
Permits Branch
Office of Water Quality

PART I

A. EFFLUENT LIMITATIONS AND MONITORING REQUIREMENTS

1. The permittee is authorized to discharge in accordance with the terms and conditions of this permit from Outfall 001[2]. The discharge is limited to condenser cooling water and ash pond discharge from internal outfalls 101 and 201 and stormwater. Samples taken in compliance with the monitoring requirements below shall be taken at a point representative of the discharge but prior to entry into the Ohio River. Such discharge shall be limited and monitored by the permittee as specified below:

DISCHARGE LIMITATIONS [4, 10]
Outfall 001
Table 1

	Quantity or Loading			Quality or Concentration			Monitoring Requirements	
Parameter	Monthly Average	Daily Maximum	Units	Monthly Average	Daily Maximum	Units	Measurement Frequency	Sample Type
Flow[11]	Report	Report	MGD	-	-	-	1 X Day	Continuous
TRO[8]	-	-	-	-	0.06	mg/l	1X Day	Grab
Chlorination/Bromination[12, 13]								
Frequency	-	-	-	-	4	Times/day	1 X Day	Report
Duration	-	-	-	-	40	Minutes/Dose	1 X Day	Report
Plant Capacity Factor (% of Total Capacity)			-	Report	-	% Daily Avg.	1 X Day	Report
Temperature [3]								
Intake	-	-	-	Report	Report	°F	1 X Hour	Grab
Effluent	-	-	-	Report	Report	°F	1 X Hour	Grab
Mixed River [9]	-	-	-	Report	Report	°F	1 X Day	Report
Mercury [1, 5, 7]	-	-	-	12	20	ng/l	1 X Bi-Monthly	Grab
Arsenic [1, 5]	-	-	-	Report	Report	mg/l	1 X Month	24 Hr. Comp.
Cadmium [1]	-	-	-	2.1	4.2	ug/l	2 X Month	24 Hr. Comp.
Selenium [1, 5]	-	-	-	Report	Report	mg/l	1 X Month	24 Hr. Comp.
Nickel [1]	-	-	-	Report	Report	mg/l	1 X Month	24 Hr. Comp.
Aluminum [1]	-	-	-	Report	Report	mg/l	1 X Month	24 Hr. Comp.
Silver [1,5]	-	-	-	Report	Report	ug/l	2 X Month	24 Hr. Comp.
Zinc [1]	-	-	-	Report	Report	mg/l	1 X Month	24 Hr. Comp.
Free Cyanide [5, 6]	-	-	-	Report	Report	mg/l	1 X Month	Grab
Sulfate	-	-	-	Report	Report	mg/l	2 X Month	24 Hr. Comp.
Copper [1][14]								
Interim	-	-	-	Report	Report	ug/l	2 X Month	24 Hr. Comp.
Final	-	-	-	31	63	ug/l	2 X Month	24 Hr. Comp.
Iron [1]	-	-	-	Report	Report	mg/l	2 X Month	24 Hr. Comp.
Boron	-	-	-	Report	Report	mg/l	1 X Quarterly[15]	Grab
Chloride	-	-	-	Report	Report	mg/l	1 X Quarterly[15]	Grab
Fluoride	-	-	-	Report	Report	mg/l	1 X Quarterly[15]	Grab
Bromide	-	-	-	Report	Report	mg/l	1 X Quarterly[15]	Grab

Table 2

Parameter	Quality or Concentration Daily Minimum	Daily Maximum	Units	Monitoring Requirements Measurement Frequency	Sample Type
pH	6.0	9.0	s.u.	1 X Month	Grab

[1] The permittee shall measure and report the identified metal in total recoverable form.

[2] Beginning December 31, 2020, there shall be no discharge of pollutants in bottom ash transport water from Unit 3. Beginning December 31, 2023, there shall be no discharge of pollutants in bottom ash transport water from Unit 2.

Beginning November 1, 2018, there shall be no discharge of pollutants in fly ash transport water.

[3] Temperature shall be monitored and measurements recorded every hour. The highest single recorded measurement for each day shall be reported on the state monthly monitoring report for each day. The highest single recorded daily measurement shall be reported on the federal discharge monitoring report as the maximum daily temperature for that month.

[4] See Part I.B. of the permit for the Narrative Water Quality Standards.

[5]

Parameter	Test Method	LOD	LOQ
Mercury	1631, Revision E	0.2 ng/l	0.5 ng/l
Arsenic	3113B	1 ug/l	3.2 ug/l
Arsenic	200.9	0.5 ug/l	1.6 ug/l
Arsenic	200.8	0.4 ug/l	1.3 ug/l
Selenium	3113B or 3114B	2 ug/l	6.4 ug/l
Selenium	200.8	2.1 ug/l	6.7 ug/l
Selenium	200.9	0.6 ug/l	1.9 ug/l
Cyanide, Free	4500-CN-G	5 ug/l	16 ug/l
Cyanide, Free	1677	0.5 ug/l	1.6 ug/l
Silver	3113B or 272.2	0.2 ug/l	0.64
Silver	200.8 (Rev. 5.4	0.001 ug/l	1.0 ug/l

[6] Sample preservation procedures and maximum allowable holding times for total cyanide, or available (free) cyanide are prescribed in Table II of 40 CFR Part 136. Note the footnotes specific to cyanide. Preservation and holding time information in Table II takes precedence over information in specific methods or elsewhere.

[7] Mercury monitoring shall be conducted bi-monthly in the months of February, April, June, August, October, and December of each year for the term of the permit using

EPA Test Method 1631, Revision E. Alternative methods may be used if first approved by IDEM.

[8] The monitoring requirements and effluent limitations for Total Residual Oxidants (TRO) will apply at any time chlorine or bromine is used and may be in the discharge. Use the test methods for Total Residual Chlorine to determine Total Residual Oxidants. At present, two test methods are considered to be acceptable to IDEM, amperometric (4500-Cl-D,E) and DPD colorimetric method (4500-Cl-G), to determine TRO concentrations at the level of 0.06 mg/l. If another EPA test method is to be used, the method must first be approved by this Department.

[9] The discharge from Outfall 001, as determined at the edge of the mixing zone described in 327 IAC 2-1-4, shall not exceed the maximum limits in the following table more than one percent (1%) of the hours in the twelve (12) month period ending with any month. At no time shall the water temperature at such locations exceed the maximum limits in the following table by more than three degrees Fahrenheit (3°F) (one and seven-tenths degrees Celsius (1.7°C)).

Table 1

	Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec
°F	50	50	60	70	80	87	89	89	87	78	70	57
°C	10	10	15.6	21.1	26.7	30.6	31.7	31.7	30.7	25.6	21.1	14

The permittee will have the option of either meeting the above limits at the end of pipe, or by meeting the limits with a mixed river temperature that takes into account the mixing zone allowed by 327 IAC 2-1-6(b). The mixed river temperature is to be determined by employing the following mathematical model:

$$T_{MR} = T_u + \frac{Q_e(T_e - T_u)}{3553}$$

Where:

T_{MR} = mixed river temperature (°F)
T_u = upstream river temperature (°F)
T_e = effluent temperature (°F)
Q_e = effluent flow (MGD)
3553 = one-half of the $Q_{7,10}$ low flow value of the receiving stream in MGD

[10] See Part III of the permit for additional requirements.

[11] Flow is to be measured continuously using a flow measuring device. The permittee may use engineering calculations to measure flow as approved by the commissioner.

[12] Chlorination/Bromination reporting requirements for frequency, duration and duration/day apply when the facility is chlorinating/brominating.

[13] During intermittent treatment, compliance monitoring samples will be collected 1 X Day, 15 minutes after initial injection of treatment chemicals. This will result in one sample collected during intermittent treatment conducted during the work week (Monday – Friday).

[14] The permittee has a 3 year schedule of compliance as outlined in Part I.F. in which to meet the final effluent limitations for Copper.

[15] Samples shall be taken once at any time during each of the four annual quarters:

(A) January-February-March;
(B) April-May-June;
(C) July-August-September; and
(D) October-November-December.

For quarterly monitoring, in the first quarter for example, 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.

2. The permittee is authorized to discharge in accordance with the terms and conditions of this permit from Outfalls 101. The discharge is limited to discharge from the West Ash Pond. Samples taken in compliance with the monitoring requirements below shall be taken at a point representative of the discharge but prior to mixing with any other wastestreams. Such discharge shall be limited and monitored by the permittee as specified below:

DISCHARGE LIMITATIONS [1, 3, 4]
Internal Outfalls 101

Table 1

	Quantity or Loading			Quality or Concentration			Monitoring	Requirements
Parameter	Monthly Average	Daily Maximum	Units	Monthly Average	Daily Maximum	Units	Measurement Frequency	Sample Type
Flow	Report	Report	MGD	-	-	-	1 X Day	24 Hr. Total
Oil & Grease[2]	-	-	-	15	20	mg/l	1 X Week	Grab
TSS[2]	-	-	-	30	70	mg/l	1 X Week	Grab

Table 2

	Quality or Concentration			Monitoring	Requirements
Parameter	Daily Minimum	Daily Maximum	Units	Measurement Frequency	Sample Type
pH	6.0	9.0	s.u.	1 X Day	Grab

[1] See Part III of the permit for additional requirements.

[2] With the next permit renewal application, the permittee is required to submit flow data for all regulated, non-regulated, and dilution wastestreams and the concentration of the selected parameters contributed by each of these wastestreams for use in developing alternate limitations using the combined wastestream formula (CWF). At the next permit renewal limits will be developed using either the combined wastestream formula or by establishing internal outfalls for determining compliance with 40 CFR 423.

[3] Monitoring at Internal Outfall 101 is only required when a the outfall is discharging to the discharge tunnel which leads to Outfall 001.

[4] The West Ash Pond ceased receiving bottom ash, fly ash and FGD wastewater in October 2015.

3. The permittee is authorized to discharge in accordance with the terms and conditions of this permit from Outfall 201. The discharge is limited to discharge from the East Ash Pond. Samples taken in compliance with the monitoring requirements below shall be taken at a point representative of the discharge but prior to mixing with any other wastestreams. Such discharge shall be limited and monitored by the permittee as specified below:

DISCHARGE LIMITATIONS [2, 4, 6, 7]
Internal Outfalls 201

Table 1

	Quantity or Loading			Quality or Concentration			Monitoring	Requirements
Parameter	Monthly Average	Daily Maximum	Units	Monthly Average	Daily Maximum	Units	Measurement Frequency	Sample Type
Flow	Report	Report	MGD	-	-	-	1 X Day	24 Hr. Total
Oil & Grease[5]	-	-	-	15	20	mg/l	1 X Week	Grab
TSS[5]	-	-	-	30	70	mg/l	1 X Week	Grab
Copper [1,3,5]	-	-	-	-	0.2	mg/l	1 X Day	24 Hr. Comp.
Iron [1,3,5, 8]	-	-	-	1.0	1.0	mg/l	1 X Day	24 Hr. Comp.

Table 2

	Quality or Concentration			Monitoring	Requirements
Parameter	Daily Minimum	Daily Maximum	Units	Measurement Frequency	Sample Type
pH	6.0	9.0	s.u.	1 X Day	Grab

[1] The permittee shall measure and report the identified metal in total recoverable form.

[2] See Part III of the permit for additional requirements.

[3] These limitations and monitoring requirements apply only during discharge of metal cleaning wastes.

[4] Monitoring at Internal Outfall 201 is only required when the outfall is discharging to the discharge tunnel which leads to Outfall 001.

[5] With the next permit renewal application, the permittee is required to submit flow data for all regulated, non-regulated, and dilution wastestreams and the concentration of the selected parameters contributed by each of these wastestreams for use in developing alternate limitations using the combined wastestream formula (CWF). At the next permit renewal limits

will be developed using either the combined wastestream formula or by establishing internal outfalls for determining compliance with 40 CFR 423.

[6] Beginning December 31, 2020, there shall be no discharge of pollutants in bottom ash transport water from Unit 3. Beginning December 31, 2023, there shall be no discharge of pollutants in bottom ash transport water from Unit 2.

[7] Beginning November 1, 2018, there shall be no discharge of pollutants in fly ash transport water.

[8] Net limits may apply. Net limitations are to be calculated by subtracting the measured background levels of these parameters in the ash pond from the actual measured concentrations of these parameters when limitations apply. These background levels are to be calculated by monitoring the ash pond effluent concentrations of Iron and Copper over a period of time, to consist of a minimum of ten samples taken over a minimum of thirty (30) days when there is no discharge of metal cleaning wastes during a period that is a least 30 days but not to exceed 90 days preceding each discharge of metal cleaning wastes. The background levels demonstrated by this monitoring, along with supporting data are to be submitted with monthly Discharge Monitoring Reports (DMR) when reporting discharge of metal cleaning wastes. A new database shall be established in the quarter preceding each subsequent discharge of metal cleaning wastes.

4. The permittee is authorized to discharge in accordance with the terms and conditions of this permit from Outfall 301. The discharge is limited to FGD WWTP discharge. Samples taken in compliance with the monitoring requirements below shall be taken prior to entry into the Unit #3 (East) Ash Pond. Such discharge shall be limited and monitored by the permittee as specified below:

DISCHARGE LIMITATIONS [5][6]
Internal Outfall 301

Table 1

	Quantity or Loading			Quality or Concentration			Monitoring Requirements	
Parameter	Monthly Average	Daily Maximum	Units	Monthly Average	Daily Maximum	Units	Measurement Frequency	Sample Type
Flow	Report	Report	MGD	-	-	-	1 X Day	24 Hr. Total
TSS	-	-	-	30	100	mg/l	2 X Month	24 Hr. Comp.
Arsenic [1, 3]								
Interim	-	-	-	Report	Report	ug/l	2 X Month	Grab
Final[4]	-	-	-	8.0	11.0	ug/l	2 X Month	Grab
Mercury[1, 2, 3]								
Interim	-	-	-	Report	Report	ng/l	6 X Year	Grab
Final[4]	-	-	-	356	788	ng/l	6 X Year	Grab
Selenium [1]								
Interim	-	-	-	Report	Report	ug/l	2 X Month	Grab
Final[4]	-	-	-	12.0	23.0	ug/l	2 X Month	Grab
Nitrate/Nitrite as N								
Interim	-	-	-	Report	Report	mg/l	2 X Month	Grab
Final[4]	-	-	-	4.4	17.0	mg/l	2 X Month	Grab

Table 2

	Quality or Concentration			Monitoring Requirements	
Parameter	Daily Minimum	Daily Maximum	Units	Measurement Frequency	Sample Type
pH	6.0	9.0	s.u.	2 X Month	Grab

[1] The permittee shall measure and report the identified metals as total recoverable metals.

[2] Mercury monitoring shall be conducted bi-monthly (every other month) in the months of February, April, June, August, October, and December of each year for the term of the permit from the effective date of this permit using EPA Test Method 1631, Revision E.

[3] The following EPA test methods and/or Standard Methods and associated LODs and LOQs are to be used in the analysis of the effluent samples. Alternative methods may be used if first approved by IDEM.

Parameter	Test Method	LOD	LOQ
Mercury	1631, Revision E	0.2 ng/l	0.5 ng/l
Arsenic	3113B	1 ug/l	3.2 ug/l
Arsenic	200.9	0.5 ug/l	1.6 ug/l
Arsenic	200.8	0.4 ug/l	1.3 ug/l

[4] No later than February 1, 2021, discharge of FGD waste water shall meet the limits in Table 1 as noted above.

[5] See Part III. A and Part III. B of the permit for additional requirements.

[6] See Permit Part I.G. for a Reopener Clause related to FGD Discharge.

4. The permittee is authorized to discharge in accordance with the terms and conditions of this permit from Outfall 004. The discharge is limited to sanitary wastewater from the sanitary wastewater treatment plant. Samples taken in compliance with the monitoring requirements below shall be taken at a point representative of the discharge but prior to entry into the Ohio River. Such discharge shall be limited and monitored by the permittee as specified below:

DISCHARGE LIMITATIONS [4, 5]
Outfall 004

Table 1

	Quantity or Loading			Quality or Concentration			Monitoring	Requirements
Parameter	Monthly Average	Daily Maximum	Units	Monthly Average	Daily Maximum	Units	Measurement Frequency	Sample Type
Flow	Report	Report	MGD	-	-	-	2 X Month	24 Hr. Total
TSS	-	-	-	30	45	mg/l	2 X Month	Grab
TBOD5	-	-	-	Report	45	mg/l	2 X Month	24 Hr. Comp.
E. coli [1]	-	-	-	125 [2]	235 [3]	count/100 ml	2 X Month	Grab

Table 2

	Quality or Concentration			Monitoring	Requirements
Parameter	Daily Minimum	Daily Maximum	Units	Measurement Frequency	Sample Type
pH	6.0	9.0	s.u.	2 X Month	Grab

[1] 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

[2] 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.

[3] 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.

[4] See Part III. A and Part III. B of the permit for additional requirements.

[5] See Part I.B. of the permit for the Narrative Water Quality Standards.

5. The permittee is required to collect intake water samples in conjunction with certain discharge samples. The intake structure is designated as 000 on the Discharge Monitoring Report (DMR) forms. Samples taken in compliance with the monitoring requirements below shall be taken at a point representative of the intake water characteristics. Such samples shall be monitored by the permittee as specified below:

DISCHARGE LIMITATIONS

Intake Structure 000

Table 1

	Quantity or Loading			Quality or Concentration			Monitoring Requirements	
Parameter[1]	Monthly Average	Daily Maximum	Units	Monthly Average	Daily Maximum	Units	Measurement Frequency	Sample Type
Mercury[2]	-	-	-	Report	Report	ng/l	1 X Monthly	Grab
Arsenic[2]	-	-	-	Report	Report	mg/l	1 X Monthly	24 Hr. Comp.
Cadmium	-	-	-	Report	Report	ug/l	1 X Monthly	24 Hr. Comp.
Selenium[2]	-	-	-	Report	Report	mg/l	1 X Monthly	24 Hr. Comp.
Nickel	-	-	-	Report	Report	mg/l	1 X Monthly	24 Hr. Comp.
Aluminum	-	-	-	Report	Report	mg/l	1 X Monthly	24 Hr. Comp.
Silver[2]	-	-	-	Report	Report	ug/l	1 X Monthly	24 Hr. Comp.
Zinc	-	-	-	Report	Report	mg/l	1 X Monthly	24 Hr. Comp.
Copper	-	-	-	Report	Report	ug/l	1 X Monthly	24 Hr. Comp.
Iron	-	-	-	Report	Report	mg/l	1 X Monthly	24 Hr. Comp.

[1] The permittee shall measure and report the identified metal in total recoverable form.

[2]

Parameter	Test Method	LOD	LOQ
Mercury	1631, Revision E	0.2 ng/l	0.5 ng/l
Arsenic	3113B	1 ug/l	3.2 ug/l
Arsenic	200.9	0.5 ug/l	1.6 ug/l
Arsenic	200.8	0.4 ug/l	1.3 ug/l
Selenium	3113B or 3114B	2 ug/l	6.4 ug/l
Selenium	200.8	2.1 ug/l	6.7 ug/l
Selenium	200.9	0.6 ug/l	1.9 ug/l
Silver	3113B or 272.2	0.2 ug/l	0.64
Silver	200.8 (Rev. 5.4	0.001 ug/l	1.0 ug/l

B. NARRATIVE WATER QUALITY STANDARDS

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

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

   a. which will settle to form putrescent, or otherwise objectionable deposits;

   b. which are in amounts sufficient to be unsightly or deleterious;

   c. which produce color, visible oil sheen, odor, or other conditions in such degree as to create a nuisance;

   d. which are in amounts sufficient to be acutely toxic to, or to 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. 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. Monthly Reporting

   The permittee shall submit monitoring reports to the Indiana Department of Environmental Management (IDEM) containing results obtained during the

previous month and shall be submitted 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 month in which the permit becomes effective. These reports shall include, but not necessarily be limited to, the Discharge Monitoring Report (DMR) and the Monthly Monitoring Report (MMR). All reports shall be submitted electronically by using the NetDMR application, upon registration, receipt of the NetDMR Subscriber Agreement, and IDEM approval of the proposed NetDMR Signatory. The NetDMR website (for initial registration and monthly DMR/MMR submittal) is: https://netdmr.epa.gov/netdmr/public/home.htm. 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. Calculations that require averaging of measurements of daily values (both concentrations and mass) shall use an arithmetic mean, except the monthly average for *E. coli* shall be calculated as a geometric mean.

b. Daily effluent values (both mass and concentration) that are less than the LOQ that are used to determine the monthly average effluent level shall be accommodated in calculation of the average using statistical methods that have been approved by the Commissioner.

c. Effluent concentrations less than the LOD shall be reported on the Discharge Monitoring Report (DMR) forms as < (less than) the value of the LOD. For example, if a substance is not detected at a concentration of 0.1 µg/l, report the value as <0.1 µg/l.

d. Effluent concentrations greater than or equal to the LOD and less than the LOQ that are reported on a DMR shall be reported as the actual value and annotated on the DMR to indicate that the value is not quantifiable.

e. Mass discharge values which are calculated from concentrations reported as less than the value of the limit of detection shall be reported as less than the corresponding mass discharge value.

f. Mass discharge values that are calculated from effluent concentrations greater than the limit of detection shall be reported as the calculated value.

3. Definitions

a. "Monthly Average" 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.

b. "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 reasonably represents the calendar day for the purposes of sampling.

c. "Daily Maximum" means the maximum allowable daily discharge for any calendar day.

d. A "24-hour composite sample" means a sample consisting of at least 3 individual flow-proportioned samples of wastewater, taken by the grab sample method or by an automatic sampler, which are taken at approximately equally spaced time intervals for the duration of the discharge within a 24-hour period and which are combined prior to analysis. A flow-proportioned composite sample may be obtained by:

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

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

(3) the discharge flow rate of each individual sampling time is divided by the total flow value to determine its percentage of the total flow value,

(4) then multiply 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.

e. "Concentration" means the weight of any given material present in a unit volume of liquid. Unless otherwise indicated in this permit, concentration values shall be expressed in milligrams per liter (mg/l).

f. The "Regional Administrator" is defined as the Region 5 Administrator, U.S. EPA, located at 77 West Jackson Boulevard, Chicago, Illinois 60604.

g. The "Commissioner" is defined as the Commissioner of the Indiana Department of Environmental Management, which is located at the following address: 100 North Senate Avenue, Indianapolis, Indiana 46204.

h. "Limit of Detection" or "LOD" means 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.

i. "Limit of Quantitation" or "LOQ" means a measurement of the concentration of a contaminant obtained by using a specified laboratory procedure calibrated at a specified concentration above 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 sometimes called limit of quantification or quantification level.

j. "Method Detection Level" or "MDL" means 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 procedure set forth in 40 CFR 136, Appendix B. The method detection level or MDL is equivalent to the LOD.

k. "Grab Sample" means a sample which is taken from a wastestream on a one-time basis without consideration of the flow rate of the wastestream and without considerations of time.

4. Test Procedures

The analytical and sampling methods used shall conform to the current version of 40 CFR 136. 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 Commissioner 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, Parts 23, Water; Atmosphere 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.

5. Recording of Results

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

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

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

c. The date(s) and time(s) analyses were performed;

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

e. The analytical techniques or methods used; and

f. The results of such measurements and analyses.

6. 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 this monitoring shall be included in the calculation and reporting of the values required in the monthly Discharge Monitoring Report (DMR) and Monthly Monitoring Report (MMR). Such increased frequency shall also be indicated. Other monitoring data not specifically required in this permit (such as internal process or internal waste stream data) which is collected by or for the permittee need not be submitted unless requested by the Commissioner.

7. 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 years 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.

D. STORM WATER MONITORING AND NON-NUMERIC EFFLUENT LIMITS

Within twelve (12) months of the effective date of this permit, the permittee shall implement the non-numeric permit conditions in this Section of the permit for the entire site as it relates to storm water associated with industrial activity regardless which outfall the storm water is discharged from.

1. Control Measures and Effluent Limits

In the non-numeric_technology-based limits included in Part D.2-4., the term "minimize" means reduce and/or eliminate to the extent achievable using control measures (including best management practices) that are technologically available and economically practicable and achievable in light of best industry practice.

2. Control Measures

Select, design, install, and implement control measures (including best management practices) to minimize pollutant discharges that address the selection and design considerations in Part D.3 to meet the non-numeric effluent limits in Part D.4. The selection, design, installation, and implementation of these control measures must be in accordance with good engineering practices and manufacturer's specifications. Any deviation from the manufacturer's specifications shall be documented. If the control measures are not achieving their intended effect in minimizing pollutant discharges, the control measures must be modified as in accordance with the corrective action requirements in Part I.D.6. Regulated storm water discharges from the facility include storm water run-on that commingles with storm water discharges associated with industrial activity at the facility.

3. Control Measure Selection and Design Considerations

When selecting and designing control measures consider the following:

a. preventing storm water from coming into contact with polluting materials is generally more effective, and cost-effective, than trying to remove pollutants from storm water;

b. use of control measures in combination may be more effective than use of control measures in isolation for minimizing pollutants in storm water discharge;

c. assessing the type and quantity of pollutants, including their potential to impact receiving water quality, is critical to designing effective control measures that will achieve the limits in this permit;

d. minimizing impervious areas at the facility and infiltrating runoff onsite (including bioretention cells, green roofs, and pervious pavement, among other approaches), can reduce runoff and improve groundwater recharge and stream base flows in local streams, although care must be taken to avoid ground water contamination;

e. flow can be attenuated by use of open vegetated swales and natural depressions to reduce in-stream impacts of erosive flow;

f. conservation and/or restoration of riparian buffers will help protect streams from storm water runoff and improve water quality; and

g. use of treatment interceptors (e.g. swirl separators and sand filters) may be appropriate in some instances to minimize the discharge of pollutants.

4. Technology-Based Effluent Limits (BPT/BAT/BCT): Non-Numeric Effluent Limits

a. Minimize Exposure

Minimize the exposure of manufacturing, processing, and material storage areas (including loading and unloading, storage, disposal, cleaning, maintenance, and fueling operations) to rain, snow, snowmelt, and runoff. To the extent technologically available and economically practicable and achievable, either locate industrial materials and activities inside or protect them with storm resistant coverings in order to minimize exposure to rain, snow, snowmelt, and runoff (although significant enlargement of impervious surface area is not recommended). In minimizing exposure, pay particular attention to the following areas:

Loading and unloading areas: locate in roofed or covered areas where feasible; use grading, berming, or curbing around the loading area to divert run-on; locate the loading and unloading equipment and vehicles so that leaks are contained in existing containment and flow diversion systems.

Material storage areas: locate indoors, or in roofed or covered areas where feasible; install berms/dikes around these areas; use dry cleanup methods.

Note: Industrial materials do not need to be enclosed or covered if storm water runoff from affected areas will not be discharged to receiving waters.

b. Good Housekeeping

Keep clean all exposed areas that are potential sources of pollutants, using such measures as sweeping at regular intervals, store materials in appropriate containers, identify and control all on-site sources of dust to minimize stormwater contamination from the deposition of dust on areas exposed to precipitation, keep all dumpsters under cover or fit with a lid that must remain closed when not in use, and ensure that waste, garbage, and floatable debris are not discharged to receiving waters by keeping exposed areas free of such materials or by intercepting them before they are discharged.

Implement a cleaning and maintenance program for all impervious areas of the facility where particulate matter, dust or debris may accumulate to minimize the discharge of pollutants in stormwater. The cleaning and maintenance program must encompass, as appropriate, areas where material loading and unloading, storage, handling and processing occur.

Stabilize unpaved areas using vegetation or paving where there is vehicle traffic or where material loading and unloading, storage, handling and processing occurs, unless feasible.

For paved areas of the facility where particulate matter, dust or debris may accumulate, to minimize the discharge of pollutants in stormwater, implement control measures such as the following, where determined to be feasible (list not exclusive): sweeping or vacuuming at regular intervals; and washing down the area and collecting and/or treating and properly disposing of the washdown water. For unstabilized areas or for stabilized areas where sweeping, vacuuming, or washing down is not possible, to minimize the discharge of particulate matter, dust, or debris or other pollutants in stormwater, implement stormwater management devices such as the following, where determined to be feasible (list not exclusive): sediment traps, vegetative buffer strips, filter fabric fence, sediment filtering boom, gravel outlet protection, and other equivalent measures that effectively trap or remove sediment.

Fugitive Dust Emissions. Minimize fugitive dust emissions from coal handling areas to minimize the tracking of coal dust offsite that could be discharged in stormwater through implementation of control measures such as the following, where determined to be feasible, (list not exclusive): installing specially designed tires; and washing vehicles in a designated area before they leave the site and controlling the wash water.

Delivery Vehicles. Minimize contamination of stormwater runoff from delivery vehicles arriving at the plant site. Implement procedures to inspect delivery vehicles arriving at the plant site as necessary to minimize discharges of pollutants in stormwater. Ensure the overall integrity of the body or container of the delivery vehicle and implement procedures to deal with leakage or spillage from delivery vehicles.

Fuel Oil Unloading Areas. Minimize contamination of precipitation or surface runoff from fuel oil unloading areas. Use containment curbs in unloading areas where feasible. In addition, ensure personnel familiar with spill prevention and response procedures are available to respond expeditiously in the event of a leak or spill during deliveries. Ensure that any leaks or spills are immediately contained and cleaned up, and use spill and overflow protection devices (e.g., drip pans, drip diapers, or other containment devices placed beneath fuel oil connectors to contain potential spillage during deliveries or from leaks at the connectors).

Chemical Loading and Unloading. Minimize contamination of precipitation or surface runoff from chemical loading and unloading areas. Use containment curbs at chemical loading and unloading areas to contain spills, where practicable. In addition, ensure personnel familiar with spill prevention and response procedures are available to respond expeditiously in the event of a leak or spill during deliveries. Ensure leaks and spills are immediately contained and cleaned up and, where practicable, load and unload in covered areas and store chemicals indoors.

Miscellaneous Loading and Unloading Areas. Minimize contamination of precipitation or surface runoff from loading and unloading areas through implementation of control measures such as the following, where determined to be feasible (list not exclusive): covering the loading area; grading, curbing, or berming around the loading area to divert run-on; locating the loading and unloading equipment and vehicles so that leaks are contained in existing containment and flow diversion systems; or equivalent procedures.

Liquid Storage Tanks. Minimize contamination of surface runoff from above-ground liquid storage tanks through implementation of control measures such as the following, where determined to be feasible, the following (list not exclusive): using protective guards around tanks; using containment curbs; installing spill and overflow protection; using dry cleanup methods; or equivalent measures.

Large Bulk Fuel Storage Tanks. Minimize contamination of surface runoff from large bulk fuel storage tanks. Use containment berms (or their equivalent). Comply with applicable state and federal laws, including Spill Prevention, Control and Countermeasure (SPCC) Plan requirements.

Spill Reduction Measures. Minimize the potential for an oil or chemical spill, or reference the appropriate part of the SPCC plan. Visually inspect as part of the routine facility inspection the structural integrity of all above-ground tanks, pipelines, pumps, and related equipment that may be exposed to stormwater, and make any necessary repairs immediately.

Oil-Bearing Equipment in Switchyards. Minimize contamination of surface runoff from oil-bearing equipment in switchyard areas. Use level grades and gravel surfaces to retard flows and limit the spread of spills, or collect runoff in perimeter ditches.

Residue-Hauling Vehicles. Inspect all residue-hauling vehicles for proper covering over the load, adequate gate sealing, and overall integrity of the container body. Repair vehicles without load covering or adequate gate sealing, or with leaking containers or beds

Ash Loading Areas. Reduce or control the tracking of ash and residue from ash loading areas. Clear the ash building floor and immediately adjacent roadways of spillage, debris, and excess water as necessary to minimize discharges of pollutants in stormwater.

Areas Adjacent to Disposal Ponds or Landfills. Minimize contamination of surface runoff from areas adjacent to disposal ponds or landfills. Reduce ash residue that may be tracked on to access roads traveled by residue handling vehicles, and reduce ash residue on exit roads leading into and out of residue handling areas.

Landfills, Scrap Yards, Surface Impoundments, Open Dumps, General Refuse Sites. Minimize the potential for contamination of runoff from these areas.

c. Maintenance

Maintain all control measures which are used to achieve the effluent limits required by this permit in effective operating condition. Nonstructural control measures must also be diligently maintained (e.g., spill response supplies available, personnel appropriately trained). If control measures need to be replaced or repaired, make the necessary repairs or modifications as expeditiously as practicable.

d. Spill Prevention and Response Procedures

Minimize the potential for leaks, spills and other releases that may be exposed to storm water and develop plans for effective response to such spills if or when they occur. At a minimum, implement:

i. Procedures for plainly labeling containers (e.g., "Used Oil", "Spent Solvents", "Fertilizers and Pesticides", etc.) that could be susceptible to spillage or leakage to encourage proper handling and facilitate rapid response if spills or leaks occur;
ii. Preventive measures such as barriers between material storage and traffic areas, secondary containment provisions, and procedures for material storage and handling;
iii. Procedures for expeditiously stopping, containing, and cleaning up leaks, spills, and other releases. Employees who may cause, detect or respond to a spill or leak must be trained in these procedures and have necessary spill response equipment available. If possible, one of these individuals should be a member of the storm water pollution prevention team;
iv. Procedures for notification of appropriate facility personnel, emergency response agencies, and regulatory agencies. State or local requirements may necessitate reporting spills or discharges to local emergency response, public health, or drinking water supply agencies. Contact information must be in locations that are readily accessible and available; and
v. A procedure for documenting all significant spills and leaks of oil or toxic or hazardous pollutants that actually occurred at exposed areas, or that drained to a storm water conveyance.

e. Erosion and Sediment Controls

Through the use of structural and/or non-structural control measures stabilize, and contain runoff from, exposed areas to minimize onsite erosion and sedimentation, and the resulting discharge of pollutants. Among other actions to meet this limit, place flow velocity dissipation devices at discharge locations and within outfall channels where

necessary to reduce erosion and/or settle out pollutants. In selecting, designing, installing, and implementing appropriate control measures for erosion and sediment control, check out information from both the State and EPA websites. The following two websites are given as information sources:

http://www.in.gov/idem/stormwater/2363.htm
and
https://www.epa.gov/npdes/stormwater-discharges-industrial-activities

f. Management of Runoff

Divert, infiltrate, reuse, contain or otherwise reduce storm water runoff, to minimize pollutants in the discharge.

g. Salt Storage Piles or Piles Containing Salt

Enclose or cover storage piles of salt, or piles containing salt, used for deicing or other commercial or industrial purposes, including maintenance of paved surfaces. Implement appropriate measures (e.g., good housekeeping, diversions, containment) to minimize exposure resulting from adding to or removing materials from the pile. Piles do not need to be enclosed or covered if storm water runoff from the piles is not discharged.

h. Employee Training

Train all employees who work in areas where industrial material or activities are exposed to storm water, or who are responsible for implementing activities necessary to meet the conditions of this permit (e.g., inspectors, maintenance personnel), including all members of the Pollution Prevention Team.

The following personnel must understand the requirements of Part I.D. and Part I.E. of this permit and their specific responsibilities with respect to those requirements: Personnel who are responsible for the design, installation, maintenance, and/or repair of controls (including pollution prevention measures); personnel responsible for the storage and handling of chemicals and materials that could become contaminants in stormwater discharges; personnel who are responsible for conducting and documenting monitoring and inspections related to storm water; and personnel who are responsible for taking and documenting corrective actions as required in Part I.D.6.

Personnel must be trained in at least the following if related to the scope of their job duties (e.g., only personnel responsible for conducting inspections need to understand how to conduct inspections): an overview of what is in the SWPPP; spill response procedures, good housekeeping, maintenance requirements, and material management practices; the location of all controls on the site required by this permit, and how they are to be maintained; the proper procedures to follow with respect to the permit's pollution prevention requirements; and when and how to conduct inspections, record applicable findings, and take corrective actions.

i. Non-Storm water Discharges

Determine if any non-storm water discharges not authorized by an NPDES permit exist. Any non-storm water discharges discovered must either be eliminated or modified into this permit.

The following non-storm water discharges are authorized and should be documented when they occur in accordance with Part I.E.2.c. of the permit:

Discharges from fire-fighting activities;
Fire Hydrant flushings;
Potable water, including water line flushings;
Uncontaminated condensate from air conditioners, coolers, and other compressors and from the outside storage of refrigerated gases or liquids;
Irrigation drainage;
Landscape watering provided all pesticides, herbicides, and fertilizer have been applied in accordance with the approved labeling;
Pavement wash water where no detergents are used and no spills or leaks of toxic or hazardous material have occurred (unless all spilled material has been removed);
Routine external building washdown that does not use detergents;
Uncontaminated ground water or spring water;
Foundation or footing drains where flows are not contaminated with process materials;
Incidental windblown mist from cooling towers that collects on rooftops or adjacent portions of the facility, but not intentional discharges from cooling towers (e.g., "piped cooling tower blowdown or drains); and
Vehicle wash- waters where uncontaminated water without detergents or solvents is utilized.

j. Dust Generation and Vehicle Tracking of Industrial Materials

Minimize generation of dust and off-site tracking of raw, final, or waste materials.

5. Annual Review

At least once every 12 months, submit an Annual Report to the Industrial NPDES Permit Section which includes the following: the results or a summary of the past year's routine facility inspection documentation; information copied or summarized from the corrective action documentation required (if applicable). If corrective action is not yet completed at the time of submission of this Annual Report, describe the status of any outstanding corrective action(s); and any incidents of noncompliance observed or, if there is no noncompliance, a certification signed by a responsible corporate officer, general partner or the proprietor, executive officer or ranking elected official, stating the facility is in compliance with this permit.

6. Corrective Actions – Conditions Requiring Review

a. If any of the following conditions occur, review the SWPPP to determine if and where revisions may need to be made to eliminate the condition and prevent its reoccurrence:

   i. An unauthorized release or discharge (e.g., spill, leak, or discharge of non-stormwater not authorized by this NPDES permit) occurs at the facility;
   ii. Control measures are not stringent enough for the discharge to meet applicable water quality standards;
   iii. A required control measure was never installed, was installed incorrectly, or is not being properly operated or maintained;

b. If construction or a change in design, operation, or maintenance at the facility significantly changes the nature of pollutants discharged in storm water from the facility, or significantly increases the quantity of pollutants discharge the permittee must review and revise the selection, design, installation, and implementation of the control measures to determine if modifications are necessary to meet the effluent limits in this permit.

7. Corrective Action Deadlines

If additional changes are necessary, a new or modified control must be installed and made operational, or a repair completed, before the next storm

event if possible, and within 45 calendar days from the time of discovery. If it is infeasible to complete the installation or repair within 45 calendar days, the reason(s) must be documented. A schedule for completing the work must also be identified, which must be done as soon as practicable after the 45-day timeframe.

Where corrective actions result in changes to any of the controls or procedures documented in the SWPPP, the SWPPP must be modified accordingly within 45 calendar days of completing corrective action work.

These time intervals are not grace periods, but are schedules considered reasonable for documenting the findings and for making repairs and improvements. They are included in this permit to ensure that the conditions prompting the need for these repairs and improvements are not allowed to persist indefinitely.

8. Corrective Action Report

The existence of any of the conditions listed in Part I.D.6 must be documented within 14 days of becoming aware of such condition. The following information must be included in the documentation:

a. Identification and description of the condition triggering the need for corrective action review. For any spills or leaks, include the following information: a description of the incident including material, date/time, amount, location, and reason for spill, and any leaks, spills or other releases that resulted in discharges of pollutants to waters of U.S., through stormwater or otherwise;

b. Date the condition was identified; and

c. A discussion of whether the triggering condition requires corrective action. For any spills or leaks, include response actions, the date/time clean-up completed, notifications made, and staff involved. Also include any measures taken to prevent the reoccurrence of such releases.

Document the corrective actions taken that occurred as a result of the conditions listed in Part I.D.6. within 45 days from the time of discovery of any of those conditions. Provide the dates when each corrective action was initiated and completed (or is expected to be completed). If applicable, document why it is infeasible to complete necessary installations or repairs within the 14-day timeframe and document the schedule for installing the controls and making them operational as soon as practicable after the 14-day timeframe.

9. Inspections

a. Routine Facility Inspections

During normal facility operating hours conduct inspections of areas of the facility covered by the requirements in this permit, including the following:

i. Areas where industrial materials or activities are exposed to stormwater;
ii. Areas identified in the SWPPP and those that are potential pollutant sources;
iii. Areas where spills and leaks have occurred in the past 3 years.
iv. Discharge points; and
v. Control measures used to comply with the effluent limits contained in this permit.

Inspections must be conducted at least quarterly (i.e., once each calendar quarter), or in some instances more frequently (e.g., monthly), as appropriate. Increased frequency may be appropriate for some types of equipment, processes and stormwater control measures, or areas of the facility with significant activities and materials exposed to stormwater.

Inspections must be performed by qualified personnel with at least one member of the stormwater pollution prevention team participating. Inspectors must consider the results of visual and analytical monitoring (if any) for the past year when planning and conducting inspections.

During the inspection examine or look out for the following:

vi. Industrial materials, residue or trash that may have or could come into contact with stormwater;
vii. Leaks or spills from industrial equipment, drums, tanks and other containers;
viii. Offsite tracking of industrial or waste materials, or sediment where vehicles enter or exit the site;
ix. Tracking or blowing of raw, final or waste materials from areas of no exposure to exposed areas; and
x. Control measures needing replacement, maintenance or repair.

During an inspection, control measures implemented to comply with effluent limits must be observed to ensure they are functioning correctly. Discharge outfalls must also be observed during this

inspection. If such discharge locations are inaccessible, nearby downstream locations must be inspected.

b. Routine Facility Inspection Documentation

The findings of facility inspections must be documented and the report maintained with the SWPPP. Findings must be summarized in the annual report. Document all findings, including but not limited to, the following information:

i. The inspection date and time;
ii. The name(s) and signature(s) of the inspector(s);
iii. Weather information;
iv. Any additional control measures needed to comply with the permit requirements; and
v. Any incidents of noncompliance observed.

Any corrective action required as a result of a routine facility inspection must be performed consistent with Part I.D.6. of this permit.

If the discharge was visual assessed, as required in Part I.D.9.c., during the facility inspection, include the results of the assessment with the report required in Part I.D.9.a., as long as all components of both types of inspections are included in the report.

E. STORM WATER POLLUTION PREVENTION PLAN

1. Development of Plan

Within 12 months from the effective date of this permit, the permittee is required to revise and update the current Storm Water Pollution Prevention Plan (SWPPP) for the permitted facility. The SWPPP does not contain effluent limitations. The SWPPP is intended to document the selection, design, and installation of control measures. As distinct from the SWPPP, the additional documentation requirements are intended to document the implementation (including inspection, maintenance, monitoring, and corrective action) of the permit requirements.

2. Contents

The plan shall include, at a minimum, the following items:

a. Pollution Prevention Team – The SWPPP must identify the staff members (by name or title) that comprise the facility's stormwater pollution prevention team as well as their individual responsibilities. The stormwater pollution prevention team is responsible for

overseeing development of the SWPPP, any later modifications to it, and for compliance with permit Parts I.D. and I.E. of this permit. Each member of the stormwater pollution prevention team must have ready access to either an electronic or paper copy of applicable portions of this permit, the most updated copy of the SWPPP, other relevant documents or information that must be kept with the SWPPP.

b. Site Description – As a minimum, the plan shall contain the following:

i. *Activities at the Facility.* Provide a description of the nature of the industrial activities at the facility.

ii. *General location map.* Provide a general location map (e.g., U.S. Geological Survey (USGS) quadrangle map) with enough detail to identify the location of the facility and all receiving waters for the stormwater discharges.

iii. *Site map.* Provide a map showing:

(A) Boundaries of the property and the size of the property in acres;

(B) Location and extent of significant structures and impervious surfaces;

(C) Directions of stormwater flow (use arrows);

(D) Locations of all stormwater control measures;

(E) Locations of all receiving waters, including wetlands, in the immediate vicinity of the facility. Indicate which waterbodies are listed as impaired and which are identified by the State of Indiana or EPA as Tier 2 or Tier 2.5 waters;

(F) Locations of all stormwater conveyances including ditches, pipes, and swales;

(G) Locations of potential pollutant sources identified;

(H) Locations where significant spills or leaks identified have occurred;

(I) Locations of all stormwater monitoring points;

(J) Locations of stormwater inlets and outfalls, with a unique identification code for each outfall (e.g., Outfall No. 1, No. 2), indicating if you are treating one or more outfalls as "substantially identical", and an approximate outline of the areas draining to each outfall;

(K) If applicable, municipal separate storm sewer systems and where the stormwater discharges to them;

(L) Areas of federally-listed critical habitat for endangered or threatened species, if applicable.

(M) Locations of the following activities where such activities are exposed to precipitation:

(a) fueling stations;

(b) vehicle and equipment maintenance and/or cleaning areas;
(c) loading/unloading areas;
(d) locations used for the treatment, storage, or disposal of wastes;
(e) liquid storage tanks;
(f) processing and storage areas;
(g) immediate access roads and rail lines used or traveled by carriers of raw materials, manufactured products, waste material, or by-products used or created by the facility;
(h) transfer areas for substances in bulk; and
(i) machinery
(j) locations and sources of run-on to the site from adjacent property that contains significant quantities of pollutants.

(N) Document in the SWPPP the locations of any of the following activities or sources that may be exposed to precipitation or surface runoff: storage tanks, scrap yards, and general refuse areas; short- and long-term storage of general materials (including but not limited to supplies, construction materials, paint equipment, oils, fuels, used and unused solvents, cleaning materials, paint, water treatment chemicals, fertilizer, and pesticides); landfills and construction sites; and stock pile areas (e.g., coal or limestone piles).

c. Potential Pollutant Sources:

The SWPPP must document areas at the facility where industrial materials or activities are exposed to stormwater or from which allowable non-stormwater discharges may be released. Industrial materials or activities include, but are not limited to: material handling equipment or activities; industrial machinery; raw materials; industrial production and processes; and intermediate products, by-products, final products, and waste products. *Material handling activities* include, but are not limited to: the storage, loading and unloading, transportation, disposal, or conveyance of any raw material, intermediate product, final product or waste product. For structures located in areas of industrial activity, be aware that the structures themselves are potential sources of pollutants. This could occur, for example, when metals such as aluminum or copper are leached from the structures as a result of acid rain.

For each area identified, the description must include:

i. *Activities in the Area.* A list of the industrial activities exposed to stormwater (e.g., material storage; equipment fueling, maintenance, and cleaning; cutting steel beams).

ii. *Pollutants.* A list of the pollutant(s) or pollutant constituents (e.g., crankcase oil, zinc, sulfuric acid, and cleaning solvents) associated with each identified activity, which could be exposed to rainfall or snowmelt and could be discharged from the facility. The pollutant list must include all significant materials that have been handled, treated, stored, or disposed, and that have been exposed to stormwater in the three years prior to the date the SWPPP is prepared or amended.

iii. *Spills and Leaks.* The SWPPP must document where potential spills and leaks could occur that could contribute pollutants to stormwater discharges, and the corresponding outfall(s) that would be affected by such spills and leaks. The SWPPP must document all significant spills and leaks of oil or toxic or hazardous pollutants that actually occurred at exposed areas, or that drained to a stormwater conveyance, in the three years prior to the date the SWPPP is prepared or amended.

iv. *Non-Storm water Discharges* – The SWPPP must document that you have evaluated for the presence of non-storm water discharges not authorized by an NPDES permit. Any non-storm water discharges have either been eliminated or incorporated into this permit. Documentation of non-storm water discharges shall include:

A written non-storm water assessment, including the following:

(1) The date of the evaluation;
(2) A description of the evaluation criteria used;
(3) A list of the outfalls or onsite drainage points that were directly observed during the evaluation; and
(4) The action(s) taken, such as a list of control measures used to eliminate unauthorized discharge(s), or documentation that a separate NPDES permit was obtained. For example, a floor drain was sealed, a sink drain was re-routed to sanitary, or an NPDES permit application was submitted for an unauthorized cooling water discharge.

v. Salt Storage - The location of any storage piles containing salt used for deicing or other commercial or industrial purposes must be documented in the SWPPP.

vi. Description of Control Measures to Meet Technology-Based Effluent Limits - The location and type of control measures you have specifically chosen and/or designed to comply with Permit

Part I.D. must be documented in the SWPPP. Regarding the control measures, the following must be documented as appropriate:

(a) How the selection and design considerations of control measures were addressed.
(b) How the control measures address the pollutant sources identified.

d. Schedules and Procedures

The following must be documented in the SWPPP:

i. Good Housekeeping – A schedule for regular pickup and disposal of waste materials, along with routine inspections for leaks and conditions of drums, tanks and containers;
ii. Maintenance – Preventative maintenance procedures, including regular inspections, testing, maintenance and repair of all control measures to avoid situations that may result in leaks, spills, and other releases, and any back-up practices in place should a runoff event occur while a control measure is off-line. The SWPPP shall include the schedule or frequency for maintaining all control measures used to comply with the storm water requirements.
iii. Spill Prevention and Response Procedures – Procedures for preventing and responding to spills and leaks, including notification procedures. For preventing spills, include in the SWPPP the control measures for material handling and storage, and the procedures for preventing spills that can contaminate stormwater. Also specify cleanup equipment, procedures and spill logs, as appropriate, in the event of spills. You may reference the existence of other plans for Spill Prevention Control and Countermeasure (SPCC) developed for the facility under Section 311 of the CWA or BMP programs otherwise required by an NPDES permit for the facility, provided that you keep a copy of that other plan onsite and make it available for review;
iv. Erosion and Sediment Control – If you use polymers and/or other chemical treatments as part of the controls, identify the polymers and/or chemicals used and the purpose; and
v. Employee Training – The elements of the employee training plan shall include all, but not be limited to, the requirements set forth in Permit Part.I.D., and also the following:

(1) The content of the training;

(2) The frequency/schedule of training for employees who have duties in areas of industrial activities subject to this permit;
(3) A log of the dates on which specific employees received training.

e. Pertaining to Inspections

Document in the SWPPP the procedures for performing, as appropriate, the types of inspections specified by this permit, including:

i. Routine facility inspections and;

For each type of inspection performed, the SWPPP must identify:

ii. Person(s) or positions of person(s) responsible for inspection;
iii. Schedules for conducting inspections, including tentative schedule for irregular stormwater runoff discharges; and
iv. Specific items to be covered by the inspection, including schedules for specific outfalls.

f. General Requirements – The SWPPP must meet the following general requirements:

i. The SWPPP shall be prepared in accordance with good engineering practices and to industry standards. The SWPPP may be developed by either a person on the staff or a third party, and it shall be certified in accordance with the signature requirements, under Part II.C.6.
ii. Retain a complete copy of the current SWPPP required by this permit at the facility in any accessible format. A complete SWPPP includes any documents incorporated by reference and all documentation supporting parts I.D. and I.E. of this permit, as well as the signed and dated certification page. Regardless of the format, the SWPPP must be immediately available to facility employees, EPA, a state or tribe, the operator of an MS4 receiving discharges from the site; and representatives of the U.S. Fish and Wildlife Service (USFWS) or the National Marine Fisheries Service (NMFS) at the time of an onsite inspection. The current SWPPP or certain information from the current SWPPP must also be made available to the public (except any confidential business information (CBI) or restricted information, but clearly identify those portions of the SWPPP that are being withheld from public access.
iii. Where the SWPPP refers to procedures in other facility documents, such as a Spill Prevention, Control and

Countermeasure (SPCC) Plan or an Environmental Management System (EMS), copies of the relevant portions of those documents must be kept with the SWPPP.

F. SCHEDULE OF COMPLIANCE

1. The permittee shall achieve compliance with the effluent limitations specified for Copper at Outfall 001 in accordance with the following schedule:

   a. The permittee shall submit a written progress report to the Compliance Data Section of the Office of Water Quality (OWQ) nine (9) months from the effective date of this permit. The progress report shall include a description of the method(s) selected for meeting the newly imposed limitation for Copper, in addition to any other relevant information. The progress report shall also include a specific time line specifying when each of the steps will be taken. The new effluent limits for Copper are deferred for the term of this compliance schedule, unless the new effluent limits can be met at an earlier date. The permittee shall notify the Compliance Data Section of OWQ as soon as the newly imposed effluent limits for Copper can be met. Upon receipt of such notification by OWQ, the final limits for Copper will become effective, but no later than thirty-six (36) months from the effective date of this permit. Monitoring and reporting of the effluent for these parameters is required during the interim period.

   b. The permittee shall submit a subsequent progress report to the Compliance Data Section of OWQ no later than eighteen (18) months from the effective date of this permit. This report shall include detailed information on the steps the permittee has taken to achieve compliance with the final effluent limitations and whether the permittee is meeting the time line set out in the initial progress report.

   c. The permittee shall submit a subsequent progress report to the Compliance Data Section of OWQ no later than twenty-seven (27) months from the effective date of this permit. This report shall include detailed information on the steps the permittee has taken to achieve compliance with the final effluent limitations and whether the permittee is meeting the time line set out in the initial progress report.

   d. Within thirty (30) days of completion of construction, the permittee shall file with the Industrial NPDES Permits Section of OWQ a notice of installation for the additional pollutant control equipment and a design summary of any modifications.

e. The permittee shall comply with the final effluent limitations for Copper no later than thirty-six (36) months from the effective date of this permit.

2. If the permittee fails to comply with any deadline contained in the foregoing schedule, the permittee shall, within fourteen (14) days following the missed deadline, submit a written notice of noncompliance to the Compliance Data Section of the OWQ stating the cause of noncompliance, any remedial action taken or planned, and the probability of meeting the date fixed for compliance with final effluent limitations.

G. REOPENING CLAUSES

This permit may be modified, or alternately, revoked and reissued, after public notice and opportunity for hearing:

1. To comply with any applicable effluent limitation or standard issued or approved under 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.

2. To incorporate any of the reopening clause provisions cited at 327 IAC 5-2-16.

3. This permit may be modified or alternately revoked and reissued, after public notice and opportunity for rehearing to comply with any applicable final agency standards, regulations and requirements issued or approved under section 316(b) of the Clean Water Act, if the standards, regulations and requirements so issued or approved contain different conditions than those in the permit.

4. If at any time prior to the completion of the construction of pollution control equipment installed to meet the conditions of this permit, including but not limited to dry bottom ash or FGD wastewater treatment equipment, the permittee notifies IDEM of its intent to permanently retire Unit 3 no later than December 31, 2023, the permittee may request a permit modification to address changes to the compliance schedule .

5. If the permittee decides to close Unit 3 or proceed with the zero liquid discharge option for FGD wastewater, the permittee may request a permit modification to revise the compliance date for the FGD wastewater to no later than December 31, 2023.

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 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 an application for renewal of this permit in accordance with 327 IAC 5-2-8(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. Pursuant to 327 IAC 5-3-2(a)(2), 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.

Under the terms of the proposed Federal E-Reporting Rule, the permittee may be required to submit its application for renewal electronically in the future.

4. Permit 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; and

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.

5. 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 a permanent reduction or elimination of any discharge controlled by the permit, e.g., plant closure, termination of discharge by connection to a POTW, a change in state law that requires the reduction or elimination of the discharge, or information indicating that the permitted 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.

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

6. 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 invasion of other private 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.

7. 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.

8. 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.

9. 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.

10. 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 Environmental Rules 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 performed under IC 13-14-2-2 commits a class C infraction.

Pursuant to IC 13-30-10-1.5(k), a person who willfully or recklessly violates any NPDES permit condition or filing requirement, any applicable standards or limitations of IC 13-18-3-2.4, IC 13-18-4-5, IC 13-18-8, IC 13-18-9, IC 13-18-10, IC 13-18-12, IC 13-18-14, IC 13-18-15, or IC 13-18-16, or who knowingly makes any false material statement, representation, or certification in any NPDES form, notice, or report commits a Class C misdemeanor.

Pursuant to IC 13-30-10-1.5(l), an offense under IC 13-30-10-1.5(k) is a Class D felony if the offense results in damage to the environment that renders the environment unfit for human or vertebrate animal life. An offense under IC 13-30-10-1.5(k) is a Class C felony if the offense results in the death of another person.

11. 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 13-30-10-1, provides that any person who knowingly or intentionally (a) destroys, alters, conceals, or falsely certifies a record that is required to be maintained under the terms of a permit issued by the department; and may be used to determine the status of compliance, (b) renders inaccurate or inoperative a recording device or a monitoring device required to be maintained by a permit

issued by the department, or (c) falsifies testing or monitoring data required by a permit issued by the department commits a Class B misdemeanor.

12. 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.

13. Wastewater treatment plant and certified operators

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.

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 operator" 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.

14. Construction Permit

In accordance with IC 13-14-8-11.6, a discharger is not required to obtain a state permit for the modification or construction of a water pollution treatment or control facility if the discharger has an effective NPDES permit.

If the discharger modifies their existing water pollution treatment or control facility or constructs a new water pollution treatment or control facility for the treatment or control of any new influent pollutant or increased levels of any existing pollutant, then, within thirty (30) days after commencement of operation, the discharger shall file with the Department of Environment Management a notice of installation for the additional pollutant control equipment and a design summary of any modifications.

The notice and design summary shall be sent to the Office of Water Quality, Industrial NPDES Permits Section, 100 North Senate Avenue, Indianapolis, IN 46204-2251.

15. 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.

16. 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. Proper Operation and Maintenance

The permittee shall at all times maintain in good working order and efficiently operate all facilities and systems (and related appurtenances) for the collection and treatment which are installed or used by the permittee and which are necessary for achieving compliance with the terms and conditions of this permit in accordance with 327 IAC 5-2-8(9).

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.

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

c. Bypasses, as defined in (a) above, are prohibited, and the Commissioner may take enforcement action against a permittee for bypass, unless the following occur:

(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.e; or

(4) The condition under Part II.B.2.b above is met.

d. 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.

e. 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 an unanticipated bypass that exceeds any effluent limitations in the permit within 24 hours of becoming aware of the bypass noncompliance. 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 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 e-mail

submittal is provided 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-mails should be sent to wwreports@idem.in.gov.

f. 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.c. The Commissioner may impose any conditions determined to be necessary to minimize any adverse effects.

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 section, 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 properly operated;

(3) The permittee complied with any remedial measures required under Part II.A.2; and

(4) The permittee submitted notice of the upset as required in the "Twenty-Four Hour 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. The discharge of pollutants in treated wastewater is allowed in compliance with the applicable effluent limitations in Part I. of this permit.

C. REPORTING REQUIREMENTS

1. Planned Changes in Facility or Discharge

Pursuant to 327 IAC 5-2-8(11)(F), the permittee shall give notice to the Commissioner as soon as possible of any planned physical alterations or additions to the permitted facility. In this context, permitted facility refers to a point source discharge, not a wastewater treatment facility. Notice is required only when either of the following applies:

a. The alteration or addition may meet one of the criteria for determining whether the facility is a new source as defined in 327 IAC 5-1.5.

b. The alteration or addition could significantly change the nature of, or increase the quantity of, pollutants discharged. This notification applies to pollutants that are subject neither to effluent limitations in Part I.A. nor to notification requirements in Part II.C.9. of this permit.

Following such notice, the permit may be modified to revise existing pollutant limitations and/or to specify and limit any pollutants not previously limited.

2. Monitoring Reports

Pursuant to 327 IAC 5-2-8(10) and 327 IAC 5-2-13 through 15, monitoring results shall be reported at the intervals and in the form specified in "Monthly Reporting", Part I.C.2.

3. Twenty-Four Hour Reporting Requirements

Pursuant to 327 IAC 5-2-8(11)(C), the permittee shall orally report to the Commissioner information on the following types of noncompliance within 24 hours from the time permittee becomes aware of such noncompliance. If the noncompliance meets the requirements of item b (Part II.C.3.b) or 327 IAC 2-6.1, then the report shall be made within those prescribed time frames. However, under 327 IAC 2-6.1-3(1), when the constituents of the discharge that is in noncompliance 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 noncompliance 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 noncomplying circumstances;

c. Any upset (as defined in Part II.B.3 above) that causes an exceedance of any effluent limitation in the permit;

d. Violation of a maximum daily discharge limitation for any of the following toxic pollutants: Cadmium, Mercury, Copper

The permittee can make the oral reports by calling (317)232-8670 during regular business hours or by calling (317) 233-7745 ((888)233-7745 toll free in Indiana) during non-business hours. A written submission shall also be provided within 5 days of the time the permittee becomes aware of the circumstances. 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 and eliminate the noncompliance and prevent its recurrence. The Commissioner may waive the written report on a case-by-case basis if the oral report has been received within 24 hours. Alternatively the permittee may submit a "Bypass/Overflow Report" (State Form 48373) or a "Noncompliance 24-Hour Notification Report" (State Form 54215), whichever is appropriate, to IDEM at (317) 232-8637 or wwreports@idem.in.gov. If a complete fax or e-mail submittal is sent within 24 hours of the time that the permittee became aware of the occurrence, then the fax report will satisfy both the oral and written reporting requirements.

Upon its effectiveness, the proposed Federal E-Reporting Rule will require these reports to be submitted electronically.

4. Other Compliance/Noncompliance Reporting

Pursuant to 327 IAC 5-2-8(11)(D), the permittee shall report any instance of noncompliance not reported under the "Twenty-Four Hour Reporting Requirements" in Part II.C.3, or any compliance schedules at the time the pertinent Discharge Monitoring Report is submitted. The report shall contain the information specified in Part II.C.3;

The permittee shall also give advance notice to the Commissioner of any planned changes in the permitted facility or activity which may result in noncompliance with permit requirements; and

All 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 14 days following each schedule date.

Upon its effectiveness, the proposed Federal E-Reporting Rule will require these reports to be submitted electronically.

5. Other Information

Pursuant to 327 IAC 5-2-8(11)(E), where the permittee becomes aware of a failure to submit any relevant facts or submitted incorrect information in a permit application or in any report, 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) The manager of one (1) or more manufacturing, production, or operating facilities provided the manager is authorized to make management decisions that govern the operation of the regulated facility including having the explicit or implicit duty to make major capital investment recommendations, and initiating and directing other comprehensive measures to assure long-term environmental compliance with environmental laws and regulations; the manager can ensure that the necessary systems are established or actions taken to gather complete and accurate information for permit application requirements; and where 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 government body or any agency or political subdivision thereof: by either a principal executive officer or ranking elected official.

(4) Under the proposed Federal E-Reporting Rule, a method will be developed for submittal of all affected reports and documents using electronic signatures that is compliant with the Cross-Media Electronic Reporting Regulation (CROMERR). Enrollment and use of NetDMR currently provides for CROMERR-compliant report submittal.

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 a 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. Electronic Signatures. If documents described in this section are submitted electronically by or on behalf of the NPDES-regulated facility, any person providing the electronic signature for such documents shall meet all relevant requirements of this section, and shall ensure that all of the relevant requirements of 40 CFR part 3 (including, in all cases, subpart D to part 3) (Cross-Media Electronic Reporting) and 40 CFR part 127 (NPDES Electronic Reporting Requirements) are met for that submission.

d. Certification. Any person signing a document identified under Part II.C.6. 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, 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. Changes in Discharge of Toxic Substances

Pursuant to 40 CFR 122.42(a)(1), 40 CFR 122.42(a)(2), and 327 IAC 5-2-9, the permittee shall notify the Commissioner as soon as it knows or has reason to believe:

a. That any activity has occurred or will occur which would result in the discharge, on a routine or frequent basis, of any pollutant identified as toxic pursuant to Section 307(a) of the Clean Water Act which is not limited in the permit, if that discharge will exceed the highest of the following "notification levels."

(1) One hundred micrograms per liter (100µg/l);

(2) Two hundred micrograms per liter (200 µg/l) for acrolein and acrylonitrile; five hundred micrograms per liter (500µg/l) for 2,4-dinitrophenol and 2-methyl-4,6-dinitrophenol; and one milligram per liter (1mg/l) for antimony;

(3) Five (5) times the maximum concentration value reported for that pollutant in the permit application in accordance with 40 CFR 122.21(g)(7); or

(4) A notification level established by the Commissioner on a case-by-case basis, either at his own initiative or upon a petition by the permittee. This notification level may exceed the level specified in subdivisions (1), (2), or (3) but may not exceed the level which can be achieved by the technology-based treatment requirements applicable to the permittee under the CWA (see 327 IAC 5-5-2).

b. That any activity has occurred or will occur which would result in any discharge, on a non-routine or infrequent basis, of a toxic pollutant which is not limited in the permit, if that discharge will exceed the highest of the following "notification levels":

(1) Five hundred micrograms per liter (500 µg/l);

(2) One milligram per liter (1 mg/l) for antimony;

(3) Ten (10) times the maximum concentration value reported for that pollutant in the permit application in accordance with Sec. 122.21(g)(7).

(4) A notification level established by the Commissioner on a case-by-case basis, either at his own initiative or upon a petition by the permittee. This notification level may exceed the level specified in subdivisions (1), (2), or (3) but may not exceed the level which can be achieved by the technology-based treatment requirements applicable to the permittee under the CWA (see 327 IAC 5-5-2).

c. That it has begun or expects to begin to use or manufacture, as an intermediate or final product or byproduct, any toxic pollutant which was not reported in the permit application under 40 CFR 122.21(g)(9).

PART III
Other Requirements

A. Polychlorinated Biphenyl

There shall be no discharge of polychlorinated biphenyl (PCBs) compounds such as those commonly used for transformer fluid.

Many electrical transformers manufactured prior to 1978 contained PCBs. Therefore, in order to determine compliance with the PCB prohibition, the permittee shall provide the following PCB* data for Outfall 001 with the application renewal. The permittee shall submit the data to the Office of Water Quality, Industrial NPDES Permits Section, 100 North Senate Avenue, Indianapolis, Indiana 46204 2251.

Parameter	Test Method	LOD	LOQ
PCBs*	608	0.1 ug/l	0.3 ug/l

*PCB-1242, PCB-1254, PCB-1221, PCB-1232, PCB-1248, PCB-1260, and PCB-1016

B. In the event that changes are to be made in the use of water treatment additives including dosage rates beyond the approved estimated maximum dosage rates, or changes that could significantly change the nature of, or increase the discharge concentration of the additive contributing to Outfalls 001 and/or 004, the permittee shall notify the Indiana Department of Environmental Management as required in Part II.C.1 of this permit. The use of any new or changed water treatment additives or dosage rates shall not cause the discharge from any permitted outfall to exhibit chronic or acute toxicity. Acute and chronic aquatic toxicity information must be provided with any notification regarding any new or changed water treatment additives or dosage rates.

C. The Storm Water Monitoring and Non Numeric Effluent Limits and the Storm Water Pollution Prevention Plan (SWP3) requirements can be found in Part I.D. and I. E. of this permit.

D. The permittee shall post a permanent marker on the stream bank at each outfall discharging directly to the Ohio River.

The marker shall consist at a minimum of the name of the establishment to which the permit was issued, the permit number, and the outfall number. The information shall be printed in letters not less than two inches in height.

The marker shall be a minimum of 2 feet by 2 feet and shall be a minimum of 3 feet above the ground.

Part IV
Cooling Water Intake Structures

A. Best Technology Available (BTA) Determination

In accordance with 40 CFR 401.14, the location, design, construction and capacity of cooling water intake structures of any point source for which a standard is established pursuant to section 301 or 306 of the Act shall reflect the best technology available for minimizing adverse environmental impact.

The EPA promulgated a Clean Water Act (CWA) section 316(b) regulation on August 15, 2014, that establishes standards for cooling water intake structures. 79 Fed. Reg. 48300-439 (August 15, 2014). The regulation establishes best technology available standards to reduce impingement and entrainment of aquatic organisms at existing power generation and manufacturing facilities and it became effective on October 14, 2014.

For permits expiring prior to July 2018, the permittee can (1) negotiate an alternative schedule for submitting required information with the Director (IDEM) after demonstrating need, or (2) request waiver(s) for submitting required information. An alternative schedule for submission of information required under the current CWA section 316(b), or waiver(s) of submittal requirements shall be reviewed and approved by IDEM. Upon approval of such alternative schedules and /or waivers, or until the time the required information/reports are submitted and the permit is renewed or modified following public notice, the IDEM is required to make a BTA determination using Best Professional Judgment (BPJ) to comply with CWA Section 316(b) based on existing information. The BTA determination is subject to change after the required information is submitted in accordance with the federal regulations effective October 14, 2014.

The facility has requested an alternate submittal date of July 1, 2019 for the 40 CFR 122.21(r)(7) and (9) thru (13) information. IDEM approves this alternate submittal date as justified in a letter to IDEM dated July 25, 2016.

Based on available information, IDEM has made a Best Technology Available (BTA) determination that the existing cooling water intake structures represent best technology available to minimize adverse environmental impact in accordance with Section 316(b) of the federal Clean Water Act (33 U.S.C. section 1326) at this time. This determination is based on Best Professional Judgment (BPJ) and will be reassessed at the next permit reissuance to ensure that the CWISs continue to meet the requirements of Section 316(b) of the federal Clean Water Act (33 U.S.C. section 1326).

B. Permit Requirements

In accordance with the recently promulgated rules at 40 CFR 122 and 40 CFR 125, the owner or operator of a facility that has CWIS with a Design Intake Flow (DIF) or Actual Intake Flow (AIF) > 125 MGD must submit the information required at 40 CFR 122.21(r)(2) through (13), including all of the associated supporting documentation and/or studies, no

later than July 14, 2018, unless an alternate schedule for submission is approved or a waiver of a particular requirement is requested and granted under 40 CFR 125.95. In addition, the permittee shall comply with requirements below:

1. In accordance with 40 CFR 125.98(b)(1), nothing in this permit authorizes take for the purposes of a facility's compliance with the Endangered Species Act.

2. At all times properly operate and maintain the intake equipment and incorporate management practices and operational measures necessary to ensure proper operation of the CWIS.

3. Inform IDEM of any proposed changes to the CWIS or proposed changes to operations at the facility that affect the information taken into account in the current BTA evaluation.

4. There shall be no discharge of debris from intake screen washing which will settle to form objectionable deposits which are in amounts sufficient to be unsightly or deleterious, or which will produce colors or odors constituting a nuisance.

5. All required reports shall be submitted to the IDEM, Office of Water Quality, NPDES Permits Branch.

6. The information required to be submitted at 40 CFR 122.21(r)(7) and (9) thru (13) shall be submitted no later than July 1, 2019. As part of the current permit renewal application, the permittee submitted information as required by 40 CFR 122.21(r)(2) through (r)(8). This information must be resubmitted along with (r)(7) and (r)(9) through (r)(13) documents no later than July 1, 2019.

7. Submit the information required to be considered by the Director per 40 CFR 125.98 to assist IDEM with the fact sheet or statement of basis for entrainment BTA, as soon as practicable, but no later than with the application for the next permit renewal.

8. During the next permit period, monitor the actual intake flows at a minimum frequency of daily for one continuous year. The permittee may use engineering calculations, such as pump capacity, to approximate intake flow. The daily intake flow information shall be submitted with the application for the next permit renewal.

National Pollutant Discharge Elimination System
Fact Sheet for
SIGECO F.B. Culley Generating Station
Draft: January 2017
Final: March 2017

Indiana Department of Environmental Management

100 North Senate Avenue
Indianapolis, Indiana 46204
(317) 232-8603
Toll Free (800) 451-6027
www.idem.IN.gov

Permittee:	Vectren Corporation SIGECO F.B. Culley Generating Station P.O. Box 209 Evansville, Indiana 47702
Existing Permit Information:	Permit Number: IN0002259 Expiration Date: November 30, 2016
Facility Contact:	Angela Casbon-Scheller P.O. Box 209 Evansville, Indiana 47702
Facility Location:	3711 Darlington Road Newburgh, IN 47630 Warrick County
Receiving Stream:	Ohio River
GLI/Non-GLI:	Non-GLI
Proposed Permit Action:	Renew
Date Application Received:	May 27, 2016
Source Category	NPDES Major– Industrial
Permit Writer:	Jennifer Carlino (317) 232-8702 Jcarlino@idem.in.gov

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1.0 INTRODUCTION

The Indiana Department of Environmental Management (IDEM) received a National Pollutant Discharge Elimination System (NPDES) Permit application from SIGECO F.B. Culley Generating Station on May 27, 2016. The current five year permit was issued with an effective date of December 1, 2011 in accordance with 327 IAC 5-2-6(a). A five year permit is proposed in accordance with 327 IAC 5-2-6(a).

The Federal Water Pollution Control Act of 1972 and subsequent amendments require a NPDES permit for the discharge of wastewater to surface waters. Furthermore, Indiana Code (IC) 13-15-1-2 requires a permit to control or limit the discharge of any contaminants into state waters or into a publicly owned treatment works. This proposed permit action by IDEM complies with both federal and state requirements.

In accordance with Title 40 of the Code of Federal Regulations (CFR) Sections 124.8 and 124.56, as well as Indiana Administrative Code (IAC) 327 Article 5, development of a Fact Sheet is required for NPDES permits. This document fulfills the requirements established in those regulations.

This Fact Sheet was prepared in order to document the factors considered in the development of NPDES Permit effluent limitations. The technical basis for the Fact Sheet may consist of evaluations of promulgated effluent guidelines, existing effluent quality, receiving water conditions, and wasteload allocations to meet Indiana Water Quality Standards. Decisions to award variances to Water Quality Standards or promulgated effluent guidelines are justified in the Fact Sheet where necessary.

2.0 FACILITY DESCRIPTION

2.1 General

SIGECO F.B. Culley Generating Station is classified under Standard Industrial Classification (SIC) Code 4911 – Electric Power Services. The facility is a coal fired steam electric generating plant with two (2) generating units which are 100 MW (Unit 2) and 270 MW (Unit 3). The Ohio River accounts for approximately 99% of the facility's intake water with well water accounting for the remainder.

Discharges from this facility are to the Ohio River. Outfall 001 discharges water from the East (internal outfall 101) and West (internal outfall 201) Ash Ponds as well as once through non-contact cooling water. Internal Outfall 301 is consists of FGD wastewater treatment plant discharge, which discharges to the East Ash Pond.

The facility has a permanent pipe line connecting the ponds, which allows the facility to pump water from one pond to the other and bypass the discharge tunnel which leads to final Outfall 001. This pipe has been utilized to dewater a pond during pond cleaning and

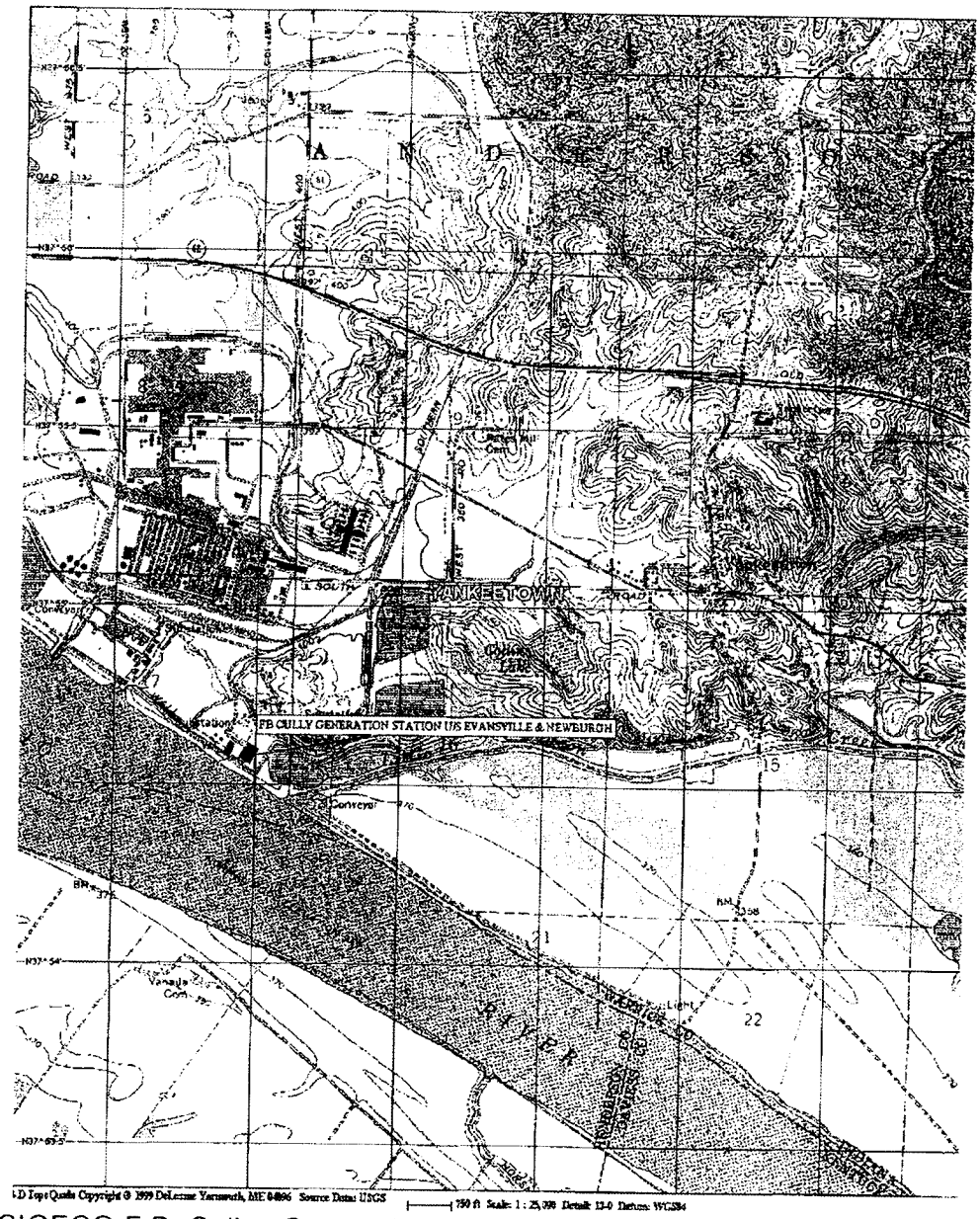
to move water from a near full pond to the other, higher capacity pond. Outfall 004 discharges treated sanitary wastewater.

Effective October 1, 2015, the Unit 2 ash lines and other waters associated with the Unit 2 boiler were re-routed to the East ash pond, which discharges through Outfall 201. Fly ash is only sluiced to the East ash pond during mechanical problems with the dry fly ash system. During each of the past few years, this scenario has only occurred for a minimal number of hours.

A more detailed description of the wastewaters associated with each outfall is provided in Section 2.5 below.

A map showing the location of the facility has been included as Figure 1.

Figure 1: Facility Location



SIGECO F.B. Culley Generating Station
3700 Darlington Road
Newburgh, IN 47630
Warrick County

2.2 Outfall Locations

Outfall 001

Latitude: 37° 54′ 35.29″

Longitude: -87° 19′ 37.99″

Outfall 101	Latitude: 37° 54′ 44.36″ Longitude: -87° 19′ 50.81″
Outfall 201	Latitude: 37° 54′ 34.49″ Longitude: -87° 19′ 27.59″
Outfall 301	Latitude: 37° 54′ 31.32″ Longitude: -87° 19′ 17.10″
Outfall 004	Latitude: 37° 54′ 38.36″ Longitude: -87° 19′ 35.09″

2.3 Wastewater Treatment

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 5-22-5. In order to operate a wastewater treatment plant the operator shall have qualifications as established in 327 IAC 5-22-7.

IDEM has given the permittee a Class B industrial wastewater treatment plant classification because

2.4 Source Water

A. Wells

Wells provide water to the potable water pretreatment system. The pretreatment system provides water to the following systems:

Condensate storage
Reverse Osmosis (RO)
Water Treatment Filter and Water Softener
Sanitary Wastewater Treatment, and
Unit #3 Floor Drains

Condensate storage discharge is used for Units #2 and #3 boiler make-up water, RO and Water Treatment Filter/Water Softener Backwash discharge is sent to Unit #3 Floor drains.

B. Unit #1 Intake

Source water is the Ohio River. This is a House Service Water Inlet. This water combines with the House Service Water Header (also fed by the Unit 2 Intake) and provides water to the following systems:

Unit #2 Boiler Seal Trough and Sump Pumps, and
N.C. Valve* to the Clarified River Water System which feeds the Units 2 & 3 FGD System.

*N.C. Valve = Normally Closed

C. Unit 2 Intake

Source water is the Ohio River. In addition to providing House Service Water as detailed above, Unit #2 Intake House Service Water also provides water to the following systems.

Unit #2 Condenser
Unit #2 Closed Cycle Cooling System
Clarified River Water System which feeds the Units 2 & 3 FGD System
Unit #2 Air Heater Wash
Unit #2 Pyrite System
Unit #2 Bottom Ash System
Unit #2 Fly Ash System, and
Unit #2 Boiler Seal Through and Sump Pumps

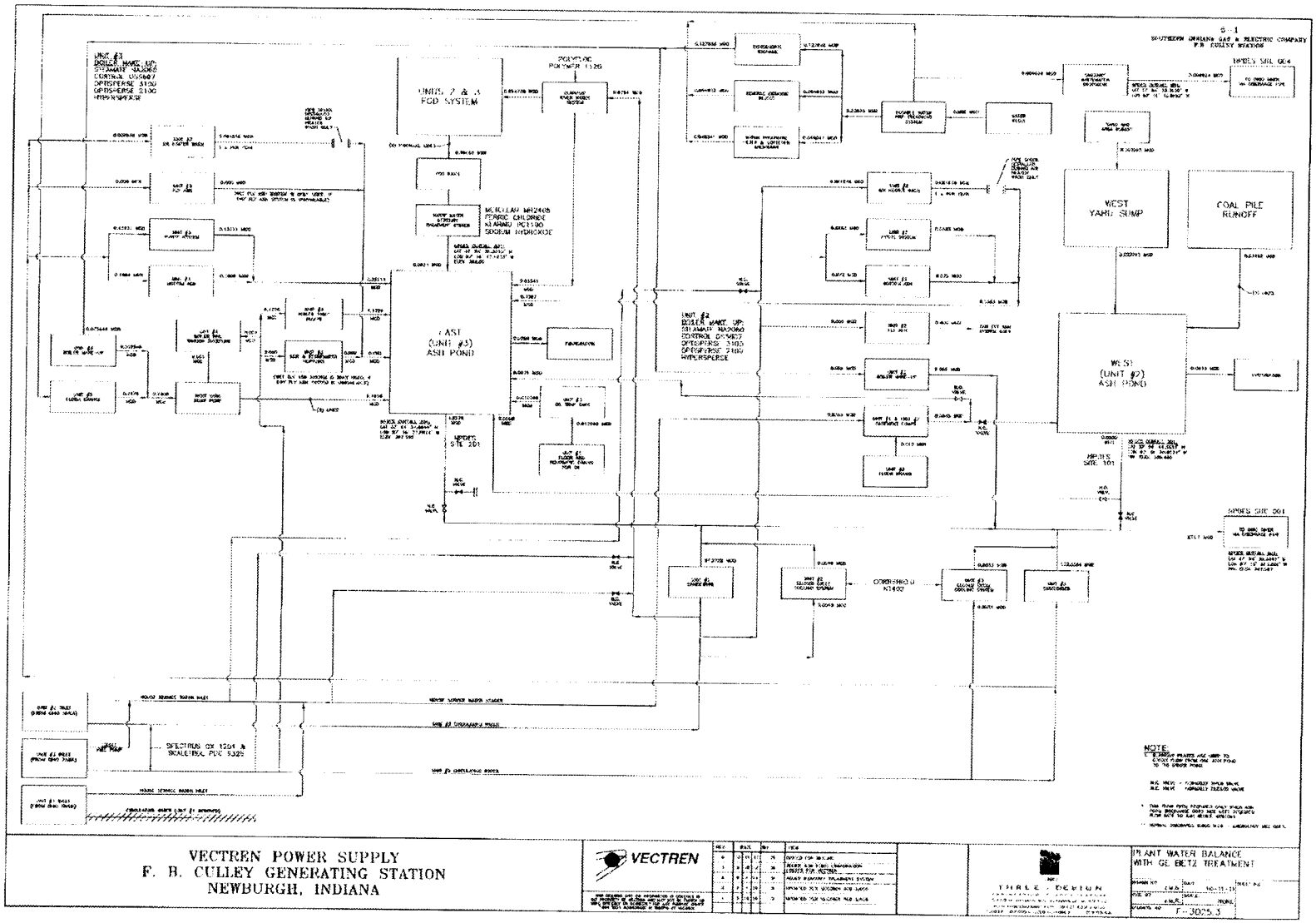
D. Unit 3 Intake

Source water is the Ohio River. The Unit #3 Intake provides water to the following systems.

Unit #3 Condenser
Unit #3 Closed Cycle Cooling System
A diesel fire pump
Unit #3 Boiler Seal Through and Sump Pumps
Unit #3 SCR & Economizer Hoppers
Unit #3 Air Heater Wash
Unit #3 Pyrite System
Unit #3 Bottom Ash and
N.C. Valve* to the Clarified River Water System which feeds the Units 2 & 3 FGD System.

*N.C. Valve = Normally Closed

A Flow Diagram has been included as Figure 2.



VECTREN POWER SUPPLY
F. B. CULLEY GENERATING STATION
NEWBURGH, INDIANA

VECTREN

THALE / DEETON

PLANT WATER BALANCE
WITH GE BETZ TREATMENT

F-3025.3

2.5 Outfall Descriptions

Outfall 001

Outfall 001 discharges to the Ohio River near mile marker 773. The average flow from the outfall is 271.5 MGD. Operations contributing to the flow include; Condenser cooling – two units (269.8 MGD) and Ash pond discharge (1.6 MGD). Discharge from the ash ponds are independently analyzed via outfalls 101 and 201. Treatment associated with Outfall 001 includes the use of chlorine and bromine.

Internal Outfall 101

Outfall 101 is an internal outfall regulating the discharge from the West ash pond (0.04 MGD). The West pond receives water from the coal pile run-off, west yard sump and Unit #1 and Unit #2 basement sumps (which includes the Unit #2 floor drains). These water sources are almost exclusively the result of rain events. The outfall seldom discharges, though when it does; it goes to the East ash pond. Any discharge from Outfall 101 would be limited to instances of high precipitation and will first discharge through Outfall 201 and ultimately through Outfall 001. It is expected that discharge from Outfall 101 directly to Outfall 001 would be a rare exception. Permit limits and monitoring requirements at Outfall 101 only apply when discharging directly to Outfall 001. The only treatment associated with Outfall 101 is sedimentation.

Internal Outfall 201

Outfall 201 is an internal outfall regulating the discharge from the East ash pond (1.6MGD). In addition to the Unit #2 and Unit #3 bottom ash lines, the east ash pond receives water from the oil separation tank, east side yard sump, air heater wash, boiler seal troughs, floor drains, greensand water treatment filters regenerant and backwash, softener regenerant streams and RO rejects, discharge from Outfall 301 (FGD WWTP), and discharge from Outfall 101 (West Ash Pond. The only treatment associated with Outfall 201 is sedimentation.

Internal Outfall 301:

Outfall 301 is an internal outfall discharging into the East ash pond. The discharge is limited to Flue Gas Desulfurization (FGD) Wastewater Treatment Plant (WWTP) discharge (0.095 MGD). The permittee has expressed that it is important to note that the wastewater treatment process is not complete at the point where water exits the treatment system and prior to entering the ash pond. Settling, with adequate retention time, is an important aspect of physical-chemical treatment system, as it allows time for the solids (pollutants of concern) to settle out the water and into the pond. The treated water is then ultimately discharged via internal Outfall 201 and then finally via Outfall 001. Treatment associated with Outfall 301 consists of chemical precipitation.

Outfall 004:

Outfall 004 regulates the discharge from the sanitary wastewater package plant. The average flow is 0.0046 MGD and the outfall discharges to the Ohio River. Treatment for the sanitary water includes disinfection with ultra violet light and activated sludge.

2.6 Changes in Operation

A chemical-precipitation system went into service on September 26, 2014, for the purpose of meeting the mercury limitations at Outfall 001, which became effective on December 1, 2014.

Future changes at this facility include plans to retire Unit 2 no later than 12/31/2023. Vectren has indicated to IDEM that a final decision on retirement of Unit 2 will be made in the next twelve months. Unit 3 is proposed to continue operation as a coal fired unit. If the permittee decides to close Unit 3 or proceed with the zero liquid discharge option for FGD wastewater at Unit 3, the permittee may request a permit modification to revise the compliance date for the federal effluent guidelines for bottom ash and/or FGD wastewater. See also Section 5.2 below.

2.7 Facility Storm Water

There are no outfalls discharging storm water only on this site.

3.0 PERMIT HISTORY

3.1 Compliance history

A review of this facility's discharge monitoring data was conducted for compliance verification. This review indicates the following permit limitation violations between July 2011 and June 2016;

Outfall 001: 4 exceedances of Total Residual Oxidants and 1 exceedance of temperature.

Outfall 004: 1 violation for exceedances of E. coli.

Outfall 101: 3 violations for exceedances in Total Suspended Solids and 2 violations for exceedances in Iron.

There are no pending or current enforcement actions regarding this NPDES permit.

4.0 RECEIVING WATER

The receiving stream for Outfalls 001 and 004 is The Ohio River. The $Q_{7,10}$ low flow value of the Ohio River upstream of the outfalls is 11,000 cfs and shall be capable of supporting a well-balanced warm water aquatic community and full body contact recreation in accordance with 327 IAC 2-1-3. The Ohio River is also designated as a public water supply and as an industrial water supply

In accordance with 327 IAC 2-1.3, language in this renewed permit specifically prohibits the permittee from undertaking deliberate actions that would result in new or increased discharges of BCC's or new or increased permit limits for non-BCC's, or from allowing a new or increased discharge of a BCC from an existing or proposed industrial user, without first proving that the new or increased discharge would not result in a significant lowering of water quality, or by submission and approval of an antidegradation demonstration to the IDEM.

A Site Map has been included as Figure 3.

Figure 3: Site Map

4.1 Receiving Stream Water Quality

Section 303(d) of the Clean Water Act requires states to identify waters, through their Section 305(b) water quality assessments, that do not or are not expected to meet applicable water quality standards with federal technology based standards alone. States are also required to develop a priority ranking for these waters taking into account the severity of the pollution and the designated uses of the waters. Once this listing and ranking of impaired waters is completed, the states are required to develop Total Maximum Daily Loads (TMDLs) for these waters in order to achieve compliance with the water quality standards. Indiana's 2014 303(d) List of Impaired Waters was developed in accordance with Indiana's Water Quality Assessment and 303(d) Listing Methodology for Waterbody Impairments and Total Maximum Daily Load Development for the 2014 Cycle.

The Ohio River (Assessment-Unit INH 6_10), HUC is on the 2014 303(d) list for Mercury, E. coli, Dioxin and PCBs. A TMDL for E. Coli is in progress for the Ohio River.

5.0 PERMIT LIMITATIONS

Two categories of effluent limitations exist for NPDES permits: Technology-Based Effluent Limits (TBELs) and; Water Quality-Based Effluent Limits (WQBELs).

TBELs require every individual member of a discharge class or category to operate their water pollution control technologies according to industry-wide standards and accepted engineering practices. TBELs are developed by applying the National Effluent Limitation Guidelines (ELGs) established by USEPA for specific industrial categories. Technology based treatment requirements under section 301(b) of the CWA represent the minimum level of control/treatment using available technology that must be imposed in a section 402 permit (40 CFR 125.3(a)).

In the absence of ELGs, TBEL effluent limits can also be based upon Best Professional Judgment (BPJ). Compliance schedules for TBELs are not allowed, since the statutory deadlines for best practicable technology (BPT), best available technology economically achievable (BAT) and best conventional control technology (BCT) have all passed.

WQBELs are designed to be protective of the beneficial uses of the receiving water and are independent of the available treatment technology. The WQBELs for this facility are based on water quality criteria in 327 IAC 2-1-6 or under the procedures described in 327 IAC 2-1-8.2 through 327 IAC 2-1-8.7 and implementation procedures in 327 IAC 5. Limitations and/or monitoring are required for parameters identified by applications of the reasonable potential to exceed WQBEL under 327 IAC 5-2-11.1(h)(1).

According to 40 CFR 122.44 and 327 IAC 5, NPDES permit limits are based on either TBELs, where applicable, BPJ, or WQBELs, whichever is most stringent. The decision to limit or monitor the parameters contained in this permit is based on information contained in the permittee's NPDES application. In addition, when performing a permit renewal, existing permit limits must be considered. These may be TBELs, WQBELs, or limits based on BPJ. When renewing a permit, the antibacksliding provisions identified in 327 IAC 5-2-10(11) are taken into consideration.

5.1 Existing Permit Limits

Outfall 001-Discharge Tunnel to the Ohio River

Parameter	Monthly Average	Daily Maximum	Units
Flow	Report	Report	MGD
TRO	-	0.06	mg/l
Chlorination/Bromination Frequency Duration	 - -	 4 40	 Times/Day Minutes/Day
Plant Capacity Factor	Report	-	% Daily Average
Temperature Intake	-	Report	°F

Effluent Mixed River	- -	Report Report	°F °F
Mercury	12	20	ng/l
Arsenic	Report	Report	mg/l
Cadmium	2.1	4.2	ug/l
Selenium	Report	Report	mg/l
Nickel	Report	Report	mg/l
Aluminum	Report	Report	mg/l
Silver	Report	Report	ug/l
Zinc	Report	Report	mg/l
Free Cyanide	Report	Report	mg/l
Sulfate	Report	Report	mg/l
Copper Non-Metal Cleaning	Report	Report	mg/l
Iron Non-Metal Cleaning	Report	Report	mg/l
Boron	Report	Report	mg/l
Chloride	Report	Report	mg/l
Fluoride	Report	Report	mg/l
Alkalinity	Report	Report	mg/l
Sodium	Report	Report	mg/l

Parameter	Daily Minimum	Daily Maximum	Units
pH	6.0	9.0	Std. Units

Outfalls 101/201-West/East Ash Pond Discharges

Parameter	Monthly Average	Daily Maximum	Units
Flow	Report	Report	MGD
TSS	30	70	mg/l
O& G	15	20	mg/l
Copper	-	0.2	mg/l
Iron	-	1.0	mg/l

Parameter	Daily Minimum	Daily Maximum	Units
pH	6.0	9.0	Std. Units

Outfall 301- FGD System Discharge

Parameter	Monthly Average	Daily Maximum	Units
Flow	Report	Report	MGD
TSS	Report	Report	mg/l
O& G	Report	Report	mg/l
Ammonia (as N)	Report	Report	mg/l
Arsenic	Report	Report	ug/l

Boron	Report	Report	ug/l
Chloride	Report	Report	mg/l
Manganese	Report	Report	mg/l
Mercury	Report	Report	ng/l
Selenium	Report	Report	ug/l
Zinc	Report	Report	mg/l

Parameter	Daily Minimum	Daily Maximum	Units
pH	6.0	9.0	Std. Units

Outfall 004- Treated sanitary wastewater

Parameter	Monthly Average	Daily Maximum	Units
Flow	Report	Report	MGD
TSS	30	45	mg/l
$TBOD_5$	Report	45	mg/l
E. coli	125	235	Count/100 ml

Parameter	Daily Minimum	Daily Maximum	Units
pH	Report	Report	Std. Units

5.2 Technology-Based Effluent Limits (TBEL)

The U.S. EPA has established technology based effluent guidelines for steam electric generating facilities. The applicable technology based standards for the FB Culley Generating Station are contained in 40 CFR 423 – Steam Electric Power Generating Point Source Category. Since this facility is classified as an "existing point source", all discharges are subject to effluent guidelines in 40 CFR 423.12, Best Practicable Control Technology (BPT) and 40 CFR 423.13, Best Available Control Technology (BAT). Revised final Effluent Limitations Guidelines (ELGs) and Standards for the Steam Electric Power Generating Industry were published in the Federal Register (FR) on November 3, 2015 and became effective on January 4, 2016.

The revised federal ELGs require dry handling for fly ash and bottom ash transport water with compliance by November 1, 2018 unless an alternate date, which is to be no later than December 31, 2023, is granted by the permitting authority. This permit prohibits discharge of fly ash or bottom ash transport water after November 1, 2018. The permittee may request an alternate compliance date beyond November 1, 2018 no later than 12-months from the effective date of this permit in accordance with the Reopening Clauses in I.F of the permit.

In evaluating the need for TBELs for Cooling Tower Blowdown, Low Volume Wastes, Metal Cleaning Wastes, Coal Pile Runoff and Ash Transport Water (prior to November 1, 2018) and in accordance with the federal effluent guideline, when wastewater streams are combined for discharge and/or treatment, 40 CFR 423 requires that the quantity of each

pollutant attributable to each controlled waste source shall not exceed the specified limitations for that waste source. Compliance with this requirement may be achieved by establishing internal monitoring locations (outfalls) prior to the regulated wastestream commingling with other wastestreams. As an alternative to establishing internal monitoring locations for determining compliance with the federal effluent guidelines, the permittee may utilize the combined wastestream formula (CWF) as described in 40 CFR 403.6(e) to calculate alternate compliance values based on the applicable portion of the ELG, to be applied to the discharge of the combined wastestreams at the final outfall(s).

IDEM has determined that there is a need to establish internal monitoring stations to determine compliance with the TBELs. With the next permit renewal application, the permittee is required to submit flow data for all regulated, non-regulated, and dilution wastestreams and the concentration of the selected parameters contributed by each of these wastestreams for use in developing alternate limitations using the combined wastestream formula (CWF).At the next permit renewal limits will be developed using either the Combined Wastestream Formula or by establishing internal outfalls for determining compliance with 40 CFR 423.

If at any time prior to the completion of the construction of pollution control equipment installed to meet the conditions of this permit, including but not limited to dry bottom ash or FGD wastewater treatment equipment, the permittee notifies IDEM of its intent to permanently retire Unit 3 no later than December 31, 2023, a reopener has been added to the permit whereby the permittee may request a permit modification to address changes to the compliance schedule for bottom ash and FGD wastewater.

Requirements applicable to all wastewater streams:

1. pH Control – 40 CFR 423.12(b)(1), The pH of all discharges, except once through cooling water, shall be within the range of 6.0-9.0 s.u.(BPT)

2. Polychlorinated biphenyl (PCB) – 40 CFR 423.12(b)(2) and 40 CFR 423.13(a), There shall be no discharge of polychlorinated biphenyl compounds such as those commonly used for transformer fluid. (BPT)

Regulated wastewater streams and their applicable requirements

There are ten (10) separate wastewater streams that are regulated by 40 CFR Part 423. The wastestreams applicable to this facility are as follows:

1. Low volume wastewater – The BPT guidelines are contained in 40 CFR 423.12(b)(3) and there are no BAT guidelines.

2. Ash handling wastewater – The BPT guidelines are contained in 40 CFR 423.12(b)(4) and the BAT guidelines are contained in 40 CFR 423.13(h) and (k).

3. Metal cleaning wastewater – The BPT guidelines are contained in 40 CFR 423.12(b)(5) and the BAT guidelines are contained in 40 CFR 423.13(e).

4. Coal Pile Runoff - The BPT guidelines are contained in 40 CFR 423.12(b)(9) and (10) and there are no BAT guidelines.

5. Flue Gas Desulfurization Wastewater – The BPT guidelines are contained in 40 CFR 423.12(b)(11) and the BAT guidelines are contained in 40 CFR 423.13(g).

6. Combustion residual leachate - There are no BPT guidelines and the BAT guidelines are contained in 40 CFR 423.13(l).

Outfall 001-Discharge Tunnel to the Ohio River

Total Residual oxidants (TRO)

The monitoring requirements and effluent limitations for Total Residual Oxidants (TRO) have been retained from the previous permit and apply at any time bromine is used and may be in the discharge. Use the test methods for Total Residual Chlorine to determine Total Residual Oxidants. At present, two test methods are considered to be acceptable to IDEM, amperometric (4500-Cl-D,E) and DPD colorimetric method (4500-Cl-G), to determine TRO concentrations at the level of 0.06 mg/l. If another EPA test method is to be used, the method must first be approved by this Department.

Plant Capacity Factor (% of Total Capacity)

This reporting requirement has been retained from the previous permit. The permittee shall report the % Daily Average 1 X Monthly.

Outfalls 101 - West Ash Pond

The West Ash Pond ceased receiving bottom ash, fly ash and FGD wastewater in October 2015.

Total Suspended Solids & Oil & Grease (O&G)

The technology based effluent limitations for Total Suspended Solids (TSS) and Oil & Grease (O&G) limitations are based on 40 CFR 423.12(b)(3) and 40 CFR 423.12(b)(4), and 40 CFR 423.12(b)(5). The effluent limitations for these parameters have been retained from the previous permit. The TSS limitations are 30 mg/l monthly average and 70 mg/l daily maximum and were previously developed using BPJ. The Oil & Grease limitations are 15 mg/l monthly average and 20 mg/l daily maximum.

Outfall 201 - East Ash Pond

Beginning November 1, 2018, there shall be no discharge of pollutants in fly ash transport water for either Unit 2 or 3. Beginning December 31, 2020, there shall be no discharge of pollutants in bottom ash transport water for Unit 3. Beginning December 31, 2023 there

shall be no discharge of bottom ash water from Unit 2. This date is based on the proposed closure date and capacity factor and considering the factors in the federal rules for establishing a compliance deadline. As noted previously, Unit 2 is scheduled for closure by no later than December 31, 2023. In addition, Unit 2 has averaged a 23.4% capacity factor over the last 5 years.

Total Suspended Solids & Oil & Grease (O&G)

The technology based effluent limitations for Total Suspended Solids (TSS) and Oil & Grease (O&G) limitations are based on 40 CFR 423.12(b)(3) and 40 CFR 423.12(b)(4), and 40 CFR 423.12(b)(5). The effluent limitations for these parameters have been retained from the previous permit. The TSS limitations are 30 mg/l monthly average and 70 mg/l daily maximum and were previously developed using BPJ. The Oil & Grease limitations are 15 mg/l monthly average and 20 mg/l daily maximum.

Iron and Copper (Metal Cleaning Waste)

Iron limitations are required based upon the presence of periodic chemical and non-chemical metal cleaning waste in the discharge. The metal cleaning waste Technology Based Effluent Limit (TBEL) in 40 CFR 423.12(b)(5) and 40 CFR 423.13(e) identifies a daily maximum and monthly average limitation of 1.0 mg/l for Iron. Net limits may apply for Iron. Net limitations are to be calculated by subtracting the measured background levels of these parameters in the ash pond from the actual measured concentrations of these parameters when limitations apply. These background levels are to be calculated by monitoring the ash pond effluent concentrations of Iron and Copper over a period of time, to consist of a minimum of ten samples taken over a minimum of thirty (30) days when there is no discharge of metal cleaning wastes during a period that is a least 30 days but not to exceed 90 days preceding each discharge of metal cleaning wastes. The background levels demonstrated by this monitoring, along with supporting data are to be submitted with monthly Discharge Monitoring Reports (DMR) when reporting discharge of metal cleaning wastes. A new database shall be established in the quarter preceding each subsequent discharge of metal cleaning wastes.

Copper limitations are required based upon the presence of periodic chemical and non-chemical metal cleaning waste in the discharge. The metal cleaning waste Technology Based Effluent Limit (TBEL) in 40 CFR 423.12(b)(5) identifies a daily maximum limitation of 1.0 mg/l for Copper. The current Daily Maximum effluent limitation for Copper is 0.2 mg/l, which is more stringent than 40 CFR 423.12 (b)(5), and has been retained from previous permits to comply with anti-backsliding requirements set forth in 327 IAC 5-2-10(11).

Outfall 301- FGD System Discharge

Internal Outfall 301 was established to regulate the discharge from the FGD Waste Treatment System to the Unit #3 (East) Ash Pond. Since the last permit renewal, the effluent limitation guidelines (ELGs) have been revised and finalized by EPA for steam electric power plants. The revised ELGs became effective January 4, 2016, and establish the following limitations for parameters in FGD discharge.

Parameter	Monthly Average	Daily Maximum	Units
TSS	30	100	mg/l
Arsenic	8.0	11.0	ug/l
Mercury	356	788	ng/l
Selenium	12	23	ug/l
Nitrate/Nitrite as N	4.4	17.0	mg/l

Parameter	Daily Minimum	Daily Maximum	Units
pH	6.0	9.0	s.u.

The permittee has requested an alternate compliance date for the new FGD limitations. To support the alternate compliance date, the permittee provided proposed schedules from a technology assessment report prepared by a third party engineer. Based on the information provided, IDEM proposes an effective of date of February 1, 2021 for Arsenic, Mercury, Selenium, and Nitrate/Nitrite as N. If the permittee decides to close Unit 3 or proceed with the zero liquid discharge option for FGD wastewater, the permittee may request a permit modification to revise the compliance date for the FGD wastewater to no later than December 31, 2023.

Outfall 004

Total Suspended Solids (TSS) and $TBOD_5$

The TBOD5 limitation has been retained from the previous permit and was originally based on the secondary treatment requirements for wastewater treatment facilities regulated in accordance with 327 IAC 5-5-3.

The TSS limitations have been retained from the previous permit and are based on the small sanitary discharge requirements in accordance with 327 IAC 5-10-5.

In accordance with the antibacksliding provisions contained in 327 IAC 5-2-10(11), these limits have been retained from the previous permit. These limitations are included to assure adequate treatment is being provided for this wastestream and meet ORSANCO and Indiana Water Quality Standards.

5.3 Water Quality-Based Effluent Limits

The water quality-based effluent limits were calculated using the criteria contained in Table 1 of 327 IAC 2-1-6, Minimum Surface Water Quality Standards, and the procedure contained in 327 IAC 5-2-11.1, Establishment of Water Quality-Based Effluent Limitations for Dischargers not discharging to Waters within the Great Lakes System.

Outfalls 001 and 004:

Narrative Water Quality Based Limits

The narrative water quality contained under 327 IAC 2-1-6(a)(1) (A)-(E) have been included in this permit to ensure that the narrative water quality criteria are met.

Numeric Water Quality Based Limits

The numeric water quality criteria and values contained in this permit have been calculated using the tables of water quality criteria under 327 IAC 2-1-6(b) & (c).

Outfall 001

Flow

The effluent flow is to be monitored in accordance with 327 IAC 5-2-13(a)2.

pH

Discharges to waters of the state are limited to the range of 6.0-9.0 s.u., in accordance with 327 IAC 2-1-6.

Cadmium and Mercury

As part of the previous permit renewal, a Wasteload Analysis (WLA) report was completed and Cadmium and Mercury were evaluated for reasonable potential to exceed (RPE) water quality criteria. The results of the RPE analysis showed that Cadmium and Mercury had reasonable potential to exceed; therefore, water quality based effluent limitations were required and included in the permit. In accordance with the antibacksliding provisions contained in 327 IAC 5-2-10(11), these limits have been retained from the previous permit.

Arsenic, Nickel, Free Cyanide, Selenium, Zinc, Iron, Boron, Chloride, Fluoride, , Silver and Sulfate,

In the previous permit, a Reasonable Potential Evaluation (RPE) was performed in conjunction with a Wasteload Allocation Analysis using monitoring data collected from February 2007 through March 2008. The evaluation concluded that the projected effluent quality (PEQ) did not exceed the projected effluent limitations (PEL) for arsenic, nickel, free cyanide, selenium, silver, sulfate, or zinc. Therefore, effluent limitations were not required. As part of this permit renewal, a Reasonable Potential Evaluation (RPE) was performed in conjunction with a Wasteload Allocation Analysis. The evaluation concluded that the projected effluent quality (PEQ) did not exceed the projected effluent limitations (PEL) for Boron, Chloride, or Fluoride.

However, EPA documents such as the "Report to Congress, Wastes from the Combustion of Fossil Fuels, Volume 1 & 2", March 1999, and related reference documents identify that certain pollutants may be present in "Utility Coal Combustion Waste" such as fly ash, bottom ash, boiler slag, and flue gas desulfurization (FGD) waste. Therefore, monitoring will continue to be required for arsenic, nickel, free cyanide, selenium, silver, sulfate, zinc, Iron, Boron, Chloride, and Fluoride. The monitoring frequency for Boron, Chloride, and Fluoride has been reduced to 1 X Quarterly.

Copper

As part of this permit renewal, a Wasteload Analysis (WLA) report was completed and Copper was evaluated for reasonable potential to exceed (RPE) a water quality criterion. The results of the RPE analysis show that Copper has reasonable potential to exceed; therefore, water quality based effluent limitations are required and have been include in the permit. The WLA002215 has been included as Attachment I.

Temperature

Intake and Effluent temperature shall be monitored and measurements recorded every hour. The highest single recorded measurement for each day shall be reported on the state monthly monitoring report for each day. The highest single recorded daily measurement shall be reported on the federal discharge monitoring report as the maximum daily temperature for that month. This requirement has been retained from the previous permit.

The discharge from Outfall 001, as determined at the edge of the mixing zone described in 327 IAC 2-1-4, shall not exceed the maximum limits in the following table more than one percent (1%) of the hours in the twelve (12) month period ending with any month. At no time shall the water temperature at such locations exceed the maximum limits in the following table by more than three degrees Fahrenheit (3°F) (one and seven-tenths degrees Celsius (1.7°C)).

Table 1

	Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec
°F	50	50	60	70	80	87	89	89	87	78	70	57
°C	10	10	15.6	21.1	26.7	30.6	31.7	31.7	30.7	25.6	21.1	14

The permittee will have the option of either meeting the above limits at the end of pipe, or by meeting the limits with a mixed river temperature that takes into account the mixing zone allowed by 327 IAC 2-1-6(b). The mixed river temperature is to be determined by employing the following mathematical model:

$$T_{MR} = T_u + \frac{Q_e(T_e - T_u)}{3553}$$

Where:

T_{MR} = mixed river temperature (°F)
T_u = upstream river temperature (°F)
T_e = effluent temperature (°F)
Q_e = effluent flow (MGD)
3553 = one-half of the $Q_{7,10}$ low flow value of the receiving stream in MGD

Total Residual Oxidants (TRO)-

Monitoring requirements and effluent limitations for TRO have been retained from the previous permit and will apply at any time chlorine and/or bromine is used and may be in the discharge. Use the test methods for Total Residual Chlorine to determine Total Residual Oxidants. At present, two test methods are considered to be acceptable to IDEM, amperometric (4500-Cl-D,E) and DPD colorimetric method (4500-Cl-G), to determine TRO concentrations at the level of 0.06 mg/l. If another EPA test method is to be used, the method must first be approved by this Department.

Chlorination / Bromination Frequency

The monitoring of chlorination/bromination frequency applies only when the facility is chlorinating / brominating intermittently. The permit requires the permittee to provide a monthly report on the "times per day" the permittee is intermittently chlorinating / brominating. The permittee is limited to no more than four (4) chlorination / bromination cycles per day.

Chlorination / Bromination Duration

The monitoring for duration of chlorination / bromination dose applies only when the facility is chlorinating / brominating intermittently. The permit requires the permittee to provide a monthly report on the number of minutes per chlorination / bromination cycle the permittee is chlorinating / brominating intermittently. The permittee is limited to no more than forty (40) minutes per chlorination / bromination cycles.

Bromide

In light of questions raised during the public comment period about possible impacts on downstream public water supplies, bromide monitoring at a frequency of quarterly has been added to the permit. See also response to Sierra Club comments below.

Outfall 004

Flow

The effluent flow is to be monitored in accordance with 327 IAC 5-2-13(a)2.

pH

Discharges to waters of the state are limited to the range of 6.0-9.0 s.u., in accordance with 327 IAC 2-1-6.

E. coli

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

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.

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.

5.4 Whole Effluent Toxicity Testing (WETT)

The permit does not contain a requirement to conduct Whole Effluent Toxicity Testing (WETT).

5.5 Antibacksliding

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

5.6 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, the existing uses and level of water quality necessary to protect those 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 (BMPs) for regulated pollutants that ensure the narrative and numeric water quality criteria applicable to each of the designated uses are achieved in the water and any designated uses of the downstream water are 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 2-1-6 or 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 2-1-6 or 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 (CWA), including a change in process or operation that will result in a significant lowering of water quality.

This permit includes new permit limitations for Copper. In accordance with 327 IAC 2-1.3-1(b), the new permit limitations are not subject to the Antidegradation Implementation Procedures in 327 IAC 2-1.3-5 and 2-1.3-6 as the new permit limitations are not the result of a deliberate activity taken by the permittee.

The permittee is prohibited from undertaking any deliberate 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 information is submitted to the commissioner demonstrating that the proposed new or increased discharge will not cause a significant lowering of water quality, or an antidegradation demonstration submitted and approved in accordance 327 IAC 2-1.3.

5.7 Storm Water

According to 40 CFR 122.26(b)(14)(ii) and 327 IAC 5-4-6(b)(1) facilities classified under Industrial Classification (SIC) Code 4991 are considered to be engaging in "industrial activity" for purposes of 40 CFR 122.26(b). Therefore, the permittee is required to have all storm water discharges associated with industrial activity permitted. Treatment for storm water discharges associated with industrial activities is required to meet, at a minimum, best available technology economically achievable/best conventional pollutant control technology (BAT/BCT) requirements. EPA has determined that non-numeric technology-based effluent limits have been determined to be equal to the best practicable technology (BPT) or BAT/BCT for storm water associated with industrial activity.

Storm water associated with industrial activity must be assessed to determine compliance with all water quality standards. The non-numeric storm water conditions and effluent limits contain the technology-based effluent limitations. Effluent limitations, as defined in the CWA, are restrictions on quantities, rates, and concentrations of constituents which are discharged. Effective implementation of these requirements should meet the applicable water quality based effluent limitations. Violation of any of these effluent limitations constitutes a violation of the permit.

Additionally, IDEM has determined that with the appropriate implementation of the required control measures and Best Management Practices (BMPs) found in Part I.D. of the permit, the discharge of storm water associated with industrial activity from this facility will meet applicable water quality standards and will not cause a significant lowering of water quality. Therefore, the storm water discharge is in compliance with Antidegradation Standards and Implementation Procedures found in 327 IAC 2-1.3 and an Antidegradation Demonstration is not required.

The TBELs require the permittee to minimize exposure of raw, final, or waste materials to rain, snow, snowmelt, and runoff. In doing so, the permittee is required, to the extent technologically available and economically achievable, to either locate industrial materials and activities inside or to protect them with storm resistant coverings. In addition, the permittee is required to: (1) use good housekeeping practices to keep exposed areas clean, (2) regularly inspect, test, maintain and repair all industrial equipment and systems to avoid situations that may result in leaks, spills, and other releases of pollutants in storm water discharges, (3) minimize the potential for leaks, spills and other releases that may be exposed to storm water and develop plans for effective response to such spills if or when they occur, (4) stabilize exposed area and contain runoff using structural and/or non-structural control measures to minimize onsite erosion and sedimentation, and the resulting discharge of pollutants, (5) divert, infiltrate, reuse, contain or otherwise reduce storm water runoff, to minimize pollutants in the permitted facility discharges, (6) enclose or cover storage piles of salt or piles containing salt used for deicing or other commercial or industrial purposes, including maintenance of paved surfaces, (7) train all employees who work in areas where industrial materials or activities are exposed to storm water, or who are responsible for implementing activities necessary to meet the conditions of this permit (e.g., inspectors, maintenance personnel), including all members of your Pollution

Prevention Team, (8) ensure that waste, garbage and floatable debris are not discharged to receiving waters by keeping exposed areas free of such materials or by intercepting them before they are discharged, and (9) minimize generation of dust and off-site tracking of raw, final or waste materials.

To meet the non-numeric effluent limitations in Part I.D.4, the permit requires the facility to select control measures (including BMPs) to address the selection and design considerations in Part I.D.3.

The permittee must control its discharge as necessary to meet applicable water quality standards. It is expected that compliance with the non-numeric effluent limitations and other terms and conditions in this permit will meet this effluent limitation. However, if at any time the permittee, or IDEM, determines that the discharge causes or contributes to an exceedance of applicable water quality standards, the permittee must take corrective actions, and conduct follow-up monitoring.

"Terms and Conditions" to Provide Information in a Storm Water Pollution Prevention Plan (SWPPP)

Distinct from the effluent limitation provisions in the permit, the permit requires the discharger to prepare a SWPPP for the permitted facility. The SWPPP is intended to document the selection, design, installation, and implementation (including inspection, maintenance, monitoring, and corrective action) of control measures being used to comply with the effluent limits set forth in Part I.D. of the permit. In general, the SWPPP must be kept up-to-date, and modified when necessary, to reflect any changes in control measures that were found to be necessary to meet the effluent limitations in the permit.

The requirement to prepare a SWPPP is not an effluent limitation, rather it documents what practices the discharger is implementing to meet the effluent limitations in Part I.D. of the permit. The SWPPP is not an effluent limitation because it does not restrict quantities, rates, and concentrations of constituents which are discharged. Instead, the requirement to develop a SWPPP is a permit "term or condition" authorized under sections 402(a)(2) and 308 of the Act. Section 402(a)(2) states, "[t]he Administrator shall prescribe conditions for [NPDES] permits to assure compliance with the requirements of paragraph (1) of this subsection, including conditions on data and information collection, reporting, and such other requirements as he deems appropriate." The SWPPP requirements set forth in this permit are terms or conditions under the CWA because the discharger is documenting information on how it intends to comply with the effluent limitations (and inspection and evaluation requirements) contained elsewhere in the permit. Thus, the requirement to develop a SWPPP and keep it up-to-date is no different than other information collection conditions, as authorized by section 402(a)(2). It should be noted that EPA has developed a guidance document, "Developing your Storm Water Pollution Prevention Plan – A guide for Industrial Operators (EPA 833-B09-002), February 2009, to assist facilities in developing a SWPPP. The guidance contains worksheets, checklists, and model forms that should assist a facility in developing a SWPPP.

Public availability of documents

Part I.E.2.d(2) of the permit requires that the permittee retain a copy of the current SWPPP at the facility and it must be immediately available, at the time of an onsite inspection or upon request, to IDEM. Additionally, interested persons can request a copy of the SWPPP through IDEM. By requiring members of the public to request a copy of the SWPPP through IDEM, the Agency is able to provide the permittees with assurance that any Confidential Business Information contained within the permitted facility's SWPPP is not released to the public.

5.8 Water Treatment Additives

In the event that changes are to be made in the use of water treatment additives that could significantly change the nature of, or increase the discharge concentration of any of the additives contributing to Outfall 001, the permittee shall notify the IDEM as required in Part II.C.1 of the permit. The use of any new or changed water treatment additives/chemicals or dosage rates shall not cause the discharge from any permitted outfall to exhibit chronic or acute toxicity. Acute and chronic aquatic toxicity information must be provided with any notification regarding any new or changed water treatment additives or dosage rates. The following is a list of water treatment additives currently approved for use at the facility:

Supplier	WTA	Outfall	Purpose
GE Benz Inc.	Corrshield NT402	001	Corrosion Inhibitor
	Cortrol OS5607	001	Oxygen Scavenger / Metal Passivator
	Ferric Chloride	001	Flocculant
	Klaraid PC1190	001	Coagulant
	Metclear MR2405	001	Flocculant
	Optisperse HP 2100	001	Boiler Treatment
	Optisperse HP 3100	001	Boiler Treatment
	Polyfloc AE 1125	001	Flocculant
	Potassium Permanganate	001	Oxidant
	Scaletrol PDC9325	001	Deposit Control
	Sodium Bisulfite	001	Dechlorination Agent
	Sodium Hydroxide	001	pH Adjustment
	Sodium Hypochlorite	001	Disinfectant
	Spectrus OX1201	001	Microbial Control
	Steamate NA0280	001	Steam Condensate Treatment

6.0 PERMIT DRAFT DISCUSSION

6.1 Discharge Limitations

The proposed final effluent limitations are based on the more stringent of the Indiana WQBELs, TBELS, or approved TMDLs and NPDES regulations as appropriate for each regulated outfall. Sections 5.2 and 5.3 of this document explain the rationale for the effluent limitations at each Outfall.

Outfall 001-Discharge Tunnel to the Ohio River

Parameter	Monthly Average	Daily Maximum	Units
Flow	Report	Report	MGD
TRO	-	0.06	mg/l
Chlorination/Bromination			
Frequency	-	4	Times/Day
Duration	-	40	Minutes/Day
Plant Capacity Factor	Report	-	% Daily Avg.
Temperature			
Intake	-	Report	°F
Effluent	-	Report	°F
Mixed River	-	Report	°F
Mercury	12	20	ng/l
Arsenic	Report	Report	mg/l
Cadmium	2.1	4.2	ug/l
Selenium	Report	Report	mg/l
Nickel	Report	Report	mg/l
Aluminum	Report	Report	mg/l
Silver	Report	Report	ug/l
Zinc	Report	Report	mg/l
Free Cyanide	Report	Report	mg/l
Sulfate	Report	Report	mg/l
Copper			
Interim	Report	Report	ug/l
Final	31	63	ug/l
Iron	Report	Report	mg/l
Boron	Report	Report	mg/l
Chloride	Report	Report	mg/l
Fluoride	Report	Report	mg/l
Bromide	Report	Report	mg/l

Parameter	Daily Minimum	Daily Maximum	Units
pH	6.0	9.0	Std. Units

Outfalls 101 – West Ash Pond

Parameter	Monthly Average	Daily Maximum	Units
Flow	Report	Report	MGD
TSS	30	70	mg/l
O& G	15	20	mg/l

Parameter	Daily Minimum	Daily Maximum	Units
pH	6.0	9.0	Std. Units

Outfall 201 - East Ash Ponds

Parameter	Monthly Average	Daily Maximum	Units
Flow	Report	Report	MGD
TSS	30	70	mg/l
O& G	15	20	mg/l
Copper	-	0.2	mg/l
Iron	1.0	1.0	mg/l

Parameter	Daily Minimum	Daily Maximum	Units
pH	6.0	9.0	Std. Units

Outfall 301-FGD System Discharge

Parameter	Monthly Average	Daily Maximum	Units
Flow	Report	Report	MGD
TSS	30	100	mg/l
Arsenic Interim Final	 Report 8.0	 Report 11.0	 ug/l ug/l
Mercury Interim Final	 Report 356	 Report 788	 ng/l ng/l
Selenium Interim Final	 Report 12.0	 Report 23.0	 ug/l ug/l
Nitrate/Nitrite as N Interim Final	 Report 4.4	 Report 17.0	 mg/l mg/l

Parameter	Daily Minimum	Daily Maximum	Units
pH	6.0	9.0	Std. Units

Outfall 004 –Treated sanitary wastewater

Parameter	Monthly Average	Daily Maximum	Units
Flow	Report	Report	MGD
TSS	30	45	mg/l
$TBOD_5$	Report	45	mg/l
E. coli	125	235	Count/100 ml

Parameter	Daily Minimum	Daily Maximum	Units
pH	6.0	9.0	Std. Units

Outfall 000-Intake Structure

Parameter	Monthly Average	Daily Maximum	Units
Mercury	Report	Report	ng/l
Arsenic	Report	Report	mg/l
Cadmium	Report	Report	ug/l
Selenium	Report	Report	mg/l
Nickel	Report	Report	mg/l
Aluminum	Report	Report	mg/l
Silver	Report	Report	ug/l
Zinc	Report	Report	mg/l
Copper	Report	Report	ug/l
Iron	Report	Report	mg/l

6.2 Monitoring Conditions and Rationale

Analytical and sampling methods used shall conform to the version of 40 CFR 136 as referenced in 327 IAC 5-2-13(d)(1). Nothing has changed to warrant modifying the monitoring conditions.

Outfall 001-Discharge Tunnel to the Ohio River

Parameter	Minimum Frequency	Sample Type
Flow	1 X Daily	Continuous
TRO	1 X Daily	Grab
Chlorination/Bromination Frequency Duration	 1 X Daily 1 X Daily	 Report Report
Plant Capacity Factor	1 X Daily	Report
Temperature Intake Effluent	 1 X Hour 1 X Hour	 Grab Grab

Mixed River	1 X Day	Report
Mercury	1 X Bi-Month	Grab
Arsenic	1 X Month	24 Hr. Comp.
Cadmium	2 X Month	24 Hr. Comp.
Selenium	1 X Month	24 Hr. Comp.
Nickel	1 X Month	24 Hr. Comp.
Aluminum	1 X Month	24 Hr. Comp.
Silver	2 X Month	24 Hr. Comp.
Zinc	1 X Month	24 Hr. Comp.
Free Cyanide	1 X Month	Grab
Sulfate	2 X Month	24 Hr. Comp.
Copper	2 X Month	24 Hr. Comp
Iron	2 X Month	24 Hr. Comp.
Boron	Quarterly	Grab
Chloride	Quarterly	Grab
Fluoride	Quarterly	Grab
Bromide	Quarterly	Grab
pH	1 X Month	Grab

Outfall 101 West Ash Pond

Parameter	Minimum Frequency	Sample Type
Flow	1 X Day	Continuous
TSS	1 X Week	Grab
O & G	1 X Week	Grab
pH	1 X Day	Grab

Outfall 201 East Ash Pond

Parameter	Minimum Frequency	Sample Type
Flow	1 X Day	Continuous
TSS	1 X Week	Grab
O & G	1 X Week	Grab
Copper	1 X Day	24 Hr. Comp.
Iron	1 X Day	24 Hr. Comp.
pH	1 X Day	Grab

Outfall 301-FGD System Discharge

Parameter	Minimum Frequency	Sample Type
Flow	1 X Day	Continuous
TSS	2 X Month	24 Hr. Total
Arsenic	2 X Month	Grab
Mercury	6 X Year	Grab
Selenium	2 X Month	Grab
pH	2 X Month	Grab
Nitrate/Nitrite as N	2 X Month	Grab

Outfall 004-Treated sanitary discharge

Parameter	Minimum Frequency	Sample Type
Flow	2 X Month	24 Hr. Total
TSS	2 X Month	Grab
TBOD5	2 X Month	24 Hr. Comp.
E. coli	2 X Month	Grab
pH	2 X Month	Grab

Outfall 000-Intake Structure

Parameter	Minimum Frequency	Sample Type
Mercury	1 X Month	Grab
Arsenic	1 X Month	24 Hr. Comp.
Cadmium	1 X Month	24 Hr. Comp.
Selenium	1 X Month	24 Hr. Comp.
Nickel	1 X Month	24 Hr. Comp.
Aluminum	1 X Month	24 Hr. Comp.
Silver	1 X Month	24 Hr. Comp.
Zinc	1 X Month	24 Hr. Comp.
Copper	1 X Month	24 Hr. Comp.
Iron	1 X Month	24 Hr. Comp.

6.3 Schedule of Compliance

The permittee requested a 36-month compliance schedule from the effective date of the permit, with status reports at 9-month increments, to allow for adequate time to 1) review and analyze potential sources of the three listed pollutants, 2) assess treatment alternatives, and 3) design and construct pollutant control equipment, if necessary. A 36-month schedule of compliance schedule has been included in the final permit.

6.4 Special Conditions and Other Permit Requirements

6.4.1 Clean Water Act (CWA) Section 316(a) Alternative Thermal Effluent Limitations

It has been determined that the F. B. Culley plant no longer requires alternative thermal discharge limits as granted under 316(a) of the Clean Water Act. Please refer to Section 5.3 of this Fact Sheet for temperature limitations.

6.4.2 Clean Water Act Section 316(b) Cooling Water Intake Structure(s) (CWIS)

Introduction

In accordance with 40 CFR 401.14, the location, design, construction and capacity of cooling water intake structures of any point source for which a standard is established pursuant to section 301 or 306 of the Act shall reflect the best technology available for minimizing adverse environmental impact.

The EPA promulgated a Clean Water Act (CWA) section 316(b) regulation on August 15, 2014, that establishes standards for cooling water intake structures. 79 Fed. Reg. 48300-439 (August 15, 2014). The regulation establishes best technology available standards to reduce impingement and entrainment of aquatic organisms at existing power generation and manufacturing facilities and it became effective on October 14, 2014.

For permits expiring prior to July 2018, the permittee can (1) negotiate an alternative schedule for submitting required information with the Director (IDEM) after demonstrating need, or (2) request waiver(s) for submitting required information. An alternative schedule for submission of information required under the current CWA section 316(b), or waiver(s) of submittal requirements shall be reviewed and approved by IDEM. Upon approval of such alternative schedules and /or waivers, or until the time the required information/reports are submitted and the permit is renewed or modified following public notice, the IDEM is required to make a BTA determination using Best Professional Judgment (BPJ) to comply with CWA Section 316(b) based on existing information. The BTA determination is subject to change after the required information is submitted in accordance with the federal regulations effective October 14, 2014.

The facility has requested an alternate submittal date of July 1, 2019 for the 40 CFR 122.21(r)(7) and (9) thru (13) information. IDEM approves this alternate submittal date as justified in a letter to IDEM dated July 25, 2016.

Cooling Water Intake Structure Data (122.21(r)(3)):

The F.B. Culley Plant cooling water intake consists of three intake structures, one for each of the three original generating units. Unit 1 retired in 2006, so only the Unit 2 and Unit 3

structures are utilized for bringing cooling water into the plant. Currently the plant has the ability to circulate a combined 188,300 gallons per minute (gpm) through Units 2 and 3.

Although the Unit 1 intake structure is no longer utilized for cooling water, it is, along with Unit 2, utilized as a source for house service water. The three intake structures are similar in construction with Unit 1 and Unit 2 being almost identical. In general, the structures are comprised of forebay structures, trash racks, sluice gates, traveling water screens, and circulating water pumps. It should be noted that after the initial trash rack, each intake structure is comprised of two equal sections that contain two sluice gates, two traveling water screens, and two circulating water pumps. Both sides in each intake can be opened and closed independently of the other side.

The forebay structures for each unit are also very similar. The entrance to each forebay structure has a hinged gate that acts as an initial deterrent to larger objects such as logs and other larger floating debris. Each intake structure is approximately 26 feet wide and was designed to be approximately 33 feet deep. The depth of the forebay structures changes day to day depending upon the amount of sediment and debris that settles in them. The bottom of the initial intake section for Units 1 and 2 is at elevations 326 ft mean sea level, whereas the bottom of the initial intake section for Unit 3 is 336.5 ft mean seal level.

While the forebay structures for each intake are similar, the circulating water pumps are not. The circulating water pumps for Unit 1 are no longer in service. Unit 2 contains two, 42-inch circulating water pumps with a pump capacity of 35,000 gpm each. The pumps are one stage and have a pump efficiency of 86 percent. Unit 3 contains two circulating water pumps with a pump capacity of 69,000 gpm each and each has a pump efficiency of 85 percent. Units 2 and 3 have a design circulating water rate of 427.8 cfs (276 MGD) with all four pumps operating.

The cooling water intake is in operation throughout the year. The operating time of each electric generating unit varies throughout the year and from year to year. During the last five years, FBC Unit 2 has averaged 23.4% capacity factor while FBC Unit 3 averaged 60.9%. The average station capacity factor for 2011 through 2015 was 48.5%. Both units were simultaneously off-line an average of 58 days per year (2011 = 56 day, 2012 = 51 days, 2013 = 33 days, 2014 = 74 days, and 2015 = 78 days). In 2015, FBC Intake #2 withdrawal from the river was 8,677 gpm averaged over all calendar hours and 51,872 gpm averaged over on- line hours. FBC Intake #3 withdrawal from the river was 87,669 gpm averaged over all calendar hours and 115,083 gpm average over on-line hours.

Conclusion

A copy of the F.B. Culley Generating Station permit renewal application was sent to U.S. Fish and Wildlife on May 5, 2016. No comments were received.

IDEM has made a Best Technology Available (BTA) determination that the existing cooling water intake structure represent best technology available to minimize adverse

environmental impact in accordance with Section 316(b) of the federal Clean Water Act (33 U.S.C. section 1326) at this time based on the following information :

1. Actual Intake flow is less than 5% or less than the mean annual flow of the source water body.
2. Unit #1 has been taken out of service, reducing design cooling water intake capacity by approximately 93.55 CFS.
3. Comparison of the historical (NER 1976-77) and more recent (2006-07) impingement studies demonstrates that impingement at the F.B. Culley Generating Station is low and has been reduced by approximately 93%.

Permit Conditions

In accordance with the recently promulgated rules at 40 CFR 122 and 40 CFR 125, the owner or operator of a facility that has CWIS with a Design Intake Flow (DIF) or Actual Intake Flow (AIF) > 125 MGD must submit the information required at 40 CFR 122.21(r)(2) through (13), including all of the associated supporting documentation and/or studies, no later than July 14, 2018, unless an alternate schedule for submission is approved or a waiver of a particular requirement is requested and granted under 40 CFR 125.95. In addition, the permittee shall comply with requirements below:

1. In accordance with 40 CFR 125.98(b)(1), nothing in this permit authorizes take for the purposes of a facility's compliance with the Endangered Species Act.

2. At all times properly operate and maintain the intake equipment and incorporate management practices and operational measures necessary to ensure proper operation of the CWIS.

3. Inform IDEM of any proposed changes to the CWIS or proposed changes to operations at the facility that affect the information taken into account in the current BTA evaluation.

4. There shall be no discharge of debris from intake screen washing which will settle to form objectionable deposits which are in amounts sufficient to be unsightly or deleterious, or which will produce colors or odors constituting a nuisance.

5. All required reports shall be submitted to the IDEM, Office of Water Quality, NPDES Permits Branch.

6. The information required to be submitted at 40 CFR 122.21(r)(7) and (9) thru (13) shall be submitted no later than July 1, 2019. As part of the current permit renewal application, the permittee submitted information as required by 40 CFR 122.21(r)(2) through (r)(8). This information must be resubmitted along with (r)(7) and (r)(9) through (r)(13) documents no later than July 1, 2019.

7. Submit the information required to be considered by the Director per 40 CFR 125.98

to assist IDEM with the fact sheet or statement of basis for entrainment BTA, as soon as practicable, but no later than with the application for the next permit renewal.

8. During the next permit period monitor the actual intake flows at a minimum frequency of daily for one continuous year. The permittee may use engineering calculations, such as pump capacity, to approximate intake flow. The daily intake flow information shall be submitted with the application for the next permit renewal.

6.4.3 Polychlorinated Biphenyl (PCB)

There shall be no discharge of polychlorinated biphenyl (PCBs) compounds such as those commonly used for transformer fluid.

Many electrical transformers manufactured prior to 1978 contained PCBs. Therefore, in order to determine compliance with the PCB prohibition, the permittee shall provide the following PCB* data for Outfall 001 with the application renewal. The permittee shall submit the data to the Office of Water Quality, Industrial NPDES Permits Section, 100 North Senate Avenue, Indianapolis, Indiana 46204 2251.

Parameter	Test Method	LOD	LOQ
PCBs*	608	0.1 ug/l	0.3 ug/l

*PCB-1242, PCB-1254, PCB-1221, PCB-1232, PCB-1248, PCB-1260, and PCB-1016

6.5 Spill Response and Reporting Requirement

Reporting requirements associated with the Spill Reporting, Containment, and Response requirements of 327 IAC 2-6.1 are included in Part II.B.2.(d), Part II.B.3.(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 exceedances 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 exceedance 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.

6.6 Post Public Notice Addendum

The draft NPDES permit for the SIGECO F.B. Culley Generating Station Facility was made available for public comment from January 12, 2017 through February 13, 2017 as part of Public Notice No. 2017-1A-RD. During this comment period, comment letters dated February 13, 2017, from Tony Mendoza of the Sierra Club and February 28, 2017, from Angela Casbon-Scheller of Vectren Corporation, was received. The comments submitted by Mr. Mendoza and Ms Casbon-Scheller and this Office's corresponding responses are summarized below: Any changes to the permit and fact sheet are so noted below.

Comments from FB Culley:

Comment 1: Part I.A.1, Table 1 (page 2 of 55) - Strike TRC from the list of parameters, and strike the TRC-continuous parameter. The TRO test analyzes for all oxidants (both chlorine and bromine). The facility uses Sodium Hypochlorite (bleach) and a bromine product simultaneously and intermittently in the circulating water system for the purpose of treating intake water to control biological growth.

Response 1: IDEM has removed TRC from Outfall 001 of the permit.

Comment 2: Part I.A.1, Table 1(page 2 of 55) - Plant Capacity Factor is reported as a monthly average on the MMR and DMR. We suggest changing "% Daily Avg." to % **Monthly Avg.** for purposes of continuity.

Response 2: The standard reporting requirement for Plant Capacity Factor is % Daily average. The monitoring frequency will be 1 x Day in the renewed permit.

Comment 3: Part I.A.1,Table 1 (page 2 of 55) - We request removal of the monitoring requirement for Boron, Chloride, Fluoride, Alkalinity, and Sodium. See prior permit footnote [8]. These parameters were included in the prior permit to determine if there was a reasonable potential to exceed WQBELs. The monitoring data during the last permit cycle indicated very low levels that were well below levels of concern on the Waste Load Allocation worksheet. In addition, the Fact Sheet on page 21 indicates the reason for maintaining the parameters in this permit is "due to the presence of FGD landfill run off in the discharge." F. B. Culley does not have a landfill. Vectren requests that monitoring requirements for Boron, Chloride, Fluoride, Alkalinity and Sodium are removed from Outfall 001.

Response 3: IDEM has removed Alkalinity and Sodium from the monitoring requirements for Outfall 001. Based on the source and nature of the discharge, monitoring for Boron, Chloride, and Fluoride will be required in the renewed permit, but at a reduced frequency of 1 X Quarterly.

Comment 4: Part I.A. 1, Table 1 (page 2 of 55) – We request that a 1X Month intake water sampling requirement for metals (Mercury, Arsenic, Cadmium, Selenium, Nickel, Aluminum, Silver Zinc, Copper and Iron) be included in this permit and on the DMR.

Response 4: IDEM has added a separate table for intake water sampling as Outfall 000. See Part I A. 6 of the permit.

Comment 5: Part I.A. 1, Footnote [5] (page 3 of 55) - The table was changed to include test methods, LOD and LOQ, for "Cyanide, Total." We suggest striking this parameter because it is not a parameter that is required to be analyzed. The facility is required to analyze for Cyanide, Free.

Response 5: IDEM has removed "Cyanide, Total." from the table.

Comment 6: Schedule of Compliance - The draft permit lists new numeric limits at Outfall 001 for Copper. Vectren requests a 36-month compliance schedule from the effective date of the permit, with status reports at 9-month increments, to allow for adequate time to 1) review and analyze potential sources of the copper, 2) assess treatment alternatives, and 3) design and construct pollutant control equipment, if necessary.

Response 6: A Schedule of Compliance for Copper at Outfall 001 has been added to the permit. Please see part 1.F of the permit.

Comment 7: Part I.A.2 (page 6 of 55) – We suggest separating Outfalls 101 and 201 into separate sections. Outfall 101 (West pond) should include discharge limits and monitoring requirements for Oil and Grease, TSS, pH, and flow since the West pond no longer receives metal cleaning wastes. In addition, footnote 6 as modified in comment #9 below should be retained. The description of Outfall 101 as listed on page 9 of the Fact Sheet in the draft permit is accurate. This is a change from prior permit descriptions. Specifically, the West pond ceased receiving bottom ash, fly ash, and FGD wastewater either directly or indirectly in October 2015.

Outfall 201 (East pond) should retain the discharge limitations as listed in Table 1 of the draft permit with the inclusion of comments or corrections as identified in this document in comments #9, 10, and 11.

Response 7: IDEM has separated the tables for Outfalls 101 and 201

Comment 8: Part I.A.2, Table 1 (page 6 of 55) - We request that the Monthly Average for Iron be restored to "-" which will match the language on Page 18 of the Fact Sheet, which says "iron limitations have been retained from the previous permit." This is specific to Outfall 201.

Response 8: The Federal Effluent Guideline established in 40 CFR 423.13(g)(3)(e) contain both Monthly average and Daily Maximum limits of 1.0 mg/l for Iron. The Monthly Average limit of 1.0 mg/l will remain in the permit.

Comment 9: Part I.A.2, footnote [6] (page 6 of 55) - This footnote needs to be clarified and we request the wording is revised to read "Monitoring at internal Outfalls 101 or 201 is only required when the outfall is discharging to the discharge tunnel which leads to Outfall 001." This footnote should be included for both outfalls, 101 and 201.

Response 9: The footnotes have been revised.

Comment 10: Part I.A.2, footnote [7] (page 6 of 55) - For Outfall 201, we request an alternate compliance date of December 31, 2020 based on the compliance schedule submitted to IDEM in November 2016 following our integrated Resource Plan public meeting. In the November 2016 document (copy attached) we outlined the IURC review and approval process as well as the engineering and construction schedule once the IURC order is received. Since we do not anticipate receiving approval from the IURC to proceed with the project until 4th quarter 2018, there is no possibility of meeting the November 1, 2018 compliance date for "no discharge of bottom ash transport water". We can, however, meet the requirement to cease discharge of fly ash transport water by November 1, 2018 and are not requesting an alternate compliance date for fly ash transport water.

Response 10: The footnote has been revised to reflect the updated compliance dates.

Comment 11: Part I.A.2 (page 6 of 55) - The footnote language pertaining to Copper and Iron Metal Cleaning net limitations, as contained in the previous permit, should be restored. This footnote applies to Outfall 201 only. We have always had net limits, so not having them would be a significant change. To restore the footnote language, and account for the background sample collection timing adjustment made during the current permit term in a letter from IDEM dated May 28, 2014, we would request that IDEM add the following footnote [8] language, "**Net limits may apply. Net limitations are to be calculated by subtracting the measured background levels of these parameters in the ash pond from the actual measured concentration of these parameters when limitations apply. These background levels are to be calculated by monitoring the ash pond effluent concentrations of Iron and Copper over a period of time, to consist of a minimum of ten samples taken over a minimum of thirty (30) days when there is no discharge of metal cleaning wastes during a period that is at least 30 days but not to exceed 90 days preceding each discharge of metal cleaning wastes. The background levels demonstrated by this monitoring, along with supporting data are to be submitted**

with monthly Discharge Monitoring Reports (DMR) when reporting discharge of metal cleaning wastes."

Response 11: The footnote language pertaining to Iron Metal Cleaning net limitations, as contained in the previous permit, has been restored.

However, IDEM believes that a more appropriate vehicle for these limitations is the development of alternate limits using the combined wastestream formula. Therefore, footnote [9] has been added which states that "With the next permit renewal application, the permittee is required to submit flow data for all regulated, non-regulated, and dilution wastestreams and the concentration of the selected parameters contributed by each of these wastestreams for use in developing alternate limitations using the combined wastestream formula (CWF). At the next permit renewal limits will be developed using either the Combined Wastestream Formula or by establishing internal outfalls for determining compliance with 40 CFR 423."

Comment 12: Part I.A.3, Footnote [5] (page 8 of 55) - We suggest this footnote specifically reference Part III.A and Part III.B, as opposed to referencing Part II in its entirety. The sections of Part III that should be excluded from the footnote are Storm Water Monitoring et al, and permanent markers on the stream bank, neither of which apply as this is an internal outfall.

Response 12: IDEM has revised the footnote.

Comment 13: Part I.A.4, Footnote [4] (page 10 of 55) - We suggest this footnote specifically reference Part III.A and Part III.B, as opposed to referencing Part III in its entirety. The sections of Part III that should be excluded from the footnote are Storm Water Monitoring et al, and permanent markers on the stream bank, neither of which apply as this is an internal outfall.

Response 13: IDEM has revised the footnote.

Comment 14: Part I.D.1 (page 16 of 55) – We request removal of this section as the facility does not have a storm water discharge, thereby making a reference to technology-based limits not applicable.

Response 14: Treatment for storm water discharges associated with industrial activities is required to meet, at a minimum, best available technology economically achievable/best conventional pollutant control technology (BAT/BCT) requirements. EPA has determined that non-numeric technology-based effluent limits have been determined to be equal to the best practicable technology (BPT) or BAT/BCT for storm water associated with industrial activity. The non-numeric storm water conditions and effluent limits contain the technology-based effluent limitations. Effluent limitations, as defined in the CWA, are restrictions on quantities, rates, and concentrations of constituents which are discharged. Effective implementation of these

requirements should meet the applicable water quality based effluent limitations.

Comment 15: Part I.D.2 (page 16 of 55) – We request removal of the reference to non-numeric effluent limits because the facility does not have a storm water outfall and therefore does not have storm water effluent.

"Select, design, install, and implement control measures (including best management practices) to minimize pollutant discharges that address the selection and design considerations in Part D.3 to meet the ~~non-numeric effluent limits in Part D.1~~."

Response 15: The non-numeric technology-based effluent limits have been determined to be equal to the best practicable technology (BPT) or BAT/BCT for storm water associated with industrial activity. The non-numeric effluent limits are BMPs and apply to the site as a whole.

Comment 16: Part I.D.5 (page 24 of 55) - We request removal of references to visual and analytical monitoring, because the facility does not have a storm water outfall, and therefore does not have a storm water discharge.

"At least once every 12 months, submit an Annual Report to the industrial NPDES Permit Section which includes the following: the results or a summary of the past year's routine facility inspection documentation and ~~quarterly visual assessment~~ documentation; information copied or..."

Response 16: IDEM agrees to remove the reference to quarterly visual assessment.

Comment 17: Part I.D.6.a.iv (page 24 of 55) - We request removal of this item, as it references visual assessments. The facility does not have a storm water outfall, and therefore does not have a storm water discharge.

"Visual assessments indicate obvious signs of storm water pollution (e.g., color, odor, floating solids, settled solids, suspended solids, foam);"

Response 17: IDEM agrees to remove Part I.D.6.a.iv.

Comment 18: Part I.D.7 (page 25 of 55) – While we acknowledge 120 days, as allowed in the currently effective permit, may be excessive under the guidelines of the 2015 MSGP, we feel 14 days is too restrictive. As a result, we are requesting to revise the corrective action deadlines to a more reasonable timeline, which will allow for appropriate research and planning to select the most effective and economic solution. The facility operates under a comprehensive Storm Water Pollution Prevention Plan, which facilitates sound management practices. The edited paragraph from the permit is as follows:

"if additional changes are necessary, a new or modified control must be installed and made operational, or a repair completed, before the

next storm event if possible, and within ~~14~~ **45** calendar days from the time of discovery. If it is infeasible to complete the installation or repair within ~~14~~ **45** calendar days, the reason(s) must be documented. A schedule for completing the work must also be identified, which must be done as soon as practicable alter the ~~14~~ **45** day timeframe ~~but no longer than 45 days after discovery~~."

"Where corrective actions result in changes to any of the controls or procedures documented in the SWPPP, the SWPPP must be modified accordingly within ~~14~~ 45 calendar days of completing corrective action work."

Response 18: IDEM has extended the corrective action deadline to 45 days.

Comment 19: Part I.D.8 (page 25 of 55) – While we acknowledge 120 days, as allowed in the currently effective permit, may be excessive under the guidelines of the 2015 MSGP, we feel 24 hours is too restrictive. As a result, we are requesting to revise the corrective action deadlines to a more reasonable timeline, which will allow for appropriate research and planning to select the most effective and economic solution. The facility operates under a comprehensive Storm Water Pollution Prevention Plan, which facilitates sound management practices. The edited language from the permit is as follows:

"The existence of any of the conditions listed in Part I.D.6 must be documented within ~~24 hours~~ **14 days** of becoming aware of such condition. The following information must be included in the documentation:"

Response 19: IDEM has extended the corrective action deadline to 14 days.

Comment 20: Part I.D.8 (page 26 of 55) – While we acknowledge 120 days, as allowed in the currently effective permit, may be excessive under the guidelines of the 2015 MSGP, we feel 14 days is too restrictive. As a result we are requesting 45 days for the corrective action deadlines, which are reasonable for appropriate research and planning to select the most effective and economic solution. The edited language from the permit is as follows:

"Document the corrective actions taken that occurred as a result of the conditions listed in Part I.D.6. within ~~14~~ **45** days from the time of discovery of any of those conditions. Provide the dates when each corrective action was initiated and completed (or is expected to be completed). If applicable, document why it is infeasible to complete necessary installations or repairs within the ~~14~~ 45-day timeframe and document the schedule for installing the controls and making them operational as soon as practicable alter the ~~14~~ 45-day timeframe."

Response 20: IDEM has extended the corrective action deadline to 45 days.

Comment 21: Part I.D.9.a (page 26 of 55) – We request removal of the reference to completing the inspections during a period when a storm water discharge is occurring, as well as references to visual and analytical monitoring, because the facility does not have a storm water outfall, and therefore does not have a storm water discharge.

> "Inspections must be conducted at least quarterly (i.e., once each calendar quarter), or in some instances more frequently (e.g. Monthly), as appropriate. Increased frequency may be appropriate for some types of equipment, processes and storm water control measures, or areas of the facility with significant activities and materials exposed to storm water. ~~At least one of the routine inspections must be conducted during a period when a stormwater discharge is occurring."~~

> "Inspections must be performed by qualified personnel with at least one member of the storm water pollution prevention team participating. ~~Inspectors must consider the results of visual and analytical monitoring (if any) for the past year when planning and conducting inspections."~~

Response 21: IDEM has removed the reference to completing the inspections during a period when a stormwater discharge is occurring, in addition to the reference to visual and analytical monitoring.

Comment 22: Part I.D.9.a (page 27 of 55) - We request removal of the paragraph that refers to an inspection during a storm water discharge. The facility does not have a storm water outfall, and therefore does not have a storm water discharge.

> "During an inspection occurring during a stormwater discharge, control measures implemented to comply with effluent limits must be observed to ensure they are functioning correctly. Discharge outfalls must also be observed during this inspection. If such discharge locations are inaccessible, nearby downstream locations must be inspected."

Response 22: IDEM has removed this section due to the fact that Outfall 001 is under water and therefore, a visual inspection is not possible.

Comment 23: Part I.D.9.b.iv.(4) (page 28 of 55) – We request removal of this item as it refers to a storm water outfall, discharge, and receiving water, which are not present at the facility.

> "Observations regarding the physical condition of any around all outfalls including any flow dissipation devices, and evidence of pollutants in discharges and/or the receiving water;"

Response 23: IDEM has removed this section due to the fact that Outfall 001 is under water and therefore, observations of the area around the outfall are not possible.

Comment 24: Part I.D.9.b (page 28 of 55) - We request removal of the last paragraph of this section as it refers to visual assessment of a discharge, which cannot be completed at the facility as it does not have a storm water discharge .

> "If the discharge was visual assessed, as required in Part I.D.9.c., during the facility inspection, include the results of the assessment with the report required in Part I.D.9.a., as long as all components of both types of inspections are included in the report."

Response 24: IDEM has removed this paragraph.

Comment 25: Parts I.D.9.c, I.D.9.d, and I.D.9.e (pages 28-30 of 55) - We request removal of these sections in their entirety, because the facility does not have a storm water outfall, and therefore does not have a storm water discharge, making the collection and assessment of a discharge sample not possible.

Response 25: IDEM has removed these sections.

Comment 26: Part I.E.2.c vi. Sampling Data (page 33 of 55) - We request removal of this section because the facility does not have a storm water outfall, and therefore does not have, nor has previously had, a storm water discharge from which to generate sampling data.

> "vi. Sampling Data All stormwater discharge sampling data collected at the facility during the previous permit term must be summarized in the SWPPP."

Response 26: IDEM has removed this section.

Comment 27: Part I.E.2.e.ii (page 35 of 55) - We request removal of this section because the facility does not have a storm water outfall and therefore cannot collect a storm water discharge.

> "ii. Quarterly visual assessment of storm water discharges."

Response 27: IDEM has removed this section.

Comment 28: Part I.E.2.f (page 35 of 55) - <u>Pertaining to Monitoring -</u> We request removal of this section because the facility does not have a storm water outfall, and therefore cannot collect a storm water discharge sample from which to conduct analytical monitoring.

Response 28: IDEM has removed this section.

Comment 29: Part I.F.3 (page 36 of 55) - We suggest revising the language to add clarity. "This permit may be modified or alternately revoked and reissued **after public notice and opportunity for rehearing**, to comply with any applicable **final agency** standards, regulations ..."

Response 29: Because the compliance dates are explained in Parts I.A.3., this section has been removed.

Comment 30: Part I.F.4 (page 37 of 55) - We suggest revising the language to add clarity that the alternate applicability date for transport waters allows up to December 31, 2023. "The permittee may submit an implementation schedule and justification for an alternate applicability date for the ELG BAT limits **under 423.13 (g)(1) or (g)(3) for FGD waste water, (h)(1)(i) for fly ash transport water, and (k)(1)(i) for bottom ash transport water** no later than twelve months..."

Response 30: IDEM has added the additional language. This is now under Part I.**G**.4

Comment 31: Part I.F.4 (page 37 of 56) - Renumber the subparts in section 4. Subparts should be a, b,c and d, instead of 1, 2, 3 and 4. The subparts for the renumbered b should be i, ii, and iii, instead of a, b, and c.

Response 31: IDEM has made the correction.

Comment 32: Part I.F.4 (page 37 of 56) - We suggest adding new subsection "e. **A public announcement for coal unit retirement no later than December 31, 2023."**

Response 32: This reopener was removed in it's entirely and the remaining reopeners were renumbered.

Comment 33: Part I.F.6 (page 37 of 56) - We request adding new section 6 to discuss future changes in operation for Unit 3 that occur prior to December 31, 2023, but after the "12 month from effective date" discussed in section 5. This will allow the facility to submit a request to stop construction of water pollution control equipment if the company notifies IDEM of its intent to permanently retire Unit 3 no later than December 31, 2023. This determination could be made during the triennial integrated Resource Plan review period or as the result of any other economic driver that makes the continued operation of unit 3 untenable. Suggested language:
If at any time prior to the completion of the construction of pollution control equipment installed to meet the conditions of this permit, including but not limited to dry bottom ash or FGD wastewater treatment equipment, the permittee notifies IDEM of its intent to permanently retire Unit 3 no later than December 31, 2023, this permit

may be modified to extend the alternate compliance schedule for pollution control equipment to December 31, 2023.

Response 33: If at any time prior to the completion of the construction of pollution control equipment installed to meet the conditions of this permit, including but not limited to dry bottom ash or FGD wastewater treatment equipment, the permittee notifies IDEM of its intent to permanently retire Unit 3 no later than December 31, 2023, the permittee may request a permit modification to address changes to the compliance schedule.

Comment 34: Part III.C (page 53 of 55) - We request removal of this item because the facility does not have dedicated storm water discharge and therefore monitoring and non-numeric effluent limits do not apply.

Response 34: The reference to the Storm Water Monitoring and Non Numeric Effluent Limits and the Storm Water Pollution Prevention Plan (SWP3) requirements is standard for all permits that contain stormwater exposed to industrial activity in their discharge. This section will remain in the permit.

Comment 35: Part IV.B.8 (page 55 of 55) - We request that "measure" is replaced with "approximate" to clarify how this information is determined and when it is reported, and establish that the data shall be collected for a period of one year, and not the entirely of the permit. This section should now read: "**During the next permit period,** monitor the actual intake flows at a minimum frequency of daily **for one continuous year.** The permittee may use engineering calculations, such as pump capacity, to measure **approximate** intake flow. **The daily intake flow information shall be submitted with the application for the next permit renewal."**

Response 35: IDEM has added the additional language.

Comment 36: Fact Sheet, Section 2.1(page 3), Facility Description General - The design intake volume of 360 MGD appears to be a legacy value from the operation of three generating units. We suggest striking the last sentence of the first paragraph in it's entirety. The Unit 1 intake structure is only used as a source for house service water since Unit 1 is retired. The average facility intake for 2014 - 2016 is 161.7 MGD, and the average discharge for 2014 - 2016 is 161.5 MGD. "...well water accounting for the remainder. The design intake volume is 360 MGD and the design discharge volume is 360 MGD."

Response 36: IDEM has removed this sentence as requested.

Comment 37: Fact Sheet, new Section 2.5 (page 9) - Internal Outfall 201. The second sentence should be revised to read "...RO rejects, and rejects from the FGD system discharge from Outfall 301 (FGD WWTP), and discharge from Outfall 101 (West Ash Pond).

Response 37: This paragraph has been revised.

Comment 38: Fact Sheet, Section 5.2 (page 15) - We request revising the language to consistently reflect the current plans to close Unit 2. The second sentence of the fourth paragraph should read, "However, because the facility SIGECO has plans to close Unit 2 by December 31, 2023 announced in the December 2016 Integrated Resource Plan filed with the IURC that the preferred generation transition plan would include closure of F.B. Culley coal Unit 2, a reopener has been proposed in the permit which states that if within 12 months from the effective date of this permit the permittee doesn't notify IDEM of its intent to permanently retire Unit 2 no later than December 31,2023, this permit may be..." We also request adding language to discuss future changes in operation for Unit 3 that occur prior to December 31,2023, but after the "12 month from effective date" discussed in permit Part I.F.5. This will allow the facility to submit a request to stop construction of water pollution control equipment if the company notified IDEM of its intent to permanently retire Unit 3 no later than December 31, 2023. This determination could be made during the triennial Integrated Resource Plan review period or as the result of any other economic driver that makes the continued operation of Unit 3 untenable. Suggested language:

If at any time prior to the completion of the construction of pollution control equipment installed to meet the conditions of this permit, including but not limited to dry bottom ash or FGD wastewater treatment equipment, the permittee notifies IDEM of its intent to permanently retire Unit 3 no later than December 31, 2023, this permit may be modified to extend the alternate compliance schedule for pollution control equipment to December 31, 2023.

Response 38: See Comment/Response 33.

Comment 39: Fact Sheet, Section 5.2, Outfalls 101/201 (page 18) -As reflected in comments 7 and 10; it is recommended that Outfalls 101and 201 be separated and the Alternate Compliance dates for Unit 2 and Unit 3 be independently listed.

Response 39: IDEM has separated the two outfalls in the Fact Sheet and added the Alternate Compliance dates for each outfall individually.

Comment 40: Fact Sheet, Section 5.2, Outfalls 101/201 Iron and Copper (Metal Cleaning Waste) (page 18)
- The paragraph begins by saying iron limitations have been retained from the previous permit. As such, the reference to a monthly average needs to stricken from the last sentence, so the end of the paragraph reads, "...daily maximum and monthly average limitation of 1.0 mg/L for Iron."

Response 40: Copper limitations are based off of 40 CFR 423.12(b)(5) and 40 CFR 423.13(e) which identifies a daily maximum and monthly average limitation of 1.0 mg/l for Iron. The monthly average will remain in the permit. The reference to the retention of Iron limits from the previous permit has been removed.

Comment 41: Fact Sheet, Section 5.3 WQBEL, (page 21) – We request removing the monitoring requirement for Boron, Chloride, Fluoride, Alkalinity, Sodium. See comment #3 for additional information.

Response 41: IDEM has removed the monitoring requirement for Alkalinity and Sodium. IDEM will retain monitoring requirements for Boron, Chloride and Fluoride, but will reduce the monitoring frequency to Quarterly.

Comment 42: Fact Sheet, Section 6.1, Outfall 001 (page 28) – We request striking TRC from the list of parameters, and strike the TRC-continuous parameter. The TRO test analyzes for all oxidants (both chlorine and bromine). The facility uses Sodium Hypochlorite (bleach) and a bromine product simultaneously and intermittently in the circulating water system for the purpose of treating intake water to control biological growth.

Response 42: IDEM has removed TRC from the permit.

Comment 43: Fact Sheet, Section 6.1, Outfalls 101/201 (page 29) - Page 18 of the Fact Sheet states that iron limitations have been retained from the previous permit. As such, we would request that the he in the monthly average column be reverted to "-".

Response 43: Iron imitations are based off of 40 CFR 423.12(b)(5) and 40 CFR 423.13(e) which identifies a daily maximum and monthly average limitation of 1.0 mg/l for Iron. The monthly average will remain in the permit. The reference to the retention of Iron limits from the previous permit has been retained.

Comment 44: Fact Sheet, Section 6.1, Outfall 004 (page 30) – The pH Daily Minimum should be corrected to 6.0 and the pH Daily Maximum should be corrected to 9.0.

Response 44: IDEM has made the correction.

Comment 45: Fact Sheet, Section 6.4.2 (page 33) - The table containing velocities of each intake at various river stages should be stricken. This information is not specifically required under the 316(b) regulation and will be updated with the "r" documents submitted in July 2019.

Response 45: IDEM has removed this table from the permit.

Comment 46: Fact Sheet, 6.4.2, Condition 8 (page 35)- And finally, we request that "measure" is replaced with "approximate" to clarify how this information is determined and when it is reported, and establish that the data shall be collected for a period of one year, and not the entirely of the permit. This section should now read: "During the next permit period, monitor the intake flows at a minimum frequency of daily for one continuous year. The permittee may use engineering calculations, such as pump capacity, to measure approximate intake flow. The daily intake flow information shall be submitted with the application for the next permit renewal. "In addition, add a sentence acknowledging that 316(b) information has been submitted as part of the current permit renewal, and it is understood this must be resubmitted during the next application. "As part of the current permit renewal application the permittee submitted information as required at 40 CFR 122.21 {r){2) through {r){S) and {r){S). This information must be resubmitted along with {r){7) and {r){9) thru {r){13) documents no later than July 1, 2019."

Response 46: IDEM has added the additional language to the permit.

Comments from the Sierra Club:

IDEM must revisit, revise, and re-issue the Draft Permit for public comment before issuing it in its final form. First, as explained below, IDEM's proposed Effluent Limitations Guidelines ("ELGs")[1] compliance deadline is not supported by any independent, well-reasoned justification as required by regulations and principles of reasoned agency decision making.

Second, neither IDEM nor Vectren has justified the proposed December 2023 compliance deadline for flue gas desulfurization ("FGD") wastewaters. Culley is already meeting the discharge limitation for at least two of the four pollutants covered by the ELGs' FGD wastewaters requirements, and can comply with limitations for the others much sooner than December 2023. Third, IDEM must consult with downstream municipal water utilities to determine if water quality based discharge limitations for bromide are needed to protect drinking water. Fourth, IDEM should remind Vectren that the re-opener process is not an invitation to delay planning to comply with the zero discharge limits for bottom ash and fly ash transport wastewaters.

I. Factual and Legal Background

The F.B. Culley generating station is located in Warrick County, Indiana, and is owned and operated by Southern Indiana Gas and Electric Co. ("Vectren"). The Culley plant comprises two units that are still in service, a 103-megwatt Unit 2 (built in 1966) and 265-megawatt Unit 3 (built in 1973). The Culley plant discharges wastewaters to the Ohio River pursuant to an IDEM issued National Pollution Discharge Elimination System ("NPDES") permit. Both Culley units have FGD systems to reduce emissions of sulfur dioxide and other harmful air pollutants.

A. Clean Water Act and Steam Electric Effluent Limitation Guidelines

The goal of the Clean Water Act ("CWA") is to eliminate all discharges of pollution into navigable waters.[2] To this end, the Act's implementing regulations establish the NPDES permitting program. Under the program, no pollutant may be discharged from any "point source" without a permit, and failure to comply with such a permit constitutes a violation of the CWA.[3] In addition, the CWA authorizes EPA to establish national, technology-based effluent limitations guidelines for discharges from categories of sources, and requires that NPDES permits include effluent limits based on the performance achievable through the use of statutorily-prescribed levels of technology that "will result in reasonable further progress toward the national goal of eliminating the discharge of all pollutants."[4]

On November 3, 2015, EPA published its revised Effluent Limitations Guidelines for the Steam Electric Power Generating Point Source Category (referred to herein as the "ELGs").[5] The ELGs became effective on January 4, 2016, and must be incorporated into NPDES permits for such generators issued after that date. The ELGs impose technology-based effluent limitations—reflecting decades of advances in water quality science and control technology—on discharges of several common types of effluent (i.e., waste streams) from coal-burning power plants, including fly ash and bottom ash transport waters and wastewater FGD systems. The ELGs establish a zero discharge standard for fly ash and bottom ash transport waters.[6] In addition, the ELGs require that the discharge of FGD wastewaters meets numeric limits for arsenic, mercury, selenium, and nitrates/nitrites.[7]

EPA vested authority to establish the compliance deadline for these ELGs wastestreams with state permitting agencies, such as IDEM.[8] Dischargers must comply with these requirements for FGD wastewaters, fly ash transport waters, and bottom ash transport waters "as soon as possible beginning November 1, 2018, but no later than December 31, 2023."[9] The ELGs rule defines "as soon as possible" to mean "November 1, 2018, unless the permitting authority establishes a later date, after receiving information from the discharger, which reflects a consideration of which reflects a consideration of the following factors:

> (1) Time to expeditiously plan (including to raise capital), design, procure, and install equipment to comply with the requirements of this part.
> (2) Changes being made or planned at the plant in response to:
> [Certain enumerated environmental regulations addressing greenhouse gases or disposal of coal combustion residuals]
> (3) For FGD wastewater requirements only, an initial commissioning period for the treatment system to optimize the installed equipment.
> (4) Other factors as appropriate.[10]

Thus, the rule established November 1, 2018 as the default compliance date, unless the permitting authority determines another date after receiving and evaluating information submitted by the discharger. In setting the compliance deadline, the permitting authority should:

> [P]rovide a well-documented justification of how it determined the "as soon as possible" date in the fact sheet or administrative record for the permit. If the permitting authority determines a date later than November 1, 2018, the justification should

> explain why allowing additional time to meet the limitations is appropriate, and why the discharger cannot meet the final effluent limitations as of November 1, 2018.[11] In addressing the factors set out in the "as soon as possible" definition, at a minimum, the permitting authority should " evaluate what operational changes are expected at the plant" to meet the new limitations, "must also consider scheduling for installation of equipment," and, for FGD wastewater only, "must consider whether it is appropriate to allow more time for implementation." The "as soon as possible" date determined by the permitting authority may or may not be different for each wastestream.[12]

B. FGD Wastewater Handling Practices at F.B. Culley

The Culley plant discharges bottom ash and fly ash waterwaters, and also discharges FGD wastewaters. Outfall 001 discharges water from the East (internal outfall 101) and West (internal outfall 201) Ash Ponds as well as once through non-contact cooling water. Internal Outfall 301 consists of FGD wastewater treatment plant discharge, which discharges to the East Ash Pond. The ash pond discharge amounts to 1.6 million gallons per day.[13] A chemical-precipitation system went into service on September 26, 2014, for the purpose of meeting the mercury limitations at Outfall 001, which became effective on December 1, 2014.[14]

II. IDEM's Proposed ELGs Deadline Impermissibly Fails to Reflect IDEM's Independent Judgment of How Quickly F.B. Culley Can Comply

In setting the compliance deadline for ELGs requirements, IDEM's Draft Permit and Fact Sheet impermissibly fail to contain any independent analysis of what date is "as soon as possible" for the F.B. Culley plant. The Draft Permit itself contains no analysis at all but simply sets the date of compliance at December 31, 2023,[15] the last possible date allowed under the regulations. The Fact Sheet simply states:

> The permittee has requested an alternate compliance date for the new FGD limitations. To support the alternate compliance date, the permittee provided proposed schedules from a technology assessment report prepared by a third party engineer. The alternate compliance schedules state that the permittee will make a final determination on which technology to pursue for FGD waste water within a year of effective date of the permit. Based on the information provided, IDEM proposes an effective of December 31, 2023 for Arsenic, Mercury, Selenium, and TDS.[16]

IDEM appears to have simply accepted these proposed schedules that Vectren submitted for two options to comply with the ELGs' FGD discharge requirements. Option 1 titled "Physical/Chemical/Biological Treatment & Discharge" assumes that work would begin on March 1, 2017 and could be completed by February 2021.[17] Option 2 titled "Spray Dryer Evaporation—Zero Liquid Discharge" assumes that work would begin in July 2019 and could then be completed by October 2023.[18] The paragraph referenced above from the Fact Sheet simply recites information that Vectren provided the agency and does not amount to IDEM's independent substantive review set out in a "well-documented justification" that is called for by the regulations and reasoned agency decision-making. IDEM does not appear to have considered, as required by the rule, whether compliance for the four FGD wastewater pollutants covered by the ELGs rule could be achieved on different timelines. In purporting to determine

the "as soon as possible" date, IDEM does not appear to have "evaluate[d] . . . operational changes" proposed, the "schedul[e] for installation of equipment," or any of the other factors in this definition.[19] Instead, IDEM appears to have accepted Vectren's representations without any analysis at all. IDEM must, at a minimum, revise the Fact Sheet to include a transparent, reproducible, and defensible description of how the agency itself reached its conclusions.

What constitutes a well-reasoned justification for extending the ELGs' compliance date beyond the default date of November 2018 depends to some extent on the facts of a given permit, but in every case, IDEM must at least address several over-arching considerations. First, as noted, the "well-documented justification" must address each of the factors set out in the "as soon as possible" definition or explain why the factors do not apply to a particular permit decision.[20] Second, IDEM must include a separate analysis for each ELGs wastestream discharged or explain why a separate analysis for each wastestream is not needed for a particular permit. Third, importantly, IDEM must address whether it is reasonable for an entity to wait to plan to comply till its existing NPDES permit is up for renewal. The final ELGs rule was signed and made public in September 2015 and yet Vectren's justification assumes that compliance project work would begin in March 2017 (Option 1) or July 2019 (Option 2), effectively granting itself a multi-years extension. This is contrary to EPA's intent in the preamble to the rule, in which it stated that "[r]egardless of when a plant's NPDES permit is ready for renewal, the plant should immediately begin evaluating how it intends to comply with the requirements of the final ELGs."[21] In light of this clear directive by EPA, IDEM must evaluate the "as soon as possible" compliance date for different F.B. Culley wastestreams based on the date that the ELG rule was signed and made public.

In the context of this Draft Permit for F.B. Culley and the comments submitted here, a "well-reasoned justification" for extending the ELGs' compliance date beyond the default date of November 2018 for F.B. Culley, must include:

> 1. IDEM must acknowledge that Vectren could have begun and likely did in fact begin work on ELGs compliance well before March 2017 (FGD Option 1) or July 2019 (FGD Option 2) and should explain why such work can be disregarded for its proposed schedule of compliance.[22]
> 2. IDEM must acknowledge that Vectren is already meeting the ELGs' limits for FGD wastewater for mercury and arsenic, and should therefore explain why an extension beyond Nov. 2018 is warranted to comply with the discharge limitations for those pollutants.
> 3. IDEM must acknowledge that Vectren's proposed schedule for FGD Option 1 shows that compliance could be achieved by February 2021 (even assuming every aspect of the schedule is reasonable), and should explain why the compliance date should not be set on or before February 2021. IDEM should consider relying on FGD Option 1 to set the "as soon as possible" date and could, if necessary, provide a re-opener provision if Vectren were later to select a zero discharge system (Option 2).

Given that the default ELGs' compliance date is November 1, 2018 and that the rule's clear intention is to achieve compliance "as soon as possible," any request for an extension beyond the default compliance date must be rigorously vetted by IDEM and even then any

extension must be as close as possible to the default date. IDEM's analysis here entirely fails to grapple with Vectren's purported need to require over six years to comply with the ELGs' FGD wastewater discharge limits. For IDEM to meet its duties, a much more rigorous analysis is required.

III. Vectren Has Not Justified a December 2023 Compliance Date for FGD wastewaters.

The Draft Permit allows until December 31, 2023 for Culley to meet the FGD wastewater discharge limitations required by the ELGs. This determination appears to be solely based on two proposed schedules submitted by Vectren to IDEM. Vectren's Option 1 is titled "Physical/Chemical/Biological Treatment & Discharge" and assumes that, if work began in March 2017—a year and a half after the ELGs were finalized—compliance could be achieved by February 2021. Vectren's Option 2 is titled "Spray Dryer Evaporation-Zero Liquid Discharge" and assumes that work would begin in July 2019—nearly four years after the ELGs were finalized—and would then be completed in October 2023. Both of these proposed schedules fail to comply with the ELGs' basic directive that compliance work should have begun when the regulations became final. In addition, there are other glaring flaws in IDEM's decision to set the compliance deadline for FGD wastewaters at December 2023.

First, Culley is already meeting the discharge limitations for mercury and arsenic and therefore IDEM should set the compliance deadline for those pollutants at the default compliance deadline of November 2018. Table 1 shows the ELGs discharge limitations for FGD wastewaters for arsenic and mercury.

Table 1
Effluent Limitation Guideline for FGD Wastewater Discharged at Existing Steam Electric Power Plants, 40 C.F.R 423.13(g)(1)(i).

Pollutant	**Daily Maximum**	**Monthly Average**
Arsenic	0.011 Mg/L	0.008 Mg/L
Mercury	788.000 ppt	356.000 ppt

As shown in Table 2, recent discharge monitoring reports for F.B. Culley show that the levels of arsenic and mercury in Culley's wastewater are both below the ELG limits:

Table 2
F.B. Culley's Discharge of Arsenic and Mercury

Date	Reported Arsenic From Outfall 001 (Mg L) (Average, Daily Max)	Reported Mercury From Outfall 301 (ppt) (Average, Daily Max)
2015.01	0.00307, 0.00307	54200, 54200
2015.02	0.00106, 0.00106	30700, 30700
2015.03	0.00224, 0.00224	No data
2015.04	0.00238, 0.00238	47800, 47800
2015.05	0.00137, 0.00137	No data
2015.06	.0005, <0.001	50200, 50200
2015.07	0.00118, 0.00118	No data
2015.08	0.00119, 0.00119	34200, 34200
2015.09	0.0012, 0.0012	No data
2015.10	0.00175, 0.00175	34900, 34900
2015.11	0.00149, 0.00149	No data
2015.12	0.00133, 0.00133	13400, 13400
2016. 01	0.00361, 0.00361	10000,10000
2016.02	0.002, 0.002	28600, 28600
2016.03	0.00217, 0.00217	No data
2016.04	0.00136, 0.00136	12700, 12700

Source: Exhibit 3 attached here, which compiles discharge monitoring data from January 2015 through April 2016 as reported in Vectren's NPDES application. [23] This data shows that the ELGs' limits for mercury and arsenic can be complied with at F.B. Culley without the need for any new treatment technology.

Second, after scrutinizing the individual elements of the proposed, and perhaps requesting additional information from Vectren, IDEM should set the deadline for compliance for the remaining FGD pollutants based on an adjustment to Vectren's Option 1 proposed schedule, which acknowledges that compliance could be achieved by February 2021, even under Vectren's assumptions. IDEM should adjust the start date for Option 1 to account for the fact that Vectren is not permitted to grant itself an extension to start work on compliance to March 2017. IDEM should also scrutinize the individual elements of the proposed schedule. After making those adjustments, Vectren should set the deadline to comply with the FGD discharge limits for the remaining FGD pollutants based on this physical/chemical/biological treatment system, with compliance being required no later than February 2021.

IV. IDEM Must Notify and Consult Municipalities Downstream to Determine If Water-Quality Based Effluent Limitations for F.B. Culley's Bromide Discharge are Necessary to Protect Drinking Water Quality.

FGD wastewater often contains significant quantities of bromide and other dissolved solids. In the preamble to the ELGs rulemaking, EPA observed that depending "on site-specific conditions and applicable state water quality standards, it may be appropriate for permitting authorities to establish water quality-based effluent limitations on bromide, especially where steam electric power plants are located upstream from drinking water intakes."[24] The bromide ion can form brominated, carcinogenic disinfection by-products (DBPs) when drinking water plants treat the incoming source water using certain disinfection processes including chlorination and ozonation.[25] EPA has established maximum concentration levels for only a few classes of the hundreds of DBPs that can be found in public drinking water. In its role as regulator of public water systems, IDEM is well aware of the serious health risks posed by DBPs and various federal and state regulations that apply.[26] These serious potential public-health problems from coal plant discharges are further explained in the report of Dr. Jeanne M VanBriesen, Ph.D., P.E, which was submitted in the ELGs rulemaking.[27]

Although there are currently no water quality criteria for bromide, discharges of bromides must be restricted, on a water quality basis, where narrative water quality standards require the protection of drinking water. EPA suggests the following steps to make use of these narrative water quality standards. First, EPA has instructed permitting authorities, here IDEM, to notify downstream drinking water treatment plants of the bromide discharge.[28] When it notifies downstream entities, IDEM should include as much information as possible on the nature and quantity of the bromide discharge from the F.B. Culley plant. As reflected in Table 3, recognizing that our search was not intended to be comprehensive, there are many municipalities downstream of the F.B. Culley plant that take drinking water from the Ohio River.

Table 3: **Downstream Cities and Towns With Drinking Water Obtained from Ohio River**

State	*Municipality*	*Source Confirming Drinking Water is Obtained from Ohio River*	*Approximate Distance Downstream of Culley*
IN	Newburgh	Indiana American Water. "2015 Annual Water Quality Report." accessed 2/2/2017.	5 miles
IN	Evansville	Evansville Water and Sewer Utility. "2015 Annual Drinking Water Quality Report." accessed 2/2/2017. http://www.evansvillegov.org/modules/showdocument.aspx?documentid=21533	19 miles

KY	Henderson	Henderson Water Utility, "Drinking Water Quality Report for 2016." accessed 2/2/2017. http://www.hkywater.org/ccr/north.pdf	31 miles
IN	Mount Vernon	Telephone call with Mt. Vernon Water Works Department. February 3, 2017.	56 miles
KY	Uniontown	Telephone call with Union County Water District. February 3, 2017	68 miles

Second, after consulting with these and any other affected municipal drinking water utilities, EPA "recommends that the permitting authority collaborate with drinking water utilities and their regulators to determine what concentration of bromides at the [public water] intake is needed to ensure that levels of bromate and DPBs do not exceed applicable MCLs."[29] With this information, IDEM must then determine the level of bromide that may be discharged without causing an exceedance of the maximum permissible level that will protect drinking water quality downstream in the Ohio River.

Based on the Draft Permit and Fact Sheet, it does not appear that IDEM has undertaken any such consultation regarding the bromide discharge from the F.B. Culley plant. IDEM should consult with downstream municipal drinking water utilities before issuing the final F.B. Culley NPDES permit, and, if necessary to protect water quality, the final permit should include discharge limits for bromides.

V. The Re-Opener Process Must Not Be Used to Further Delay Culley Unit 3's Compliance With the Bottom and Fly Ash Zero Discharge Requirements.

Vectren has stated that it intends to retrofit Culley Unit 3 to comply with the zero discharge limitations for bottom ash and fly ash transport wastewaters.[30] This Draft Permit simply sets the zero discharge compliance date at November 2018 and invites Vectren to file a re-opener application to justify a later date,[31] though IDEM acknowledges that such an application is a near-certainty if Vectren intends to continue to operate Unit 3.[32] In this permit action, IDEM should remind Vectren of its duty to diligently prepare to comply with the ELGs. IDEM should remind Vectren that, if it wishes to continue to operate Unit 3 as a coal-burning unit, Vectren must be diligently planning *now* to eliminate discharge of bottom ash and fly ash transport waters. Proposed schedules for bottom ash conversion for Unit 3, for example, must not assume that work begins only when such re-opener application is filed.

IDEM Response to Sierra Club comments:

ELG Compliance Dates:

IDEM has independently considered the factors outlined in the federal ELGs. Specifically, IDEM has reviewed the proposed schedule and supporting documentation from F.B. Culley submitted during the Comment Period on the Draft Permit.

IDEM has revised the Draft Permit with regard to the ELG compliance dates as a result of information submitted by Vectren and an independent review by IDEM.

Compliance for fly ash transport water zero discharge of pollutants will be required by no later than November 1, 2018 for both Units 2 and 3.

Compliance for bottom ash transport water zero discharge of pollutants will be required by no later than December 31, 2020 for Unit 3. This is based, among other factors, on the IURC review and approval process as well as the engineering and design schedule needed to complete this upgrade.

Compliance for bottom ash transport water zero discharge of pollutants will be required by no later than December 31, 2023 for Unit 2. This date is based on the proposed closure date and capacity factor and considering the factors in the rule for establishing a compliance deadline. As noted previously, Unit 2 is scheduled for closure by no later than December 31, 2023 and will thus be zero discharge at that time. In addition, Unit 2 has averaged a 23.4% capacity factor over the last 5 years.

With regard to FGD ELG schedule, IDEM will require compliance with the FGD ELGs by no later than February 1, 2021 for Units 2 and 3. If Vectren decides to close Unit 3 or proceed with zero discharge option the ELG Rule allows compliance with zero discharge by December 31, 2023. Permit language will be included in the NPDES Permit to reflect this option.

Re-Opener Process:

The reopener language in the Draft Permit has been deleted to reflect the above noted decisions on ELG compliance dates. A new reopener has been included to allow Vectren to apply for a NPDES Permit Modification if they decide to no longer operate Unit 3 (in addition to no longer operating Unit 2). The reopener would allow Vectren to apply for a Permit Modification to revise the compliance dates for zero discharge of bottom ash transport water pollutants as well as the compliance date for the FGD wastewater to no later than December 31, 2023.

Notification to Municipalities Downstream to Determine if Water Quality Based Effluent Limitations for F.B. Culley's Bromide Discharge are Necessary to Protect Drinking Water Quality

The nearest downstream public water supply with a surface water intake is the community of Evansville which is 19 miles downstream. Evansville has not reported issues with Bromide at their intake. ORSANCO monitors for bromide in the Ohio River at Newburgh (RM 776) which is downstream of Culley and upstream of Evansville. The bromide concentrations measured by ORSANCO are, on average, less than 0.06 mg/L. This level of Bromide is well below concentrations that might be of concern at Evansville. Quarterly bromide monitoring has been added to the F.B. Culley permit to better characterize the discharge levels of bromide.

ATTACHMENT I
Waste Load Allocation

State Form 5574

DEPARTMENT OF ENVIRONMENTAL MANAGEMENT

INDIANAPOLIS

OFFICE MEMORANDUM

Date: December 21, 2016

To: Jennifer Carlino
Industrial NPDES Permits Section

Thru: Nicole Gardner, Chief
Industrial Permits Section
John Elliott
Permits Branch

From: Miranda Hancock
Industrial NPDES Permits Section

Subject: Wasteload Allocation Report for the Vectren F.B. Culley Generating Station, Warrick County (IN0002259, WLA002215)

A reasonable potential analysis for a number of pollutants of concern was done for the renewal of the NPDES permit for Vectren F.B. Culley Generating Station in Warrick County. The analyses were done for the Outfall 001 (discharging to the Ohio River). The Q7,10 of the Ohio River upstream of the outfall 001 is 11,000 cfs. The Ohio River is designated for full-body contact recreation and shall be capable of supporting a well-balanced, warm water aquatic community. The Ohio River is also designated as a public water supply and as an industrial water supply. The average effluent flow used in the analysis is 252 MGD (Outfall 001).

The Ohio River near the Town of Newburgh (Assessment Unit INH6_10) is on the 2014 303(d) list for PCBs, Dioxin and Mercury in the water column, and for *E.coli*. A TMDL for the Ohio River in 8 Digit HUC (05140201) has not been done. EPA is currently conducting a bacteria TMDL for the Ohio River.

The reasonable potential analysis for Outfall 001 for the pollutants of concern is included in Tables 1 and 2. The results of the analysis show that the discharge has a reasonable potential to exceed a water quality criterion for Copper and Mercury. Therefore, water quality-based effluent limitations (WQBELs) are required for these parameters. The WQBELs are included in Table 3.

The documentation of the wasteload allocation analysis is included as an attachment to this document.

Results of Reasonable Potential Statistical Procedure
For Vectren F. B. Culley in Warrick County
Outfall 001 to Ohio River
(IN0002259, WLA002215)

Parameter	Monthly Average Comparison			Daily Maximum Comparison			Reasonable Potential to Exceed?	Source of PEL (Indiana or ORSANCO)
	Monthly Average PEQ (mg/l)	Monthly Average PEL* (mg/l)	PEQ > PEL?	Daily Maximum PEQ (mg/l)	Daily Maximum PEL* (mg/l)	PEQ > PEL?		
Copper	0.069	0.031	Yes	0.093	0.063	Yes	Yes	ORSANCO
Mercury	0.000020	0.000012	Yes	0.000020	0.000020	No	Yes	Indiana
Nickel	0.040	0.099	No	0.040	0.24	No	No	Indiana
Selenium	0.0044	0.029	No	0.0044	0.057	No	No	ORSANCO
Boron	1.8	37	No	2.6	82	No	No	Indiana
Chloride	48	580	No	67	1,200	No	No	Indiana
Fluoride	0.43	6.6	No	0.59	13	No	No	Indiana
Sulfate	90	1,600	No	130	3,900	No	No	ORSANCO

* Based on an effluent flow of 252 mgd.

December 21, 2016

STATE OF INDIANA
DEPARTMENT OF ENVIRONMENTAL MANAGEMENT
PUBLIC NOTICE NO: 2017 – 3E – F
DATE OF NOTICE: MARCH 28, 2017

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

MAJOR – RENEWAL

SIGECO F.B. CULLEY GENERATING STATION, Permit No. IN0002259, WARRICK COUNTY, 3711 Darlington Rd, Newburgh, IN. This major industrial facility discharges 252 million gallons daily of storm water, sanitary, process & non-process wastewater into the Ohio River. Permit Manager: Jennifer Carlino, 317/232-8702, JCarlino@idem.in.gov.

Notice of Right to Administrative Review [Permits]

If you wish to challenge this Permit, you must file a Petition for Administrative Review with the Office of Environmental Adjudication (OEA), and serve a copy of the Petition upon IDEM. The requirements for filing a Petition for Administrative Review are found in IC 4-21.5-3-7, IC 13-15-6-1 and 315 IAC 1-3-2. A summary of the requirements of these laws is provided below.

A Petition for Administrative Review must be filed with the Office of Environmental Adjudication (OEA) within fifteen (15) days of the issuance of this notice (eighteen (18) days if you received this notice by U.S. Mail), and a copy must be served upon IDEM. Addresses are:

Director
Office of Environmental Adjudication
Indiana Government Center North
Room 501
100 North Senate Avenue
Indianapolis, Indiana 46204

Commissioner
Indiana Department of Environmental Management
Indiana Government Center North
Room 1301
100 North Senate Avenue
Indianapolis, Indiana 46204

The Petition must contain the following information:

1. The name, address and telephone number of each petitioner.
2. A description of each petitioner's interest in the Permit.
3. A statement of facts demonstrating that each petitioner is:
   a. a person to whom the order is directed;
   b. aggrieved or adversely affected by the Permit; or
   c. entitled to administrative review under any law.
4. The reasons for the request for administrative review.
5. The particular legal issues proposed for review.
6. The alleged environmental concerns or technical deficiencies of the Permit.
7. The Permit terms and conditions that the petitioner believes would be appropriate and would comply with the law.
8. The identity of any persons represented by the petitioner.
9. The identity of the person against whom administrative review is sought.
10. A copy of the Permit that is the basis of the petition.
11. A statement identifying petitioner's attorney or other representative, if any.

Failure to meet the requirements of the law with respect to a Petition for Administrative Review may result in a waiver of your right to seek administrative review of the Permit. Examples are:

1. Failure to file a Petition by the applicable deadline;
2. Failure to serve a copy of the Petition upon IDEM when it is filed; or
3. Failure to include the information required by law.

If you seek to have a Permit stayed during the Administrative Review, you may need to file a Petition for a Stay of Effectiveness. The specific requirements for such a Petition can be found in 315 IAC 1-3-2 and 315 IAC 1-3-2.1.
Pursuant to IC 4-21.5-3-17, OEA will provide all parties with Notice of any pre-hearing conferences, preliminary hearings, hearings, stays, or orders disposing of the review of this action. If you are entitled to Notice under IC 4-21.5-3-5(b) and would like to obtain notices of any pre-hearing conferences, preliminary hearings, hearings, stays, or orders disposing of the review of this action without intervening in the proceeding you must submit a written request to OEA at the address above.
If you have procedural or scheduling questions regarding your Petition for Administrative Review you may contact the Office of Environmental Adjudication at (317) 232-8591 or see OEA's website at http://www.in.gov/oea.

IDEM

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

Eric J. Holcomb
Governor

Bruno Pigott
Commissioner

VIA ELECTRONIC MAIL February 28, 2017

Mr. Wayne Games, VP of Power Supply
SIGECO A.B. Brown Generating Station
P.O. Box 209
Evansville, Indiana 47702

Dear Mr. Games:

Re: Final Permit No. IN0052191
SIGECO A.B. Brown Generating Station
Mt. Vernon, IN – Posey County

Your application for a National Pollutant Discharge Elimination System (NPDES) permit for authorization to discharge into the waters of the State of Indiana has been processed in accordance with Section 402 and 405 of the Federal Water Pollution Control Act, as amended (33 U.S.C. 1251, et seq.), and IC 13-15, IDEM's permitting authority. All discharges from this facility shall be consistent with the terms and conditions of this permit.

One condition of your permit requires periodic reporting of several effluent parameters. You are required to submit both federal discharge monitoring reports (DMRs) and state Monthly Monitoring Reports (MMRs) on a routine basis. The MMR form can be found on IDEM's web site at http://www.in.gov/idem/cleanwater/2396.htm.

Once you are on this page, select the "IDEM Forms" page and locate the "Monthly Monitoring Report (MMR) for Industrial Discharge Permits-30530" under the Wastewater Facilities heading. We recommend selecting the "XLS" version because it will complete all of the calculations when you enter the data.

All NPDES permit holders are required to submit their monitoring data to IDEM using NetDMR. Please contact Rose McDaniel at (317) 233-2653 or Helen Demmings at (317) 232-8815 if you would like more information on NetDMR. Information is also available on our website at http://IN.gov/idem/cleanwater/2422.htm.

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 subject the permittee to criminal or civil penalties. (See Part II A.2.)

It is therefore urged that your office and treatment operator understand this part of the permit.

The draft NPDES permit for the SIGECO A.B. Brown Generating Station was made available for public comment from December 29, 2016 through January 30, 2017 as part of Public Notice No. 2016-12C-RD. During this comment period, a comment letter dated January 27, 2017, from Angie Casbon-Scheller with Vectren Corporation, was received. Also, a letter dated January 30, 2017 from Tony Mendoza with Sierra Club. The Post Public Notice Addendum is located at the end of the Fact Sheet.

It should also be noted that any 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 filing a petition for administrative review with the Office of Environmental Adjudication (OEA) within fifteen (15) days of the emailing of an electronic copy of this letter or within eighteen (18) days of the mailing of this letter by filing at the following addresses:

Director
Office of Environmental Adjudication
Indiana Government Center North
Room 501
100 North Senate Avenue
Indianapolis, Indiana 46204

Commissioner
Indiana Department of Environmental Management
Indiana Government Center North
Room 1301
100 North Senate Avenue
Indianapolis, Indiana 46204

If you have any questions concerning the permit, please contact Nicole Gardner at 317/232-8707 or ngardner@idem.in.gov. Questions concerning appeal procedures should be directed to the Office of Environmental Adjudication, at 317/232-8591.

Sincerely,

Paul Novak

Paul Novak, Chief
Permits Branch
Office of Water Quality

Enclosures

cc: U.S. EPA, Region V
Vanderburgh County Health Department
Lisa Messinger, Vectren
Angela Casbon-Scheller, Vectren

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"), and IDEM's authority under IC 13-15,

VECTREN CORPORATION
SIGECO A.B. Brown GENERATING STATION

is authorized to discharge from the steam electric generating facility that is located at 8511 Welborn Road, Mt. Vernon, Indiana, to receiving waters identified as the Ohio River in accordance with effluent limitations, monitoring requirements, and other conditions set forth in Parts I, II, III and IV hereof. This permit may be revoked for the nonpayment of applicable fees in accordance with IC 13-18-20.

Effective Date: April 1, 2017

Expiration Date: March 31, 2022

In order to receive authorization to discharge beyond the date of expiration, the permittee shall submit such information and forms as are required by the Indiana Department of Environmental Management no later than 180 days prior to the date of expiration.

Issued February 28, 2017, for the Indiana Department of Environmental Management.

Paul Novak

Paul Novak, Chief
Permits Branch
Office of Water Quality

PART I

A. EFFLUENT LIMITATIONS AND MONITORING REQUIREMENTS

1. The permittee is authorized to discharge from the outfall listed below in accordance with the terms and conditions of this permit. The permittee is authorized to discharge from Outfall 001[3][8][9]. Samples taken in compliance with the monitoring requirements below shall be taken at a point representative of the discharge but prior to entry in the unnamed tributary to the Ohio River. Such discharge shall be limited and monitored by the permittee as specified below.

DISCHARGE LIMITATIONS [4]
Outfall 001

Table 1

	Quantity or Loading			Quality or Concentration			Monitoring Requirements	
Parameter	Monthly Average	Daily Maximum	Units	Monthly Average	Daily Maximum	Units	Measurement Frequency	Sample Type
Flow[11]	Report	Report	MGD	-	-	-	1 X Day	24 Hr. Total
Oil & Grease[14]	-	-	-	10	15	mg/l	1X Week	Grab
TSS[14]	-	-	-	30	70	mg/l	1X Week	Grab
Aluminum [1]	-	-	-	Report	Report	mg/l	1 X Month	24 Hr. Comp.
Arsenic [1, 5]	-	-	-	Report	Report	mg/l	1 X Month	24 Hr. Comp.
Boron	-	-	-	Report	Report	mg/l	2 X Month	Grab
Cadmium [1]	-	-	-	Report	Report	mg/l	1 X Month	24 Hr. Comp.
T. Chromium [1]	-	-	-	Report	Report	mg/l	2 X Month	24 Hr. Comp.
Zinc [1]	-	-	-	Report	Report	mg/l	2 X Month	24 Hr. Comp.
Copper [1, 16]								
Interim	-	-	-	0.033	0.067	mg/l	2 X Month	24 Hr. Comp.
Final	-	-	-	0.028	0.056	mg/l	2 X Month	24 Hr. Comp
Iron [1, 13]								
Metal Cleaning [14,15]		-	-	Report	1.0	mg/l	1 X Day	24 Hr. Comp.
Non-Metal Cleaning		-	-	Report	Report	mg/l	2 X Month	24 Hr. Comp
Free Cyanide [5, 6]		-	-	Report	Report	mg/l	1 X Month	Grab
Nickel [1]	-	-	-	Report	Report	mg/l	1 X Month	24 Hr. Comp.
Mercury [1, 5, 7]		-	-	12	20	ng/l	1 X Bi-Monthly	Grab
Selenium [1, 5, 16]								
Interim	-	-	-	Report	Report	mg/l	1 X Month	24 Hr. Comp.
Final	-	-	-	0.13	0.26	mg/l	1 X Month	24 Hr. Comp.
Silver [1]	-	-	-	Report	Report	ug/l	1 X Month	24 Hr. Comp.
Sulfate	-	-	-	Report	Report	mg/l	1 X Month	24 Hr. Comp
Chlorination [11, 13]								
Frequency	-	-	-	-	4	Times/day	1 X Day	Report
Dose Duration	-	-	-	-	40	Minutes/Dose	1 X Day	Report
Duration/Day	-	-	-	-	120	Minutes/Day	1 X Day	Report

Table 1 (continued)

Parameter	Quantity or Loading Monthly Average	Daily Maximum	Units	Quality or Concentration Monthly Average	Daily Maximum	Units	Monitoring Requirements Measurement Frequency	Sample Type
TRC								
Intermittent [5, 12]	-	-	-	-	0.2	mg/l	1 X Day	Grab
Temperature	-	-	-	Report	Report	°F	1 X Month	Grab
Chloride [16]								
Interim	-	-	-	Report	Report	mg/l	2 X Month	Grab
Final	-	-	-	580	1200	mg/l	2 X Month	Grab
Fluoride	-	-	-	Report	Report	mg/l	2 X Month	Grab
Alkalinity	-	-	-	Report	Report	mg/l	2 X Month	Grab
Sodium	-	-	-	Report	Report	mg/l	2 X Month	Grab

Table 2

Parameter	Quality or Concentration Daily Minimum	Daily Maximum	Units	Monitoring Requirements Measurement Frequency	Sample Type
pH	6.0	9.0	s.u.	1 X Month	Grab

[1] The permittee shall measure and report the identified metal in total recoverable form.

[2] The water quality based effluent limit (WQBEL) for TRC is less than the limit of quantitation (LOQ) as specified in footnote [5]. Compliance with this permit will be demonstrated if the effluent concentrations measured are less than the LOQ.

If the measured concentration of chlorine is greater than the water quality based effluent limitations and above the respective LOD specified in the table below in any three (3) consecutive analyses, or any five (5) out of nine (9) analyses, then the discharger shall re-examine the chlorination/de-chlorination procedures.

Case-Specific LOD/LOQ

The permittee may determine a case-specific LOD or LOQ using the analytical method specified above, or any other test method which is approved by the Commissioner prior to use. The LOD shall be derived by the procedure specified for method detection limits contained in 40 CFR Part 136, Appendix B, and the LOQ shall be set equal to 3.18 times the LOD. Other methods may be used if first approved by the Commissioner.

[3] Beginning November 1, 2018 there shall be no discharge of fly ash or bottom ash transport water. The permittee may request an alternate compliance date beyond November 1, 2018 no later than 12-months from the effective date of this permit in accordance with the Reopening Clause in I.F. IDEM will evaluate the information

submitted and make a determination to extend the compliance date beyond November 1, 2018.

[4] See Part I.B. of the permit for the Narrative Water Quality Standards.

[5] The following EPA test methods and/or Standard Methods and associated LODs and LOQs are to be used in the analysis of the effluent samples. Alternative methods may be used if first approved by IDEM.

Parameter	Test Method	LOD	LOQ
Mercury	1631, Revision E	0.2 ng/l	0.5 ng/l
Arsenic	3113B	1 ug/l	3.2 ug/l
Arsenic	200.9	0.5 ug/l	1.6 ug/l
Arsenic	200.8	0.4 ug/l	1.3 ug/l
Selenium	3113B or 3114B	2 ug/l	6.4 ug/l
Selenium	200.8	2.1 ug/l	6.7 ug/l
Selenium	200.9	0.6 ug/l	1.9 ug/l
Cyanide, Free	4500-CN-G	5 ug/l	16 ug/l
Cyanide, Free	1677	0.5 ug/l	1.6 ug/l
Silver	3113B or 272.2	0.2 ug/l	0.64 ug/l
Silver	200.8 (Rev. 5.4	0.001 ug/l	1.0 ug/l
Chlorine	4500-Cl-D,E or 4500-Cl-G	0.02 mg/l	0.06 mg/l

[6] Sample preservation procedures and maximum allowable holding times for total cyanide, or available (free) cyanide are prescribed in Table II of 40 CFR Part 136. Note the footnotes specific to cyanide. Preservation and holding time information in Table II takes precedence over information in specific methods or elsewhere.

[7] Mercury monitoring shall be conducted bi-monthly in the months of February, April, June, August, October, and December of each year for the term of the permit using EPA Test Method 1631, Revision E. Alternative methods may be used if first approved by IDEM.

[8] The discharge is limited to Cooling Tower Blowdown, Coal Pile Runoff, Metal Cleaning Waste, Low Volume Waste, and storm water.

[9] See Part III of the permit for additional requirements.

[10] The weekly volume of discharged water will be collected using a flow meter totalizer and the weekly flow volume will be used to calculate the daily average which will be reported to IDEM.

[11] Chlorination reporting requirements for frequency, duration and duration/day apply when the facility is chlorinating.

[12] During intermittent treatment, compliance monitoring samples will be collected 1 X Day, 15 minutes after initial injection of treatment chemicals. This will result in one sample collected during intermittent treatment conducted during the work week (Monday – Friday).

[13] See Permit Part I.F. for a Reopener Clause related to these parameters.

[14] These limitations and monitoring requirements apply only during discharge of metal cleaning wastes.

[15] Net limits may apply. Net limitations are to be calculated by subtracting the measured background levels of these parameters in the ash pond from the actual measured concentration of these parameters when limitations apply. These background levels are to be calculated by monitoring the ash pond effluent concentrations of Iron and Copper over a period of time, to consist of a minimum of ten samples taken over a minimum of thirty (30) days when there is no discharge of metal cleaning wastes during a period that is at least 30 days but not to exceed 90 days preceding each discharge of metal cleaning wastes. The background levels demonstrated by this monitoring, along with supporting data are to be submitted with monthly Discharge Monitoring Reports (DMR) when reporting discharge of metal cleaning wastes.

[16] The permittee has a 3 year schedule of compliance as outlined in Part I.G. in which to meet the final effluent limitations for Copper, Chloride, and Selenium.

2. The permittee is authorized to discharge from the outfall listed below in accordance with the terms and conditions of this permit. The permittee is authorized to discharge from Outfall 004[3][7][9]. Samples taken in compliance with the monitoring requirements below shall be taken at a point representative of the discharge but prior to entry in the unnamed tributary to the Ohio River. Such discharge shall be limited and monitored by the permittee as specified below.

DISCHARGE LIMITATIONS [4]
Outfall 004

Table 1

	Quantity or Loading			Quality or Concentration			Monitoring Requirements	
Parameter	Monthly Average	Daily Maximum	Units	Monthly Average	Daily Maximum	Units	Measurement Frequency	Sample Type
Flow	Report	Report	MGD	-	-	-	1 X Day	24 Hr. Total
Oil & Grease[2]	-	-	-	10	15	mg/l	1 X Day	Grab
TSS[2]	-	-	-	30	70	mg/l	1 X Day	Grab
Cadmium[1]	-	-	-	-	Report	mg/l	[8]	24 Hr. Comp.
Copper[1][2]	-	-	-	-	Report	mg/l	[8]	24 Hr. Comp.
Iron[1][2]	-	-	-	-	Report	mg/l	[8]	24 Hr. Comp.
Selenium[1,5]	-	-	-	-	Report	mg/l	[8]	24 Hr. Comp.
Nickel[1]	-	-	-	-	Report	mg/l	[8]	24 Hr. Comp.
Aluminum[1]	-	-	-	-	Report	mg/l	[8]	24 Hr. Comp.
Silver[1,5]	-	-	-	-	Report	mg/l	[8]	24 Hr. Comp.
Free Cyanide[5,6]	-	-	-	-	Report	mg/l	[8]	Grab
Zinc[1]	-	-	-	-	Report	mg/l	[8]	24 Hr. Comp.
Arsenic[1,5]	-	-	-	-	Report	µg/l	[8]	24 Hr. Comp.
T. Chromium[1]	-	-	-	-	Report	mg/l	[8]	24 Hr. Comp.
Mercury[1,5]	-	-	-	-	Report	ng/l	[8]	Grab

Table 2

	Quality or Concentration			Monitoring Requirements	
Parameter	Daily Minimum	Daily Maximum	Units	Measurement Frequency	Sample Type
pH	6.0	9.0	s.u.	1 X Day	Grab

[1] The permittee shall measure and report the identified metal in total recoverable form.

[2] See Permit Part I.F. for a Reopener Clause related to these parameters.

[3] Beginning November 1, 2018 there shall be no discharge of fly ash or bottom ash transport water. The permittee may request an alternate compliance date beyond November 1, 2018 no later than 12-months from the effective date of this permit in accordance with the Reopening Clause in I.F. IDEM will evaluate the information

submitted and make a determination to extend the compliance date beyond November 1, 2018.

[4] See Part I.B. of the permit for the Narrative Water Quality Standards.

[5]

Parameter	Test Method	LOD	LOQ
Mercury	1631, Revision E	0.2 ng/l	0.5 ng/l
Arsenic	3113B	1 ug/l	3.2 ug/l
Arsenic	200.9	0.5 ug/l	1.6 ug/l
Arsenic	200.8	0.4 ug/l	1.3 ug/l
Selenium	3113B or 3114B	2 ug/l	6.4 ug/l
Selenium	200.8	2.1 ug/l	6.7 ug/l
Selenium	200.9	0.6 ug/l	1.9 ug/l
Cyanide, Free	4500-CN-G	5 ug/l	16 ug/l
Cyanide, Free	1677	0.5 ug/l	1.6 ug/l
Silver	3113B or 272.2	0.2 ug/l	0.64 ug/l
Silver	200.8 (Rev. 5.4	0.001 ug/l	1.0 ug/l

[6] Sample preservation procedures and maximum allowable holding times for total cyanide, or available (free) cyanide are prescribed in Table II of 40 CFR Part 136. Note the footnotes specific to cyanide. Preservation and holding time information in Table II takes precedence over information in specific methods or elsewhere.

[7] See Part III of the permit for additional requirements.

[8] Daily when the ash pond is discharging to Outfall 004.

[9] Outfall 004 is the emergency overflow from the Ash Pond. The discharge is limited to Coal Pile Runoff, Metal Cleaning Waste, Low Volume Waste, and storm water.

3. The permittee is authorized to discharge from the outfall listed below in accordance with the terms and conditions of this permit. The permittee is authorized to discharge from Outfalls 103 and 203. The discharge is limited to sanitary wastewater from the plant processing and coal handling processing areas respectively. Samples taken in compliance with the monitoring requirements below shall be taken at a point representative of the discharge from each outfall but prior to mixing with any other wastestreams. Such discharge shall be limited and monitored by the permittee as specified below:

DISCHARGE LIMITATIONS
Internal Outfalls 103, 203

Table 1

	Quantity or Loading			Quality or Concentration			Monitoring Requirements	
Parameter	Monthly Average	Daily Maximum	Units	Monthly Average	Daily Maximum	Units	Measurement Frequency	Sample Type
Flow	Report	Report	MGD	-	-	-	1 X Month	24 Hr. Total
$TBOD_5$	-	-	-	Report	45	mg/l	2 X Month	24 Hr. Comp.
E. coli [2]	-	-	-	125[3]	235[4]	cfu/100 ml	2 X Month	Grab
TSS[5]	-	-	-	Report	Report	mg/l	2 X Month	Grab

Table 2

	Quality or Concentration			Monitoring Requirements	
Parameter	Daily Minimum	Daily Maximum	Units	Measurement Frequency	Sample Type
TRC [1]	0.5	-	mg/l	1 X Month	Grab

[1] The effluent shall be disinfected on a continuous basis year-round. The chlorine residual shall be maintained at a concentration of not less than 0.5 mg/l as measured at the effluent end of the chlorine contact tank for the term of the permit. The daily minimum chlorine residual value shall be reported.

[2] 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

[3] 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.

[4] 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.

[5] See Permit Part I.F. for a Reopener Clause related to this parameter.

4. The permittee is authorized to discharge from the outfall listed below in accordance with the terms and conditions of this permit. The permittee is authorized to discharge from Outfalls 005S and 006S. The discharge is limited to storm water. Samples taken in compliance with the monitoring requirements below shall be taken at a point representative of the discharge but prior to entry into unnamed tributaries to the Ohio River. Such discharge shall be limited and monitored by the permittee as specified below:

DISCHARGE LIMITATIONS [1,2,3]

Outfalls 005S and 006S

Parameter	Quality or Concentration Daily Maximum	Units	Monitoring Measurement Frequency [5]	Requirements Sample Type
Flow	Report	MGD	Annually	Estimate Total
pH	Report	s.u.	Annually	Grab
O&G	Report	mg/l	Annually	Grab
$CBOD_5$	Report	mg/l	Annually	Grab
COD	Report	mg/l	Annually	Grab
TSS	Report	mg/l	Annually	Grab
T. Phosphorus	Report	mg/l	Annually	Grab
Ammonia (as N)	Report	mg/l	Annually	Grab
Nitrate + Nitrite Nitrogen	Report	mg/l	Annually	Grab
Total Kjeldahl Nitrogen	Report	mg/l	Annually	Grab
Aluminum [4]	Report	mg/l	Annually	Grab
Zinc [4]	Report	mg/l	Annually	Grab

[1] All samples shall be collected from the discharge resulting from a storm event that is greater than 0.1 inches and at least 72 hours from the previously measurable (greater than 0.1 inch rainfall) storm event. For each sample taken, the permittee shall record the duration and total rainfall of the storm event, the number of days between beginning of the storm measured and the end of the previous measurable rain event, and the outside temperature at the time of sampling. A grab sample shall be taken during the first thirty (30) minutes of the discharge (or as soon thereafter as practicable).

[2] The Storm Water Monitoring and Non Numeric Effluent Limits and the Storm Water Pollution Prevention Plan (SWP3) requirements can be found in Parts I.D. and I.E. of this permit.

[3] See Part I.B. of the permit for additional requirements.

[4] The permittee shall measure and report these parameters as **total recoverable**.

[5] Monitoring shall occur annually between April 1st and August 31st.

B. NARRATIVE WATER QUALITY STANDARDS

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

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

   a. which will settle to form putrescent, or otherwise objectionable deposits;

   b. which are in amounts sufficient to be unsightly or deleterious;

   c. which produce color, visible oil sheen, odor, or other conditions in such degree as to create a nuisance;

   d. which are in amounts sufficient to be acutely toxic to, or to 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. 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. Monthly Reporting

   The permittee shall submit monitoring reports to the Indiana Department of Environmental Management (IDEM) containing results obtained during the previous month and shall be submitted 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 month in which the

permit becomes effective. These reports shall include, but not necessarily be limited to, the Discharge Monitoring Report (DMR) and the Monthly Monitoring Report (MMR). All reports shall be submitted electronically by using the NetDMR application, upon registration, receipt of the NetDMR Subscriber Agreement, and IDEM approval of the proposed NetDMR Signatory. The NetDMR website (for initial registration and monthly DMR/MMR submittal) is: https://netdmr.epa.gov/netdmr/public/home.htm. 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. Calculations that require averaging of measurements of daily values (both concentrations and mass) shall use an arithmetic mean, except the monthly average for *E. coli* shall be calculated as a geometric mean.

b. Daily effluent values (both mass and concentration) that are less than the LOQ that are used to determine the monthly average effluent level shall be accommodated in calculation of the average using statistical methods that have been approved by the Commissioner.

c. Effluent concentrations less than the LOD shall be reported on the Discharge Monitoring Report (DMR) forms as < (less than) the value of the LOD. For example, if a substance is not detected at a concentration of 0.1 µg/l, report the value as <0.1 µg/l.

d. Effluent concentrations greater than or equal to the LOD and less than the LOQ that are reported on a DMR shall be reported as the actual value and annotated on the DMR to indicate that the value is not quantifiable.

e. Mass discharge values which are calculated from concentrations reported as less than the value of the limit of detection shall be reported as less than the corresponding mass discharge value.

f. Mass discharge values that are calculated from effluent concentrations greater than the limit of detection shall be reported as the calculated value.

3. Definitions

a. "Monthly Average" 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.

b. "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 reasonably represents the calendar day for the purposes of sampling.

c. "Daily Maximum" means the maximum allowable daily discharge for any calendar day.

d. A "24-hour composite sample" means a sample consisting of at least 3 individual flow-proportioned samples of wastewater, taken by the grab sample method or by an automatic sampler, which are taken at approximately equally spaced time intervals for the duration of the discharge within a 24-hour period and which are combined prior to analysis. A flow-proportioned composite sample may be obtained by:

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

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

(3) the discharge flow rate of each individual sampling time is divided by the total flow value to determine its percentage of the total flow value,

(4) then multiply 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.

e. "Concentration" means the weight of any given material present in a unit volume of liquid. Unless otherwise indicated in this permit, concentration values shall be expressed in milligrams per liter (mg/l).

f. The "Regional Administrator" is defined as the Region 5 Administrator, U.S. EPA, located at 77 West Jackson Boulevard, Chicago, Illinois 60604.

g. The "Commissioner" is defined as the Commissioner of the Indiana Department of Environmental Management, which is located at the

following address: 100 North Senate Avenue, Indianapolis, Indiana 46204.

h. "Limit of Detection" or "LOD" means 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.

i. "Limit of Quantitation" or "LOQ" means a measurement of the concentration of a contaminant obtained by using a specified laboratory procedure calibrated at a specified concentration above 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 sometimes called limit of quantification or quantification level.

j. "Method Detection Level" or "MDL" means 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 procedure set forth in 40 CFR 136, Appendix B. The method detection level or MDL is equivalent to the LOD.

k. "Grab Sample" means a sample which is taken from a wastestream on a one-time basis without consideration of the flow rate of the wastestream and without considerations of time.

4. Test Procedures

The analytical and sampling methods used shall conform to the current version of 40 CFR 136. 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 Commissioner 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, Parts 23, Water; Atmosphere 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.

5. Recording of Results

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

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

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

c. The date(s) and time(s) analyses were performed;

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

e. The analytical techniques or methods used; and

f. The results of such measurements and analyses.

6. 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 this monitoring shall be included in the calculation and reporting of the values required in the monthly Discharge Monitoring Report (DMR) and Monthly Monitoring Report (MMR). Such increased frequency shall also be indicated. Other monitoring data not specifically required in this permit (such as internal process or internal waste stream data) which is collected by or for the permittee need not be submitted unless requested by the Commissioner.

7. 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 years 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.

D. STORM WATER MONITORING AND NON-NUMERIC EFFLUENT LIMITS

Within twelve (12) months of the effective date of this permit, the permittee shall implement the non-numeric permit conditions in this Section of the permit for the entire site as it relates to storm water associated with industrial activity regardless which outfall the storm water is discharged from.

1. Control Measures and Effluent Limits

In the technology-based limits included in Part D.2-4., the term "minimize" means reduce and/or eliminate to the extent achievable using control measures (including best management practices) that are technologically available and economically practicable and achievable in light of best industry practice.

2. Control Measures

Select, design, install, and implement control measures (including best management practices) to minimize pollutant discharges that address the selection and design considerations in Part D.3 to meet the non-numeric effluent limits in Part D.4. The selection, design, installation, and implementation of these control measures must be in accordance with good engineering practices and manufacturer's specifications. Any deviation from the manufacturer's specifications shall be documented. If the control measures are not achieving their intended effect in minimizing pollutant discharges, the control measures must be modified as in accordance with the corrective action requirements in Part I.D.6. Regulated storm water discharges from the facility include storm water run-on that commingles with storm water discharges associated with industrial activity at the facility.

3. Control Measure Selection and Design Considerations

When selecting and designing control measures consider the following:

a. preventing storm water from coming into contact with polluting materials is generally more effective, and cost-effective, than trying to remove pollutants from storm water;

b. use of control measures in combination may be more effective than use of control measures in isolation for minimizing pollutants in storm water discharge;

c. assessing the type and quantity of pollutants, including their potential to impact receiving water quality, is critical to designing effective control measures that will achieve the limits in this permit;

d. minimizing impervious areas at the facility and infiltrating runoff onsite (including bioretention cells, green roofs, and pervious pavement, among other approaches), can reduce runoff and improve groundwater recharge and stream base flows in local streams, although care must be taken to avoid ground water contamination;

e. flow can be attenuated by use of open vegetated swales and natural depressions to reduce in-stream impacts of erosive flow;

f. conservation and/or restoration of riparian buffers will help protect streams from storm water runoff and improve water quality; and

g. use of treatment interceptors (e.g. swirl separators and sand filters) may be appropriate in some instances to minimize the discharge of pollutants.

4. Technology-Based Effluent Limits (BPT/BAT/BCT): Non-Numeric Effluent Limits

a. Minimize Exposure

Minimize the exposure of manufacturing, processing, and material storage areas (including loading and unloading, storage, disposal, cleaning, maintenance, and fueling operations) to rain, snow, snowmelt, and runoff. To the extent technologically available and economically practicable and achievable, either locate industrial materials and activities inside or protect them with storm resistant coverings in order to minimize exposure to rain, snow, snowmelt, and runoff (although significant enlargement of impervious surface area is not recommended). In minimizing exposure, pay particular attention to the following areas:

Loading and unloading areas: locate in roofed or covered areas where feasible; use grading, berming, or curbing around the loading area to divert run-on; locate the loading and unloading equipment and vehicles so that leaks are contained in existing containment and flow diversion systems.

Material storage areas: locate indoors, or in roofed or covered areas where feasible; install berms/dikes around these areas; use dry cleanup methods.

Note: Industrial materials do not need to be enclosed or covered if storm water runoff from affected areas will not be discharged to receiving waters.

b. Good Housekeeping

Keep clean all exposed areas that are potential sources of pollutants, using such measures as sweeping at regular intervals, store materials in appropriate containers, identify and control all on-site sources of dust to minimize stormwater contamination from the deposition of dust on areas exposed to precipitation, keep all dumpsters under cover or fit with a lid that must remain closed when not in use, and ensure that waste, garbage, and floatable debris are not discharged to receiving waters by keeping exposed areas free of such materials or by intercepting them before they are discharged.

Implement a cleaning and maintenance program for all impervious areas of the facility where particulate matter, dust or debris may accumulate to minimize the discharge of pollutants in stormwater. The cleaning and maintenance program must encompass, as appropriate, areas where material loading and unloading, storage, handling and processing occur.

Stabilize unpaved areas using vegetation or paving where there is vehicle traffic or where material loading and unloading, storage, handling and processing occurs, unless feasible.

For paved areas of the facility where particulate matter, dust or debris may accumulate, to minimize the discharge of pollutants in stormwater, implement control measures such as the following, where determined to be feasible (list not exclusive): sweeping or vacuuming at regular intervals; and washing down the area and collecting and/or treating and properly disposing of the washdown water. For unstabilized areas or for stabilized areas where sweeping, vacuuming, or washing down is not possible, to minimize the discharge of particulate matter, dust, or debris or other pollutants in stormwater, implement stormwater management devices such as the following, where determined to be feasible (list not exclusive): sediment traps, vegetative buffer strips, filter fabric fence, sediment filtering boom, gravel outlet protection, and other equivalent measures that effectively trap or remove sediment.

Fugitive Dust Emissions. Minimize fugitive dust emissions from coal handling areas to minimize the tracking of coal dust offsite that could be discharged in stormwater through implementation of control measures such as the following, where determined to be feasible, (list not exclusive): installing specially designed tires; and washing vehicles in a designated area before they leave the site and controlling the wash water.

Delivery Vehicles. Minimize contamination of stormwater runoff from delivery vehicles arriving at the plant site. Implement procedures to inspect delivery vehicles arriving at the plant site as necessary to minimize discharges of pollutants in stormwater. Ensure the overall integrity of the body or container of the delivery vehicle and implement procedures to deal with leakage or spillage from delivery vehicles.

Fuel Oil Unloading Areas. Minimize contamination of precipitation or surface runoff from fuel oil unloading areas. Use containment curbs in unloading areas where feasible. In addition, ensure personnel familiar with spill prevention and response procedures are available to respond expeditiously in the event of a leak or spill during deliveries. Ensure that any leaks or spills are immediately contained and cleaned up, and use spill and overflow protection devices (e.g., drip pans, drip diapers, or other containment devices placed beneath fuel oil connectors to contain potential spillage during deliveries or from leaks at the connectors).

Chemical Loading and Unloading. Minimize contamination of precipitation or surface runoff from chemical loading and unloading areas. Use containment curbs at chemical loading and unloading areas to contain spills, where practicable. In addition, ensure personnel familiar with spill prevention and response procedures are available to respond expeditiously in the event of a leak or spill during deliveries. Ensure leaks and spills are immediately contained and cleaned up and, where practicable, load and unload in covered areas and store chemicals indoors.

Miscellaneous Loading and Unloading Areas. Minimize contamination of precipitation or surface runoff from loading and unloading areas through implementation of control measures such as the following, where determined to be feasible (list not exclusive): covering the loading area; grading, curbing, or berming around the loading area to divert run-on; locating the loading and unloading equipment and vehicles so that leaks are contained in existing containment and flow diversion systems; or equivalent procedures.

Liquid Storage Tanks. Minimize contamination of surface runoff from above-ground liquid storage tanks through implementation of control measures such as the following, where determined to be feasible, the following (list not exclusive): using protective guards around tanks; using containment curbs; installing spill and overflow protection; using dry cleanup methods; or equivalent measures.

Large Bulk Fuel Storage Tanks. Minimize contamination of surface runoff from large bulk fuel storage tanks. Use containment berms (or their equivalent). Comply with applicable state and federal laws, including Spill Prevention, Control and Countermeasure (SPCC) Plan requirements.

Spill Reduction Measures. Minimize the potential for an oil or chemical spill, or reference the appropriate part of the SPCC plan. Visually inspect as part of the routine facility inspection the structural integrity of all above-ground tanks, pipelines, pumps, and related equipment that may be exposed to stormwater, and make any necessary repairs immediately.

Oil-Bearing Equipment in Switchyards. Minimize contamination of surface runoff from oil-bearing equipment in switchyard areas. Use level grades and gravel surfaces to retard flows and limit the spread of spills, or collect runoff in perimeter ditches.

Residue-Hauling Vehicles. Inspect all residue-hauling vehicles for proper covering over the load, adequate gate sealing, and overall integrity of the container body. Repair vehicles without load covering or adequate gate sealing, or with leaking containers or beds

Ash Loading Areas. Reduce or control the tracking of ash and residue from ash loading areas. Clear the ash building floor and immediately adjacent roadways of spillage, debris, and excess water as necessary to minimize discharges of pollutants in stormwater.

Areas Adjacent to Disposal Ponds or Landfills. Minimize contamination of surface runoff from areas adjacent to disposal ponds or landfills. Reduce ash residue that may be tracked on to access roads traveled by residue handling vehicles, and reduce ash residue on exit roads leading into and out of residue handling areas.

Landfills, Scrap Yards, Surface Impoundments, Open Dumps, General Refuse Sites. Minimize the potential for contamination of runoff from these areas.

c. Maintenance

Maintain all control measures which are used to achieve the effluent limits required by this permit in effective operating condition. Nonstructural control measures must also be diligently maintained (e.g., spill response supplies available, personnel appropriately trained). If control measures need to be replaced or repaired, make the necessary repairs or modifications as expeditiously as practicable.

d. Spill Prevention and Response Procedures

Minimize the potential for leaks, spills and other releases that may be exposed to storm water and develop plans for effective response to such spills if or when they occur. At a minimum, implement:

i. Procedures for plainly labeling containers (e.g., "Used Oil", "Spent Solvents", "Fertilizers and Pesticides", etc.) that could be susceptible to spillage or leakage to encourage proper handling and facilitate rapid response if spills or leaks occur;
ii. Preventive measures such as barriers between material storage and traffic areas, secondary containment provisions, and procedures for material storage and handling;
iii. Procedures for expeditiously stopping, containing, and cleaning up leaks, spills, and other releases. Employees who may cause, detect or respond to a spill or leak must be trained in these procedures and have necessary spill response equipment available. If possible, one of these individuals should be a member of the storm water pollution prevention team;
iv. Procedures for notification of appropriate facility personnel, emergency response agencies, and regulatory agencies. State or local requirements may necessitate reporting spills or discharges to local emergency response, public health, or drinking water supply agencies. Contact information must be in locations that are readily accessible and available; and
v. A procedure for documenting all significant spills and leaks of oil or toxic or hazardous pollutants that actually occurred at exposed areas, or that drained to a storm water conveyance.

e. Erosion and Sediment Controls

Through the use of structural and/or non-structural control measures stabilize, and contain runoff from, exposed areas to minimize onsite erosion and sedimentation, and the resulting discharge of pollutants. Among other actions to meet this limit, place flow velocity dissipation devices at discharge locations and within outfall channels where

necessary to reduce erosion and/or settle out pollutants. In selecting, designing, installing, and implementing appropriate control measures for erosion and sediment control, check out information from both the State and EPA websites. The following two websites are given as information sources:

http://www.in.gov/idem/stormwater/2363.htm
and
http://water.epa.gov/polwaste/npdes/stormwater/Stormwater-Pollution-Prevention-Plans-for-Construction-Activities.cfm

f. Management of Runoff

Divert, infiltrate, reuse, contain or otherwise reduce storm water runoff, to minimize pollutants in the discharge.

g. Salt Storage Piles or Piles Containing Salt

Enclose or cover storage piles of salt, or piles containing salt, used for deicing or other commercial or industrial purposes, including maintenance of paved surfaces. Implement appropriate measures (e.g., good housekeeping, diversions, containment) to minimize exposure resulting from adding to or removing materials from the pile. Piles do not need to be enclosed or covered if storm water runoff from the piles is not discharged.

h. Employee Training

Train all employees who work in areas where industrial material or activities are exposed to storm water, or who are responsible for implementing activities necessary to meet the conditions of this permit (e.g., inspectors, maintenance personnel), including all members of the Pollution Prevention Team.

The following personnel must understand the requirements of Part I.D. and Part I.E. of this permit and their specific responsibilities with respect to those requirements: Personnel who are responsible for the design, installation, maintenance, and/or repair of controls (including pollution prevention measures); personnel responsible for the storage and handling of chemicals and materials that could become contaminants in stormwater discharges; personnel who are responsible for conducting and documenting monitoring and inspections related to storm water; and personnel who are responsible for taking and documenting corrective actions as required in Part I.D.6.

Personnel must be trained in at least the following if related to the scope of their job duties (e.g., only personnel responsible for conducting inspections need to understand how to conduct inspections): an overview of what is in the SWPPP; spill response procedures, good housekeeping, maintenance requirements, and material management practices; the location of all controls on the site required by this permit, and how they are to be maintained; the proper procedures to follow with respect to the permit's pollution prevention requirements; and when and how to conduct inspections, record applicable findings, and take corrective actions.

i. Non-Storm water Discharges

Determine if any non-storm water discharges not authorized by an NPDES permit exist. Any non-storm water discharges discovered must either be eliminated or modified into this permit.

The following non-storm water discharges are authorized and should be documented when they occur in accordance with Part I.E.2.c. of the permit:

Discharges from fire-fighting activities;
Fire Hydrant flushings;
Potable water, including water line flushings;
Uncontaminated condensate from air conditioners, coolers, and other compressors and from the outside storage of refrigerated gases or liquids;
Irrigation drainage;
Landscape watering provided all pesticides, herbicides, and fertilizer have been applied in accordance with the approved labeling;
Pavement wash water where no detergents are used and no spills or leaks of toxic or hazardous material have occurred (unless all spilled material has been removed);
Routine external building washdown that does not use detergents;
Uncontaminated ground water or spring water;
Foundation or footing drains where flows are not contaminated with process materials;
Incidental windblown mist from cooling towers that collects on rooftops or adjacent portions of the facility, but not intentional discharges from cooling towers (e.g., "piped cooling tower blowdown or drains);and
Vehicle wash- waters where uncontaminated water without detergents or solvents is utilized.

j. Dust Generation and Vehicle Tracking of Industrial Materials

Minimize generation of dust and off-site tracking of raw, final, or waste materials.

5. Annual Review

At least once every 12 months, submit an Annual Report to the Industrial NPDES Permit Section which includes the following: the results or a summary of the past year's routine facility inspection documentation and quarterly visual assessment documentation; information copied or summarized from the corrective action documentation required (if applicable). If corrective action is not yet completed at the time of submission of this Annual Report, describe the status of any outstanding corrective action(s); and any incidents of noncompliance observed or, if there is no noncompliance, a certification signed by a responsible corporate officer, general partner or the proprietor, executive officer or ranking elected official, stating the facility is in compliance with this permit.

6. Corrective Actions – Conditions Requiring Review

a. If any of the following conditions occur, review the SWPPP to determine if and where revisions may need to be made to eliminate the condition and prevent its reoccurrence:

   i. An unauthorized release or discharge (e.g., spill, leak, or discharge of non-stormwater not authorized by this NPDES permit) occurs at the facility;
   ii. Control measures are not stringent enough for the discharge to meet applicable water quality standards;
   iii. A required control measure was never installed, was installed incorrectly, or is not being properly operated or maintained;
   iv. Visual assessments indicate obvious signs of stormwater pollution (e.g., color, odor, floating solids, settled solids, suspended solids, foam); or

b. If construction or a change in design, operation, or maintenance at the facility significantly changes the nature of pollutants discharged in storm water from the facility, or significantly increases the quantity of pollutants discharge the permittee must review and revise the selection, design, installation, and implementation of the control measures to determine if modifications are necessary to meet the effluent limits in this permit.

7. Corrective Action Deadlines

If additional changes are necessary, a new or modified control must be installed and made operational, or a repair completed, before the next storm event if possible, and within 45 calendar days from the time of discovery. If it is infeasible to complete the installation or repair within 45 calendar days, the reason(s) must be documented. A schedule for completing the work must also be identified, which must be done as soon as practicable after the 45 day timeframe.

Where corrective actions result in changes to any of the controls or procedures documented in the SWPPP, the SWPPP must be modified accordingly within 14 calendar days of completing corrective action work.

These time intervals are not grace periods, but are schedules considered reasonable for documenting the findings and for making repairs and improvements. They are included in this permit to ensure that the conditions prompting the need for these repairs and improvements are not allowed to persist indefinitely.

8. Corrective Action Report

The existence of any of the conditions listed in Part I.D.6 must be documented within 14 days of becoming aware of such condition. The following information must be included in the documentation:

a. Identification and description of the condition triggering the need for corrective action review. For any spills or leaks, include the following information: a description of the incident including material, date/time, amount, location, and reason for spill, and any leaks, spills or other releases that resulted in discharges of pollutants to waters of U.S., through stormwater or otherwise;

b. Date the condition was identified; and

c. A discussion of whether the triggering condition requires corrective action. For any spills or leaks, include response actions, the date/time clean-up completed, notifications made, and staff involved. Also include any measures taken to prevent the reoccurrence of such releases.

Document the corrective actions taken that occurred as a result of the conditions listed in Part I.D.6. within 45 days from the time of discovery of any of those conditions. Provide the dates when each corrective action was initiated and completed (or is expected to be completed). If applicable, document why it is infeasible to complete necessary installations or repairs

within the 45-day timeframe and document the schedule for installing the controls and making them operational as soon as practicable after the 45-day timeframe.

9. Inspections

a. Routine Facility Inspections

During normal facility operating hours conduct inspections of areas of the facility covered by the requirements in this permit, including the following:

i. Areas where industrial materials or activities are exposed to stormwater;
ii. Areas identified in the SWPPP and those that are potential pollutant sources;
iii. Areas where spills and leaks have occurred in the past 3 years.
iv. Discharge points; and
v. Control measures used to comply with the effluent limits contained in this permit.

Inspections must be conducted at least quarterly (i.e., once each calendar quarter), or in some instances more frequently (e.g., monthly), as appropriate. Increased frequency may be appropriate for some types of equipment, processes and stormwater control measures, or areas of the facility with significant activities and materials exposed to stormwater. At least one of the routine inspections must be conducted during a period when a stormwater discharge is occurring.

Inspections must be performed by qualified personnel with at least one member of the stormwater pollution prevention team participating. Inspectors must consider the results of visual and analytical monitoring (if any) for the past year when planning and conducting inspections.

During the inspection examine or look out for the following:

vi. Industrial materials, residue or trash that may have or could come into contact with stormwater;
vii. Leaks or spills from industrial equipment, drums, tanks and other containers;
viii. Offsite tracking of industrial or waste materials, or sediment where vehicles enter or exit the site;
ix. Tracking or blowing of raw, final or waste materials from areas of no exposure to exposed areas; and

x. Control measures needing replacement, maintenance or repair.

During an inspection occurring during a stormwater discharge, control measures implemented to comply with effluent limits must be observed to ensure they are functioning correctly. Discharge outfalls must also be observed during this inspection. If such discharge locations are inaccessible, nearby downstream locations must be inspected.

As part of conducting the routine facility inspections at least quarterly, address all potential sources of pollutants, including (if applicable) air pollution control equipment (e.g., baghouses, electrostatic precipitators, scrubbers, and cyclones), for any signs of degradation (e.g., leaks, corrosion, or improper operation) that could limit their efficiency and lead to excessive emissions. Consider monitoring air flow at inlets and outlets (or use equivalent measures) to check for leaks (e.g., particulate deposition) or blockage in ducts.

Also inspect all process and material handling equipment (e.g., conveyors, cranes, and vehicles) for leaks, drips, or the potential loss of material; and material storage areas (e.g., piles, bins, or hoppers for storing coke, coal, scrap, or slag, as well as chemicals stored in tanks and drums) for signs of material losses due to wind or stormwater runoff.

b. Routine Facility Inspection Documentation

The findings of facility inspections must be documented and the report maintained with the SWPPP. Findings must be summarized in the annual report. Document all findings, including but not limited to, the following information:

i. The inspection date and time;
ii. The name(s) and signature(s) of the inspector(s);
iii. Weather information;
iv. All observations relating to the implementation of control measures at the facility, including:
    (1) A description of any discharges occurring at the time of the inspection;
    (2) Any previously unidentified discharges and/or pollutants from the site;
    (3) Any evidence of, or the potential for, pollutants entering the drainage system;
    (4) Observations regarding the physical condition of and around all outfalls including any flow dissipation devices,

and evidence of pollutants in discharges and/or the receiving water;

(5) Any control measures needing maintenance, repairs, or replacement;

v. Any additional control measures needed to comply with the permit requirements; and

vi. Any incidents of noncompliance observed.

Any corrective action required as a result of a routine facility inspection must be performed consistent with Part I.D.6. of this permit.

If the discharge was visual assessed, as required in Part I.D.9.c., during the facility inspection, include the results of the assessment with the report required in Part I.D.9.a., as long as all components of both types of inspections are included in the report.

c. Quarterly Visual Assessment Procedures

Once each quarter for the entire permit term, collect a stormwater sample from each outfall and conduct a visual assessment of each of these samples. These samples are not required to be collected consistent with 40 CFR Part 136 procedures but should be collected in such a manner that the samples are representative of the stormwater discharge. Guidance on monitoring is available at:

http://water.epa.gov/polwaste/npdes/stormwater/EPA-Multi-Sector-General-Permit-MSGP.cfm

The visual assessment must be made:

i. Of a sample in a clean, clear glass, or plastic container, and examined in a well-lit area;

ii. On samples collected within the first 30 minutes of an actual discharge from a storm event. If it is not possible to collect the sample within the first 30 minutes of discharge, the sample must be collected as soon as practicable after the first 30 minutes and document why it was not possible to take samples within the first 30 minutes. In the case of snowmelt, samples must be taken during a period with a measurable discharge from the site; and

iii. For storm events, on discharges that occur at least 72 hours (3 days) from the previous discharge. The 72-hour (3-day) storm interval does not apply if you document that less than a 72-hour (3-day) interval is representative for local storm events during the sampling period.

Visually inspect or observe the sample for the following water quality characteristics:

iv. Color;
v. Odor;
vi. Clarity (diminished);
vii. Floating solids;
viii. Settled solids;
ix. Suspended solids;
x. Foam;
xi. Oil sheen; and
xii. Other obvious indicators of stormwater pollution.

Whenever the visual assessment shows obvious signs of stormwater pollution, initiate the corrective action procedures in Part I.D.6.

d. Quarterly Visual Assessment Documentation

Results of visual assessments must be documented and the documentation maintained onsite with the SWPPP. Documentation of the visual assessment must include, but is not be limited to:

i. Sample location(s);
ii. Sample collection date and time, and visual assessment date and time for each sample;
iii. Personnel collecting the sample and performing visual assessment, and their signatures;
iv. Nature of the discharge (i.e., runoff or snowmelt);
v. Results of observations of the stormwater discharge;
vi. Probable sources of any observed stormwater contamination; and
vii. If applicable, why it was not possible to take samples within the first 30 minutes.

Any corrective action required as a result of a quarterly visual assessment must be performed consistent with Part I.D.6. of this permit.

e. Exceptions to Quarterly Visual Assessments

i. Adverse Weather Conditions: When adverse weather conditions prevent the collection of samples during the quarter, documentation of the rationale for no visual assessment for the quarter must be included with the SWPPP records. Adverse conditions are those that are dangerous or create inaccessibility for personnel, such as local flooding, high winds,

or electrical storms, or situations that otherwise make sampling impractical, such as extended frozen conditions, drought, inadequate rainfall quantities, and rain events that occur too close in succession to achieve a minimum of 72 hours from the previous discharge.

ii. Snow: In areas subject to snow, at least one quarterly visual assessment must capture snowmelt discharge, taking into account the exception described above for climates with irregular stormwater runoff.

E. STORM WATER POLLUTION PREVENTION PLAN

1. Development of Plan

Within 12 months from the effective date of this permit, the permittee is required to revise and update the current Storm Water Pollution Prevention Plan (SWPPP) for the permitted facility. The SWPPP does not contain effluent limitations. The SWPPP is intended to document the selection, design, and installation of control measures. As distinct from the SWPPP, the additional documentation requirements are intended to document the implementation (including inspection, maintenance, monitoring, and corrective action) of the permit requirements.

2. Contents

The plan shall include, at a minimum, the following items:

a. Pollution Prevention Team – The SWPPP must identify the staff members (by name or title) that comprise the facility's stormwater pollution prevention team as well as their individual responsibilities. The stormwater pollution prevention team is responsible for overseeing development of the SWPPP, any later modifications to it, and for compliance with permit Parts I.D. and I.E. of this permit. Each member of the stormwater pollution prevention team must have ready access to either an electronic or paper copy of applicable portions of this permit, the most updated copy of the SWPPP, other relevant documents or information that must be kept with the SWPPP.

b. Site Description – As a minimum, the plan shall contain the following:

i. *Activities at the Facility.* Provide a description of the nature of the industrial activities at the facility.

ii. *General location map.* Provide a general location map (e.g., U.S. Geological Survey (USGS) quadrangle map) with enough detail to

identify the location of the facility and all receiving waters for the stormwater discharges.

iii. *Site map.* Provide a map showing:

(A) Boundaries of the property and the size of the property in acres;
(B) Location and extent of significant structures and impervious surfaces;
(C) Directions of stormwater flow (use arrows);
(D) Locations of all stormwater control measures;
(E) Locations of all receiving waters, including wetlands, in the immediate vicinity of the facility. Indicate which waterbodies are listed as impaired and which are identified by the State of Indiana or EPA as Tier 2 or Tier 2.5 waters;
(F) Locations of all stormwater conveyances including ditches, pipes, and swales;
(G) Locations of potential pollutant sources identified;
(H) Locations where significant spills or leaks identified have occurred;
(I) Locations of all stormwater monitoring points;
(J) Locations of stormwater inlets and outfalls, with a unique identification code for each outfall (e.g., Outfall No. 1, No. 2), indicating if you are treating one or more outfalls as "substantially identical", and an approximate outline of the areas draining to each outfall;
(K) If applicable, municipal separate storm sewer systems and where the stormwater discharges to them;
(L) Areas of federally-listed critical habitat for endangered or threatened species, if applicable.
(M) Locations of the following activities where such activities are exposed to precipitation:
    (a) fueling stations;
    (b) vehicle and equipment maintenance and/or cleaning areas;
    (c) loading/unloading areas;
    (d) locations used for the treatment, storage, or disposal of wastes;
    (e) liquid storage tanks;
    (f) processing and storage areas;
    (g) immediate access roads and rail lines used or traveled by carriers of raw materials, manufactured products, waste material, or by-products used or created by the facility;
    (h) transfer areas for substances in bulk; and

(i) machinery
(j) locations and sources of run-on to the site from adjacent property that contains significant quantities of pollutants.

(N) Document in the SWPPP the locations of any of the following activities or sources that may be exposed to precipitation or surface runoff: storage tanks, scrap yards, and general refuse areas; short- and long-term storage of general materials (including but not limited to supplies, construction materials, paint equipment, oils, fuels, used and unused solvents, cleaning materials, paint, water treatment chemicals, fertilizer, and pesticides); landfills and construction sites; and stock pile areas (e.g., coal or limestone piles).

c. Potential Pollutant Sources:

The SWPPP must document areas at the facility where industrial materials or activities are exposed to stormwater or from which allowable non-stormwater discharges may be released. Industrial materials or activities include, but are not limited to: material handling equipment or activities; industrial machinery; raw materials; industrial production and processes; and intermediate products, by-products, final products, and waste products. *Material handling activities* include, but are not limited to: the storage, loading and unloading, transportation, disposal, or conveyance of any raw material, intermediate product, final product or waste product. For structures located in areas of industrial activity, be aware that the structures themselves are potential sources of pollutants. This could occur, for example, when metals such as aluminum or copper are leached from the structures as a result of acid rain.

For each area identified, the description must include:

i. *Activities in the Area.* A list of the industrial activities exposed to stormwater (e.g., material storage; equipment fueling, maintenance, and cleaning; cutting steel beams).
ii. *Pollutants.* A list of the pollutant(s) or pollutant constituents (e.g., crankcase oil, zinc, sulfuric acid, and cleaning solvents) associated with each identified activity, which could be exposed to rainfall or snowmelt and could be discharged from the facility. The pollutant list must include all significant materials that have been handled, treated, stored, or disposed, and that have been exposed to stormwater in the three years prior to the date the SWPPP is prepared or amended.

iii. *Spills and Leaks.* The SWPPP must document where potential spills and leaks could occur that could contribute pollutants to stormwater discharges, and the corresponding outfall(s) that would be affected by such spills and leaks. The SWPPP must document all significant spills and leaks of oil or toxic or hazardous pollutants that actually occurred at exposed areas, or that drained to a stormwater conveyance, in the three years prior to the date the SWPPP is prepared or amended.

iv. *Non-Storm water Discharges* – The SWPPP must document that you have evaluated for the presence of non-storm water discharges not authorized by an NPDES permit. Any non-storm water discharges have either been eliminated or incorporated into this permit. Documentation of non-storm water discharges shall include:

A written non-storm water assessment, including the following:

(1) The date of the evaluation;
(2) A description of the evaluation criteria used;
(3) A list of the outfalls or onsite drainage points that were directly observed during the evaluation; and
(4) The action(s) taken, such as a list of control measures used to eliminate unauthorized discharge(s), or documentation that a separate NPDES permit was obtained. For example, a floor drain was sealed, a sink drain was re-routed to sanitary, or an NPDES permit application was submitted for an unauthorized cooling water discharge.

v. Salt Storage - The location of any storage piles containing salt used for deicing or other commercial or industrial purposes must be documented in the SWPPP.

vi. Sampling Data - All stormwater discharge sampling data collected at the facility during the previous permit term must be summarized in the SWPPP.

vii. Description of Control Measures to Meet Technology-Based Effluent Limits - The location and type of control measures you have specifically chosen and/or designed to comply with Permit Part I.D. must be documented in the SWPPP. Regarding the control measures, the following must be documented as appropriate:

(a) How the selection and design considerations of control measures were addressed.
(b) How the control measures address the pollutant sources identified.

d. Schedules and Procedures

The following must be documented in the SWPPP:

i. Good Housekeeping – A schedule for regular pickup and disposal of waste materials, along with routine inspections for leaks and conditions of drums, tanks and containers;

ii. Maintenance – Preventative maintenance procedures, including regular inspections, testing, maintenance and repair of all control measures to avoid situations that may result in leaks, spills, and other releases, and any back-up practices in place should a runoff event occur while a control measure is off-line. The SWPPP shall include the schedule or frequency for maintaining all control measures used to comply with the storm water requirements.

iii. Spill Prevention and Response Procedures – Procedures for preventing and responding to spills and leaks, including notification procedures. For preventing spills, include in the SWPPP the control measures for material handling and storage, and the procedures for preventing spills that can contaminate stormwater. Also specify cleanup equipment, procedures and spill logs, as appropriate, in the event of spills. You may reference the existence of other plans for Spill Prevention Control and Countermeasure (SPCC) developed for the facility under Section 311 of the CWA or BMP programs otherwise required by an NPDES permit for the facility, provided that you keep a copy of that other plan onsite and make it available for review;

iv. Erosion and Sediment Control – If you use polymers and/or other chemical treatments as part of the controls, identify the polymers and/or chemicals used and the purpose; and

v. Employee Training – The elements of the employee training plan shall include all, but not be limited to, the requirements set forth in Permit Part.I.D., and also the following:

(1) The content of the training;
(2) The frequency/schedule of training for employees who have duties in areas of industrial activities subject to this permit;
(3) A log of the dates on which specific employees received training.

e. Pertaining to Inspections

Document in the SWPPP the procedures for performing, as appropriate, the types of inspections specified by this permit, including:

i. Routine facility inspections and;
ii. Quarterly visual assessment of stormwater discharges.

For each type of inspection performed, the SWPPP must identify:

iii. Person(s) or positions of person(s) responsible for inspection;
iv. Schedules for conducting inspections, including tentative schedule for irregular stormwater runoff discharges; and
v. Specific items to be covered by the inspection, including schedules for specific outfalls.

f. Pertaining to Monitoring

Document in the SWPPP the procedures for conducting the five types of analytical monitoring specified by this permit, where applicable to the facility, including Benchmark monitoring;

For each type of monitoring, the SWPPP must document:

i. Locations where samples are collected, including any determination that two or more outfalls are substantially identical;
ii. Parameters for sampling and the frequency of sampling for each parameter;
iii. Schedules for monitoring at the facility, including schedule for alternate monitoring periods for climates with irregular stormwater runoff;
iv. Any numeric control values (effluent limitations guidelines, TMDL-related requirements, or other requirements) applicable to discharges from each outfall; and
v. Procedures (e.g., responsible staff, logistics, laboratory to be used) for gathering storm event data.

g. General Requirements – The SWPPP must meet the following general requirements:

i. The SWPPP shall be prepared in accordance with good engineering practices and to industry standards. The SWPPP may be developed by either a person on the staff or a third party, and it shall be certified in accordance with the signature requirements, under Part II.C.6.
ii. Retain a complete copy of the current SWPPP required by this permit at the facility in any accessible format. A complete SWPPP includes any documents incorporated by reference and all documentation supporting parts I.D. and I.E. of this permit, as well as the signed and dated certification page. Regardless of the

format, the SWPPP must be immediately available to facility employees, EPA, a state or tribe, the operator of an MS4 receiving discharges from the site; and representatives of the U.S. Fish and Wildlife Service (USFWS) or the National Marine Fisheries Service (NMFS) at the time of an onsite inspection. The current SWPPP or certain information from the current SWPPP must also be made available to the public (except any confidential business information (CBI) or restricted information, but clearly identify those portions of the SWPPP that are being withheld from public access.

iii. Where the SWPPP refers to procedures in other facility documents, such as a Spill Prevention, Control and Countermeasure (SPCC) Plan or an Environmental Management System (EMS), copies of the relevant portions of those documents must be kept with the SWPPP.

F. REOPENING CLAUSES

This permit may be modified, or alternately, revoked and reissued, after public notice and opportunity for hearing:

1. to comply with any applicable effluent limitation or standard issued or approved under 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.

2. to incorporate any of the reopening clause provisions cited at 327 IAC 5-2-16.

3. This permit may be modified or alternately revoked and reissued after public notice and opportunity for rehearing, to comply with any applicable final agency standards, regulations and requirements issued or approved under section 316(b) of the Clean Water Act, if the standards, regulations and requirements so issued or approved contain different conditions than those in the permit.

4. The permittee may submit an implementation schedule and justification for an alternate applicability date for the ELG BAT limits under 423.13(h)(1)(i) and 423.13(k)(1)(i) for fly ash and bottom ash transport waters no later than twelve months from the effective date of the permit. The justification shall consider the following factors:

a. Time to expeditiously plan (including to raise capital), design, procure, and install equipment to comply with the requirements of this part;

b. Changes being made or planned at the plant in response to:
   i. New source performance standards for greenhouse gases from new fossil fuel-fired electric generating units, under sections 111, 301, 302, and 307(d)(1)(C) of the Clean Air Act, as amended, 42 U.S.C. 7411, 7601, 7602, 7607(d)(1)(C);
   ii. Emission guidelines for greenhouse gases from existing fossil fuel-fired electric generating units, under sections 111, 301, 302, and 307(d) of the Clean Air Act, as amended, 42 U.S.C. 7411, 7601, 7602, 7607(d); or
   iii. Regulations that address the disposal of coal combustion residuals as solid waste, under sections 1006(b), 1008(a), 2002(a), 3001, 4004, and 4005(a) of the Solid Waste Disposal Act of 1970, as amended by the Resource Conservation and Recovery Act of 1976, as amended by the Hazardous and Solid Waste Amendments of 1984, 42 U.S.C. 6906(b), 6907(a), 6912(a), 6944, and 6945(a);

c. For FGD wastewater requirements only, an initial commissioning period for the treatment system to optimize the installed equipment; and

d. Other factors as appropriate such as consideration of grid reliability issues, the timing and progress of 316(b) compliance, the timing and progress of 316(a) compliance, and any other relevant factor that may affect a permittee's ability to implement the necessary facility retrofits.

   The permittee shall comply with the ELG BAT limits by the dates specified in the permit unless IDEM approves and incorporates a later date through modification of the permit.

e. A public announcement for coal unit retirement no later than December 31, 2023.

5. to include a case-specific Limit of Detection (LOD) and/or Limit of Quantitation (LOQ). The permittee must demonstrate that such action is warranted in accordance with the procedures specified under Appendix B, 40 CFR Part 136, using the most sensitive analytical methods approved by EPA under 40 CFR Part 136, or approved by the Commissioner.

6. If within 12 months from the effective date of this permit the permittee doesn't notify IDEM of its intent to permanently retire the coal units at the facility pursuant to subsection I.4.e of this permit, this permit may be modified, or alternately, revoked and reissued, after public notice and opportunity for hearing to require either: a) the permittee submit proposed alternate

limitations developed using the combined wastestream formula (CWF) for the parameters of low volume waste and cooling tower blowdown; or b) the permittee must establish internal outfalls for determining compliance with 40 CFR 423, which requires that in the event that waste streams from various sources are combined for treatment or discharge, the quantity of each pollutant or pollutant property controlled attributable to each controlled waste source shall not exceed the specified limitations for that waste source.

G. SCHEDULE OF COMPLIANCE

1. The permittee shall achieve compliance with the effluent limitations specified for Copper, Chloride, and Selenium at Outfall 001 in accordance with the following schedule:

   a. The permittee shall submit a written progress report to the Compliance Data Section of the Office of Water Quality (OWQ) nine (9) months from the effective date of this permit. The progress report shall include a description of the method(s) selected for meeting the newly imposed limitations for Copper, Chloride, and Selenium, in addition to any other relevant information. The progress report shall also include a specific time line specifying when each of the steps will be taken. The new effluent limits for Copper, Chloride, and Selenium are deferred for the term of this compliance schedule, unless the new effluent limits can be met at an earlier date. The permittee shall notify the Compliance Data Section of OWQ as soon as the newly imposed effluent limits for Copper, Chloride, and Selenium can be met. Upon receipt of such notification by OWQ, the final limits for Copper, Chloride, and Selenium will become effective, but no later than thirty-six (36) months from the effective date of this permit. Monitoring and reporting of the effluent for these parameters is required during the interim period.

   b. The permittee shall submit a subsequent progress report to the Compliance Data Section of OWQ no later than eighteen (18) months from the effective date of this permit. This report shall include detailed information on the steps the permittee has taken to achieve compliance with the final effluent limitations and whether the permittee is meeting the time line set out in the initial progress report.

   c. The permittee shall submit a subsequent progress report to the Compliance Data Section of OWQ no later than twenty-seven (27) months from the effective date of this permit. This report shall include detailed information on the steps the permittee has taken to achieve compliance with the final effluent limitations and whether the permittee is meeting the time line set out in the initial progress report.

d. Within thirty (30) days of completion of construction, the permittee shall file with the Industrial NPDES Permits Section of OWQ a notice of installation for the additional pollutant control equipment and a design summary of any modifications.

e. The permittee shall comply with the final effluent limitations for Copper, Chloride, and Selenium no later than thirty-six (36) months from the effective date of this permit.

2. If the permittee fails to comply with any deadline contained in the foregoing schedule, the permittee shall, within fourteen (14) days following the missed deadline, submit a written notice of noncompliance to the Compliance Data Section of the OWQ stating the cause of noncompliance, any remedial action taken or planned, and the probability of meeting the date fixed for compliance with final effluent limitations.

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 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 an application for renewal of this permit in accordance with 327 IAC 5-2-8(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. Pursuant to 327 IAC 5-3-2(a)(2), 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.

Under the terms of the proposed Federal E-Reporting Rule, the permittee may be required to submit its application for renewal electronically in the future.

4. Permit 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; and

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.

5. 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 a permanent reduction or elimination of any discharge controlled by the permit, e.g., plant closure, termination of discharge by connection to a POTW, a change in state law that requires the reduction or elimination of the discharge, or information indicating that the permitted 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.

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

6. 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 invasion of other private 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.

7. 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.

8. 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.

9. 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.

10. 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 Environmental Rules 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 performed under IC 13-14-2-2 commits a class C infraction.

Pursuant to IC 13-30-10-1.5(k), a person who willfully or recklessly violates any NPDES permit condition or filing requirement, any applicable standards or limitations of IC 13-18-3-2.4, IC 13-18-4-5, IC 13-18-8, IC 13-18-9, IC 13-18-10, IC 13-18-12, IC 13-18-14, IC 13-18-15, or IC 13-18-16, or who knowingly makes any false material statement, representation, or certification in any NPDES form, notice, or report commits a Class C misdemeanor.

Pursuant to IC 13-30-10-1.5(l), an offense under IC 13-30-10-1.5(k) is a Class D felony if the offense results in damage to the environment that renders the environment unfit for human or vertebrate animal life. An offense under IC 13-30-10-1.5(k) is a Class C felony if the offense results in the death of another person.

11. 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 13-30-10-1, provides that any person who knowingly or intentionally (a) destroys, alters, conceals, or falsely certifies a record that is required to be maintained under the terms of a permit issued by the department; and may be used to determine the status of compliance, (b) renders inaccurate or inoperative a recording device or a monitoring device required to be maintained by a permit

issued by the department, or (c) falsifies testing or monitoring data required by a permit issued by the department commits a Class B misdemeanor.

12. 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.

13. Wastewater treatment plant and certified operators

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.

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 operator" 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.

14. Construction Permit

In accordance with IC 13-14-8-11.6, a discharger is not required to obtain a state permit for the modification or construction of a water pollution treatment or control facility if the discharger has an effective NPDES permit.

If the discharger modifies their existing water pollution treatment or control facility or constructs a new water pollution treatment or control facility for the treatment or control of any new influent pollutant or increased levels of any existing pollutant, then, within thirty (30) days after commencement of operation, the discharger shall file with the Department of Environment Management a notice of installation for the additional pollutant control equipment and a design summary of any modifications.

The notice and design summary shall be sent to the Office of Water Quality, Industrial NPDES Permits Section, 100 North Senate Avenue, Indianapolis, IN 46204-2251.

15. 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.

16. 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. Proper Operation and Maintenance

The permittee shall at all times maintain in good working order and efficiently operate all facilities and systems (and related appurtenances) for the collection and treatment which are installed or used by the permittee and which are necessary for achieving compliance with the terms and conditions of this permit in accordance with 327 IAC 5-2-8(9).

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.

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

c. Bypasses, as defined in (a) above, are prohibited, and the Commissioner may take enforcement action against a permittee for bypass, unless the following occur:

(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.e; or

(4) The condition under Part II.B.2.b above is met.

d. 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.

e. 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 an unanticipated bypass that exceeds any effluent limitations in the permit within 24 hours of becoming aware of the bypass noncompliance. 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 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 e-mail

submittal is provided 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-mails should be sent to wwreports@idem.in.gov.

f. 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.c. The Commissioner may impose any conditions determined to be necessary to minimize any adverse effects.

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 section, 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 properly operated;

(3) The permittee complied with any remedial measures required under Part II.A.2; and

(4) The permittee submitted notice of the upset as required in the "Twenty-Four Hour 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. The discharge of pollutants in treated wastewater is allowed in compliance with the applicable effluent limitations in Part I. of this permit.

C. REPORTING REQUIREMENTS

1. Planned Changes in Facility or Discharge

Pursuant to 327 IAC 5-2-8(11)(F), the permittee shall give notice to the Commissioner as soon as possible of any planned physical alterations or additions to the permitted facility. In this context, permitted facility refers to a point source discharge, not a wastewater treatment facility. Notice is required only when either of the following applies:

a. The alteration or addition may meet one of the criteria for determining whether the facility is a new source as defined in 327 IAC 5-1.5.

b. The alteration or addition could significantly change the nature of, or increase the quantity of, pollutants discharged. This notification applies to pollutants that are subject neither to effluent limitations in Part I.A. nor to notification requirements in Part II.C.9. of this permit.

Following such notice, the permit may be modified to revise existing pollutant limitations and/or to specify and limit any pollutants not previously limited.

2. Monitoring Reports

Pursuant to 327 IAC 5-2-8(10) and 327 IAC 5-2-13 through 15, monitoring results shall be reported at the intervals and in the form specified in "Monthly Reporting", Part I.C.2.

3. Twenty-Four Hour Reporting Requirements

Pursuant to 327 IAC 5-2-8(11)(C), the permittee shall orally report to the Commissioner information on the following types of noncompliance within 24 hours from the time permittee becomes aware of such noncompliance. If the noncompliance meets the requirements of item b (Part II.C.3.b) or 327 IAC 2-6.1, then the report shall be made within those prescribed time frames. However, under 327 IAC 2-6.1-3(1), when the constituents of the discharge that is in noncompliance 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 noncompliance 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 noncomplying circumstances;

c. Any upset (as defined in Part II.B.3 above) that causes an exceedance of any effluent limitation in the permit;

d. Violation of a maximum daily discharge limitation for any of the following toxic pollutants: Copper, Mercury, Selenium

The permittee can make the oral reports by calling (317)232-8670 during regular business hours or by calling (317) 233-7745 ((888)233-7745 toll free in Indiana) during non-business hours. A written submission shall also be provided within 5 days of the time the permittee becomes aware of the circumstances. 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 and eliminate the noncompliance and prevent its recurrence. The Commissioner may waive the written report on a case-by-case basis if the oral report has been received within 24 hours. Alternatively the permittee may submit a "Bypass/Overflow Report" (State Form 48373) or a "Noncompliance 24-Hour Notification Report" (State Form 54215), whichever is appropriate, to IDEM at (317) 232-8637 or wwreports@idem.in.gov. If a complete fax or e-mail submittal is sent within 24 hours of the time that the permittee became aware of the occurrence, then the fax report will satisfy both the oral and written reporting requirements.

Upon its effectiveness, the proposed Federal E-Reporting Rule will require these reports to be submitted electronically.

4. Other Compliance/Noncompliance Reporting

Pursuant to 327 IAC 5-2-8(11)(D), the permittee shall report any instance of noncompliance not reported under the "Twenty-Four Hour Reporting Requirements" in Part II.C.3, or any compliance schedules at the time the pertinent Discharge Monitoring Report is submitted. The report shall contain the information specified in Part II.C.3;

The permittee shall also give advance notice to the Commissioner of any planned changes in the permitted facility or activity which may result in noncompliance with permit requirements; and

All 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 14 days following each schedule date.

Upon its effectiveness, the proposed Federal E-Reporting Rule will require these reports to be submitted electronically.

5. Other Information

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

6. Signatory Requirements

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) The manager of one (1) or more manufacturing, production, or operating facilities provided the manager is authorized to make management decisions that govern the operation of the regulated facility including having the explicit or implicit duty to make major capital investment recommendations, and initiating and directing other comprehensive measures to assure long-term environmental compliance with environmental laws and regulations; the manager can ensure that the necessary systems are established or actions taken to gather complete and accurate information for permit application requirements; and where 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 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. Electronic Signatures. If documents described in this section are submitted electronically by or on behalf of the NPDES-regulated facility, any person providing the electronic signature for such documents shall meet all relevant requirements of this section, and shall ensure that all of the relevant requirements of 40 CFR part 3 (including, in all cases, subpart D to part 3) (Cross-Media Electronic Reporting) and 40 CFR part 127 (NPDES Electronic Reporting Requirements) are met for that submission.

d. Certification. Any person signing a document identified under Part II.C.9., 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 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, 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. Changes in Discharge of Toxic Substances

Pursuant to 40 CFR 122.42(a)(1), 40 CFR 122.42(a)(2), and 327 IAC 5-2-9, the permittee shall notify the Commissioner as soon as it knows or has reason to believe:

a. That any activity has occurred or will occur which would result in the discharge, on a routine or frequent basis, of any pollutant identified as toxic pursuant to Section 307(a) of the Clean Water Act which is not limited in the permit, if that discharge will exceed the highest of the following "notification levels."

(1) One hundred micrograms per liter (100µg/l);

(2) Two hundred micrograms per liter (200 µg/l) for acrolein and acrylonitrile; five hundred micrograms per liter (500µg/l) for 2,4-dinitrophenol and 2-methyl-4,6-dinitrophenol; and one milligram per liter (1mg/l) for antimony;

(3) Five (5) times the maximum concentration value reported for that pollutant in the permit application in accordance with 40 CFR 122.21(g)(7); or

(4) A notification level established by the Commissioner on a case-by-case basis, either at his own initiative or upon a petition by the permittee. This notification level may exceed the level specified in subdivisions (1), (2), or (3) but may not exceed the level which can be achieved by the technology-based treatment

requirements applicable to the permittee under the CWA (see 327 IAC 5-5-2).

b. That any activity has occurred or will occur which would result in any discharge, on a non-routine or infrequent basis, of a toxic pollutant which is not limited in the permit, if that discharge will exceed the highest of the following "notification levels":

(1) Five hundred micrograms per liter (500 µg/l);

(2) One milligram per liter (1 mg/l) for antimony;

(3) Ten (10) times the maximum concentration value reported for that pollutant in the permit application in accordance with Sec. 122.21(g)(7).

(4) A notification level established by the Commissioner on a case-by-case basis, either at his own initiative or upon a petition by the permittee. This notification level may exceed the level specified in subdivisions (1), (2), or (3) but may not exceed the level which can be achieved by the technology-based treatment requirements applicable to the permittee under the CWA (see 327 IAC 5-5-2).

c. That it has begun or expects to begin to use or manufacture, as an intermediate or final product or byproduct, any toxic pollutant which was not reported in the permit application under 40 CFR 122.21(g)(9).

PART III
Other Requirements

A. Polychlorinated Biphenyl

There shall be no discharge of polychlorinated biphenyl (PCBs) compounds such as those commonly used for transformer fluid.

Many electrical transformers manufactured prior to 1978 contained PCBs. Therefore, in order to determine compliance with the PCB prohibition, the permittee shall provide the following PCB* data for Outfall 001 with the application renewal. The permittee shall submit the data to the Office of Water Quality, Industrial NPDES Permits Section, 100 North Senate Avenue, Indianapolis, Indiana 46204 2251.

Parameter	Test Method	LOD	LOQ
PCBs*	608	0.1 ug/l	0.3 ug/l

*PCB-1242, PCB-1254, PCB-1221, PCB-1232, PCB-1248, PCB-1260, and PCB-1016

B. The permittee shall post a permanent marker on the stream bank at each outfall discharging directly to the Ohio River.

The marker shall consist at a minimum of the name of the establishment to which the permit was issued, the permit number, and the outfall number. The information shall be printed in letters not less than two inches in height.

The marker shall be a minimum of 2 feet by 2 feet and shall be a minimum of 3 feet above the ground.

C. In the event that changes are to be made in the use of water treatment additives including dosage rates beyond the approved estimated maximum dosage rates, or changes that could significantly change the nature of, or increase the discharge concentration of the additive contributing to the Outfalls, the permittee shall notify the Indiana Department of Environmental Management as required in Part II.C.1 of this permit. The use of any new or changed water treatment additives or dosage rates shall not cause the discharge from any permitted outfall to exhibit chronic or acute toxicity. Acute and chronic aquatic toxicity information must be provided with any notification regarding any new or changed water treatment additives or dosage rates.

D. The Storm Water Monitoring and Non Numeric Effluent Limits and the Storm Water Pollution Prevention Plan (SWP3) requirements can be found in Part I.D. and I. E. of this permit.

Part IV
Cooling Water Intake Structures

A. Best Technology Available (BTA) Determination

In accordance with 40 CFR 401.14, the location, design, construction and capacity of cooling water intake structures of any point source for which a standard is established pursuant to section 301 or 306 of the Act shall reflect the best technology available for minimizing adverse environmental impact.

The EPA promulgated a Clean Water Act (CWA) section 316(b) regulation on August 15, 2014, that establishes standards for cooling water intake structures. 79 Fed. Reg. 48300-439 (August 15, 2014). The regulation establishes best technology available standards to reduce impingement and entrainment of aquatic organisms at existing power generation and manufacturing facilities and it became effective on October 14, 2014.

For permits expiring prior to 45 months from the effective date (before July 2018), the permittee can (1) negotiate an alternative schedule for submitting required information with the Director (IDEM) after demonstrating need, or (2) request waiver(s) for submitting required information. An alternative schedule for submission of information required under the current CWA section 316(b), or waiver(s) of submittal requirements shall be approved by IDEM. Upon approval of such alternative schedules and /or waivers, or until the time the required information/reports are submitted and the permit is renewed or modified following public notice, the IDEM is required to make a BTA determination using Best Professional Judgment (BPJ) to comply with CWA Section 316(b) based on existing information. The BTA determination is subject to change after the required information is submitted in accordance with the federal regulations effective October 14, 2014.

Based on available information, IDEM has made a Best Technology Available (BTA) determination that the existing cooling water intake structures represent best technology available to minimize adverse environmental impact in accordance with Section 316(b) of the federal Clean Water Act (33 U.S.C. section 1326) at this time. This determination is based on Best Professional Judgment (BPJ) and will be reassessed at the next permit reissuance to ensure that the CWISs continue to meet the requirements of Section 316(b) of the federal Clean Water Act (33 U.S.C. section 1326).

B. Permit Requirements

In accordance with the recently promulgated rules at 40 CFR 122 and 40 CFR 125, the owner or operator of a facility that has CWIS with a Design Intake Flow (DIF) ≥ 2 MGD and an Actual Intake Flow (AIF) < 125 MGD must submit the information required at 40 CFR 122.21(r)(2) through (6) and (8), including all of the associated supporting documentation and/or studies. Studies defined at 40 CFR 122.21(r)(7) are also required when applicable. In addition, the permittee shall comply with requirements below:

1. In accordance with 40 CFR 125.98(b)(1), nothing in this permit authorizes take for the purposes of a facility's compliance with the Endangered Species Act.

2. At all times properly operate and maintain the intake equipment and incorporate management practices and operational measures necessary to ensure proper operation of the CWIS..

3. Inform IDEM of any proposed changes to the CWIS or proposed changes to operations at the facility that affect the information taken into account in the current BTA evaluation.

4. There shall be no discharge of debris from intake screen washing which will settle to form objectionable deposits which are in amounts sufficient to be unsightly or deleterious, or which will produce colors or odors constituting a nuisance.

5. All required reports shall be submitted to the IDEM, Office of Water Quality, NPDES Permits Branch.

6. Submit the information required to be considered by the Director per 40 CFR 125.98 to assist IDEM with the fact sheet or statement of basis for entrainment BTA, as soon as practicable, but no later than with the application for the next permit renewal.

7. During the next permit period, monitor the intake flows at a minimum frequency of daily for one continuous year. The permittee may use engineering calculations, such as pump capacity, to approximate intake flow. The daily intake flow information shall be submitted with the application for the next permit renewal.

National Pollutant Discharge Elimination System
Fact Sheet For
Vectren Corporation
SIGECO A.B. Brown Generating Station

Draft: December 2016
Final: February 2017

Indiana Department of Environmental Management
100 North Senate Avenue
Indianapolis, Indiana 46204
(317) 232-8603
Toll Free (800) 451-6027
www.idem.IN.gov

Permittee:	Vectren Corporation SIGECO A.B. Brown Generating Station P.O. Box 209 Evansville, Indiana 47702
Existing Permit Information:	Permit Number: IN0052191 Expiration Date: September 30, 2016
Facility Contact:	Angela Casbon-Scheller, Manager-Utility Environmental Compliance acscheller@vectren.com (812) 491-4787
Facility Location:	SIGECO A.B. Brown Generating Station 8511 Welborn Road Mt. Vernon, Indiana 47620 Posey County
Receiving Stream:	Outfall 001: Ohio River Outfall 004: unnamed tributary to the Ohio River
GLI/Non-GLI:	Non-GLI
Proposed Permit Action:	Permit Renewal
Date Application Received:	March 31, 2016
Source Category	**NPDES Major:** Non-Contact Cooling Water, Cooling Tower Blowdown; Low Volume Wastewater; Ash Handling Wastewater, Metal Cleaning Wastewater, Coal Pile Runoff, Treated Sanitary Wastewater
Permit Writer:	Miranda Hancock mihancoc@idem.in.gov (317) 234-8129 Nicole Gardner ngardner@idem.in.gov (317) 232-8707

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1.0 INTRODUCTION

The Indiana Department of Environmental Management (IDEM) received a National Pollutant Discharge Elimination System (NPDES) Permit application from Vectren Corporation SIGECO A.B. Brown Generating Station on March 31, 2016. The current five year permit was issued with an effective date of October 1, 2009 in accordance with 327 IAC 5-2-6(a).

The Federal Water Pollution Control Act of 1972 and subsequent amendments require a NPDES permit for the discharge of wastewater to surface waters. Furthermore, Indiana Code (IC) 13-15-1-2 requires a permit to control or limit the discharge of any contaminants into state waters or into a publicly owned treatment works. This proposed permit action by IDEM complies with both federal and state requirements.

In accordance with Title 40 of the Code of Federal Regulations (CFR) Sections 124.8 and 124.56, as well as Indiana Administrative Code (IAC) 327 Article 5, development of a Fact Sheet is required for NPDES permits. This document fulfills the requirements established in those regulations.

This Fact Sheet was prepared in order to document the factors considered in the development of NPDES Permit effluent limitations. The technical basis for the Fact Sheet may consist of evaluations of promulgated effluent guidelines, existing effluent quality, receiving water conditions, and wasteload allocations to meet Indiana Water Quality Standards. Decisions to award variances to Water Quality Standards or promulgated effluent guidelines are justified in the Fact Sheet where necessary.

2.0 FACILITY DESCRIPTION

2.1 General

Vectren Corporation SIGECO A.B. Brown Generating Station is classified under Standard Industrial Classification (SIC) Code 4911 – Electric Services. The facility is a coal fired steam electric generating plant with two (2) 265 MW generating units, and two (2) natural gas turbines, 85 MW and 90 MW. The gas turbines are used during peak load periods and the operating of these units does not contribute to the wastewater discharge. The Ohio River accounts for approximately 95% of the facility's intake water with well water accounting for remainder. The design intake volume is 9.11 MGD. Average daily intake for 2015 was 5.97 MGD while average discharge volume for 2015 was 1.53 MGD. Extensive recycling of the ash pond water accounts for the difference between intake and discharge volumes.

A map showing the location of the facility has been included as Figure 1 and Figure 2.

Figure 1: Facility Location Topography Map

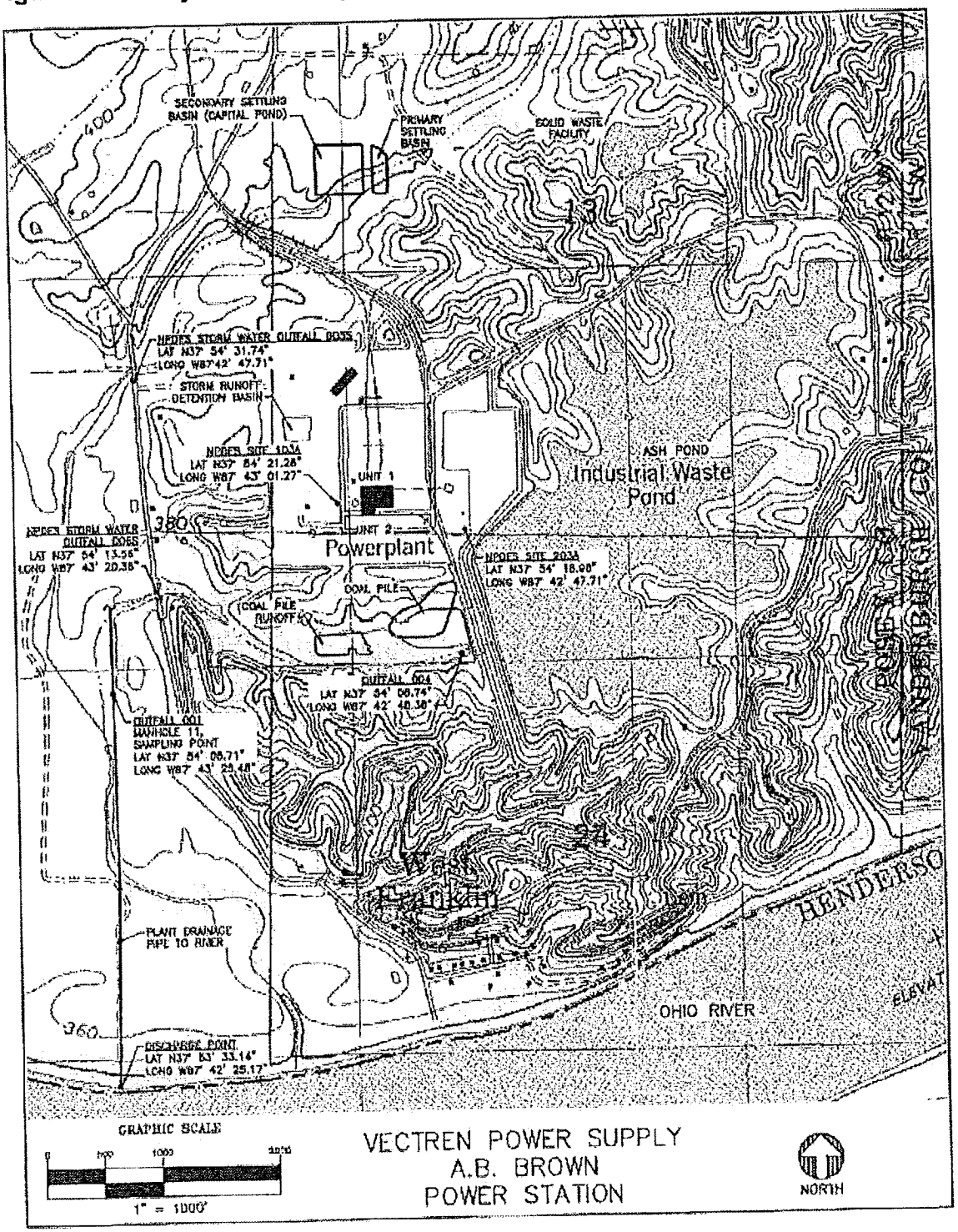
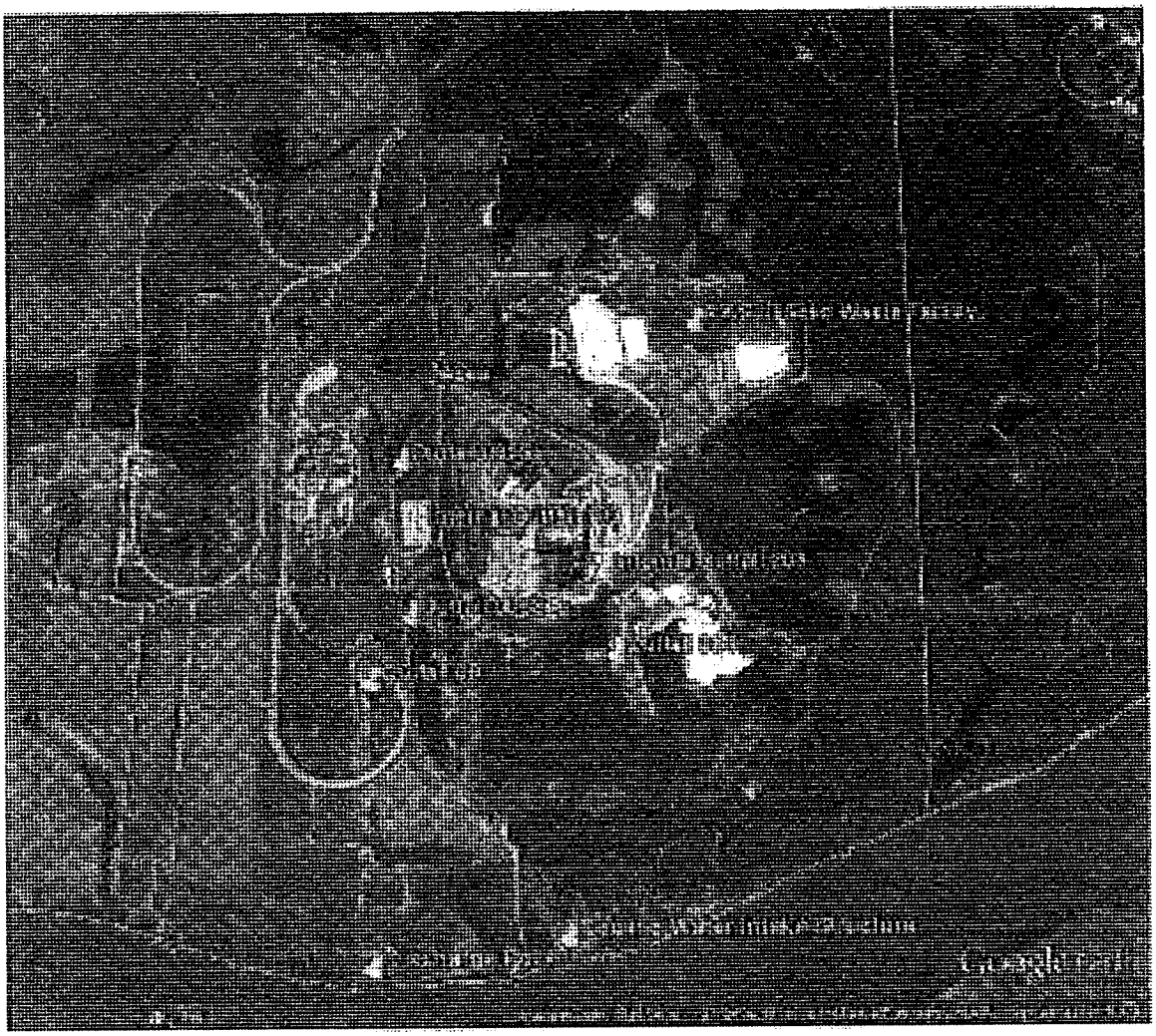


Figure 2: Facility Location Aerial Map



SIGECO A.B. Brown Generating Station
8511 Welborn Road
Mt. Vernon, Indiana 47620
Posey County

2.2 Outfall Locations

Outfall	Latitude	Longitude	Receiving Water	Flow Summary	Avg. Flow (MGD)
001	37.90159	87.723744	Ohio River	Please refer to section 2.3 below for a detailed description and simplified flow diagram.	1.53*
004	37.90243	87.713433	unnamed tributary to the Ohio River	emergency overflow from the ash pond	-
103	37.90591	87.717019	internal outfall to 001	treated sanitary wastewater	0.0033*
203	37.90527	87.713114	internal outfall to 001	treated sanitary wastewater	0.001*
005S	37.90882	87.723044	unnamed tributary to the Ohio River	Storm water from northern part of plant	1.309*
006S	37.90377	87.722328	unnamed tributary to the Ohio River	storm water from central & southwestern part of plant	1.84*
		*Flows are variable			

2.3 Wastewater Treatment

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(s) as required by IC 13-18-11-11 and 327 IAC 5-22-5. In order to operate a wastewater treatment plant the operator shall have qualifications as established in 327 IAC 5-22-7. The permittee has a wastewater treatment system that has been given a Class B industrial wastewater treatment plant classification.

The following describes the discharges and wastewater treatment systems at the A.B. Brown Generating Station. A Simplified Flow Diagram has been included as Figure 3 below and a Full Flow Diagram has been included as Figure 4 below.

Outfall 001

Outfall 001 discharges to the Ohio River near river mile 817. The average flow from the outfall is 1.53 MGD for the September 2014 – February 2016 time period. Outfall 001 consists of the discharge water from cooling tower blow down, floor and equipment drains, low volume plant waste water, FGD landfill runoff water (restricted type III), FGD scrubber area sumps, treatment system #1, fly ash transport, bottom ash transport, ash pond, treatment system #2, periodic metal cleaning wastes, treated sanitary wastewater, coal pile run-off and south side run off pond emergency overflow. Of the discharge waters listed, most do not discharge discretely to the 001 pipe. The direct discharges into the outfall 001 pipe are the cooling tower blowdown, the lined

settling pond for treatment system #2 and the ash pond storm water bypass line (which is only utilized during heavy precipitation). A simplified schematic has been included as Figure 3 below which identifies how each wastewater stream intermingles or directly discharges to the outfall 001 pipe.

- Cooling Tower Blow Down: Non-contact cooling water is withdrawn primarily from the Ohio River, with make-up water being drawn from the onsite Ranney Radial Collection Well. Non-contact cooling water is treated with scale and corrosion inhibiting water treatment additives and a polymer is added prior to being blown down to a series of three (3) cooling tower blow down settling basins. The third basin in the series discharges to the Ohio River via Outfall 001.

- Floor and Equipment Drains: Floor and equipment drain discharge combines with fuel oil storage area drains and passes through a primary and secondary oil / water separator. The Oil / Water separator consists of a primary tank / baffle chamber and a secondary concrete holding chamber. This discharge point from this system is from the underflow of the secondary treatment so that any residual oils stay on the surface of the holding chamber. Discharge then discharges to the Ohio River via Outfall 001.

- FGD Landfill Run Off: The FGD Landfill Surge Basin discharges to the FGD Landfill Settling Basin (Capital Pond). As of July 2014, the landfill run-off is injected with CO2 (treatment code 2-L) prior to being pumped to the FGD scrubber sumps. The waters in the FGD scrubber sumps are then pumped to Physical-Chemical Treatment System #1 (described below).

- FGD Scrubbers: There is not a direct slurry discharge from the FGD scrubbers. The water removed from the filter cake during the belt filter vacuum process recycles to the thickener tank. This particular scrubbing process is unique to the A.B. Brown plant. The 1.2 MGD flow from the FGD scrubbers noted on the water flow diagram is the wash water used to spray off the belt filter and the filter cake truck loading bays from both scrubbers. This wash water drains to the scrubber sumps and is then pumped to Physical-Chemical Treatment System #1 (described next). The ash pond is the source water and it recirculates back to the ash pond after passing through the FGD system scrubber pump and Physical-Chemical Treatment System #1. As stated in the Effluent Limitations Guidelines and Standards for the Steam Electric Power Generating Point Source Category; Final Rule with a January 4, 2016 effective date, "Wastewater generated from cleaning the FGD scrubber, cleaning FGD solids separation equipment, cleaning FGD solids dewatering equipment, or that is collected in floor drains in the FGD process area is not considered FGD wastewater." [40 CFR 423.11(n)] As a result of this statement provided by EPA, the wash waters collected in the scrubber sumps for the truck loading areas and belt filter wash are not considered FGD wastewater.

- Treatment System #1: This physical-chemical treatment system was constructed for meeting the mercury effluent limit as listed in the 2011 NPDES permit renewal. The system treats water from the landfill capital pond and scrubber belt filter wash / sumps in a set of mixing tanks which add coagulant, pH adjustment, organosulfide, and a polymer / flocculant prior to the wastewater entering the ash pond. The mixing tanks are located along the edge of the ash pond and discharge into the pond for settling.

- Fly Ash: As of November 2009, A.B. Brown Generating Station fly ash is sent for recycling to a cement kiln via a barge load out system at the river. The Hydroveyor system used to move the dry fly ash to the load out facility requires a vacuum which is created by the flow of water within the ash lines. Ash pond water recirculates within the ash lines to form the vacuum. During times of high river levels that restrict barge traffic or during kiln outages the fly ash is conveyed to the ash pond through the fly ash sluice lines. For the last three years, the two generating units have operated an average of 81% of the possible days and wet sluiced 25% of fly ash generated or roughly 20,000 tons per year.

- Bottom Ash: Bottom Ash accounts for 15-20% of ash generated. For the last three years, the facility has averaged 21,000 tons of bottom ash generation per year. All bottom ash is wet sluiced to the ash pond.

- Ash Pond Wastewater: Ash pond wastewater is discharged as needed to control the pond level. The ash pond receives discharges from rainfall and run off, bottom ash transport water, fly ash transport water, coal pile run off / south side run off pond, chemistry lab and battery room floor drains, landfill / Capital Pond water, and waters associated with the dual alkali FGD scrubber sump which consists of waters used to wash down the belt filters and truck loading bays. A storm water bypass line has been installed for the purpose of routing ash pond waters directly to the new settling pond during periods of exceptionally high rainfall. The storm water bypass line will aid the facility in limiting discharges via the principal spillway (Outfall 004) by routing it through the primary permitted outfall (Outfall 001). Influent flow to the Ash Pond is approximately 9.7 MGD. Ash pond wastewater not discharged through treatment system #2 or the storm water bypass line is lost to evaporation, recirculated to the FGD System, and used for wash down source water. Ash pond water recycled to internal systems or recycled within the ash pond is approximately 7.9 MGD.

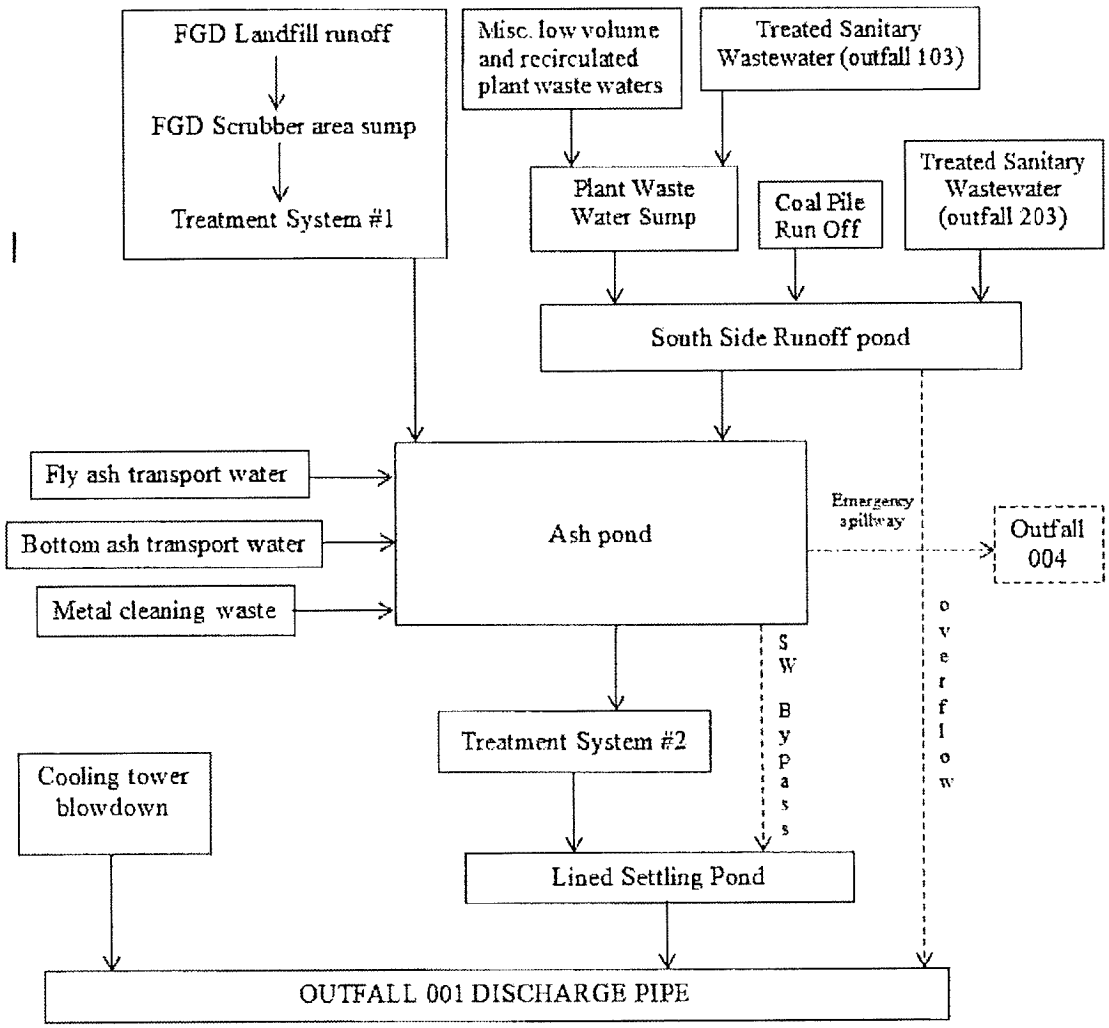
- Treatment System #2: This physical-chemical treatment system treats water from the ash pond with a duplicate set of tanks using the same chemicals as the aforementioned (treatment system #1) set of tanks and take the water to a new, lined settling pond near the cooling towers. Water from the new pond enters the discharge pipe near the cooling tower blow down line for eventual flow to Outfall 001. The new settling pond allows for a more steady flow rate from the ash pond discharge which is heavily influenced by precipitation.

- Periodic Metal Cleaning Waste: Chemical metal cleanings occur on each unit once every 6-7 years. The last chemical metal cleaning on Unit 1 occurred during early April 2015. The last chemical metal cleaning on Unit 2 occurred during mid-October 2014.

- Coal Pile / South Side Run Off Pond: The boiler water pretreatment system, reverse osmosis reject, water treatment filter & softener backwash, boiler blow down, precipitator & ash pit area floor drains, air heater wash, the hopper seal & ash hopper overflow, and occasional discharges of the lime storage tank are discharged to the Coal Pile Run Off / South Side Run Off Pond. Rainfall and run off, coal trestle dust suppression, coal handling French drain, coal handling and sanitary waste from the coal handling area (Internal Outfall 203), and the East Ditch Drain (which contains yard drainage and wash down), discharge to the Coal Pile Run Off / South Side Run-Off Pond. The south side run-off pond discharges continuously to the ash pond. In emergency situations, the south side run-off pond can also be discharged directly to the Ohio

River via Outfall 001. This may occur for a few hours each year. The last occurrence was April 2014. The South Side Run-Off Pond level is monitored via the plant electronic data system.

Figure 3: Simplified Flow Diagram



Outfall 004 – Emergency Overflow Discharge

Outfall 004 is designated as an emergency overflow from the ash pond to an unnamed tributary to the Ohio River. The ash pond is described in detail in the Outfall 001 description. During periods of excessive precipitation, when discharges to Outfall 001 are not able to maintain an acceptable water level in the ash pond, water may discharge from the ash pond via Outfall 004.

Internal Outfall 103 - Sanitary Wastewater

Internal Outfall 103 is an internal outfall regulating the discharge from the sanitary wastewater treatment plant. Treatment consists of activated sludge biological treatment and disinfection with

chlorine tablets. Following treatment, the outfall combines with other plant wastes and discharges to the Ohio River through Outfall 001. The average flow is less than 3,300 gallons per day (0.0033 MGD). Treatment for the sanitary water includes:

- disinfection with chlorine tablets (2-F)
- activated sludge (3-A)

Internal Outfall 203 – Sanitary Wastewater

Internal Outfall 203 is an internal outfall regulating the discharge from the sanitary wastewater treatment plant serving the coal handling offices and SIMI building. Treatment consists of activated sludge biological treatment and disinfection with chlorine tablets. Following treatment, the outfall discharges to the coal pile run-off /south side run-off pond which pumps to the ash pond. The average flow is less than 1,000 gallons per day (0.001 MGD). The south side run-off pond discharges continuously to the coal ash pond. Treatment for the sanitary water includes:

- disinfection with chlorine tablets (2-F)
- activated sludge (3-A)

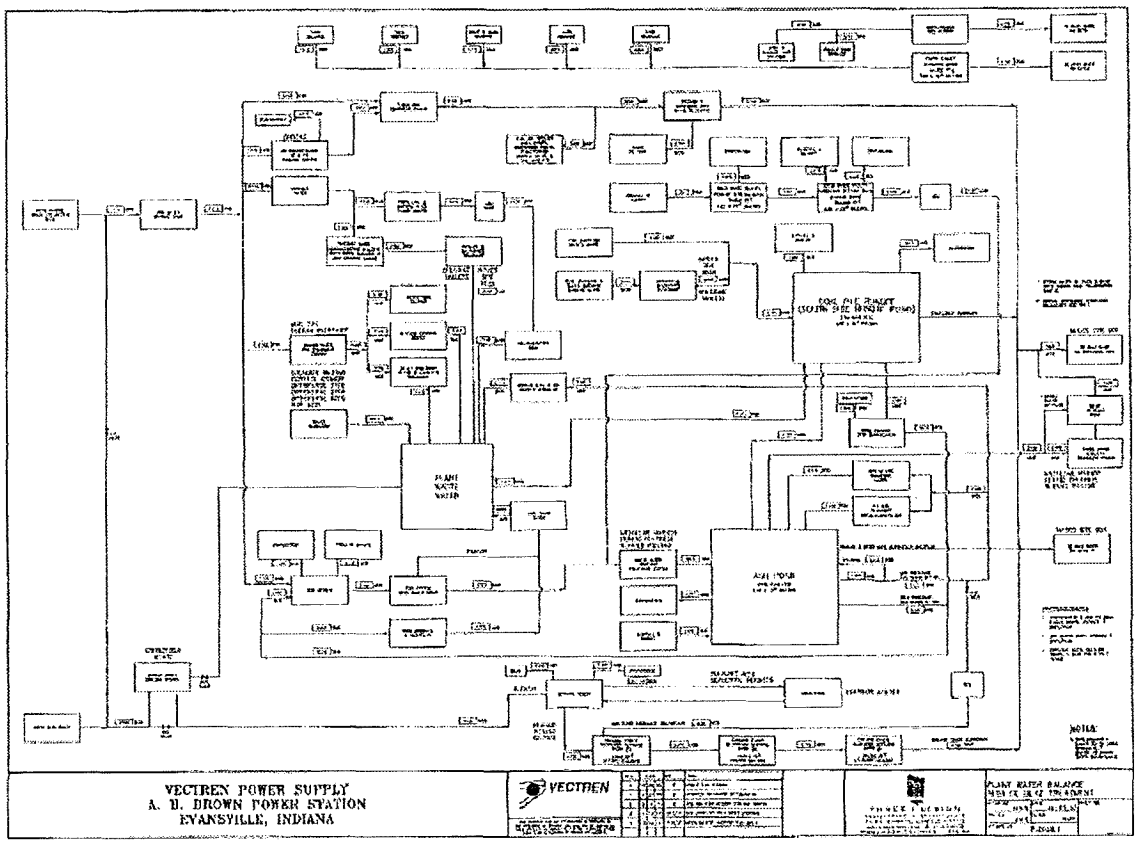
Outfall 005S – Storm Water North Collection Area

Storm water from the northern part of the plant which includes the area surrounding the landfill, cooling tower blow down basins, and plant entrance road are discharged through this outfall. The outfall discharges to an unnamed tributary to the Ohio River.

Outfall 006S – Storm Water Central and Southwest Collection Area

Storm water from the central and southwestern part of the plant which includes the cooling towers, substation, rail road, coal truck delivery road, and open areas are discharged through this outfall. The outfall discharges to an unnamed tributary to the Ohio River.

Figure 4: Flow Diagram (click diagram to open full view)



2.4 Changes in Operation

On July 2, 2014 this facility completed installation of the chemical-precipitations treatment systems that were constructed for the purpose of meeting the mercury limitations promulgated by the August 6, 2010 Wasteload Allocation Report.

Future changes at this facility include plans to retire Units 1 and 2 no later than 12/31/2023. Vectren has indicated to IDEM that a final decision on retirement will be made in the next twelve months. This permit renewal requires Vectren to notify IDEM of their final decision on retirement within twelve months of the effective date of this permit renewal. At that time, a proposed modification of the permit is expected that would address compliance issues with the federal effluent guidelines applicable to this facility. See Section 5.2 below.

3.0 PERMIT HISTORY

3.1 Compliance history

There are no pending or current enforcement actions regarding this NPDES permit. A review of this facility's discharge monitoring data was conducted for compliance verification. This review indicates the following permit limitation violations between July, 2011 and June, 2016:

Outfall 001: 4 exceedances of pH, 1 exceedance of Iron, 2 exceedances of TRO.
Outfall 004: 4 exceedances of pH, 1 exceedance of TSS.

4.0 RECEIVING WATER

The receiving stream for Outfall 001 is the Ohio River. The $Q_{7,10}$ low flow value of the Ohio River is 12,900 cfs and shall be capable of supporting a well-balanced warm water aquatic community and full body contact recreation in accordance with 327 IAC 2-1-3.The Ohio River is also designated as a public water supply and as an industrial water supply.

The receiving stream for Outfalls 004, 005S, and 006S is an unnamed tributary to the Ohio River. The $Q_{7,10}$ low flow value of the unnamed tributary to the Ohio River is 0.0 cfs and shall be capable of supporting a well-balanced warm water aquatic community and full body contact recreation in accordance with 327 IAC 2-1-3.

In accordance with 327 IAC 2-1.3, language in this renewed permit specifically prohibits the permittee from undertaking deliberate actions that would result in new or increased discharges of BCC's or new or increased permit limits for non-BCC's, or from allowing a new or increased discharge of a BCC from an existing or proposed industrial user, without first proving that the new or increased discharge would not result in a significant lowering of water quality, or by submission and approval of an antidegradation demonstration to the IDEM.

4.1 Receiving Stream Water Quality

Section 303(d) of the Clean Water Act requires states to identify waters, through their Section 305(b) water quality assessments, that do not or are not expected to meet applicable water quality standards with federal technology based standards alone. States are also required to develop a priority ranking for these waters taking into account the severity of the pollution and the designated uses of the waters. Once this listing and ranking of impaired waters is completed, the states are required to develop Total Maximum Daily Loads (TMDLs) for these waters in order to achieve compliance with the water quality standards. Indiana's 2014 303(d) List of Impaired Waters was developed in accordance with Indiana's Water Quality Assessment and 303(d) Listing Methodology for Waterbody Impairments and Total Maximum Daily Load Development for the 2014 Cycle.

The Ohio River (Assessment-Unit INH8_05) is on the 2014 303(d) list for E. Coli, Mercury, and PCBs in fish tissue. A TMDL for E. Coli is in progress for the Ohio River.

5.0 PERMIT LIMITATIONS

Two categories of effluent limitations exist for NPDES permits: Technology-Based Effluent Limits (TBELs) and Water Quality-Based Effluent Limits (WQBELs).

TBELs require every individual member of a discharge class or category to operate their water pollution control technologies according to industry-wide standards and accepted engineering practices. TBELs are developed by applying the National Effluent Limitation Guidelines (ELGs)

established by USEPA for specific industrial categories. Technology based treatment requirements under section 301(b) of the CWA represent the minimum level of control/treatment using available technology that must be imposed in a section 402 permit (40 CFR 125.3(a)).

In the absence of ELGs, TBEL effluent limits can also be based upon Best Professional Judgment (BPJ) under 40 CFR 122.43, 122.44, 125.3, and Section 402(a)(1) of the Clean Water Act (CWA).

WQBELs are designed to be protective of the beneficial uses of the receiving water and are independent of the available treatment technology. The WQBELs for this facility are based on water quality criteria in 327 IAC 2-1-6 or under the procedures described in 327 IAC 2-1-8.2 through 327 IAC 2-1-8.7 and implementation procedures in 327 IAC 5. Limitations and/or monitoring are required for parameters identified by applications of the reasonable potential to exceed WQBEL under 327 IAC 5-2-11.1(h)(1).

According to 40 CFR 122.44 and 327 IAC 5, NPDES permit limits are based on either TBELs, where applicable, BPJ, or WQBELs, whichever is most stringent. The decision to limit or monitor the parameters contained in this permit is based on information contained in the permittee's NPDES application. In addition, when performing a permit renewal, existing permit limits must be considered. These may be TBELs, WQBELs, or limits based on BPJ. When renewing a permit, the antibacksliding provisions identified in 327 IAC 5-2-10(11) are taken into consideration.

5.1 Existing Permit Limits

Outfall 001:

Parameter	Monthly Average	Daily Maximum	Units
Flow	Report	Report	MGD
Oil and Grease (O & G)	10	15	mg/l
TSS	30	70	mg/l
Aluminum	Report	Report	mg/l
Arsenic	Report	Report	mg/l
Boron	Report	Report	mg/l
Cadmium	Report	Report	mg/l
T. Chromium	Report	Report	mg/l
Zinc	Report	Report	mg/l
Copper			
Metal Cleaning	0.033	0.067	mg/l
Non-Metal Cleaning	Report	Report	mg/l
Iron			
Metal Cleaning	---	1.0	mg/l
Non-Metal Cleaning	Report	Report	mg/l
Free Cyanide	Report	Report	mg/l
Nickel	Report	Report	mg/l

Mercury	12	20	ng/l
Selenium	Report	Report	mg/l
Silver	Report	Report	mg/l
Sulfate	Report	Report	mg/l
TRC/TRO-Intermittent	---	0.2	mg/l
Chlorination/Bromination			
Frequency	---	4	Times/Day
Duration	---	40	Minutes/Dose
Duration/Day	---	120	Minutes/Day
Temperature	Report	Report	°F
Chloride	Report	Report	mg/l
Fluoride	Report	Report	mg/l
Alkalinity	Report	Report	mg/l
Sodium	Report	Report	mg/l

Parameter	Daily Minimum	Daily Maximum	Units
pH	6.0	9.0	Std Units

Outfall 004:

Parameter	Monthly Average	Daily Maximum	Units
Flow	Report	Report	MGD
Oil and Grease	10	15	mg/l
TSS	30	70	mg/l
Cadmium	---	Report	mg/l
Copper	---	Report	mg/l
Selenium	---	Report	mg/l
Nickel	---	Report	mg/l
Aluminum	---	Report	mg/l
Silver	---	Report	mg/l
Free Cyanide	---	Report	mg/l
Zinc	---	Report	mg/l
Arsenic	---	Report	µg/l
T. Chromium	---	Report	mg/l
Mercury	---	Report	mg/l

Parameter	Daily Minimum	Daily Maximum	Units
pH	6.0	9.0	Std Units

Outfalls 103 and 203:

Parameter	Monthly Average	Daily Maximum	Units
Flow	Report	Report	MGD
$TBOD_5$	Report	45	mg/l

E. coli	125	235	cfu/100 ml

Parameter	Daily Minimum	Daily Maximum	Units
pH	6.0	9.0	Std Units

Outfall 005S and 006S:

Parameter	Daily Maximum	Units
Flow	Report	MGD
pH	Report	s.u.
Oil & Grease	Report	mg/l
$CBOD_5$	Report	mg/l
COD	Report	mg/l
Total Kjeldahl Nitrogen	Report	mg/l
Nitrate + Nitrite Nitrogen	Report	mg/l
Total Phosphorus	Report	mg/l
TSS	Report	mg/l

5.2 Technology-Based Effluent Limits (TBEL)

The U.S. EPA has established technology based effluent guidelines for steam electric generating facilities. The applicable technology based standards for the A.B. Brown Generating Station are contained in 40 CFR 423 – Steam Electric Power Generating Point Source Category. Since this facility is classified as an "existing point source", all discharges are subject to effluent guidelines in 40 CFR 423.12, Best Practicable Control Technology (BPT) and 40 CFR 423.13, Best Available Control Technology (BAT). Revised final Effluent Limitations Guidelines (ELGs) and Standards for the Steam Electric Power Generating Industry were published in the Federal Register (FR) on November 3, 2015 and became effective on January 4, 2016.

The revised federal ELGs require dry handling for fly ash and bottom ash transport water with compliance by November 1, 2018 unless an alternate date, which is to be no later than December 31, 2023, is granted by the permitting authority. This permit prohibits discharge of fly ash or bottom ash transport water after November 1, 2018. The permittee may request an alternate compliance date beyond November 1, 2018 no later than 12-months from the effective date of this permit in accordance with the Reopening Clauses in I.F of the permit. IDEM will evaluate the information submitted and make a determination at that time whether to extend the compliance date beyond November 1, 2018.

In evaluating the need for TBELs for Cooling Tower Blowdown, Low Volume Wastes, Metal Cleaning Wastes, Coal Pile Runoff and Ash Transport Water (prior to November 1, 2018) and in accordance with the federal effluent guideline, when wastewater streams are combined for discharge and/or treatment, 40 CFR 423 requires that the quantity of each pollutant attributable to each controlled waste source shall not exceed the specified limitations for that waste source. Compliance with this requirement may be achieved by establishing internal monitoring locations (outfalls) prior to the regulated wastestream commingling with other wastestreams. As an alternative to establishing internal monitoring locations for determining compliance with the

federal effluent guidelines, the permittee may utilize the combined wastestream formula (CWF) as described in 40 CFR 403.6(e) to calculate alternate compliance values based on the applicable portion of the ELG, to be applied to the discharge of the combined wastestreams at the final outfall(s).

IDEM has determined that there is a need to establish internal monitoring stations to determine compliance with the TBELs. However, because SIGECO has announced in the December 2016 Integrated Resource Plan filed with the IURC that the preferred generation transition plan would include closure of the A.B.Brown coal units by December 31, 2023, a reopener has been proposed in the permit which states that if within 12 months from the effective date of this permit the permittee doesn't notify IDEM of its intent to permanently retire the facility no later than December 31, 2023, this permit may be modified, or alternately, revoked and reissued, after public notice and opportunity for hearing to require either: a) the permittee submit proposed alternate limitations developed using the combined wastestream formula (CWF) for the parameters specified; or b) the permittee must establish internal outfalls for determining compliance with 40 CFR 423, which requires that in the event that waste streams from various sources are combined for treatment or discharge, the quantity of each pollutant or pollutant property controlled attributable to each controlled waste source shall not exceed the specified limitations for that waste source.

Requirements applicable to all wastewater streams:

1. pH Control – 40 CFR 423.12(b)(1), the pH of all discharges, except once through cooling water, shall be within the range of 6.0-9.0 s.u. (BPT).

2. Polychlorinated biphenyl (PCB) – 40 CFR 423.12(b)(2) and 40 CFR 423.13(a), There shall be no discharge of Polychlorinated biphenyl compounds such as those commonly used for transformer fluid BPT).

Regulated wastewater streams and their applicable definitions and requirements:

There are several separate wastewater streams that are regulated by 40 CFR Part 423. The wastestreams applicable to this facility are as follows:

1. Cooling tower blowdown – The BPT guidelines are contained in 40 CFR 423.12(b)(7) and (8), and the BAT guidelines are contained in 40 CFR 423.13(d). As defined in 40 CFR 423.11(j), blowdown means the minimum discharge of recirculating water for the purpose of discharging materials contained in the water, the further buildup of which would cause concentrations in amounts exceeding limits established by best engineering practices.

2. Low volume wastewater – The BPT guidelines are contained in 40 CFR 423.12(b)(3), and there are not BAT guidelines. The term low volume waste sources means, taken collectively as if from one source, wastewater from all sources except those for which specific limitations or standards are otherwise established in this part. Low volume waste sources include, but are not limited to, the following: Wastewater from ion exchange water treatment systems, water treatment evaporator blowdown, laboratory and sampling streams, boiler blowdown, floor drains, cooling tower basin cleaning wastes, recirculation house service water systems, and wet scrubber air pollution control systems whose

primary purpose is particulate removal. Sanitary wastes, air condition wastes, and wastewater from carbon capture or sequestrations systems are not included in this definition.

3. Ash handling wastewater – The BPT guidelines are contained in 40 CFR 423.12(b)(4), and the BAT guidelines are contained in 40 CFR 423.13. The definitions can be found in 40 CFR 423.11(e) and (f) – The term fly ash means the ash that is carried out of the furnace by the gas stream and collected mechanical precipitators, electrostatic precipitators, and/or fabric filters. Economizer ash is included when it is collect with fly ash; and the term bottom ash means that ash that drops out of the furnace gas stream in the furnace and in the economizer sections. Economizer ash is included when it is collect with bottom ash.

4. Metal cleaning wastewater – The BPT guidelines are contained in 40 CFR 423.12(b)(5) [non-chemical] and the BAT guidelines are contained in 40 CFR 423.13(e) [chemical]. Metal Cleaning Waste as defined by 40 CFR 423.11(d) means any wastewater resulting from cleaning [with or without chemical cleaning compounds] any metal process equipment including, but not limited to, boiler tube cleaning, boiler fireside cleaning, and air preheater cleaning.

5. Coal Pile Runoff – The BPT guidelines are contained in 40 CFR 423.12(b)(9) and (10), and there are no BAT guidelines. Coal pile run-off as defined in 40 CFR 423.11(m) means the rainfall runoff from or through and coal storage pile.

Technology Based Effluent Limitations Table
Effluent Guidelines from 40 CFR 423

Wastestream [3]	pH (s.u.) Min/Max	Res. Chlorine (mg/l) [4] Max.	TSS (mg/l) Max / Avg.	O&G (mg/l) Max / Avg.	Cu (mg/l) Max / Avg.	Fe (mg/l) Max / Avg.	Cr (mg/l) Max / Avg.	Zn (mg/l) Max / Avg.	As (ug/l) Max / Avg.	Hg (ng/l) Max / Avg.	Se (ug/l) Max / Avg.	NO3/NO2 (mg/l) Max / Avg.	TDS (mg/l) Max / Avg.
Once through non-contact cooling water:	6.0 / 9.0	0.2											
Cooling tower blowdown:	6.0 / 9.0	0.2					0.2 / 0.2	1.0 / 1.0					
Low volume wastewater:	6.0 / 9.0		100 / 30	20 / 15									
Ash handling wastewater [1]:	6.0 / 9.0		100 / 30	20 / 15									
Metal cleaning wastewater:	6.0 / 9.0		100 / 30	20 / 15									
Chemical Metal cleaning waste	6.0 / 9.0		100 / 30	20 / 15	1.0 / 1.0	1.0 / 1.0							
Coal Pile Runoff:	6.0 / 9.0		50 [5]						11.0 / 8.0	788.0 / 356.0	23.0 / 12.0	17.0 / 4.4	
FGD Wastewater	6.0 / 9.0		100 / 30	20 / 15					4.0 / —	1.8 / 1.3	453.0 / 227.0		39 / 22
Gasification													
Combustion Residual Leachate	6.0 / 9.0		100 / 30	20 / 15									
Flue Gas Mercury Control [2]													

[1] There shall be no discharge of pollutants in fly ash or bottom ash transport water. Dischargers must meet the discharge limitation by a date determined by the permitting authority that is as soon as possible beginning Novemb
[2] There shall be no discharge of pollutants in flue gas mercury control wastewater. Dischargers must meet the discharge limitation in this paragraph by a date determined by the permitting authority that is as soon as possible beginning November 1, 2018, but no later than December 31, 2023.
[3] When wastewater streams are combined for discharge and/or treatment 40 CFR 423 requires that the quantity of each pollutant or pollutant property controlled attributable to each controlled waste source shall not exceed the specified limitations for that waste source.
[4] The discharge of chlorine is limited to a maximum of two hours per day for each electrical generating unit.
[5] This value is an instantaneous limitation (at any time), not a daily maximum.

Outfall 001

Total Suspended Solids & Oil & Grease (Low Volume Waste, Metal Cleaning Waste, Coal Pile Run-off)

The technology based effluent limitations for Total Suspended Solids (TSS) and Oil & Grease based on 40 CFR 423 would be 30 mg/l monthly average and 100 mg/l daily maximum (TSS) and 15 mg/l monthly average and 20 mg/l daily maximum (Oil & Grease). However, the current permit limits were developed previously using BPJ to be more protective of water quality and have been retained from the previous permit. The TSS limitations are 30 mg/l monthly average and 70 mg/l daily maximum. The Oil & Grease limitations are 10 mg/l monthly average and 15 mg/l daily maximum.

Iron (Metal Cleaning Waste)

Iron limitations have been retained from the previous permit and are required based upon the presence of periodic chemical and non-chemical metal cleaning waste in the discharge. The metal cleaning waste Technology Based Effluent Limit (TBEL) in 40 CFR 423.12(b)(5) and 423.13 (e) identifies a daily maximum and monthly average limitation of 1.0 mg/l for Iron.

Copper (Metal Cleaning Waste)

Copper limitations are required based upon the presence of periodic chemical and non-chemical metal cleaning waste in the discharge. The metal cleaning waste Technology Based Effluent Limit (TBEL) in 40 CFR 423.12(b)(5) and 40 CFR 423.13 (e) identifies daily maximum and monthly average limitations of 1.0 mg/l for Copper.

However, the water quality based effluent limitations (WQBELs) for copper are more stringent than the TBEL, and shall be applied whenever periodic chemical and non-chemical metal cleaning waste could be present in the discharge. A more detailed discussion is provided in Section 5.3 below.

Total Chromium & Zinc (Cooling Tower Blowdown) and 126 Priority Pollutants

The discharge of cooling tower blowdown is regulated by 40 CFR 423.13(d). 40 CFR 423.13(d)(1) prohibits the discharge of the 126 priority pollutants listed in Appendix A of this regulations in detectable amounts with the exception of total zinc and total chromium which have specific numeric limits. In accordance with 423.12(d)(3), instead of the monitoring specified in 40 CFR 122.48(b), compliance with the limitations for the 126 priority pollutants in paragraph (d)(1) of 40 CFR 423.13 may be determined by engineering calculations which demonstrate that the regulated pollutants are not detectable in the final discharge by the analytical methods in 40 CFR Part 136. However, compliance with the above limitations for the 126 priority pollutants (with the exception of zinc and chromium) in paragraph (d)(1) of 40 CFR 423.13 must be reported each time there is a change in the chemicals added for cooling tower maintenance.

Outfall 004

Total Suspended Solids & Oil & Grease

The technology based effluent limitations for Total Suspended Solids (TSS) and Oil & Grease based on 40 CFR 423 would be 30 mg/l monthly average and 100 mg/l daily maximum (TSS) and 15 mg/l monthly average and 20 mg/l daily maximum (Oil & Grease). However, the current permit limits are more stringent and have been retained from the previous permit. The TSS limitations are 30 mg/l monthly average and 70 mg/l daily maximum. The Oil & Grease limitations are 10 mg/l monthly average and 15 mg/l daily maximum.

Outfalls 103/203

TBOD5, E. Coli, and TRC

The TBOD5 limitation has been retained from the previous permit and was originally based on the secondary treatment requirements for wastewater treatment facilities regulated in accordance with 327 IAC 5-5-3.

The E. Coli and TRC limitations have been retained from the previous permit and are based on the Disinfection Requirements required by 327 IAC 5-10-6.

5.3 Water Quality-Based Effluent Limits

The water quality-based effluent limits were calculated using the criteria contained in Table 1 of 327 IAC 2-1-6, Minimum Surface Water Quality Standards, and the procedure contained in 327 IAC 5-2-11.1, Establishment of Water Quality-Based Effluent Limitations for Dischargers not discharging to Waters within the Great Lakes System.

Narrative Water Quality Based Limits

The narrative water quality contained under 327 IAC 2-1-6(a)(1) (A)-(E) have been included in this permit to ensure that the narrative water quality criteria are met.

Numeric Water Quality Based Limits

The numeric water quality criteria and values contained in this permit have been calculated using the tables of water quality criteria under 327 IAC 2-1-6(b) & (c).

Outfall 001

pH

Discharges to waters of the state are limited to the range of 6.0-9.0 s.u., in accordance with 327 IAC 2-1-6.

Temperature

The facility has a closed cycle cooling water system consisting of recirculating cooling towers and other water recycling. The system withdraws approximately 8.7 MGD of water from the Ohio River and discharges approximately 1.53 MGD to the river. Monthly temperature limitations are not required because of the closed cooling system and the small amount of discharge to the Ohio River ($Q_{7,10}$ flow of 8,333 MGD). However, monthly monitoring will be required.

Flow

The effluent flow is to be monitored in accordance with 327 IAC 5-2-13(a)2.

Total Residual Chlorine (TRC)-Intermittent

The intermittent TRC limit of 0.2 mg/l daily maximum has been retained from the previous permit and is based on 327 IAC 2-1-6. To be considered an intermittent discharge, total residual chlorine shall not be detected in the discharge from any single generating unit for a period of more than forty (40) minutes in duration, and such periods shall be separated by at least five (5) hours. The permittee is limited to no more than four (4) chlorination cycles per day. The intermittent TRC limitations were developed for the control of zebra mussels.

Chlorination Frequency

The monitoring of chlorination frequency applies only when the facility is chlorinating intermittently. The permit requires the permittee to provide a monthly report on the "times per day" the permittee is intermittently chlorinating. The permittee is limited to no more than four (4) chlorination cycles per day.

Chlorination Duration

The monitoring for duration of chlorination dose applies only when the facility is chlorinating intermittently. The permit requires the permittee to provide a monthly report on the number of minutes per chlorination cycle the permittee is chlorinating intermittently. The permittee is limited to no more than forty (40) minutes per chlorination cycles.

Total Suspended Solids & Oil and Grease

Total Suspended Solids (TSS) and Oil & Grease limitations are pollutants of concern under 40 CFR 423. The effluent limitations for Total Suspended Solids (TSS) and Oil and Grease at Outfall 001 have been retained from the previous permit. The TSS limitations are 30 mg/l monthly average and 70 mg/l daily maximum. The Oil & Grease limitations are 10 mg/l monthly average and 15 mg/l daily maximum.

Copper

Water quality based effluent limitations (WQBELs) for Copper are more stringent than the TBELs, and therefore are the applicable effluent limitations. These limits are Monthly Average 0.028 mg/l and Daily Maximum 0.056 mg/l. These calculations are based on Wasteload Allocation 002242 completed on December 8th, 2016. The permittee requested and provided justification for a 36-month schedule of compliance for these new limitations, therefore, a schedule of compliance has been included in the final permit.

Mercury

In accordance with the antibacksliding provisions contained in 327 IAC 5-2-10(11), these limits have been retained from the previous permit.

Chloride

Wasteload Allocation 002242, completed on December 8th, 2016 show Chloride has the Reasonable Potential to Exceed (RPE) Preliminary Effluent Limitations (PELs) for chloride. Chloride limits are set to a Monthly Average of 580 mg/l and a Daily Maximum of 1200 mg/l. The permittee requested and provided justification for a 36-month schedule of compliance for these new limitations, therefore, a schedule of compliance has been included in the final permit.

Selenium

Wasteload Allocation 002242, completed on December 8th, 2016 show Selenium has the Reasonable Potential to Exceed (RPE) Preliminary Effluent Limitations (PELs) for Selenium. Selenium limits are set to a Monthly Average of 0.13 mg/l and a Daily Maximum of 0.26 mg/l. The permittee requested and provided justification for a 36-month schedule of compliance for these new limitations, therefore, a schedule of compliance has been included in the final permit.

5.4 Whole Effluent Toxicity Testing (WETT)

The permit does not contain a requirement to conduct Whole Effluent Toxicity Testing (WETT).

5.5 Antibacksliding

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

5.6 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, the existing uses and level of water quality necessary to protect those 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 (BMPs) for regulated pollutants that ensure the narrative and numeric water quality criteria applicable to each of the designated uses are achieved in the water and any designated uses of the downstream water are 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 2-1-6 or 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 2-1-6 or 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 (CWA), including a change in process or operation that will result in a significant lowering of water quality.

This permit includes new permit limitations for Copper, Chloride, and Selenium. In accordance with 327 IAC 2-1.3-1(b), the new permit limitations are not subject to the Antidegradation Implementation Procedures in 327 IAC 2-1.3-5 and 2-1.3-6 as the new permit limitations are not the result of a deliberate activity taken by the permittee.

The permittee is prohibited from undertaking any deliberate 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 information is submitted to the commissioner demonstrating that the proposed new or increased discharge will not cause a significant lowering of water quality, or an antidegradation demonstration submitted and approved in accordance 327 IAC 2-1.3.

5.7 Storm Water

According to 40 CFR 122.26(b)(14)(ii) and 327 IAC 5-4-6(b)(1) facilities classified under Industrial Classification (SIC) Code 4911, are considered to be engaging in "industrial activity" for purposes of 40 CFR 122.26(b). Therefore, the permittee is required to have all storm water discharges associated with industrial activity permitted. Treatment for storm water discharges associated with industrial activities is required to meet, at a minimum, best available technology economically achievable/best conventional pollutant control technology (BAT/BCT) requirements. EPA has determined that non-numeric technology-based effluent limits have been determined to be equal to the best practicable technology (BPT) or BAT/BCT for storm water associated with industrial activity.

Storm water associated with industrial activity must be assessed to determine compliance with all water quality standards. The non-numeric storm water conditions and effluent limits contain

the technology-based effluent limitations. Effluent limitations, as defined in the CWA, are restrictions on quantities, rates, and concentrations of constituents which are discharged. Effective implementation of these requirements should meet the applicable water quality based effluent limitations. Violation of any of these effluent limitations constitutes a violation of the permit.

Additionally, IDEM has determined that with the appropriate implementation of the required control measures and Best Management Practices (BMPs) found in Part I.D. of the permit, the discharge of storm water associated with industrial activity from this facility will meet applicable water quality standards and will not cause a significant lowering of water quality. Therefore, the storm water discharge is in compliance with Antidegradation Standards and Implementation Procedures found in 327 IAC 2-1.3 and an Antidegradation Demonstration is not required.

The TBELs require the permittee to minimize exposure of raw, final, or waste materials to rain, snow, snowmelt, and runoff. In doing so, the permittee is required, to the extent technologically available and economically achievable, to either locate industrial materials and activities inside or to protect them with storm resistant coverings. In addition, the permittee is required to: (1) use good housekeeping practices to keep exposed areas clean, (2) regularly inspect, test, maintain and repair all industrial equipment and systems to avoid situations that may result in leaks, spills, and other releases of pollutants in storm water discharges, (3) minimize the potential for leaks, spills and other releases that may be exposed to storm water and develop plans for effective response to such spills if or when they occur, (4) stabilize exposed area and contain runoff using structural and/or non-structural control measures to minimize onsite erosion and sedimentation, and the resulting discharge of pollutants, (5) divert, infiltrate, reuse, contain or otherwise reduce storm water runoff, to minimize pollutants in the permitted facility discharges, (6) enclose or cover storage piles of salt or piles containing salt used for deicing or other commercial or industrial purposes, including maintenance of paved surfaces, (7) train all employees who work in areas where industrial materials or activities are exposed to storm water, or who are responsible for implementing activities necessary to meet the conditions of this permit (e.g., inspectors, maintenance personnel), including all members of your Pollution Prevention Team, (8) ensure that waste, garbage and floatable debris are not discharged to receiving waters by keeping exposed areas free of such materials or by intercepting them before they are discharged, and (9) minimize generation of dust and off-site tracking of raw, final or waste materials.

To meet the non-numeric effluent limitations in Part I.D.4, the permit requires the facility to select control measures (including BMPs) to address the selection and design considerations in Part I.D.3.

The permittee must control its discharge as necessary to meet applicable water quality standards. It is expected that compliance with the non-numeric effluent limitations and other terms and conditions in this permit will meet this effluent limitation. However, if at any time the permittee, or IDEM, determines that the discharge causes or contributes to an exceedance of applicable water quality standards, the permittee must take corrective actions, and conduct follow-up monitoring.

"Terms and Conditions" to Provide Information in a Storm Water Pollution Prevention Plan (SWPPP)

Distinct from the effluent limitation provisions in the permit, the permit requires the discharger to prepare a SWPPP for the permitted facility. The SWPPP is intended to document the selection, design, installation, and implementation (including inspection, maintenance, monitoring, and corrective action) of control measures being used to comply with the effluent limits set forth in Part I.D. of the permit. In general, the SWPPP must be kept up-to-date, and modified when necessary, to reflect any changes in control measures that were found to be necessary to meet the effluent limitations in the permit.

The requirement to prepare a SWPPP is not an effluent limitation, rather it documents what practices the discharger is implementing to meet the effluent limitations in Part I.D. of the permit. The SWPPP is not an effluent limitation because it does not restrict quantities, rates, and concentrations of constituents which are discharged. Instead, the requirement to develop a SWPPP is a permit "term or condition" authorized under sections 402(a)(2) and 308 of the Act. Section 402(a)(2) states, "[t]he Administrator shall prescribe conditions for [NPDES] permits to assure compliance with the requirements of paragraph (1) of this subsection, including conditions on data and information collection, reporting, and such other requirements as he deems appropriate." The SWPPP requirements set forth in this permit are terms or conditions under the CWA because the discharger is documenting information on how it intends to comply with the effluent limitations (and inspection and evaluation requirements) contained elsewhere in the permit. Thus, the requirement to develop a SWPPP and keep it up-to-date is no different than other information collection conditions, as authorized by section 402(a)(2).

It should be noted that EPA has developed a guidance document, "Developing your Storm Water Pollution Prevention Plan – A guide for Industrial Operators (EPA 833-B09-002), February 2009, to assist facilities in developing a SWPPP. The guidance contains worksheets, checklists, and model forms that should assist a facility in developing a SWPPP.

Public availability of documents

Part I.E.2.d(2) of the permit requires that the permittee retain a copy of the current SWPPP at the facility and it must be immediately available, at the time of an onsite inspection or upon request, to IDEM. Additionally, interested persons can request a copy of the SWPPP through IDEM. By requiring members of the public to request a copy of the SWPPP through IDEM, the Agency is able to provide the permittees with assurance that any Confidential Business Information contained within the permitted facility's SWPPP is not released to the public.

5.8 Water Treatment Additives

In the event that changes are to be made in the use of water treatment additives that could significantly change the nature of, or increase the discharge concentration of any of the additives contributing to Outfall 001 the permittee shall notify the IDEM as required in Part II.C.1 of the permit. The use of any new or changed water treatment additives/chemicals or dosage rates shall not cause the discharge from any permitted outfall to exhibit chronic or acute toxicity. Acute and chronic aquatic toxicity information must be provided with any notification

regarding any new or changed water treatment additives or dosage rates. The following is a list of water treatment additives currently approved for use at the facility:

Chemical	Purpose/Use	Outfall
Calcium Hypochlorite tablets	Sanitizer	001
Corrshield NT 402	Corrosion Inhibitor	001
Cortrol OS 5607	Oxygen Scavenger	001
Foamtrol AF 1440	Antifoam	001
Gengard 7044	Dispersant	001
Gengard 8142	Corrosion Inhibitor	001
Hypersperse MDC 220	RO Antiscalant	001
Inhibitor AZ 8104	Water-based corrosion inhibitor	001
Kermira PIX-111	Flocculant	001
Klaraid PC 1190	Coagulant	001
MetClear MR2405	Flocculant	001
Optisperse HP 2100	Boiler Treatment	001
Optisperse HP 3100	Boiler Treatment	001
Optisperse HTP 3001	Boiler Treatment	001
Potassium Permanganate	Oxidant	001
Scaletrol PDC 9325	Deposit Control	001
Sodium Hydroxide	pH Adjustment	001
Sodium Hypochlorite	Disinfectant	001
Steamate NA 2060	Steam Condensate Treatment	001
Sulfuric Acid	pH Control	001

6.0 PERMIT DRAFT DISCUSSION

6.1 Discharge Limitations

The proposed final effluent limitations are based on the more stringent of the Indiana WQBELs, TBELS, or approved TMDLs and NPDES regulations as appropriate for each regulated outfall. Sections 5.2 and 5.3 of this document explain the rationale for the effluent limitations at each Outfall.

Outfall 001:

Parameter	Monthly Average	Daily Maximum	Units	Source of limitation	Minimum Frequency	Sample Type
Flow	Report	Report	MGD	IAC	Daily	24 Hour Total
Oil and Grease (O & G)	10	15	mg/l	BPJ	1 X Week	Grab
TSS	30	70	mg/l	BPJ	1 X Week	Grab
Aluminum	Report	Report	mg/l	WQBEL	1 X Month	24 Hr. Comp.
Arsenic	Report	Report	mg/l	WQBEL	1 X Month	24 Hr. Comp.
Boron	Report	Report	mg/l	WQBEL	2 X Month	Grab

Cadmium	Report	Report	mg/l	WQBEL	2 X Month	24 Hr. Comp
T. Chromium	Report	Report	mg/l	TBEL	2 X Month	24 Hr. Comp.
Zinc	Report	Report	mg/l	TBEL	2 X Month	24 Hr. Comp.
Copper						
Interim	0.033	0.067	mg/l	WQBEL	2 X Month	24 Hr. Comp.
Final	0.028	0.056	mg/l	WQBEL	2 X Month	24 Hr. Comp.
Iron						
Metal Cleaning	---	1.0	mg/l	TBEL	1 X Day	24 Hr. Comp.
Non-Metal Cleaning	Report	Report	mg/l	TBEL	2 X Month	24 Hr. Comp
Free Cyanide	Report	Report	mg/l	WQBEL	1 X Month	Grab
Nickel	Report	Report	mg/l	WQBEL	1 X Month	24 Hr. Comp.
Mercury	12	20	ng/l	WQBEL	1 X Bimonthly	Grab
Selenium						
Interim	Report	Report	mg/l	WQBEL	1 X Month	24 Hr. Comp.
Final	0.13	0.26	mg/l	WQBEL	1 X Month	24 Hr. Comp.
Silver	Report	Report	mg/l	WQBEL	2 X Month	24 Hr. Comp.
Sulfate	Report	Report	mg/l	WQBEL	2 X Month	Grab
TRC -intermittent	---	0.2	mg/l	WQBEL	Daily	Grab
Chlorination						
Frequency	---	4	Times/Day	WQBEL	Daily	Report
Duration	---	40	Minutes/Dose	WQBEL	Daily	Report
Duration/Day	---	120	Minutes/Day	TBEL	Daily	Report
Temperature	Report	Report	°F	WQBEL	1 X Month	Grab
Chloride						
Interim	Report	Report	mg/l	WQBEL	2 X Month	Grab
Final	580	1200	mg/l	WQBEL	2 X Month	Grab
Fluoride	Report	Report	mg/l	BPJ	2 X Month	Grab
Alkalinity	Report	Report	mg/l	BPJ	2 X Month	Grab
Sodium	Report	Report	mg/l	BPJ	2 X Month	Grab

Parameter	Daily Minimum	Daily Maximum	Units	Source of limitation	Minimum Frequency	Sample Type
pH	6.0	9.0	Std Units	IAC	1 x Month	Grab

<u>Outfall 004:</u> Must be eliminated by the compliance date in permit unless an alternate compliance date is established in accordance with section I.G. of this permit.

Parameter	Monthly Average	Daily Maximum	Units	Source of limitation	Minimum Frequency	Sample Type
Flow	Report	Report	MGD	IAC	Daily	24 Hr. Total
Oil and Grease	10	15	mg/l	TBEL	Daily	Grab
TSS	30	70	mg/l	TBEL	Daily	Grab
Cadmium	---	Report	mg/l	WQBEL	*	24 Hr. Comp.
Copper	---	Report	mg/l	WQBEL	*	24 Hr. Comp.
Selenium	---	Report	mg/l	WQBEL	*	24 Hr. Comp.
Nickel	---	Report	mg/l	WQBEL	*	24 Hr. Comp.
Aluminum	---	Report	mg/l	WQBEL	*	24 Hr. Comp.
Silver	---	Report	mg/l	WQBEL	*	24 Hr. Comp.
Free Cyanide	---	Report	mg/l	WQBEL	*	Grab
Zinc	---	Report	mg/l	WQBEL	*	24 Hr. Comp.
Arsenic	---	Report	µg/l	WQBEL	*	24 Hr. Comp.
T. Chromium	---	Report	mg/l	TBEL	*	24 Hr. Comp.
Mercury	---	Report	mg/l	WQBEL	*	Grab

*Daily during discharge

Parameter	Daily Minimum	Daily Maximum	Units	Source of limitation	Minimum Frequency	Sample Type
pH	6.0	9.0	Std Units	IAC	1 x Day	Grab

Outfalls 103 and 203:

Parameter	Monthly Average	Daily Maximum	Units	Source of limitation	Minimum Frequency	Sample Type
Flow	Report	Report	MGD	IAC	1 X Month	24 Hr. Total
$TBOD_5$	Report	45	mg/l	TBEL	2 X Month	24 Hr. Comp.
E. coli	125	235	cfu/100 ml	WQBEL	2 X Month	Grab
TSS	Report	Report	mg/l	TBEL	2 X Month	Grab

Parameter	Daily Minimum	Daily Maximum	Units	Source of limitation	Minimum Frequency	Sample Type
TRC	0.5	--	mg/l	WQBEL	1 X Month	Grab

Outfall 005S and 006S:

Parameter	Daily Maximum	Units	Source of limitation	Minimum Frequency	Sample Type
Flow	Report	MGD	IAC	Annually	Estimate Total
pH	Report	s.u.	WQBEL	Annually	Grab
Oil & Grease	Report	mg/l	WQBEL	Annually	Grab
$CBOD_5$	Report	mg/l	WQBEL	Annually	Grab
COD	Report	mg/l	WQBEL	Annually	Grab
TSS	Report	mg/l	WQBEL	Annually	Grab
Total Phosphorus	Report	mg/l	WQBEL	Annually	Grab
Ammonia (as N)	Report	mg/l	WQBEL	Annually	Grab
Total Kjeldahl Nitrogen	Report	mg/l	WQBEL	Annually	Grab
Nitrate + Nitrite Nitrogen	Report	mg/l	WQBEL	Annually	Grab
Aluminum	Report	mg/l	WQBEL	Annually	Grab
Zinc	Report	mg/l	WQBEL	Annually	Grab

6.2 Monitoring Conditions and Rationale

Analytical and sampling methods used shall conform to the version of 40 CFR 136 as referenced in 327 IAC 5-2-13(d)(1).

6.3 Schedule of Compliance

The draft permit contains new effluent limits for Chloride, Copper, and Selenium. In accordance with 40 CFR 122.47(a), 40 CFR 123.25(a)(18), and 327 IAC 5-2-12, a schedule of compliance is allowed in a NPDES permit when requested and justified by the permittee, but only when appropriate and when the schedule of compliance requires achievement of compliance "as soon as possible" and meets other specified conditions.

The permittee requested a 36-month compliance schedule from the effective date of the permit, with status reports at 9-month increments, to allow for adequate time to 1) review and analyze

potential sources of the three listed pollutants, 2) assess treatment alternatives, and 3) design and construct pollutant control equipment, if necessary. A 36-month schedule of compliance schedule has been included in the final permit.

6.4 Special Conditions and Other Permit Requirements

6.4.1 Clean Water Act Section 316(b) Cooling Water Intake Structure(s) (CWIS)

Introduction

In accordance with 40 CFR 401.14, the location, design, construction and capacity of cooling water intake structures of any point source for which a standard is established pursuant to section 301 or 306 of the Act shall reflect the best technology available for minimizing adverse environmental impact.

The EPA promulgated a Clean Water Act (CWA) section 316(b) regulation on August 15, 2014, that establishes standards for cooling water intake structures. 79 Fed. Reg. 48300-439 (August 15, 2014). The regulation establishes best technology available standards to reduce impingement and entrainment of aquatic organisms at existing power generation and manufacturing facilities and it became effective on October 14, 2014.

For permits expiring prior to 45 months from the effective date (before July 2018), the permittee can (1) negotiate an alternative schedule for submitting required information with the Director (IDEM) after demonstrating need, or (2) request waiver(s) for submitting required information. An alternative schedule for submission of information required under the current CWA section 316(b), or waiver(s) of submittal requirements shall be approved by IDEM. Upon approval of such alternative schedules and /or waivers, or until the time the required information/reports are submitted and the permit is renewed or modified following public notice, the IDEM is required to make a BTA determination using Best Professional Judgment (BPJ) to comply with CWA Section 316(b) based on existing information. The BTA determination is subject to change after the required information is submitted in accordance with the federal regulations effective October 14, 2014.

Intake Water Structures Descriptions (121.21(r)(3)):

A.B. Brown Plant cooling water intake provides, approximately 8.7 MGD, through a pumped caisson located approximately 1.5 miles away from the plant on the bank of the Ohio River. The caisson system includes three pumps that withdraw water through two wedge wire screen with 0.125-inch slots. The screens are positioned 102 ft. offshore at a mean depth of 22 ft. below the water surface. Each pump is capable of 3,300 gpm at 176 ft. of head and each screen is capable of passing 14,000 gpm at 0.5 ft/sec through-slot velocity. It takes two pumps to run both units and there are two screens that each pass 3,300 gpm, which calculated to a through-slot velocity of 0.12 ft/s. The screens are back flushed with compressed air as necessary to clear debris.

The cooling water intake is in operation throughout the year. The operated time of each electric generating unit varies throughout the year and from year to year. During the last five years,

ABB Unit 1 has averaged 61.17% capacity factor while ABB Unit 2 averaged 57.55%. The average station capacity factor for 2011 through 2015 was 59.36%. Both units were simultaneously off-line an average of 4 days per year (2011 = 1 day, 2012 = 0 days, 2013 =3 days, 2014 = 2 days, and 2015 = 12 days). In 2015, ABB Unit 1 average withdrawal from the river was 2200 gpm and ABB Unit 2 was 1700 gpm.

Conclusion

A copy of the A.B. Brown Generating Station permit renewal application was sent to U.S. Fish and Wildlife on May 12, 2016. No comments were received. IDEM has made a Best Technology Available (BTA) determination that the existing cooling water intake structure represent best technology available to minimize adverse environmental impact in accordance with Section 316(b) of the federal Clean Water Act (33 U.S.C. section 1326) at this time based on the following information:

1. Actual Intake flow is 9.1 MGD due to use of cooling towers. That 9.1 MGD is significantly less than 5% of the mean annual flow of the source water body.
2. This facility's CWIS uses a wedge wire screen with 0.125 slot openings and a through slot velocity $\leq$ 0.5 ft/s. Based upon studies conducted for the development of the categorical 316(b) regulations, maintaining velocities below 0.5 ft/s allows most aquatic life to avoid impingement upon the intake structure(s).

Permit Conditions

In accordance with the recently promulgated rules at 40 CFR 122 and 40 CFR 125, the owner or operator of a facility that has CWIS with a Design Intake Flow (DIF) ≥ 2 MGD and an Actual Intake Flow (AIF) < 125 MGD must submit the information required at 40 CFR 122.21(r)(2) through (6) and (8), including all of the associated supporting documentation and/or studies. Studies defined at 40 CFR 122.21(r)(7) are also required when applicable. In addition, the permittee shall comply with requirements below:

1. In accordance with 40 CFR 125.98(b)(1), nothing in this permit authorizes take for the purposes of a facility's compliance with the Endangered Species Act.

2. At all times properly operate and maintain the intake equipment and incorporate management practices and operational measures necessary to ensure proper operation of the CWIS..

3. Inform IDEM of any proposed changes to the CWIS or proposed changes to operations at the facility that affect the information taken into account in the current BTA evaluation.

4. There shall be no discharge of debris from intake screen washing which will settle to form objectionable deposits which are in amounts sufficient to be unsightly or deleterious, or which will produce colors or odors constituting a nuisance.

5. All required reports shall be submitted to the IDEM, Office of Water Quality, NPDES Permits Branch.

6. Submit the information required to be considered by the Director per 40 CFR 125.98

to assist IDEM with the fact sheet or statement of basis for entrainment BTA, as soon as practicable, but no later than with the application for the next permit renewal.

7. During the next permit period, monitor the intake flows at a minimum frequency of daily for one continuous year. The permittee may use engineering calculations, such as pump capacity, to approximate intake flow. The daily intake flow information shall be submitted with the application for the next permit renewal. As part of the current permit renewal application the permittee submitted information as required at 40 CFR 122.21 (r)(2) through (r)(5) and (r)(8). This information must be resubmitted as part of the next permit renewal application. Information to address 40 CFR 122.21 (r)(6) and (r)(7) was not submitted because the facility has cooling towers, which meet the requirement for Best Available Technology.

6.4.2 Polychlorinated Biphenyl (PCB)

There shall be no discharge of polychlorinated biphenyl (PCB) compounds attributable to facility operations such as those historically used in transformer fluids. In order to determine compliance with the PCB discharge prohibition, the permittee shall provide the following PCB data with the next NPDES permit renewal application for at least one sample taken from each final outfall. The corresponding facility water intakes shall be monitored at the same time as the final outfalls.

Pollutant	Test Method	LOD	LOQ
PCBs*	EPA 608	0.1 ug/L	0.3 ug/L

*PCB 1242, 1254, 1221, 1232, 1248, 1260, 1016

6.5 Spill Response and Reporting Requirement

Reporting requirements associated with the Spill Reporting, Containment, and Response requirements of 327 IAC 2-6.1 are included in Part II.B.2.(d), Part II.B.3.(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 exceedances 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 exceedance 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.

6.6 Permit Processing/Public Comment

Pursuant to IC 13-15-5-1, IDEM will publish a general notice in the newspaper with the largest general circulation within the above county. A 30-day comment period is available in order to solicit input from interested parties, including the general public. Comments concerning the draft permit should be submitted in accordance with the procedure outlined in the enclosed public notice form.

6.7 Post Public Notice Addendum

The draft NPDES permit for the SIGECO A.B. Brown Generating Station was made available for public comment from December 29, 2016 through January 30, 2017 as part of Public Notice No. 2016-12C-RD. During this comment period, a comment letter dated January 27, 2017, from Angie Casbon-Scheller with Vectren Corporation, was received. Also, a letter dated January 30, 2017 from Tony Mendoza with Sierra Club was received. The comments submitted by each party, and this Office's corresponding responses are summarized below: Any changes to the permit and/or fact sheet are so noted below.

Comments from Vectren:

Comment 1: Part I.A.1,Table 1(page 2 of 56) -The limit of 1.0 mg/L does not retain the prior permit limit and does not agree with the Fact Sheet. Page 25 of the Fact Sheet states "report only" and is further supported on page 18 of the Fact Sheet by the statement "Iron limitations have been retained from the previous permit." The monthly average for iron metal cleaning should be report only, not 1.0 mg/L.

Response 1: This typo has been corrected.

Comment 2: Part I.A.1,Table 1(page 2 of 56) - Copper and Iron Metal Cleaning parameters each contain a reference to footnote 16, which discusses net limitations, yet footnote 16 is not included. The footnote language as contained in the previous permit should be restored. We have always had net limits, so not having them would be a significant change. To restore the footnote language, and account for the background sample collection timing adjustment made during the current permit term in a letter from IDEM dated May 28, 2014, we would request that DEM add the following footnote [16] language, "Net limits may apply. Net limitations are to be calculated by subtracting the measured background levels of these parameters in the ash pond from the actual measured concentration of these parameters when limitations apply. These background levels are to be calculated by monitoring the ash pond effluent concentrations of Iron and Copper over a period of time, to consist of a minimum of ten samples taken over a minimum of thirty (30) days when there is no discharge of metal cleaning wastes during a period that is at least 30 days but not to exceed 90 days preceding each discharge of metal cleaning wastes. The background levels demonstrated by this monitoring, along with supporting data are to be submitted with monthly Discharge Monitoring Reports (DMR) when reporting discharge of metal cleaning wastes."

Response 2: The requirement for net limits for iron has been added back into the permit. A compliance schedule to meet the water quality based effluent limits for copper has been added to the permit.

Comment 3: Part I.A.1,Table 1(pages 2-3 of 56) - Strike TRO from the list of parameters, strike the term "bromination" from the "Chlorination/Bromination" parameter, and strike the TRC- continuous parameter. The facility does not use bromine, therefore references to it and the TRO parameter are not applicable. The facility uses Sodium Hypochlorite (bleach) in the cooling towers for controlling biological growth, and it is only fed on an intermittent basis.

Response 3: TRO has been removed from the list of parameters as the facility does not use bromine.

Comment 4: Part I.A.1, Footnote [8] (page 4 of 56) - Strike this footnote since bromine is not used, thereby rendering the TRO parameter not applicable.

Response 4: This footnote has been removed.

Comment 5: Part I.A.1, Footnote [11] (page 4 of 56) - The outfall and therefore the flow measuring device is located in the middle of a rail spur that is owned by a neighboring company. The A.B. Brown personnel have to coordinate with the train schedule for the neighboring company and a recent change in that company's ownership has led to our outfall access point being blocked more frequently and causing delays to move the rail cars. In addition, the A.B. Brown facility has varying staffing levels throughout the week which can make getting to the outfall that much more challenging on certain days. We would request that IDEM restore the language from the current permit (effective date October 1, 2011), so the footnote will read: [11] The weekly volume of discharged water will be collected using a flow meter totalizer and the weekly flow volume will be used to calculate the daily average which will be reported to IDEM.

Response 5: This language has been restored.

Comment 6: Part I.A.1,Footnote [12] (page 5 of 56) - Strike the terms "bromination" and "brominating" because bromine is not used at the facility.

Response 6: Reference to bromination has been removed.

Comment 7: Part I.A.2, Footnote [8] (page 7 of 56) - Outfall 004 only discharges during significant rainfall events and is not dependent on the Coal Pile / South Side Runoff Pond discharging to the ash pond. Modify this footnote to read, "Daily when the ash pond is discharging to Outfall 004."

Response 7: This clarification has been made.

Comment 8: Part I.A.2, Footnote [9) (page 7 of 56) - Remove "Cooling Tower Blowdown" from this footnote. The cooling tower blowdown water does not discharge to the ash

pond. [9] Outfall 004 is the emergency overflow from the Ash Pond. The discharge is limited to ~~Cooling Tower Blowdown~~, Coal Pile Runoff, Metal Cleaning Waste, Low Volume Waste, and storm water.

Response 8: Reference to Cooling Tower Blowdown has been removed.

Comment 9: Part I.A.4 (page 10 of 56) - "Unnamed tributaries to" was removed from the description of where samples are to be collected. We would request that you restore the previous language, which will make this section match the Fact Sheet and the prior permit. The fourth sentence of the opening paragraph, just prior to the DISCHARGE LIMITATIONS table, should read, "Samples taken in compliance with the monitoring requirements below shall be taken at a point representative of the discharge but prior to entry into unnamed tributaries to the Ohio River."

Response 9: This change has been made.

Comment 10: Part I.D.7 (page 25 of 56) - While we acknowledge 120 days, as allowed in the currently effective permit, may be excessive under the guidelines of the 2015 MSGP, we feel 14 days is too restrictive. As a result, we are requesting to revise the corrective action deadlines to a more reasonable timeline, which will allow for appropriate research and planning to select the most effective and economic solution. The facility operates under a comprehensive Storm Water Pollution Prevention Plan, which facilitates sound management practices.

Response 10: This change has been made.

Comment 11: Part I.D.8 (page 25 of 56) - While we acknowledge 120 days, as allowed in the currently effective permit, may be excessive under the guidelines of the 2015 MSGP, we feel 24 hours is too restrictive. As a result, we are requesting to revise the corrective action deadlines to a more reasonable timeline, which will allow for appropriate research and planning to select the most effective and economic solution. The facility operates under a comprehensive Storm Water Pollution Prevention Plan, which facilitates sound management practices.

Response 11: This change has been made.

Comment 12: Part I.D.8 (page 26 of 56) - While we acknowledge 120 days, as allowed in the currently effective permit, may be excessive under the guidelines of the 2015 MSGP, we feel 14 days is too restrictive. As a result we are requesting 45 days for the corrective action deadlines, which are reasonable for appropriate research and planning to select the most effective and economic solution.

Response 12: This change has been made.

Comment 13: Part I.D.9.e.i (page 30 of 56) - We would request that you add an exception to taking a substitute sample when adverse weather conditions prevent the collection of a sample during a quarter. Depending on weather conditions, such as drought, inadequate rainfall quantities, and rain events that occur too close in succession,

requiring a substitute sample could result in sampling events that are close enough together that the conditions have not varied, and/or result in falling into a continuous substitute sampling routine. The facility is currently only required to collect an annual sample, so the collection of quarterly visual samples is a significant increase in the level of water quality monitoring, even with adding the suggested exception.

Response 13: This change has been made.

Comment 14: Part I.F.3 (page 36 of 56) - Revise the language to add clarity. "This permit may be modified or alternately revoked and reissued after public notice and opportunity for rehearing, to comply with any applicable final agency standards, regulations ..."

Response 14: This clarification has been made.

Comment 15: Part I.F.4 (page 37 of 56) - Revise the language to add clarity that the alternate applicability date for transport waters allows up to December 31,2023. "The permittee may submit an implementation schedule and justification for an alternate applicability date for the ELG BAT limits under 423.13 (h)(1)(i) and (k)(1)(i) for fly ash and bottom ash transport waters no later than twelve months..."

Response 15: This clarification has been made.

Comment 16: Part I.F.4 (page 37 of 56) - Add new subsection "e. A public announcement for coal unit retirement no later than December 31, 2023."

Response 16: This new section has been added.

Comment 17: Part I.F.6 (pages 37-38 of 56) - Revise language to reflect the new subsection e requested in the preceding comment and to clarify. "If within 12 months from the effective date of this permit the permittee doesn't notify IDEM of its intent to permanently retire the coal units at the facility ~~no later than December 31, 2023~~ pursuant to subsection I.4.e of this permit, this permit may be modified..."

Response 17: This clarification has been made.

Comment 18: Part V.B.7 (page 56 of 56) - We would request that you replace "measure" with "approximate" to clarify how this information is determined and when it is reported, and establish that the data shall be collected for a period of one year, and not the entirely of the permit. This section should now read: "During the next permit period, monitor the ~~actual~~ intake flows at a minimum frequency of daily for one continuous year. The permittee may be-use engineering calculations, such as pump capacity, to measure approximate intake flow. The daily intake flow information shall be submitted with the application for the next permit renewal."

Response 18: This clarification has been made.

Comment 19: Fact Sheet, Section 2.2 (page 6), Facility Description Outfall Locations – Outfall

001 Flow Summary language should be modified as follows, "...treatment system #1,fly ash transport water, bottom ash transport water, ash pond wastewater, treatment system #2, periodic metal cleaning wastewaters, ..."

Response 19: This clarification has been made.

Comment 20: Fact Sheet, Section 2.2 (page 6), Facility Description Outfall Locations - Outfalls 005S and 006S Avg. Flow (MGD) should be changed to variable because these are storm water flows, which can vary greatly depending on a variety of conditions. As currently listed in the draft permit, these values could be incorrectly interpreted as daily volumes.

Response 20: Variable has been added.

Comment 21: Fact Sheet, Section 2.3 (page 8) - Ash Pond Wastewater: The description has been corrected to clarify the waters which enter the ash pond and to add language about a recently installed storm water bypass line that was installed as a result of decommissioning the upper dam to meet CCR obligations.

Response: 21: This description has been clarified.

Comment 22: Fact Sheet, Section 2.3 (page 8) - Treatment System #2: We would request that you remove the last three sentences as this language has now been incorporated into the Ash Pond Wastewater description.

Response 22: This description has been clarified.

Comment 23: Fact Sheet, Section 2.3, Figure 2 (page 10) - An updated Flow (Water Balance) Diagram to more accurately reflect the information throughout the permit is provided with these comments. See Attachment A.

Response 23: An updated Water Balance has been added to the Fact Sheet as Figure 4.

Comment 24: Fact Sheet, Section 5.2 (15) - Revise language to reflect current information. An official announcement of retirement would not occur until a formal filing with the IURC. "IDEM has determined that there is a need to establish internal monitoring stations to determine compliance with the TBELs.

Response 24: The language has been revised.

Comment 25: Fact Sheet, Section 5.2 (page 18) - We would request that you remove the reference to Outfall 004 because the parameters discussed are not applicable to Outfall 004, and restore a separate section for Outfall 004 as listed in the current permit (effective date October 1, 2011) that contains the applicable language for Total Suspended Solids and Oil & Grease.

Response 25: Reference to Outfall 004 has been removed.

Comment 26: Fact Sheet, Section 5.3 Outfall 001 Temperature (page 19) - Remove the statement "Effluent Limitations for temperature are based on 327 AC 2-1-6(b)." The facility does not have temperature limits and temperature data is submitted as report only.

Response 26: This statement has been removed.

Comment 27: Fact Sheet, Section 5.3 Outfall 001 Total Residual Chlorine (TRC)-Continuous (page 19-20)- remove this section because the facility does not use a continuous chlorine feed.

Response 27: This section has been removed.

Comment 28: Fact Sheet, Section 5.3 Outfall 001 Total Residual Oxidants (TRO) (page 20) – Remove this section because the facility does not use bromine.

Response 28: This section has been removed.

Comment 29: Fact Sheet, Section 5.3 Outfall 001 Chlorination / Bromination (page 20) – Remove all references to bromination and brominating because the facility does not use bromine.

Response 29: References to bromine has been removed.

Comment 30: Fact Sheet, Section 6.1 Outfall 004 (page 26) - Revise table header to be consistent with other sections. "Outfall 004: Must be eliminated by the compliance date in the permit unless an alternate compliance date is established in accordance with section I.G. of this permit."

Response 30: Table header has been revised.

Comment 31: Fact Sheet, Section 6.1 Outfall 004 (page 26) - Sampling minimum frequency should be daily during discharge for all parameters. Remove the notation, "*Daily when the Coal Pile/South Side Run Off Pond Discharges to the Ash Pond" from the bottom of the table.

Response 31: This clarification has been made.

Comment 32: Fact Sheet, 6.4.1 (page 29)- And finally, we would request that you replace "measure" with "approximate" to clarify how this information is determined and when it is reported, and establish that the data shall be collected for a period of one year, and not the entirely of the permit.

Response 32: This clarification has been made.

Comments from Sierra Club – Tony Mendoza and Casey Roberts Including Exhibit 1 to Sierra Club Comments on the Draft A.B. Brown NPDES Permit:

Comment 1: Specifically, IDEM's finding that the A.B. Brown plant does not discharge flue gas desulfurization ("FGD") wastewaters within the meaning of the Effluent Limitations Guidelines ("ELGs")[1] is incorrect and must be revisited.

... the A.B. Brown plant discharges wastewater that "comes into contact with...the FGD solids" and that are best described as "FGD solids wash water," which is explicitly included in such definition.[3] Because no exemption to this broad definition applies and because A.B. Brown discharges this wastewater to the Ohio River, IDEM must revise the Draft Permit before re-issuance to require compliance with the ELGs discharge limitations for FGD wastewaters.

Nor can the belt filter wash water be deemed "cleaning FGD solids dewatering equipment" within the meaning of the ELGs rule's definition for two reasons. First, as Dr. Sahu concludes, the belt filter washwater is not used for "cleaning FGD solids dewatering equipment" because cleaning typically is a periodic or intermittent process as opposed to a continuous one. In general, equipment is used for its intended purpose for the majority of the time and occasionally, when its performance degrades below acceptable metrics, it is cleaned. Thus, cleaning is inherently an intermittent or occasional activity, interspersed by much longer time intervals when the equipment in question is in use and not being cleaned.[19]

Here, it appears that large amounts of water are used continuously—for washing FGD solids off the belt to allow the process to continue. The use of these waters is therefore not to clean the belt but instead is part of the treatment process itself. Second, as Dr. Sahu notes, there is a canon of regulatory interpretation that holds that an exemption should be narrowly interpreted to reduce the effect of a general prohibition.[20]

Response 1: IDEM does not agree that the A.B. Brown plant wastewater that comes into contact with the FGD solids is "FGD solids wash water".

The FGD wastewaters at A.B. Brown are generated from the washwater used to spray off the belt filter press as well as the wastewater collected in the filter cake truck loading bays. The EPA definition of FGD wastewater specifically excludes wastewater generated from cleaning the FGD solids dewatering equipment or that is collected in the floor drains in the FGD process area.

As stated in the Fact Sheet with the Public Noticed Draft permit – the FGD wastewaters at A.B. Brown are therefore not considered FGD wastewater subject to ELG limitations in the rule.

Given that the wash waters are used for cleaning the belt filter press and that there is no distinction in the rule for 'continuous cleaning' vs. 'batch' cleaning, IDEM also does not agree with the arguments raised by Sierra Club that the wastewaters are subject to ELG limitations simply because they are continuously

cleaning the belt filter press.

IDEM's above conclusions are further supported by the *USEPA Effluent Limitations Guidelines and Standards for the Steam Electric Power Generating Point Source Category: EPAs Response to Public Comments – Part 3 of 10, Page 3-580.* In that Response to Comments, EPA stated that "the dual alkali FGD scrubber at A. B. Brown Station would not be subject to the final FGD limitations(as the final FGD only apply if the unit discharges FGD wastewater as defined by the rule) ...."

Comment 2: IDEM must revisit, revise, and re-issue the Draft Permit for public comment before issuing it in its final form.

In applying the ELGs rule to any facility, IDEM is required to make its own independent judgment regarding any dispute as to the applicability of these standards and explain its rationale. In the proposed A.B. Brown permitting action, IDEM has failed to make such independent judgment.

Response 2: The Fact Sheet clearly states that the wastewaters collected in the scrubber sumps and belt filter wash are not considered FGD wastewater. IDEM is making no change to this conclusion and therefore does not need to revisit, revise or re-issue the Draft Permit.

STATE OF INDIANA
DEPARTMENT OF ENVIRONMENTAL MANAGEMENT
PUBLIC NOTICE NO: 2017 – 2B – F
DATE OF NOTICE: FEBRUARY 28, 2017

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

MAJOR – RENEWAL

SIGECO A.B. BROWN GENERATING STATION, Permit No. IN0052191, VANDERBURGH COUNTY, Evansville, IN. This major industrial facility discharges 1.6 million gallons daily of storm water, sanitary & process wastewater into the Ohio River. Permit Manager: Nicole Gardner, ngardner@idem.in.gov or 317/232-8707.

Notice of Right to Administrative Review [Permits]

If you wish to challenge this Permit, you must file a Petition for Administrative Review with the Office of Environmental Adjudication (OEA), and serve a copy of the Petition upon IDEM. The requirements for filing a Petition for Administrative Review are found in IC 4-21.5-3-7, IC 13-15-6-1 and 315 IAC 1-3-2. A summary of the requirements of these laws is provided below.

A Petition for Administrative Review must be filed with the Office of Environmental Adjudication (OEA) within fifteen (15) days of the issuance of this notice (eighteen (18) days if you received this notice by U.S. Mail), and a copy must be served upon IDEM. Addresses are:

Director
Office of Environmental Adjudication
Indiana Government Center North
Room 501
100 North Senate Avenue
Indianapolis, Indiana 46204

Commissioner
Indiana Department of Environmental Management
Indiana Government Center North
Room 1301
100 North Senate Avenue
Indianapolis, Indiana 46204

The Petition must contain the following information:

1. The name, address and telephone number of each petitioner.
2. A description of each petitioner's interest in the Permit.
3. A statement of facts demonstrating that each petitioner is:
   a. a person to whom the order is directed;
   b. aggrieved or adversely affected by the Permit; or
   c. entitled to administrative review under any law.
4. The reasons for the request for administrative review.
5. The particular legal issues proposed for review.
6. The alleged environmental concerns or technical deficiencies of the Permit.
7. The Permit terms and conditions that the petitioner believes would be appropriate and would comply with the law.
8. The identity of any persons represented by the petitioner.
9. The identity of the person against whom administrative review is sought.
10. A copy of the Permit that is the basis of the petition.
11. A statement identifying petitioner's attorney or other representative, if any.

Failure to meet the requirements of the law with respect to a Petition for Administrative Review may result in a waiver of your right to seek administrative review of the Permit. Examples are:

1. Failure to file a Petition by the applicable deadline;
2. Failure to serve a copy of the Petition upon IDEM when it is filed; or
3. Failure to include the information required by law.

If you seek to have a Permit stayed during the Administrative Review, you may need to file a Petition for a Stay of Effectiveness. The specific requirements for such a Petition can be found in 315 IAC 1-3-2 and 315 IAC 1-3-2.1.
Pursuant to IC 4-21.5-3-17, OEA will provide all parties with Notice of any pre-hearing conferences, preliminary hearings, hearings, stays, or orders disposing of the review of this action. If you are entitled to Notice under IC 4-21.5-3-5(b) and would like to obtain notices of any pre-hearing conferences, preliminary hearings, hearings, stays, or orders disposing of the review of this action without intervening in the proceeding you must submit a written request to OEA at the address above.
If you have procedural or scheduling questions regarding your Petition for Administrative Review you may contact the Office of Environmental Adjudication at (317) 232-8591 or see OEA's website at http://www.in.gov/oea.

APPENDIX B

STATE OF MICHIGAN

BEFORE THE MICHIGAN PUBLIC SERVICE COMMISSION

In the matter of the application of CONSUMERS ENERGY COMPANY for authority to increase its rates for the generation and distribution of electricity and for other relief.	))))))	Case No. U-18322

DIRECT TESTIMONY

OF

HEATHER A. BREINING

ON BEHALF OF

CONSUMERS ENERGY COMPANY

March 2017

HEATHER A. BREINING
DIRECT TESTIMONY

Q. Please state your name and business address.

A. My name is Heather A. Breining and my business address is 1945 West Parnall Road, Jackson, Michigan 49201.

Q. By whom are you employed and in what capacity?

A. I am employed by Consumers Energy Company ("Consumers Energy" or the "Company") as a Senior Engineering Technical Analyst II. I assumed this position as of June 1, 2013.

Q. Please describe your educational background and experience.

A. In 2001 I earned a Bachelor degree in Mathematics with a minor in Physics from Spring Arbor University. I have been employed by Consumers Energy for 15 years in various areas including Environmental Services, Transaction Strategies, and Resource Planning.

Q. What are your responsibilities as a Senior Engineering Technical Analyst II?

A. I am responsible for evaluating and analyzing potential compliance options with environmental regulations and/or legislation and assuring that Consumers Energy's capital expenditures for environmental compliance are technically sound, economic, and complement the broader corporate strategy related to delivering safe, reliable, and reasonably priced energy. In addition, I am responsible for managing the Company's emission allowance portfolio as well as providing the necessary environmental documentation to support both Power Supply Cost Recovery and Electric Rate Case proceedings.

Q. Have you previously testified before the Michigan Public Service Commission ("MPSC" or the "Commission")?

A. Yes. I testified in the 2016 electric rate case, Case No. U-17990.

Q. What is the purpose of your testimony?

A. The purpose of my testimony is to describe the environmental regulations with which the Company's electric generating fleet must comply, the cost of compliance with those regulations, as well as the timing and the justification for the investments made to ensure regulatory compliance. My testimony and exhibits support Company witness Danielle M. Hill's Exhibit A-61 (DMH-4). The rationale and description of expenditures related to Resource Conservation Recovery Act ("RCRA"), Steam Electric Effluent Guidelines ("SEEG") compliance, and for studies that are necessary in order to ensure compliance with Clean Water Act ("CWA") Section 316(b) will be addressed in my testimony.

Q. Are you sponsoring exhibits with your testimony?

A. Yes, I am sponsoring the following exhibits:

Exhibit A-38 (HAB-1)	Air Quality Compliance Costs & Schedule;
Exhibit A-39 (HAB-2)	Coal Combustion Residuals Compliance Costs & Schedule;
Exhibit A-40 (HAB-3)	Water Quality Compliance Costs & Schedule;
Exhibit A-41 (HAB-4)	**Confidential** – Coal Combustion Residuals Supporting Documentation; and
Exhibit A-42 (HAB-5)	**Confidential** – Water Quality Compliance Supporting Documentation.

Q. Were these exhibits prepared by you or under your direction?

A. Yes.

Q. Can you please list the environmental regulations with which Consumers Energy is required to comply and that are relevant to expenditures for which the Company is seeking recovery in this case?

A. Yes. The Company's fossil-fueled Electric Generating Units ("EGUs") are subject to numerous, complex, and overlapping air regulations intended to reduce the emission of air contaminants. In addition to air regulations, there are also a number of additional environmental regulations related to water and waste regulation. The Company is seeking recovery of costs incurred for compliance with the following regulations:

Air Quality Regulations

	Regulation	Acronym	Controlled Pollutant	Compliance Date
a.	Cross-State Air Pollution Rule	CSAPR	NOx, SO_2	2015
b.	Mercury Air Toxics Standards	MATS	Hg, PM, Acid Gases, Metals	2015*
c.	Michigan Mercury Rule	MMR	Hg	2015*

*Compliance is 2016 with a one-year extension

Water Quality Regulations

	Regulation	Acronym	Controlled Pollutant	Compliance Date
f.	Clean Water Act §316(b)	316(b)	Fish Protection	2018-2021
g.	Steam Electric Effluent Guidelines	SEEG	Effluent	2018-2023

Coal Combustion Residuals (Waste) Regulations

	Regulation	Acronym	Controlled Pollutant	Compliance Date
h.	Resource Conservation Recovery Act	RCRA	Coal Combustion By-Product	2018

Environmental Regulations – Air Quality

Q. Can you please describe the Cross State Air Pollution Rule ("CSAPR")?

A. CSAPR is a cap and trade rule much like the Clean Air Interstate Rule. CSAPR governs the emission of sulfur dioxide ("SO_2") and nitrogen oxides ("NO_x") from fossil-fueled EGUs through the use of an allowance based "cap and trade" program except that it restricts interstate trading for use only for addressing relatively small changes in year-to-year emissions variability. Under this program, NO_x is regulated on both an annual basis and during the ozone season (May through September). Each allowance (annual or ozone) permits the emission of one ton of NO_x, with the emissions cap and number of allocated allowances decreasing over time. SO_2 is regulated on an annual basis only, with the emissions cap decreasing over time. Phase I was effective from January 1, 2015 through December 31, 2016 and Phase II became effective on January 1, 2017.

Q. Can you please describe the Mercury and Air Toxics Standards ("MATS")?

A. MATS is a federal rule that was finalized by the Environmental Protection Agency ("EPA") in December 2011 and regulates emissions of mercury, acid gases, certain metals, and organic constituents via emission rate limits or the use of work practices for coal- and oil-fired EGUs. Unlike prior regulations allowing allowance purchases or emission averaging over multiple units, MATS requires unit-by-unit control equipment. Compliance with MATS was required by April 16, 2015; however, the Company received an extension from the Michigan Department of Environmental Quality ("MDEQ") which pushed compliance to April 16, 2016. Consumers Energy has five coal-fired units and two oil-fired units subject to MATS.

1 Q. Can you please describe the Michigan Mercury Rule ("MMR")?

2 A. The purpose of the MMR is to regulate the emissions of mercury in the State of
3 Michigan. Existing coal-fired EGUs must choose one of three methods to comply with
4 the emission limits and any new EGU will be required to utilize Best Available Control
5 Technology. Initial compliance with MMR was January 1, 2015; however, in response to
6 the Office of Regulatory Reform recommendation A-2, the MDEQ revised the MMR in
7 October of 2013 to align the compliance deadline to the MATS' required compliance
8 date. In addition, the MDEQ issued variances for compliance requirements under MMR
9 and also indicated that construction extensions granted via the MATS process would also
10 cover MMR related requirements. Therefore, the effective date of compliance with
11 MMR was April 16, 2016.

12 Q. Please describe what regulations EGUs face regarding Greenhouse Gases.

13 A. On October 23, 2015, the EPA published into the Federal Register the finalized Clean
14 Power Plan addressing carbon emissions from EGUs. This was a parallel rulemaking
15 under the Clean Air Act ("CAA") Section 111(d) Existing Source Performance Standards
16 and CAA Section 111(b) New Source Performance Standards ("NSPS"). Legal
17 proceedings have begun as petitions for review challenging the final Section 111(d) rule
18 for existing EGUs have been filed. In addition, motions to stay the rule have been filed
19 by numerous utilities, unions, states (led by West Virginia and Texas), coal interests (led
20 by the National Mining Association), and by business interests (led by the Chamber of
21 Commerce of the United States). On February 9, 2016, the United States Supreme Court
22 acted on the filed motions and issued five orders granting a stay of the Clean Power Plan
23 pending judicial review. The orders indicate that the stay will be in effect through a

determination by the Court to deny any petitions for writs of certiorari that are filed, or after a judgment is issued by the Court if the Court takes the case on certiorari. In addition, the Trump administration has indicated that it intends to re-evaluate the Clean Power Plan.

Consumers Energy cannot predict the outcome of these EPA rules in court or the effect of the new Trump administration on the EPA rules, but will continue to monitor regulatory activity regarding greenhouse gas emissions standards that may affect EGUs. As a result, the Company is not seeking recovery, as a part of this filing, for any expenditure related to greenhouse gas emissions compliance as it currently has none identified for its existing fleet of generating units.

Air Quality Compliance Strategy

Q. Describe Consumers Energy's historic Air Quality Compliance Strategy ("AQCS").

A. Cost recovery reflecting the Company's AQCS was approved in the November 19, 2015 Order in electric rate Case No. U-17735. This AQCS has prudently ensured compliance with applicable state and federal environmental regulations. The Company's actions and investments to achieve such compliance have been performed in a manner which has minimized, to the extent reasonably possible, the associated costs for customers. The investments made to ensure environmental compliance have allowed the continued operation of Michigan-based coal generation, thus helping preserve the fuel diversity necessary to protect customers from significant fuel price fluctuations and helped ensure continued supply reliability for the Company's customers and the State of Michigan.

Q. What capital investments are the Company seeking recovery of in this case that are specifically related to air quality control?

A. As shown in Exhibit A-38 (HAB-1), the Company has nearly completed the installation of the entire suite of AQCS projects. The Company is seeking recovery in this proceeding for the remaining project close-out costs associated with the installation of Pulse Jet Fabric Filter at J.H. Campbell Unit 1 for compliance with MATS, MMR, and CSAPR.

Environmental Regulations and Compliance Strategy – Waste

Q. Can you please describe the relevant parts of the RCRA as related to Coal Combustion Residual ("CCR") management?

A. On April 17, 2015, the EPA published 40 CFR Parts 257 and 261, Disposal of CCRs from Electric Utilities, in the Federal Register under Subtitle D of the RCRA. The new rules establish minimum national criteria for purposes of determining which CCR solid waste disposal facilities and solid waste management practices pose a reasonable probability of adverse effect on health or the environment under RCRA. The rule is considered self-implementing, meaning that affected facilities must certify compliance with the published standards and schedules despite existing state rules or adaptation of state rules to encompass new standards. By codifying standards under Subtitle D, Owners and Operators are not required to obtain permits and states are not required to adopt and implement the new rules. Instead, the rules' only enforcement mechanism is for a state or citizen group to bring a RCRA citizen suit in federal district court against any facility that is alleged to be in noncompliance with the newly promulgated minimum standards. In December 2016, the Water Infrastructure Improvements for the Nation Act

("WIIN") was passed. This bill provides authority for state implementation of coal ash management through a state permit program in lieu of the current enforcement of the CCR Rule through the RCRA Citizen Suit Authority. States may elect to submit a CCR permit program to the EPA for approval and the EPA must either approve the permit program or enforce their own. In the interim the EPA has direct enforcement authority of the RCRA CCR rule in addition to states and citizens.

Q. How does Consumers Energy intend to comply with management of CCRs under the RCRA?

A. The current strategy is to implement the bulk of these requirements by the end of 2019 to comply with RCRA deadlines.

At J.H. Campbell and D.E. Karn, the bottom ash ponds will cease accepting CCR by 2018. Consumers Energy has elected to replace the unlined bottom ash ponds with more protective concrete tanks by the end of 2017 and will continue wet sluicing bottom ash to these tanks. Due to the cessation of electric generating operation at J.C. Weadock, B.C. Cobb, and J.R. Whiting, bottom ash pond closures at those facilities will also begin in 2017 as these impoundments are no longer receiving bottom ash.

The D.E. Karn landfill has commenced closure, and closure activities will continue at a rate that allows for placement of CCR in the final cover system to adequately construct the final cover. The J.C. Weadock landfill will continue to operate for the life of the D.E. Karn facility. As a result of RCRA, beginning in 2015, and continuing through 2016, efforts commenced to remove water conveyances from the landfill, followed by grading to promote drainage to ditches. This work included modifying the existing outlet structure and systematically draining ponded water out of

low areas. The modifications of the existing outlet structure allow for gravity drainage of the interior of the disposal area thus minimizing groundwater infiltration to the landfill. In 2018 the installation of a soil-bentonite slurry wall at the Weadock landfill is planned to fully enclose the perimeter dike. Completing the construction of the slurry wall eliminates the passive "vent" to the discharge channel and provides encapsulation of CCR materials as well as controls for potential sources of groundwater impacts.

Q. What capital investments are Consumers Energy seeking recovery of in this case that are specifically related to RCRA compliance?

A. As shown on Exhibit A-39 (HAB-2), Consumers Energy is seeking recovery during the test year in this proceeding for the construction of the bottom ash concrete tanks. The installation of the concrete tanks assures that the Company will be able to continue wet sluicing bottom ash, and thus not require any major operational changes to the generating units. The Company will also be completing the slurry wall at the J.C. Weadock site during the test year for this case, the costs for which the Company is also seeking recovery.

Q. Are there potentially less-costly alternatives for the Company's RCRA compliance strategy?

A. Potentially, yes. The passage of the WIIN Act in late December 2016, and subsequent Company discussions with MDEQ in January and February of 2017, together provide a likelihood that the State of Michigan will have a permitting program for CCR by 2019. This state permitting program provides permit protection for the applicant which reduces the potential liability associated with defending a third party lawsuit under the Federal CCR program. This new state permit possibility has allowed us to consider less robust

and thus less expensive alternative compliance plans. As a result, at the DE Karn site we are exploring the potential for a double-lined bottom-ash surface-impoundment, under a possible early retirement scenario. The referenced lower-cost alternative is only potentially feasible for the DE Karn Units 1&2, and would not be feasible for the JH Campbell Units 1&2. Even if economic modeling indicates that JH Campbell Unit 1 and/or Unit 2 should retire earlier than their planned 2030 retirement date, JH Campbell Unit 3 will still be in operation to 2040. Since all three units will have a shared system, and bottom ash tanks are a more robust, longer-term solution, that site will still require the installation of the tanks.

Q. What would the cost impact of undertaking the less expensive double-lined bottom-ash surface impoundment alternative, instead of constructing the bottom ash concrete tanks at DE Karn Units 1&2?

A. The capital construction cost for a double-lined impoundment is estimated to be approximately $8 million dollars less than the total capital cost of concrete tanks at the DE Karn Units 1&2. If the decision is made to retire DE Karn Units 1&2 early and switch to the lower cost option for RCRA compliance at these units, then the overall 2017 expenditures would be significantly reduced and dollars would be shifted into 2018. As a result, the test year costs would increase by approximately $5.1 million, while reducing DE Karn's total overall RCRA compliance by approximately $8 million. These preliminary estimates are budgetary in nature due to the early stage of evaluation.

Environmental Regulations and Compliance Strategy – Water

Q. Can you please describe the CWA Section 316(b)?

A. On August 15, 2014, the EPA published the final Section 316(b) rule ("Final Rule") in the Federal Register, establishing new standards for Cooling Water Intake Structures ("CWIS"). The Final Rule became effective on October 14, 2014 and requires existing power generation facilities with a design intake flow greater than two million gallons per day ("mgd") from waters of the United States for cooling to reduce impingement and entrainment of fish and other aquatic organisms at CWIS. Additionally, any facility subject to the Final Rule with actual flows in excess of 125 mgd must provide an entrainment study with its National Pollutant Discharge System ("NPDES") permit application. As such, the Final Rule will apply to all of Consumers Energy's base-load generation facilities and require submittal of entrainment studies. Consumers Energy has been conducting the required studies since the Final Rule was finalized. These studies are critical to demonstrating which controls are compliant technology options to protect aquatic life.

The Final Rule establishes national requirements which apply to the location, design, construction, and capacity of CWIS and requires the use of Best Technology Available ("BTA") for minimizing adverse environmental impact. For impingement, the EPA has determined the BTA to be modified traveling screens, with fish return systems. However, six additional alternatives, with equal or better performance, are available for a facility to meet this standard. For entrainment, the EPA did not determine a BTA, because no one technology can be universally employed at all facilities. Rather, entrainment BTA is determined on a site-specific basis by the regulatory agency

1 responsible for administering the NPDES program. The site specific controls are
2 justified through a series of prescribed studies, including but not limited to entrainment
3 characterization; technical feasibility and cost evaluation; benefits valuations; non-water
4 quality and other environmental impacts; and peer review. For the J.H. Campbell and
5 D.E. Karn facilities, these prescribed studies are scheduled to be completed during the
6 first quarter of 2017. Several studies must receive peer review, which is scheduled to be
7 completed during the last quarter of 2017.

8 Q. How does Consumers Energy intend to comply with the CWA Section 316(b)?

9 A. To demonstrate compliance with impingement and entrainment standards, it is projected
10 that D.E. Karn Units 1&2 will require installation of new fine mesh wedge wire screen
11 intakes. D.E. Karn Units 3&4 will require no new controls as their existing cooling
12 towers are sufficient. J.H. Campbell Unit 3 will require no new controls as its existing
13 offshore wedge wire screen intake is sufficient. For J.H. Campbell Units 1&2,
14 preliminary evaluation suggests modifying the deep water intake for J.H. Campbell
15 Unit 3 to accommodate intake for Units 1&2 has the potential for significant cost savings
16 and environmental benefits over installing fine mesh screens at the J.H. Campbell Unit
17 1&2 intake. B.C. Cobb, J.C. Weadock, and J.R. Whiting will be in the decommissioning
18 phase and will not be required to provide additional demonstration studies or modify their
19 cooling water intake structures.

20 The prescribed studies and associated BTA demonstrations for D.E. Karn and J.H.
21 Campbell were to be submitted to the MDEQ by the NPDES permit application which
22 was due April 4, 2016; however, the Company petitioned and the MDEQ accepted the
23 proposal to submit information by April 1, 2018. The MDEQ's final determination on

BTA is expected in late 2018 or early 2019, with an assumed operational compliance date by year-end 2021. This timeline is dependent on the State's timely issuance of the final NPDES permit, the particular site-specific controls/technologies ultimately determined to be BTA, and the negotiation of appropriate timelines in the NPDES permitting process for the J.H. Campbell and D.E. Karn generating complexes.

Q. Are there other water related regulations to which Consumers Energy's facilities are subject?

A. Yes. On November 3, 2015, the EPA published the final Effluent Limitation Guidelines ("ELG") rule for the Steam Electric Power Generating Point Source Category (referred to as "SEEG") into the Federal Register. The final SEEG rule establishes effluent limitations based on BTA for existing sources. The final rule excludes oil-fired generation units and units with a nameplate capacity of 50 MW or less. The final rule also establishes NSPS and Pretreatment Standards for Existing and New Sources that discharge to Publically Owned Treatment Works.

Q. What BTA technologies have been defined for each waste stream?

A. The final SEEG rule, in addition to already regulating effluent limitations for several waste streams (such as low volume wastewaters), establishes BTA model technologies for the following waste streams:

Waste Stream	Existing Source BTA Model Technology
FGD Wastewater*	Chemical Precipitation + Biological Treatment
Fly Ash Transport Water*	Dry handling
Bottom Ash Transport Water	Dry handling/Closed loop
Combustion Residual Leachate	Impoundment (Equal to existing BPT)
FGMC Wastewater*	Dry handling
Gasification Wastewater*	Evaporation
Nonchemical Metal Cleaning Wastes	No technology chosen – BTA for nonchemical metal cleaning wastewater is reserved.

Note: * These waste streams are not generated at the J.H. Campbell or D.E. Karn facilities.

Existing source BTA effluent limitations for waste streams present at Consumers Energy facilities are summarized below:

Waste stream	Present At	Existing Source BTA Effluent Limitations
Bottom Ash Transport Water	J.H. Campbell D.E. Karn	No discharge of pollutants, including if transport water is used in other plant process or is sent to a treatment system. Exception for reuse in FGD scrubber. Low volume, short duration discharges from minor leaks or minor maintenance events is allowed.
Combustion Residual Leachate	J.H. Campbell	TSS Daily Max. = 100 mg/L TSS Monthly Avg. = 30 mg/L
Nonchemical Metal Cleaning Wastes	J.H. Campbell D.E. Karn	Reserved. No federal limits established. EPA expects the permitting authority to examine the historical permitting record to determine how discharges of this waste stream should be permitted.

Q. What are the applicability dates apply for SEEG?

A. Compliance with new BTA limitations does not apply until a date determined by the permitting authority that is "as soon as possible" beginning November 1, 2018, but no later than December 31, 2023. The "as soon as possible" date determined may or may not be the same for each waste stream. The permitting authority must consider several factors, including time for the facility to plan changes being made or planned in response

to other regulations, such as the CCR rule, and other factors as appropriate. The final CCR rule regulates infrastructure also affected by the SEEG rule, specifically bottom ash ponds/impoundments. If unlined impoundments cannot meet certain criteria, facilities are required to cease using them in 2018. The evaluation of a potential double-lined surface impoundment in lieu of a tank mentioned in my RCRA testimony is projected to still comply with these requirements.

In light of the EPA's proposed timing of implementation, Consumers Energy needs to implement SEEG requirements within the next NPDES permit cycle (2016 – 2021). In order to do so, Consumers Energy was required to describe process water and water management changes in the Company's April 2016 permit reissuance application.

The current SEEG compliance strategy is to plan for full compliance by year-end 2021, which is consistent with a three- to four-year implementation timeline after receipt of the NPDES permit renewals, which is expected in late 2017 or early 2018 for J.H. Campbell and D.E. Karn.

Q. Why is Consumers Energy planning for SEEG implementation by year-end 2021 when the finalized SEEG rule allows for a permit writer to establish applicability dates no later than December 31, 2023?

A. An applicability date of December 31, 2023 would be the Company's preferred and optimal path forward, but the Company has determined that the MDEQ is unlikely to grant the Company's request for extension based on recently established applicability dates (December 31, 2021) which the MDEQ established for the DTE Electric Company's Belle River facility. The Company has communicated its desire for an extension to the MDEQ and will continue to pursue such timing in reissued NPDES

1 permits. NPDES permit applications for reissuance were submitted to the MDEQ in
2 April, 2016, with MDEQ review and draft permit issuance anticipated in late-2017;
3 however, the MDEQ has no requirement to respond by a date certain. Until NPDES
4 permit reissuance is finalized, likely in 2018, assuming the MDEQ would establish the
5 latest possible applicability date would be imprudent. The Company is therefore
6 proceeding with a compliance plan which is based on an applicability date of December
7 31, 2021.

8 Q. How does Consumers Energy intend to comply with SEEG?

9 A. At J.H. Campbell and D.E. Karn, as explained above, the RCRA-CCR rule requires
10 unlined bottom ash ponds not meeting performance standards to cease accepting CCR in
11 2018. As a result, Consumers Energy has elected to replace the unlined bottom ash
12 ponds with concrete tanks by the end of 2017 and to continue wet sluicing bottom ash to
13 these tanks. Per the SEEG rule, the transport water will need to be managed in a closed
14 loop system and not discharged. A blow-down stream will need to be treated and
15 returned to the closed loop system or disposed of in a terminal process to manage the
16 expected eventual build-up of suspended and dissolved solids. While the concrete tanks
17 will be constructed in 2017, the closed loop systems will likely not be constructed until
18 the 2020-2021 timeframe to accommodate reissuance of NPDES permits as previously
19 mentioned. However, if Consumers Energy determines that it should retire DE Karn
20 Units 1&2 early and employ the lined impoundment option instead of constructing
21 concrete tanks for RCRA compliance, there is the potential we could avoid having to
22 install the closed loop systems with wastewater treatment. Any potential cost savings
23 associated with closed loop systems with wastewater treatment would occur beyond the

test year of this case. The expenditures within the test year allow for the finalization of the various studies and required reviews necessary for successful NPDES negotiations with the MDEQ, which are necessary regardless of whether or not a decision is made to retire the units early.

At J.H. Campbell, low volume wastewaters and other non-bottom ash transport process water streams currently flowing to the bottom ash ponds will be segregated from the bottom ash system, treated in new lined impoundments and oil/water separators (to remove suspended solids and oil and grease). Post treatment, these waste streams will be discharged to the Unit 3 intake canal for subsequent reuse in the cooling water or house service water systems (referred to as a multi-stream reuse system) or potentially used as make up in the Spray Dry Absorber raw water feed system, where it would be consumed entirely, without discharge. Coal pile runoff water currently drains to the bottom ash pond/ditch system. In 2016, coal pile runoff modifications were completed to ensure the discharge quality of this waste stream. Upon approval from the MDEQ, the coal pile runoff water will be retained in an expanded detention basin, and if necessary, receive further treatment to remove total suspended solids and discharged to the Unit 1&2 intake canal for subsequent reuse. No change to the management of combustion residual leachate system is planned.

At D.E. Karn, low volume wastewaters and other process water streams currently flowing to the bottom ash pond will be segregated from the bottom ash system, treated in new lined impoundments and oil/water separators (to remove suspended solids, oil, and grease) and either discharged to the intake canal for subsequent reuse in cooling water or

house service water systems (referred to as a multi-stream reuse system) or used for the coal pile dust suppression system.

J.R. Whiting and B.C. Cobb are expected to have industrial storm water (non-contact) runoff discharges only and thus are not anticipated to be affected by SEEG.

Q. What capital investments are Consumers Energy seeking recoveries for in this case that is specifically related to Section 316(b) and SEEG compliance?

A. As shown on Exhibit A-40 (HAB-3), Consumers Energy is seeking recovery for expenditures at the J.H. Campbell and D.E. Karn sites that are necessary for compliance with CWA Section 316(b) and SEEG. During the test year, Section 316(b) expenditures are for the completion of the required studies for entrainment and impingement, obtaining peer reviews and compiling the submittal packages for the MDEQ. Beyond the test year, the Company is seeking recovery for the design, engineering, and construction of fine mesh wedge wire screens at the D.E. Karn facility and an alternate intake channel at J.H. Campbell facility.

For SEEG compliance, the Company is seeking recovery for the segregation and management of low volume wastewaters and other non-bottom ash transport process water streams from the bottom ash system. In addition to the water segregation, the Company will be optimizing the performance of the bottom ash tank systems. This includes characterization of the bottom ash tank recirculation system and treatment of the low volume miscellaneous waste in order to meet the required discharge limits at the outfall. Once the water characterization has been completed, the Company anticipates the commencement of the design and engineering of the wastewater treatment and closed

loop recirculating systems at both its D.E. Karn and J.H. Campbell facilities. The construction of these systems will occur beyond the test year.

Q. In the February 28, 2017 Order in Case No. U-17990 (pages 30-31), the Commission stated that it was not persuaded that Consumers Energy would incur SEEG expenditures in the test year for that case given that the Company had requested the MDEQ for an extension in the SEEG compliance deadline from 2021 to 2023. Given that the Company's request for such an extension remains pending, will the SEEG test year expenditures sponsored by you in this proceeding occur prior to September 30, 2018?

A. Yes. The projected SEEG expenditures in this case have been minimized to the greatest extent possible, without compromising the schedule for SEEG compliance. The test year expenditures allow for the finalization of the various studies and reviews necessary for NPDES negotiations with the MDEQ. It also allows time for the results of the economic modeling associated with the "Medium Four" units to be completed.

Q. In the February 28, 2017 Order in Case No. U-17990 (page 31), the Commission cited concern regarding the Company's historical spending on SEEG compliance being less than that which was projected in previous rate case filings. Can you address this issue in the context of the Company's projections for SEEG spending in this proceeding?

A. As stated previously, the projected SEEG expenditures in this case have been minimized to the greatest extent possible, without compromising the schedule for SEEG compliance. The test year expenditures allow for the finalization of the various studies and reviews necessary for NPDES negotiations with the MDEQ. It also allows time for the results of the economic modeling associated with the "Medium Four" units to be completed.

Q. Are there any water-related expenditures that would be avoidable if any of the "Medium four" units is retired by year-end 2023?

A. As previously stated, compliance timelines for 316(b) and SEEG are entirely dependent upon the NPDES process. The State will determine the site-specific controls/ technologies which are deemed to be BTA; there will be a negotiation of appropriate timelines in the NPDES permitting process for the J.H. Campbell and D.E. Karn generating complexes and the ultimate issue of the finalized NPDES permit. We strongly believe it is likely that SEEG and 316(b) compliance will be required by year-end 2021, although 2023 is the latest allowable under federal law for those regulations. The MDEQ has provided no indication that leads to a reasonable conclusion that it will grant an extension to the 2023 deadline for compliance, and its recent action in denying DTE Electric Company's request for such an extension supports the Company's position that it must act to achieve compliance by the end of 2021.

If both DE Karn units were to retire by year-end 2023, then all 316(b) and SEEG expenditures for that site would likely cease no later than fourth quarter of 2018. Any associated potential cost savings would occur beyond the test year. The expenditures within the test year allow for the finalization of the various studies and required peer reviews necessary for successful NPDES negotiations with the MDEQ, which are necessary regardless of whether or not a decision is made to retire the units early.

At the JH Campbell site, Units 1&2 share an intake channel. Unit 3 has a separate intake channel. The current strategy for 316(b) compliance is to reroute the Unit 1 and Unit 2 intake channel into the Unit 3 deep water intake and add an additional array of wedge wire screens. If either Unit 1 or Unit 2 were to retire by year-end 2023, then there

likely would not be a need for the alternate intake, and therefore all of those costs would be avoidable. While the associated projected cost savings would occur beyond the test year, the remaining expenditures within the test year allow for the finalization of the various studies and required peer reviews necessary for NPDES negotiations with the MDEQ, and would still be necessary and incurred.

SEEG compliance is much more complicated. All three units at the JH Campbell site will have a completely combined system. Even though there may be potential for either Unit 1 and/or Unit 2 to retire early, depending upon the outcome of the retirement study, Unit 3 will still be operational. Any potential cost savings associated with SEEG compliance for Units 1 or 2 would occur beyond the test year, but the exact timing of when the savings will occur is entirely dependent upon the applicability date that is determined by the State in the NPDES permit. If the MDEQ determines the 316(b) and SEEG applicability date to be year-end 2021, but early retirements do not occur until year-end 2023, then there would be no SEEG capital cost savings.

All three units will be sending their bottom ash transport water to one bottom ash tank at the site. The closed loop systems with wastewater treatment will need to be sized appropriately to accommodate all three units, even if for only two years in this scenario. Additional engineering studies would be required to determine the precise cost savings related to wastewater treatment and closed loop recirculation costs pertaining to Units 1, 2, or both being retired on or before 2023.

Environmental Capital Investment Summary

Q. Describe how Consumers Energy's overall environmental compliance plan for air, water, and waste provides value to customers.

A. The Company's approach has considered a variety of technologies; deferral of expenditures for as long as possible consistent with the applicable rules; risks associated with relying on and use of emission allowance purchases; and the wisdom of retrofitting older, smaller generating units. As noted previously in Case No. U-17735, the Company's economic analyses indicate that it is not in the best interest of the customers to retrofit the older, smaller coal-fired units at this time. The Company is, however, moving forward with environmental control installations on the five larger coal units. When complete, these major investments in emission control technology will allow the Company to continue down the path of sustainability by providing significant environmental benefits through the substantial reduction of SO_2, NO_x, particulate matter, mercury, metals, acid gases, and other pollutants as well as an enhancement in CCR management, water management, and fish protection. These efforts will improve the quality of life we enjoy in Michigan. These investments also allow the continued operation of 1,250 MW of Michigan-based, coal-fired electric generation, thus, preserving the fuel diversity that is necessary to protect customers from significant fuel price fluctuations.

Q. How do customers benefit from the Company's sustainability efforts?

A. We do many things each day that are consistent with sustainable principles and provide great customer value. One such example is our commitment to provide safe, clean, reliable, and affordable energy. Good air quality is valued by our customers and it is

important to us. Consumers Energy has been reducing emissions for decades using various approaches, including fuel switching and emission reduction technology. By 2020, we have committed to reducing our SO_2 emissions by 92% and our nitrogen dioxide emissions by 89%. This commitment single-handedly provides a positive quality of life that our customers deserve.

Over the last 20 plus years, Consumers Energy has minimized its solid waste generation and disposal, but to further support continued sustainability improvement the Company has established a waste minimization goal of one million cubic yards of landfill space saved through 2019. The Company will achieve this goal by increasing its cumulative amount of landfill avoided material by 10% every year through 2019 and currently, we are exceeding those interim targets. To put this into perspective, one million cubic yards of trash would be the equivalent of five football fields stacked from goal line to goal line 100 feet deep. Reducing the amount of waste that is sent to landfill not only saves on disposal costs, but it also protects the environment.

Stewardship of water is also a major focus for the Company. Water use is integral to our business. We treat it as the precious resource it is. Hydroelectric and steam electric generation account for the majority of the water we use, so that's where we're focusing much of our immediate attention. That means cutting back and recycling water wherever feasible at existing plants, and making water conservation a priority when we consider new generation sources. We're currently working on a two-phase water reduction plan that would ultimately reduce our water use by 320 million gallons per day.

Q. How has Consumers Energy ensured that the costs associated with the installation of pollution control equipment, for the various environmental regulations, are reasonable and prudent?

A. Consumers Energy ensures that the costs for pollution control equipment are reasonable and prudent in several different ways. Company witness Hill discusses the project cost reasonableness and prudency in her direct testimony.

In addition to Ms. Hill's testimony, please refer to Confidential Exhibit A-41 (HAB-4) and Confidential Exhibit A-42 (HAB-5). In Confidential Exhibit A-41 (HAB-4) you will find documents which support the Company's RCRA compliance plan and expenditures. In Confidential Exhibit A-42 (HAB-5) you will find documents which support our 316(b) and SEEG compliance plan and expenditures.

Q. Are Consumers Energy's environmental compliance plan and associated investments reasonable and prudent?

A. Yes. The Company has reasonably ensured compliance with applicable state and federal environmental regulations. The Company's investments made to achieve such compliance have been made in a manner that has minimized, to the extent reasonably possible, the associated costs for customers. The investments made ensure continued supply reliability and sustainability. They ensure sustainability by maintaining environmental compliance and achieving significant reduction of pollutants. They ensure supply reliability by allowing for the continued operation of Michigan-based coal generation, thus helping preserve the fuel diversity necessary to protect customers from significant fuel price fluctuations. The Commission should approve the Company's costs associated with its environmental regulatory compliance efforts.

Q. Does this conclude your testimony?

A. Yes.

STATE OF MICHIGAN

BEFORE THE MICHIGAN PUBLIC SERVICE COMMISSION

In the matter of the application of CONSUMERS ENERGY COMPANY for authority to increase its rates for the generation and distribution of electricity and for other relief.	))))))	Case No. U-18322

EXHIBITS

OF

HEATHER A. BREINING

ON BEHALF OF

CONSUMERS ENERGY COMPANY

(REDACTED VERSION)

March 2017

MICHIGAN PUBLIC SERVICE COMMISSION

Consumers Energy Company
Summary of Projected Electric & Common Capital Expenditures
for the Years 2015 through September 2018
($000)

Case No.: U-18322
Exhibit: A-38 (HAB-1)
Witness: HABreining
Date: March 2017

Line No.	Air Quality Compliance Projects	2015 Actual	2016 Actual	9 Months Ended September 30, 2017 Projected	3 Months Ended December 31, 2017 Projected	9 Months Ended September 30, 2018 Projected
	(a)	(c)	(d)	(d)	(e)	(f)
1	D.E. Karn, Unit 1 - Spray Dry Absorber	-$2,001	$375	$0	$0	$0
2	D.E. Karn, Unit 1 - Activated Carbon Injection	$876	-$68	$0	$0	$0
3	D.E. Karn, Unit 2 - Spray Dry Absorber	$5,231	$154	$0	$0	$0
4	D.E. Karn, Unit 2 - Activated Carbon Injection	$1,101	-$50	$0	$0	$0
5	J.H. Campbell, Unit 1 - Dry Sorbent Injection	$19,830	$10,000	$479	$0	$0
6	J.H. Campbell, Unit 1 - Pulse Jet Fabric Filter	$48,874	$8,887	$315	$5	$0
7	J.H. Campbell, Unit 1 - Activated Carbon Injection	$5,330	$2,391	$26	$0	$0
8	J.H. Campbell, Unit 2 - Selective Catalytic Reduction	$0	$0	$0	$0	$0
9	J.H. Campbell, Unit 2 - Pulse Jet Fabric Filter	$17	$0	$0	$0	$0
10	J.H. Campbell, Unit 2 - Dry Sorbent Injection	$23,575	$11,895	$522	$0	$0
11	J.H. Campbell, Unit 2 - Activated Carbon Injection	$6,640	$2,187	$21	$0	$0
12	J.H. Campbell, Unit 3 - Spray Dry Absorber	$70,153	$51,071	$896	$0	$0
13	J.H. Campbell, Unit 3 - Pulse Jet Fabric Filter	$42,388	$45,388	$591	$0	$0
14	J.H. Campbell, Unit 3 - Activated Carbon Injection	$2,240	$1,760	$0	$0	$0
15	**Total Expenditures**	**$224,254**	**$133,991**	**$2,849**	**$5**	**$0**

MICHIGAN PUBLIC SERVICE COMMISSION

Case No.: U-18322
Exhibit: A-39 (HAB-2)
Witness: HABreining
Date: March 2017

Consumers Energy Company
Summary of Projected Electric & Common Capital Expenditures
for the Years 2015 through September 2018
($000)

Line No.	Resource Conservation Recovery Act	2015 Actual	2016 Actual	9 Months Ended September 30, 2017 Projected	3 Months Ended December 31, 2017 Projected	9 Months Ended September 30, 2018 Projected
	(a)	(b)	(c)	(d)	(e)	(f)
1	D.E. Karn Facility - Bottom Ash Tanks	$324	$1,311	$12,823	$965	$0
2	D.E. Karn Facility - Ground Water Monitors	$89	$28	$0	$0	$0
3	J.H. Campbell Facility - Bottom Ash Tanks	$365	$1,900	$23,038	$1,734	$0
4	J.H. Campbell Facility - Ground Water Monitors	$300	$55	$0	$0	$0
5	J.C. Weadock Facility - Landfill Improvements	$2,179	$1,639	$0	$0	$0
6	J.C. Weadock Facility - Slurry Wall	$0	$0	$0	$0	$3,194
7	J.C. Weadock Facility - Ground Water Monitors	$323	$45	$0	$0	$0
8	B.C. Cobb Facility - Ground Water Monitors	$196	$17	$0	$0	$0
9	J.R. Whiting Facility - Ground Water Monitors	$152	$0	$0	$0	$0
10	**Total RCRA Expenditures**	**$3,928**	**$4,996**	**$35,861**	**$2,699**	**$3,194**

MICHIGAN PUBLIC SERVICE COMMISSION

Case No.: U-18322
Exhibit: A-40 (HAB-3)
Witness: HABreining
Date: March 2017
Page 1 of 1

Consumers Energy Company
Summary of Projected Electric & Common Capital Expenditures
for the Years 2015 through September 2018
($000)

Line No.	Clean Water Act §316(b)	2015 Actual	2016 Actual	9 Months Ended September 30, 2017 Projected	3 Months Ended December 31, 2017 Projected	9 Months Ended September 30, 2018 Projected
	(a)	(b)	(c)	(d)	(e)	(f)
1	D.E. Karn Facility - Demonstration Testing	$562	$12	$44	$15	$45
2	D.E. Karn Facility - Fine-mesh Wedge Wire Intakes	$0	$0	$0	$0	$0
3	J.H. Campbell Facility - Demonstration Testing	$384	$3	$26	$9	$28
4	J.H. Campbell Facility - Intake Modification	$0	$0	$75	$25	$69
5	**Total CWA §316(b) Expenditures**	**$946**	**$14**	**$145**	**$48**	**$142**

Line No.	Steam Electric Effluent Guidelines	2015 Actual	2016 Actual	9 Months Ended September 30, 2017 Projected	3 Months Ended December 31, 2017 Projected	9 Months Ended September 30, 2018 Projected
	(a)	(b)	(c)	(d)	(e)	(f)
6	D.E. Karn Facility - Waste Water Treatment*	$439	$641	$336	$112	$371
7	D.E. Karn Facility - Closed Loop Systems	$0	$0	$0	$0	$0
8	J.H. Campbell Facility - Waste Water Treatment*	$614	$2,740	$828	$182	$643
9	J.H. Campbell Facility - Closed Loop Systems	$0	$0	$0	$0	$0
8	**Total SEEG Expenditures**	**$1,053**	**$3,381**	**$1,164**	**$294**	**$1,014**

* Expenditures May Include: Tressel Modifications, Coal Pile Run-off Modifications, MISC Waste Water Studies & Modifications

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APR 17 2017

The Honorable E. Scott Pruitt
Administrator
United States Environmental Protection Agency
William Jefferson Clinton Building
1200 Pennsylvania Avenue, NW
Mail Code: 1101A
Washington, DC 20460

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E. Scott Pruitt
Administrator

May 23, 2017

Mr. Major L. Clark III
Acting Chief Counsel
Office of Advocacy
U.S. Small Business Administration
409 3rd Street, SW
Washington, D.C. 20416

Dear Mr. Clark:

Thank you for your letter of April 17, 2017, sharing the Office of Advocacy's comments on the Trichloroethylene and Methylene Chloride/N-Methylpyrrolidone Proposed Rules, issued under the Toxic Substances Control Act (TSCA) section 6(a).

The comments you provided on behalf of small businesses are very important to the U.S. Environmental Protection Agency as we implement the amended TSCA and consider the next steps for these proposed rules. Thank you also for engaging with the EPA on the Small Business Advocacy Review Panel process to ensure that small business views were brought to the agency's attention and considered in the development of these proposals.

If you have any questions or comments, please contact Wendy Cleland-Hamnett, Acting Assistant Administrator for OCSPP, at cleland-hamnett.wendy@epa.gov or (202) 564-2910.

Respectfully yours,

E. Scott Pruitt

1200 Pennsylvania Ave. NW • Mail Code 1101A • Washington, DC 20460 • (202) 564-4700 • Fax: (202) 501-1450

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E. SCOTT PRUITT
ADMINISTRATOR

May 23, 2017

Ms. Tayyaba Waqar
Assistant Chief Counsel
Office of Advocacy
U.S. Small Business Administration
409 3rd Street, SW
Washington, D.C. 20416

Dear Ms. Waqar:

Thank you for your letter of April 17, 2017, sharing the Office of Advocacy's comments on the Trichloroethylene and Methylene Chloride/N-Methylpyrrolidone Proposed Rules, issued under the Toxic Substances Control Act (TSCA) section 6(a).

The comments you provided on behalf of small businesses are very important to the U.S. Environmental Protection Agency as we implement the amended TSCA and consider the next steps for these proposed rules. Thank you also for engaging with the EPA on the Small Business Advocacy Review Panel process to ensure that small business views were brought to the agency's attention and considered in the development of these proposals.

If you have any questions or comments, please contact Wendy Cleland-Hamnett, Acting Assistant Administrator for OCSPP, at cleland-hamnett.wendy@epa.gov or (202) 564-2910.

Respectfully yours,

E. Scott Pruitt

1200 PENNSYLVANIA AVE. NW • MAIL CODE 1101A • WASHINGTON, DC 20460 • (202) 564-4700 • FAX: (202) 501-1450

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UNITED STATES ENVIRONMENTAL PROTECTION AGENCY
WASHINGTON, D.C. 20460

May 3, 2017

THE ADMINISTRATOR

(b) (6)

Dear (b) (6)

Thank you for your recent correspondence. It is an honor and privilege to lead the U.S. Environmental Protection Agency. Promoting and protecting a strong and healthy environment is one of government's lifeblood priorities, and the EPA is vital to that mission. I look forward to working with the agency's dedicated employees, stakeholders and our state partners on a shared vision to protect our environment for future generations.

The climate is changing, and human activity impacts our changing climate in some manner. The ability to measure with precision the degree and extent of that impact, and what to do about it, are subject to continuing debate and dialogue. I am committed to having an open and honest debate to better inform current and future regulatory decisions.

We as an agency will always strive to strike a balance between protecting our water, air and natural resources and building our economy. We do not have to choose between them. Our nation has a stellar history of protecting our natural resources and our environment while also respecting economic growth and jobs, and we will continue to do that.

Among my top priorities are improving America's water infrastructure and focusing on the EPA's core mission of protecting our nation's air, water and land. We need to shape the work of the EPA by setting national standards and finding neighborhood solutions. We will also strive for regulatory certainty so regulated industries will know exactly what is expected of them.

I am a firm believer in the EPA's mission to protect human health and the environment and look forward to the opportunity to help provide future generations with a better and healthier environment. I hope you will follow our efforts by visiting www.epa.gov to learn more about the EPA's work and what you can do to help us achieve solid results.

On behalf of everyone at the EPA, I thank you for your interest in our work and your support for protecting the environment.

Respectfully yours,

E. Scott Pruitt

(b) (6)

RECEIVED

MAR 21 2017

Office of the General Counsel
Oklahoma Bar Association

GRIEVANCE FORM

RETURN FORM TO: Office of the General Counsel
Oklahoma Bar Association
P.O. Box 53036
Oklahoma City, OK 73152

Complainant Information: (Please see attachment)

Prefix: ☐ Mr. ☐ Mrs. ☐ Ms. Complainants: Center for Biological Diversity, Prof. Kristen vande Biezenbos, University of Oklahoma College of Law

First Name: _____ Date of birth: _____

Middle Name: _____ Email: _____

Last Name: _____ Telephone:

Address: _____ Home: _____

City: _____ Business: _____

State: _____ Zip code: _____ Mobile: _____

Attorney against whom you wish to file a grievance: (NO LAW FIRMS)

Prefix: ☑ Mr. ☐ Mrs. ☐ Ms.

First Name: Edward

Middle Name: Scott

Last Name: Pruitt

Address: U.S. Environmental Protection Agency, William Jefferson Clinton Bldg, Mail Code 1101A, 1200 Pennsylvania Ave NW

City: Washington

State: DC Zip code: 20460

Telephone:

Business: (202) 564-4700

Home: _____

Mobile: _____

Email: pruitt.scott@epa.gov

1. Did you employ the attorney? Yes _____ No ✓
   a. Approximate date you employed the attorney: N/A
   b. Was there a written agreement for services? Yes _____ No _____
      (If yes, attach copy)
   c. What, if any, was the amount paid to the attorney? N/A
   d. Date Paid: N/A (attach proof of payment)

*** * * DO NOT WRITE ON BACK OF FORM * * ***

*** * * DO NOT SEND ORIGINAL DOCUMENTS, PROVIDE COPIES AS ORIGINALS CANNOT BE RETURNED * * ***

2. If you did not employ the attorney, what is your connection to him/her?

See attachment

3. Please furnish the following information, if available:
   a. Name of Court/County: N/A
   b. Case Number: N/A
   c. Title of Suit: N/A vs. N/A
   d. Approximate Date case was filed: N/A

4. If you are or have been represented by any other attorney with regard to this same matter, state the name and address of the other attorney:

   Name: N/A
   Address:
   City:
   State: Zip code:

5. If you have made a grievance about this same matter to any other Official or Agency, state its (their) name(s), and the approximate date you reported it:

N/A

6. In the event a disciplinary hearing is held, would you be willing to appear and testify as a witness? Yes ✓ No

* * * DO NOT WRITE ON BACK OF FORM * * *

* * * DO NOT SEND ORIGINAL DOCUMENTS, PROVIDE COPIES AS ORIGINALS CANNOT BE RETURNED * * *

7. Names and addresses of witnesses to this grievance:

A. Name: Sheldon Whitehouse, U.S. Senator
Address: Rm 530 Hart Senate office Bldg
City: Washington
State: DC Zip: 20510

B. Name: Tom Carper, Senator, Senate Cmte on Env't and Public Works
Address:
City: Washington
State: DC Zip: 20510-6175

C. Name: Sarah K. Magruder Lyle, Am. Fuel + Petrochemical Manufacturers
Address: 1667 K Street NW Suite 700
City: Washington
State: DC Zip: 20006

8. Nature of grievance against the attorney explained in full detail. **(Use a separate piece of paper if necessary).** If you employed the attorney, state what you employed him/her to do. Include what the attorney did or did not do. Further information may be requested.

See attachment

I hereby certify that I have read the foregoing matters and that they are true and correct to the best of my knowledge.

Your Signature

Date: Mar. 21, 2017

This grievance form must be signed before it can be considered.
It is imperative that you notify this office of an address change.
If you are not available as a witness, your grievance may be dismissed.

Attachment to Grievance Form of Center for Biological Diversity and Kristen van de Biezenbos
(Mar. 21, 2017)

Complainant 1: Center for Biological Diversity
By and through: Amy R. Atwood, Senior Attorney
P.O. Box 11374
Portland, OR 97211
atwood@biologicaldiversity.org
(971) 717-6401

Complainant 2: Kristen van de Biezenbos, Associate Professor
In her Personal Capacity as a Resident of the State of Oklahoma
c/o: The University of Oklahoma College of Law
300 Timberdell Road
Norman, OK 73019
k.van.de.biezenbos@ou.edu

QUESTION # 2: If you did not employ the attorney, what is your connection to him/her?

Center for Biological Diversity: The Center for Biological Diversity, an environmental conservation organization with members in Oklahoma that works to protect species from the threat of extinction, depends on the U.S. Environmental Protection Agency to enforce environmental laws that are critical to the environmental protection advocacy work that the organization undertakes, and depends upon the head of the Agency to adhere to the highest ethical standards.

Prof. Kristen van de Biezenbos: As an Oklahoma resident, I depend on the legal profession in our state, particularly those who hold public office, to maintain the highest standards of professional conduct.

QUESTION # 8:

On behalf of the Center for Biological Diversity (the "Center") and Prof. Kristen van de Biezenbos, in her personal capacity, the undersigned hereby files this grievance against Edward Scott Pruitt, who is admitted to practice law in Oklahoma. The Center and Prof. van de Biezenbos seek an investigation of Mr. Pruitt, now head of the U.S. Environmental Protection Agency and formerly Attorney General of the State of Oklahoma, who appears to have violated Oklahoma Rule of Professional Conduct 8.4(c) during recent sworn testimony before a United States Senate Committee considering his nomination to be the Administrator of the U.S. Environmental Protection Agency (EPA).

Rule 8.4(c) provides that "[i]t is professional misconduct for a lawyer to ... engage in conduct involving dishonesty, fraud, deceit or misrepresentation." Comment 5, following this Rule in Chapter 1, App. 3-A, indicates the rules of professional conduct apply with greater force to attorneys holding public office, such as Mr. Pruitt, and states "[a] lawyer's abuse of public office can suggest an inability to fulfill the professional role of lawyers."

During a January 18, 2017 hearing of the U.S. Senate Committee on Environment and Public Works, which was considering Mr. Pruitt's appointment to administer the EPA, Mr. Pruitt stated three times that he only used his official Oklahoma Attorney General email address to conduct official business. However, an examination of documents the Oklahoma Attorney General's Office released in response to a state public records act lawsuit, there are several instances where Mr. Pruitt used a personal email address to conduct official business. *See* Exhibit ("Ex.") A (Transcript, Hearing on Nomination of Attorney General Scott Pruitt to be Administrator of the U.S. Environmental Protection Agency (Jan. 18, 2017)) (Excerpts) at 242; *see also* Ex. B (Letter from Democratic members, Committee on Environment and Public Works, U.S. Senate (Mar. 17, 2017).

In apparent contradiction to Mr. Pruitt's statement, in an e-mail dated August 14, 2013, Ms. Sarah K. Magruder Lyle, Vice President, Strategic Initiatives, American Fuel & Petrochemical Manufacturers communicated with Mr. Pruitt, requesting that he take a particular action in his capacity as Oklahoma Attorney General. Ex. C (Email from Sarah Magruder Lyle to Scott Pruitt, Subject: AFPM's 2014 Renewable Fuel Standards Waiver Filed (Aug. 14, 2013)). This e-mail, addressed to Mr. Pruitt at his personal "me.com" email address, requested Mr. Pruitt to act on a matter within the scope of his authority as Oklahoma Attorney General, and thus both relates to state business and contradicts Mr. Pruitt's sworn statement to Senator Whitehouse. Further evidence that this email concerns state business is provided by the fact that Ms. Lyle copied Clayton Eubanks of the Oklahoma Attorney General's office on the email at Mr. Eubanks' official state email address (Clayton.Eubanks@oag.ok.gov). *Id.* While it is unclear whether Mr. Pruitt took the state action requested of him by Ms. Lyle, that circumstance does not negate Mr. Pruitt's use of his me.com email account for state business purposes.

Another email includes a partially redacted email address for Mr. Pruitt, and shows correspondence from an Oklahoma representative of the American Legislative Exchange Council, or ALEC, regarding a speaking engagement for Mr. Pruitt at an ALEC meeting in his capacity as Oklahoma Attorney General. *See* Ex. D (Emails Re: ALEC Speaking Engagement (April 16, 2013)).

These emails do not include messages sent from Mr. Pruitt's personal email address, but they do show (or suggest) that he received official email at a nonofficial, personal "me.com" address. The clear inference is that AFPM association and ALEC (and possibly others) were aware of Mr. Pruitt's me.com address, likely because Mr. Pruitt used it to send emails, possibly including emails concerning official state business.[1] Further investigation could provide additional factual development in this area.

In addition, as noted in a letter sent March 17, 2017 from the Democratic members of the U.S. Senate Committee on Environment and Public Works, Mr. Pruitt failed to mention public speeches or presentations that he has made related to energy or the environment since 1998. *See*

[1] Additional emails from Mr. Pruitt's tenure may be forthcoming. *See, e.g.*, Ben Wolfgang, *Washington Times*, Oklahoma Supreme Court agrees with state AG, delays release of Pruitt emails (Feb. 28, 2017) (*available at* http://www.washingtontimes.com/news/2017/feb/28/scott-pruitt-email-release-delayed-oklahoma-suprem/).

Ex. B at 3. Specifically, Mr. Pruitt failed to state that he made speeches or presentations at the following events: a July 15, 2014 Four Star Leadership event; an August 4, 2014 telephonic briefing entitled "States Push Back: Curbing EPA's Power Grab"; and a May 20, 2014 discussion entitled "Scott Pruitt Presents 'The Oklahoma Attorney General's Plan: The Clean Air Act Section III(d) Framework that Preserves States' Rights" that was sponsored by the Federalist Society and held at the National Press Club. *See id.*

Based on the above, the Office of General Counsel should commence an investigation into whether these events constitute violations of the Oklahoma Rules of Professional Conduct, with emphasis on Rule 8.4(c), in the context of Mr. Pruitt's position as a public servant which holds him to the highest standards of ethical conduct. Indeed, it appears that Mr. Pruitt misrepresented material facts that bore on the Senate Committee's analysis of Mr. Pruitt's fitness to serve as EPA Administrator. The Center and Prof. Van de Biezenbos respectfully request the Oklahoma Bar Association's Office of General Counsel to investigate this grievance and determine whether Mr. Pruitt violated the Oklahoma Rules of Professional Conduct during his Congressional in connection with his confirmation hearing to serve as Administrator of the U.S. Environmental Protection Agency.

Exhibit A

Transcript, Hearing on Nomination of Attorney General Scott Pruitt to be Administrator of the U.S. Environmental Protection Agency
January 18, 2017
(Excerpts)

HEARING ON NOMINATION OF ATTORNEY GENERAL SCOTT PRUITT TO BE ADMINISTRATOR OF THE U.S. ENVIRONMENTAL PROTECTION AGENCY

Wednesday, January 18, 2017

United States Senate

Committee on Environment and Public Works

Washington, D.C.

The committee met, pursuant to notice, at 10:00 a.m. in room 406, Dirksen Senate Office Building, the Honorable John Barrasso [chairman of the committee] presiding.

Present: Senators Barrasso, Carper, Inhofe, Capito, Boozman, Wicker, Fischer, Moran, Rounds, Ernst, Sullivan, Cardin, Sanders, Whitehouse, Merkley, Gillibrand, Booker, Markey, Duckworth, and Harris.

Also Present: Senator Lankford.

STATEMENT OF THE HONORABLE JOHN BARRASSO, A UNITED STATES SENATOR FROM THE STATE OF WYOMING

Senator Barrasso. Good morning. I call this hearing to order.

We have quite a full house today. I welcome the audience. This is a formal Senate hearing, and in order to allow the Committee to conduct its business, we will maintain decorum. That means if there are disorders, demonstrations by a member of the audience, the person causing the disruption will be escorted from the room by the Capitol Police.

Since this is our first hearing of this session, I would like to welcome our new members, Senators Jerry Moran, Joni Ernst, Tammy Duckworth and Kamala Harris. Thank you very much and congratulations in joining the Committee.

I would also like to welcome Senator Tom Carper in his new role as the Ranking Member of the Committee. You are here, even if you have a scratchy throat, 40 years from when you were Treasurer of Delaware, member of Congress, governor, member of the U.S. Senate. Have not missed a day. You are Cal Ripken, Jr. and the iron man. So thanks for being here. Thank you. I look forward to working with you.

He deserves applause.

With regard to procedure, we will follow the early bird rule in terms of the order of member questions. Members who were here at the start, as you all are, will be placed in the line based on your seniority on the Committee. Members who arrive after the hearing has started will be added to the line in the order they arrive.

With respect to today's hearing, we will abide by the Committee's five-minute rule. The five minutes includes not just the questions, but also the nominee's answers, so I ask our members to please leave enough time for the nominee to answer your question. Today we will have many rounds of questions as are necessary so that members' questions are answered.

Today's hearing is to consider the nomination of Attorney General of Oklahoma, Scott Pruitt, to be the Administrator of the Environmental Protection Agency. Attorney General Pruitt has been a distinguished public servant as well, and we will hear the same from his fellow Oklahomans today. He served eight years in the Oklahoma State Senate before being elected Attorney General of Oklahoma in November of 2010, where he still serves.

There are numerous statements from his peers and the people that he has helped over the years that stand as a testament to his strong qualifications to run the Environmental Protection Agency.

Twenty-four State attorneys general wrote to both Ranking Member Carper and to me stating that "As attorneys general, we understand the need to work collaboratively to address threats to our environment that cross State lines, as well as the importance of a Federal counterpart in the EPA Administrator who possesses the knowledge, experience, and principles to work with our States to address issues affecting our environment. We believe that no one exemplifies these qualities more than Scott Pruitt."

Now, Attorney General Pruitt has taken on polluters, including the oil industry, when there was cause. Randy Ellis, an award-winning

investigative reporter with the Oklahoman newspaper, praised Pruitt for his ability to take on industry. The paper highlighted the work of Attorney General Pruitt to hold a large oil company accountable. This is what Ellis stated. He said, "Mr. Pruitt demonstrated that he will take on industry when they overstep when he sued oil companies such as BP who knowingly double-dipped by collecting reimbursements for corrective action environmental costs for sites that they polluted."

This is why I believe President-elect Trump nominated Attorney General Pruitt to serve as the Administrator of the Environmental Protection Agency. The EPA, under the leadership of a qualified and responsible administrator, is a vital tool that must be used to protect the air we breathe, the water we drink, and the communities where our families live. It is truly a sacred trust.

Colleagues on both sides of the aisle say that Attorney General Pruitt has the right experience for the position. Attorney General Pruitt understands the need to both protect the environment, while allowing our Nation's economy to grow. The agency needs a leader who will follow the laws created by this Committee.

During the last eight years, EPA administrators created broad and legally questionable new regulations which have undermined the American people's faith in the Agency. These regulations have done great damage to the livelihoods of our Nation's hardest working citizens. The regulatory zeal of the last eight years has violated a fundamental principle of environmental stewardship, which is do no harm. This failed environmental leadership has contributed to two of

the worst Government-created environmental disasters in decades: the Gold King Mine spill and Flint, Michigan's water crisis. Those disasters hurt people, many from low-income and minority communities who can least afford it.

As I have discussed with Attorney General Pruitt, my home State of Wyoming is a leading energy producing State. We have abundant supplies of coal, natural gas, crude oil, and uranium. These industries provide thousands of good paying jobs for Wyoming communities. We are also, in my opinion, one of the most beautiful States in the Nation. We are home to Yellowstone and Grand Teton National Parks and numerous national forests and pristine lakes and waterways. Our wildlife population is diverse and abundant. We have thriving populations of grizzly bears, wolves, elk, and bison. People travel from around the world to come to Wyoming because our State's natural resources are spectacular.

Wyoming has managed to strike that balance between our environment and our economy, and it shows. For eight years, Wyoming has suffered under an EPA that didn't believe in striking a balance. As EPA regulations crushed energy jobs in my State, State revenue fell that pays for State programs. This includes paying for our vital environmental programs. Clearly, a wholesale change is needed. Any new Administrator of the Environmental Protection Agency needs to protect the environment in a responsible way that doesn't ignore the good work that States do to protect their air, land, and water, as well as their economies.

At this time I would like to ask Ranking Member Senator Carper for an opening statement.

[The prepared statement of Senator Barrasso follows:]

Senator Whitehouse. I just want to touch on two things, and then we'll wrap up. The first is that on your questionnaire you listed an email address with a me.com domain as your business email. You also have an OAG.ok.gov address. Are there other email addresses that you have and are the other email addresses that you use for business other than your me.com and your OAG.ok.gov email addresses?

Mr. Pruitt. I am sorry, Senator. The "me" address is not a business email address. I am not sure why it was designated as such.

Senator Whitehouse. Well, maybe we can just correct the filing on that.

Mr. Pruitt. There are no other email addresses, if that is your question, Senator.

Senator Whitehouse. We have gone through the cases that you list as your environmental cases. When we take out the cases that were started by your predecessor, Drew Edmonson, and when you take out the cases that are fish kill cases, which I understand is a formulaic matter that is resolved by letter at the staff level, you count the fish, you pay the fee, and when you take out the qui tam cases, which are, for those who aren't lawyers, a private individual who brings an action and then the attorney general can step in and take the action over if they want, but it is brought in the first instance by a private individual. And then if you take out the cases in which you sued EPA, there is virtually nothing left.

And in addition to that, we have that you closed the environmental protection unit in Oklahoma as a free-standing unit. You told me when we met that you had rolled it into your federalism

unit. But I was just on the federalism unit is website, and the word "environmental" doesn't even appear on that. It appears to be run by the Solicitor General. It says over and over again that it is involved in appellate litigation. And of course, if you are bringing an action, you are not starting at the appellate level.

Mr. Pruitt. Senator, if I may, the Deputy Solicitor General, Clayton Eubanks, was actually employed by the previous attorney general. He has been designated the Deputy Solicitor General and is responsible for environmental related advice and consent to those agencies.

Senator Whitehouse. Yes. That's a different function, though. That's a different f unction than to bring an action. I have been an attorney general, too. I know the difference. The attorney general has an obligation to provide lawyers, to give advice to agencies. But you also have the authority to bring criminal actions, if you wish. And you have the authority to bring civil actions, if you wish. And it is those authorities that I believe have not gotten much attention.

And the last piece of that, because you will have a chance to respond, but I am on a short clock, is that there was in Oklahoma an environmental crimes task force that your predecessor led. It describes, and I would ask to have these documents put into the record, from 1997 to 2010 the OECTF, the Environmental Crimes Task Force or the Environmental Protection Unit, in conjunction with EPA and other entities, conducted 142 criminal investigations, resulting in 56 prosecutions. Criminal cases resulted in individual convictions on 110 felonies, 21 misdemeanor counts, corporate convictions, 10

felony and 3 misdemeanor counts, $8 million in fines, 28 years of jail time. We can put it in the record.

Do you even participate in the Oklahoma Environmental Crimes Task Force still?

Senator Barrasso. Without objection.

[The referenced information follows:]

Senator Barrasso. I want to thank all the members of the committee for your patience. I certainly want to thank the nominee for his time and his testimony today. The hearing is adjourned.

[Whereupon, at 4:55 p.m., the hearing was adjourned.]

Exhibit B

Letter from Democratic Members, U.S. Senate Committee on Environment and Public Works to EPA Administrator Scott Pruitt
March 17, 2017

United States Senate

COMMITTEE ON ENVIRONMENT AND PUBLIC WORKS

March 17, 2017

The Honorable Scott Pruitt
Administrator
Environmental Protection Agency
1200 Pennsylvania Ave., NW
Washington, DC 20004

Dear Administrator Pruitt:

Recent reporting and long-delayed disclosure of emails and documents from your time as the Oklahoma Attorney General show that you were not fully forthcoming and truthful with the Committee in advance of your confirmation. As members of the Environment and Public Works Committee, we respectfully request that you provide clarification by answering several questions and make specific commitments to promote transparency and accountability at the EPA as preceding Administrators have done before you. Our concerns and requests are described below, and we ask that you respond to us by April 7, 2017.

1. **Correcting the Record Regarding Your Use of Personal Email Address to Conduct Official Business**

In response to questions from Senator Whitehouse about your personal email address and use of it for official business, you stated three separate times that you only used your official Oklahoma Attorney General email address to conduct official business. Yet an examination of the documents the Oklahoma Attorney General's Office released to the *New York Times*, Fox 25 in Oklahoma, and the Center for Media and Democracy (CMD) reveal several instances in which your personal email address was used for official business. Fox 25 also received confirmation from the Oklahoma Attorney General's Office that you used your personal email address for official business and released a video showing documents proving you both received and sent official emails via your personal email address.

> **Request:** Based on this new information, we request that you correct the record, and provide an answer to one of the email-related questions posed to you during your confirmation process: "Have you ever conducted business using your personal email accounts, non-official Oklahoma Attorney General email accounts, text messages, instant messenger, voicemails, or any other medium? If yes, please provide all business-related emails, texts, from those mediums and any others used you used to conduct official business while Attorney General of Oklahoma."

Additionally, upon review of the documents responsive to the previously mentioned Open Records Act requests, the extent of your personal email use and whether your personal email accounts were adequately searched to respond to those requests remains unclear.

Moreover, the use of a personal email address to conduct official business could violate the Presidential and Federal Records Act Amendments of 2014.

Request: Please respond to the following questions:

- Were your personal email accounts searched for emails and documents that were responsive to the recently-released partial production of documents related to CMD's Open Records Act request? If so, how many responsive documents were found and how many were released?
- Dozens of Oklahoma Open Records Act requests, including nine from CMD, are currently pending before the Oklahoma Attorney General's Office, including some for text messages. Do you commit to allowing the Oklahoma Attorney General's Office to search your personal email account(s) and phone(s) for responsive documents?
- Have you retained all official emails and texts you sent and received on your personal email accounts and phones while Attorney General of Oklahoma?
- Since January 20, 2017, have you or any political appointees at EPA used non-official electronic messaging accounts, including email addresses, personal phones, and any encrypted messaging applications (e.g., Confide, Signal, Whisper) to send or receive official messages? If so, have complete copies of those records been forwarded to the corresponding official accounts within the 20 days after the creation or transmission of the record, as required by the Presidential and Federal Records Act Amendments of 2014?
- What steps are you taking to ensure you and all political appointees at EPA comply with the Presidential and Federal Records Act Amendments of 2014?
- In a question for the record following your confirmation hearing, Senator Whitehouse asked you to notify the Committee of all of the email addresses you plan to use in your role as EPA Administrator, including aliases or pseudonyms, which you agreed to do. The Committee has not yet received this information, and we request that you promptly provide it.

2. Affirm and Comply with the EPA Policy Regarding the Use of Personal Email Accounts

As you may know, during the confirmation process of your predecessor, Regina A. McCarthy, then Ranking Member David Vitter requested that the agency "issue new guidance … that outlines … standards and procedures to ensure that all official business is conducted solely on official government email accounts …" In response, then Acting Administrator Robert Perciasepe put into place CIO 2155.3, "Records Management Policy." The policy provides for full compliance by EPA and its personnel with records management and access requirements, and includes detailed implementation procedures and requirements for agency officials, management, staff and contractors.

Request: We ask that you commit to maintain the Records Management Policy and its rigorous implementation. We also ask that you direct staff to follow the spirit and intent of the policy as well as its express requirements, and that you ensure that devices, such as PIN-protected email or document transmission or other encryption applications not be

used by political appointees. In addition, in light of your own failure to respond truthfully to Senator Whitehouse's question, we ask that you affirm in writing your commitment to never use any personal email account to conduct professional business for the entirety of your tenure at EPA.

3. **Release of Your Calendar**

During your confirmation process, Senator Carper asked you to "list all public speeches or presentations you have made that included references to any issue related to energy or the environment since 1998, and please provide copies (written, audio, or video) of any such speeches or presentations." In your responses to the Committee[1], you provided a list of such events, but an examination of the documents the Oklahoma Attorney General released to the Center for Media and Democracy indicate that the material you provided the Committee was incomplete. For example, the list you provided does not include: a June 27, 2014 breakfast panel sponsored by the Americans for Prosperity; a July 15, 2014 Four Star Leadership event; an August 4, 2014 telephonic briefing entitled "States Push Back: Curbing EPA's Power Grab"; and a May 20, 2014 discussion entitled "Scott Pruitt Presents 'The Oklahoma Attorney General's Plan: The Clean Air Act Section 111(d) Framework that Preserves States' Rights'" that was sponsored by the Federalist Society and held at the National Press Club. The Oklahoma Attorney General has not yet agreed to release all of the documents requested by the Center for Media and Democracy and additional discrepancies between the events you told the Committee you participated in and what you appear to have actually done may yet be revealed.

Moreover, an examination of the documents that were released by the Oklahoma Attorney General demonstrate a disturbing pattern of coordination with the oil and gas sector as you planned your efforts to oppose EPA's regulations. For example, the American Fuel & Petrochemical Manufacturers, which opposed EPA's Renewable Fuel Standard (RFS) Program and ozone regulations, provided you with suggested language for an Oklahoma AG-authored petition, noting in 2013 that "this argument is more credible coming from a State." Later that year, you filed letters in opposition to both the RFS and ozone limits. In 2013, Devon Energy organized a meeting between your office, Leonard Leo of the Federalist Society and coal industry lawyer Paul Seby to plan the creation of a "clearinghouse" that would "assist AGs in addressing federalism issues." Melissa Houston, your then chief of staff, emailed Devon Energy saying "this will be an amazing resource for the AGs and for industry."

Request: The combination of your failure to disclose all of your speaking engagements to the Committee and your record of close coordination with the oil and gas sector raise concerns about whether such coordination will continue in your current role as EPA Administrator. So that we may better perform our oversight roles, we request that at the end of each month, you provide the Committee with a copy of your calendar that lists all meetings, calls, and events in which you participated, and the participants and subject of each such meeting, call, or event. We note that former Administrator McCarthy routinely released copies of her calendar under Freedom of Information Act requests,[2] and former

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[1] https://www.epw.senate.gov/public/_cache/files/daf68bcb-f572-4a90-b0bb-6da7c4790603/scott-pruitt-qfr-supplemental-materials-01.18.2017.pdf

[2] http://www.eenews.net/stories/1060022093

Administrator Jackson made her own, and other EPA appointees' calendars, publicly available each day.[3]

4. **Address Concerns about Secrecy Associated with Transition and Other Political Appointees**

A February 24, 2017 article in E&E News titled "Trump team kept some transition members secret" described a "broader 'action team' responsible for producing an 'action plan' for the agency whose members were never publicly disclosed." One of these members was reportedly Steve Milloy, who lists himself as the author of "Scare Pollution: Why and How to Fix the EPA," as well as a member of the Trump EPA transition team on his twitter biography.[4] According to the article, one of his lawsuits against the EPA "likened tests exposing people to diesel engine particulate emissions to medical experiments performed in Nazi concentration camps." His name does not appear on the official transition team list[5] for the agency. Other reports of personnel working on the EPA transition team raise conflicts of interest questions. For example, David Schnare, who is listed on the official transition team, is still identified as the General Counsel on the website of the E&E Legal Institute, which has sued the agency on both the Clean Power Plan and Waters of the United States rule (which is currently being weakened at the recent direction of the President).

According to the Office of Government Ethics (OGE) regulations,[6] there are several categories of employee who are subject to public financial disclosure requirements, including "Employees in positions which are excepted from the competitive service because of their confidential or policy-making character, unless the position has been excluded from the public financial disclosure requirements by the Director of the Office of Government Ethics."

Moreover, even if an employee is excluded from having to file public financial disclosures, OGE rules state that new entrant reports are required to be submitted by "An individual who has assumed the duties of a position for which public financial disclosure is required ("covered position"), unless the individual is expected to serve no more than 60 days in any single calendar year or unless the individual is transferring from one covered position to another without a break in service of more than 30 days." The Designated Agency Ethics Official (DAEO) would be expected to work to address any conflicts of interest that were revealed in those reports.

Request: We request that you provide the Committee with the following materials, along with monthly updates to these materials, until all political appointments to non-confirmed positions at EPA have been made:

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[3] https://www.epa.gov/sites/production/files/2014-02/documents/transparency_in_epas_operations.pdf
[4] https://twitter.com/JunkScience
[5] https://greatagain.gov/agency-landing-teams-54916f71f462#.cjg5vn69r
[6] https://www.oge.gov/Web/278eGuide.nsf/2cf9ac792bc0654a85257ca1005f838a/b03cd8fb3320588b85257f450074047?OpenDocument and https://www.oge.gov/Web/278eGuide.nsf/Content/Definitions+-+Officers+and+Employees+Subject+to+Public+Financial+Disclosure

- A list of all individuals who have at any time served on the Trump EPA transition and/or beach-head teams, including members of the "broader action team" referenced in the E&E News article, along with their affiliation(s) prior to their appointments.
- For each individual who has served or expects to serve as a member of the EPA transition and/or beach-head teams for longer than 60 days, including individuals who are serving as consultants, contractors or experts, a copy of the new entrant report that was filed with the DAEO, any conflicts analysis that was prepared for the individual, and documentation detailing any recusals or other measures designed to mitigate such conflicts. If no such report, analysis or documentation was prepared, please explain why not.
- A list of all individuals who are serving in, or plan to serve in, non-confirmed political appointments at the EPA, along with their affiliation(s) prior to their appointments.
- For each individual who is currently serving in a non-confirmed political appointment, please provide a copy of the new entrant report that was filed with the DAEO, any conflicts analysis that was prepared for the individual, and documentation detailing any recusals or other measures designed to mitigate such conflicts. If no such report, analysis or documentation was prepared, please explain why not.

5. **Commit to Transparent and Timely Review of Freedom of Information Act (FOIA) Requests**

While you were Attorney General of Oklahoma, your office accumulated a significant backlog of Open Records Act requests from the media and public, and in some cases it took your office over two years to produce responsive documents.

Request: To ensure the EPA is responding to FOIA requests in a transparent and timely manner, we ask that you provide the Committee with a list of open FOIA requests submitted to EPA (and the date on which each was submitted) at the end of each month.

We very much appreciate your prompt attention to this matter. Thank you for your consideration of our requests. If you have any questions about these requests, please feel free to contact Michal Freedhoff at the Committee on Environment and Public Works at 202 224 8832.

Sincerely,

Tom Carper
U.S. Senator

Bernard Sanders
U.S. Senator

Sheldon Whitehouse
U.S. Senator

Edward J. Markey
U.S. Senator

Tammy Duckworth
U.S. Senator

Exhibit C

Email from Sarah Magruder Lyle to Scott Pruitt
Subject: AFPM's 2014 Renewable Fuel Standards Waiver Filed
(Aug. 14, 2013)

From:	Sarah Magruder Lyle
To:	Scott Pruitt (Scott.pruitt@me.com)
Cc:	Clayton.Eubanks@oag.ok.gov
Subject:	AFPM's 2014 Renewable Fuels Standard Waiver Filed
Date:	08/14/2013 03:48 PM
Attachments:	AFPM RFS Waiver Petition 8.13.2013.pdf

Dear General Pruitt –

I hope you are doing well!

Attached you will find AFPM's 2014 Renewable Fuels Standard (RFS) waiver petition which was filed with the Environmental Protection Agency (EPA) on August 13. While this petition does not address environmental harm, it provides compelling support on the economic harm cause by the ethanol blendwall under the RFS mandate. The filing of this petition starts the statutory 90-day time period within which EPA must respond.

AFPM remains very interested in the prospect of your state filing a similar waiver request highlighting the environmental harm caused by the RFS mandate which we discussed previously. I would be happy to answer any questions you may have. Please feel free to contact me at slyle@afpm.org or at 202.552.4367.

Best,

Sarah K. Magruder Lyle
Vice President, Strategic Initiatives

American
Fuel & Petrochemical
Manufacturers
1667 K Street NW
Suite 700
Washington, DC 20006
202.457.0480 office
202.552.4367 direct

slyle@afpm.org
Learn more about AFPM at afpm.org

CONFIDENTIALITY NOTICE: This electronic message contains information from the American Fuel & Petrochemical Manufacturers that may be confidential or privileged. The information is intended solely for the use of the individual(s) or entity(ies) named above. If you are not the intended recipient, be aware that any disclosure, copying, distribution, or use of the contents of this message is prohibited. If you have received this e-mail in error, please notify us immediately by telephone at (202) 457-0480 or by reply e-mail and permanently delete this e-mail, any attachments, and all copies thereof.

Exhibit D

Emails Re: ALEC Speaking Engagement (April 16, 2013)

From Amy Kjose Anderson <aanderson@alec.org>
To "Ashley.Olmstead@oag.ok.gov" <Ashley.Olmstead@oag.ok.gov>, Melissa Houston <melissamhouston@gmail.com>, "Scott PRuitt (scott.pruitt@[redacted] <scott.pruitt@[redacted]
Cc "A bro, Derek" <Derek.Albro@dvn.com>
Date 04/16/2013 02:20 PM
Subject RE: ALEC Speaking Engagement

Forgot to include the title of the workshop: Embracing American Energy Opportunities: From Wellheads to Pipelines

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Amy Kjose Anderson
Civil Justice Task Force Director and Oklahoma Membership Contact
American Legislative Exchange Council
(p) (202) 742-8510
(m) (202) 870-1110
alec.org/CivilJustice

From: Amy Kjose Anderson
Sent: Tuesday, April 16, 2013 11:38 AM
To: 'Ashley.Olmstead@oag.ok.gov'; 'Melissa Houston'; Scott PRuitt (scott.pruitt@[redacted]
Cc: 'Albro, Derek'
Subject: ALEC Speaking Engagement

Wanted to provide you with details on General Pruitt's speaking engagement at the May 3rd ALEC meeting. The energy workshop will be in Ballroom DE at the Cox Convention Center and runs from 11am to 12:15 on the 3rd. General Pruitt will be joined by Jack Stark, Continental and Corey Goulet, TransCanada. Corey will be discussing infrastructure, Jack will be talking about fracking technology and safety, and we are looking forward to hearing General Pruitt's remarks on state primacy in oil and gas regulation and the EPA's sue & settle modus operandi. We expect that Corporation Commissioner Douglas will moderate the panel, though this is still underworks. Each panelist will have 15 to 20 minutes, which should leave 15 minutes for Q&A. If he has any questions, don't hesitate to call or email me. I will also be available on the day of at (202) 870-1110.

General Pruitt will be registered to attend any of the ALEC conference he would like. He's welcome to attend the Board Dinner on the evening of the 2nd at the Governor's Mansion (just let me know ahead of time) and we'd love to have him stick around for any of the rest of the conference... there is a reception on the evening of the 3rd at the Petroleum Club from 6 to 8pm. And let me know whether you've considered if he would like to participate as the Civil Justice Task Force Luncheon speaker... would be delightful to have our current legislative members benefit from his experience as a former state legislator, an ALEC member and a now attorney general. Koch Industries is sponsoring that luncheon.

Melissa, would you also like to be registered for the event? I can extend you a complimentary registration.

From:	meetings@alec.org
Reply To:	meetings@alec.org
To:	melissa.houston@oag.ok.gov
Cc:	rhonda.geller@oag.ok.gov
Subject:	Purchase Confirmation No. 075420 (Ms. Melissa Houston)
Date:	04/22/2013 07:00 PM

Dear Ms. Melissa Houston,

Thank you for your purchase!
For your records, here is a summary of your purchase from **The American Legislative Exchange Council**.

Date/Time: 4/22/2013 7:55 PM

Purchased By:
Ms. Melissa Houston
Customer ID: 2436020
(405) 522-4422
melissa.houston@oag.ok.gov

Your confirmation number is: 075420 Please keep this number for any references.

Shopping Cart Items	Amount	Quantity	Total
2013 Spring Task Force Summit	$500.00	1	$500.00
Spring Task Force Summit 2013 Registration Discounts	($500.00)	1	($500.00)

Subtotal	**$0.00**
Taxes	$0.00
Shipping	$0.00
Invoice Total	**$0.00**
Grand Total	**$0.00**
Payment	$0.00
Order Balance	$0.00

From:	Amy Kjose Anderson
To:	Katie.Dark@oag.ok.gov
Subject:	RE: Attorney General Information
Date:	05/02/2013 09:58 AM

The sponsors for the Friday evening reception are:
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Daiichi Sankyo, Inc.
OGE
Oklahoma State Chamber of Commerce

And the sponsor for the Board Dinner is Express Employment Professionals.

I'll be back to you shortly on the person who will meet AG Pruitt in the lobby.

Thanks!

Amy Kjose Anderson
Civil Justice Task Force Director and Oklahoma Membership Contact
American Legislative Exchange Council
1101 Vermont Ave NW, 11th Floor
Washington, D.C. 20005
(p) (202) 742-8510
(f) (202) 466-3801
alec.org/CivilJustice

From: Katie.Dark@oag.ok.gov [Katie.Dark@oag.ok.gov]
Sent: Wednesday, May 01, 2013 11:39 AM
To: Amy Kjose Anderson
Subject: Attorney General Information

Amy,

Thanks for giving me all the information.

If you could send me the information regarding who will be meeting the Attorney General in the lobby before the speaking event and their information.

Also, the rest of the information on the reception and if there will be any specials guests at the reception.

Thank you so much!

Katie Dark

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