**GenOn Power Midwest LP**
**Avon Lake Generating Station**
33570 Lake Road
Avon Lake, OH 44012

**VIA TRACKED DELIVERY**

August 29, 2019

Mr. Cole Miller
Ohio Environmental Protection Agency
Central Office
Division of Surface Water
Lazarus Government Center
50 West Town Street, Suite 700
Columbus, OH 43215

OHIO EPA-DSW
2019 SEP -3 AM 11:00

**GenOn Power Midwest LP**
**Avon Lake Generating Station**
**NPDES Permit No. 3IB00002*LD**
**Flow Reduction Report per Part I.C.2---Interim Status Update**

Dear Mr. Miller:

The Avon Lake Generating Station (ALGS), operated by GenOn Power Midwest LP (GenOn), is located in Lorain County, approximately 20 miles west of Cleveland, Ohio, on the southern shore of Lake Erie. GenOn changed its name from NRG to GenOn on March 8, 2019. ALGS maintains one coal-fired steam electric unit (Unit 9) and one simple cycle gas turbine for a total net generating capacity of approximately 715 megawatts (MW). Unit 7 was retired on April 15, 2016 and has not operated as an electric generating unit (nor utilized non-contact cooling water) since then.

## Regulatory Obligations and Ongoing 316(b) Compliance Activities

The Ohio Environmental Protection Agency (OEPA) renewed Avon Lake's National Pollutant Discharge Elimination System (NPDES) Permit No. 3IB00002*LD, effective January 1, 2019. Per Part I.C.2. of the current permit and to address interim compliance obligations of Section 316(b) of the Clean Water Act, ALGS must evaluate the feasibility of reducing station cooling water withdrawals further during periods when the station is offline (i.e., when Unit 9 is not operating). This interim status update describes the ongoing flow reduction evaluation and provides updates to the Flow Reduction Report that was submitted to OEPA on April 29, 2019.

GenOn is currently developing technical material under §122.21(r)(2)-(13) for submittal to OEPA no later than February 1, 2020. Commensurate with these efforts, ALGS is evaluating flow reductions as one of the technologies and operating measures that could be used to help comply with the 316(b) requirements. As an extension of this work, and as required by Part I.C.2. of the current NPDES permit, ALGS is examining the feasibility of further reducing station withdrawals when Unit 9 is offline and which represents a period when one-pump operations are still maintained as further discussed below. The goal is to reduce impingement and entrainment during one-pump operations. ALGS is exploring alternatives that will potentially reduce through-screen velocities to below 0.5 foot per second (fps). The resulting flow reductions will also reduce impacts during the May-June peak entrainment season and the peak impingement season from February-May.

**Intake Tunnel Flow Velocity**

Traditionally, ALGS has maintained a flow velocity of 1 fps in the intake tunnel when Unit 9 is offline to sustain oxygen levels and avoid mussel die-off and condenser tube plugging upon restart. Mussel infestations in the intake tunnel could be significant, and if inadequate oxygen levels are encountered, mussel die-off would occur. As an initial assessment in this regard, ALGS is evaluating whether a lower flow, and lower oxygen level, in the intake tunnel can be implemented without causing mussel die-off. It has been speculated that ALGS could maintain a velocity as low as 0.5 fps and still supply an adequate oxygen level that would avoid mussel die-off. Correspondingly, a reduced flow velocity would facilitate one-pump flow reductions via pump throttling or other means. Ongoing monitoring would be required to ensure that significant mussel growth and subsequent die-off will not occur due to reduced tunnel velocities.

ALGS hired commercial divers to enter and inspect the physical condition of the intake tunnel and evaluate the presence of mussels during the Summer Readiness Outage in early May 2019. The tunnel was found to be in good overall condition with very little to no mussel growth. The inspection indicates that reduced intake tunnel velocities can be implemented for evaluation. In addition to flow reductions during one-pump operations, ALGS will evaluate no-pump operations. The no-pump scenario would be to cycle between one-pump and no-pump operations. It is anticipated that some flow may be required from time to time for mussel control. ALGS will evaluate whether the pump can be shut down for days, a week, or even longer when Unit 9 is offline without experiencing unacceptable mussel infestation. ALGS will evaluate this mode of operation after the summer peak load season, in the fall and winter when Unit 9 can be offline for extended periods. An update on the success of this approach will be incorporated into the §122.21(r)(2)-(8) report which is due for submittal to OEPA on February 1, 2020.

**Initial Flow Reduction Alternatives for One-Pump Operations**

As documented in the April 29, 2019 Flow Reduction Report, preliminary alternatives identified for consideration during one-pump operations included throttling one pump, flow metering, increasing rotor lift for winter operation, adding a variable-frequency drive (VFD) to one pump, modifying a pump for lower capacity, short circuiting one pump output through one or two idle pumps, and adding a jockey pump. Several of these alternatives were eliminated for the reasons cited below. Subsequent to the April 2019 report, ongoing efforts have further refined this list of alternatives, particularly related to recirculation of non-contact cooling water flows. The discussion below identifies alternatives that were either previously or recently eliminated and those that have been retained for consideration. These alternatives are broken out by those associated with direct no-pump and one-pump flow reductions and those which contain a recirculation component.

**Flow Reduction Alternatives**

As noted above, some of the initially identified alternatives were previously eliminated in lieu of more promising options, such as those related to pump throttling and application of VFDs or magnetic (mag) drives. Options that were previously eliminated include:

- Modifying a pump for lower capacity – This alternative was eliminated because the full capacity of all three Unit 9 circulating water pumps (CWPs) are needed for full-load operations.
- Short circuiting one pump output through one or two idle pumps – This alternative was eliminated because the idle pumps would have to be secured, causing undue wear and tear on those pumps. In addition, during a Unit 9 restart, the pumps would need to be unsecured, leading to a more complicated process to bring the unit back online.

- Adding a jockey pump – This alternative would have necessitated the installation of a smaller new pump to operate in place of an existing CWP. Physical constraints and cost precluded further consideration of this alternative.

Options that have been eliminated since the April 29, 2019 report include:

- Installation of a VFD or mag drive – This option has been eliminated because a flow reduction approach, cross-connecting the 11-foot-diameter Unit 9 intake tunnel with the adjacent Unit 6-8 circulating water flume, provides greater flow reductions and more operational flexibility at a lower capital and operation and maintenance cost.

Retained as a potentially viable option in the April 2019 report, pump throttling involves several different steps. During testing in March 2019, the Unit 9 "B" CWP was operated while inlet valves were closed on the condenser water boxes. Specifically, three of the four water boxes (two each on Condenser "A" and Condenser "B") were valved off, with the remaining water box inlet throttled (approximately 20 to 25 percent) using the existing inline butterfly valve. When combined with a partial siphon break on the condenser, this throttling condition enabled the system pressure to achieve a sustainable 7.5 pounds per square inch (psi) and a resultant drop in flow to near 90,000 gallons per minute (gpm). This is a notable decrease from the CWP design flow of 110,000 gpm. At this system pressure (7.5 psi), the minimum flow ratings of the CWP are being approached. ALGS began successfully implementing this flow reduction measure during one-pump operations in March 2019.

**Flow Recirculation Alternatives**

ALGS currently operates a small recirculation system during cold weather to help avoid icing of the intake screens. The heating gate is situated between the discharge and intake channels and is equipped with a bow thruster (electric ship propeller) that pulls warm water back into the intake channel. This heating gate is typically operated when Unit 9 is online and two or three CWPs are running. It is estimated that up to 15,000 gpm of non-contact cooling water can be circulated with the existing system. ALGS evaluated whether this recirculating system can be utilized during one-pump operations. Every gallon of non-contact cooling water that can be recirculated replaces a gallon of water that must be withdrawn from Lake Erie. Flow recirculation would be most valuable during peak entrainment and impingement seasons. Due to the presence of fish in the discharge channel and potential increases in impingement from this approach, ALGS will continue to operate this system only as needed during the cold weather. However, this alternative has been eliminated from further consideration as an additional flow recirculation measure.

Another recirculation option described in the April 2019 report involved the potential design of a modified flow path to cross-connect the 11-foot-diameter Unit 9 intake tunnel with the adjacent Unit 6-8 circulating water flume. Water recirculated in this manner would flow back into the Unit 9 intake behind the traveling water screens. The pipe and valve would be sized to provide anywhere from 0 to 100 percent flow from one CWP. This alternative would allow ALGS to manage the flow through the Unit 9 intake tunnel, keeping it flooded and the mussels alive, while reducing the flow and velocity through the traveling water screens with one pump in service. Calculations indicate that through-screen velocities should be less than 0.5 fps with one CWP in service. The feasibility, size, design, and cost of the recirculation pipe, valve, and orifices have been evaluated, and it was determined that this level of recirculation flow can be achieved without causing any undue wear on the pumps, piping, or concrete structures. This flow recirculation approach will constitute one of the several BTA compliance approaches that will be presented for OEPA's consideration in the §122.21 (r)(2)-(8) report.

ALGS will continue to evaluate the possibility of improving cooling water recirculation when the station is online (two- and three-pump operation), both during the winter and at other times of the year when Lake Erie water temperatures are low enough to allow some recirculation without affecting operational efficiency. From an overall perspective, it is recognized that any achievable flow reductions will also help ALGS comply with its over-arching 316(b) requirements. This will be evaluated if the modified flow path to cross-connect the 11-foot-diameter Unit 9 intake tunnel with the adjacent Unit 6-8 circulating water flume is installed.

**Summary of Retained Alternatives**

From the above discussions, the following table summarizes the flow reduction alternatives currently retained for further consideration/evaluation during one-pump operations (Unit 9 offline):

| Alternative | Description | CWPs Operating | Capacity (gpm) | Recirc Flow (gpm) | Comments |
|---|---|---|---|---|---|
| Existing Condition | One Pump Design Flow | 1 | 110,000 | 0 | |
| 1 | Throttle One Pump | 1 | 90,000 | 0 | 18% reduction from 110,000 gpm design flow |
| 4A | Cross-connect Unit 9 Intake Tunnel - recirc. closed | 1 | 94,000 | 0 | |
| 4B | Cross-connect Unit 9 Intake Tunnel - recirc. throttled 10% | 1 | 94,000 | 47,000 to 70,500 | Flow through screens may be cut by 50-75% |
| 4C | Cross-connect Unit 9 Intake Tunnel - recirc. open | 1 | 94,000 | 94,000 | No flow through intake screens, but flow through intake tunnel |
| 5 | Shut pump off | 0 | 0 | 0 | Cycle between no-pump and one-pump operations |

**Flow Instrumentation**

At full-load conditions, Unit 9 operates three fixed-speed CWPs, each with a design capacity of 110,000 gpm. Preliminary indications are that these pumps, due to their age (49 years) and wear and tear, are operating at closer to 90,000 or 100,000 gpm. Information supporting these decreased operational capabilities was gathered from a newly installed flow meter that briefly operated during June 2019 prior to electrical issues that resulted in short-circuiting of the associated portable flow data recorder. Repairs to the flow data recorder are expected by early September, and ALGS will resume data collection to further assess and quantify flows during one-, two-, and three-pump operations.

**Schedule**

As mentioned, GenOn is currently developing technical material under §122.21(r)(2)-(13) for submittal to OEPA no later than February 1, 2020. Within this framework, ALGS is evaluating flow reductions as one of the technologies and operating measures that could be used to help comply with the 316(b) requirements. ALGS needs to assess how no-pump and one-pump flow reductions may work within the strategies developed for 316(b) compliance. As such, an evaluation of additional no-pump and one-pump flow reductions will be made concurrently with the (r)(2)-(13) submittal in February 2020 in order to allow sufficient time to further vet the alternatives identified within this correspondence, including receipt of necessary preliminary designs and possible field testing. For the recirculation option to cross-connect

the Unit 9 and Unit 6-8 intake tunnels, additional efforts will be required to do a preliminary design and to specify the equipment and its installation.

In addition, ALGS will begin to evaluate no-pump operations this fall and winter when Unit 9 is offline for extended periods. If this measure can be implemented without undue mussel die-off in the intake tunnel, obvious benefits would accrue during the January-May impingement and May-June entrainment seasons. Following reactivation of the flow meter (anticipated by early September), data collection will resume relative to one-, two-, and three-pump design flow comparative evaluations.

We trust that this submittal is in accordance with OEPA's expectations. Should you have any questions or concerns regarding the information contained herein, please contact Scott Cameron directly at (440) 930-6564 or via email at Scott.Cameron@genon.com.

Respectfully submitted,

Daniel A. Rogatto
Plant Manager

cc: Ms. Zorica Dejanovic, OEPA-NEDO (via email)
Scott Cameron, ALGS
Steve Frank, GenOn
David Shott, APTIM

Ohio Environmental Protection Agency

**Mike DeWine**, Governor
**Jon Husted**, Lt. Governor
**Laurie A. Stevenson**, Director

9489 0090 0027 6054 1446 66

9489 0090 0027 6054 1468 68

April 17, 2019

Re: NPDES Name Change
Ohio EPA Permit No. 3IB00002*LD
Application No.: OH0001112

GenOn Holdings, Inc.
Attn: Daniel Rogatto
1360 Post Oak Boulevard, Suite 2000
Houston, TX 77056

Dear Mr. Rogatto:

Ohio EPA-DSW has received a written request from the OEPA Northeast District Office regarding your company's name change for the above permit. The NPDES permit has been changed to reflect the correct name. Attached is a new copy of front page of your current permit.

Should you have any questions, please contact me at (614) 644-2031.
Sincerely,

Kevin J. Fowler, Supervisor
Permit Processing Unit
Division of Surface Water

KJF/kep

Enclosure

**CERTIFIED MAIL**

cc: NEDO
File

Application No. OH0001112

Issue Date: November 20, 2018

Effective Date: January 1, 2019

Expiration Date: December 31, 2023

Ohio Environmental Protection Agency
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., hereinafter referred to as the "Act"), and the Ohio Water Pollution Control Act (Ohio Revised Code Section 6111),

GenOn Power Midwest, LP

is authorized by the Ohio Environmental Protection Agency, hereinafter referred to as "Ohio EPA," to discharge from the Avon Lake Generating Station located at 33570 Lake Road, Avon Lake, Ohio, Lorain County and discharging to Lake Erie in accordance with the conditions specified in Parts I, II, III, IV, V, and VI of this permit.

This permit is conditioned upon payment of applicable fees as required by Section 3745.11 of the Ohio Revised Code.

This permit and the authorization to discharge shall expire at midnight on the expiration date shown above. In order to receive authorization to discharge beyond the above date of expiration, the permittee shall submit such information and forms as are required by the Ohio EPA no later than 180 days prior to the above date of expiration.

Laurie A. Stevenson
Director

Total Pages: 64

GenOn Holdings, Inc.
1360 Post Oak Blvd. Suite 2000
Houston, Texas 77056

GenOn Holdings, Inc.

OHIO EPA - DSW
2019 APR 12 AM 9:59

April 2, 2019

Ohio EPA
Division of Surface Water, NPDES Permit Unit
P.O. Box 1049
Columbus, OH 43216-1049

Re: Corporate Name Change GenOn Holdings, Inc. Subsidiaries - Permits, Licenses, and Registrations

To whom it may concern:

Please be advised that certain wholly-owned GenOn Holdings, Inc. subsidiaries and holders of the referenced permits (see attached list) recently changed their name from NRG to GenOn.

There is no change in owner, operator, or control of these facilities. Furthermore, there is no change in facility operation, emissions and discharges, or any other conditions represented in the referenced permits. We request that the name "NRG Power Midwest LP" be replaced with "GenOn Power Midwest, LP" on the permits, licenses, and/or registrations that are listed in the attached table.

Documentation evidencing the name change is enclosed. You can find additional information about GenOn Holdings, Inc. on its website www.GenOn.com. If there are any questions, please contact me at 440-930-6426 or at daniel.rogatto@genon.com. Thank you.

Sincerely,

Daniel Rogatto
Plant Manager

31B-2 & LD

**Name Changes for GenOn Holdings, Inc. Corporate Subsidiary Entities**
(33750 Lake Road, Avon Lake, OH 44010)

| Old Name | New Name |
|---|---|
| NRG Power Midwest LP | GenOn Power Midwest, LP |

**Permits, Licenses, & Registrations that Require Name Changes**

| |
|---|
| NPDES Permit 3IB00002*LD |

## Stiteler, Deborah

**From:** Miller, Cole
**Sent:** Thursday, November 29, 2018 9:42 AM
**To:** Stiteler, Deborah
**Subject:** FW: NRG Avon Lake NPDES Finalization

Can you sent the NRG Avon Lake package to:

33570 Lake Rd
AVON Lake, Oh 44012

9489 0090 0027 6025 8184 35

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**From:** Cameron, Scott <Scott.Cameron@genon.com>
**Sent:** Thursday, November 29, 2018 9:41 AM
**To:** Miller, Cole <Cole.Miller@epa.ohio.gov>
**Cc:** Dejanovic, Zorica <Zorica.Dejanovic@epa.ohio.gov>
**Subject:** Re: NRG Avon Lake NPDES Finalization

33570 Lake Rd
AVON Lake, Oh 44012

Sent from my iPhone

On Nov 29, 2018, at 9:25 AM, "Cole.Miller@epa.ohio.gov" <Cole.Miller@epa.ohio.gov> wrote:

> Scott,
>
> We sent the permit package to the previous address. What address should we route it to?
>
> In the meantime, here's a link to the permit:
>
> http://wwwapp.epa.ohio.gov/dsw/permits/doc/3IB00002.pdf
>
> And a link to the fact sheet:
>
> https://epa.ohio.gov/dsw/permits/index
>
> Thanks,
> Cole Miller
> Ohio EPA
> (614) 728-3846
>
> ---
>
> **From:** Cameron, Scott <Scott.Cameron@genon.com>
> **Sent:** Wednesday, November 21, 2018 7:10 PM
> **To:** Miller, Cole <Cole.Miller@epa.ohio.gov>
> **Cc:** Dejanovic, Zorica <Zorica.Dejanovic@epa.ohio.gov>
> **Subject:** Re: NRG Avon Lake NPDES Finalization

Cole
I'm sorry I'm off until next Monday the 26th on vacation out of town.
Thanks
Scott

Sent from my iPhone

On Nov 20, 2018, at 8:12 AM, "Cole.Miller@epa.ohio.gov" <Cole.Miller@epa.ohio.gov> wrote:

> Hi Scott,
>
> Ohio EPA is preparing to finalize the NRG AL permit. If you're available this afternoon (anytime after 12:00), I would like to discuss the final permit. Similarly, I'm available after 12:30 tomorrow.
>
> In short, does 1:00 PM today work for a call?
>
> Thanks,
> Cole Miller
> Ohio EPA, DSW
> (614) 728-3846



**Did You Know:** Children of parents who talk to their teens about d up to 50% less likely to use. Start the conversation: StartTalking.Oh

This email is intended for the sole use of the intended recipient and may contain privileged, sensitive or protected information. If you are not the intended recipier that the unauthorized use, disclosure, copying, distribution, or action taken in reliance on the contents of this communication is prohibited. If you have received th error, please notify the sender via telephone or return email and immediately delete this email.

Ohio Environmental Protection Agency

**John R. Kasich**, Governor
**Mary Taylor**, Lt. Governor
**Craig W. Butler**, Director

November 20, 2018

RE: Ohio EPA Permit No:3IB00002*LD
Facility Name: Avon Lake Generation Station

NRG Power Midwest, LP
121 Champion Way, Suite 300
Canonsburg PA 15317

Ladies and Gentlemen:

Transmitted herewith is one copy of the final National Pollutant Discharge Elimination System permit referenced above. A copy of this NPDES permit is available online at http://epa.ohio.gov/dsw/permits/npdes_info. An invoice for a NPDES permit issuance fee may be included, and is in addition to any application fee previously submitted. If an invoice is enclosed it will include instructions for paying the issuance fee to Ohio EPA.

You are hereby notified that this action of the Director is final and may be appealed to the Environmental Review Appeals Commission pursuant to Section 3745.04 of the Ohio Revised Code. The appeal must be in writing and set forth the action complained of and the grounds upon which the appeal is based. The appeal must be filed with the Commission within thirty (30) days after notice of the Director's action. The appeal must be accompanied by a filing fee of $70.00, made payable to "Ohio Treasurer Josh Mandel", which the Commission, in its discretion, may reduce if by affidavit you demonstrate that payment of the full amount of the fee would cause extreme hardship. Notice of the filing of the appeal shall be filed with the Director within three (3) days of filing with the Commission. Ohio EPA requests that a copy of the appeal be served upon the Ohio Attorney General's Office, Environmental Enforcement Section. An appeal may be filed with the Environmental Review Appeals Commission at the following address:

Environmental Review Appeals Commission
30 East Broad Street, 4th floor
Columbus, OH 43215

Ohio EPA has developed a customer service survey to get feedback from regulated entities that have contacted Ohio EPA for regulatory assistance, or worked with the Agency to obtain a permit, license or other authorization. Ohio EPA's goal is to provide our customers with the best possible customer service, and your feedback is important to us in meeting this goal. Please take a few minutes to complete this survey and share your experience with us at http://www.surveymonkey.com/s/ohioepacustomersurvey .

Sincerely,

Kevin J. Fowler, Supervisor
Permit Processing Unit
Division of Surface Water

9489 0090 0027 6025 8190 43

KJF/dks

Enclosure

**CERTIFIED MAIL**

# Ohio EPA Invoice/Receipt

**Date Printed:** November 20, 2018

**Revenue ID:** 1256485

***Please include this Revenue ID with all correspondence.***

**Organization ID:** 34101

**Information:** NRG Power Midwest LP
121 Champion Way Ste 200
Canonsburg, PA 15317-

**Due Date:** February 01, 2019

**Amount Due:** $2,250.00

**Effective Date:** January 01, 2019

**Revenue Description:** DSW- NPDES Permit Issuance (PTONI)

**Program Name:** Surface Water Programs

**Reason:** NPDES Permiy Issuance for NRG Avon Lake Generating Station 3IB00000*LD

***For some Revenues, Interest and/or Penalties may be charged for late payment.***

**Next Interest Date (if applicable):** March 03, 2019

**Next Penalty Date (if applicable):**

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**Remittance Advice** | **Detach Here - Please Return This Portion With Your Payment**

**Organization ID:** 34101

**Information:** NRG Power Midwest LP
121 Champion Way Ste 200
Canonsburg, PA 15317-

**Due Date:** Feb 01, 2019

**Amount Due:** $2,250.00

**Secondary Type/Id:** SNPDE / 3IB00002

**Revenue Type:** PTONI

**Amount Enclosed:** $_____

**Please write this number on your check. Revenue ID: 1256485**
**Make check or money order payable to "Treasurer, State of Ohio"**

**Remit to:** **Ohio Environmental Protection Agency - OFA**
**Department L-2711**
**Columbus, OH 43260-2711**

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**For Ohio EPA use only**

**Check ID:** _____

**Check Date:** _____

**Check Number:** _____

**Check Amount:** $_____

| | | | | |
|---|---|---|---|---|
| 34101 | NRG Power Midwest LP | 225000 | PTONI | 1256485 |

Application No. OH0001112

Issue Date: November 20, 2018

Effective Date: January 1, 2019

Expiration Date: December 31, 2023

Ohio Environmental Protection Agency
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., hereinafter referred to as the "Act"), and the Ohio Water Pollution Control Act (Ohio Revised Code Section 6111),

NRG Power Midwest LP

is authorized by the Ohio Environmental Protection Agency, hereinafter referred to as "Ohio EPA," to discharge from the NRG Avon Lake Generating Station located at 33570 Lake Road, Avon Lake, Ohio, Lorain County and discharging to Lake Erie in accordance with the conditions specified in Parts I, II, III, IV, V, and VI of this permit.

This permit is conditioned upon payment of applicable fees as required by Section 3745.11 of the Ohio Revised Code.

This permit and the authorization to discharge shall expire at midnight on the expiration date shown above. In order to receive authorization to discharge beyond the above date of expiration, the permittee shall submit such information and forms as are required by the Ohio EPA no later than 180 days prior to the above date of expiration.

Craig W. Butler
Director

Total Pages: 64

Part I, A. - FINAL EFFLUENT LIMITATIONS AND MONITORING REQUIREMENTS

1. During the period beginning on the effective date of this permit and lasting until the expiration date, the permittee is authorized to discharge in accordance with the following limitations and monitoring requirements from outfall 3IB00002001. See Part II, OTHER REQUIREMENTS, for locations of effluent sampling.

Table - Final Outfall - 001 - Final

| Effluent Characteristic | Discharge Limitations | | | | | | | Monitoring Requirements | | |
|---|---|---|---|---|---|---|---|---|---|---|
| | Concentration Specified Units | | | | Loading* kg/day | | | | | |
| Parameter | Maximum | Minimum | Weekly | Monthly | Daily | Weekly | Monthly | Measuring Frequency | Sampling Type | Monitoring Months |
| 00011 - Water Temperature - F | - | - | - | - | - | - | - | 1/Day | Continuous | All |
| 00400 - pH - S.U. | 9.0 | 6.0 | - | - | - | - | - | 1/Month | Grab | All |
| 34044 - Oxidants, Total Residual - mg/l | 0.05 | - | - | - | - | - | - | 1/Day | Grab | All |
| 50050 - Flow Rate - MGD | - | - | - | - | - | - | - | 1/Day | Continuous | All |
| 50060 - Chlorine, Total Residual - mg/l | 0.2 | - | - | - | - | - | - | 1/Day | Grab | All |
| 78739 - Chlorination/Bromination Duration - Minutes | 120 | - | - | - | - | - | - | 1/Day | Total | All |

Notes for Station Number 3IB00002001:

a. The Total Residual Chlorine (TRC) and Total Residual Oxidants (TRO) limits are the maximum allowed at the outfall at any time. TRC and TRO may not be discharged from this outfall for more than two hours per day. Simultaneous multi-unit chlorination and/or bromination is permitted. Analyses are to be performed by amperometric titration, Orion Residual Chlorine Electrode, or another EPA approved method during chlorination and/or bromination. The daily grab samples for TRC and TRO shall represent the maximum concentration discharged during chlorination and/or bromination.

b. Water temperature requires intake (3IB00002800) monitoring for outfall 3IB00002001. Report intake/outfall temperature estimated to correspond to a maximum temperature differential sustained for one hour.

c. TRO reflects the use of bromine compounds. Bromine can be used separately or in combination with chlorine. These limits are effective when bromine is used. Discharge limitations for TRO may be met using a dehalogenation agent, if necessary. Dehalogenation shall then be achieved by using stoichiometric calculations to determine the amount of dehalogenating agent necessary to completely eliminate the residual.

d. TRO is to be reported on days when bromine compounds are used with or without chlorine. Report "AH" on the DMR on days when no bromine compounds are used and explain in the remarks section.

e. TRC is to be reported on days when only chlorine compounds are used, when no bromine compounds are used. Report "AH" on the DMR if bromine (or a combination of bromine and chlorine) is used and explain in the remarks section.

f. Chlorination/bromination duration monitoring is to be performed only on days when using chlorine and/or bromine treatment. On days when treatment is not used, report "AH" on the DMR and explain in the remarks section.

g. Sampling shall be performed when discharging. If no discharge occurs during the entire month, eDMR users should select the "No Discharge" check box on the data entry form and pin the eDMR.

h. Samples taken in compliance with monitoring requirement specified above shall be taken at Sampling Stations described in Part II, Other Requirements.

Part I, A. - FINAL EFFLUENT LIMITATIONS AND MONITORING REQUIREMENTS

2. During the period beginning on the effective date of this permit and lasting until the expiration date, the permittee is authorized to discharge in accordance with the following limitations and monitoring requirements from outfall 3IB00002002. See Part II, OTHER REQUIREMENTS, for locations of effluent sampling.

Table - Final Outfall - 002 - Final

| Effluent Characteristic | Discharge Limitations | | | | | | | Monitoring Requirements | | |
|---|---|---|---|---|---|---|---|---|---|---|
| | Concentration Specified Units | | | | Loading* kg/day | | | | | |
| Parameter | Maximum | Minimum | Weekly | Monthly | Daily | Weekly | Monthly | Measuring Frequency | Sampling Type | Monitoring Months |
| 00530 - Total Suspended Solids - mg/l | 100 | - | - | 30 | - | - | - | 1/Week | 24hr Composite | All |
| 00550 - Oil and Grease, Total - mg/l | 20 | - | - | 15 | - | - | - | 1/Month | Grab | All |
| 01119 - Copper, Total Recoverable - ug/l | - | - | - | - | - | - | - | 1/Quarter | 24hr Composite | All |
| 50050 - Flow Rate - MGD | - | - | - | - | - | - | - | 1/Day | 24hr Total | All |
| 50092 - Mercury, Total (Low Level) - ng/l | 1700 | - | - | 2.6 | 0.0192 | - | 0.000030 | 1/Month | Grab | All |
| 51600 - pH Range Excursion, Maximum Duration - Minutes | 60 | - | - | - | - | - | - | 1/Day | Total | All |
| 61941 - pH, Maximum - S.U. | - | - | - | - | - | - | - | 1/Day | Continuous | All |
| 61942 - pH, Minimum - S.U. | - | - | - | - | - | - | - | 1/Day | Continuous | All |
| 82581 - pH Range Excursions, > 60 Minutes - Number/Day | 0 | - | - | - | - | - | - | 1/Day | Total | All |
| 82582 - pH Range Excursions, Monthly Total Duration - Minutes | 446 | - | - | - | - | - | - | 1/Month | Total | All |

Notes for Station Number 3IB00002002:

a. Effluent loadings based on 2.98 MGD.

b. Spray down water from the synthetic fuel facility is permitted to be discharged through this outfall.

c. Sampling shall be performed when discharging. If no discharge occurs during the entire month, eDMR users should select the "No Discharge" check box on the data entry form and pin the eDMR.

d. Mercury - See Part II, Items J, K and L. Samples for mercury at this station shall be collected one detention time after samples collected

e. Samples taken in compliance with monitoring requirements specified above shall be taken at Sampling Stations described in Part II, Other Requirements.

f. For pH, the maximum limit is 9.0 and the minimum limit is 6.0 S.U. Violations will occur if:

1. Total minutes of excursions from these limits exceed 7 hours and 26 minutes (446 minutes) during a single month. See pH Range Excursions, Monthly Total Duration (in minutes), Reporting Code 82582. If no excursions occur during the month, report "0"; or

2. An individual excursion event continues uninterrupted for more than 60 minutes. See:

a) pH Range Excursions, Maximum Duration (in minutes), Reporting Code 51600. If no excursions occur, report "0".

b) pH Range Excursions, > 60 Minutes (Number/Day), Reporting Code 82581. Enter the number of excursions each day that exceed 60 minutes in duration.

Part I, A. - FINAL EFFLUENT LIMITATIONS AND MONITORING REQUIREMENTS

3. During the period beginning on the effective date of this permit and lasting until the expiration date, the permittee is authorized to discharge in accordance with the following limitations and monitoring requirements from outfall 3IB00002004. See Part II, OTHER REQUIREMENTS, for locations of effluent sampling.

Table - Final Outfall - 004 - Final

| Effluent Characteristic | Discharge Limitations | | | | | | | Monitoring Requirements | | |
|---|---|---|---|---|---|---|---|---|---|---|
| | Concentration Specified Units | | | | Loading* kg/day | | | | | |
| Parameter | Maximum | Minimum | Weekly | Monthly | Daily | Weekly | Monthly | Measuring Frequency | Sampling Type | Monitoring Months |
| 00530 - Total Suspended Solids - mg/l | 100 | - | - | 30 | - | - | - | 2/Week | 24hr Composite | All |
| 00550 - Oil and Grease, Total - mg/l | 20 | - | - | 15 | - | - | - | 2/Week | Grab | All |
| 01119 - Copper, Total Recoverable - ug/l | - | - | - | - | - | - | - | 1/Quarter | 24hr Composite | All |
| 34044 - Oxidants, Total Residual - mg/l | 0.01 | - | - | - | - | - | - | 1/Day | Grab | All |
| 50050 - Flow Rate - MGD | - | - | - | - | - | - | - | 1/Day | Continuous | All |
| 50060 - Chlorine, Total Residual - mg/l | 0.038 | - | - | - | - | - | - | 1/Day | Grab | All |
| 51600 - pH Range Excursion, Maximum Duration - Minutes | 60 | - | - | - | - | - | - | 1/Day | Total | All |
| 61941 - pH, Maximum - S.U. | - | - | - | - | - | - | - | 1/Day | Continuous | All |
| 61942 - pH, Minimum - S.U. | - | - | - | - | - | - | - | 1/Day | Continuous | All |
| 82581 - pH Range Excursions, > 60 Minutes - Number/Day | 0 | - | - | - | - | - | - | 1/Day | Total | All |
| 82582 - pH Range Excursions, Monthly Total Duration - Minutes | 446 | - | - | - | - | - | - | 1/Month | Total | All |

Notes for Station Number 3IB00002004:

a. The Total Residual Chlorine (TRC) and Total Residual Oxidants (TRO) limits are the maximum allowed at the outfall at any time. TRC and TRO may not be discharged from this outfall for more than two hours per day. Simultaneous multi-unit chlorination and/or bromination is permitted. Analyses are to be performed by amperometric titration, Orion Residual Chlorine Electrode, or another EPA approved method during chlorination and/or bromination. The daily grab samples for TRC and TRO shall represent the maximum concentration discharged during chlorination and/or bromination.

b. TRO reflects the use of bromine compounds. Bromine can be used separately or in combination with chlorine. These limits are effective when bromine is used. Discharge limitations for TRO may be met using a dehalogenation agent, if necessary. Dehalogenation shall then be achieved by using stoichiometric calculations to determine the amount of dehalogenating agent necessary to completely eliminate the residual.

c. TRO is to be reported on days when bromine compounds are used with or without chlorine. Report "AH" on the DMR on days when no bromine compounds are used and explain in the remarks section.

d. TRC is to be reported on days when only chlorine compounds are used, when no bromine compounds are used. Report "AH" on the DMR if bromine (or a combination of bromine and chlorine) is used and explain in the remarks section.

e. Sampling shall be performed when discharging. If no discharge occurs during the entire month, eDMR users should select the "No Discharge" check box on the data entry form. Pin the eDMR.

f. Samples taken in compliance with monitoring requirements specified above shall be taken at Sampling Stations described in Part II, Other Requirements.

g. For pH, the maximum limit is 9.0 and the minimum limit is 6.0 S.U. Violations will occur if:

1. Total minutes of excursions from these limits exceed 7 hours and 26 minutes (446 minutes) during a single month. See pH Range Excursions, Monthly Total Duration (in minutes), Reporting Code 82582. If no excursions occur during the month, report "0"; or

2. An individual excursion event continues uninterrupted for more than 60 minutes. See:

a) pH Range Excursions, Maximum Duration (in minutes), Reporting Code 51600. If no excursions occur, report "0".

b) pH Range Excursions, > 60 Minutes (Number/Day), Reporting Code 82581. Enter the number of excursions each day that exceed 60 minutes in duration.

h. See Part II, Item O for requirements of bottom ash transport water.

Part I, A. - FINAL EFFLUENT LIMITATIONS AND MONITORING REQUIREMENTS

4. During the period beginning on the effective date of this permit and lasting until the expiration date, the permittee is authorized to discharge in accordance with the following limitations and monitoring requirements from outfall 3IB00002601. See Part II, OTHER REQUIREMENTS, for locations of effluent sampling.

Table - Internal Monitoring Station - 601 - Final

| Effluent Characteristic | Discharge Limitations | | | | | | | Monitoring Requirements | | |
|---|---|---|---|---|---|---|---|---|---|---|
| | Concentration Specified Units | | | | Loading* kg/day | | | | | |
| Parameter | Maximum | Minimum | Weekly | Monthly | Daily | Weekly | Monthly | Measuring Frequency | Sampling Type | Monitoring Months |
| 50092 - Mercury, Total (Low Level) - ng/l | - | - | - | - | - | - | - | 1/2 months | Grab | Bimonthly - Even |
| 74062 - Overflow Occurrence - No./Month | - | - | - | - | - | - | - | 1/Month | Calculated | All |

Notes for Station Number 3IB00002601:

a. Mercury - See Part II, Items J, K, and L. Samples for mercury at this station shall be collected one detention time before samples collected for Outfall 3IB00002002.

b. Bimonthly even samples shall be taken in February, April, June, August, October and December.

c. Bottom Ash Trasnport Water - See Part II, Item O for compliance dates.

d. Overflow Occurrence - This is the number of days per month for which there is a discharge from the clarifier which receives bottom ash transport water.

Part I, A. - FINAL EFFLUENT LIMITATIONS AND MONITORING REQUIREMENTS

5. During the period beginning on the effective date of this permit and lasting until the expiration date, the permittee is authorized to discharge in accordance with the following limitations and monitoring requirements from outfall 3IB00002604. See Part II, OTHER REQUIREMENTS, for locations of effluent sampling.

Table - Internal Monitoring Station - 604 - Final

| Effluent Characteristic | Discharge Limitations | | | | | | | Monitoring Requirements | | |
|---|---|---|---|---|---|---|---|---|---|---|
| | Concentration Specified Units | | | | Loading* kg/day | | | Measuring | Sampling | Monitoring |
| Parameter | Maximum | Minimum | Weekly | Monthly | Daily | Weekly | Monthly | Frequency | Type | Months |
| 00400 - pH - S.U. | - | - | - | - | - | - | - | 1/Month | Grab | All |
| 00530 - Total Suspended Solids - mg/l | 100 | - | - | 30 | - | - | - | 1/Month | Grab | All |
| 00550 - Oil and Grease, Total - mg/l | 20 | - | - | 15 | - | - | - | 1/Month | Grab | All |
| 50050 - Flow Rate - MGD | - | - | - | - | - | - | - | 1/Day | 24hr Total Estimate | All |

Notes for Station Number 3IB00002604:

a. Flowrate monitoring is required daily when discharging boiler blowdown water. If no boiler blowdown water is discharged during the month, eDMR users should select the "No Discharge" check box on the data entry form. Pin the eDMR. If there is at least one discharge during the month, report "AH" for flow rate for each day when there is no discharge.

b. Samples taken in compliance with monitoring requirements specified above shall be taken at Sampling Stations described in Part II, Other Requirements.

Part I, A. - FINAL EFFLUENT LIMITATIONS AND MONITORING REQUIREMENTS

6. During the period beginning on the effective date of this permit and lasting until the expiration date, the permittee is authorized to discharge in accordance with the following limitations and monitoring requirements from outfall 3IB00002610. See Part II, OTHER REQUIREMENTS, for locations of effluent sampling.

Table - Internal Monitoring Station - 610 - Final

| Effluent Characteristic | Discharge Limitations | | | | | | | Monitoring Requirements | | |
|---|---|---|---|---|---|---|---|---|---|---|
| | Concentration Specified Units | | | | Loading* kg/day | | | | | |
| Parameter | Maximum | Minimum | Weekly | Monthly | Daily | Weekly | Monthly | Measuring Frequency | Sampling Type | Monitoring Months |
| 00400 - pH - S.U. | - | - | - | - | - | - | - | 1/Week | Grab | All |
| 00530 - Total Suspended Solids - mg/l | 50 | - | - | - | - | - | - | 1/Week | 24hr Composite | All |
| 50050 - Flow Rate - MGD | - | - | - | - | - | - | - | 1/Day | 24hr Total | All |

Notes for Station Number 3IB00002610:

a. This facility is designed, constructed and operated to treat a volume of coal pile runoff associated with a 10-year, 24-hour rainfall event. Any untreated overflow from this facility resulting from a rainfall event greater than a 10-year, 24-hour storm shall not be subject to the above effluent limitations.

b. Samples taken in compliance with monitoring requirements specified above shall be taken at Sampling Stations described in Part II, Other Requirements.

c. Sampling shall be performed when discharging. If no discharge occurs during the entire month, eDMR users should select the "No Discharge" check box on the data entry form. Pin the eDMR.

Part I, A. - FINAL EFFLUENT LIMITATIONS AND MONITORING REQUIREMENTS

7. During the period beginning on the effective date of this permit and lasting until the expiration date, the permittee is authorized to discharge in accordance with the following limitations and monitoring requirements from outfall 3IB00002611. See Part II, OTHER REQUIREMENTS, for locations of effluent sampling.

Table - Internal Monitoring Station - 611 - Final

| Effluent Characteristic | Discharge Limitations | | | | | | | Monitoring Requirements | | |
|---|---|---|---|---|---|---|---|---|---|---|
| | Concentration Specified Units | | | | Loading* kg/day | | | | | |
| Parameter | Maximum | Minimum | Weekly | Monthly | Daily | Weekly | Monthly | Measuring Frequency | Sampling Type | Monitoring Months |
| 00400 - pH - S.U. | - | - | - | - | - | - | - | 3/Week | Grab | All |
| 00530 - Total Suspended Solids - mg/l | 100 | - | - | 30 | - | - | - | 1/Week | 24hr Composite | All |
| 00550 - Oil and Grease, Total - mg/l | 20 | - | - | 15 | - | - | - | 1/Week | Grab | All |
| 00980 - Iron, Total Recoverable - ug/l | 1000 | - | - | 1000 | - | - | - | 1/Week | 24hr Composite | All |
| 01119 - Copper, Total Recoverable - ug/l | 1000 | - | - | 1000 | - | - | - | 1/Week | 24hr Composite | All |
| 50050 - Flow Rate - MGD | - | - | - | - | - | - | - | 1/Day | 24hr Total | All |

Notes for Station Number 3IB00002611:

a. Samples collected for this outfall shall be collected prior to metal cleaning wastes being discharged into the coal pile runoff treatment system.

b. Samples taken in compliance with monitoring requirements specified above shall be taken at Sampling Stations described in Part II, Other Requirements.

c. Sampling shall be performed when discharging. If no discharge occurs during the entire month, eDMR users should select the "No Discharge" check box on the data entry form. Pin the eDMR.

Part I, A. - FINAL EFFLUENT LIMITATIONS AND MONITORING REQUIREMENTS

8. During the period beginning on the effective date of this permit and lasting until the expiration date, the permittee is authorized to discharge in accordance with the following limitations and monitoring requirements from outfall 3IB00002610. See Part II, OTHER REQUIREMENTS, for locations of effluent sampling.

Table - Internal Monitoring Station - 612 - Final

| Effluent Characteristic | Discharge Limitations | | | | | | | Monitoring Requirements | | |
|---|---|---|---|---|---|---|---|---|---|---|
| | Concentration Specified Units | | | | Loading* kg/day | | | Measuring | Sampling | Monitoring |
| Parameter | Maximum | Minimum | Weekly | Monthly | Daily | Weekly | Monthly | Frequency | Type | Months |
| 00550 - Oil and Grease, Total - mg/l | - | - | - | - | - | - | - | 1/Month | Grab | All |
| 50050 - Flow Rate - MGD | - | - | - | - | - | - | - | 1/Month | 24hr Total | All |

Notes for Station Number 3IB00002612:

a. Samples taken in compliance with monitoring requirements specified above shall be taken at Sampling Stations described in Part II, Other Requirements.

b. Sampling shall be performed when discharging. If no discharge occurs during the entire month, eDMR users should select the "No Discharge" check box on the data entry form. Pin the eDMR.

Part I, B. - INTAKE MONITORING REQUIREMENTS

1. Intake Monitoring. During the period beginning on the effective date of this permit and lasting until the expiration date, the permittee shall monitor the Intake at Station Number 3IB00002800, and report to the Ohio EPA in accordance with the following table. See Part II, OTHER REQUIREMENTS, for location of sampling.

Table - Intake Monitoring - 800 - Final

| Effluent Characteristic | Discharge Limitations | | | | | | | Monitoring Requirements | | |
|---|---|---|---|---|---|---|---|---|---|---|
| | Concentration Specified Units | | | | Loading* kg/day | | | Measuring | Sampling | Monitoring |
| Parameter | Maximum | Minimum | Weekly | Monthly | Daily | Weekly | Monthly | Frequency | Type | Months |
| 00011 - Water Temperature - F | - | - | - | - | - | - | - | 1/Day | Continuous | All |

Notes for Station Number 3IB00002800:

a. Samples taken in compliance with monitoring requirements specified above shall be taken at Sampling Stations described in Part II, Other Requirements.

b. Water temperature requires intake (3IB00002800) monitoring for outfall 3IB00002001. Report intake/outfall temperature estimated to correspond to a maximum temperature differential sustained for one hour.

Part I,C. Schedule of Compliance

1. Section 316(b) Compliance

Under Section 316(b) of the federal CWA, cooling water intake structures (CWISs) are required to use best technology available (BTA) to minimize adverse environmental impact resulting from the operation of the intake. The permittee is considered an existing source under 40 CFR 125.9, Subpart J - "Requirements Applicable to Cooling Water Intake Structures for Existing Facilities Under Section 316(b) of the Clean Water Act." New rules for CWISs were promulgated on October 14, 2014.

a. The permittee shall submit all of the following information to the Ohio EPA, Central Office no later than February 1, 2020 (Event Code 21599):

i. Source water physical data as detailed in 40 CFR 122.21(r)(2).

ii. Cooling water intake structure data as detailed in 40 CFR 122.21(r)(3).

iii. Source water baseline biological characterization data as detailed in 40 CFR 122.21(r)(4).

iv. Cooling water system data as detailed in 40 CFR 122.21(r)(5).

v. Impingement mortality reduction as detailed in BTA (r)(6). The compliance methods can be found in 40 CFR 125.94(c). If compliance options 125.94(c)(5) or (c)(6) are chosen, then an impingement technology performance optimization study is required as described in 122.21(r)(6)(i) and 122.21(r)(6)(ii), respectively.

vi. Entrainment performance studies as detailed in 40 CFR 122.21(r)(7)

vii. Operational status as detailed in 40 CFR 122.21(r)(8).

viii. The results of the entrainment characterization study as detailed in 40 CFR 122.21(r)(9). (Event Code 21599).

b. The permittee shall submit the following information related to the entrainment characterization study to the Ohio EPA, Central Office:

i. A status report on the entrainment study shall be submitted no later than February 1, 2018. (Event Code 95999)

ii. A status report on the entrainment study shall be submitted no later than February 1, 2019. (Event Code 95999)

c. The following submittals will require Peer Review, as detailed in 40 CFR 122.21(r)(13), prior to submittal no later than February 1, 2020.

i. Comprehensive technical feasibility and cost evaluation study as detailed in 40 CFR 122.21(r)(10). (Event Code 21599).

ii. Benefits valuation study as detailed in 40 CFR 122.21(r)(11). (Event Code 21599).

iii. Non-water quality and other environmental impacts study as detailed in 40 CFR 122.21(r)(12). (Event Code 21599).

d. This permit may be modified if new federal rules are promulgated prior to the submittal of this information at the next permit renewal.

e. Nothing in this permit authorizes take for the purposes of a facility's compliance with the Endangered Species Act.

2. Interim Compliance with 316(b)

The permittee shall determine the feasibility of reducing station withdrawal further during periods when the station is offline. Reducing withdrawal lessens the amount of impingement and entrainment. The facility shall implement the improvements where feasible considering economics and potential interference with the final BTA determination. If the final BTA determination does not incorporate flow reductions during periods when the station is offline, the permittee will not be required to continue the practice.

The permittee shall submit a report on the findings and feasibility of the interim BTA proposal with a proposed implementation schedule, if applicable, within 4 Months of the effective date of the permit. (Event Code 21599)

Part II, OTHER REQUIREMENTS

A. Description of the location of the required sampling stations are as follows:

| Sampling Station | Description of Location |
|---|---|
| 3IB00002001 | Condenser cooling water and boiler blowdown representative of station 3IB00002604. At combined discharge into discharge channel to Lake Erie. (Lat: 41 N 30 ' 15 "; Long: 82 W 03 ' 00 ") |
| 3IB00002002 | Combined wastewater treatment system at discharge from filters prior to Lake Erie, includes 3IB00002610 and 3IB00002611. (Lat: 41N 30 ' 30"; Long: 82 W 03 ' 00 ") |
| 3IB00002004 | Low volume wastewater treatment system. At discharge of low volume wastewater system prior to Lake Erie. (Lat: 41 N 30 ' 30 "; Long: 82 W 03 ' 00 ") |
| 3IB00002601 | Internal monitoring station to combined wastewater treatment system. |
| 3IB00002604 | Boiler blowdown water. At points representative of boiler blowdown. |
| 3IB00002610 | Coal pile runoff treatment system prior to discharge to combined treatment basin (outfall 3IB00002002). |
| 3IB00002611 | Treated metal cleaning wastewater prior to mixing with any other wastewater. |
| 3IB00002612 | At the discharge of Unit # 9 heat exchanger non-contact cooling water prior to entering outfall 3IB00002001. |
| 3IB00002800 | Intake water at inlet to plant from Lake Erie. |

B. This permit shall be modified, or alternatively, revoked and reissued, to comply with any applicable effluent standard or limitation issued or approved under Sections 301, 304 or 307 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.

The permit as modified or reissued under this paragraph shall also contain any other requirements of the Act then applicable.

C. Water quality based permit limitations in this permit may be revised based on updated wasteload allocations or use designation rules. This permit may be modified, or revoked and reissued, to include new water quality based effluent limits or other conditions that are necessary to comply with a revised wasteload allocation, or an approved total maximum daily loads (TMDL) report as required under Section 303 (d) of the Clean Water Act.

D. In the event that the permittee's operation requires the use of cooling or boiler water treatment additives that are discharged to surface waters of the state, written permission must be obtained from the director of the Ohio EPA prior to use. Discharges of these additives must meet Ohio Water Quality Standards and shall not be harmful or inimical to aquatic life. Reporting and testing requirements to apply for permission to use additives can be obtained from the Ohio EPA, Central Office, Division of Surface Water, NPDES Permit Unit. This information is also available on the DSW website:

http://www.epa.ohio.gov/portals/35/policy/01_22u2.pdf .

E. Best Management Plan: Bottom Ash Transport System

The Avon Lake ash recycle system shall be operated in a manner consistent with the following:

1. The permittee will maintain in good working order and operate as efficiently as possible the bottom ash transport recycle system installed and used at the Avon Lake Generating Station. The bottom ash transport recycle system shall be operated to minimize the overflow of the ash recycle tank and prevent the solids overload of the combined wastewater treatment system filters, except as provided in the paragraph of Part III, General Conditions, entitled, "UNAUTHORIZED DISCHARGE"

2. Bypasses or shutdown of the bottom ash transport recycle system in excess of 48 hours duration when the unit is operating shall be reported as specified in the paragraph of Part III, General Conditions, entitled "UNAUTHORIZED DISCHARGE"

3. All bypasses or shutdowns of the bottom ash transport recycle system that result in overflow of the combined wastewater treatment basin or the low volume wastewater treatment basin shall be reported as per the paragraph of Part III, General Conditions, entitled, "UNAUTHORIZED DISCHARGE".

4. All bypasses or shutdowns of the bottom ash transport recycle system that result in noncompliance with effluent limitations of Part I shall be reported as per the paragraph of Part III, General Conditions, entitled, "NONCOMPLIANCE NOTIFICATION".

F. There shall not be a discharge of any polychlorinated biphenyl compounds attributable to the permittee's operations.

G. The parameters below have had effluent limitations established that are below the Ohio EPA Quantification Level (OEPA QL) for the 40 CFR 136 promulgated analytical procedure for those parameters. In accordance with the ORC Section 6111.13 and OAC Rule 3745-33-07(C), if a discharge limit is set below the OEPA QL, any analytical result reported less than the OEPA QL shall be considered to be in compliance with that limit. OEPA QLs may be expressed as Practical Quantification Levels (PQL) or Minimum Levels (ML).

The permittee must utilize the lowest available detection method currently approved under 40 CFR Part 136 for monitoring these parameters.

REPORTING:

All analytical results, even those below the OEPA QL (listed below), shall be reported. Analytical results are to be reported as follows:

1. Results above the QL: Report the analytical result for the parameter of concern.

2. Results above the MDL, but below the QL: Report the analytical result, even though it is below the QL.

3. Results below the MDL: Analytical results below the method detection limit shall be reported as "below detection" using the reporting code "AA".

The following table of quantification levels will be used to determine compliance with NPDES permit limits:

| Parameter | PQL | ML |
|---|---|---|
| Chlorine, Total Residual | 0.050 mg/l | -- |
| Total Residual Oxidants | 0.050 mg/l | -- |

This permit may be modified, or alternatively, revoked and reissued, to include more stringent effluent limits or conditions if information generated as a result of the conditions of this permit indicate the presence of these pollutants in the discharge at levels above the water quality based effluent limit (WQBEL).

H. Analytical Detection Levels

The permittee shall use analytical procedures approved under 40 CFR 136 with MDL (method detection levels) less than or equal to one-third of the most stringent applicable waste load allocations for each parameter.

I. All parameters, except flow, need not be monitored on days when the plant is not normally staffed (Saturdays, Sundays, and holidays). On those days, report "AN" on the monthly report form.

J. General Mercury Variance

The permittee is granted a general mercury variance under the provisions of Rule 3745-33-07(D)(10) of the Ohio Administrative Code. The permittee has demonstrated that the facility is currently unable to comply with the monthly average water quality based effluent limit of 1.3 ng/l without construction of expensive end-of-pipe controls more stringent than those required by sections 301(b) and 306 of the Clean Water Act. The NRG Avon Lake Generating Station is currently able to achieve an annual average mercury concentration of 12 ng/l. For general mercury variance purposes, the annual average mercury effluent concentration is defined as the average of the most recent 12 months of effluent data.

One of the conditions of the general mercury variance is that the permittee make reasonable progress towards attaining the water quality based effluent limits for mercury (1.b, below). To accomplish this, the permittee is required to continue implementing a pollutant minimization program (PMP) for mercury. The elements of a PMP include: a control strategy to locate, identify and, where cost-effective, reduce levels of mercury that contribute to discharge levels; periodic monitoring of sources and the treatment system; and annual reporting of results.

The plan of study that was part of the permittee's 2011 application for coverage under the general mercury variance included items associated with developing a control strategy and initial implementation of a PMP. By implementing the plan of study and meeting other conditions of its NPDES permit, the permittee has been taking actions consistent with a PMP for mercury. Condition 1.d below, requires the permittee to continue implementing a PMP for mercury.

1. As conditions of this variance, the permittee shall meet the following requirements:

a. The permittee shall comply with the effluent limitations for mercury at outfall 3IB00002002 given in Part I, A. of this permit.

b. The permittee shall make reasonable progress towards attaining the monthly average water quality-based effluent limit for mercury by complying with the general mercury variance conditions included in this NPDES permit.

c. The permittee shall use EPA Method 1631 to comply with the influent and effluent mercury monitoring requirements of this permit.

d. The permittee shall continue implementing a PMP for mercury consistent with the plan of study included in the permittee's mercury variance application effective on August 1, 2011 and any other relevant information submitted by the permittee, including the following activities:

i. Continued evaluation of fuel options.
ii. Conducting extensive cleaning from the two existing Combined Wastewater Treatment Basins.
iii. Performing additional maintenance and modifications to the bottom ash hydrobins, ash recycle system and adjacent areas to eliminate wastewater containing significant quantities of ash from discharging to the basins.

e. The permittee shall assess the impact of the mercury variance on public health, safety, and welfare by, as a minimum, monitoring for mercury in the facility's influent and effluent as required by this NPDES permit.

f. The permittee shall maintain an annual average mercury effluent concentration equal to or less than 12 ng/l.

g. On or prior to March 1 of each year, the permittee shall submit two copies of an annual PMP report to Ohio EPA, Division of Surface Water, NPDES Permit Unit, P.O. Box 1049, Columbus, OH, 43216-1049. The annual PMP report shall include:

i. All minimization program monitoring results for the year

ii. A list of potential sources of mercury

iii. A summary of all actions taken to meet the effluent limits for mercury

iv. Any updates of the control strategy, including actions planned to reduce the levels of mercury in the treatment plant's final effluent

The Ohio EPA Annual Mercury PMP Report and Appendices are available on the Division of Surface Water Permits Program Technical Assistance web page at http://www.epa.ohio.gov/dsw/permits/technical_assistance.aspx . Open the Mercury list.

h. Upon completion of the actions identified in the plan of study as required in Part II, Item J.1.d. of this permit or upon submittal of the permittee's NPDES permit renewal application, whichever comes first, the permittee shall submit to Ohio EPA's Northeast District Office a certification stating that all permit conditions imposed to implement the plan of study and the PMP have been satisfied and whether compliance with the monthly average water quality based effluent limit for mercury has been achieved and can be maintained. This certification shall be accompanied by the following:

i. All available mercury influent and effluent data for the most recent 12-month period.

ii. Data documenting all known significant sources of mercury and the steps that have been taken to reduce or eliminate those sources; and

iii. A determination of the lowest mercury concentration that currently available data indicate can be reliably achieved through implementation of the PMP.

2. Exceedance of the annual average limit of 12 ng/l.

a. If at any time after the effective date of this permit, the permittee's annual average mercury effluent concentration exceeds 12 ng/l, the permittee shall:

i. Notify Ohio EPA's Northeast District Office not later than 30 days from the date of the exceedance.

ii. Submit an individual variance application, if a variance is desired, not later than 6 months from the date of the exceedance; or

iii. Request a permit modification not later than 6 months from the date of the exceedance for a compliance schedule to attain compliance with the water quality-based effluent limits for mercury.

b. If the permittee complies with either 2.a.ii or 2.a.iii, above, the general mercury variance conditions included in this NPDES permit will remain in effect until the date that the Director acts on the individual variance application or the date that the permit modification becomes effective.

c. If the permittee does not comply with either 2.a.ii or 2.a.iii, above, a monthly water-quality based effluent limit for mercury of 1.3 ng/l shall apply at outfall 3IB00002002 beginning 6 months from the date of the exceedance.

3. The requirements of Part II, Item J.2 shall not apply if the permittee demonstrates to the satisfaction of the Director that the mercury concentration in the permittee's effluent exceeds 12 ng/l due primarily to the presence of mercury in the permittee's intake water.

K. Permit Reopener for Mercury Variance Revisions

Ohio EPA may reopen and modify this permit at any time based upon Ohio EPA water quality standard revisions to the mercury variance granted in Part II, Item J of this permit.

L. Renewal of Mercury Variance

For renewal of the mercury variance authorized in this permit, the permittee shall include the following information with the submittal of the subsequent NPDES permit renewal application:

1. the certification described under Part II, Item J.1.h., and all information required under Part II, Item J.1.h.i. through Part II, Item J.1.h.iii;

2. a status report on the progress being made implementing the pollutant minimization program (PMP). This information may be included in the annual PMP report required under Part II, Item J.1.g;

3. a listing of the strategies and/or programs in the PMP which will be continued under the next renewal of this permit; and

4. a statement requesting the renewal of the mercury variance.

M. Outfall Signage

The permittee shall maintain a permanent marker on the shoreline at each outfall that is regulated under this NPDES permit. If a marker does not currently exist, the permittee shall install one within 4 months of the effective date of this permit. This includes final outfalls and bypasses. The marker shall consist at a minimum of the name of the establishment to which the permit was issued, the Ohio EPA permit number, and the outfall number and a contact telephone 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 ground level. The sign shall not be obstructed such that persons in boats or persons swimming on the river or someone fishing or walking along the shore cannot read the sign. Vegetation shall be periodically removed to keep the sign visible. If the outfall is normally submerged the sign shall indicate that. When an existing marker is replaced or reset, the new marker shall comply with the requirements of this section.

N. Notification to Public Water Supply Operators.

1. As required by the Ohio Administrative Code 3745-33-08(F), permits for facilities designated by the director as major discharges, in the following locations, shall require the permittee to notify the public water supply operator as soon as practicable after a discharge begins that results from a spill, separate sewer overflow, bypass, upset, or combined sewer overflow that reaches waters of the state:

a. Discharges within three thousand feet of a public water supply intake located in a lake; or

b. Discharges within ten stream miles upstream of a public water supply intake located in a reservoir or any other surface water of the state.

2. Public water supply operators meeting the criteria in Part II, Item N.1 above for the NRG Avon Lake Generating Station are:

City of Avon Lake Public Water Supply
Avon Lake Municipal Utilities
201 Miller Road
Avon Lake, Ohio 44012

3. Within 6 months of the effective date of this permit, the permittee shall develop notification procedures between the wastewater system operator and public water supply operator[s] listed above in Part II, Item N.2 that defines the specific notification requirements to the public water supply operator and what constitutes notification "as soon as practicable".

4. The permittee is also required to notify Ohio EPA and the City of Avon Lake at least 60 days prior to the use of bromine or sodium bromide.

O. Steam Electric Effluent Limitation Guideline - Bottom Ash Transport Water

NRG Avon Lake shall, as soon as possible but no later than December 31, 2023, comply with the Steam Electric Generating Power Generating Effluent Guidelines (ELGs) for bottom ash transport water as required by 40 CFR 423. For discharges of bottom ash transport water generated before December 31, 2023, (i.e., legacy wastewater), the quantity of pollutants shall not exceed the quantities in the table for final outfall 002.

The permittee shall notify Ohio EPA within 14 days of compliance of the ELG.

If the Steam Electric Power Generating Effluent Guidelines compliance dates or requirements for pollutants in bottom ash transport water are further delayed or modified, the permittee shall comply with the ELGs as soon as possible, but no later than the timeline established in 40 CFR 423.

P. Cooling Water Intake Structure Monitoring Requirements
The permittee is required to perform the following monitoring:

1. Visual or Remote Inspections

The permittee shall either conduct weekly visual inspections or employ remote monitoring devices during the period the cooling water intake structure is in operation.

Q. Cooling Water Intake Structure Record Keeping and Reporting Requirements

1. Record Keeping Requirements The permittee shall keep records of all the data used to complete the permit application and show compliance with the requirements of the 316(b) regulations until the subsequent permit is re-issued.

2. Reporting Requirements

Annually after February 1, 2020, the permittee shall submit an annual certification statement signed by the responsible corporate officer indicating whether there have been any substantial modifications of any units that impact the cooling water withdrawals and a summary of those changes. In addition, revisions must be submitted to the information required at 40 CFR 122.21(r) during the next permit application when new information is available

PART III - GENERAL CONDITIONS

1. DEFINITIONS

"Daily discharge" means the discharge of a pollutant measured during a calendar day or any 24-hour period that reasonably represents the calendar day for purposes of sampling. For pollutants with limitations expressed in units of mass, the "daily discharge" is calculated as the total mass of the pollutant discharged over the day. For pollutants with limitations expressed in other units of measurement, the "daily discharge" is calculated as the average measurement of the pollutant over the day.

"Average weekly" discharge limitation means the highest allowable average of "daily discharges" over a calendar week, calculated as the sum of all "daily discharges" measured during a calendar week divided by the number of "daily discharges" measured during that week. Each of the following 7-day periods is defined as a calendar week: Week 1 is Days 1 - 7 of the month; Week 2 is Days 8 - 14; Week 3 is Days 15 - 21; and Week 4 is Days 22 - 28. If the "daily discharge" on days 29, 30 or 31 exceeds the "average weekly" discharge limitation, Ohio EPA may elect to evaluate the last 7 days of the month as Week 4 instead of Days 22 - 28. Compliance with fecal coliform bacteria or E coli bacteria limitations shall be determined using the geometric mean.

"Average monthly" discharge limitation means the highest allowable average of "daily discharges" over a calendar month, calculated as the sum of all "daily discharges" measured during a calendar month divided by the number of "daily discharges" measured during that month. Compliance with fecal coliform bacteria or E coli bacteria limitations shall be determined using the geometric mean.

"85 percent removal" means the arithmetic mean of the values for effluent samples collected in a period of 30 consecutive days shall not exceed 15 percent of the arithmetic mean of the values for influent samples collected at approximately the same times during the same period.

"Absolute Limitations" Compliance with limitations having descriptions of "shall not be less than," "nor greater than," "shall not exceed," "minimum," or "maximum" shall be determined from any single value for effluent samples and/or measurements collected.

"Net concentration" shall mean the difference between the concentration of a given substance in a sample taken of the discharge and the concentration of the same substances in a sample taken at the intake which supplies water to the given process. For the purpose of this definition, samples that are taken to determine the net concentration shall always be 24-hour composite samples made up of at least six increments taken at regular intervals throughout the plant day.

"Net Load" shall mean the difference between the load of a given substance as calculated from a sample taken of the discharge and the load of the same substance in a sample taken at the intake which supplies water to given process. For purposes of this definition, samples that are taken to determine the net loading shall always be 24-hour composite samples made up of at least six increments taken at regular intervals throughout the plant day.

"MGD" means million gallons per day.

"mg/l" means milligrams per liter.

"ug/l" means micrograms per liter.

"ng/l" means nanograms per liter.

"S.U." means standard pH unit.

"kg/day" means kilograms per day.

"Reporting Code" is a five digit number used by the Ohio EPA in processing reported data. The reporting code does not imply the type of analysis used nor the sampling techniques employed.

"Quarterly (1/Quarter) sampling frequency" means the sampling shall be done in the months of March, June, August, and December, unless specifically identified otherwise in the Effluent Limitations and Monitoring Requirements table.

"Yearly (1/Year) sampling frequency" means the sampling shall be done in the month of September, unless specifically identified otherwise in the effluent limitations and monitoring requirements table.

"Semi-annual (2/Year) sampling frequency" means the sampling shall be done during the months of June and December, unless specifically identified otherwise.

"Winter" shall be considered to be the period from November 1 through April 30.

"Bypass" means the intentional diversion of waste streams from any portion of the treatment facility.

"Summer" shall be considered to be the period from May 1 through October 31.

"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.

"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.

"Sewage sludge" means a solid, semi-solid, or liquid residue generated during the treatment of domestic sewage in a treatment works as defined in section 6111.01 of the Revised Code. "Sewage sludge" includes, but is not limited to, scum or solids removed in primary, secondary, or advanced wastewater treatment processes. "Sewage sludge" does not include ash generated during the firing of sewage sludge in a sewage sludge incinerator, grit and screenings generated during preliminary treatment of domestic sewage in a treatment works, animal manure, residue generated during treatment of animal manure, or domestic septage.

"Sewage sludge weight" means the weight of sewage sludge, in dry U.S. tons, including admixtures such as liming materials or bulking agents. Monitoring frequencies for sewage sludge parameters are based on the reported sludge weight generated in a calendar year (use the most recent calendar year data when the NPDES permit is up for renewal).

"Sewage sludge fee weight" means the weight of sewage sludge, in dry U.S. tons, excluding admixtures such as liming materials or bulking agents. Annual sewage sludge fees, as per section 3745.11(Y) of the Ohio Revised Code, are based on the reported sludge fee weight for the most recent calendar year.

2. GENERAL EFFLUENT LIMITATIONS

The effluent shall, at all times, be free of substances:

A. In amounts that will settle to form putrescent, or otherwise objectionable, sludge deposits; or that will adversely affect aquatic life or water fowl;

B. Of an oily, greasy, or surface-active nature, and of other floating debris, in amounts that will form noticeable accumulations of scum, foam or sheen;

C. In amounts that will alter the natural color or odor of the receiving water to such degree as to create a nuisance;

D. In amounts that either singly or in combination with other substances are toxic to human, animal, or aquatic life;

E. In amounts that are conducive to the growth of aquatic weeds or algae to the extent that such growths become inimical to more desirable forms of aquatic life, or create conditions that are unsightly, or constitute a nuisance in any other fashion;

F. In amounts that will impair designated instream or downstream water uses.

3. FACILITY OPERATION AND QUALITY CONTROL

All wastewater treatment works shall be operated in a manner consistent with the following:

A. At all times, the permittee shall maintain in good working order and operate as efficiently as possible all treatment or control facilities or systems installed or used by the permittee necessary to achieve compliance with the terms and conditions of this permit. Proper operation and maintenance also includes adequate laboratory controls and appropriate quality assurance procedures. This provision requires the operation of back-up or auxiliary facilities or similar systems which are installed by a permittee only when the operation is necessary to achieve compliance with conditions of the permit.

B. The permittee shall effectively monitor the operation and efficiency of treatment and control facilities and the quantity and quality of the treated discharge.

C. Maintenance of wastewater treatment works that results in degradation of effluent quality shall be scheduled during non-critical water quality periods and shall be carried out in a manner approved by Ohio EPA as specified in the Paragraph in the PART III entitled, "UNAUTHORIZED DISCHARGES".

4. REPORTING

A. Monitoring data required by this permit shall be submitted monthly on Ohio EPA 4500 Discharge Monitoring Report (DMR) forms using the electronic DMR (e-DMR) internet application. e-DMR allows permitted facilities to enter, sign, and submit DMRs on the internet. e-DMR information is found on the following web page:

http://www.epa.ohio.gov/dsw/edmr/eDMR.aspx

Alternatively, if you are unable to use e-DMR due to a demonstrated hardship, monitoring data may be submitted on paper DMR forms provided by Ohio EPA. Monitoring data shall be typed on the forms. Please contact Ohio EPA, Division of Surface Water at (614) 644-2050 if you wish to receive paper DMR forms.

B. DMRs shall be signed by a facility's Responsible Official or a Delegated Responsible Official (i.e. a person delegated by the Responsible Official). The Responsible Official of a facility is defined as:

1. For corporations - a president, secretary, treasurer, or vice-president of the corporation in charge of a principal business function, or any other person who performs similar policy or decision making functions for the corporation; or the manager of one or more manufacturing, production or operating facilities, provided the manager is authorized to make management decisions which govern the operation of the regulated facility including having explicit or implicit duty of making 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 partnerships - a general partner;

3. For a sole proprietorship - the proprietor; or,

4. For a municipality, state or other public facility - a principal executive officer, a ranking elected official or other duly authorized employee.

For e-DMR, the person signing and submitting the DMR will need to obtain an eBusiness Center account and Personal Identification Number (PIN). Additionally, Delegated Responsible Officials must be delegated by the Responsible Official, either on-line using the eBusiness Center's delegation function, or on a paper delegation form provided by Ohio EPA. For more information on the PIN and delegation processes, please view the following web page:

http://epa.ohio.gov/dsw/edmr/eDMR.aspx

C. DMRs submitted using e-DMR shall be submitted to Ohio EPA by the 20th day of the month following the month-of-interest. DMRs submitted on paper must include the original signed DMR form and shall be mailed to Ohio EPA at the following address so that they are received no later than the 15th day of the month following the month-of-interest:

Ohio Environmental Protection Agency
Lazarus Government Center
Division of Surface Water - PCU
P.O. Box 1049
Columbus, Ohio 43216-1049

D. 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 in Section 5. SAMPLING AND ANALYTICAL METHODS, the results of such monitoring shall be included in the calculation and reporting of the values required in the reports specified above.

E. Analyses of pollutants not required by this permit, except as noted in the preceding paragraph, shall not be reported to the Ohio EPA, but records shall be retained as specified in Section 7. RECORDS RETENTION.

5. SAMPLING AND ANALYTICAL METHOD

Samples and measurements taken as required herein shall be representative of the volume and nature of the monitored flow. Test procedures for the analysis of pollutants shall conform to regulation 40 CFR 136, "Test Procedures For The Analysis of Pollutants" unless other test procedures have been specified in this permit. The permittee shall periodically calibrate and perform maintenance procedures on all monitoring and analytical instrumentation at intervals to insure accuracy of measurements.

6. RECORDING OF RESULTS

For each measurement or sample taken pursuant to the requirements of this permit, the permittee shall record the following information:

A. The exact place and date of sampling; (time of sampling not required on EPA 4500)

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

C. The date the analyses were performed on those samples;

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

E. The analytical techniques or methods used; and

F. The results of all analyses and measurements.

7. RECORDS RETENTION

The permittee shall retain all of the following records for the wastewater treatment works for a minimum of three years except those records that pertain to sewage sludge disposal, use, storage, or treatment, which shall be kept for a minimum of five years, including:

A. All sampling and analytical records (including internal sampling data not reported);

B. All original recordings for any continuous monitoring instrumentation;

C. All instrumentation, calibration and maintenance records;

D. All plant operation and maintenance records;

E. All reports required by this permit; and

F. Records of all data used to complete the application for this permit for a period of at least three years, or five years for sewage sludge, from the date of the sample, measurement, report, or application.

These periods will be extended during the course of any unresolved litigation, or when requested by the Regional Administrator or the Ohio EPA. The three year period, or five year period for sewage sludge, for retention of records shall start from the date of sample, measurement, report, or application.

8. AVAILABILITY OF REPORTS

Except for data determined by the Ohio EPA to be entitled to confidential status, all reports prepared in accordance with the terms of this permit shall be available for public inspection at the appropriate district offices of the Ohio EPA. Both the Clean Water Act and Section 6111.05 Ohio Revised Code state that effluent data and receiving water quality data shall not be considered confidential.

9. DUTY TO PROVIDE INFORMATION

The permittee shall furnish to the Director, within a reasonable time, any information which the Director may request to determine whether cause exists for modifying, revoking, and reissuing, or terminating the permit, or to determine compliance with this permit. The permittee shall also furnish to the Director, upon request, copies of records required to be kept by this permit.

10. RIGHT OF ENTRY

The permittee shall allow the Director or an authorized representative upon presentation of credentials and other documents as may be required by law to:

A. Enter upon the permittee's premises where a regulated facility or activity is located or conducted, or where records must be kept under the conditions of this permit.

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

C. Inspect at reasonable times any facilities, equipment (including monitoring and control equipment), practices, or operations regulated or required under this permit.

D. Sample or monitor at reasonable times, for the purposes of assuring permit compliance or as otherwise authorized by the Clean Water Act, any substances or parameters at any location.

11. UNAUTHORIZED DISCHARGES

A. 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 assure efficient operation. These bypasses are not subject to the provisions of paragraphs 11.B and 11.C.

B. Notice

1. Anticipated Bypass - If the permittee knows in advance of the need for a bypass, it shall submit prior notice, if possible at least ten days before the date of the bypass.

2. Unanticipated Bypass - The permittee shall submit notice of an unanticipated bypass as required in paragraph 12.B (24 hour notice).

C. Prohibition of Bypass

1. Bypass is prohibited, and the Director may take enforcement action against a permittee for bypass, unless:

a. Bypass was unavoidable to prevent loss of life, personal injury, or severe property damage;

b. 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 which occurred during normal periods of equipment downtime or preventive maintenance; and

c. The permittee submitted notices as required under paragraph 11.B.

2. The Director may approve an anticipated bypass, after considering its adverse effects, if the Director determines that it will meet the three conditions listed above in paragraph 11.C.1.

12. NONCOMPLIANCE NOTIFICATION

A. Exceedance of a Daily Maximum Discharge Limit

1. The permittee shall report noncompliance that is the result of any violation of a daily maximum discharge limit for any of the pollutants listed by the Director in the permit by e-mail or telephone within twenty-four (24) hours of discovery.

The permittee may report to the appropriate Ohio EPA district office e-mail account as follows (this method is preferred):

Southeast District Office: sedo24hournpdes@epa.state.oh.us
Southwest District Office: swdo24hournpdes@epa.state.oh.us
Northwest District Office: nwdo24hournpdes@epa.state.oh.us
Northeast District Office: nedo24hournpdes@epa.state.oh.us
Central District Office: cdo24hournpdes@epa.state.oh.us
Central Office: co24hournpdes@epa.state.oh.us

The permittee shall attach a noncompliance report to the e-mail. A noncompliance report form is available on the following web site under the Monitoring and Reporting - Non-Compliance Notification section:

http://epa.ohio.gov/dsw/permits/individuals.aspx

Or, the permittee may report to the appropriate Ohio EPA district office by telephone toll-free between 8:00 AM and 5:00 PM as follows:

Southeast District Office: (800) 686-7330
Southwest District Office: (800) 686-8930
Northwest District Office: (800) 686-6930
Northeast District Office: (800) 686-6330
Central District Office: (800) 686-2330
Central Office: (614) 644-2001

The permittee shall include the following information in the telephone noncompliance report:

a. The name of the permittee, and a contact name and telephone number;

b. The limit(s) that has been exceeded;

c. The extent of the exceedance(s);

d. The cause of the exceedance(s);

e. The period of the exceedance(s) including exact dates and times;

f. If uncorrected, the anticipated time the exceedance(s) is expected to continue; and,

g. Steps taken to reduce, eliminate or prevent occurrence of the exceedance(s).

B. Other Permit Violations

1. The permittee shall report noncompliance that is the result of any unanticipated bypass resulting in an exceedance of any effluent limit in the permit or any upset resulting in an exceedance of any effluent limit in the permit by e-mail or telephone within twenty-four (24) hours of discovery.

The permittee may report to the appropriate Ohio EPA district office e-mail account as follows (this method is preferred):

Southeast District Office: sedo24hournpdes@epa.state.oh.us
Southwest District Office: swdo24hournpdes@epa.state.oh.us
Northwest District Office: nwdo24hournpdes@epa.state.oh.us
Northeast District Office: nedo24hournpdes@epa.state.oh.us
Central District Office: cdo24hournpdes@epa.state.oh.us
Central Office: co24hournpdes@epa.state.oh.us

The permittee shall attach a noncompliance report to the e-mail. A noncompliance report form is available on the following web site:

http://www.epa.ohio.gov/dsw/permits/permits.aspx

Or, the permittee may report to the appropriate Ohio EPA district office by telephone toll-free between 8:00 AM and 5:00 PM as follows:

Southeast District Office: (800) 686-7330
Southwest District Office: (800) 686-8930
Northwest District Office: (800) 686-6930
Northeast District Office: (800) 686-6330
Central District Office: (800) 686-2330
Central Office: (614) 644-2001

The permittee shall include the following information in the telephone noncompliance report:

a. The name of the permittee, and a contact name and telephone number;

b. The time(s) at which the discharge occurred, and was discovered;

c. The approximate amount and the characteristics of the discharge;

d. The stream(s) affected by the discharge;

e. The circumstances which created the discharge;

f. The name and telephone number of the person(s) who have knowledge of these circumstances;

g. What remedial steps are being taken; and,

h. The name and telephone number of the person(s) responsible for such remedial steps.

2. The permittee shall report noncompliance that is the result of any spill or discharge which may endanger human health or the environment within thirty (30) minutes of discovery by calling the 24-Hour Emergency Hotline toll-free at (800) 282-9378. The permittee shall also report the spill or discharge by e-mail or telephone within twenty-four (24) hours of discovery in accordance with B.1 above.

C. When the telephone option is used for the noncompliance reports required by A and B, the permittee shall submit to the appropriate Ohio EPA district office a confirmation letter and a completed noncompliance report within five (5) days of the discovery of the noncompliance. This follow up report is not necessary for the e-mail option which already includes a completed noncompliance report.

D. If the permittee is unable to meet any date for achieving an event, as specified in a schedule of compliance in their permit, the permittee shall submit a written report to the appropriate Ohio EPA district office within fourteen (14) days of becoming aware of such a situation. The report shall include the following:

1. The compliance event which has been or will be violated;

2. The cause of the violation;

3. The remedial action being taken;

4. The probable date by which compliance will occur; and,

5. The probability of complying with subsequent and final events as scheduled.

E. The permittee shall report all other instances of permit noncompliance not reported under paragraphs A or B of this section on their monthly DMR submission. The DMR shall contain comments that include the information listed in paragraphs A or B as appropriate.

F. If the permittee becomes aware that it failed to submit an application, or submitted incorrect information in an application or in any report to the director, it shall promptly submit such facts or information.

13. RESERVED

14. DUTY TO MITIGATE

The permittee shall take all reasonable steps to minimize or prevent any discharge in violation of this permit which has a reasonable likelihood of adversely affecting human health or the environment.

15. AUTHORIZED DISCHARGES

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 by this permit shall constitute a violation of the terms and conditions of this permit. Such violations may result in the imposition of civil and/or criminal penalties as provided for in Section 309 of the Act and Ohio Revised Code Sections 6111.09 and 6111.99.

16. DISCHARGE CHANGES

The following changes must be reported to the appropriate Ohio EPA district office as soon as practicable:

A. For all treatment works, any significant change in character of the discharge which the permittee knows or has reason to believe has occurred or will occur which would constitute cause for modification or revocation and reissuance. The permittee shall give advance notice to the Director of any planned changes in the permitted facility or activity which may result in noncompliance with permit requirements. Notification of permit changes or anticipated noncompliance does not stay any permit condition.

B. For publicly owned treatment works:

1. Any proposed plant modification, addition, and/or expansion that will change the capacity or efficiency of the plant;

2. The addition of any new significant industrial discharge; and

3. Changes in the quantity or quality of the wastes from existing tributary industrial discharges which will result in significant new or increased discharges of pollutants.

C. For non-publicly owned treatment works, any proposed facility expansions, production increases, or process modifications, which will result in new, different, or increased discharges of pollutants.

Following this notice, modifications to the permit may be made to reflect any necessary changes in permit conditions, including any necessary effluent limitations for any pollutants not identified and limited herein. A determination will also be made as to whether a National Environmental Policy Act (NEPA) review will be required. Sections 6111.44 and 6111.45, Ohio Revised Code, require that plans for treatment works or improvements to such works be approved by the Director of the Ohio EPA prior to initiation of construction.

D. In addition to the reporting requirements under 40 CFR 122.41(l) and per 40 CFR 122.42(a), all existing manufacturing, commercial, mining, and silvicultural dischargers must notify the Director as soon as they know or have reason to believe:

1. That any 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 "notification levels" specified in 40 CFR Sections 122.42(a)(1)(i) through 122.42(a)(1)(iv).

2. 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 "notification levels" specified in 122.42(a)(2)(i) through 122.42(a)(2)(iv).

17. TOXIC POLLUTANTS

The permittee shall comply with effluent standards or prohibitions established under Section 307 (a) of the Clean Water Act for toxic pollutants within the time provided in the regulations that establish these standards or prohibitions, even if the permit has not yet been modified to incorporate the requirement. Following establishment of such standards or prohibitions, the Director shall modify this permit and so notify the permittee.

18. PERMIT MODIFICATION OR REVOCATION

A. After notice and opportunity for a hearing, this permit may be modified or revoked, by the Ohio EPA, in whole or in part during its term for cause including, but not limited to, the following:

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

2. Obtaining this permit by misrepresentation or failure to disclose fully all relevant facts; or

3. Change in any condition that requires either a temporary or permanent reduction or elimination of the permitted discharge.

B. Pursuant to rule 3745-33-04, Ohio Administrative Code, the permittee may at any time apply to the Ohio EPA for modification of any part of this permit. The filing of a request by the permittee for a permit modification or revocation does not stay any permit condition. The application for modification should be received by the appropriate Ohio EPA district office at least ninety days before the date on which it is desired that the modification become effective. The application shall be made only on forms approved by the Ohio EPA.

19. TRANSFER OF OWNERSHIP OR CONTROL

This permit may be transferred or assigned and a new owner or successor can be authorized to discharge from this facility, provided the following requirements are met:

A. The permittee shall notify the succeeding owner or successor of the existence of this permit by a letter, a copy of which shall be forwarded to the appropriate Ohio EPA district office. The copy of that letter will serve as the permittee's notice to the Director of the proposed transfer. The copy of that letter shall be received by the appropriate Ohio EPA district office sixty (60) days prior to the proposed date of transfer;

B. A written agreement containing a specific date for transfer of permit responsibility and coverage between the current and new permittee (including acknowledgement that the existing permittee is liable for violations up to that date, and that the new permittee is liable for violations from that date on) shall be submitted to the appropriate Ohio EPA district office within sixty days after receipt by the district office of the copy of the letter from the permittee to the succeeding owner;

At anytime during the sixty (60) day period between notification of the proposed transfer and the effective date of the transfer, the Director may prevent the transfer if he concludes that such transfer will jeopardize compliance with the terms and conditions of the permit. If the Director does not prevent transfer, he will modify the permit to reflect the new owner.

20. 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 is or may be subject under Section 311 of the Clean Water Act.

21. SOLIDS DISPOSAL

Collected grit and screenings, and other solids other than sewage sludge, shall be disposed of in such a manner as to prevent entry of those wastes into waters of the state, and in accordance with all applicable laws and rules.

22. CONSTRUCTION AFFECTING NAVIGABLE WATERS

This permit does not authorize or approve the construction of any onshore or offshore physical structures or facilities or the undertaking of any work in any navigable waters.

23. CIVIL AND CRIMINAL LIABILITY

Except as exempted in the permit conditions on UNAUTHORIZED DISCHARGES or UPSETS, nothing in this permit shall be construed to relieve the permittee from civil or criminal penalties for noncompliance.

24. STATE LAWS AND REGULATIONS

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.

25. 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 any injury to private property or any invasion of personal rights, nor any infringement of federal, state, or local laws or regulations.

26. UPSET

The provisions of 40 CFR Section 122.41(n), relating to "Upset," are specifically incorporated herein by reference in their entirety. For definition of "upset," see Part III, Paragraph 1, DEFINITIONS.

27. SEVERABILITY

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 circumstance, is held invalid, the application of such provision to other circumstances, and the remainder of this permit, shall not be affected thereby.

28. SIGNATORY REQUIREMENTS

All applications submitted to the Director shall be signed and certified in accordance with the requirements of 40 CFR 122.22.

All reports submitted to the Director shall be signed and certified in accordance with the requirements of 40 CFR Section 122.22.

29. OTHER INFORMATION

A. 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 Director, it shall promptly submit such facts or information.

B. ORC 6111.99 provides that any person who falsifies, tampers with, or knowingly renders inaccurate any monitoring device or method required to be maintained under this permit shall, upon conviction, be punished by a fine of not more than $25,000 per violation.

C. ORC 6111.99 states 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 $25,000 per violation.

D. ORC 6111.99 provides that any person who violates Sections 6111.04, 6111.042, 6111.05, or division (A) of Section 6111.07 of the Revised Code shall be fined not more than $25,000 or imprisoned not more than one year, or both.

30. NEED TO HALT OR REDUCE ACTIVITY

40 CFR 122.41(c) states that 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 conditions of this permit.

31. APPLICABLE FEDERAL RULES

All references to 40 CFR in this permit mean the version of 40 CFR which is effective as of the effective date of this permit.

32. AVAILABILITY OF PUBLIC SEWERS

Not withstanding the issuance or non-issuance of an NPDES permit to a semi-public disposal system, whenever the sewage system of a publicly owned treatment works becomes available and accessible, the permittee operating any semi-public disposal system shall abandon the semi-public disposal system and connect it into the publicly owned treatment works.

## Part IV. Storm Water Control Measures and Pollution Prevention Programs

In Part IV and in Part VI, 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.

### A. Control Measures.

You shall select, design, install, and implement control measures (including best management practices) to address the selection and design considerations in Part IV.B, and meet the control measures/best management practices in Part IV.C and any applicable numeric effluent limits in Part I. The selection, design, installation, and implementation of these control measures shall be in accordance with good engineering practices and manufacturer's specifications. Note that you may deviate from such manufacturer's specifications where you provide justification for such deviation and include documentation of your rationale in the part of your SWPPP that describes your control measures, consistent with Part IV.J.3. If you find that your control measures are not achieving their intended effect of minimizing pollutant discharges, you shall modify these control measures as expeditiously as practicable. Regulated storm water discharges from your facility include storm water run-on that commingles with storm water discharges associated with industrial activity at your facility.

### B. Control Measure Selection and Design Considerations.

You shall consider the following when selecting and designing control measures:

1. Preventing storm water from coming into contact with polluting materials is generally more effective, and less costly, than trying to remove pollutants from storm water;

2. Using control measures in combination is more effective than using control measures in isolation for minimizing pollutants in your storm water discharge;

3. 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;

4. 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 shall be taken to avoid ground water contamination;

5. Attenuating flow using open vegetated swales and natural depressions can reduce in-stream impacts of erosive flows;

6. Conserving and/or restoring of riparian buffers will help protect streams from storm water runoff and improve water quality; and

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

**C. Control Measures/Best Management Practices (BMPs)**

1. Minimize Exposure. You shall 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 by either locating these industrial materials and activities inside or protecting them with storm resistant coverings (although significant enlargement of impervious surface area is not recommended). In minimizing exposure, you should pay particular attention to the following:

   a. Use grading, berming, or curbing to prevent runoff of contaminated flows and divert run-on away from these areas;

   b. Locate materials, equipment, and activities so that leaks are contained in existing containment and diversion systems (confine the storage of leaky or leak-prone vehicles and equipment awaiting maintenance to protected areas);

   c. Clean up spills and leaks promptly using dry methods (e.g., absorbents) to prevent the discharge of pollutants;

   d. Use drip pans and absorbents under or around leaky vehicles and equipment or store indoors where feasible;

   e. Use spill/overflow protection equipment;

   f. Drain fluids from equipment and vehicles prior to on-site storage or disposal;

   g. Perform all cleaning operations indoors, under cover, or in bermed areas that prevent runoff and run-on and also that capture any overspray; and

   h. Ensure that all washwater drains to a proper collection system (i.e., not the storm water drainage system).

   The discharge of vehicle and equipment washwater, including tank cleaning operations, is not authorized by this permit.

2. Good Housekeeping. You shall 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 storing materials in appropriate containers.

3. Maintenance. You shall 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 discharged to receiving waters. You shall maintain all control measures that are used to achieve the control measures/best management practices (BMPs) required by this permit in effective operating condition. Nonstructural control measures shall also be diligently maintained (e.g., spill response supplies available, personnel appropriately trained). If you find that your

control measures need to be replaced or repaired, you shall make the necessary repairs or modifications as expeditiously as practicable.

4. Spill Prevention and Response Procedures. You shall 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 shall implement:

   a. 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;

   b. Preventative measures such as barriers between material storage and traffic areas, secondary containment provisions, and procedures for material storage and handling;

   c. 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 shall 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 (Part IV.J.1); and

   d. Where a leak, spill or other release containing a hazardous substance or oil in an amount equal to or in excess of a reportable quantity established under either 40 CFR Part 110, 40 CFR Part 117, or 40 CFR Part 302, occurs during a 24-hour period, you shall notify the Ohio EPA in accordance with the requirements of Part III Item 12 of this permit.

5. Erosion and Sediment Controls. You shall stabilize exposed areas and contain runoff using structural and/or non-structural control measures to minimize onsite erosion and sedimentation, and the resulting discharge of pollutants. Among other actions you shall take to meet this limit, you shall 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 consult with the Ohio Department of Natural Resources (ODNR) Division of Soil and Water Conservation's Rainwater and Land Development manual (http://epa.ohio.gov/dsw/storm/technical_guidance.aspx), U.S. EPA's internet-based resources relating to BMPs for erosion and sedimentation, including the sector-specific *Industrial Storm Water Fact Sheet Series*, (www.epa.gov/npdes/stormwater/msgp), *National Menu of Storm Water BMPs* (www.epa.gov/npdes/stormwater/menuofbmps), and *National Management Measures to Control Nonpoint Source Pollution from Urban Areas* (www.epa.gov/owow/nps/urbanmm/index.html).

6. Management of Runoff. You shall divert, infiltrate, reuse, contain, or otherwise reduce storm water runoff, to minimize pollutants in your discharges. In selecting, designing, installing, and implementing appropriate control measures, you are encouraged to consult with the Ohio Department of Natural Resources (ODNR) Division of Soil and Water Conservation's Rainwater and Land Development manual (http://epa.ohio.gov/dsw/storm/technical_guidance.aspx), U.S. EPA's internet-based resources relating to runoff management, including the sector-specific

*Industrial Storm Water Fact Sheet Series*, (www.epa.gov/npdes/stormwater/msgp), *National Menu of Storm Water BMPs* (www.epa.gov/npdes/stormwater/menuofbmps), and *National Management Measures to Control Nonpoint Source Pollution from Urban Areas* (www.epa.gov/owow/nps/urbanmm/index.html).

7. Salt Storage Piles or Piles Containing Salt. You shall 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 shall implement appropriate measures (e.g., good housekeeping, diversions, containment) to minimize exposure resulting from adding to or removing materials from the pile.

8. Sector Specific Control Measures/Best Management Practices (BMPs). You shall achieve any additional control measures/best management practices (BMPs) stipulated in the relevant sector-specific section(s) of Part IV.K. of this permit.

9. Employee Training. You shall 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. Training shall cover both the specific control measures used to achieve the conditions in this Part, and monitoring, inspection, planning, reporting, and documentation requirements in other parts of this permit. Ohio EPA requires that training be conducted at least annually (or more often if employee turnover is high).

10. Non-Storm Water Discharges. You shall eliminate non-storm water discharges not authorized by an NPDES permit. The following are the non-storm water discharges authorized under this permit:

    a. Discharges from fire-fighting activities (not planned exercises);

    b. Fire hydrant flushings;

    c. Potable water, including water line flushings;

    d. Uncontaminated condensate from air conditioners, coolers/chillers, and other compressors and from the outside storage of refrigerated gases or liquids;

    e. Irrigation drainage;

    f. Landscape watering provided all pesticides, herbicides, and fertilizer have been applied in accordance with the approved labeling;

    g. Pavement wash waters where no detergents or hazardous cleaning products are used (e.g., bleach, hydrofluoric acid, muriatic acid, sodium hydroxide, nonylphenols, etc.), and the wash waters do not come into contact with oil and grease deposits, sources of pollutants associated with industrial activities (see Part IV.J.2), or any other toxic or hazardous materials, unless residues are first cleaned up using dry clean-up methods (e.g., applying absorbent materials and sweeping, using hydrophobic mops/rags) and you have implemented appropriate control

measures to minimize discharges of mobilized solids and other pollutants (e.g., filtration, detention, settlement);

h. Routine external building washdown/power wash water that does not use detergents or hazardous cleaning products (e.g., those containing bleach, hydrofluoric acid, muriatic acid, sodium hydroxide, nonylphenols, etc.);

i. Uncontaminated ground water or spring water;

j. Foundation or footing drains where flows are not contaminated with process materials; and

k. Incidental windblown mist from cooling towers that collect on rooftops or adjacent portions of your facility, but not intentional discharges from the cooling tower (e.g., "piped" cooling tower blowdowns or drains).

l. Outfalls 001, 002, and 004.

11. Waste, Garbage and Floatable Debris. You shall 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.

12. Dust Generation and Vehicle Tracking of Industrial Materials. You shall minimize generation of dust and off-site tracking of raw, final, or waste materials.

**D. Corrective Actions**

1. Conditions Requiring Review and Revision to Eliminate Problem. If any of the following conditions occur, you shall review and revise the selection, design, installation, and implementation of your control measures to ensure that the condition is eliminated and will not be repeated in the future:

a. An unauthorized release or discharge (e.g., spill, leak, or discharge of non-storm water not authorized by this or another NPDES permit) occurs at your facility;

b. A discharge violates a numeric effluent limit;

c. You become aware, or Ohio EPA determines, that your control measures are not stringent enough for the discharge to meet applicable water quality standards;

d. An inspection or evaluation of your facility by an Ohio EPA official or local MS4 operator determines that modifications to the control measures are necessary to meet the control measures/best management practices (BMPs) in this permit; or

e. You find in your routine facility inspection or quarterly visual assessment that your control measures are not being properly operated and maintained.

2. Conditions Requiring Review to Determine if Modifications Are Necessary. If any of the following conditions occur, you shall review the selection, design, installation, and implementation of your control measures to determine if modifications are necessary to meet the Part IV.A conditions in this permit:

   a. Construction or a change in design, operation, or maintenance at your facility significantly changes the nature of pollutants discharged in storm water from your facility, or significantly increases the quantity of pollutants discharged; or

   b. Sampling results exceeds an applicable benchmark.

3. Corrective Action Deadlines. You shall document your discovery of any of the conditions listed in Part IV.D.1 and Part IV.D.2 within 24 hours of making such discovery. Subsequently, within 30 days of such discovery, you shall 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 24 hours and 30 days is detailed in Part IV.D.4. If you determine that changes are necessary following your review, any modifications to your control measures shall 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 are schedules considered reasonable for documenting 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.

4. Corrective Action Report. Within 24 hours of discovery of any condition listed in Part IV.D.1 and Part IV.D.2, you shall document the following information (i.e., question 4 of the Corrective Actions section in the Annual Reporting Form, available at http://www.epa.state.oh.us/portals/35/permits/IndustrialStormWater_Final_GP_AppI_dec11.pdf):

   - Identification of the condition triggering the need for corrective action review;
   - Description of the problem identified; and
   - Date the problem was identified.

   Within 30 days of discovery of any condition listed in Part IV.D.1 and Part IV.D.2, you shall document the following information (i.e., questions 7-11 of the Corrective Actions section in the Annual Reporting Form):

   - Summary of corrective action taken or to be taken (or, for triggering events identified in Part IV.D.2 where you determine that corrective action is not necessary, the basis for this determination);

- Notice of whether SWPPP modifications are required as a result of this discovery or corrective action;

- Date corrective action initiated; and

- Date corrective action completed or expected to be completed.

You shall include this documentation in an annual report as required in Part V. A.2 and retain onsite with your SWPPP.

5. Effect of Corrective Action. If the event triggering the review is a permit violation (e.g., non-compliance with an effluent limit), correcting it does not remove the original violation. Additionally, failing to take corrective action in accordance with this section is an additional permit violation. Ohio EPA will consider the appropriateness and promptness of corrective action in determining enforcement responses to permit violations.

6. Substantially Identical Outfalls. If the event triggering corrective action is linked to an outfall that represents other substantially identical outfalls, your review shall assess the need for corrective action for each outfall represented by the outfall that triggered the review. Any necessary changes to control measures that affect these other outfalls shall also be made before the next storm event if possible, or as soon as practicable following that storm event.

**E. Inspections**

Beginning on the effective date of this permit, you shall conduct the inspections in Part IV.E.1 and Part IV.E.2 at your facility.

1. Routine Facility Inspections.

   a. Conduct routine facility inspections of all areas of the facility where industrial materials or activities are exposed to storm water, and of all storm water control measures used to comply with Part IV. Items A-C conditions contained in this permit. Routine facility inspections shall be conducted at least quarterly (i.e., once each calendar quarter) although in many instances, more frequent inspection (e.g., monthly) may be appropriate for some types of equipment, processes, and control measures or areas of the facility with significant activities and materials exposed to storm water. Perform these inspections during periods when the facility is in operation. You shall specify the relevant inspection schedules in your SWPPP document as required in Part IV. Items A-C. These routine inspections shall be performed by qualified personnel (for definition see VI - Definitions) with at least one member of your storm water pollution prevention team participating. At least once each calendar year, the routine facility inspection shall be conducted during a period when a storm water discharge is occurring.

   You shall document the findings of each routine facility inspection performed and maintain this documentation onsite with your SWPPP. You are not required to submit your routine

facility inspection findings to Ohio EPA, unless specifically requested to do so. At a minimum, your documentation of each routine facility inspection shall include:

i. The inspection date and time;

ii. The name(s) and signature(s) of the inspector(s);

iii. Weather information and a description of any discharges occurring at the time of the inspection;

iv. Any previously unidentified discharges of pollutants from the site;

v. Any control measures needing maintenance or repairs;

vi. Any failed control measures that need replacement;

vii. Any incidents of noncompliance observed; and

viii. Any additional control measures needed to comply with the permit requirements.

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

b. Exceptions to Routine Facility Inspections:

*Inactive and Unstaffed Sites:* The requirement to conduct routine facility inspections on a quarterly basis does not apply at a facility that is inactive and unstaffed, as long as there are no industrial materials or activities exposed to storm water. Such a facility is only required to conduct an annual site inspection in accordance with the requirements of Part IV.E.1. To invoke this exception, you shall maintain a statement in your SWPPP pursuant to Part IV.F indicating that the site is inactive and unstaffed, and that there are no industrial materials or activities exposed to precipitation, in accordance with the substantive requirements in 40 CFR 122.26(g)(4)(iii). The statement shall be signed and certified in accordance with Appendix B, Subsection 11. If circumstances change and industrial materials or activities become exposed to storm water or your facility becomes active and/or staffed, this exception no longer applies and you shall immediately resume quarterly facility inspections. If you are not qualified for this exception at the time you are authorized under this permit, but during the permit term you become qualified because your facility is inactive and unstaffed, and there are no industrial materials or activities that are exposed to storm water, then you shall include the same signed and certified statement as above and retain it with your records pursuant to Part IV.J.5.

Inactive and unstaffed facilities covered under Sectors D (Asphalt Paving and Roofing Materials and Lubricant Manufacturing), E (Glass, Clay, Cement, Concrete, and Gypsum Products) and J (Non-Metallic Mineral Mining and Dressing), are not required to meet the "no industrial materials or activities exposed to storm water" standard to be eligible for this

exception from routine inspections, consistent with the requirements established in relevant sector requirements.

*Ohio EPA's Encouraging Environmental Excellence (E3) Program*: If your facility has been recognized under the Gold and Platinum levels by Ohio EPA's Encouraging Environmental Excellence (E3) Program, you only need to conduct routine facility inspections for two quarters each year. If Part IV.K of this permit requires your facility to conduct routine facility inspections on a monthly basis, you only need to conduct routine facility inspections on a quarterly basis.

2. Quarterly Visual Assessment of Storm Water Discharges.

a. Quarterly Visual Assessment Procedures

Once each calendar quarter for the entire permit term, except for outfalls 001, 002, and 004, you shall collect a storm water sample from each outfall (except as noted in Part IV.E.2.c) that requires sampling under this permit 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 storm water discharge. The visual assessment shall be made:

- Of a sample in a clean, clear glass, or plastic container, and examined in a well-lit area;

- 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 shall be collected as soon as practicable after the first 30 minutes and you shall document why it was not possible to take samples within the first 30 minutes. In the case of snowmelt, samples shall be taken during a period with a measurable discharge from your site; and

- 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. If it is not possible to collect the sample on discharges that occur at least 72 hours (3 days) from the previous discharge, the sample shall be collected as close to this storm interval as practicable and you shall document why it was not possible to take samples from a 72 hour (3 day) storm interval.

- Areas Subject to Snow: In areas subject to snow, at least one quarterly visual assessment shall capture snowmelt discharge.

- For the following water quality characteristics: color, odor, clarity, floating solids, settled solids, suspended solids, foam, oil sheen, and other obvious indicators of storm water pollution.

b. Quarterly Visual Assessment Documentation

You shall document the results of your visual assessments and maintain this documentation onsite with your SWPPP. You are not required to submit your visual assessment findings to Ohio EPA, unless specifically requested to do so. At a minimum, your documentation of the visual assessment shall include:

- Sample location(s);
- Sample collection date and time, and visual assessment date and time for each sample;
- Personnel collecting the sample and performing visual assessment, and their signatures;
- Nature of the discharge (i.e., runoff or snowmelt);
- Results of observations of the storm water discharge;
- Probable sources of any observed storm water contamination; and
- If applicable, why it was not possible to take samples within the first 30 minutes and/or from a 72 hour (3 day) storm interval.

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

c. Exceptions to Quarterly Visual Assessments

The following are exceptions to quarterly visual assessments:

- Adverse Weather Conditions: When adverse weather conditions prevent the collection of samples during the quarter, you shall take a substitute sample during the next qualifying storm event. Documentation of the rationale for no visual assessment for the quarter shall be included with your 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 drought or extended frozen conditions.

- Inactive and unstaffed sites: The requirement for a quarterly visual assessment does not apply at a facility that is inactive and unstaffed, as long as there are no industrial materials or activities exposed to storm water. To invoke this exception, you shall maintain a statement in your SWPPP indicating that the site is inactive and unstaffed, and that there are no industrial materials or activities exposed to precipitation, in accordance with the substantive requirements in 40 CFR 122.26(g)(4)(iii). The statement shall be signed and certified in accordance with Part III.28 of this permit. If circumstances change and industrial materials or activities become exposed to storm water or your facility becomes active and/or staffed, this exception no longer applies and you shall immediately resume quarterly visual assessments. If you are not qualified for this exception at the time you are

authorized under this permit, but during the permit term you become qualified because your facility is inactive and unstaffed, and there are no industrial materials or activities that are exposed to storm water, then you shall include the same signed and certified statement as above and retain it with your records.

- *Ohio EPA's Encouraging Environmental Excellence (E3) Program*: If your facility has been recognized under the Gold and Platinum levels by Ohio EPA's Encouraging Environmental Excellence (E3) Program, you only need to conduct quarterly visual assessment of storm water discharges for two quarters each year.

**F. Storm Water Pollution Prevention Plan (SWPPP)**

A storm water pollution prevention plan (SWPPP) shall be developed to address each outfall that discharges to waters of the state that contains storm water associated with industrial activity. Storm water pollution prevention plans shall be prepared in accordance with good engineering practices. The SWPPP shall 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. The SWPPP shall describe and ensure the implementation of practices which are to be used to reduce the pollutants in storm water discharges associated with industrial activity at the facility and to assure compliance with the terms and conditions of this permit. Facilities must implement the provisions of the storm water pollution prevention plan required under this part as a condition of this permit.

The SWPPP does not contain effluent limitations; the limitations or benchmarks are contained in Part I. The SWPPP is intended to document the selection, design, and installation of control measures. As distinct from the SWPPP, the documentation requirements are intended to document the implementation (including inspection, maintenance, monitoring, and corrective action) of the permit requirements.

**G. Deadlines for SWPPP Preparation and Compliance.**

1. The plan for a storm water discharge associated with industrial activity:

   a. Shall be prepared within six months of the effective date of this permit (and updated based on facility or materials handling changes as specified in Part IV, Item I);

   b. Shall provide for implementation and compliance with the terms of the plan within twelve months of the effective date of this permit.

2. Upon showing of good cause, the Director may establish a later date for preparing and compliance with a plan for a storm water discharge associated with industrial activity.

**H. Signature and Plan Review.**

1. The plan shall be signed and dated in accordance with Part III, Item 28, and be retained on-site at the facility which generates the storm water discharge.

2. The permittee shall make plans immediately available upon request to the Ohio EPA Director, or authorized representative, or Regional Administrator of U.S. EPA, a local agency approving storm water management plans, or in the case of a storm water discharge associated with industrial activity which discharges through a municipal separate storm sewer system, to the operator of the municipal system.

3. The Director may notify the permittee at any time that the plan does not meet one or more of the minimum requirements of this Part. Within 30 days of such notification from the Director, the permittee shall make the required changes to the plan and shall submit to the Director a written certification that the requested changes have been made.

4. All storm water pollution prevention plans required under this permit are considered reports that shall be available to the public under Section 308(b) of the Act. Confidential Business Information (CBI) may be withheld from the public, but may not be withheld from those staff cleared for CBI review within Ohio EPA. An interested party wishing a copy of a discharger's SWPPP will have to contact the Ohio EPA to obtain a copy.

**I. Keeping SWPPP Current**

The permittee shall modify the plan whenever necessary to address any of the triggering conditions for corrective action in Part IV.D and to ensure that they do not reoccur, or to reflect changes implemented when a review following the triggering conditions in Part IV.D.2 indicates that changes to your control measures are necessary to meet the control measures/best management practices (BMPs) in this permit. Changes to your SWPPP document shall be made in accordance with the corrective action deadlines in Part IV.D.3 and Part IV.D.4.

Amendments to the plan may be reviewed by Ohio EPA in the same manner as Part IV.H above.

**J. Contents of SWPPP.**

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

1. Pollution Prevention Team. You shall identify the staff members (by name or title) that comprise the facility's storm water pollution prevention team as well as their individual responsibilities. Your storm water pollution prevention team is responsible for assisting the facility manager in developing and revising the facility's SWPPP as well as maintaining control measures and taking corrective actions where required. Each member of the storm water pollution prevention team shall have ready access to either an electronic or paper copy of applicable portions of this permit and your SWPPP.

2. Description of Potential Pollutant Sources. You shall document at your facility where industrial materials or activities are exposed to storm water and from which allowable non-storm water discharges are 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 product or waste product. For each area identified, the description shall include, at a minimum:

a. Site Description. Your SWPPP shall include:

i. A description of the industrial activities at your facility;

ii. A general location map (e.g. U.S. Geologic Survey (USGS) quadrangle map) with enough detail to identify the location of your facility and all receiving waters for your storm water discharges.

iii. A site map showing

- The size of the property in acres;
- The location and extent of significant structures and impervious surfaces;
- Directions of storm water flow (use arrows);
- Locations of all existing structural control measures;
- Locations of all receiving waters in the immediate vicinity of your facility;
- Locations of all storm water conveyances including ditches, pipes and swales;
- Locations of potential pollutant sources identified under Part IV J. 2.b;
- Locations where significant spills or leaks identified under Part IV J. 2.b. have occurred;
- Locations of all storm water monitoring points;
- Locations of storm water inlets and outfalls, with a unique identification code for each outfall (e.g. Outfall 001, Outfall 002, etc), indicating any outfalls that are considered substantially identical to another outfall, and an approximate outline of the areas draining to each outfall;
- Municipal separate storm sewer systems, where your storm water discharges to them;
- Locations and descriptions of all non-storm water discharges identified under Part IV. C. 10;
- Locations of the following activities where such activities are exposed to precipitation
  - Fueling stations;

- Vehicle and equipment maintenance and/or cleaning areas;
- Loading/unloading areas;
- 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;
- Transfer areas for substances in bulk;
- Machinery; and

- Locations and sources of run-on to your site from adjacent property that contains significant quantities of pollutants.

b. Inventory of Exposed Materials. This includes a list of industrial activities exposed to storm water (e.g., material storage; equipment fueling, maintenance, and cleaning; cutting steel beams). This also includes a list of the pollutant(s) or pollutant constituents (e.g, crankcase oil, zinc, sulfuric acid, and cleaning solvents) associated with each identified activity. The pollutant list shall include all significant materials that have been handled, treated, stored, or disposed, and that have been exposed to storm water in the three years prior to the data you prepare of amend your SWPPP.

c. Spills and Leaks. You shall document where potential spills and leaks could occur that could contribute pollutants to storm water discharges, and the corresponding outfall(s) that would be affected by such spills and leaks. You shall document 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, in the three years prior to the date you prepare or amend your SWPPP. Note that significant spills and leaks include, but are not limited to, releases of oil or hazardous substances in excess of quantities that are reportable under CWA Section 311 (see 40 CFR 110.6 and 40 CFR 117.21) or Section 102 of the Comprehensive Environmental Response, Compensation and Liability Act (CERCLA), 42 USC Section 9602. This permit does not relieve you of the reporting requirements of 40 CFR 110, 40 CFR 117, and 40 CFR 302 relating to spills or other releases of oil or hazardous substances.

d. Sampling Data. A summary of existing discharge sampling data describing pollutants in storm water discharges from the facility.

e. Non-Storm Water Discharges. You shall document that you have evaluated for the presence of non-storm water discharges, except for those listed in Part I and Part IV.C.10, and that all unauthorized discharges have been eliminated. Documentation of your evaluation shall include: 1) The date of any 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; 4) The different types of non-storm water discharge(s) and source locations; and 5) The action(s) taken, such as a list of control measures used to eliminate unauthorized discharge(s),

if any were identified. 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.

f. Salt Storage. You shall document the location of any storage piles containing salt used for deicing or other commercial or industrial purposes.

3. Description of Control Measures. You shall document the location and type of control measures you have installed and implemented at your site to achieve the control measures/best management practices (BMPs) in Part IV.C, and where applicable, in Part IV.K. You shall describe how you addressed the control measure selection and design considerations in Part IV.B. This documentation shall describe how the control measures at your site address both the pollutant sources identified in Part IV.J.2 and any storm water run-on that commingles with any discharges covered under this permit.

4. Schedules and Procedures.

a. Pertaining to Control Measures used to Comply with the Control Measures/Best Management Practices (BMPs). The following shall be documented in your SWPPP:

i. Good Housekeeping (See Part IV.C.2) – 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 (See Part IV.C.3) – Preventative maintenance procedures, including regular inspections, testing, maintenance, and repair of all industrial equipment and systems, and 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;

iii. Spill Prevention and Response Procedures (See Part IV.C.4) – Procedures for preventing and responding to spills and leaks. 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 (hard copy or electronic) and make it available for review consistent with Part IV.J.5; and

iv. Employee Training (See Part IV.C.9) – A schedule for all types of necessary training.

b. Pertaining to Monitoring and Inspection. Where applicable, you shall document in your SWPPP your procedures for conducting analytical storm water monitoring. You shall document in your SWPPP your procedures for performing, as appropriate, the two types of inspections specified by this permit, including: 1) Routine facility inspections (See Part IV.E.1) and 2) Quarterly visual assessment of storm water discharges (See Part IV.E.2).

5. Documentation Requirements. You are required to keep inspection, monitoring, and certification records with your SWPPP that together keep your records complete and up-to-date, and demonstrate your full compliance with the conditions of this permit. You shall retain a copy of the current SWPPP required by this permit at the facility, and it shall be immediately available to Ohio EPA; a local agency approving storm water management plans; and the operator of an MS4 receiving discharges from the site. Ohio EPA may provide access to portions of your SWPPP to a member of the public upon request. Confidential Business Information (CBI) may be withheld from the public, but may not be withheld from those staff cleared for CBI review within Ohio EPA. Your current SWPPP or certain information from your current SWPPP shall be made available to the public, except any confidential business information (CBI) or restricted information, but you must clearly identify those portions of the SWPPP that are being withheld from public access. See 40 CFR Part 2 for relevant definitions of CBI: **http://www.gpo.gov/fdsys/pkg/CFR-2013-title40-vol1/pdf/CFR-2013-title40-vol1-part2-subpartB.pdf**.

## K. Sector-Specific Requirements

### Sector O – Steam Electric Generating Facilities.

You shall comply with the following sector-specific requirements associated with your primary industrial activity and any co-located industrial activities, as defined in Part VI. The sector-specific requirements apply to those areas of your facility where those sector-specific activities occur. These sector-specific requirements are in addition to any requirements specified elsewhere in this permit.

1. Limitations on Coverage – Except for process discharges covered under Part I and other allowable discharges listed in Part IV.C.10

   a. *Prohibition of Non-Storm Water Discharges.* Non-storm water discharges subject to effluent limitations guidelines are not covered by this permit.

   b. *Prohibition of Storm Water Discharges.* Storm water discharges from the following are not covered by this permit:

      i. ancillary facilities (e.g., fleet centers and substations) that are not contiguous to a stream electric power generating facility;

      ii. gas turbine facilities (providing the facility is not a dual-fuel facility that includes a steam boiler), and combined-cycle facilities where no supplemental fuel oil is burned (and the facility is not a dual-fuel facility that includes a steam boiler); and

      iii. cogeneration (combined heat and power) facilities utilizing a gas turbine.

2. Additional Control Measures/Best Management Practices (BMPs). The following good housekeeping measures are required in addition to Part IV.C.2:

   a. *Fugitive Dust Emissions.* 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.

b. *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.

c. *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).

d. *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.

e. *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.

f. *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.

g. *Large Bulk Fuel Storage Tanks.* Minimize contamination of surface runoff from large bulk fuel storage tanks. Consider containment berms (or their equivalent). You shall also comply with applicable State and Federal laws, including Spill Prevention, Control and Countermeasure (SPCC) Plan requirements.

h. *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.

i. *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.

j. *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.

k. *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.

l. *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.

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

3. Additional SWPPP Requirements.

a. *Drainage Area Site Map.* (See also Part IV.J.2.a.) 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).

b. *Documentation of Good Housekeeping Measures.* You shall document in your SWPPP the good housekeeping measures implemented to meet the effluent limits in Part IV.K.2.

4. Additional Inspection Requirements.

a. As part of your inspection, inspect the following areas 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.

## Part V. Monitoring and Reporting Requirements

### A. Reporting and Recordkeeping

1. Reporting Benchmark Monitoring Data to Ohio EPA. – Reserved. The coal pile run-off effluent limit is included in internal monitoring station 610.

2. Annual Report. You shall complete an annual report using the Annual Reporting Form provided by Ohio EPA at the following location:

   http://epa.ohio.gov/Portals/35/permits/OHR000006_Final%20Permit.pdf [Pages 141-142]

   You are not required to submit your annual report to Ohio EPA unless specifically requested. The timeframe to complete the report is at the discretion of the permittee but the same schedule to complete shall be maintained throughout this permit term. You shall keep the completed annual reports with your SWPPP.

### B. Storm Water Monitoring Requirements – Reserved.

## Part VI. Definitions and Acronyms

**Action Area** – all areas to be affected directly or indirectly by the storm water discharges, allowable non-storm water discharges, and storm water discharge-related activities, and not merely the immediate area involved in these discharges and activities.

**Best Management Practices (BMPs)** – schedules of activities, practices (and prohibitions of practices), structures, vegetation, maintenance procedures, and other management practices to prevent or reduce the discharge of pollutants to surface waters of the State. BMPs also include treatment requirements, operating procedures, and practices to control plant site runoff, spillage or leaks, sludge or waste disposal, or drainage from raw material storage. See 40 CFR 122.2.

**Co-located Industrial Activities** – Any industrial activities, excluding your primary industrial activity(ies), located on-site that are defined by the storm water regulations at 122.26(b)(14)(i)-(ix) and (xi). An activity at a facility is not considered co-located if the activity, when considered separately, does not meet the description of a category of industrial activity covered by the storm water regulations or identified by the SIC code list in Appendix D.

**Control Measure** – refers to any BMP or other method (including effluent limitations) used to prevent or reduce the discharge of pollutants to surface waters of the State.

**Director** – the Director of the Ohio Environmental Protection Agency (Ohio EPA).

**Discharge** – when used without qualification, means the "discharge of a pollutant." See 40 CFR 122.2.

**Discharge of a pollutant** – any addition of any "pollutant" or combination of pollutants to "surface waters of the State" from any "point source," or any addition of any pollutant or combination of pollutants to the waters of the "contiguous zone" or the ocean from any point source other than a vessel or other floating craft which is being used as a means of transportation. This includes additions of pollutants into surface waters of the State from: surface runoff which is collected or channeled by man; discharges through pipes, sewers, or other conveyances, leading into privately owned treatment works. See 40 CFR 122.2.

**Discharge-related activities** – activities that cause, contribute to, or result in storm water and allowable non-storm water point source discharges, and measures such as the siting, construction and operation of BMPs to control, reduce, or prevent pollution in the discharges.

**Drought-stricken area** – a period of below average water content in streams, reservoirs, ground-water aquifers, lakes and soils.

**U.S. EPA Approved or Established Total Maximum Daily Loads (TMDLs)** – "U.S. EPA Approved TMDLs" are those that are developed by a State and approved by U.S. EPA. "U.S. EPA Established TMDLs" are those that are developed by U.S. EPA.

**Existing Discharger** – an operator applying for coverage under this permit for discharges authorized previously under an NPDES general or individual permit.

**Facility or Activity** – any NPDES "point source" (including land or appurtenances thereto) that is subject to regulation under the NPDES program. See 40 CFR 122.2.

**Federal Facility** – any buildings, installations, structures, land, public works, equipment, aircraft, vessels, and other vehicles and property, owned by, or constructed or manufactured for the purpose of leasing to, the federal government.

**Illicit Discharge** – is defined at 40 CFR 122.26(b)(2) and refers to any discharge to a municipal separate storm sewer that is not entirely composed of storm water, except discharges authorized under an NPDES permit (other than the NPDES permit for discharges from the MS4) and discharges resulting from fire fighting activities.

**Impaired Water** (or "Water Quality Impaired Water" or "Water Quality Limited Segment") – A water is impaired for purposes of this permit if it has been identified by a State or U.S. EPA pursuant to Section 303(d) of the Clean Water Act as not meeting applicable State water quality standards (these waters are called "water quality limited segments" under 40 CFR 30.2(j)). Impaired waters include both waters with approved or established TMDLs, and those for which a TMDL has not yet been approved or established.

**Industrial Activity** – the 10 categories of industrial activities included in the definition of "storm water discharges associated with industrial activity" as defined in 40 CFR 122.26(b)(14)(i)-(ix) and (xi).

**Industrial Storm Water** – storm water runoff from industrial activity.

**Municipal Separate Storm Sewer** – a conveyance or system of conveyances (including roads with drainage systems, municipal streets, catch basins, curbs, gutters, ditches, man-made channels, or storm drains):

(i) Owned or operated by a State, city, town, borough, county, parish, 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 and approved management agency under section 208 of the CWA that discharges to surface waters of the State;

(ii) Designed or used for collecting or conveying storm water;

(iii) Which is not a combined sewer; and

(iv) Which is not part of a Publicly Owned Treatment Works (POTW) as defined at 40 CFR 122.2. See 40 CFR 122.26(b)(4) and (b)(7).

**New Discharger** – a facility from which there is a discharge, that did not commence the discharge at a particular site prior to August 13, 1979, which is not a new source, and which has never received a finally effective NPDES permit for discharges at that site. See 40 CFR 122.2.

**New Source** – any building, structure, facility, or installation from which there is or may be a "discharge of pollutants," the construction of which commenced:

- after promulgation of standards of performance under section 306 of the CWA which are applicable to such source, or
- after proposal of standards of performance in accordance with section 306 of the CWA which are applicable to such source, but only if the standards are promulgated in accordance with section 306 within 120 days of their proposal. See 40 CFR 122.2.

**New Source Performance Standards (NSPS)** – technology-based standards for facilities that qualify as new sources under 40 CFR 122.2 and 40 CFR 122.29.

**No exposure** – all industrial materials or activities are protected by a storm-resistant shelter to prevent exposure to rain, snow, snowmelt, and/or runoff. See 40 CFR 122.26(g).

**Ohio EPA** – the Ohio Environmental Protection Agency.

**Operator** – any entity with a storm water discharge associated with industrial activity that meets either of the following two criteria:

(i) The entity has operational control over industrial activities, including the ability to modify those activities; or

(ii) The entity has day-to-day operational control of activities at a facility necessary to ensure compliance with the permit (e.g., the entity is authorized to direct workers at a facility to carry out activities required by the permit).

**Person** – an individual, association, partnership, corporation, municipality, State or Federal agency, or an agent or employee thereof. See 40 CFR 122.2.

**Point source** – any discernible, confined, and discrete conveyance, including but not limited to any pipe, ditch, channel, tunnel, conduit, well, discrete fissure, container, rolling stock, concentrated animal feeding operation, landfill leachate collection system, vessel, or other floating craft from which pollutants are or may be discharged. This term does not include return flows from irrigated agriculture or agricultural storm water runoff. See 40 CFR 122.2.

**Pollutant** – dredged spoil, solid waste, incinerator residue, filter backwash, sewage, garbage, sewage sludge, munitions, chemical wastes, biological materials, heat, wrecked or discarded equipment, rock, sand, cellar dirt, and industrial, municipal and agricultural waste discharged into water. See 40 CFR 122.2.

**Pollutant of concern** – A pollutant which causes or contributes to a violation of a water quality standard, including a pollutant which is identified as causing an impairment in a state's 303(d) list.

**Primary industrial activity** – includes any activities performed on-site which are (1) identified by the facility's primary SIC code; or (2) included in the narrative descriptions of 122.26(b)(14)(i), (iv), (v), or

(vii), and (ix). [For co-located activities covered by multiple SIC codes, it is recommended that the primary industrial determination be based on the value of receipts or revenues or, if such information is not available for a particular facility, the number of employees or production rate for each process may be compared. The operation that generates the most revenue or employs the most personnel is the operation in which the facility is primarily engaged. In situations where the vast majority of on-site activity falls within one SIC code, that activity may be the primary industrial activity.] Narrative descriptions in 40 CFR 122.26(b)(14) identified above include: (i) activities subject to storm water effluent limitations guidelines, new source performance standards, or toxic pollutant effluent standards; (iv) hazardous waste treatment storage, or disposal facilities including those that are operating under interim status or a permit under subtitle C of the Resource Conservation and Recovery Act (RCRA); (v) landfills, land application sites and open dumps that receive or have received industrial wastes; (vii) steam electric power generating facilities; and (ix) sewage treatment works with a design flow of 1.0 mgd or more.

**Qualified Personnel** – Qualified personnel are those who possess the knowledge and skills to assess conditions and activities that could impact storm water quality at your facility, and who can also evaluate the effectiveness of control measures.

**Reportable Quantity Release** – a release of a hazardous substance at or above the established legal threshold that requires emergency notification. Refer to 40 CFR Parts 110, 117, and 302 for complete definitions and reportable quantities for which notification is required.

**Runoff coefficient** – the fraction of total rainfall that will appear at the conveyance as runoff. See 40 CFR 122.26(b)(11).

**Semi-Arid Climate** – areas where annual rainfall averages from 10 to 20 inches.

**Significant materials** – includes, but is not limited to: raw materials; fuels; materials such as solvents, detergents, and plastic pellets; finished materials such as metallic products; raw materials used in food processing or production; hazardous substances designated under section 101(14) of CERCLA; any chemical the facility is required to report pursuant to section 313 of Title III of SARA; fertilizers; pesticides; and waste products such as ashes, slag and sludge that have the potential to be released with storm water discharges. See 40 CFR 122.26(b)(12).

**Special Aquatic Sites** – sites identified in 40 CFR 230 Subpart E. These are geographic areas, large or small, possessing special ecological characteristics of productivity, habitat, wildlife protection, or other important and easily disrupted ecological values. These areas are generally recognized as significantly influencing or positively contributing to the general overall environmental health or vitality of the entire ecosystem of a region.

**Storm Water** – storm water runoff, snow melt runoff, and surface runoff and drainage. See 40 CFR 122.26(b)(13).

**Storm Water Discharges Associated with Construction Activity** – a discharge of pollutants in storm water runoff from areas where soil disturbing activities (e.g., clearing, grading, or excavating), construction materials, or equipment storage or maintenance (e.g., fill piles, borrow areas, concrete truck washout, fueling), or other industrial storm water directly related to the construction process (e.g., concrete or asphalt batch plants) are located. See 40 CFR 122.26(b)(14)(x) and 40 CFR 122.26(b)(15).

**Storm Water Discharges Associated with Industrial Activity** – the discharge from any conveyance that is used for collecting and conveying storm water and that is directly related to manufacturing, processing or raw materials storage areas at an industrial plant. The term does not include discharges from facilities or activities excluded from the NPDES program under Part 122. For the categories of industries identified in this section, the term includes, but is not limited to, storm water discharges from industrial plant yards; 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; material handling sites; refuse sites; sites used for the application or disposal of process waste waters (as defined at part 401 of this chapter); sites used for the storage and maintenance of material handling equipment; sites used for residual treatment, storage, or disposal; shipping and receiving areas; manufacturing buildings; storage areas (including tank farms) for raw materials, and intermediate and final products; and areas where industrial activity has taken place in the past and significant materials remain and are exposed to storm water. For the purposes of this paragraph, material handling activities include storage, loading and unloading, transportation, or conveyance of any raw material, intermediate product, final product, by-product or waste product. The term excludes areas located on plant lands separate from the plant's industrial activities, such as office buildings and accompanying parking lots as long as the drainage from the excluded areas is not mixed with storm water drained from the above described areas. Industrial facilities include those that are federally, State, or municipally owned or operated that meet the description of the facilities listed in 40 CFR 122.26(b)(14).

**Surface Waters of the State -** Means all streams, lakes, ponds, marshes, watercourses, waterways, springs, irrigation systems, drainage systems, and all other bodies or accumulations of surface water, natural or artificial, which are situated wholly or partly within, or border upon, this state, or are within its jurisdiction, except those private waters which do not combine or effect a junction with natural surface waters.

**Total Maximum Daily Loads (TMDLs)** – A TMDL is a calculation of the maximum amount of a pollutant that a waterbody can receive and still meet water quality standards, and an allocation of that amount to the pollutant's sources. A TMDL includes wasteload allocations (WLAs) for point source discharges; load allocations (LAs) for nonpoint sources and/or natural background, and shall include a margin of safety (MOS) and account for seasonal variations. (See section 303(d) of the Clean Water Act and 40 CFR 130.2 and 130.7).

**Water Quality Impaired** – See 'Impaired Water'.

**Water Quality Standards** – A water quality standard defines the water quality goals of a water body, or portion thereof, by designating the use or uses to be made of the water and by setting criteria necessary to protect the uses. States and U.S. EPA adopt water quality standards to protect public health or welfare, enhance the quality of water and serve the purposes of the Clean Water Act (See CWA sections 101(a)2 and 303(c)). Water quality standards also include an antidegradation policy. See P.U.D. o. 1 of Jefferson County et al v. Wash Dept of Ecology et al, 511 US 701, 705 (1994).

**"You" and "Your"** – as used in this permit are intended to refer to the permittee, the operator, or the discharger as the context indicates and that party's facility or responsibilities. The use of "you" and "your" refers to a particular facility and not to all facilities operated by a particular entity. For example, "you shall submit" means the permittee shall submit something for that particular facility. Likewise, "all your discharges" would refer only to discharges at that one facility.

**ABBREVIATIONS AND ACRONYMS**

BAT – Best Available Technology Economically Achievable

BOD5 – Biochemical Oxygen Demand (5-day test)

BMP – Best Management Practice

BPJ – Best Professional Judgment

BPT – Best Practicable Control Technology Currently Available

CERCLA – Comprehensive Environmental Response, Compensation and Liability Act

CGP – Construction General Permit

COD – Chemical Oxygen Demand

CWA – Clean Water Act (or the Federal Water Pollution Control Act, 33 U.S.C. §1251 *et seq*)

CWT – Centralized Waste Treatment

DMR – Discharge Monitoring Report

U.S. EPA – U. S. Environmental Protection Agency

FWS – U. S. Fish and Wildlife Service

LA – Load Allocations

MDMR – MSGP Discharge Monitoring Report

MGD – Million Gallons per Day

MOS – Margin of Safety

MS4 – Municipal Separate Storm Sewer System

MSDS – Material Safety Data Sheet

MSGP – Multi-Sector General Permit

NAICS – North American Industry Classification System

NMFS – U. S. National Marine Fisheries Service

NOI – Notice of Intent

NOT – Notice of Termination

NPDES – National Pollutant Discharge Elimination System

NRC – National Response Center

NTU – Nephelometric Turbidity Unit

OMB – U. S. Office of Management and Budget

ORW – Outstanding Resource Water

OSM – U. S. Office of Surface Mining

POTW – Publicly Owned Treatment Works

RCRA – Resource Conservation and Recovery Act

RQ – Reportable Quantity

SARA – Superfund Amendments and Reauthorization Act

SIC – Standard Industrial Classification

SMCRA – Surface Mining Control and Reclamation Act

SPCC – Spill Prevention, Control, and Countermeasures

SWPPP – Storm Water Pollution Prevention Plan

TMDL – Total Maximum Daily Load

TSDF – Treatment, Storage, or Disposal Facility

TSS – Total Suspended Solids

USGS – United States Geological Survey

WLA – Wasteload Allocation

WQS – Water Quality Standard

National Pollutant Discharge Elimination System (NPDES) Permit Program

# FACT SHEET

Regarding an NPDES Permit To Discharge to Waters of the State of Ohio
for NRG Power Midwest GP LLC

Public Notice No.: 17-12-007
Public Notice Date: December 6, 2017
Comment Period Ends: January 5, 2018

Ohio EPA Permit No.: 3IB00002*LD
Application No.: OH0001112

Name and Address of Applicant:
**NRG Power Midwest GP LLC**
**33570 Lake Road**
**Avon Lake, Ohio 44012**

Name and Address of Facility Where Discharge Occurs:
**Avon Lake Generating Station**
**33570 Lake Road**
**Avon Lake, Ohio 44012**
**Lorain County**

Receiving Water: Lake Erie

Subsequent Stream Network: Lake Erie

## INTRODUCTION

Development of a Fact Sheet for NPDES permits is mandated by Title 40 of the Code of Federal Regulations (CFR), Section 124.8 and 124.56. This document fulfills the requirements established in those regulations by providing the information necessary to inform the public of actions proposed by the Ohio Environmental Protection Agency (Ohio EPA), as well as the methods by which the public can participate in the process of finalizing those actions.

This Fact Sheet is prepared in order to document the technical basis and risk management decisions that are considered in the determination of water quality based NPDES Permit effluent limitations. The technical basis for the Fact Sheet may consist of evaluations of promulgated effluent guidelines, existing effluent quality, instream biological, chemical and physical conditions, and the relative risk of alternative effluent limitations. This Fact Sheet details the discretionary decision-making process empowered to the Director by the Clean Water Act (CWA) and Ohio Water Pollution Control Law (Ohio Revised Code [ORC] 6111). Decisions to award variances to Water Quality Standards (WQS) or promulgated effluent guidelines for economic or technological reasons will also be justified in the Fact Sheet where necessary.

No antidegradation review was necessary.

Effluent limits based on available treatment technologies are required by Section 301(b) of the CWA. Many of these have already been established by the United States Environmental Protection Agency (U.S. EPA) in the effluent guideline regulations (a.k.a. categorical regulations) for industry categories in 40 CFR Parts 405-499. Technology-based regulations for publicly-owned treatment works are listed in the Secondary Treatment Regulations (40 CFR Part 133). If regulations have not been established for a category of dischargers, the director may establish technology-based limits based on best professional judgment (BPJ).

Ohio EPA reviews the need for water-quality-based limits on a pollutant-by-pollutant basis. Wasteload allocations (WLAs) are used to develop these limits based on the pollutants that have been detected in the

discharge, and the receiving water's assimilative capacity. The assimilative capacity depends on the flow in the water receiving the discharge, and the concentration of the pollutant upstream. The greater the upstream flow, and the lower the upstream concentration, the greater the assimilative capacity is. Assimilative capacity may represent dilution (as in allocations for metals), or it may also incorporate the break-down of pollutants in the receiving water (as in allocations for oxygen-demanding materials).

The need for water-quality-based limits is determined by comparing the WLA for a pollutant to a measure of the effluent quality. The measure of effluent quality is called Projected Effluent Quality (PEQ). This is a statistical measure of the average and maximum effluent values for a pollutant. As with any statistical method, the more data that exists for a given pollutant, the more likely that PEQ will match the actual observed data. If there is a small data set for a given pollutant, the highest measured value is multiplied by a statistical factor to obtain a PEQ; for example if only one sample exists, the factor is 6.2, for two samples - 3.8, for three samples - 3.0. The factors continue to decline as samples sizes increase. These factors are intended to account for effluent variability, but if the pollutant concentrations are fairly constant, these factors may make PEQ appear larger than it would be shown to be if more sample results existed.

## SUMMARY OF PERMIT CONDITIONS

*Outfall 3IB00002001*
The effluent limits and monitoring requirements proposed for the following parameters are the same as in the previous permit, although some monitoring frequencies have changed: temperature, pH, total residual oxidants, flow rate, total residual chlorine, and chlorination/bromination duration.

*Outfall 3IB00002002*
The effluent limits and monitoring requirements proposed for the following parameters are the same as in the previous permit, although some monitoring frequencies have changed: copper, flow rate, pH range excursion maximum duration, pH, number of pH range excursions greater than 60 minutes, and monthly duration of pH range excursions.

The loading limits for total suspended solids and oil and grease were removed because the outfall is influenced by storm water and the federal effluent limit guidelines allow the limit to be expressed as solely a concentration limitation.

A lower, variance based monthly average limit is proposed for mercury. The loading limits were also modified based on a reasonable measure flow.

The daily maximum mercury limit was revised to the applicable standard. The inside mixing zone had been applied but mixing zones are no longer allowed for bioaccumulating pollutants such as mercury. The facility has consistently met the lower limit.

*Outfall 3IB00002004*
The effluent limits and monitoring requirements proposed for the following parameters are the same as in the previous permit, although some monitoring frequencies have changed: copper, total residual oxidants, flow rate, total residual chlorine, pH range excursion maximum duration, pH, number of pH range excursions greater than 60 minutes, and monthly duration of pH range excursions.

The loading limits for total suspended solids and oil and grease were removed because the outfall is influenced by storm water and the federal effluent limit guidelines allow the limit to be expressed as solely a concentration limitation.

*Outfall 3IB00002601*
New monitoring for overflows is proposed to determine compliance for the zero-discharge limitation for bottom ash transport water.

*Outfalls 3IB00002604, 3IB00002610, 3IB00002611, 3IB00002612, and 3IB00002800*
The effluent limits and monitoring requirements proposed for internal outfalls 604, 610, 611, 612, and 800 are the same as in the previous permit.

*Other requirements*
A schedule of compliance is proposed to ensure compliance with federal 316(b) regulations.

A bottom ash transport water elimination requirement is proposed based on federal ELGs.

In Part II of the permit, special conditions are included that address mercury variance; notification to public water supply operators including any new uses of bromine or sodium bromide; parameters with limits below detection; and outfall signage.

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## PROCEDURES FOR PARTICIPATION IN THE FORMULATION OF FINAL DETERMINATIONS

The draft action shall be issued as a final action unless the Director revises the draft after consideration of the record of a public meeting or written comments, or upon disapproval by the Administrator of the U.S. Environmental Protection Agency.

Within thirty days of the date of the Public Notice, any person may request or petition for a public meeting for presentation of evidence, statements or opinions. The purpose of the public meeting is to obtain additional evidence. Statements concerning the issues raised by the party requesting the meeting are invited. Evidence may be presented by the applicant, the state, and other parties, and following presentation of such evidence other interested persons may present testimony of facts or statements of opinion.

Requests for public meetings shall be in writing and shall state the action of the Director objected to, the questions to be considered, and the reasons the action is contested. Such requests should be addressed to:

**Legal Records Section**
**Ohio Environmental Protection Agency**
**P.O. Box 1049**
**Columbus, Ohio 43216-1049**

Interested persons are invited to submit written comments upon the discharge permit. Comments should be submitted in person or by mail no later than 30 days after the date of this Public Notice. Deliver or mail all comments to:

**Ohio Environmental Protection Agency**
**Attention: Division of Surface Water**
**Permits Processing Unit**
**P.O. Box 1049**
**Columbus, Ohio 43216-1049**

The Ohio EPA permit number and Public Notice numbers should appear on each page of any submitted comments. All comments received no later than 30 days after the date of the Public Notice will be considered.

Citizens may conduct file reviews regarding specific companies or sites. Appointments are necessary to conduct file reviews, because requests to review files have increased dramatically in recent years. The first 250 pages copied are free. For requests to copy more than 250 pages, there is a five-cent charge for each page copied. Payment is required by check or money order, made payable to Treasurer State of Ohio.

For additional information about this fact sheet or the draft permit, contact Cole Miller at (614) 728-3846 or cole.miller@epa.ohio.gov.

## INFORMATION REGARDING CERTAIN WATER QUALITY BASED EFFLUENT LIMITS

This draft permit may contain proposed water-quality-based effluent limits (WQBELs) for parameters that **are not** priority pollutants. (See the following link for a list of the priority pollutants: http://epa.ohio.gov/portals/35/pretreatment/Pretreatment_Program_Priority_Pollutant_Detection_Limits.pdf .) In accordance with ORC 6111.03(J)(3), the Director established these WQBELs after considering, to the extent consistent with the Federal Water Pollution Control Act, evidence relating to the technical feasibility and economic reasonableness of removing the polluting properties from those wastes and to evidence relating to conditions calculated to result from that action and their relation to benefits to the people of the state and to accomplishment of the purposes of this chapter. This determination was made based on data and information

available at the time the permit was drafted, which included the contents of the timely submitted NPDES permit renewal application, along with any and all pertinent information available to the Director.

This public notice allows the permittee to provide to the Director for consideration during this public comment period additional site-specific pertinent and factual information with respect to the technical feasibility and economic reasonableness for achieving compliance with the proposed final effluent limitations for these parameters. The permittee shall deliver or mail this information to:

**Ohio Environmental Protection Agency**
**Attention: Division of Surface Water**
**Permits Processing Unit**
**P.O. Box 1049**
**Columbus, Ohio 43216-1049**

Should the applicant need additional time to review, obtain or develop site-specific pertinent and factual information with respect to the technical feasibility and economic reasonableness of achieving compliance with these limitations, written notification for any additional time shall be sent to the above address no later than 30 days after the Public Notice Date on Page 1.

Should the applicant determine that compliance with the proposed WQBELs for parameters other than the priority pollutants is technically and/or economically unattainable, the permittee may submit an application for a variance to the applicable WQS used to develop the proposed effluent limitation in accordance with the terms and conditions set forth in OAC 3745-33-07(D). The permittee shall submit this application to the above address no later than 30 days after the Public Notice Date.

Alternately, the applicant may propose the development of site-specific WQS pursuant to OAC 3745-1-39. The permittee shall submit written notification regarding their intent to develop site specific WQS for parameters that are not priority pollutants to the above address no later than 30 days after the Public Notice Date.

## LOCATION OF DISCHARGE/RECEIVING WATER USE CLASSIFICATION

Avon Lake Generating Station discharges to Lake Erie. Figure 1 shows the approximate location of the facility.

This segment of Lake Erie is described by Ohio EPA River Code: 24-500, County: Lorain, Ecoregion: Erie-Ontario Lake Plain. Lake Erie is designated for the following uses under Ohio's WQS (OAC 3745-1-31): Exceptional Warmwater Habitat, Superior High Quality Water, Agricultural Water Supply, Industrial Water Supply, Bathing Waters, and Public Water Supply.

Use designations define the goals and expectations of a waterbody. These goals are set for aquatic life protection, recreation use and water supply use, and are defined in the Ohio WQS (OAC 3745-1-07). The use designations for individual waterbodies are listed in rules -08 through -32 of the Ohio WQS. Once the goals are set, numeric WQS are developed to protect these uses. Different uses have different water quality criteria.

Use designations for aquatic life protection include habitats for coldwater fish and macroinvertebrates, warmwater aquatic life and waters with exceptional communities of warmwater organisms. These uses all meet the goals of the federal CWA. Ohio WQS also include aquatic life use designations for waterbodies which cannot meet the CWA goals because of human-caused conditions that cannot be remedied without causing fundamental changes to land use and widespread economic impact. The dredging and clearing of some small streams to support agricultural or urban drainage is the most common of these conditions. These streams are given Modified Warmwater or Limited Resource Water designations.

Recreation uses are defined by the depth of the waterbody and the potential for wading or swimming. Uses are defined for bathing waters, swimming/canoeing (Primary Contact Recreation) and wading only (Secondary Contact which are generally waters too shallow for swimming or canoeing).

Water supply uses are defined by the actual or potential use of the waterbody. Public Water Supply designations apply near existing water intakes so that waters are safe to drink with standard treatment. Most other waters are designated for agricultural water supply and industrial water supply.

## FACILITY DESCRIPTION

Avon Lake Generating Station is a coal-fired steam-electric generating station. This facility is involved in the generation, transmission, and distribution of electric power. The daily production rate is approximately 800 megawatts of electricity.

The process operations at Avon Lake Generating Station are classified in the Standard Industrial Classification (SIC) category 4911, Electric Services. The process wastewaters generated from these operations are regulated under 40 CFR Part 423, Steam Electric Power Generating Point Source Category.

## DESCRIPTION OF EXISTING DISCHARGE

Avon Lake Generating Station has three final outfalls and five internal outfalls. The primary discharges are non-contact cooling water, bottom ash transport water, coal pile runoff, and low volume wastes such as floor drains or recirculating house service water systems. Table 1 highlights the primary outfalls, internal monitoring stations, wastewater sources, treatment processes, discharge/receiving streams and associated flows at Avon Lake Generating Station.

Sanitary waste is discharged to the City of Avon Lake collection system.

There was one effluent violation at outfall 004 in 2012 for oil and grease as shown in Table 2.

The average flow rates for the permit cycle for each outfall are shown on Table 3.

Table 4 presents data compiled from the NPDES permit renewal application Form 2C.

Table 5 presents a summary of unaltered Discharge Monitoring Report (DMR). Data are presented for the period April 2012 to April 2017, and current permit limits are provided for comparison.

Table 6 summarizes the chemical specific data for outfalls 001, 002, and 004 by presenting the average and maximum PEQ values.

Table 7 summarizes the results of acute whole effluent toxicity (WET) tests of outfall 004.

## ASSESSMENT OF IMPACT ON RECEIVING WATERS

The *Ohio 2016 Integrated Water Quality Monitoring and Assessment Report* lists the Lake Erie Central Basin Shoreline as impaired for the aquatic life, recreation and fish consumption uses. Monitoring to develop a comprehensive Lake Erie nearshore monitoring program was funded by a Great Lakes Restoration Initiative grant conducted from 2011-2013. Fish community sampling results were used to update assessment unit status for the 2014 *Integrated Report*. Because data assessment and analyses were still underway for this project, causes and sources were retained from the previous report and include: siltation, nutrients, exotic species and direct habitat alterations (causes) and municipal point sources, urban runoff/storm sewers, habitat modifications other than hydromodification, combined sewer overflows, streambank modification/destabilization and non-irrigated crop production (sources).

The 2016 report is available at this Ohio EPA web site:

http://epa.ohio.gov/dsw/tmdl/OhioIntegratedReport.aspx

## DEVELOPMENT OF WATER-QUALITY-BASED EFFLUENT LIMITS

Determining appropriate effluent concentrations is a multiple-step process in which parameters are identified as likely to be discharged by a facility, evaluated with respect to Ohio water quality criteria, and examined to determine the likelihood that the existing effluent could violate the calculated limits.

### Parameter Selection

Effluent data for the Avon Lake Generating Station were used to determine what parameters should undergo WLA. The parameters discharged are identified by the data available to Ohio EPA DMR data submitted by the permittee, compliance sampling data collected by Ohio EPA, and any other data submitted by the permittee, such as priority pollutant scans required by the NPDES application or by pretreatment, or other special conditions in the NPDES permit. The sources of effluent data used in this evaluation are as follows:

| | |
|---|---|
| Self-monitoring data (DMR) * | April 2012 through March 2017 |
| NPDES application Form 2C data | January 2015 |

*Mercury used the timeframe of September 2013 through August 2018.

### Statistical Outliers and Other Non-representative Data

The bis(2-ethylhexyl)phthalate sample result of 89.2 ug/L submitted with application form 2C was determined to be invalid because it was not sampled properly. Bis(2-ethylhexyl)phthalate is a plasticizer and sampling with plastic tubing can affect results. The facility re-sampled using glass containers and both results were non-detects.

This data is evaluated statistically, and PEQ values are calculated for each pollutant. Average PEQ ($PEQ_{avg}$) values represent the 95th percentile of monthly average data, and maximum PEQ ($PEQ_{max}$) values represent the 95th percentile of all data points (see Table 6).

The PEQ values are used according to Ohio rules to compare to applicable WQS and allowable WLA values for each pollutant evaluated. Initially, PEQ values are compared to the applicable average and maximum WQS. If both PEQ values are less than 25 percent of the applicable WQS, the pollutant does not have the reasonable potential to cause or contribute to exceedances of WQS, and no WLA is done for that parameter. If either $PEQ_{avg}$ or $PEQ_{max}$ is greater than 25 percent of the applicable WQS, a WLA is conducted to determine whether the parameter exhibits reasonable potential and needs to have a limit or if monitoring is required (see Table 8).

**Wasteload Allocation**

For those parameters that require a WLA, the results are based on the uses assigned to the receiving waterbody in OAC 3745-1. Dischargers are allocated pollutant loadings/concentrations based on the Ohio WQS (OAC 3745-1). Most pollutants are allocated by a mass-balance method because they do not degrade in the receiving water.

WLAs for direct discharges to lakes are done using the following equation for average criteria: WLA = (11 x Water Quality Criteria) – (10 x Background Concentration). Allocations for maximum criteria are set equal to the Inside Mixing Zone Maximum (IMZM) values.

The data used in the WLA are listed in and Table 9. The WLA results to maintain all applicable criteria are presented in Table 10.

**Thermal Wasteload**

On July 29, 2014, NRG submitted a Thermal Mixing Zone Evaluation Final Report as required by the existing NPDES Permit. The report satisfied the conditions outlined in rule OAC 3745-2-08 (C). The conclusions of the report are as follows:

- The thermal plume is buoyant, occupying the top few feet of the water column;
- The thermal plume tends to flow along the Lake Erie shoreline, expanding in width and losing heat to the surrounding water and atmosphere before being directed toward the open waters of Lake Erie by the Miller Road Park breakwall;
- The area of the thermal plume for the conditions modeled ranged from 89,000 $m^2$ to 2,498,000 $m^2$. The largest plumes occurred during summer temperatures and periods with elevated wind speeds;
- The thermal plume does not interfere with or block passage of fish or aquatic life; interfere with migration, survival, or reproduction of aquatic organisms; or jeopardize the continued existence of endangered or threatened species; and
- The thermal plume does not interfere with the designated or existing uses of Lake Erie.

After evaluating the information submitted in the report, Ohio EPA has determined that NRG Avon Lake Generating Station does not have the reasonable potential to violate temperature WQS.

**Whole Effluent Toxicity Wasteload Allocation**

Whole effluent toxicity (WET) is the total toxic effect of an effluent on aquatic life measured directly with a toxicity test. Acute WET measures short term effects of the effluent while chronic WET measures longer term and potentially more subtle effects of the effluent.

WQS for WET are expressed in Ohio's narrative "free from" WQS rule [OAC 3745-1-04(D)]. These "free froms" are translated into toxicity units (TUs) by the associated WQS Implementation Rule (OAC 3745-2-09). WLAs can then be calculated using TUs as if they were water quality criteria.

The WLA calculations for WET are similar to those for aquatic life criteria - using the chronic toxicity unit ($TU_c$) and 7Q10 flow for the average and the acute toxicity unit ($TU_a$) and 1Q10 flow for the maximum. These values are the levels of effluent toxicity that should not cause instream toxicity during critical low-flow conditions. For Avon Lake Generating Station, the WLA values for outfall 001, 002, and 004 are 1.0 $TU_a$ and 11 $TU_c$.

The chronic toxicity unit ($TU_c$) is defined as 100 divided by the estimate of the effluent concentration which causes a 25% reduction in growth or reproduction of test organisms ($IC_{25}$):

$$TU_c = 100/IC_{25}$$

This equation applies outside the mixing zone for warmwater, modified warmwater, exceptional warmwater, coldwater, and seasonal salmonid use designations except when the following equation is more restrictive (*Ceriodaphnia dubia* only):

$TU_c$ = 100/geometric mean of No Observed Effect Concentration and Lowest Observed Effect Concentration

The acute toxicity unit ($TU_a$) is defined as 100 divided by the concentration in water having 50% chance of causing death to aquatic life ($LC_{50}$) for the most sensitive test species:

$$TU_a = 100/LC_{50}$$

This equation applies outside the mixing zone for warmwater, modified warmwater, exceptional warmwater, coldwater, and seasonal salmonid use designations.

## REASONABLE POTENTIAL/EFFLUENT LIMITS/MANAGEMENT DECISIONS

After appropriate effluent limits are calculated, the reasonable potential of the discharger to violate the WQS must be determined. Each parameter is examined and placed in a defined "group". Parameters that do not have a WQS or do not require a WLA based on the initial screening are assigned to either group 1 or 2. For the allocated parameters, the preliminary effluent limits (PEL) based on the most restrictive average and maximum WLAs are selected from Table 10. The average PEL ($PEL_{avg}$) is compared to the average PEQ ($PEQ_{avg}$) from Table 6, and the $PEL_{max}$ is compared to the $PEQ_{max}$. Based on the calculated percentage of the allocated value [($PEQ_{avg} \div PEL_{avg}$) X 100, or ($PEQ_{max} \div PEL_{max}$) X 100)], the parameters are assigned to group 3, 4, or 5. The groupings are listed in Table 11.

The final effluent limits are determined by evaluating the groupings in conjunction with other applicable rules and regulations. Table 12 presents the final effluent limits and monitoring requirements proposed for Avon Lake Generating Station outfalls 001, 002, and 004 and internal monitoring stations 601, 604, 610, 611, and 612 and the basis for their recommendation. Unless otherwise indicated, the monitoring frequencies proposed in the permit are continued from the existing permit.

### Direct Discharge Outfalls

Outfall 001

*Water temperature and flow rate*

Monitoring for these parameters is proposed to continue in order to evaluate the performance of the treatment plant.

*Total residual chlorine and chlorination/bromination duration*
Permit limits for residual chlorine and the duration of chlorine discharges are being continued. Limits for residual chlorine are required because chlorine is a BAT parameter under the federal effluent regulations for steam electric power facilities. The chlorine limit is based on an analysis of the inside-mixing-zone maximum WQS when discharges of chlorine are limited to two hours per day. This information indicates that WQS can be significantly higher for a two hour per day exposure than when organisms are exposed for 48- to 96-hours, as is typical of most acute aquatic toxicity tests. The 120 minute limit on chlorine/bromine duration regulates the exposure time so that chlorine levels will not exceed WQS.

Limits on total residual oxidants reflect the use of bromine and bromine/chlorine mixtures for control of biofouling in the cooling system. The analytical method for these pollutants does not easily distinguish between bromine and chlorine, and limits are set for the total measurement (residual oxidants) as a result. The permit would require Avon Lake Generating Station to report results for residual chlorine when only chlorine is used as a biocide, and reports residual oxidants when bromine or bromine/chlorine mixtures are used.

The limit for residual oxidants is based on data submitted by the Chemical Manufacturers Association to U.S. EPA Region V that shows bromine being approximately four times as toxic as chlorine. The discharge limit for residual oxidants is therefore set at ¼ of the chlorine limit.

*Total residual oxidants*
The limit recommended for total residual oxidants is based on best technical judgment regarding the relative toxicity of bromine.

*pH*
Limits proposed for pH are based on WQS (OAC 3745-1-35).

Outfall 002
*Flow rate*
Monitoring for flow rate is proposed to continue in order to evaluate the performance of the treatment plant.

*Total suspended solids and oil and grease*
The limits recommended for these parameters are based on the ELGs found in 40 CFR Part 423.12(b)(4) and (5), best practicable control technology currently available for ash transport and metal cleaning waste. All ELG limits are shown in Attachment 1.

*Copper*
The Ohio EPA risk assessment (Table 11) places copper in group 3. This placement, as well as the data in Table 4, Table 5, and Table 6, support that copper does not have the reasonable potential to contribute to WQS exceedances, and limits are not necessary to protect water quality. Monitoring at a low frequency is proposed to document that copper continues to remain at low levels. The frequency is proposed to reduce from monthly to quarterly.

*Mercury*
The Ohio EPA risk assessment (Table 11) places mercury in group 5. This placement, as well as the data in Table 4, Table 5, and Table 6, indicates that the reasonable potential to exceed WQS exists and limits are necessary to protect water quality. For mercury, the PEQ is greater than 100 percent of the WLA. Pollutants that meet this requirement must have permit limits under OAC 3745-33-07(A)(1). The thirty-day average

concentration limit for mercury is based on a mercury variance. The daily maximum concentration limit for mercury is based on the WLA.

*pH, pH excursion maximum duration, pH excursions greater than 60 minutes, and pH excursion monthly duration*
Limits for pH excursion maximum duration, pH excursions greater than 60 minutes, and pH range excursion monthly duration are proposed to continue from the existing permit and are based on the ELGs found in 40 CFR part 401.17 and 40 CFR part 423.12(b)(1). pH is monitored continuously at outfall 002. To prevent violations if pH briefly varies from the 6.0-9.0 S.U. range, limits are proposed to ensure that pH doesn't vary for more than an hour at a time or for more than 446 minutes per month. This is protective of WQS.

Outfall 004
*Flow rate*
Monitoring for flow rate is proposed to continue in order to evaluate the performance of the treatment plant.

*Total suspended solids and oil and grease*
The limits recommended for these parameters are based on the ELGs found in 40 CFR Part 423.12(b)(3), best practicable control technology currently available for low volume waste. All ELG limits are shown in Attachment 1.

*Copper*
The Ohio EPA risk assessment (Table 11) places copper in group 3. This placement, as well as the data in Table 4,Table 5, and Table 6, support that copper does not have the reasonable potential to contribute to WQS exceedances, and limits are not necessary to protect water quality. Monitoring at a low frequency is proposed to document that copper continues to remain at low levels. The frequency is proposed to reduce from weekly to quarterly.

*pH, pH excursion maximum duration, pH excursions greater than 60 minutes, and pH excursion monthly duration*
Limits for pH excursion maximum duration, pH excursions greater than 60 minutes, and pH range excursion monthly duration are proposed to continue from the existing permit and are based on the ELGS found in 40 CFR part 401.17 and 40 CFR part 423.12(b)(1). pH is monitored continuously at outfall 004. To prevent violations if pH briefly varies from the 6.0-9.0 S.U. range, limits are proposed to ensure that pH doesn't vary for more than an hour at a time or for more than 446 minutes per month. This is protective of WQS.

*Total residual chlorine and total residual oxidants*
The limits for total residual chlorine and total residual oxidants are proposed to continue from the existing permit and are based on the WLA as limited by the inside mixing zone maximum. The inside mixing zone maximum is a value calculated to avoid rapidly lethal conditions in the effluent mixing zone. These limits are included in the permit to allow the discharge of additives which contain chlorine and/or bromine. Total residual chlorine and total residual oxidants only need monitored during treatment events.

**Internal Monitoring Outfalls**
Consistent with 40 CFR 122.45(h), the current permit includes monitoring and limits at internal stations 604, 610, 611, and 612. Effluent guideline limits are applied at this outfall to ensure that these treatment standards are met prior to combining with other waste streams. If monitoring was not done at this location, it would not be possible to verify compliance with these standards due to dilution. Federal rules at 40 CFR 125.3(f) prohibit attaining these standards by dilution.

Outfall 601
*Mercury*

Monitoring for mercury is proposed to continue from the existing permit and is based on best technical judgment.

Outfall 604

*Flow rate and pH*

Monitoring for flow rate and pH is proposed to continue in order to evaluate the performance of the treatment plant.

*Total suspended solids and oil and grease*

The limits recommended for these parameters are based on the ELGs found in 40 CFR Part 423.12(b)(3), best practicable control technology currently available for low volume waste, which includes boiler blowdown. All ELG limits are shown in Attachment 1.

Outfall 610

*Flow rate and pH*

Monitoring for flow rate and pH is proposed to continue in order to evaluate the performance of the treatment plant.

*Total suspended solids*

The limit recommended for total suspended solids is based on the ELGs found in 40 CFR Part 423.12(b)(9), best practicable control technology currently available for coal pile runoff. All ELG limits are shown in Attachment 1.

Outfall 611

*Copper, iron, oil and grease, and total suspended solids*

The limit recommended for these parameters is based on the ELGs found in 40 CFR 423.12(b)(5). While the permittee does not use chemical metal cleaners, past limits are proposed to continue for copper and iron based on best professional judgment.

*Flow rate and pH*

Monitoring for these parameters are proposed to continue from the existing permit based on best technical judgment.

Outfall 612

*Flow rate and oil and grease*

Monitoring for flow rate and oil and grease is proposed to continue from the existing permit and is based on best technical judgment.

**Intake Monitoring**

Outfall 800

*Temperature*

Temperature is proposed to continue from the existing permit and is based on best technical judgment.

## OTHER REQUIREMENTS

### Cooling Water Intake Structure Compliance

Under Section 316(b) of the federal CWA, cooling water intake structures (CWISs) are required to use best technology available (BTA) to minimize adverse environmental impact resulting from the operation of the intake. New rules were promulgated on October 14, 2014, and facilities with permits that expire after July 18,

2018 must be in compliance with the new rules. The CWIS is considered an existing unit at an existing facility and therefore must comply with 40 CFR 125, Subpart J.

A compliance schedule in Part 1.C of the permit is proposed for the Avon Lake Generating Station to submit the impingement and entrainment information required in 40 CFR 122.21 by February 1, 2020. Avon Lake Generating Station is in the midst of a two-year entrainment study in preparation of the submittal. Some of the relevant information to be submitted includes:

- Design intake flow rate.
- Maximum design intake flow rate of pumps.
- Percentage of intake flow rate used for cooling purposes.
- Through-screen design intake velocity.
- Impingement/entrainment data.
- Operation of the cooling water system.
- Description of screens, technologies, and operational measures used to reduce impingement and entrainment.

40 CFR 125, Subpart J also requires the Director to make an interim BTA determination. The Avon Lake Generating Station operates two boilers for power generation: Unit 7 and Unit 9. Both utilize 3/8-inch mesh vertical water screens along nine ten-foot wide bays. One additional bay with fixed screens are utilized for the screen wash pumps. Unit 7 uses two 52,000 gallons per minute (gpm) pumps for cooling water. Unit 9 utilizes three 110,000 gpm circulating water pumps. Unit 7 was re-designated as a Limited Use Boiler in April 2016 and is used only for steam support. In 2016 and 2017, the Avon Lake Generating Station was operating at less than 30% of its equivalent availability capacity.

According to the impingement and entrainment conducted by the Avon Lake Power Plant in 2006, 25.8 million larval and juvenile-size fish were estimated to be entrained annually in 2006. The annual rate of impingement is estimated to be 12.2 million fish using actual withdrawal rates in 2006. The through-screen intake flow velocity is 1.5 feet per second at maximum capacity.

Ohio EPA has determined that the current intake structure does not represent BTA to minimize adverse environmental impact. In addition to the entrainment study, a four-month compliance schedule is proposed for NRG Avon Lake Generating to investigate the feasibility of reducing flow during times the plant is not in operation. Reducing flows combined with the lower utilization capacity will result in a determination that the intake would reduce adverse impacts while the entrainment characterization study is being prepared..

**Bottom Ash Transport Water**

The federal rule revising the Steam Electric Power Generating Effluent Guidelines was finalized on September 30, 2015. The rule identifies zero discharge of bottom ash transport water as the Best Available Technology Economically Achievable (BAT) based on dry handling of bottom ash or complete recycle of transport water.

The rule required implementation as soon as possible beginning November 1, 2018, but no later than December 31, 2023. However, on April 25, 2017, the U.S. EPA published a stay in the federal register of compliance dates that have not yet passed. On September 17, 2017, U.S. EPA published another final rule that extended as soon as possible two years, or November 1, 2020, for bottom ash transport water and flue gas desulfurization waste streams. Within the preamble of the rule, the U.S. EPA included a footnote which indicated that the rule was being reconsidered and that if a new rule is not promulgated prior to November 1, 2020, that U.S. EPA would postpone the compliance dates again.

The Director may establish a later date than November 1, 2020, based on four factors [40 CFR 423.11(t)] including the time it takes to design and raise capital as well as *other factors as appropriate*. Based on the factors listed below, the Director has determined that as soon as possible is December 31, 2023. Additional language is proposed to capture the potential for different timelines and/or different final ELGs depending on additional rule-making by U.S. EPA.

- The permittee indicated that to design and raise capital to implement the ELGs would take approximately 4 years.
- The federal register published on September 17, 2017, indicated that U.S. EPA will implement a new rule-making which would propose and finalize revised ELGs.
- As discussed below, the permittee has a complete recycle system of bottom ash transport water which does not discharge when the plant is operating.
- Based on the timeframe that it takes to implement the current ELGs, the likelihood that the *as soon as possible* date of November 1, 2020 is delayed, the potential for final ELGs to be substantially different, and the fact that the current system is largely zero discharge, December 31, 2023, is as soon as possible.

Regarding the current discharge of bottom ash transport water, the facility currently recycles the bottom ash transport water and requires makeup water when the unit is operating. The discharge of bottom ash transport water typically occurs in one of three ways:

- When the unit is not operating, the make-up water continues to be added and comes in contact with transport water within the bottom ash recycle tank.

- Decanted bottom ash from the hydrobins is occasionally stored on a concrete storage pad and storm water may come into contact with the bottom ash and be discharged.

- The bottom ash transport water recycle system is inoperable.

In the interim, the requirements of BPT bottom ash transport water standards remain in effect. The best practicable control technology limits for total suspended solids and oil and grease are included at outfall 002 and are being renewed from the previous permit. After December 31, 2023, the prohibition of bottom ash transport water will be in effect. Avon Lake Generating Station is also required to continue to minimize the discharge of bottom ash transport water and to notify Ohio EPA of bypasses or shutdowns of the bottom ash transport water recycle system.

**Analytical detection levels**
To ensure that data is obtained that allows Ohio EPA to make water quality-related decisions; a special condition is proposed in Part II of the permit that provides guidance on the MDLs the permittee must use in analyzing contaminants.

**Mercury variance renewal**
The Avon Lake Generating Station permit was renewed on June 28, 2011 to include a mercury variance, and variance-based limits for mercury. Based on the monitoring results from April 2012 to April 2017, and the new application information, the Avon Lake Generating Station has determined that the facility will not meet the 30-day average permit limit of 1.3 ng/L. However, the effluent data shows that the permittee can meet the mercury annual average value of 12 ng/L. The permittee's application has also demonstrated to the satisfaction of Ohio EPA that there is no readily apparent means of complying with the WQBEL without constructing prohibitively expensive end-of-pipe controls for mercury. Based upon these demonstrations, the Avon Lake Generating Station is eligible for the mercury variance under OAC 3745-33-07(D)(10)(a).

Avon Lake Generating Station submitted information supporting the renewal of the variance. The permittee identified predominant sources of mercury, implemented housekeeping improvements and procedural changes for better control of the Ash Filter backwashing cycles, and tested polymers to evaluate enhancing solids/mercury removal to reduce the amount of mercury being discharged. The calculation of the $PEQ_{avg}$ value from 2012 to 2017 compared to the $PEQ_{avg}$ calculated at the time the original variance was issued shows a reduction from 13.34 ng/L to 2.41 ng/L. The Pollutant Minimization Program (PMP) schedule developed from the original variance continues to be implemented, and further reductions in mercury may be possible.

Ohio EPA has reviewed the mercury variance application and has determined that it meets the requirements of the OAC. A condition in Part II of the NPDES permit lists the provisions of the mercury variance, and includes the following requirements:

- A variance-based monthly average effluent limit of 2.6 ng/L, which was developed from sampling data submitted by the permittee;
- A requirement that the permittee make reasonable progress to meet the WQBEL for mercury by implementing the plan of study, which has been developed as part of the PMP;
- Low-level mercury monitoring of the plant's influent and effluent;
- A requirement that the annual average mercury effluent concentration is less than or equal to 12 ng/L as specified in the plan of study;
- A summary of the elements of the plan of study;
- A requirement to submit an annual report on implementation of the PMP; and
- A requirement for submittal of a certification stating that all permit conditions related to implementing the plan of study and the PMP have been satisfied, but that compliance with the monthly average WQBEL for mercury has not been achieved.

**Storm Water Compliance**
Parts IV, V, and VI have been included with the draft permit to ensure that any storm water flows from the facility site are properly regulated and managed. As an alternative to complying with Parts IV, V, and VI, the Avon Lake Generating Station may seek permit coverage under the general permit for industrial storm water permit or submit a "No Exposure Certification." Parts IV, V, and VI will be removed from the final permit if: 1) the Avon Lake Generating Station submits a Notice of Intent (NOI) for coverage under the general permit for industrial storm water or submits a No Exposure Certification, 2) Ohio EPA determines that the facility is eligible for coverage under the general permit or meets the requirements for a No Exposure Certification, and 3) the determination by Ohio EPA can be made prior to the issuance of the final permit.

**Outfall Signage**
Part II of the permit includes requirements for the permittee to place and maintain a sign at each outfall to Lake Erie providing information about the discharge. Signage at outfalls is required pursuant to OAC 3745-33-08(A).

**Bis(2-ethylhexyl) phthalate Sampling**
Part II of the permit includes a condition specifying sampling procedures for bis(2-ethlyhexyl) phthalate.

**Public Water Supply Notification**
An addition to OAC 3745-33-08 requires that permittees discharging wastewater within three thousand feet of a public water supply intake, must develop spill (or bypass) notification procedures in conjunction with the downstream public water supply operator. Since the City of Avon Lake Public Water Supply operates a public water supply intake less than three thousand feet from the Avon Lake Generating Station, an item in Part II of the permit requires the development of notification procedures within six months after the effective date of the permit.

Additionally, the permittee is required to notify Ohio EPA and the City of Avon Lake at least 60 days prior to the use of bromine or sodium bromide.

**Whole Effluent Toxicity Reasonable Potential**
The three acute toxicity results (see Table 7) showed the discharge from Outfall 004 was not toxic. Reasonable potential for toxicity is not demonstrated. No monitoring is proposed at this time.

**Part III**
Part III of the permit details standard conditions that include monitoring, reporting requirements, compliance responsibilities, and general requirements.

**Figure 1. Location of Avon Lake Generating Station**

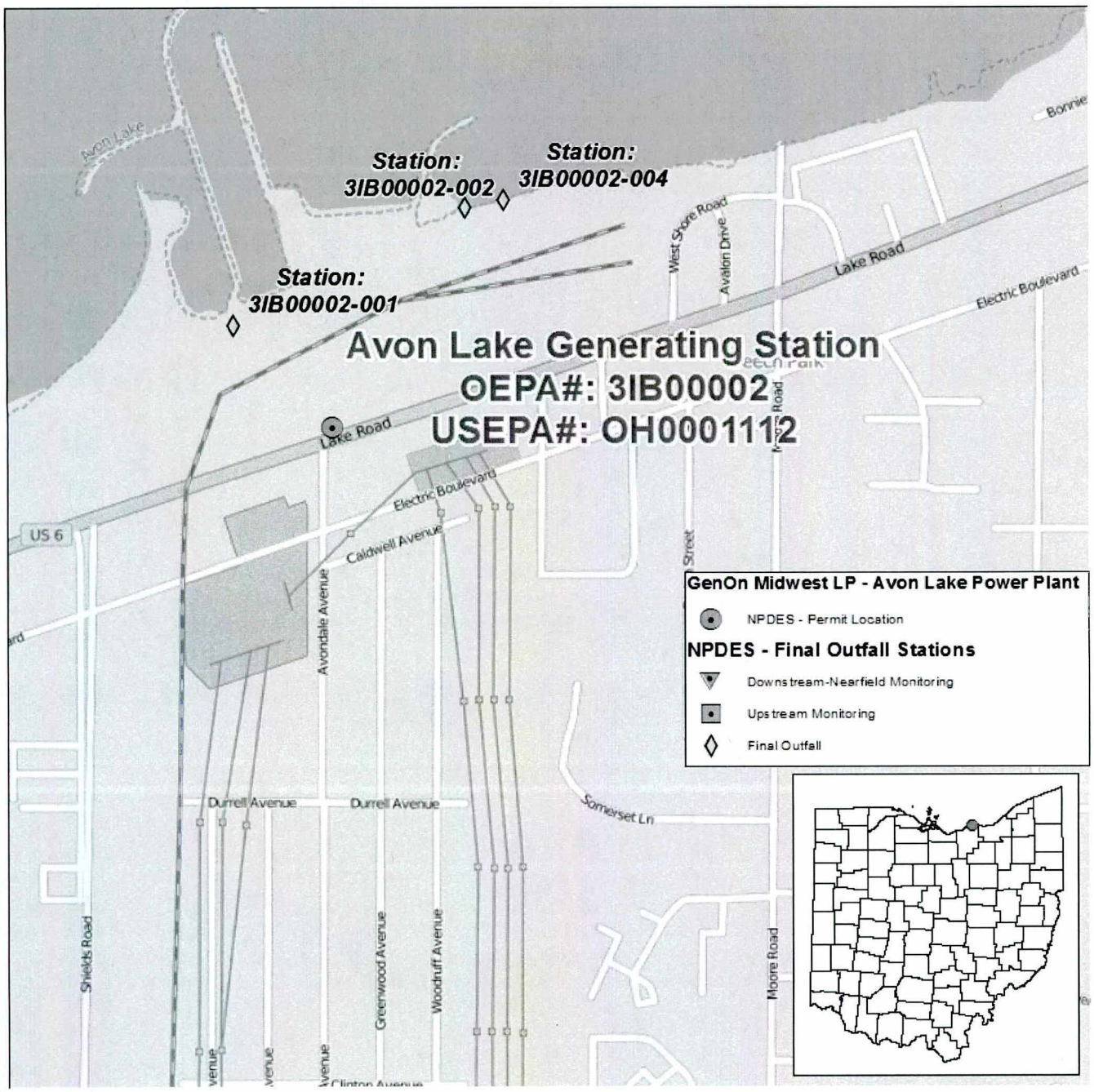


**Figure 2. Water Balance Diagram**

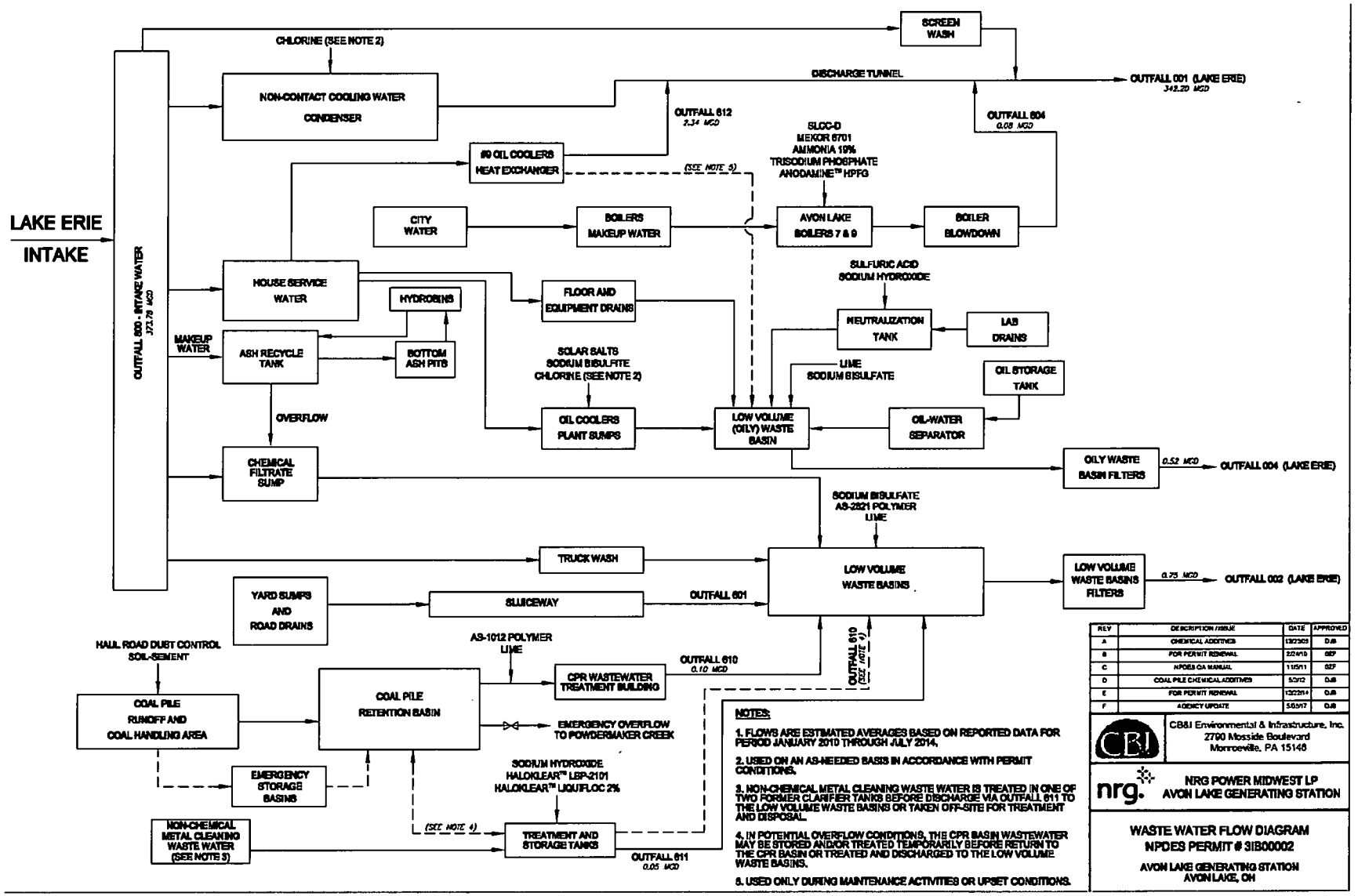


**Table 1. Summary of Avon Lake Generating Station Outfalls**

| Station | Wastewater Source | Treatment Utilized | Receiving Stream | Average Flow Rate (MGD)* | Applied FEG (40 CFR) |
|---|---|---|---|---|---|
| 001 | Once-thru cooling water discharge, boiler blowdown, heat exchanger | Chlorine disinfection | Lake Erie | 527 | 423.13 (b) |
| 002 | Ash transport water, coal pile runoff, metal cleaning | Sedimentation, chemical precipitation, neutralization, gravity filtration | Lake Erie | 1.03 | 423.12 (b) |
| 004 | Low volume waste system, oily water separator, floor drains | Sedimentation, chlorine disinfection, neutralization, gravity filtration | Lake Erie | 0.91 | 423.12 (b)(3) |
| 601 | Ash recycle water overflow | -- | 002 | -- | -- |
| 604 | Boiler blowdown | -- | 001 | 0.29 | 423.12 (b)(3) |
| 610 | Coal pile runoff | Neutralization, chemical precipitation, pressure filtration | 002 | 0.22 | 423.12 (b)(9) |
| 611 | Treated metal cleaning wastewater | Neutralization, chemical precipitation, pressure filtration | 002 | 0.081 | 423.12 (b)(5) |
| 612 | Non-contact cooling water | -- | 001 | 3.4 | -- |

*Average flow rate shown is 95$^{th}$ percentile of monthly averages.

**Table 2. Effluent Violations**

| PARAMETER | 2012 | 2013 | 2014 | 2015 | 2016 | 2017 |
|---|---|---|---|---|---|---|
| Outfall 004 - Oil and Grease, Total | 1 | 0 | 0 | 0 | 0 | 0 |

**Table 3. Average Annual Effluent Flow Rates**

| | Flow Rate (Million Gallons per Day) | | | | |
|---|---|---|---|---|---|
| **Outfall** | **Year** | **# obs.** | **Median** | **95th Percentile** | **Maximum** |
| 001 | 2012 | 275 | 358 | 599 | 599 |
| | 2013 | 365 | 393 | 475.1 | 599 |
| | 2014 | 364 | 316.8 | 440.6 | 440.6 |
| | 2015 | 365 | 316.8 | 599 | 599 |
| | 2016 | 366 | 158.4 | 475.1 | 475.1 |
| | 2017 | 90 | 158.4 | 316.755 | 368.5 |
| 002 | 2012 | 273 | 0.68 | 0.954 | 1.26 |
| | 2013 | 365 | 0.68 | 1.22 | 2.18 |
| | 2014 | 364 | 0.55 | 1.1985 | 2.98 |
| | 2015 | 364 | 0.465 | 0.9685 | 1.34 |
| | 2016 | 364 | 0.23 | 0.64 | 1.14 |
| | 2017 | 90 | 0.195 | 0.592 | 0.7 |
| 004 | 2012 | 275 | 0.46 | 1.529 | 1.97 |
| | 2013 | 365 | 0.39 | 0.698 | 1.36 |
| | 2014 | 364 | 0.355 | 0.67 | 1.48 |
| | 2015 | 365 | 0.46 | 1.304 | 1.61 |
| | 2016 | 366 | 0.34 | 0.73 | 1.01 |
| | 2017 | 90 | 0.345 | 0.5975 | 0.74 |
| 604 | 2012 | 61 | 0.06 | 0.2 | 0.28 |
| | 2013 | 86 | 0.06 | 0.195 | 0.43 |
| | 2014 | 92 | 0.06 | 0.2345 | 0.48 |
| | 2015 | 188 | 0.11 | 0.3 | 0.45 |
| | 2016 | 84 | 0.07 | 0.347 | 0.5 |
| 610 | 2012 | 109 | 0.11 | 0.216 | 0.22 |
| | 2013 | 176 | 0.12 | 0.1825 | 0.22 |
| | 2014 | 168 | 0.13 | 0.23 | 0.24 |
| | 2015 | 129 | 0.16 | 0.21 | 0.51 |
| | 2016 | 84 | 0.15 | 0.21 | 0.22 |
| | 2017 | 36 | 0.17 | 0.2875 | 0.31 |
| 611 | 2012 | 5 | 0.0432 | 0.08062 | 0.081 |
| 612 | 2012 | 8 | 2.55 | 3.4 | 3.4 |
| | 2013 | 12 | 1.7 | 3.4 | 3.4 |
| | 2014 | 12 | 1.7 | 3.4 | 3.4 |
| | 2015 | 12 | 1.7 | 3.29 | 3.4 |
| | 2016 | 9 | 3.4 | 3.4 | 3.4 |
| | 2017 | 2 | 1.7 | 1.7 | 1.7 |

**Table 4. Effluent Characterization Based on Form 2C Data**

| Parameter | Units | 001 | 002 | 004 |
|---|---|---|---|---|
| Nitrate + Nitrite | mg/L | 0.08 | 0.47 | 0.21 |
| Aluminum | ug/L | 83 | 130 | <200 |
| Barium | ug/L | 19 | 31 | 26 |
| Boron | ug/L | 57 | 120 | 34 |
| Iron | ug/L | 110 | 60 | 120 |
| Molybdenum | ug/L | 9.9 | 4 | 3 |
| Manganese | ug/L | 7.6 | <10 | 6.9 |
| Antimony | ug/L | <3 | 0.33 | 0.15 |
| Titanium | ug/L | <10 | 6 | 4 |
| Arsenic | ug/L | 0.4 | 5 | 0.93 |
| Cadmium | ug/L | 0.034 | 0.08 | <0.5 |
| Copper | ug/L | <10 | 4.1 | 7.8 |
| Lead | ug/L | 0.076 | 0.1 | <2 |
| Nickel | ug/L | 1.6 | 2.9 | 2.0 |
| Thallium | ug/L | <1 | 0.35 | <1 |
| Zinc | ug/L | <10 | 3 | 3.7 |
| Total Phenols | ug/L | 0.02 | <50 | <50 |
| Bis(2-ethylhexyl)Phthalate | ug/L | 89.2[A] | <5 | <5 |

[A] =This is believed to be an outlier. The sample was taken using plastic tubing within the facility's 24-hour composite sampler. The facility resampled on dates using glass containers to take samples when the plant was off-line and generating which resulted in <2.06 ug/L on May 31, 2017, and <2.08 ug/L on June 12, 2017, respectively. This value is excluded from PEQ development.

**Table 5. Effluent Characterization Using Self-Monitoring Data**

| Parameter | Calculation Type | Units | Day Max | 30 Day Max | Obs. | 50th | 95th | Data Range |
|---|---|---|---|---|---|---|---|---|
| **Outfall 001** | | | | | | | | |
| Water Temperature | Temp. | F | | | 1815 | 64.9 | 95.7 | 34.2-101 |
| pH | Conc. | S.U. | 6.0 - 9.0 | | 61 | 7.51 | 8.23 | 7-8.33 |
| Oxidants, Total Residual | Conc. | mg/l | 0.05 | | 0 | | | - |
| Flow Rate | Flow | MGD | | | 1825 | 317 | 506 | .5-599 |
| Chlorine, Total Residual | Conc. | mg/l | 0.2 | | 0 | | | - |
| Chlorination/Bromination Duration | Time | Minutes | 120 | | 0 | | | - |
| **Outfall 002** | | | | | | | | |
| Total Suspended Solids | Conc. | mg/l | 100 | 30 | 241 | 2 | 11 | 1-36 |
| Oil and Grease, Total | Conc. | mg/l | 20 | 15 | 61 | 2.55 | 2.7 | 1.1-5.9 |
| Copper, Total Recoverable | Conc. | ug/l | | | 61 | 5 | 5 | 5-11 |
| Flow Rate | Flow | MGD | | | 1820 | 0.51 | 1.07 | .01-2.98 |
| Mercury, Total (Low Level) | Loading | kg/day | 0.043 | 0.00010 | 62 | 0.00000192 | 0.00000546 | .00000000946-.0000124 |
| Mercury, Total (Low Level) | Conc. | ng/l | 3400 | 8.0 | 62 | 0.997 | 3.77 | .25-6.06 |
| pH Range Excursion, Maximum Duration | Time | Minutes | 60 | | 1826 | 0 | 0 | 0-3 |
| pH, Maximum | Conc. | S.U. | | | 1824 | 7.93 | 8.4 | 7.2-10.4 |
| pH, Minimum | Conc. | S.U. | | | 1824 | 7.2 | 7.2 | 4.03-7.56 |
| pH Range Excursions, > 60 Minutes | Count | Number/Day | 0 | | 1826 | 0 | 0 | 0-0 |
| pH Range Excursions, Monthly Total Duration | Time | Minutes | 446 | | 60 | 0 | 1.05 | 0-6 |
| **Outfall 004** | | | | | | | | |
| Total Suspended Solids | Conc. | mg/l | 100 | 30 | 480 | 2 | 8.81 | 1-48 |
| Oil and Grease, Total | Conc. | mg/l | 20 | 15 | 480 | 2.55 | 2.7 | 1.05-21 |

| Parameter | Calculation Type | Units | Day Max | 30 Day Max | Obs. | 50th | 95th | Data Range |
|---|---|---|---|---|---|---|---|---|
| Copper, Total Recoverable | Conc. | ug/l | | | 241 | 5 | 12 | 5-24 |
| Oxidants, Total Residual | Conc. | mg/l | 0.01 | | 0 | | | - |
| Flow Rate | Flow | MGD | | | 1825 | 0.4 | 0.946 | .01-1.97 |
| Chlorine, Total Residual | Conc. | mg/l | 0.038 | | 0 | | | - |
| pH Range Excursion, Maximum Duration | Time | Minutes | 60 | | 1826 | 0 | 0 | 0-10 |
| pH, Maximum | Conc. | S.U. | | | 1826 | 7.48 | 7.89 | 7.2-10.4 |
| pH, Minimum | Conc. | S.U. | | | 1824 | 7.18 | 7.2 | 3.8-7.2 |
| pH Range Excursions, > 60 Minutes | Count | Number/Day | 0 | | 1826 | 0 | 0 | 0-0 |
| pH Range Excursions, Monthly Total Duration | Time | Minutes | 446 | | 60 | 0 | 2 | 0-10 |
| **Outfall 601** | | | | | | | | |
| Mercury, Total (Low Level) | Conc. | ng/l | | | 30 | 1.47 | 54.3 | 0.25-146 |
| **Outfall 604** | | | | | | | | |
| pH | Conc. | S.U. | | | 46 | 9.13 | 9.72 | 8.1-9.76 |
| Total Suspended Solids | Conc. | mg/l | 100 | 30 | 46 | 2 | 13.9 | 1-40 |
| Oil and Grease, Total | Conc. | mg/l | 20 | 15 | 45 | 2.55 | 2.69 | 2.5-2.8 |
| Flow Rate | Flow | MGD | | | 511 | 0.07 | 0.29 | .01-.5 |
| **Outfall 610** | | | | | | | | |
| pH | Conc. | S.U. | | | 149 | 8.64 | 9.3 | 7.14-11.4 |
| Total Suspended Solids | Conc. | mg/l | 50 | | 149 | 4.2 | 14.6 | 1-32 |
| Flow Rate | Flow | MGD | | | 702 | 0.13 | 0.22 | .01-.51 |
| **Outfall 611** | | | | | | | | |
| pH | Conc. | S.U. | | | 5 | 8.3 | 8.64 | 7.14-8.7 |
| Total Suspended Solids | Conc. | mg/l | 100 | 30 | 2 | 1.5 | 1.95 | 1-2 |
| Oil and Grease, Total | Conc. | mg/l | 20 | 15 | 2 | 5.5 | 8.2 | 2.5-8.5 |

| Parameter | Calculation Type | Units | Day Max | 30 Day Max | Obs. | 50th | 95th | Data Range |
|---|---|---|---|---|---|---|---|---|
| Iron, Total Recoverable | Conc. | ug/l | 1000 | 1000 | 2 | 86 | 126 | 42-130 |
| Copper, Total Recoverable | Conc. | ug/l | 1000 | 1000 | 2 | 5 | 5 | 5-5 |
| Flow Rate | Flow | MGD | | | 5 | 0.0432 | 0.0806 | .0083-.081 |
| **Outfall 612** | | | | | | | | |
| Oil and Grease, Total | Conc. | mg/l | | | 55 | 2.6 | 5.43 | 1.2-9 |
| Flow Rate | Flow | MGD | | | 55 | 1.7 | 3.4 | .85-3.4 |
| **Outfall 800** | | | | | | | | |
| Water Temperature | Temp. | F | | | 1823 | 55.6 | 79.4 | 33.2-85.8 |

**Table 6. Projected Effluent Quality**

| Parameter | Units | Number of Samples | Number > MDL | PEQ Average | PEQ Maximum |
|---|---|---|---|---|---|
| Outfall 001 | | | | | |
| Thallium | ug/l | 10 | 0 | -- | -- |
| Nitrite Plus Nitrate | mg/l | 1 | 1 | 0.3621 | 0.496 |
| Sulfate | mg/l | 1 | 1 | 95.05 | 130.2 |
| Aluminum | ug/l | 1 | 1 | 375.7 | 514.6 |
| Barium | ug/l | 1 | 1 | 85.99 | 117.8 |
| Boron | ug/l | 1 | 1 | 258 | 353.4 |
| Iron | ug/l | 1 | 1 | 497.9 | 682 |
| Magnesium | ug/l | 1 | 1 | 39830 | 54560 |
| Molybdenum | ug/l | 1 | 1 | 44.81 | 61.38 |
| Manganese | ug/l | 1 | 1 | 34.4 | 47.12 |
| Arsenic | ug/l | 1 | 1 | 1.797 | 2.461 |
| Cadmium | ug/l | 1 | 1 | 0.1539 | 0.2108 |
| Lead | ug/l | 1 | 1 | 0.344 | 0.4712 |
| Nickel | ug/l | 1 | 1 | 7.242 | 9.92 |
| Phenol | ug/l | 1 | 1 | 0.09052 | 0.124 |
| Outfall 002 | | | | | |
| Total Suspended Solids | mg/l | 241 | 110 | 9.7853 | 13.861 |
| Oil and Grease | mg/l | 61 | 1 | 4.307 | 5.9 |
| Copper | ug/l | 61 | 1 | 8.03 | 11 |
| Mercury (Sept. '13 – Aug. '18) | ng/l | 60 | 50 | 1.77 | 2.60 |
| Nitrite Plus Nitrate | mg/l | 1 | 1 | 2.127 | 2.914 |
| Sulfate | mg/l | 1 | 1 | 1177 | 1612 |
| Aluminum | ug/l | 1 | 1 | 586.6 | 803.5 |
| Barium | ug/l | 1 | 1 | 140.3 | 192.2 |
| Boron | ug/l | 1 | 1 | 543.1 | 744 |
| Iron | ug/l | 1 | 1 | 271.6 | 372 |
| Magnesium | ug/l | 1 | 1 | 43400 | 59460 |
| Molybdenum | ug/l | 1 | 1 | 18.1 | 24.8 |
| Titanium | ug/l | 1 | 1 | 27.16 | 37.2 |
| Antimony | ug/l | 1 | 1 | 1.494 | 2.046 |
| Arsenic | ug/l | 1 | 1 | 22.63 | 31 |
| Cadmium | ug/l | 1 | 1 | 0.353 | 0.4836 |
| Lead | ug/l | 1 | 1 | 0.4707 | 0.6448 |
| Nickel | ug/l | 1 | 1 | 13.13 | 17.98 |
| Thallium | ug/l | 1 | 1 | 1.584 | 2.17 |

| Parameter | Units | Number of Samples | Number > MDL | PEQ Average | PEQ Maximum |
|---|---|---|---|---|---|
| Zinc | ug/l | 1 | 1 | 13.58 | 18.6 |
| Outfall 004 | | | | | |
| Total Suspended Solids | mg/l | 480 | 210 | 6.0473 | 10.525 |
| Oil and Grease, Total | mg/l | 480 | 12 | 2.2661 | 3.726 |
| Selenium, Total Recoverable | ug/l | 11 | 0 | -- | -- |
| Copper, Total Recoverable | ug/l | 241 | 16 | 8.4105 | 12.329 |
| pH Range Excursion, Maximum Duration | Minutes | 1339 | 2 | 0.876 | 1.2 |
| Acute Toxicity, *Ceriodaphnia dubia* | $TU_a$ | 3 | 0 | -- | -- |
| Acute Toxicity, *Pimephales promelas* | $TU_a$ | 3 | 0 | -- | -- |
| Nitrite Plus Nitrate | mg/l | 1 | 1 | 0.9505 | 1.302 |
| Sulfate | mg/l | 1 | 1 | 176.5 | 241.8 |
| Barium | ug/l | 1 | 1 | 117.7 | 161.2 |
| Boron | ug/l | 1 | 1 | 153.9 | 210.8 |
| Iron | ug/l | 1 | 1 | 543.1 | 744 |
| Magnesium | ug/l | 1 | 1 | 43090 | 59020 |
| Molybdenum | ug/l | 1 | 1 | 13.58 | 18.6 |
| Manganese | ug/l | 1 | 1 | 31.23 | 42.78 |
| Titanium | ug/l | 1 | 1 | 18.1 | 24.8 |
| Antimony | ug/l | 1 | 1 | 0.6789 | 0.93 |
| Arsenic | ug/l | 1 | 1 | 4.209 | 5.766 |
| Nickel | ug/l | 1 | 1 | 9.052 | 12.4 |
| Zinc | ug/l | 1 | 1 | 16.75 | 22.94 |

MDL = analytical method detection limit
PEQ = projected effluent quality

**Table 7. Summary of Acute and Toxicity Results – Outfall 004**

| | *Ceriodaphnia dubia* (water flea) | *Pimephales promelas* (fathead minnow) |
|---|---|---|
| **Date** | **$TU_a$** | **$TU_a$** |
| 12/8/2010 | AA | AA |
| 3/2/2011 | AA | AA |
| 6/9/2011 | AA | AA |

AA = non-detection; analytical method detection limit of 0.2 $TU_a$
$TU_a$ = acute toxicity unit

**Table 8. Water Quality Criteria in the Study Area**

| Parameter | Units | Outside Mixing Zone Criteria | | | | Maximum Aquatic Life | Inside Mixing Zone Maximum |
|---|---|---|---|---|---|---|---|
| | | Average | | | | | |
| | | Wildlife | Human Health | Agri-culture | Aquatic Life | | |
| Aluminum | ug/l | -- | 4500 | -- | -- | -- | -- |
| Antimony | ug/l | -- | 780 | -- | 190 | 900 | 1800 |
| Arsenic | ug/l | -- | 580 | 100 | 150 | 340 | 680 |
| Barium | ug/l | -- | 160000 | -- | 220 | 2000 | 4000 |
| Bis(2-ethylhexyl)phthalate | ug/l | -- | 32c | -- | 8.4 | 1100 | 2100 |
| Boron | ug/l | -- | 200000 | -- | 3900 | 33000 | 65000 |
| Cadmium | ug/l | -- | 730 | 50 | 3.2 | 6.6 | 13 |
| Copper | ug/l | -- | 64000 | 500 | 12 | 19 | 38 |
| Iron | ug/l | -- | -- | 5000 | -- | -- | -- |
| Lead | ug/l | -- | -- | 100 | 9.9 | 190 | 380 |
| Manganese | ug/l | -- | 61000 | -- | -- | -- | -- |
| Mercury | ng/l | 1.3 | 3.1 | 10000 | 910 | 1700 | 3400 |
| Molybdenum | ug/l | -- | 10000 | -- | 20000 | 190000 | 370000 |
| Nickel | ug/l | -- | 43000 | 200 | 69 | 620 | 1200 |
| Nitrate + Nitrite | mg/l | -- | -- | 100 | -- | -- | -- |
| Phenol | ug/l | -- | 2400 | -- | 400 | 4700 | 9400 |
| Selenium | ug/l | -- | 3100 | 50 | 5 | -- | -- |
| Zinc | ug/l | -- | 35000 | 25000 | 160 | 160 | 320 |

**Table 9. Instream Conditions and Discharger Flow**

| Parameter | Units | Season | Value | Basis |
|---|---|---|---|---|
| *Hardness* | mg/l | annual | 140 | BWQR |
| *Avon Lake Generating flow* | cfs | annual | 814.8 | 95th percentile of monthly averages |
| *Background Water Quality* | | | | |
| Aluminum | ug/l | | 330 | BWQR; 1988; n=640; 146<MDL; Statewide 50th percentile. |
| Arsenic - TR | ug/l | | 0 | No representative data available. |
| Barium | ug/l | | 68 | BWQR; 1999-03; n=1729; 0<MDL; Statewide 50th percentile. |
| Bis(2-ethylhexyl)phthalate | ug/l | | 0 | No representative data available. |
| Boron | ug/l | | 0 | No representative data available. |
| Cadmium - TR | ug/l | | 0.25 | BWQR; 1999-03; n=1696; 1365<MDL; Statewide 50th percentile. |
| Iron - TR | ug/l | | 650 | BWQR; 1999-03; n=3018; 15<MDL; Statewide 50th percentile. |
| Lead - TR | ug/l | | 2 | BWQR; 1999-03; n=2814; 1458<MDL; Statewide 50th percentile. |
| Magnesium | mg/l | | 0 | No representative data available. |
| Manganese - TR | ug/l | | 0 | No representative data available. |
| Molybdenum | ug/l | | 0 | No representative data available. |
| Nickel - TR | ug/l | | 20 | BWQR; 1999-03; n=1259; 1105<MDL; Statewide 50th percentile. |
| Nitrate-N + Nitrite-N | mg/l | | 0.73 | BWQR; 1999-03; n=5852; 515<MDL; Statewide 50th percentile. |
| Phenol (wwh,ewh,mwh) | ug/l | | 0 | No representative data available. |
| Sulfates | mg/l | | 0 | No representative data available. |

MDL = analytical method detection limit
n = number of samples

**Table 10. Summary of Effluent Limits to Maintain Applicable Water Quality Criteria**

| | | Outside Mixing Zone Criteria | | | | | Inside Mixing Zone Maximum |
|---|---|---|---|---|---|---|---|
| | | | Average | | | Maximum | |
| Parameter | Units | Wildlife | Human Health | Agri-culture | Aquatic Life | Aquatic Life | |
| *Outfall 001* | | | | | | | |
| Aluminum | ug/l | -- | 46200 | -- | -- | -- | -- |
| Arsenic | ug/l | -- | 6380 | 1100 | 1650 | -- | 680 |
| Barium | ug/l | -- | 1759320 | -- | 1740 | -- | 4000 |
| Bis(2-ethylhexyl)phthalate | ug/l | -- | 352 | -- | 92 | -- | 2100 |
| Boron | ug/l | -- | 2200000 | -- | 42900 | -- | 65000 |
| Cadmium | ug/l | -- | 8028 | 548 | 33 | -- | 13 |
| Iron | ug/l | -- | -- | 48500 | -- | -- | -- |
| Lead | ug/l | -- | -- | 1080 | 89 | -- | 380 |
| Manganese | ug/l | -- | 671000 | -- | -- | -- | -- |
| Molybdenum | ug/l | -- | 110000 | -- | 220000 | -- | 370000 |
| Nickel | ug/l | -- | 472800 | 2000 | 559 | -- | 1200 |
| Nitrate + Nitrite | mg/l | -- | -- | 1093 | -- | -- | -- |
| Phenol | ug/l | -- | 26400 | -- | 4400 | -- | 9400 |
| *Outfall 002* | | | | | | | |
| Aluminum | ug/l | -- | 46200 | -- | -- | -- | -- |
| Arsenic | ug/l | -- | 6380 | 1100 | 1650 | -- | 680 |
| Barium | ug/l | -- | 1759320 | -- | 1740 | -- | 4000 |
| Boron | ug/l | -- | 2200000 | -- | 42900 | -- | 65000 |
| Cadmium | ug/l | -- | 8028 | 548 | 33 | -- | 13 |
| Iron | ug/l | -- | -- | 48500 | -- | -- | -- |
| Lead | ug/l | -- | -- | 1080 | 89 | -- | 380 |
| Manganese | ug/l | -- | 671000 | -- | -- | -- | -- |
| Molybdenum | ug/l | -- | 110000 | -- | 220000 | -- | 370000 |
| Nickel | ug/l | -- | 472800 | 2000 | 559 | -- | 1200 |
| Nitrate + Nitrite | mg/l | -- | -- | 1093 | -- | -- | -- |
| Phenol | ug/l | -- | 26400 | -- | 4400 | -- | 9400 |
| Copper | ug/l | -- | 703950 | 5450 | 82 | -- | 38 |
| Mercury | ng/l | 1.3 | 3.1 | 10000 | 910 | -- | 1700 |
| *Outfall 004* | | | | | | | |
| Aluminum | ug/l | -- | 49500 | -- | -- | -- | -- |
| Arsenic | ug/l | -- | 6380 | 1100 | 1650 | -- | 680 |
| Barium | ug/l | -- | 1759320 | -- | 1740 | -- | 4000 |
| Boron | ug/l | -- | 2200000 | -- | 42900 | -- | 65000 |
| Iron | ug/l | -- | -- | 48500 | -- | -- | -- |
| Molybdenum | ug/l | -- | 110000 | -- | 220000 | -- | 370000 |
| Nickel | ug/l | -- | 472800 | 2000 | 559 | -- | 1200 |
| Nitrate + Nitrite | mg/l | -- | -- | 1093 | -- | -- | -- |
| Antimony | ug/l | -- | 8580 | -- | 2090 | -- | 1800 |
| Copper | ug/l | -- | 703950 | 5450 | 82 | -- | 38 |

| Parameter | Units | Outside Mixing Zone Criteria | | | | | Inside Mixing Zone Maximum |
|---|---|---|---|---|---|---|---|
| | | | Average | | | Maximum | |
| | | Wildlife | Human Health | Agri-culture | Aquatic Life | Aquatic Life | |
| Zinc | ug/l | -- | 384850 | 274850 | 1610 | -- | 320 |
| Manganese | ug/l | -- | 671000 | -- | -- | -- | -- |
| Selenium - TR | ug/l | -- | 34100 | 550 | 55 | -- | -- |

**Table 11. Parameter Assessment**

Outfall 001

*Group 1:* Due to a lack of criteria, the following parameters could not be evaluated at this time.

Magnesium Sulfates

*Group 2:* PEQ < 25 percent of WQS or all data below minimum detection limit.
WLA not required. No limit recommended; monitoring optional.

| | | |
|---|---|---|
| Aluminum | Arsenic | Boron |
| Cadmium | Iron | Lead |
| Manganese | Molybdenum | Nickel |
| Nitrate + Nitrite | Phenol | Bis(2-ethylhexyl)phthalate |

*Group 3:* $PEQ_{max}$ < 50 percent of maximum PEL and $PEQ_{avg}$ < 50 percent of average PEL.
No limit recommended; monitoring optional.

Barium

*Group 4:* $PEQ_{max}$ >= 50 percent, but < 100 percent of the maximum PEL or
$PEQ_{avg}$ >= 50 percent, but < 100 percent of the average PEL. Monitoring is appropriate.

No Group 4 Parameters.

*Group 5:* Maximum PEQ >= 100 percent of the maximum PEL or average PEQ >= 100 percent of the average PEL, or either the average or maximum PEQ is between 75 and 100 percent of the PEL and certain conditions that increase the risk to the environment are present. Limit recommended.

Limits to Protect Numeric Water Quality Criteria

| Parameter | Units | Recommended Effluent Limits Average | Maximum |
|---|---|---|---|

PEL = preliminary effluent limit
PEQ = projected effluent quality
WLA = wasteload allocation
WQS = water quality standard

*Group 1:* Due to a lack of criteria, the following parameters could not be evaluated at this time.

Magnesium Sulfates

*Group 2:* PEQ < 25 percent of WQS or all data below minimum detection limit.
WLA not required. No limit recommended; monitoring optional.

| | | |
|---|---|---|
| Aluminum | Arsenic | Boron |
| Cadmium | Iron | Lead |
| Manganese | Molybdenum | Nickel |
| Nitrate + Nitrite | Phenol | |

*Group 3:* $PEQ_{max}$ < 50 percent of maximum PEL and $PEQ_{avg}$ < 50 percent of average PEL.
No limit recommended; monitoring optional.

Barium Copper

*Group 4:* $PEQ_{max}$ >= 50 percent, but < 100 percent of the maximum PEL or
$PEQ_{avg}$ >= 50 percent, but < 100 percent of the average PEL. Monitoring is appropriate.

No Group 4 Parameters.

*Group 5:* Maximum PEQ >= 100 percent of the maximum PEL or average PEQ >= 100 percent of the average PEL, or either the average or maximum PEQ is between 75 and 100 percent of the PEL and certain conditions that increase the risk to the environment are present. Limit recommended.

Limits to Protect Numeric Water Quality Criteria

| | | Recommended Effluent Limits | |
|---|---|---|---|
| Parameter | Units | Average | Maximum |
| Mercury | ng/l | 1.3 | 1700 |

PEL = preliminary effluent limit
PEQ = projected effluent quality
WLA = wasteload allocation
WQS = water quality standard

Outfall 004

*Group 1:* Due to a lack of criteria, the following parameters could not be evaluated at this time.

| | | |
|---|---|---|
| Magnesium | Sulfates | Titanium |

*Group 2:* PEQ < 25 percent of WQS or all data below minimum detection limit.
WLA not required. No limit recommended; monitoring optional.

| | | |
|---|---|---|
| Aluminum | Arsenic | Boron |
| Iron | Molybdenum | Nickel |
| Nitrate + Nitrite | Antimony | Zinc |
| Manganese | Selenium | |

*Group 3:* $PEQ_{max}$ < 50 percent of maximum PEL and $PEQ_{avg}$ < 50 percent of average PEL.
No limit recommended; monitoring optional.

| | |
|---|---|
| Barium | Copper |

*Group 4:* $PEQ_{max}$ >= 50 percent, but < 100 percent of the maximum PEL or
$PEQ_{avg}$ >= 50 percent, but < 100 percent of the average PEL. Monitoring is appropriate.

No Group 4 Parameters.

*Group 5:* Maximum PEQ >= 100 percent of the maximum PEL or average PEQ >= 100 percent of the average PEL, or either the average or maximum PEQ is between 75 and 100 percent of the PEL and certain conditions that increase the risk to the environment are present. Limit recommended.

Limits to Protect Numeric Water Quality Criteria

| | | Recommended Effluent Limits | |
|---|---|---|---|
| Parameter | Units | Average | Maximum |

No Group 5 Parameters.

PEL = preliminary effluent limit
PEQ = projected effluent quality
WLA = wasteload allocation
WQS = water quality standard

**Table 12. Final Effluent Limits**

| Parameter | Units | Concentration | | Loading (kg/day)[a] | | Basis[b] |
|---|---|---|---|---|---|---|
| | | 30 Day Average | Daily Maximum | 30 Day Average | Daily Maximum | |
| Outfall 001 | | | | | | |
| Water Temperature | °F | ---------- Monitor ---------- | | | | M |
| pH | S.U. | 6.0 - 9.0 | | -- | -- | WQS |
| Total Residual Oxidants | mg/L | | 0.05 | | | IMZM |
| Flow Rate | MGD | ---------- Monitor ---------- | | | | M |
| Chlorine, Total Residual | mg/L | -- | 0.2 | -- | -- | BAT |
| Chlorination/Brominatio n Duration | Minutes | -- | 120 | -- | -- | IMZM / BPJ |
| Outfall 002 | | | | | | |
| Total Suspended Solids | mg/L | 30 | 100 | -- | -- | BPT |
| Oil and Grease | mg/L | 15 | 20 | -- | -- | BPT |
| Copper | ug/L | ---------- Monitor ---------- | | | | M |
| Flow Rate | MGD | ---------- Monitor ---------- | | | | M |
| Mercury | ng/L | 2.6 | 1700 | 0.000030 | 0.0192 | VAR, WLA |
| pH Range Excursions Duration | Minutes | -- | 60 | -- | -- | ELG |
| pH | S.U. | 6.0 - 9.0 | | -- | -- | BPT |
| pH Range Excursions > 60 Minutes | No./Day | -- | 0 | -- | -- | ELG |
| pH Range Excursions Monthly Duration | Minutes | -- | 446 | -- | -- | ELG |
| Outfall 004 | | | | | | |
| Total Suspended Solids | mg/L | 30 | 100 | -- | -- | BPT |
| Oil and Grease | mg/L | 15 | 20 | -- | -- | BPT |
| Copper | ug/L | ---------- Monitor ---------- | | | | M |
| Total Residual Oxidants | mg/L | | 0.01 | -- | -- | BTJ |
| Flow Rate | MGD | ---------- Monitor ---------- | | | | M |
| Total Residual Chlorine | mg/L | -- | 0.038 | -- | -- | WQS |
| pH Range Excursions Duration | Minutes | -- | 60 | -- | -- | BTJ |
| pH | S.U. | 6.0 - 9.0 | | -- | -- | BPT |
| pH Range Excursions > 60 Minutes | No./Day | -- | 0 | -- | -- | BTJ |
| pH Range Excursions Monthly Duration | Minutes | -- | 446 | -- | -- | BTJ |
| Internal Monitoring Station 601 | | | | | | |
| Overflow Occurrence | No. Month | ---------- Monitor ---------- | | | | BAT |

| Parameter | Units | Concentration | | Loading (kg/day)[a] | | Basis[b] |
|---|---|---|---|---|---|---|
| | | 30 Day Average | Daily Maximum | 30 Day Average | Daily Maximum | |
| Mercury | ng/L | ---------- Monitor ---------- | | | | M |
| Internal Monitoring Station 604 | | | | | | |
| pH | S.U. | ---------- Monitor ---------- | | | | M |
| Total Suspended Solids | mg/L | 30 | 100 | -- | -- | BPT |
| Oil and Grease | mg/L | 15 | 20 | -- | -- | BPT |
| Flow Rate | MGD | ---------- Monitor ---------- | | | | M |
| Internal Monitoring Station 610 | | | | | | |
| pH | S.U. | ---------- Monitor ---------- | | | | M |
| Total Suspended Solids | mg/L | -- | 50 | -- | -- | BPT |
| Flow Rate | MGD | ---------- Monitor ---------- | | | | M |
| Internal Monitoring Station 611 | | | | | | |
| pH | S.U. | ---------- Monitor ---------- | | | | BTJ |
| Total Suspended Solids | mg/L | 30 | 100 | -- | -- | BPT |
| Oil and Grease | mg/L | 15 | 20 | -- | -- | BPT |
| Iron | ug/L | 1,000 | 1,000 | -- | -- | BPJ |
| Copper | ug/L | 1,000 | 1,000 | -- | -- | BPJ |
| Flow Rate | MGD | ---------- Monitor ---------- | | | | BTJ |
| Internal Monitoring Station 612 | | | | | | |
| Oil and Grease | mg/L | ---------- Monitor ---------- | | | | M |
| Flow Rate | MGD | ---------- Monitor ---------- | | | | M |
| Internal Monitoring Station 800 | | | | | | |
| Water Temperature | F | ---------- Monitor ---------- | | | | M |

[a] Effluent loadings based on:
Outfall 002: 2.98 MGD

[b] Definitions:

BAT = Best Available Technology Economically Achievable, Federal Effluent Guidelines, 40 CFR Part 423.13
BPJ = Best Professional Judgment
BPT = Best Practicable Control Technology Currently Available, Federal Effluent Guidelines, 40 CFR 423.12
BTJ = Best Technical Judgment
M = BTJ of Permit Guidance 2: Determination of Sampling Frequency Formula for Industrial Waste Discharges
VAR = Mercury variance (OAC 3745-33-07(D)(10)(a))
WLA = Wasteload Allocation procedures (OAC 3745-2)
WQS = Ohio Water Quality Standards (OAC 3745-1)

## Attachment 1. Applicable Federal Effluent Limitation Guidelines

### 40 CFR 423.12 - Best Practicable Control Technology Currently Available

| Parameter (mg/L) | Daily Maximum | 30-Day Average |
|---|---|---|
| Low Volume Waste Sources (b)(3) | | |
| Total Suspended Solids | 100 | 30 |
| Oil & Grease | 20 | 15 |
| Chemical Metal Cleaning Wastes (b)(5) | | |
| Total Suspended Solids | 100 | 30 |
| Oil & Grease | 20 | 15 |
| Copper, Total | 1.0 | 1.0 |
| Iron, Total | 1.0 | 1.0 |
| Coal Pile Runoff (b)(9) | | |
| Total Suspended Solids | 50 | -- |

### 40 CFR 423.13 - Best Available Technology Economically Achievable

| Parameter (mg/L) | Daily Maximum | 30-Day Average |
|---|---|---|
| Once Through Cooling Water (b)(1) | | |
| Total Residual Chlorine | 0.2 | -- |

Total residual chlorine may not be discharged from any single generating unit for more than two hours per day.

**Attachment 2. List of Boiler/Cooling Water System Additives**

| AVON LAKE GENERATING STATION<br>CHEMICAL ADDITIVES LIST | | | |
|---|---|---|---|
| NO. | CHEMICAL | USE | STORAGE LOCATION |
| | | | |
| 1 | AMMONIA 19% | BOILER PH CONTROL | 5676 GAL BULK OUTSIDE STORAGE TANK LOCATED IN TRANSFORMER YARD |
| | | | |
| 2A | SODIUM HYDROXIDE (CAUSTIC) | REGENERATION OF CONDENSATE POLISHER RESINS & PH ADJUST MENT ON NEUTRALIZATION TANK | 4,000 GAL AUX. BULK STORAGE TANK<br>5,000 GAL MAIN BULK STORAGE TANK<br>UNIT 9 SOUTHSIDE |
| 2B | SODIUM HYDROXIDE (CAUSTIC) | NON-CHEMICAL METAL CLEANING WASTEWATER PH ADJUSTMENT | 250-GAL TOTES IN PACKAGE BOILER ROOM |
| | | | |
| 3 | SULFURIC ACID | REGENERATION OF CONDENSATE POLISHER RESINS & PH ADJUST MENT ON NEUTRALIZATION TANK | 5,000 GAL BULK OUTSIDE STORAGE TANK LOCATED IN TRANSFORMER YARD |
| | | | |
| 4 | COARSE SOLAR SALT | R/O SOFTENER REGENERATION | 30 TON BULK OUTSIDE STORAGE TANK LOCATED IN TRANSFORMER YARD |
| | | | |
| 5 | AS-2821 POLYMER | ASH POND TSS TREATMENT | 200 GALLON TOTES, UNIT 7 ID FAN HOUSE |
| | | | |
| 6 | AS-1012 POLYMER | COAL PILE RUNOFF POND TREATMENT | 50 LB. BAGS, CPRO TREATMENT BUILDING |
| | | | |
| 7A | LIME | COAL PILE RUNOFF POND TREATMENT | BULK LIME SILO, CPRO TREATMENT BUILDING |
| 7B | LIME | OILY POND PH CONTROL | 50 LB BAGS IN STORAGE SHED |
| 7C | LIME | ASH BASIN PH CONTROL | 50 LB BAGS IN STORAGE SHED |
| | | | |
| 8 | MEKOR 6701 CORROSION INHIBITOR | FEEDWATER TREATMENT, UNIT 7 BOILER | 120 GALLON TOTES, UNIT 7 TURBINE BASEMENT SOUTHSIDE |
| | | | |
| 9 | SLCC-D | PH CONTROL, UNIT 7 BOILER | 120 GALLON TOTES, UNIT 7 TURBINE BASEMENT SOUTHSIDE |
| | | | |
| 10A | SODIUM BISULFATE | OILY POND PH CONTROL | 50 LB BAGS IN STORAGE SHED |
| 10B | SODIUM BISULFATE | ASH POND PH CONTROL | 50 LB BAGS IN STORAGE SHED |
| | | | |

| AVON LAKE GENERATING STATION<br>CHEMICAL ADDITIVES LIST | | | |
|---|---|---|---|
| NO. | CHEMICAL | USE | STORAGE LOCATION |
| 11 | SODIUM BISULFITE | DECHLORINATION OF R/O FEED | 50 LB BAGS |
| | | | |
| 12 | TRISODIUM PHOSPHATE | UNIT 7 BOILER TREATMENT | 50 LB BAGS |
| | | | |
| 13A | CHLORINE | CHLORINATION OF FEEDWATER FOR NON-CONTACT COOLING | (NOT CURRENTLY STORED ON SITE) |
| 13B | CHLORINE | UNIT 9 MAIN TURBINE OIL COOLER | (NOT CURRENTLY STORED ON SITE) |
| | | | |
| 14 | SOIL-SEMENT | CRUSTING AGENT FOR COAL PILE | (NOT CURRENTLY STORED ON SITE – APPLIED BY CONTRACTOR) |
| | | | |
| 15 | HAUL ROAD DUST CONTROL | DUST SUPRESSANT FOR COAL PILE AREA AND HAUL ROAD | 55-GAL DRUMS NEAR BEARING SEAL WATER TANK |
| | | | |
| 16 | HALOKLEAR™ LBP-2101 | NON-CHEMICAL METAL CLEANING WASTEWATER FLOCCULATION AND CLARIFICATION | (NOT CURRENTLY STORED ON SITE – CONTRACTOR SUPPLIES IN 250-GAL TOTE) |
| | | | |
| 17 | HALOKLEAR™ LIQUIFLOC 2% | NON-CHEMICAL METAL CLEANING WASTEWATER FLOCCULATION | 250-GAL TOTE IN PACKAGE BOILER ROOM |
| | | | |
| 18 | ANODAMINE™ HPFG | CORROSION PROTECTION DURING LAYUP OF BOILER | 250-GAL TOTES IN UNIT 7 TURBINE BASIN |

**Addendum 1. Acronyms**

| | |
|---|---|
| ABS | Anti-backsliding |
| BAT | Best Available Technology Economically Achievable |
| BCT | Best Conventional Pollutant Control Technology |
| BPJ | Best professional judgment |
| BPT | Best Practicable Control Technology Currently Available |
| BTJ | Best technical judgment |
| CFR | Code of Federal Regulations |
| CONSWLA | Conservative substance wasteload allocation |
| CWA | Clean Water Act |
| CWIS | Cooling water intake structure |
| DMR | Discharge Monitoring Report |
| DMT | Dissolved metal translator |
| ELG | Federal effluent limitation guideline |
| gpm | Gallons per minute |
| IMZM | Inside mixing zone maximum |
| MDL | Analytical method detection limit |
| MGD | Million gallons per day |
| NPDES | National Pollutant Discharge Elimination System |
| NSPS | New source performance standards |
| OAC | Ohio Administrative Code |
| Ohio EPA | Ohio Environmental Protection Agency |
| ORC | Ohio Revised Code |
| ORSANCO | Ohio River Valley Water Sanitation Commission |
| PEL | Preliminary effluent limit |
| PEQ | Projected effluent quality |
| PMP | Pollution Minimization Program |
| PPE | Plant performance evaluation |
| SIC | Standard Industrial Classification |
| TBEL | Technology-based effluent limit |

| | |
|---|---|
| TMDL | Total Daily Maximum Load |
| TRE | Toxicity reduction evaluation |
| TU | Toxicity unit |
| U.S. EPA | United States Environmental Protection Agency |
| WET | Whole effluent toxicity |
| WLA | Wasteload allocation |
| WQBEL | Water-quality-based effluent limit |
| WQS | Water Quality Standards |

Major

Facility List: NRG Power Midwest LP - Avon Lake Power Plant | 3IB00002*LD | OH0001112

Generate Public Notice

Generate Cover Letter

**Public Notice No.:** OEPA -17-12-007

**Public Notice Issue Date:** 06-Dec-17

**New Permit:** ☐

## Facility Address Information

### Mailing Information

**Contact:** Scott Cameron

**Address:** 121 Champion Way, Suite 300

Canonsburg | PA | 15317

### Location Information

**Owner Name:** NRG Power Midwest LP (NRG Energy)

**Address:** 33570 Lake Road

**City, County:** Avon Lake | Lorain | 47/NE

## Current SWIMS Facility Information

**Nature of Business**

Electrical power generation plant

**Outfall Flow Info**

| Outfall | Avg. Flow | | Latitude | Longitude |
|---|---|---|---|---|
| 1 | 505000000 | gpd | 41 N 30' 30 | 82W 3'28" |
| 2 | 2980000 | gpd | 41 N 30' 36 | 82W 3'7" |
| 4 | 946000 | gpd | 41 N 30' 36 | 82W 3'4" |

**Receiving Stream:**
**(Double click Outfall to add PN)**

| Outfall | Receiving Steam |
|---|---|
| 1 | Lake Erie |
| 2 | Lake Erie |
| 4 | lake Erie |

**Limited Paramaters**
**(Double click Outfall to add PN)**

| Outfall N | Paramater |
|---|---|
| 1 | Chlorine, Total Residual |
| 4 | Chlorine, Total Residual |
| 2 | Total Suspended Solids |
| 604 | Total Suspended Solids |
| 604 | Oil and Grease, Total |
| 1 | pH |
| 4 | Oxidants, Total Residual |
| 2 | Oil and Grease, Total |
| 4 | Oil and Grease, Total |
| 1 | Oxidants, Total Residual |
| 2 | pH Range Excursions, > 60 Minutes |

## Public Notice Information

**Public Notice Nature of Business:**

Electrical power generation plant

**Public Notice Outfall List:**

Outfall No. Avg. Flow Latitude Longitude

1505000000 gpd41 N 30' 30"82W 3'28"
22980000 gpd41 N 30' 36"82W 3'7"
4946000 gpd41 N 30' 36"82W 3'4"

1 150
4 150
150
250

**Public Notice Receiving Stream List:**

1Lake Erie

**Public Notice Parameter List:**

PN DRAFT PERMIT DNO
ACCESS DRAFT
WORKFLOW
PN FINAL PERMIT
ACCESS FINAL

## Miller, Cole

**From:** Ward, Ashley
**Sent:** Thursday, October 11, 2018 12:41 PM
**To:** Fischbein, William; Miller, Cole
**Subject:** RE: NRG Avon Lake Sign-off Attorney Client

I'm fine with this moving as well.

It's probably better to stick with the paper sign off packages for now. It's less likely to get lost in people's emails.

If no changes are made, PPU mails out the hard copies that were used for sign off, so it isn't ALWAYS a waste of paper. Although it often is.

**From:** Fischbein, William
**Sent:** Thursday, October 11, 2018 11:59 AM
**To:** Miller, Cole <Cole.Miller@epa.ohio.gov>; Ward, Ashley <ashley.ward@epa.ohio.gov>
**Subject:** RE: NRG Avon Lake Sign-off Attorney Client

I'm fine with the proposed changes

**From:** Miller, Cole
**Sent:** Wednesday, October 10, 2018 1:47 PM
**To:** Ward, Ashley <ashley.ward@epa.ohio.gov>; Fischbein, William <William.Fischbein@epa.ohio.gov>
**Subject:** RE: NRG Avon Lake Sign-off Attorney Client

No. I was saving paper. To me, the FS and permit would be easier to look at electronically because it shows track changes. I can ask them to make a sign-off if you'd like it.

**From:** Ward, Ashley
**Sent:** Wednesday, October 10, 2018 1:45 PM
**To:** Miller, Cole <Cole.Miller@epa.ohio.gov>; Fischbein, William <William.Fischbein@epa.ohio.gov>
**Subject:** RE: NRG Avon Lake Sign-off Attorney Client

Did PPU send a hard copy of the sign off package around? I don't have it in my pile to review.

**From:** Miller, Cole
**Sent:** Wednesday, October 10, 2018 12:52 PM
**To:** Ward, Ashley <ashley.ward@epa.ohio.gov>; Fischbein, William <William.Fischbein@epa.ohio.gov>
**Subject:** RE: NRG Avon Lake Sign-off Attorney Client

It would be great if we can get this to U.S. EPA on October 19. This would allow us to have the permit effective Jan. 1, 2019. This would make things cleaner with the ELGs.

**From:** Miller, Cole
**Sent:** Wednesday, September 26, 2018 11:30 AM
**To:** Ward, Ashley <ashley.ward@epa.ohio.gov>; Fischbein, William <William.Fischbein@epa.ohio.gov>
**Subject:** NRG Avon Lake Sign-off Attorney Client

Please see attached for the sign-off package for NRG AL. The FS and permit have track changes so it should be easier to see what changes were made than having a print-out version. Please let me know if you have any questions or comments.

Cole

Debbie,

Please finalize by the end of the month. Mainly we need an effective date of Jan. 1 2019 with at least 30 days after the issue date.

Cole

Ohio EPA
State of Ohio Environmental Protection Agency

## COVER MEMO – NPDES Major Permits

Subject: (NPDES # 3IB00002*LD ) Final Issuance for Renewal NPDES Permit for NRG Power Midwest LP w/factsheet

Prepared by: Cole Miller Division: DSW Date: 11/07/2018

NECESSARY APPROVALS

**NPDES Management:** Date:

Supervisor _____ / /

or

Manager _____ / /

**Legal:**

Legal _____ / /

Does Management have comments? ☐ Yes ☐ No

Does Legal have comments? ☐ Yes ☐ No

RETURN ALL SUPPORTING DOCUMENTS TO:

Name: Ashley Ward Division: DSW

Name: Debbie Stiteler

**CO contact to fill out prior to returning package to PPU:**

Have changes been made to the Factsheet? ☐ Yes ☐ No

Have changes been made in SWIMs? ☐ Yes ☐ No

# LEGAL SHEET – When submitting a permit for finalization.

| | |
|---|---|
| Facility: | NRG Avon Lake |
| Permit Number: | 3IB00002*LD |
| Date: | September 26, 2018 |
| Staff: | Cole Miller |
| Peer Reviewer: | Eric Nygaard |

| QUESTION: | RESPONSE: |
|---|---|
| Have changes been made to the permit after it was public noticed? | X Yes ☐ No |
| Based on your knowledge of this permit and the permittee, do you anticipate an appeal of any terms and conditions of the permit? | ☐ Yes ☐ No<br>**It's possible** |
| If US EPA reviewed the permit, are there any continuing concerns? | ☐ Yes X No ☐ N/A |
| **If the answers to all questions above are no, you do not need to answer the questions below and this package does not need to go through Management/Legal sign-off. However, this legal sheet should still be sent to PPU.** | |
| Identify key changes to permit's terms and conditions from the public-noticed version of the permit. | Please see track changes versions of the permit and FS. |
| Has the permittee had an opportunity to comment on the changes? | No. |
| Did permittee comment on the draft permit? | Yes. |
| Did Ohio EPA make changes based on comments? If so, identify. | Yes. Please see track changes versions of the permit, FS, and RTC. |
| Identify issues that were not changed based on comments? | No. |
| If an appeal is anticipated, describe the terms and conditions likely to be appealed. | Mercury variance, 316(b), ELGs, potentially lack of bromide limits |
| If EPA has any continuing concerns, describe them. | They indicated that we should make a best technology available (BTA) determination based on flow reduction. I believe that it would be arbitrary since all of the impingement options are different. |
| Do you have any other legal concerns about the terms and conditions? | No. |

Permit Changes:
- Mercury limit revision
- Overflow occurrence monitoring to track bottom ash transport water
- Re-instating outfall 611 (metal cleaning waste)
- 316(b) small changes

U.S.EPA has approved ~~it~~ current language

Ohio Environmental Protection Agency

# Division of Surface Water
# Response to Comments

**Project: NRG Power Midwest LP – Avon Lake Generating Station, National Pollutant Discharge Elimination System (NPDES) Permit**
**Ohio EPA ID #: 3IB00002*LD**

## Agency Contacts for this Project


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Ohio EPA held a public meeting on April 25, 2018, with a comment period from Dec. 6, 2017 to May 4, 2018, regarding NRG Power Midwest LP – Avon Lake Generating Station (3IB00002*LD). This document summarizes the comments and questions received at the public meeting and during the comment period.

Ohio EPA reviewed and considered all comments received during the public comment period. By law, Ohio EPA has authority to consider specific issues related to protection of the environment and public health. Often, public concerns fall outside the scope of that authority. For example, concerns about zoning issues are addressed at the local level. Ohio EPA may respond to those concerns in this document by identifying another government agency with more direct authority over the issue.

In an effort to help you review this document, the questions are grouped by topic, often summarized and organized in a consistent format.

## General Public Comment Response

Approximately 100 comments and testimonials were provided after the initial public comment period was extended. The first seven items address questions and comments provided by the public. The remaining items (eight-20) address comments received from Sierra Club, U.S. EPA, and the permittee.

For reference, the following units are used in the discussion:

| *Unit* | *Abbreviation* | *Equivalent* |
|---|---|---|
| *Milligram per liter* | mg/L | Parts per **million** |
| *Microgram per liter* | µg/L | Parts per **billion** |
| *Nanograms per liter* | ng/L | Parts per **trillion** |

**Comment 1. Mercury**

***1.1 Mercury Variance***

**Many commenters requested that the mercury variance be denied. One commenter cited the mercury variance rules which require reasonable progress toward achieving pollutant minimization. Specifically, variances must be denied without reasonable progress.**

*Ohio EPA Response*:

The mercury variance is proposed in the final permit action.

The permittee has made reasonable progress toward implementing the pollutant minimization plan. The original variance granted in the 2011 permit renewal was a monthly average concentration limit of 8.0 ng/L. Ohio EPA has reviewed data since the draft permit was proposed in December 2017 **and has included a revised limit of 2.6 ng/L which** is based on the 95$^{th}$ percentile of the projected population.

The permittee's 2017 annual average is 1.26 ng/L which is less than the intake average of 2.22 ng/L per the permittee's Year 7 mercury pollutant minimization plan. 1.26 ng/L is also less than the most restrictive criterion of 1.3 ng/L.

| *Source* | *Monthly Limit (ng/L)* | *Timeframe of effluent data used* |
|---|---|---|
| *2011 Renewal* | 8.0 | June 2005 – Aug. 2010 |
| *2017 Draft* | 3.7 | April 2012 – March 2017 |
| *2018 Final* | 2.6 | Sept. 2013 – August 2018 |

***1.2 Mercury Exposure***

**Many commenters expressed concern for the protection of drinking water and safety of fish consumption with respect to the mercury variance.**

*Ohio EPA Response:*

The variance mercury standards are presented below. A monthly average mercury limit of 2.6 ng/L will be protective of all but the wildlife criteria.

| *Source* | *Value (ng/L)* | *Comments* |
|---|---|---|
| *Drinking Water* | 2,000 | Drinking Water Maximum Contaminant Level |
| *Surface Water* | 1,700 | Aquatic life maximum |
| | 3.1 | Protection of drinking water and fish consumption |
| | **2.6 – Proposed Limit** | |

| | |
|---|---|
| 1.3 | Protection of wildlife such as the bald eagle. |

The proposed limit is protective of drinking water criteria and fish consumption. However, Ohio EPA has a fish consumption advisory for Lake Erie, with two species on the advisory for mercury. Additionally, there's a statewide advisory for sensitive populations (i.e., women of child-bearing age and children under age 15) to eat no more than one meal per week due to mercury. See the weblink below for more information.

https://epa.ohio.gov/portals/35/fishadvisory/fishadvisory_pamphlet.pdf

**Comment 2. Permit Renewal**

**Many commenters said the permit renewal should be denied.**

*Ohio EPA Response:*

The Ohio Administrative Code (OAC) rule 3745-33-04 has specific standards to deny permit renewals or to terminate a permit. Specifically:

> *In renewing a permit, the director shall consider the compliance history of the permit holder and may deny the renewal if the director determines that the permit holder has not complied with the terms and conditions of the existing permit…*

The permittee is in compliance with the current permit; therefore, there is no cause to deny the permit renewal application.

**Comment 3. Bottom Ash**

***3.1 Bottom Ash Disposal***

**Some commenters expressed concern about proper disposal of bottom ash.**

*Ohio EPA Response:*

The permittee does not have a coal combustion residual (CCR) landfill on-site. CCR landfills are typically large impoundments where ash is disposed of in a wet slurry. Instead, the permittee dewaters the bottom ash and disposes of it at a licensed landfill or through beneficial reuse such as an alternative to sand in concrete materials. Historically, the permittee used the Republic Landfill in Lorain County but currently uses the Rumpke landfill in Mansfield.

See U.S. EPA's website for additional information regarding beneficial reuse of CCR materials:

https://www.epa.gov/coalash/coal-ash-reuse

***3.2 Timelines to cease discharge***

**Some commenters asked that the timeline to implement the requirements of the effluent limitation guidelines (ELGs) related to bottom ash transport water be accelerated.**

*Ohio EPA Response:*

The proposed deadline remains at Dec. 31, 2023. Please see the Fact Sheet for revised details on the determination of the date.

**Comment 4. Fish Impingement and Entrainment**

***4.1 Timeline***

**Commenters suggested a faster timeline to reduce fish deaths at the cooling water intake and requiring flow reductions when the power plant is not producing energy.**

*Ohio EPA Response:*

The interim compliance milestone to implement flow reduction when the plant is not operating has been decreased from 12 months to four months to account for time in public notice.

The federal rules require a report to be prepared and peer reviewed. Ohio EPA and the permittee determined an alternative submittal schedule to provide the information and the permittee continues to work on it. A submittal date of Feb. 1, 2020, is appropriate.

***4.2 Review***

**Commenters requested additional information regarding how "best technology available" is determined.**

*Ohio EPA Response:*

The federal requirements largely separate the requirements of impingement and entrainment.

For impingement, which is when aquatic life becomes stuck on the screens, facilities have seven options to be compliant. Three commonly selected options include closed-cycle recirculating systems, 0.5 feet per second through-screen design velocity and 0.5 feet per second through-screen actual velocity. *See 40 CFR 125.94(c) for all the impingement mortality options.*

For entrainment, which is when aquatic life passes through the screens and go through the cooling system, each intake is approved on a site-specific basis. Permittees that withdraw as much as NRG Avon Lake are required to look at closed-cycle recirculating systems, fine mesh screens with a mesh size of two millimeters or smaller, and water reuse or alternate sources of cooling. The Director of Ohio EPA will then determine whether the proposed technology is the site-specific best technology available based on five must-

consider factors and six may-consider factors. *See 40 CFR 125.98(f) for the Director requirements for site-specific entrainment which is at the link below.*

https://www.law.cornell.edu/cfr/text/40/125.98

**Comment 5. Air Pollution Control**

**Commenters indicated that air pollution is linked to water pollution and asked both be considered when deciding whether to issue or deny the NPDES permit.**

*Ohio EPA Response:*

Impacts from air deposition are not within the NPDES review authorities of this permit action. The Clean Air Act and its amendments address air pollution. For information regarding compliance, please see Ohio EPA's eDocument search or contact the Northeast District Office at (330) 963-1200.

http://edocpub.epa.ohio.gov/publicportal/edochome.aspx

**Comment 6. Proposed Language Change**

Commenters made the following proposals:

**6.1. Step-down schedule for reducing the allowable gallons of wastewater per day.**

*Ohio EPA Response*

A schedule was already included to eliminate discharges from bottom ash transport effective Dec. 31, 2023. Additionally, the permittee is required to submit annual progress reports toward reducing mercury concentrations in the discharge.

**6.2. A deadline for elimination of toxic discharges.**

*Ohio EPA Response*

See **Response 6.1.** above.

**6.3. A required annual report on fish kills.**

*Ohio EPA Response*

The required report discussed in **Response 4.1.** requires two years of sampling data in which the permittee will determine the fish mortality rate. Fish kills are directly proportional to the amount of water withdrawn. The amount of flow discharged is already reported to Ohio EPA and therefore, an additional report is unnecessary.

For impingement, which is a measurement of aquatic life which is stuck on screens, there are mitigation strategies including low through-screen

velocities and modified traveling screens which scoop and return impinged fish to the receiving stream in addition to reducing flow.

Reduced velocities were found to protect 96 percent of the fish investigated by U.S. EPA[1]. Modified traveling screens and other technologies would require two additional years of study and associated reported information. In both cases, additional reporting would be unnecessary.

**6.4. Annual progress reports on efforts to eliminate mercury discharges.**

*Ohio EPA Response*

This is already required. See **Response 6.1.** above.

**6.5. Decreasing discharge limits for bromides.**

*Ohio EPA Response*

The permit has been revised to require prior notification to Ohio EPA and the City of Avon Lake to use bromine. The permit continues to include a re-opener clause to incorporate other water quality-based effluent limits which allows Ohio EPA to incorporate any new standards for bromide.

The permittee currently does not use chlorine, bromine, or bromide; however, the permit authorizes limited use of bromine at a level of 0.05 mg/L. The testing methodology for analyzing bromine, chlorine and other oxidants is the same which is why the parameter is "total residual oxidants."

**Comment 7. Additional Comments and Questions**

Commenters had the following questions

**7.1. When was the last inspection?**

*Ohio EPA Response*

Ohio EPA inspected terms and conditions of the NPDES permit on July 24, 2018. No violations were noted.

**7.2. What are the consequences of non-compliance and who is responsible? What happens if the owner ceases to exist?**

*Ohio EPA Response*

[1] U.S. EPA *Technical Development Document for the Final Section 316(b) Existing Facilities Rule* (2014) Page 6-66

A maximum of $10,000 per each violation per day is the penalty allowed by law (Ohio Revised Code 6111.09). The owner of the facility is the entity to which the penalty would be assessed.

The owner at the time of violations occurring would be responsible. If the corporation ceases to exist, Ohio would continue to have the authority to issue enforcement action for past non-compliance.

**7.3. Why is there a difference of reported intake flow of 389 million gallons per day (MGD) discharged versus an intake of 427 MGD?**

*Ohio EPA Response*

The numbers provided were from different sources which accounts for the inadvertent discrepancy. Overall, the amount of water withdrawn will be the amount discharged with potentially a small amount of water lost to evaporation.

**7.4. It was indicated that most of the discharge is once-through condense cooling water. What is the remaining amount and what are the specific contents?**

*Ohio EPA Response*

There are three final discharge points which were analyzed for pollutants. Only Outfall 002 had the potential to exceed a water quality standard which was for mercury.

A table from the fact sheet is included for reference below. Outfalls 001, 002, and 004 are all direct-to-Lake Erie discharges. The remaining stations are internal to the final outfalls.

| *Station* | *Wastewater Source* | *Treatment Utilized* | *Receiving Stream* | *Average Flow Rate* (MGD)* |
|---|---|---|---|---|
| *001* | Once-thru cooling water discharge, boiler blowdown, heat exchanger | Chlorine disinfection | Lake Erie | 527 |
| *002* | Ash transport water, coal pile runoff, metal cleaning | Sedimentation, chemical precipitation, neutralization, gravity filtration | Lake Erie | 1.03 |
| *004* | Low volume waste system, oily water separator, floor drains | Sedimentation, chlorine disinfection, neutralization, gravity filtration | Lake Erie | 0.91 |

| | | | | |
|---|---|---|---|---|
| *601* | Ash recycle water overflow | -- | 002 | -- |
| *604* | Boiler blowdown | -- | 001 | 0.29 |
| *610* | Coal pile runoff | Neutralization, chemical precipitation, pressure filtration | 002 | 0.22 |
| *611* | Treated metal cleaning wastewater | Neutralization, chemical precipitation, pressure filtration | 002 | 0.081 |
| *612* | Non-contact cooling water | -- | 001 | 3.4 |

**Average is the 95th percentile of monthly averages*

**7.5. The permit does not address heat pollution.**

*Ohio EPA Response*

The permittee demonstrated the thermal plume does not interfere with the designated or existing uses of Lake Erie based on a mixing zone study. Therefore, no additional measures are required.

**7.6. The permit does not address storm fallouts.**

*Ohio EPA Response*

If the term "fallout" is regarding municipal storm water outlets, the City of Avon Lake is a regulated Municipal Separate Storm Sewer System (MS4) with requirements to minimize storm water pollution. Independent of the city, NRG Avon Lake also has its own storm water pollution prevention requirements.

**7.7. Has Canada been consulted in terms of compliance?**

*Ohio EPA Response*

No, Canada has not been consulted. For reference, Canada's most stringent mercury standard is 4 ng/L for methylmercury[2], compared to NRG Avon Lake's limit of 2.6 ng/L total recoverable mercury.

**7.8. Is Lorain County in non-attainment for ozone and fine particulates?**

*Ohio EPA Response*

Yes, Lorain County is listed as non-attainment for particulate matter ($PM_{2.5}$) and ozone. Please visit Ohio EPA's website for more information:

https://epa.ohio.gov/dapc/general/naaqs

[2] Canadian Council of Ministers of the Environment: http://st-ts.ccme.ca/en/index.html?chems=131,133&chapters=1,2,3,4,5

Cooling Water Intake Structure Regulations [316(b)]

***Peer Review***

**Comment 8:** **Regarding the peer review requirements of 40 CFR 122.21(r)(13), the final permit should clarify that NRG must comply fully with all aspects of paragraph (r)(13), and provide a specific schedule for doing so that will allow adequate time for Ohio EPA to consider and provide input regarding the required peer review reports and incorporate the rest of 40 CFR 122.21(r)(13).** *(Ohio Environmental Council, Environmental Law & Policy, and Sierra Club [the "Conservation Organizations"])*

**Response 8:** This change has not been made.

The proposed compliance schedule references the requirements of 40 CFR 122.21(r)(13). The reference does not limit or change the requirements of the rule. To include all the rule language would be impractical as the application rule language is extensive.

Additionally, the permittee provided a list of four peer reviewers on Jan. 5, 2018, for Ohio EPA to review. In a Jan. 19, 2018, e-mail, Ohio EPA indicated there were no objections to the list provided. Therefore, the language submitting the list of peer reviewers as soon as possible has been removed.

**Comment 9:** **The permittee requests that the Entrainment Characterization Study be removed from the list of reports which requires Peer Review. The application rule specifies (r)(10) through (r)(12) need to be peer reviewed.**

**Response 9:** Condition I.C.1.c.i has been moved from the list of studies requiring peer review to the list of studies which require submittal (Part I.C.1.a).

***Monitoring, reporting, and recordkeeping requirements***

**Comment 10:** **The Conservation Organizations request that the monitoring, reporting, and recordkeeping requirements of 40 CFR 125.98(b) be included in the permit.**

**Response 10:** This change has been made. See conditions Part II, Items P and Q.

***Interim Best Technology Available***

**Comment 11:** **U.S. EPA requested the fact sheet indicate an interim Best Technology Available (BTA) determination based on reduction of intake volume due to a lower utilization rate**

**Response 11:** This change has not been made.

The permittee's submittal from 2006 indicated that the maximum through-screen velocity was approximately 1.5 foot per second (fps). The impingement mortality options identified in 40 CFR 125.94(c) are prescriptive.

While option 40 CFR 125.94(c)(6), *Systems of technologies*, does allow for flow reduction, the permittee would continue to withdraw 120 MGD on days not operating. Ohio EPA does not believe that a withdrawal of 120 MGD can be BTA even with the lower utilization capacity.

More broadly, Ohio EPA disagrees that an affirmative interim BTA is required. The federal rule does not define "interim BTA" and references "interim BTA" only four times, primarily in the context of including requirements based on the Director's best professional judgment (BPJ).

For permits being renewed for the first time after the *existing facilities* rule became effective (Oct. 14, 2014), it is possible cooling water intake structure does not represent BTA nor could be reasonably interpreted as BTA on an interim basis. It would be arbitrary to make a BPJ determination without accounting for the final requirements of the rule. Instead, Ohio EPA interprets interim BTA as additional requirements necessary to align permittees with the required standards as well as setting a schedule to implement final determinations.

For this permit, Ohio EPA has included interim compliance milestones to have the required application information submitted as soon as possible and will make a final determination after all information has been received. Additionally, the permittee is required to investigate additional flow reduction during non-operation which would ideally reduce through-screen velocities to less than 0.5 fps.

**Comment 12:** **The final permit must be revised to make clear that the permittee must, in its report on the feasibility of flow reduction during times the station is offline, also provide information about potential environmental and social benefits. This requirement would be consistent with the Clean Water Act's goals instead of solely making a feasibility determination based on economics.**

**Additionally, Ohio EPA should require flow reduction as objectively defined by Ohio EPA instead of being defined by the permittee.** *(Conservation Organizations)*

**Response 12:** The fact sheet has been revised that there is no interim BTA. The interim measures may reduce impingement and entrainment, but reduction of flow may not be included in the final BTA demonstration. Therefore, the environmental and social benefit evaluation will still be done as part of the larger 316(b) report being submitted no later than Feb. 1, 2020.

The final 316(b) report will be submitted within 12 months of the flow reduction feasibility report. While flow reduction may be part of the final BTA, the permittee may select other technologies to meet BTA or even other methods of flow reduction such as a variable speed pump. Therefore, no additional provisions of determining feasibility are proposed.

Steam Electric Effluent Limitation Guidelines

***Bottom Ash Transport Water***

**Comment 13:** **U.S. EPA made the following comments:**

a. **Add a footnote for final outfall 002 that references Part II.O which relates to the compliance date for bottom ash transport water.**
b. **Revise Part II.O to address legacy wastewater associated with bottom ash transport water.**
c. **Please include a means for evaluating the zero-discharge limitation for bottom ash transport water.**
d. **Revise the Fact Sheet for clarity regarding ash waters generated prior to the as soon as possible date.**

**Response 13:** These changes have been made. Please see the permit and fact sheet for revisions.

**Comment 14:** **The fact sheet and permit must require the permittee to comply with the currently applicable final 2015 Effluent Limitation Guidelines (ELGs) limits, without commentary on the speculative possibility of any future modification of the final limits.** *(Conservation Organizations)*

**Response 14:** This change has not been made. The language in Part II, Item O of the draft permit requires the permittee to automatically comply with any new and/or alternative conditions that may be established in the Steam Electric Power Generating Effluent Guidelines. This mechanism allows the permit to automatically enforce any applicable ELGs, without modifying the permit language or compliance dates. Since the permit is not being modified, the modification rule (40 CFR 122.62) does not apply.

**Comment 15:** **The Conservation Organizations request a more thorough description of how the Director determined the "as soon as possible" compliance date for the zero-discharge of bottom ash transport water.** *(Conservation Organizations)*

**Response 15:** Please see the revised fact sheet for additional information.

***Metal Cleaning Waste***

**Comment 16:** **U.S. EPA indicated that the metal cleaning wastes monitored and limited at internal outfall 611 should continue based on best professional judgment (BPJ).**

**Response 16:** This change has been made. Outfall 611 has been re-instated in the proposed permit with the existing limits.

**Comment 17:** **The permittee noted a reference to Outfall 611 in the permit and requested for the reference to be removed.**

**Response 17:** No change has been made.

As discussed in **Response 16**, Ohio EPA has re-instated Outfall 611. Therefore, the reference in Part II will continue.

Mercury Variance

**Comment 18:** **The Conservation Organizations request that the proposed mercury variance be reconsidered and to consider more recent information on the costs and benefits of end-of-pipe mercury controls.** *(Conservation Organizations)*

**Response 18:** No change has been made.

The current permit has a mercury variance of 8.0 ng/L and in the proposed draft permit this value is reduced to 3.7 ng/L. The permittee has and continues to make reasonable progress toward the elimination of the discharge of mercury.

More broadly, Ohio EPA agrees that controlling mercury pollution is important and has been very stringent on regulating point sources. In addition to eliminating the mixing zone for bioaccumulating chemicals of concern (BCCs) in the Lake Erie basin as required by the Great Lakes Initiative (GLI), Ohio EPA has extended this requirement to all of Ohio.

Also, the variance is much more than a pass at meeting water quality criteria. Permittees that have been granted variances are required to develop pollutant minimization plans (PMPs), implement the PMPs, submit annual progress reports, and comply with an annual average mercury limit of 12 ng/L as well as a monthly average limit determined by effluent data. The general mercury variance has been successful at reducing mercury concentrations in permitted dischargers and Ohio EPA believes further reductions are occurring.

Bromide and Notification to Public Water Supply

**Comment 19:** **The Conservation Organizations request that Ohio EPA notify and consult municipalities to determine water-quality based effluent limitations for the Avon Lake Power Plant's bromide discharge are necessary to protect drinking water quality.** *(Conservation Organizations)*

**Response 19:** See **Response 6.5.**

**Comment 20:** **The permittee indicated that there was a typographical error related to cross-referencing in Part II Item N.**

**Response 20:** The permit has been revised to update the cross-reference.

**End of Response to Comments**

Application No. OH0001112

Issue Date:

Effective Date:

Expiration Date: 5 Years

**DRAFT COPY**
**SUBJECT TO REVISION**
**OHIO EPA**

Ohio Environmental Protection Agency
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., hereinafter referred to as the "Act"), and the Ohio Water Pollution Control Act (Ohio Revised Code Section 6111),

NRG Power Midwest LP

is authorized by the Ohio Environmental Protection Agency, hereinafter referred to as "Ohio EPA," to discharge from the NRG Avon Lake Generating Station located at 33570 Lake Road, Avon Lake, Ohio, Lorain County and discharging to Lake Erie in accordance with the conditions specified in Parts I, II, III, IV, V, and VI of this permit.

This permit is conditioned upon payment of applicable fees as required by Section 3745.11 of the Ohio Revised Code.

This permit and the authorization to discharge shall expire at midnight on the expiration date shown above. In order to receive authorization to discharge beyond the above date of expiration, the permittee shall submit such information and forms as are required by the Ohio EPA no later than 180 days prior to the above date of expiration.

Craig W. Butler
Director

Total Pages: 62

PERSON ID: 24084
PLACE ID: 24651
DOCUMENT ID: 34101
ORGANIZATION ID:
REVENUE ID: 1256485

Part I, A. - FINAL EFFLUENT LIMITATIONS AND MONITORING REQUIREMENTS

1. During the period beginning on the effective date of this permit and lasting until the expiration date, the permittee is authorized to discharge in accordance with the following limitations and monitoring requirements from outfall 3IB00002001. See Part II, OTHER REQUIREMENTS, for locations of effluent sampling.

Table - Final Outfall - 001 - Final

| Effluent Characteristic | Discharge Limitations | | | | | | | Monitoring Requirements | | |
|---|---|---|---|---|---|---|---|---|---|---|
| | Concentration Specified Units | | | | Loading* kg/day | | | | | |
| Parameter | Maximum | Minimum | Weekly | Monthly | Daily | Weekly | Monthly | Measuring Frequency | Sampling Type | Monitoring Months |
| 00011 - Water Temperature - F | - | - | - | - | - | - | - | 1/Day | Continuous | All |
| 00400 - pH - S.U. | 9.0 | 6.0 | - | - | - | - | - | 1/Month | Grab | All |
| 34044 - Oxidants, Total Residual - mg/l | 0.05 | - | - | - | - | - | - | 1/Day | Grab | All |
| 50050 - Flow Rate - MGD | - | - | - | - | - | - | - | 1/Day | Continuous | All |
| 50060 - Chlorine, Total Residual - mg/l | 0.2 | - | - | - | - | - | - | 1/Day | Grab | All |
| 78739 - Chlorination/Bromination Duration - Minutes | 120 | - | - | - | - | - | - | 1/Day | Total | All |

Notes for Station Number 3IB00002001:

a. The Total Residual Chlorine (TRC) and Total Residual Oxidants (TRO) limits are the maximum allowed at the outfall at any time. TRC and TRO may not be discharged from this outfall for more than two hours per day. Simultaneous multi-unit chlorination and/or bromination is permitted. Analyses are to be performed by amperometric titration, Orion Residual Chlorine Electrode, or another EPA approved method during chlorination and/or bromination. The daily grab samples for TRC and TRO shall represent the maximum concentration discharged during chlorination and/or bromination.

b. Water temperature requires intake (3IB00002800) monitoring for outfall 3IB00002001. Report intake/outfall temperature estimated to correspond to a maximum temperature differential sustained for one hour.

c. TRO reflects the use of bromine compounds. Bromine can be used separately or in combination with chlorine. These limits are effective when bromine is used. Discharge limitations for TRO may be met using a dehalogenation agent, if necessary. Dehalogenation shall then be achieved by using stoichiometric calculations to determine the amount of dehalogenating agent necessary to completely eliminate the residual.

d. TRO is to be reported on days when bromine compounds are used with or without chlorine. Report "AH" on the DMR on days when no bromine compounds are used and explain in the remarks section.

e. TRC is to be reported on days when only chlorine compounds are used, when no bromine compounds are used. Report "AH" on the DMR if bromine (or a combination of bromine and chlorine) is used and explain in the remarks section.

f. Chlorination/bromination duration monitoring is to be performed only on days when using chlorine and/or bromine treatment. On days when treatment is not used, report "AH" on the DMR and explain in the remarks section.

g. Sampling shall be performed when discharging. If no discharge occurs during the entire month, eDMR users should select the "No Discharge" check box on the data entry form and pin the eDMR.

h. Samples taken in compliance with monitoring requirement specified above shall be taken at Sampling Stations described in Part II, Other Requirements.

Part I, A. - FINAL EFFLUENT LIMITATIONS AND MONITORING REQUIREMENTS

2. During the period beginning on the effective date of this permit and lasting until the expiration date, the permittee is authorized to discharge in accordance with the following limitations and monitoring requirements from outfall 3IB00002002. See Part II, OTHER REQUIREMENTS, for locations of effluent sampling.

Table - Final Outfall - 002 - Final

| Effluent Characteristic | Discharge Limitations | | | | | | | Monitoring Requirements | | |
|---|---|---|---|---|---|---|---|---|---|---|
| | Concentration Specified Units | | | | Loading* kg/day | | | | | |
| Parameter | Maximum | Minimum | Weekly | Monthly | Daily | Weekly | Monthly | Measuring Frequency | Sampling Type | Monitoring Months |
| 00530 - Total Suspended Solids - mg/l | 100 | - | - | 30 | - | - | - | 1/Week | 24hr Composite | All |
| 00550 - Oil and Grease, Total - mg/l | 20 | - | - | 15 | - | - | - | 1/Month | Grab | All |
| 01119 - Copper, Total Recoverable - ug/l | - | - | - | - | - | - | - | 1/Quarter | 24hr Composite | All |
| 50050 - Flow Rate - MGD | - | - | - | - | - | - | - | 1/Day | 24hr Total | All |
| 50092 - Mercury, Total (Low Level) - ng/l | 1700 | - | - | 3.7 | 0.0192 | - | 0.000042 | 1/Month | Grab | All |
| 51600 - pH Range Excursion, Maximum Duration - Minutes | 60 | - | - | - | - | - | - | 1/Day | Total | All |
| 61941 - pH, Maximum - S.U. | - | - | - | - | - | - | - | 1/Day | Continuous | All |
| 61942 - pH, Minimum - S.U. | - | - | - | - | - | - | - | 1/Day | Continuous | All |
| 82581 - pH Range Excursions, > 60 Minutes - Number/Day | 0 | - | - | - | - | - | - | 1/Day | Total | All |
| 82582 - pH Range Excursions, Monthly Total Duration - Minutes | 446 | - | - | - | - | - | - | 1/Month | Total | All |

Notes for Station Number 3IB00002002:

a. Effluent loadings based on 2.98 MGD.

b. Spray down water from the synthetic fuel facility is permitted to be discharged through this outfall.

c. Sampling shall be performed when discharging. If no discharge occurs during the entire month, eDMR users should select the "No Discharge" check box on the data entry form and pin the eDMR.

d. Mercury - See Part II, Items J, K and L. Samples for mercury at this station shall be collected one detention time after samples collected for Outfall 3IB00002601.

e. Samples taken in compliance with monitoring requirements specified above shall be taken at Sampling Stations described in Part II, Other Requirements.

f. For pH, the maximum limit is 9.0 and the minimum limit is 6.0 S.U. Violations will occur if:

1. Total minutes of excursions from these limits exceed 7 hours and 26 minutes (446 minutes) during a single month. See pH Range Excursions, Monthly Total Duration (in minutes), Reporting Code 82582. If no excursions occur during the month, report "0"; or

2. An individual excursion event continues uninterrupted for more than 60 minutes. See:

a) pH Range Excursions, Maximum Duration (in minutes), Reporting Code 51600. If no excursions occur, report "0".

b) pH Range Excursions, > 60 Minutes (Number/Day), Reporting Code 82581. Enter the number of excursions each day that exceed 60 minutes in duration.

Part I, A. - FINAL EFFLUENT LIMITATIONS AND MONITORING REQUIREMENTS

3. During the period beginning on the effective date of this permit and lasting until the expiration date, the permittee is authorized to discharge in accordance with the following limitations and monitoring requirements from outfall 3IB00002004. See Part II, OTHER REQUIREMENTS, for locations of effluent sampling.

Table - Final Outfall - 004 - Final

| Effluent Characteristic | Discharge Limitations | | | | | | | Monitoring Requirements | | |
|---|---|---|---|---|---|---|---|---|---|---|
| | Concentration Specified Units | | | | Loading* kg/day | | | | | |
| Parameter | Maximum | Minimum | Weekly | Monthly | Daily | Weekly | Monthly | Measuring Frequency | Sampling Type | Monitoring Months |
| 00530 - Total Suspended Solids - mg/l | 100 | - | - | 30 | - | - | - | 2/Week | 24hr Composite | All |
| 00550 - Oil and Grease, Total - mg/l | 20 | - | - | 15 | - | - | - | 2/Week | Grab | All |
| 01119 - Copper, Total Recoverable - ug/l | - | - | - | - | - | - | - | 1/Quarter | 24hr Composite | All |
| 34044 - Oxidants, Total Residual - mg/l | 0.01 | - | - | - | - | - | - | 1/Day | Grab | All |
| 50050 - Flow Rate - MGD | - | - | - | - | - | - | - | 1/Day | Continuous | All |
| 50060 - Chlorine, Total Residual - mg/l | 0.038 | - | - | - | - | - | - | 1/Day | Grab | All |
| 51600 - pH Range Excursion, Maximum Duration - Minutes | 60 | - | - | - | - | - | - | 1/Day | Total | All |
| 61941 - pH, Maximum - S.U. | - | - | - | - | - | - | - | 1/Day | Continuous | All |
| 61942 - pH, Minimum - S.U. | - | - | - | - | - | - | - | 1/Day | Continuous | All |
| 82581 - pH Range Excursions, > 60 Minutes - Number/Day | 0 | - | - | - | - | - | - | 1/Day | Total | All |
| 82582 - pH Range Excursions, Monthly Total Duration - Minutes | 446 | - | - | - | - | - | - | 1/Month | Total | All |

Notes for Station Number 3IB00002004:

a. The Total Residual Chlorine (TRC) and Total Residual Oxidants (TRO) limits are the maximum allowed at the outfall at any time. TRC and TRO may not be discharged from this outfall for more than two hours per day. Simultaneous multi-unit chlorination and/or bromination is permitted. Analyses are to be performed by amperometric titration, Orion Residual Chlorine Electrode, or another EPA approved method during chlorination and/or bromination. The daily grab samples for TRC and TRO shall represent the maximum concentration discharged during chlorination and/or bromination.

b. TRO reflects the use of bromine compounds. Bromine can be used separately or in combination with chlorine. These limits are effective when bromine is used. Discharge limitations for TRO may be met using a dehalogenation agent, if necessary. Dehalogenation shall then be achieved by using stoichiometric calculations to determine the amount of dehalogenating agent necessary to completely eliminate the residual.

c. TRO is to be reported on days when bromine compounds are used with or without chlorine. Report "AH" on the DMR on days when no bromine compounds are used and explain in the remarks section.

d. TRC is to be reported on days when only chlorine compounds are used, when no bromine compounds are used. Report "AH" on the DMR if bromine (or a combination of bromine and chlorine) is used and explain in the remarks section.

e. Sampling shall be performed when discharging. If no discharge occurs during the entire month, eDMR users should select the "No Discharge" check box on the data entry form. Pin the eDMR.

f. Samples taken in compliance with monitoring requirements specified above shall be taken at Sampling Stations described in Part II, Other Requirements.

g. For pH, the maximum limit is 9.0 and the minimum limit is 6.0 S.U. Violations will occur if:

1. Total minutes of excursions from these limits exceed 7 hours and 26 minutes (446 minutes) during a single month. See pH Range Excursions, Monthly Total Duration (in minutes), Reporting Code 82582. If no excursions occur during the month, report "0"; or

2. An individual excursion event continues uninterrupted for more than 60 minutes. See:

a) pH Range Excursions, Maximum Duration (in minutes), Reporting Code 51600. If no excursions occur, report "0".

b) pH Range Excursions, > 60 Minutes (Number/Day), Reporting Code 82581. Enter the number of excursions each day that exceed 60 minutes in duration.

Part I, A. - FINAL EFFLUENT LIMITATIONS AND MONITORING REQUIREMENTS

4. During the period beginning on the effective date of this permit and lasting until the expiration date, the permittee is authorized to discharge in accordance with the following limitations and monitoring requirements from outfall 3IB00002601. See Part II, OTHER REQUIREMENTS, for locations of effluent sampling.

Table - Internal Monitoring Station - 601 - Final

| Effluent Characteristic | Discharge Limitations | | | | | | | Monitoring Requirements | | |
|---|---|---|---|---|---|---|---|---|---|---|
| | Concentration Specified Units | | | | Loading* kg/day | | | | | |
| Parameter | Maximum | Minimum | Weekly | Monthly | Daily | Weekly | Monthly | Measuring Frequency | Sampling Type | Monitoring Months |
| 50092 - Mercury, Total (Low Level) - ng/l | - | - | - | - | - | - | - | 1/2 months | Grab | Bimonthly - Even |

Notes for Station Number 3IB00002601:

a. Mercury - See Part II, Items J, K, and L. Samples for mercury at this station shall be collected one detention time before samples collected for Outfall 3IB00002002.

b. Bimonthly even samples shall be taken in February, April, June, August, October and December.

Part I, A. - FINAL EFFLUENT LIMITATIONS AND MONITORING REQUIREMENTS

5. During the period beginning on the effective date of this permit and lasting until the expiration date, the permittee is authorized to discharge in accordance with the following limitations and monitoring requirements from outfall 3IB00002604. See Part II, OTHER REQUIREMENTS, for locations of effluent sampling.

Table - Internal Monitoring Station - 604 - Final

| Effluent Characteristic | Discharge Limitations | | | | | | | Monitoring Requirements | | |
|---|---|---|---|---|---|---|---|---|---|---|
| | Concentration Specified Units | | | | Loading* kg/day | | | | | |
| Parameter | Maximum | Minimum | Weekly | Monthly | Daily | Weekly | Monthly | Measuring Frequency | Sampling Type | Monitoring Months |
| 00400 - pH - S.U. | - | - | - | - | - | - | - | 1/Month | Grab | All |
| 00530 - Total Suspended Solids - mg/l | 100 | - | - | 30 | - | - | - | 1/Month | Grab | All |
| 00550 - Oil and Grease, Total - mg/l | 20 | - | - | 15 | - | - | - | 1/Month | Grab | All |
| 50050 - Flow Rate - MGD | - | - | - | - | - | - | - | 1/Day | 24hr Total Estimate | All |

Notes for Station Number 3IB00002604:

a. Flowrate monitoring is required daily when discharging boiler blowdown water. If no boiler blowdown water is discharged during the month, eDMR users should select the "No Discharge" check box on the data entry form. Pin the eDMR. If there is at least one discharge during the month, report "AH" for flow rate for each day when there is no discharge.

b. Samples taken in compliance with monitoring requirements specified above shall be taken at Sampling Stations described in Part II, Other Requirements.

Part I, A. - FINAL EFFLUENT LIMITATIONS AND MONITORING REQUIREMENTS

6. During the period beginning on the effective date of this permit and lasting until the expiration date, the permittee is authorized to discharge in accordance with the following limitations and monitoring requirements from outfall 3IB00002610. See Part II, OTHER REQUIREMENTS, for locations of effluent sampling.

Table - Internal Monitoring Station - 610 - Final

| Effluent Characteristic | Discharge Limitations | | | | | | | Monitoring Requirements | | |
|---|---|---|---|---|---|---|---|---|---|---|
| | Concentration Specified Units | | | | Loading* kg/day | | | | | |
| Parameter | Maximum | Minimum | Weekly | Monthly | Daily | Weekly | Monthly | Measuring Frequency | Sampling Type | Monitoring Months |
| 00400 - pH - S.U. | - | - | - | - | - | - | - | 1/Week | Grab | All |
| 00530 - Total Suspended Solids - mg/l | 50 | - | - | - | - | - | - | 1/Week | 24hr Composite | All |
| 50050 - Flow Rate - MGD | - | - | - | - | - | - | - | 1/Day | 24hr Total | All |

Notes for Station Number 3IB00002610:

a. This facility is designed, constructed and operated to treat a volume of coal pile runoff associated with a 10-year, 24-hour rainfall event. Any untreated overflow from this facility resulting from a rainfall event greater than a 10-year, 24-hour storm shall not be subject to the above effluent limitations.

b. Samples taken in compliance with monitoring requirements specified above shall be taken at Sampling Stations described in Part II, Other Requirements.

c. Sampling shall be performed when discharging. If no discharge occurs during the entire month, eDMR users should select the "No Discharge" check box on the data entry form. Pin the eDMR.

Part I, A. - FINAL EFFLUENT LIMITATIONS AND MONITORING REQUIREMENTS

7. During the period beginning on the effective date of this permit and lasting until the expiration date, the permittee is authorized to discharge in accordance with the following limitations and monitoring requirements from outfall 3IB00002610. See Part II, OTHER REQUIREMENTS, for locations of effluent sampling.

Table - Internal Monitoring Station - 612 - Final

| Effluent Characteristic | Discharge Limitations | | | | | | | Monitoring Requirements | | |
|---|---|---|---|---|---|---|---|---|---|---|
| | Concentration Specified Units | | | | Loading* kg/day | | | | | |
| Parameter | Maximum | Minimum | Weekly | Monthly | Daily | Weekly | Monthly | Measuring Frequency | Sampling Type | Monitoring Months |
| 00550 - Oil and Grease, Total - mg/l | - | - | - | - | - | - | - | 1/Month | Grab | All |
| 50050 - Flow Rate - MGD | - | - | - | - | - | - | - | 1/Month | 24hr Total | All |

Notes for Station Number 3IB00002612:

a. Samples taken in compliance with monitoring requirements specified above shall be taken at Sampling Stations described in Part II, Other Requirements.

b. Sampling shall be performed when discharging. If no discharge occurs during the entire month, eDMR users should select the "No Discharge" check box on the data entry form. Pin the eDMR.

Part I, B. - INTAKE MONITORING REQUIREMENTS

1. Intake Monitoring. During the period beginning on the effective date of this permit and lasting until the expiration date, the permittee shall monitor the Intake at Station Number 3IB00002800, and report to the Ohio EPA in accordance with the following table. See Part II, OTHER REQUIREMENTS, for location of sampling.

Table - Intake Monitoring - 800 - Final

| Effluent Characteristic | Discharge Limitations | | | | | | | Monitoring Requirements | | |
|---|---|---|---|---|---|---|---|---|---|---|
| | Concentration Specified Units | | | | Loading* kg/day | | | | | |
| Parameter | Maximum | Minimum | Weekly | Monthly | Daily | Weekly | Monthly | Measuring Frequency | Sampling Type | Monitoring Months |
| 00011 - Water Temperature - F | - | - | - | - | - | - | - | 1/Day | Continuous | All |

Notes for Station Number 3IB00002800:

a. Samples taken in compliance with monitoring requirements specified above shall be taken at Sampling Stations described in Part II, Other Requirements.

b. Water temperature requires intake (3IB00002800) monitoring for outfall 3IB00002001. Report intake/outfall temperature estimated to correspond to a maximum temperature differential sustained for one hour.

Part I,C. Schedule of Compliance

1. Section 316(b) Compliance

Under Section 316(b) of the federal CWA, cooling water intake structures (CWISs) are required to use best technology available (BTA) to minimize adverse environmental impact resulting from the operation of the intake. The permittee is considered an existing source under 40 CFR 125.9, Subpart J - "Requirements Applicable to Cooling Water Intake Structures for Existing Facilities Under Section 316(b) of the Clean Water Act." New rules for CWISs were promulgated on October 14, 2014.

a. The permittee shall submit all of the following information to the Ohio EPA, Central Office no later than February 1, 2020 (Event Code 21599):

i. Source water physical data as detailed in 40 CFR 122.21(r)(2).

ii. Cooling water intake structure data as detailed in 40 CFR 122.21(r)(3).

iii. Source water baseline biological characterization data as detailed in 40 CFR 122.21(r)(4).

iv. Cooling water system data as detailed in 40 CFR 122.21(r)(5).

v. Impingement mortality reduction as detailed in BTA (r)(6). The compliance methods can be found in 40 CFR 125.94(c). If compliance options 125.94(c)(5) or (c)(6) are chosen, then an impingement technology performance optimization study is required as described in 122.21(r)(6)(i) and 122.21(r)(6)(ii), respectively.

vi. Entrainment performance studies as detailed in 40 CFR 122.21(r)(7)

vii. Operational status as detailed in 40 CFR 122.21(r)(8).

b. The permittee shall submit the following information related to the entrainment characterization study to the Ohio EPA, Central Office:

i. A status report on the entrainment study shall be submitted no later than February 1, 2018. (Event Code 95999)

ii. A status report on the entrainment study shall be submitted no later than February 1, 2019. (Event Code 95999)

c. The following submittals will require Peer Review, as detailed in 40 CFR 122.21(r)(13), prior to submittal no later than February 1, 2020. The list and qualifications of the proposed peer reviewers must be submitted to Ohio EPA, Central Office, as soon as possible. The peer reviewers must be approved by the Director. This approval process may require additional time and information.

i. The results of the entrainment characterization study as detailed in 40 CFR 122.21(r)(9). (Event Code 21599).

ii. Comprehensive technical feasibility and cost evaluation study as detailed in 40 CFR 122.21(r)(10). (Event Code 21599).

iii. Benefits valuation study as detailed in 40 CFR 122.21(r)(11). (Event Code 21599).

iv. Non-water quality and other environmental impacts study as detailed in 40 CFR 122.21(r)(12). (Event Code 21599).

d. This permit may be modified if new federal rules are promulgated prior to the submittal of this information at the next permit renewal.

e. Nothing in this permit authorizes take for the purposes of a facility's compliance with the Endangered Species Act.

2. Interim Compliance with 316(b)

The permittee shall determine the feasibility of reducing station withdrawal further during periods when the station is offline. Reducing withdrawal lessens the amount of impingement and entrainment. The facility shall implement the improvements where feasible considering economics and potential interference with the final BTA determination. If the final BTA determination does not incorporate flow reductions during periods when the station is offline, the permittee will not be required to continue the practice.

The permittee shall submit a report on the findings and feasibility of the interim BTA proposal with a proposed implementation schedule, if applicable, within 12 Months of the effective date of the permit. (Event Code 21599)

Part II, OTHER REQUIREMENTS

A. Description of the location of the required sampling stations are as follows:

| Sampling Station | Description of Location |
|---|---|
| 3IB00002001 | Condenser cooling water and boiler blowdown representative of station 3IB00002604. At combined discharge into discharge channel to Lake Erie. (Lat: 41 N 30 ' 15 "; Long: 82 W 03 ' 00 ") |
| 3IB00002002 | Combined wastewater treatment system at discharge from filters prior to Lake Erie, includes 3IB00002610 and 3IB00002611. (Lat: 41N 30 ' 30"; Long: 82 W 03 ' 00 ") |
| 3IB00002004 | Low volume wastewater treatment system. At discharge of low volume wastewater system prior to Lake Erie. (Lat: 41 N 30 ' 30 "; Long: 82 W 03 ' 00 ") |
| 3IB00002601 | Internal monitoring station to combined wastewater treatment system. |
| 3IB00002604 | Boiler blowdown water. At points representative of boiler blowdown. |
| 3IB00002610 | Coal pile runoff treatment system prior to discharge to combined treatment basin (outfall 3IB00002002). |
| 3IB00002612 | At the discharge of Unit # 9 heat exchanger non-contact cooling water prior to entering outfall 3IB00002001. |
| 3IB00002800 | Intake water at inlet to plant from Lake Erie. |

B. This permit shall be modified, or alternatively, revoked and reissued, to comply with any applicable effluent standard or limitation issued or approved under Sections 301, 304 or 307 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.

The permit as modified or reissued under this paragraph shall also contain any other requirements of the Act then applicable.

C. Water quality based permit limitations in this permit may be revised based on updated wasteload allocations or use designation rules. This permit may be modified, or revoked and reissued, to include new water quality based effluent limits or other conditions that are necessary to comply with a revised wasteload allocation, or an approved total maximum daily loads (TMDL) report as required under Section 303 (d) of the Clean Water Act.

D. In the event that the permittee's operation requires the use of cooling or boiler water treatment additives that are discharged to surface waters of the state, written permission must be obtained from the director of the Ohio EPA prior to use. Discharges of these additives must meet Ohio Water Quality Standards and shall not be harmful or inimical to aquatic life. Reporting and testing requirements to apply for permission to use additives can be obtained from the Ohio EPA, Central Office, Division of Surface Water, NPDES Permit Unit. This information is also available on the DSW website:

http://www.epa.ohio.gov/portals/35/policy/01_22u2.pdf .

E. Best Management Plan: Bottom Ash Transport System

The Avon Lake ash recycle system shall be operated in a manner consistent with the following:

1. The permittee will maintain in good working order and operate as efficiently as possible the bottom ash transport recycle system installed and used at the Avon Lake Generating Station. The bottom ash transport recycle system shall be operated to minimize the overflow of the ash recycle tank and prevent the solids overload of the combined wastewater treatment system filters, except as provided in the paragraph of Part III, General Conditions, entitled, "UNAUTHORIZED DISCHARGE"

2. Bypasses or shutdown of the bottom ash transport recycle system in excess of 48 hours duration when the unit is operating shall be reported as specified in the paragraph of Part III, General Conditions, entitled "UNAUTHORIZED DISCHARGE"

3. All bypasses or shutdowns of the bottom ash transport recycle system that result in overflow of the combined wastewater treatment basin or the low volume wastewater treatment basin shall be reported as per the paragraph of Part III, General Conditions, entitled, "UNAUTHORIZED DISCHARGE".

4. All bypasses or shutdowns of the bottom ash transport recycle system that result in noncompliance with effluent limitations of Part I shall be reported as per the paragraph of Part III, General Conditions, entitled, "NONCOMPLIANCE NOTIFICATION".

F. There shall not be a discharge of any polychlorinated biphenyl compounds attributable to the permittee's operations.

G. The parameters below have had effluent limitations established that are below the Ohio EPA Quantification Level (OEPA QL) for the 40 CFR 136 promulgated analytical procedure for those parameters. In accordance with the ORC Section 6111.13 and OAC Rule 3745-33-07(C), if a discharge limit is set below the OEPA QL, any analytical result reported less than the OEPA QL shall be considered to be in compliance with that limit. OEPA QLs may be expressed as Practical Quantification Levels (PQL) or Minimum Levels (ML).

The permittee must utilize the lowest available detection method currently approved under 40 CFR Part 136 for monitoring these parameters.

REPORTING:

All analytical results, even those below the OEPA QL (listed below), shall be reported. Analytical results are to be reported as follows:

1. Results above the QL: Report the analytical result for the parameter of concern.

2. Results above the MDL, but below the QL: Report the analytical result, even though it is below the QL.

3. Results below the MDL: Analytical results below the method detection limit shall be reported as "below detection" using the reporting code "AA".

The following table of quantification levels will be used to determine compliance with NPDES permit limits:

| Parameter | PQL | ML |
|---|---|---|
| Chlorine, Total Residual | 0.050 mg/l | -- |
| Total Residual Oxidants | 0.050 mg/l | -- |

This permit may be modified, or alternatively, revoked and reissued, to include more stringent effluent limits or conditions if information generated as a result of the conditions of this permit indicate the presence of these pollutants in the discharge at levels above the water quality based effluent limit (WQBEL).

H. Analytical Detection Levels

The permittee shall use analytical procedures approved under 40 CFR 136 with MDL (method detection levels) less than or equal to one-third of the most stringent applicable waste load allocations for each parameter.

I. All parameters, except flow, need not be monitored on days when the plant is not normally staffed (Saturdays, Sundays, and holidays). On those days, report "AN" on the monthly report form.

J. General Mercury Variance

The permittee is granted a general mercury variance under the provisions of Rule 3745-33-07(D)(10) of the Ohio Administrative Code. The permittee has demonstrated that the facility is currently unable to comply with the monthly average water quality based effluent limit of 1.3 ng/l without construction of expensive end-of-pipe controls more stringent than those required by sections 301(b) and 306 of the Clean Water Act. The NRG Avon Lake Generating Station is currently able to achieve an annual average mercury concentration of 12 ng/l. For general mercury variance purposes, the annual average mercury effluent concentration is defined as the average of the most recent 12 months of effluent data.

One of the conditions of the general mercury variance is that the permittee make reasonable progress towards attaining the water quality based effluent limits for mercury (1.b, below). To accomplish this, the permittee is required to continue implementing a pollutant minimization program (PMP) for mercury. The elements of a PMP include: a control strategy to locate, identify and, where cost-effective, reduce levels of mercury that contribute to discharge levels; periodic monitoring of sources and the treatment system; and annual reporting of results.

The plan of study that was part of the permittee's 2011 application for coverage under the general mercury variance included items associated with developing a control strategy and initial implementation of a PMP. By implementing the plan of study and meeting other conditions of its NPDES permit, the permittee has been taking actions consistent with a PMP for mercury. Condition 1.d below, requires the permittee to continue implementing a PMP for mercury.

1. As conditions of this variance, the permittee shall meet the following requirements:

a. The permittee shall comply with the effluent limitations for mercury at outfall 3IB00002002 given in Part I, A. of this permit.

b. The permittee shall make reasonable progress towards attaining the monthly average water quality-based effluent limit for mercury by complying with the general mercury variance conditions included in this NPDES permit.

c. The permittee shall use EPA Method 1631 to comply with the influent and effluent mercury monitoring requirements of this permit.

d. The permittee shall continue implementing a PMP for mercury consistent with the plan of study included in the permittee's mercury variance application effective on August 1, 2011 and any other relevant information submitted by the permittee, including the following activities:

i. Continued evaluation of fuel options.
ii. Conducting extensive cleaning from the two existing Combined Wastewater Treatment Basins.
iii. Performing additional maintenance and modifications to the bottom ash hydrobins, ash recycle system and adjacent areas to eliminate wastewater containing significant quantities of ash from discharging to the basins.

e. The permittee shall assess the impact of the mercury variance on public health, safety, and welfare by, as a minimum, monitoring for mercury in the facility's influent and effluent as required by this NPDES permit.

f. The permittee shall maintain an annual average mercury effluent concentration equal to or less than 12 ng/l.

g. On or prior to March 1 of each year, the permittee shall submit two copies of an annual PMP report to Ohio EPA, Division of Surface Water, NPDES Permit Unit, P.O. Box 1049, Columbus, OH, 43216-1049. The annual PMP report shall include:

i. All minimization program monitoring results for the year

ii. A list of potential sources of mercury

iii. A summary of all actions taken to meet the effluent limits for mercury

iv. Any updates of the control strategy, including actions planned to reduce the levels of mercury in the treatment plant's final effluent

The Ohio EPA Annual Mercury PMP Report and Appendices are available on the Division of Surface Water Permits Program Technical Assistance web page at http://www.epa.ohio.gov/dsw/permits/technical_assistance.aspx . Open the Mercury list.

h. Upon completion of the actions identified in the plan of study as required in Part II, Item J.1.d. of this permit or upon submittal of the permittee's NPDES permit renewal application, whichever comes first, the permittee shall submit to Ohio EPA's Northeast District Office a certification stating that all permit conditions imposed to implement the plan of study and the PMP have been satisfied and whether compliance with the monthly average water quality based effluent limit for mercury has been achieved and can be maintained. This certification shall be accompanied by the following:

i. All available mercury influent and effluent data for the most recent 12-month period.

ii. Data documenting all known significant sources of mercury and the steps that have been taken to reduce or eliminate those sources; and

iii. A determination of the lowest mercury concentration that currently available data indicate can be reliably achieved through implementation of the PMP.

2. Exceedance of the annual average limit of 12 ng/l.

a. If at any time after the effective date of this permit, the permittee's annual average mercury effluent concentration exceeds 12 ng/l, the permittee shall:

i. Notify Ohio EPA's Northeast District Office not later than 30 days from the date of the exceedance.

ii. Submit an individual variance application, if a variance is desired, not later than 6 months from the date of the exceedance; or

iii. Request a permit modification not later than 6 months from the date of the exceedance for a compliance schedule to attain compliance with the water quality-based effluent limits for mercury.

b. If the permittee complies with either 2.a.ii or 2.a.iii, above, the general mercury variance conditions included in this NPDES permit will remain in effect until the date that the Director acts on the individual variance application or the date that the permit modification becomes effective.

c. If the permittee does not comply with either 2.a.ii or 2.a.iii, above, a monthly water-quality based effluent limit for mercury of 1.3 ng/l shall apply at outfall 3IB00002002 beginning 6 months from the date of the exceedance.

3. The requirements of Part II, Item J.2 shall not apply if the permittee demonstrates to the satisfaction of the Director that the mercury concentration in the permittee's effluent exceeds 12 ng/l due primarily to the presence of mercury in the permittee's intake water.

K. Permit Reopener for Mercury Variance Revisions

Ohio EPA may reopen and modify this permit at any time based upon Ohio EPA water quality standard revisions to the mercury variance granted in Part II, Item J of this permit.

L. Renewal of Mercury Variance

For renewal of the mercury variance authorized in this permit, the permittee shall include the following information with the submittal of the subsequent NPDES permit renewal application:

1. the certification described under Part II, Item J.1.h., and all information required under Part II, Item J.1.h.i. through Part II, Item J.1.h.iii;

2. a status report on the progress being made implementing the pollutant minimization program (PMP). This information may be included in the annual PMP report required under Part II, Item J.1.g;

3. a listing of the strategies and/or programs in the PMP which will be continued under the next renewal of this permit; and

4. a statement requesting the renewal of the mercury variance.

M. Outfall Signage

The permittee shall maintain a permanent marker on the shoreline at each outfall that is regulated under this NPDES permit. If a marker does not currently exist, the permittee shall install one within 4 months of the effective date of this permit. This includes final outfalls and bypasses. The marker shall consist at a minimum of the name of the establishment to which the permit was issued, the Ohio EPA permit number, and the outfall number and a contact telephone 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 ground level. The sign shall not be obstructed such that persons in boats or persons swimming on the river or someone fishing or walking along the shore cannot read the sign. Vegetation shall be periodically removed to keep the sign visible. If the outfall is normally submerged the sign shall indicate that. When an existing marker is replaced or reset, the new marker shall comply with the requirements of this section.

N. Notification to Public Water Supply Operators.

1. As required by the Ohio Administrative Code 3745-33-08(F), permits for facilities designated by the director as major discharges, in the following locations, shall require the permittee to notify the public water supply operator as soon as practicable after a discharge begins that results from a spill, separate sewer overflow, bypass, upset, or combined sewer overflow that reaches waters of the state:

a. Discharges within three thousand feet of a public water supply intake located in a lake; or

b. Discharges within ten stream miles upstream of a public water supply intake located in a reservoir or any other surface water of the state.

2. Public water supply operators meeting the criteria in Part II, Item M.1 above for the NRG Avon Lake Generating Station are:

City of Avon Lake Public Water Supply
Avon Lake Municipal Utilities
201 Miller Road
Avon Lake, Ohio 44012

3. Within 6 months of the effective date of this permit, the permittee shall develop notification procedures between the wastewater system operator and public water supply operator[s] listed above in Part II, Item M.2 that defines the specific notification requirements to the public water supply operator and what constitutes notification "as soon as practicable".

O. Steam Electric Effluent Limitation Guideline - Bottom Ash Transport Water

NRG Avon Lake shall, as soon as possible but no later than December 31, 2023, comply with the Steam Electric Generating Power Generating Effluent Guidelines (ELGs) for bottom ash transport water as required by 40 CFR 423.

The permittee shall notify Ohio EPA within 14 days of compliance of the ELG.

If the Steam Electric Power Generating Effluent Guidelines compliance dates or requirements for pollutants in bottom ash transport water are further delayed or modified, the permittee shall comply with the ELGs as soon as possible, but no later than the timeline established in 40 CFR 423.

**LORAIN COUNTY**

The following matters are the subject of this public notice by the Ohio Environmental Protection Agency. The complete public notice, including any additional instructions for submitting comments, requesting information, a public hearing, or filing an appeal may be obtained at: http://www.epa.ohio.gov/actions.aspx or Hearing Clerk, Ohio EPA, 50 W. Town St. P.O. Box 1049, Columbus, Ohio 43216. Ph: 614-644-3037 email: HClerk@epa.ohio.gov

Draft NPDES Permit Renewal - Subject to Revision

NRG Power Midwest LP - Avon Lake Power Plant
33570 Lake Rd, Avon Lake, OH 44012
Facility Description: Power Plant
Receiving Water: Lake Erie
ID #: 3IB00002
Date of Action: 02/15/2018
A public hearing has been requested for the draft NPDES permit 3IB00002 NRG Power Midwest LP-Avon Lake Generating Station, public noticed on December 6, 2017 (Public Notice Date 17-12-007). A public hearing will be held on April 25, 2018 at 6:00 PM at the Avon Lake Public Library, Waugaman Gallery, 32649 Electric Boulevard, Avon Lake, OH 44012. The hearing will end when everyone in attendance has had an opportunity to provide comments. Submit all comments to Ohio EPA-DSW, Attn: Permits Processing Unit, PO Box 1049, Columbus, OH 43216-1049 or by email to: epa.dswcomments@epa.ohio.gov. Comments will be received until 5 pm on May 2, 2018. Comments will also be received during the scheduled public hearing.

**WEEKLY REVIEW - FEBRUARY 12, 2018**
**DOCUMENTS RECEIVED OR PREPARED DURING PREVIOUS WEEK**

**LORAIN**

Draft NPDES Permit Renewal - Subject to Revision

NRG Power Midwest LP - Avon Lake Power Plant
33570 Lake Rd, Avon Lake, OH 44012
Facility Description: Power Plant
Receiving Water: Lake Erie
ID #: 3IB00002
Date of Action: 02/15/2018
A public hearing has been requested for the draft NPDES permit 3IB00002 NRG Power Midwest LP-Avon Lake Generating Station, public noticed on December 6, 2017 (Public Notice Date 17-12-007). A public hearing will be held on April 25, 2018 at 6:00 PM at the Avon Lake Public Library, Waugaman Gallery, 32649 Electric Boulevard, Avon Lake, OH 44012. The hearing will end when everyone in attendance has had an opportunity to provide comments. Submit all comments to Ohio EPA-DSW, Attn: Permits Processing Unit, PO Box 1049, Columbus, OH 43216-1049 or by email to: epa.dswcomments@epa.ohio.gov. Comments will be received until 5 pm on May 2, 2018. Comments will also be received during the scheduled public hearing.

LORAIN CO COMMISSIONERS
226 MIDDLE AVE
ELYRIA, OH 44035-5641

LORAIN CO GENERAL HEALTH DISTRICT
9880 S MURRAY RIDGE RD
ELYRIA, OH 44035

LORAIN CO METRO PARKS
12882 DIAGONAL RD
LAGRANGE, OH 44050
Attn: JAMES D. MARTIN

CITY OF AMHERST
206 S MAIN ST
AMHERST, OH 44001-2195
Attn: MAYOR

CITY OF AVON
36080 CHESTER RD
AVON, OH 44011-1099
Attn: MAYOR

CITY OF AVON LAKE
150 AVON BELDEN RD
AVON LAKE, OH 44012
Attn: MAYOR

CITY OF ELYRIA
328 BROAD ST
ELYRIA, OH 44035
Attn: MAYOR

CITY OF LORAIN
200 W ERIE AVE
LORAIN, OH 44052
Attn: MAYOR

CITY OF NORTH RIDGEVILLE
7307 AVON BELDEN RD
NORTH RIDGEVILLE, OH 44039
Attn: MAYOR

CITY OF OBERLIN
S MAIN ST
BERLIN, OH 44074
Attn: MAYOR

CITY OF SHEFFIELD LAKE
609 HARRIS RD
SHEFFIELD LAKE, OH 44054
Attn: MAYOR

CITY OF VERMILION
5511 LIBERTY AVE
VERMILION, OH 44089
Attn: MAYOR

VILLAGE OF GRAFTON
960 MAIN ST
GRAFTON, OH 44044
Attn: MAYOR

VILLAGE OF KIPTON
299 STATE ST PO BOX 177
KIPTON, OH 44049
Attn: MAYOR

VILLAGE OF LAGRANGE
355 S CENTER ST PO BOX 597
LAGRANGE, OH 44050-0597
Attn: MAYOR

VILLAGE OF ROCHESTER
113 GRIGGS RD
WELLINGTON, OH 44090
Attn: MAYOR

VILLAGE OF SHEFFIELD
4340 COLORADO AVE
ELYRIA, OH 44054
Attn: MAYOR

VILLAGE OF SOUTH AMHERST
103 W MAIN ST
SOUTH AMHERST, OH 44001
Attn: MAYOR

LLAGE OF WELLINGTON
5 WILLARD MEMORIAL SQ
WELLINGTON, OH 44090
Attn: MAYOR

AVON LAKE GENERATING STATION
33570 LAKE ROAD
AVON LAKE, OH 44012
Attn: SCOTT CAMERON, ENV SPECIALIST

## Peterson, Katrina

**From:** Peelle, Darla
**Sent:** Tuesday, February 06, 2018 4:21 PM
**To:** Miller, Cole; Dejanovic, Zorica
**Cc:** Blasick, Richard; Moore, Steven; McCarron, Mary; Pierce, Dina; Lee, James; Peterson, Katrina
**Subject:** Change in NRG Power Midwest hearing TYPE

**Importance:** High

Greetings everyone –

Please pardon the interruption – again. There was a communications mix-up about the type of hearing being requested, which all of us, other than Katrina (thank goodness) missed. Thanks, Katrina! This hearing will not be for a water quality certification, but is an NPDES permit. All other information is correct.

The following hearing has been scheduled:

NRG, Power Midwest, LP **NPDES** Hearing
April 25, 6 p.m.
Avon Lake Public Library, Waugaman Gallery
32649 Electric Blvd.
Avon Lake, OH 44012
Holmes County

Cole: I have reserved a car for the two of us. We should be on the road no later than 1:30 p.m. Please let me know if anyone else from Columbus plans to attend.

Cole and Z: Mary McCarron must review your PowerPoint presentations at least two weeks prior to the hearing, so it should be submitted no later than April 11. Thanks! I also want to make note that the library has a laptop, screen and projector. You need only bring the presentation on a jump drive.

Katrina: Please send a copy of the final public notice to Dina Pierce and me as an FYI. Thanks!

teven: The Citizen Advisory for this hearing should go out no later than April 11. Thanks!

If anyone has questions, please contact me asap. My direct line is (614) 728-0035.

---

**From:** Peelle, Darla
**Sent:** Tuesday, February 6, 2018 11:52 AM
**To:** Miller, Cole <Cole.Miller@epa.ohio.gov>; Dejanovic, Zorica <Zorica.Dejanovic@epa.ohio.gov>
**Cc:** Blasick, Richard <Richard.Blasick@epa.ohio.gov>; Moore, Steven <Steven.Moore@epa.ohio.gov>; McCarron, Mary <Mary.McCarron@epa.ohio.gov>; Pierce, Dina <Dina.Pierce@epa.ohio.gov>; Lee, James <James.Lee@epa.ohio.gov>; Peterson, Katrina <katrina.peterson@epa.ohio.gov>
**Subject:** NRG Power Midwest, LP 401 Hearing Scheduled

Greetings everyone –

The following hearing has been scheduled:

NRG, Power Midwest, LP 401 Hearing
April 25, 6 p.m.
Avon Lake Public Library, Waugaman Gallery

32649 Electric Blvd.
Avon Lake, OH 44012
Holmes County

Cole: I have reserved a car for the two of us. We should be on the road no later than 1:30 p.m. Please let me know if anyone else from Columbus plans to attend.

Cole and Z: Mary McCarron must review your PowerPoint presentations at least two weeks prior to the hearing, so it should be submitted no later than April 11. Thanks! I also want to make note that the library has a laptop, screen and projector. You need only bring the presentation on a jump drive.

Katrina: Please send a copy of the final public notice to Dina Pierce and me as an FYI. Thanks!

Steven: The Citizen Advisory for this hearing should go out no later than April 11. Thanks!

If anyone has questions, please contact me asap. My direct line is (614) 728-0035.

Regards,

*Darla*

Darla L. Peelle
**Ohio EPA** | Public Involvement Coordinator
Northeast District Office
Phone: (614) 644-2160
Fax: (614) 644-3727
www.epa.ohio.gov

Ohio Environmental Protection Agency

## Peterson, Katrina

**From:** Miller, Cole
**Sent:** Monday, December 18, 2017 10:48 AM
**To:** Peterson, Katrina
**Subject:** PN Extension 3IB00002

Hi Trina,

Please extend the comment period two weeks from Jan. 5 to Jan 19 for 3IB00002. If there's no process to extend, then this is just FYI.

Thanks!

Cole

NRG Power Midwest LP
Avon Lake Generating Station
33570 Lake Road
Avon Lake, OH 44012

*VIA TRACKED DELIVERY AND EMAIL*

December 18, 2017

Ohio Environmental Protection Agency
Central Office
Division of Surface Water
Lazarus Government Center
Permits Processing Unit
50 West Town Street, Suite 700
P.O. Box 1049
Columbus, OH 43216-1049

Ohio Environmental Protection Agency
Northeast District Office
2110 East Aurora Road
Twinsburg, OH 44087

OHIO EPA - DSW
2017 DEC 20 AM 10:12

**Draft Authorization to Discharge**
**Public Notice No. OEPA 17-12-007 DFT**
**Ohio EPA Permit No.: 3IB00002*LD**
**NRG Power Midwest LP**
**Avon Lake Generating Station**
**Draft Permit Comments**

Attention: Division of Surface Water Permits and Compliance Section

Based on our review of the draft authorization to discharge under the National Pollutant Discharge Elimination System (NPDES) Ohio EPA Permit No. 3IB00002*LD public noticed on December 6, 2017, NRG Power Midwest LP, as a wholly owned subsidiary of GenOn Energy, Inc., which is itself a wholly owned subsidiary of NRG Energy, Inc., submits the following comments on the above Avon Lake Generating Station (Avon Lake) Draft NPDES Permit.

**Page 15, Part II, Other Requirements, A. Description of the Location of the Required Sampling Stations, Final Outfall 002 Description.**
Since Internal Monitoring Station 3IB00002611 is proposed to be removed from the final permit, Avon Lake requests reference to 3IB00002611 be deleted from the Outfall 002 location description.

**Page 22, Part II, Other Requirements, N.2. And N. 3. Notification to Public Water Supply Operators.**
Avon Lake requests reference to Part II, Items M.1 and M.2 be revised to reference the relevant conditions in Part II, Items **N.1.** and **N.2.** This addresses a minor reformatting issue.

**Page 13, Part I,C. Schedule of Compliance, 1.c. 316(b) Submittals Requiring Peer Review, i. The Results of the Entrainment Characterization Study as detailed in 40 CFR 122.21(r)(9). (Event Code 21599).**

Peer Review of the Entrainment Characterization Study is not required by the 316(b) Federal CWA rule (preamble 48361 [bottom]) because it is "implicitly reviewed via its use in (r)(10) and (r)(11)." It is also not included under the rule at 122.21(r)(13). Avon Lake respectfully requests this specific condition be deleted and the Part I,C.1c. be renumbered accordingly.

Avon Lake appreciates the proactive opportunity to provide draft permit preview comments and OEPA's reasonable responses to said comments. Additionally Avon Lake acknowledges and values the ongoing dialogue offered by OEPA throughout the permit renewal process as well as the general timely responsiveness to routine inquiries and requests for permit determinations/ applications from both the Northeast District and Central Offices.

Should you have any questions or require additional information regarding the above comments, please contact Nate Rozic directly at (724) 554-6208 or via email at Nathan.Rozic@nrg.com.

Respectfully submitted,

Daniel A. Rogatto
Plant Manager

cc: Ms. Zorica Dejanovic, OEPA-NEDO (via email)
Mr. Cole Miller, OEPA-DSW (via email)
Scott Cameron, Avon Lake Generating Station
Nathan Rozic, GenOn Power Midwest LP

Ohio Environmental Protection Agency

John R. Kasich, Governor
Mary Taylor, Lt. Governor
Craig W. Butler, Director

November 29, 2017

RE: Ohio EPA Permit No.: 3IB00002*LD
Facility Name: NRG Avon Lake Generation Station

NRG Power Midwest LP
121 Champion Way, Suite 300
Canonsburg, PA 44012

Ladies and Gentlemen:

Transmitted herewith is one copy of the public notice, draft permit, and fact sheet if major permit in the above referenced matter.

The public has been invited to submit comments regarding this draft permit. If sufficient public interest is indicated, a public meeting will be held.

The permit as drafted will be issued as a final action unless the director revises the permit after consideration of all written comments received during the 30-day period following public notice and consideration of the record of a public meeting, if one is held, or unless the draft is disapproved by the Regional Administrator, U.S. Environmental Protection Agency.

You should note that a general condition of your permit states that issuance of a NPDES permit does not relieve you of the duty of complying with all applicable federal, state, and local laws, ordinances, and regulations.

Sincerely,

Kevin J. Fowler, Supervisor
Permit Processing Unit
Division of Surface Water

9489 0090 0027 6024 1786 08

KJF/dks

Enclosure

CERTIFIED MAIL

Ohio Environmental Protection Agency

**John R. Kasich**, Governor
**Mary Taylor**, Lt. Governor
**Craig W. Butler**, Director

November 29, 2017

Re: Public Notice No.: 17-12-007

Mayor and Council
Village of Avon Lake
150 Avon Belden Rd
Avon Lake, OH 44012

Ladies and Gentlemen:

Enclosed is one copy of the Public Notice referenced above regarding National Pollutant Discharge Elimination System (NPDES) permits or modifications. This notice is being advertised in a newspaper of general circulation in the county, and is being provided to certain public officials and the regulated entity.

In order to provide further public notice, we will appreciate your assistance in posting this notice in a conspicuous location for a thirty-day period starting on the date of Public Notice.

Thank you for your cooperation in this matter.

Sincerely,

Kevin J. Fowler, Supervisor
Permit Processing Unit
Division of Surface Water

KJF/dks

Enclosure

47/NE

Application No.: OH0001112
Ohio EPA Permit No.: 3IB00002*LD

## National Pollutant Discharge Elimination System (NPDES) Permit Program

## PUBLIC NOTICE

## NPDES Permit to Discharge to State Waters

Ohio Environmental Protection Agency
Permits Section
50 West Town St., Suite 700
P. O. Box 1049
Columbus, Ohio 43216-1049
(614) 644-2001

| | |
|---|---|
| Public Notice No. | OEPA 17-12-007 DFT |
| Date of Issue of Public Notice: | Dec-06-2017 |
| Name and Address of Applicant: | NRG Power Midwest LP, 121 Champion Way, Suite 300, Canonsburg, PA, 15317 |
| Name and Address of Facility Where Discharge Occurs: | NRG Avon Lake Generation Station, 33570 Lake Road, Avon Lake, OH, 44012 , Lorain County |

Outfall Flow and Location List:

| | | | |
|---|---|---|---|
| 001 | 505000000 GPD | 41 N 30 ' 30" | 82 W 3 ' 28" |
| 002 | 2980000 GPD | 41 N 30 ' 36" | 82 W 3 ' 7" |
| 004 | 946000 GPD | 41 N 30 ' 36" | 82 W 3 ' 4" |

| | |
|---|---|
| Receiving Stream: | Lake Erie |
| Nature of Business: | Electrical power generation plant |
| Key parameters to be limited in the permit are as follows: | pH, Oxidants, Total Residual, Chlorine, Total Residual, Chlorination/Bromination Duration - Minutes, Total Suspended Solids, Oil and Grease, Total, Mercury, Total (Low Level), pH Range Excursion, Maximum Duration - Minutes, pH Range Excursions, >60 Minutes - Number/Day, pH Range Excursions, Monthly Total Duration - Minutes |

On the basis of preliminary staff review and application of standards and regulations, the director of the Ohio Environmental Protection Agency will issue a permit for the discharge subject to certain effluent conditions and special conditions. The draft permit will be issued as a final action unless the director revises the draft after consideration of the record of a public meeting or written comments, or upon disapproval by the administrator of the U.S. Environmental Protection Agency. Any person may submit written comments on the draft permit and administrative record and may request a public hearing. A request for public hearing shall be in writing and shall state the nature of the issues to be raised. In appropriate cases, including cases where there is significant public interest, the director may hold a public hearing on a draft permit or permits prior to final issuance of the permit or permits. Following final action by the director, any aggrieved party has the right to appeal to the Environmental Review Appeals Commission.

Interested persons are invited to submit written comments upon the discharge permit. Comments should be submitted in person or by mail no later than 30 days after the date of this public notice. Comments should be delivered or mailed to both of the following locations: 1) Ohio Environmental Protection Agency, Lazarus Government Center, Division of Surface Water, Permits Processing Unit, 50 West Town St., Suite 700, P.O. Box 1049, Columbus, Ohio 43216-1049 and 2) Ohio Environmental Protection Agency, Northeast District Office 2110 East Aurora Road, Twinsburg, Ohio 44087 .

The Ohio EPA permit number and public notice numbers should appear next to the above address on the envelope and on each page of any submitted comments. All comments received no later than 30 days after the date of this public notice will be considered.

*Proposed Water Quality Based Effluent Limitations* This draft permit contains water quality based effluent limitation(s) (WQBELs). In accordance with Ohio Revised Code Section 6111.03(J)(3), the Director establishes WQBELs after considering, to the extent consistent with the Federal Water Pollution Control Act, evidence relating to the technical feasibility and economic reasonableness of removing the polluting properties from those wastes and to evidence relating to conditions calculated to result from that action and their relation to benefits to the people of the state and to accomplishment of the purposes of this chapter. This determination was made based on data and information available at the time the permit was drafted, which included the contents of the of the timely submitted National Pollutant Discharge Elimination System (NDPES) permit renewal application, along with any and all pertinent information available to the Director.

This public notice hereby allows the permittee to provide to the Director for consideration during this public comment period, additional site-specific pertinent and factual information with respect to the technical feasibility and economic reasonableness for achieving compliance with WQBEL(s). This information shall be submitted to the addresses listed above.

Should the applicant need additional time to review, obtain or develop site-specific pertinent and factual information with respect to the technical feasibility and economic reasonableness of achieving compliance with WQBEL(s), written notification for any additional time shall be sent no later than 30 days after the date of this public notice to the Director at the addresses listed above.

Should the applicant determine that compliance with a WQBEL is technically and/or economically unattainable, the permittee may submit an application for a variance to the applicable WQBEL in accordance with the terms and conditions set forth in Ohio Administrative Code (OAC) Rule 3745-33-07(D) no later than 30 days after the date of this public notice to the addresses listed above.

Alternately, the applicant may propose the development of site-specific water quality standard(s) pursuant to OAC Rule 3745-1-35. The permittee shall submit written notification to the Director regarding their intent to develop site-specific water quality standards for the pollutant at issue to the addresses listed above no later than 30 days after the date of this public notice.

The application, fact sheets, permit including effluent limitations, special conditions, comments received, and other documents are available for inspection and may be copied at a cost of 5 cents per page at the Ohio Environmental Protection Agency at the address shown on page one of this public notice any time between the hours of 8 a.m. and 4:30 p.m., Monday through Friday. Copies of the public notice are available at no charge at the same address. Individual NPDES draft permits that are in public notice are now available on DSW's web site: http://www.epa.ohio.gov/dsw/permits/individuals/draftperm.aspx

Mailing lists are maintained for persons or groups who desire to receive public notice for all applications in the state or for certain geographical areas. Persons or groups may also request copies of fact sheets, applications, or other documents pertaining to specific applications. Persons or groups may have their names put on such a list by making a written request to the agency at the address shown above.

National Pollutant Discharge Elimination System (NPDES) Permit Program

# FACT SHEET

Regarding an NPDES Permit To Discharge to Waters of the State of Ohio
for NRG Power Midwest GP LLC

Public Notice No.: 17-12-007
Public Notice Date: December 6, 2017
Comment Period Ends: January 5, 2018

Ohio EPA Permit No.: 3IB00002*LD
Application No.: OH0001112

Name and Address of Applicant:
**NRG Power Midwest GP LLC**
**33570 Lake Road**
**Avon Lake, Ohio 44012**

Name and Address of Facility Where Discharge Occurs:
**Avon Lake Generating Station**
**33570 Lake Road**
**Avon Lake, Ohio 44012**
**Lorain County**

Receiving Water: Lake Erie

Subsequent Stream Network: Lake Erie

## INTRODUCTION

Development of a Fact Sheet for NPDES permits is mandated by Title 40 of the Code of Federal Regulations (CFR), Section 124.8 and 124.56. This document fulfills the requirements established in those regulations by providing the information necessary to inform the public of actions proposed by the Ohio Environmental Protection Agency (Ohio EPA), as well as the methods by which the public can participate in the process of finalizing those actions.

This Fact Sheet is prepared in order to document the technical basis and risk management decisions that are considered in the determination of water quality based NPDES Permit effluent limitations. The technical basis for the Fact Sheet may consist of evaluations of promulgated effluent guidelines, existing effluent quality, instream biological, chemical and physical conditions, and the relative risk of alternative effluent limitations. This Fact Sheet details the discretionary decision-making process empowered to the Director by the Clean Water Act (CWA) and Ohio Water Pollution Control Law (Ohio Revised Code [ORC] 6111). Decisions to award variances to Water Quality Standards (WQS) or promulgated effluent guidelines for economic or technological reasons will also be justified in the Fact Sheet where necessary.

No antidegradation review was necessary.

Effluent limits based on available treatment technologies are required by Section 301(b) of the CWA. Many of these have already been established by the United States Environmental Protection Agency (U.S. EPA) in the effluent guideline regulations (a.k.a. categorical regulations) for industry categories in 40 CFR Parts 405-499. Technology-based regulations for publicly-owned treatment works are listed in the Secondary Treatment Regulations (40 CFR Part 133). If regulations have not been established for a category of dischargers, the director may establish technology-based limits based on best professional judgment (BPJ).

Ohio EPA reviews the need for water-quality-based limits on a pollutant-by-pollutant basis. Wasteload allocations (WLAs) are used to develop these limits based on the pollutants that have been detected in the

discharge, and the receiving water's assimilative capacity. The assimilative capacity depends on the flow in the water receiving the discharge, and the concentration of the pollutant upstream. The greater the upstream flow, and the lower the upstream concentration, the greater the assimilative capacity is. Assimilative capacity may represent dilution (as in allocations for metals), or it may also incorporate the break-down of pollutants in the receiving water (as in allocations for oxygen-demanding materials).

The need for water-quality-based limits is determined by comparing the WLA for a pollutant to a measure of the effluent quality. The measure of effluent quality is called Projected Effluent Quality (PEQ). This is a statistical measure of the average and maximum effluent values for a pollutant. As with any statistical method, the more data that exists for a given pollutant, the more likely that PEQ will match the actual observed data. If there is a small data set for a given pollutant, the highest measured value is multiplied by a statistical factor to obtain a PEQ; for example if only one sample exists, the factor is 6.2, for two samples - 3.8, for three samples - 3.0. The factors continue to decline as samples sizes increase. These factors are intended to account for effluent variability, but if the pollutant concentrations are fairly constant, these factors may make PEQ appear larger than it would be shown to be if more sample results existed.

## SUMMARY OF PERMIT CONDITIONS

*Outfall 3IB00002001*
The effluent limits and monitoring requirements proposed for the following parameters are the same as in the previous permit, although some monitoring frequencies have changed: temperature, pH, total residual oxidants, flow rate, total residual chlorine, and chlorination/bromination duration.

*Outfall 3IB00002002*
The effluent limits and monitoring requirements proposed for the following parameters are the same as in the previous permit, although some monitoring frequencies have changed: copper, flow rate, pH range excursion maximum duration, pH, number of pH range excursions greater than 60 minutes, and monthly duration of pH range excursions.

The loading limits for total suspended solids and oil and grease were removed because the outfall is influenced by storm water and the federal effluent limit guidelines allow the limit to be expressed as solely a concentration limitation.

A lower, variance based monthly average limit is proposed for mercury. The loading limits were also modified based on a reasonable measure flow.

The daily maximum mercury limit was revised to the applicable standard. The inside mixing zone had been applied but mixing zones are no longer allowed for bioaccumulating pollutants such as mercury. The facility has consistently met the lower limit.

*Outfall 3IB00002004*
The effluent limits and monitoring requirements proposed for the following parameters are the same as in the previous permit, although some monitoring frequencies have changed: copper, total residual oxidants, flow rate, total residual chlorine, pH range excursion maximum duration, pH, number of pH range excursions greater than 60 minutes, and monthly duration of pH range excursions.

The loading limits for total suspended solids and oil and grease were removed because the outfall is influenced by storm water and the federal effluent limit guidelines allow the limit to be expressed as solely a concentration limitation.

*Outfall 3IB00002611*
This outfall is proposed to be removed from the permit. The outfall is tributary to Outfall 002 which contains the same monitoring and limit requirements.

The outfall previously included copper and iron monitoring and limits which are not included in Outfall 002. The federal effluent guideline for these parameters were modified to only apply to chemical metal cleaning waste. The facility does not use chemicals in their cleaning and the limit is not applicable. Therefore, there is no longer a need to monitor this waste stream separately.

*Outfalls 3IB00002601, 3IB00002604, 3IB00002610, and 3IB00002612*
The effluent limits and monitoring requirements proposed for internal outfalls 601, 604, 610, 612, and 800 are the same as in the previous permit.

*Other requirements*
A schedule of compliance is proposed to ensure compliance with federal 316(b) regulations.

A bottom ash transport water elimination requirement is proposed based on federal ELGs.

In Part II of the permit, special conditions are included that address mercury variance; notification to public water supply operators; parameters with limits below detection; and outfall signage.

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## PROCEDURES FOR PARTICIPATION IN THE FORMULATION OF FINAL DETERMINATIONS

The draft action shall be issued as a final action unless the Director revises the draft after consideration of the record of a public meeting or written comments, or upon disapproval by the Administrator of the U.S. Environmental Protection Agency.

Within thirty days of the date of the Public Notice, any person may request or petition for a public meeting for presentation of evidence, statements or opinions. The purpose of the public meeting is to obtain additional evidence. Statements concerning the issues raised by the party requesting the meeting are invited. Evidence may be presented by the applicant, the state, and other parties, and following presentation of such evidence other interested persons may present testimony of facts or statements of opinion.

Requests for public meetings shall be in writing and shall state the action of the Director objected to, the questions to be considered, and the reasons the action is contested. Such requests should be addressed to:

**Legal Records Section**
**Ohio Environmental Protection Agency**
**P.O. Box 1049**
**Columbus, Ohio 43216-1049**

Interested persons are invited to submit written comments upon the discharge permit. Comments should be submitted in person or by mail no later than 30 days after the date of this Public Notice. Deliver or mail all comments to:

**Ohio Environmental Protection Agency**
**Attention: Division of Surface Water**
**Permits Processing Unit**
**P.O. Box 1049**
**Columbus, Ohio 43216-1049**

The Ohio EPA permit number and Public Notice numbers should appear on each page of any submitted comments. All comments received no later than 30 days after the date of the Public Notice will be considered.

Citizens may conduct file reviews regarding specific companies or sites. Appointments are necessary to conduct file reviews, because requests to review files have increased dramatically in recent years. The first 250 pages copied are free. For requests to copy more than 250 pages, there is a five-cent charge for each page copied. Payment is required by check or money order, made payable to Treasurer State of Ohio.

For additional information about this fact sheet or the draft permit, contact Cole Miller at (614) 728-3846 or cole.miller@epa.ohio.gov.

## INFORMATION REGARDING CERTAIN WATER QUALITY BASED EFFLUENT LIMITS

This draft permit may contain proposed water-quality-based effluent limits (WQBELs) for parameters that **are not** priority pollutants. (See the following link for a list of the priority pollutants: http://epa.ohio.gov/portals/35/pretreatment/Pretreatment_Program_Priority_Pollutant_Detection_Limits.pdf .) In accordance with ORC 6111.03(J)(3), the Director established these WQBELs after considering, to the extent consistent with the Federal Water Pollution Control Act, evidence relating to the technical feasibility and economic reasonableness of removing the polluting properties from those wastes and to evidence relating to conditions calculated to result from that action and their relation to benefits to the people of the state and to accomplishment of the purposes of this chapter. This determination was made based on data and information

available at the time the permit was drafted, which included the contents of the timely submitted NPDES permit renewal application, along with any and all pertinent information available to the Director.

This public notice allows the permittee to provide to the Director for consideration during this public comment period additional site-specific pertinent and factual information with respect to the technical feasibility and economic reasonableness for achieving compliance with the proposed final effluent limitations for these parameters. The permittee shall deliver or mail this information to:

**Ohio Environmental Protection Agency**
**Attention: Division of Surface Water**
**Permits Processing Unit**
**P.O. Box 1049**
**Columbus, Ohio 43216-1049**

Should the applicant need additional time to review, obtain or develop site-specific pertinent and factual information with respect to the technical feasibility and economic reasonableness of achieving compliance with these limitations, written notification for any additional time shall be sent to the above address no later than 30 days after the Public Notice Date on Page 1.

Should the applicant determine that compliance with the proposed WQBELs for parameters other than the priority pollutants is technically and/or economically unattainable, the permittee may submit an application for a variance to the applicable WQS used to develop the proposed effluent limitation in accordance with the terms and conditions set forth in OAC 3745-33-07(D). The permittee shall submit this application to the above address no later than 30 days after the Public Notice Date.

Alternately, the applicant may propose the development of site-specific WQS pursuant to OAC 3745-1-39. The permittee shall submit written notification regarding their intent to develop site specific WQS for parameters that are not priority pollutants to the above address no later than 30 days after the Public Notice Date.

## LOCATION OF DISCHARGE/RECEIVING WATER USE CLASSIFICATION

Avon Lake Generating Station discharges to Lake Erie. Figure 1 shows the approximate location of the facility.

This segment of Lake Erie is described by Ohio EPA River Code: 24-500, County: Lorain, Ecoregion: Erie-Ontario Lake Plain. Lake Erie is designated for the following uses under Ohio's WQS (OAC 3745-1-31): Exceptional Warmwater Habitat, Superior High Quality Water, Agricultural Water Supply, Industrial Water Supply, Bathing Waters, and Public Water Supply.

Use designations define the goals and expectations of a waterbody. These goals are set for aquatic life protection, recreation use and water supply use, and are defined in the Ohio WQS (OAC 3745-1-07). The use designations for individual waterbodies are listed in rules -08 through -32 of the Ohio WQS. Once the goals are set, numeric WQS are developed to protect these uses. Different uses have different water quality criteria.

Use designations for aquatic life protection include habitats for coldwater fish and macroinvertebrates, warmwater aquatic life and waters with exceptional communities of warmwater organisms. These uses all meet the goals of the federal CWA. Ohio WQS also include aquatic life use designations for waterbodies which cannot meet the CWA goals because of human-caused conditions that cannot be remedied without causing fundamental changes to land use and widespread economic impact. The dredging and clearing of some small streams to support agricultural or urban drainage is the most common of these conditions. These streams are given Modified Warmwater or Limited Resource Water designations.

Recreation uses are defined by the depth of the waterbody and the potential for wading or swimming. Uses are defined for bathing waters, swimming/canoeing (Primary Contact Recreation) and wading only (Secondary Contact which are generally waters too shallow for swimming or canoeing).

Water supply uses are defined by the actual or potential use of the waterbody. Public Water Supply designations apply near existing water intakes so that waters are safe to drink with standard treatment. Most other waters are designated for agricultural water supply and industrial water supply.

## FACILITY DESCRIPTION

Avon Lake Generating Station is a coal-fired steam-electric generating station. This facility is involved in the generation, transmission, and distribution of electric power. The daily production rate is approximately 800 megawatts of electricity.

The process operations at Avon Lake Generating Station are classified in the Standard Industrial Classification (SIC) category 4911, Electric Services. The process wastewaters generated from these operations are regulated under 40 CFR Part 423, Steam Electric Power Generating Point Source Category.

## DESCRIPTION OF EXISTING DISCHARGE

Avon Lake Generating Station has three final outfalls and five internal outfalls. The primary discharges are non-contact cooling water, bottom ash transport water, coal pile runoff, and low volume wastes such as floor drains or recirculating house service water systems. Table 1 highlights the primary outfalls, internal monitoring stations, wastewater sources, treatment processes, discharge/receiving streams and associated flows at Avon Lake Generating Station.

Sanitary waste is discharged to the City of Avon Lake collection system.

There was one effluent violation at outfall 004 in 2012 for oil and grease as shown in Table 2.

The average flow rates for the permit cycle for each outfall are shown on Table 3.

Table 4 presents data compiled from the NPDES permit renewal application Form 2C.

Table 5 presents a summary of unaltered Discharge Monitoring Report (DMR). Data are presented for the period April 2012 to April 2017, and current permit limits are provided for comparison.

Table 6 summarizes the chemical specific data for outfalls 001, 002, and 004 by presenting the average and maximum PEQ values.

Table 7 summarizes the results of acute whole effluent toxicity (WET) tests of outfall 004.

## ASSESSMENT OF IMPACT ON RECEIVING WATERS

The *Ohio 2016 Integrated Water Quality Monitoring and Assessment Report* lists the Lake Erie Central Basin Shoreline as impaired for the aquatic life, recreation and fish consumption uses. Monitoring to develop a comprehensive Lake Erie nearshore monitoring program was funded by a Great Lakes Restoration Initiative grant conducted from 2011-2013. Fish community sampling results were used to update assessment unit status for the 2014 *Integrated Report.* Because data assessment and analyses were still underway for this project, causes and sources were retained from the previous report and include: siltation, nutrients, exotic species and direct habitat alterations (causes) and municipal point sources, urban runoff/storm sewers, habitat modifications other than hydromodification, combined sewer overflows, streambank modification/destabilization and non-irrigated crop production (sources).

The 2016 report is available at this Ohio EPA web site:

http://epa.ohio.gov/dsw/tmdl/OhioIntegratedReport.aspx

## DEVELOPMENT OF WATER-QUALITY-BASED EFFLUENT LIMITS

Determining appropriate effluent concentrations is a multiple-step process in which parameters are identified as likely to be discharged by a facility, evaluated with respect to Ohio water quality criteria, and examined to determine the likelihood that the existing effluent could violate the calculated limits.

### Parameter Selection

Effluent data for the Avon Lake Generating Station were used to determine what parameters should undergo WLA. The parameters discharged are identified by the data available to Ohio EPA DMR data submitted by the permittee, compliance sampling data collected by Ohio EPA, and any other data submitted by the permittee, such as priority pollutant scans required by the NPDES application or by pretreatment, or other special conditions in the NPDES permit. The sources of effluent data used in this evaluation are as follows:

| | |
|---|---|
| Self-monitoring data (DMR) | April 2012 through March 2017 |
| NPDES application Form 2C data | January 2015 |

### Statistical Outliers and Other Non-representative Data

The bis(2-ethylhexyl)phthalate sample result of 89.2 ug/L submitted with application form 2C was determined to be invalid because it was not sampled properly. Bis(2-ethylhexyl)phthalate is a plasticizer and sampling with plastic tubing can affect results. The facility re-sampled using glass containers and both results were non-detects.

This data is evaluated statistically, and PEQ values are calculated for each pollutant. Average PEQ ($PEQ_{avg}$) values represent the 95th percentile of monthly average data, and maximum PEQ ($PEQ_{max}$) values represent the 95th percentile of all data points (see Table 6).

The PEQ values are used according to Ohio rules to compare to applicable WQS and allowable WLA values for each pollutant evaluated. Initially, PEQ values are compared to the applicable average and maximum WQS. If both PEQ values are less than 25 percent of the applicable WQS, the pollutant does not have the reasonable potential to cause or contribute to exceedances of WQS, and no WLA is done for that parameter. If either $PEQ_{avg}$ or $PEQ_{max}$ is greater than 25 percent of the applicable WQS, a WLA is conducted to determine whether the parameter exhibits reasonable potential and needs to have a limit or if monitoring is required (see Table 8).

**Wasteload Allocation**
For those parameters that require a WLA, the results are based on the uses assigned to the receiving waterbody in OAC 3745-1. Dischargers are allocated pollutant loadings/concentrations based on the Ohio WQS (OAC 3745-1). Most pollutants are allocated by a mass-balance method because they do not degrade in the receiving water.

WLAs for direct discharges to lakes are done using the following equation for average criteria: WLA = (11 x Water Quality Criteria) – (10 x Background Concentration). Allocations for maximum criteria are set equal to the Inside Mixing Zone Maximum (IMZM) values.

The data used in the WLA are listed in and Table 9. The WLA results to maintain all applicable criteria are presented in Table 10.

**Thermal Wasteload**
On July 29, 2014, NRG submitted a Thermal Mixing Zone Evaluation Final Report as required by the existing NPDES Permit. The report satisfied the conditions outlined in rule OAC 3745-2-08 (C). The conclusions of the report are as follows:

- The thermal plume is buoyant, occupying the top few feet of the water column;
- The thermal plume tends to flow along the Lake Erie shoreline, expanding in width and losing heat to the surrounding water and atmosphere before being directed toward the open waters of Lake Erie by the Miller Road Park breakwall;
- The area of the thermal plume for the conditions modeled ranged from 89,000 $m^2$ to 2,498,000 $m^2$. The largest plumes occurred during summer temperatures and periods with elevated wind speeds;
- The thermal plume does not interfere with or block passage of fish or aquatic life; interfere with migration, survival, or reproduction of aquatic organisms; or jeopardize the continued existence of endangered or threatened species; and
- The thermal plume does not interfere with the designated or existing uses of Lake Erie.

After evaluating the information submitted in the report, Ohio EPA has determined that NRG Avon Lake Generating Station does not have the reasonable potential to violate temperature WQS.

**Whole Effluent Toxicity Wasteload Allocation**
Whole effluent toxicity (WET) is the total toxic effect of an effluent on aquatic life measured directly with a toxicity test. Acute WET measures short term effects of the effluent while chronic WET measures longer term and potentially more subtle effects of the effluent.

WQS for WET are expressed in Ohio's narrative "free from" WQS rule [OAC 3745-1-04(D)]. These "free froms" are translated into toxicity units (TUs) by the associated WQS Implementation Rule (OAC 3745-2-09). WLAs can then be calculated using TUs as if they were water quality criteria.

The WLA calculations for WET are similar to those for aquatic life criteria - using the chronic toxicity unit ($TU_c$) and 7Q10 flow for the average and the acute toxicity unit ($TU_a$) and 1Q10 flow for the maximum. These values are the levels of effluent toxicity that should not cause instream toxicity during critical low-flow conditions. For Avon Lake Generating Station, the WLA values for outfall 001, 002, and 004 are 1.0 $TU_a$ and 11 $TU_c$.

The chronic toxicity unit ($TU_c$) is defined as 100 divided by the estimate of the effluent concentration which causes a 25% reduction in growth or reproduction of test organisms ($IC_{25}$):

$$TU_c = 100/IC_{25}$$

This equation applies outside the mixing zone for warmwater, modified warmwater, exceptional warmwater, coldwater, and seasonal salmonid use designations except when the following equation is more restrictive (*Ceriodaphnia dubia* only):

$TU_c$ = 100/geometric mean of No Observed Effect Concentration and Lowest Observed Effect Concentration

The acute toxicity unit ($TU_a$) is defined as 100 divided by the concentration in water having 50% chance of causing death to aquatic life ($LC_{50}$) for the most sensitive test species:

$$TU_a = 100/LC_{50}$$

This equation applies outside the mixing zone for warmwater, modified warmwater, exceptional warmwater, coldwater, and seasonal salmonid use designations.

## REASONABLE POTENTIAL/EFFLUENT LIMITS/MANAGEMENT DECISIONS

After appropriate effluent limits are calculated, the reasonable potential of the discharger to violate the WQS must be determined. Each parameter is examined and placed in a defined "group". Parameters that do not have a WQS or do not require a WLA based on the initial screening are assigned to either group 1 or 2. For the allocated parameters, the preliminary effluent limits (PEL) based on the most restrictive average and maximum WLAs are selected from Table 10. The average PEL ($PEL_{avg}$) is compared to the average PEQ ($PEQ_{avg}$) from Table 6, and the $PEL_{max}$ is compared to the $PEQ_{max}$. Based on the calculated percentage of the allocated value [($PEQ_{avg} \div PEL_{avg}$) X 100, or ($PEQ_{max} \div PEL_{max}$) X 100)], the parameters are assigned to group 3, 4, or 5. The groupings are listed in Table 11.

The final effluent limits are determined by evaluating the groupings in conjunction with other applicable rules and regulations. Table 12 presents the final effluent limits and monitoring requirements proposed for Avon Lake Generating Station outfalls 001, 002, and 004 and internal monitoring stations 601, 604, 610, and 612 and the basis for their recommendation. Unless otherwise indicated, the monitoring frequencies proposed in the permit are continued from the existing permit.

### Direct Discharge Outfalls

Outfall 001

*Water temperature and flow rate*

Monitoring for these parameters is proposed to continue in order to evaluate the performance of the treatment plant.

*Total residual chlorine and chlorination/bromination duration*
Permit limits for residual chlorine and the duration of chlorine discharges are being continued. Limits for residual chlorine are required because chlorine is a BAT parameter under the federal effluent regulations for steam electric power facilities. The chlorine limit is based on an analysis of the inside-mixing-zone maximum WQS when discharges of chlorine are limited to two hours per day. This information indicates that WQS can be significantly higher for a two hour per day exposure than when organisms are exposed for 48- to 96-hours, as is typical of most acute aquatic toxicity tests. The 120 minute limit on chlorine/bromine duration regulates the exposure time so that chlorine levels will not exceed WQS.

Limits on total residual oxidants reflect the use of bromine and bromine/chlorine mixtures for control of biofouling in the cooling system. The analytical method for these pollutants does not easily distinguish between bromine and chlorine, and limits are set for the total measurement (residual oxidants) as a result. The permit would require Avon Lake Generating Station to report results for residual chlorine when only chlorine is used as a biocide, and reports residual oxidants when bromine or bromine/chlorine mixtures are used.

The limit for residual oxidants is based on data submitted by the Chemical Manufacturers Association to U.S. EPA Region V that shows bromine being approximately four times as toxic as chlorine. The discharge limit for residual oxidants is therefore set at ¼ of the chlorine limit.

*Total residual oxidants*
The limit recommended for total residual oxidants is based on best technical judgment regarding the relative toxicity of bromine.

*pH*
Limits proposed for pH are based on WQS (OAC 3745-1-35).

Outfall 002
*Flow rate*
Monitoring for flow rate is proposed to continue in order to evaluate the performance of the treatment plant.

*Total suspended solids and oil and grease*
The limits recommended for these parameters are based on the ELGs found in 40 CFR Part 423.12(b)(4) and (5), best practicable control technology currently available for ash transport and metal cleaning waste. All ELG limits are shown in Attachment 1.

*Copper*
The Ohio EPA risk assessment (Table 11) places copper in group 3. This placement, as well as the data in Table 4, Table 5, and Table 6, support that copper does not have the reasonable potential to contribute to WQS exceedances, and limits are not necessary to protect water quality. Monitoring at a low frequency is proposed to document that copper continues to remain at low levels. The frequency is proposed to reduce from monthly to quarterly.

*Mercury*
The Ohio EPA risk assessment (Table 11) places mercury in group 5. This placement, as well as the data in Table 4, Table 5, and Table 6, indicates that the reasonable potential to exceed WQS exists and limits are necessary to protect water quality. For mercury, the PEQ is greater than 100 percent of the WLA. Pollutants that meet this requirement must have permit limits under OAC 3745-33-07(A)(1). The thirty-day average concentration limit for mercury is based on a mercury variance. The daily maximum concentration limit for mercury is based on the WLA.

*pH, pH excursion maximum duration, pH excursions greater than 60 minutes, and pH excursion monthly duration*
Limits for pH excursion maximum duration, pH excursions greater than 60 minutes, and pH range excursion monthly duration are proposed to continue from the existing permit and are based on the ELGs found in 40 CFR part 401.17 and 40 CFR part 423.12(b)(1). pH is monitored continuously at outfall 002. To prevent violations if pH briefly varies from the 6.0-9.0 S.U. range, limits are proposed to ensure that pH doesn't vary for more than an hour at a time or for more than 446 minutes per month. This is protective of WQS.

Outfall 004
*Flow rate*
Monitoring for flow rate is proposed to continue in order to evaluate the performance of the treatment plant.

*Total suspended solids and oil and grease*
The limits recommended for these parameters are based on the ELGs found in 40 CFR Part 423.12(b)(3), best practicable control technology currently available for low volume waste. All ELG limits are shown in Attachment 1.

*Copper*
The Ohio EPA risk assessment (Table 11) places copper in group 3. This placement, as well as the data in Table 4,Table 5, and Table 6, support that copper does not have the reasonable potential to contribute to WQS exceedances, and limits are not necessary to protect water quality. Monitoring at a low frequency is proposed to document that copper continues to remain at low levels. The frequency is proposed to reduce from weekly to quarterly.

*pH, pH excursion maximum duration, pH excursions greater than 60 minutes, and pH excursion monthly duration*
Limits for pH excursion maximum duration, pH excursions greater than 60 minutes, and pH range excursion monthly duration are proposed to continue from the existing permit and are based on the ELGS found in 40 CFR part 401.17 and 40 CFR part 423.12(b)(1). pH is monitored continuously at outfall 004. To prevent violations if pH briefly varies from the 6.0-9.0 S.U. range, limits are proposed to ensure that pH doesn't vary for more than an hour at a time or for more than 446 minutes per month. This is protective of WQS.

*Total residual chlorine and total residual oxidants*
The limits for total residual chlorine and total residual oxidants are proposed to continue from the existing permit and are based on the WLA as limited by the inside mixing zone maximum. The inside mixing zone maximum is a value calculated to avoid rapidly lethal conditions in the effluent mixing zone. These limits are included in the permit to allow the discharge of additives which contain chlorine and/or bromine. Total residual chlorine and total residual oxidants only need monitored during treatment events.

**Internal Monitoring Outfalls**
Consistent with 40 CFR 122.45(h), the current permit includes monitoring and limits at internal stations 604, 610, and 612. Effluent guideline limits are applied at this outfall to ensure that these treatment standards are met prior to combining with other waste streams. If monitoring was not done at this location, it would not be possible to verify compliance with these standards due to dilution. Federal rules at 40 CFR 125.3(f) prohibit attaining these standards by dilution.

Outfall 601
*Mercury*
Monitoring for mercury is proposed to continue from the existing permit and is based on best technical judgment.

Outfall 604
*Flow rate and pH*
Monitoring for flow rate and pH is proposed to continue in order to evaluate the performance of the treatment plant.

*Total suspended solids and oil and grease*
The limits recommended for these parameters are based on the ELGs found in 40 CFR Part 423.12(b)(3), best practicable control technology currently available for low volume waste, which includes boiler blowdown. All ELG limits are shown in Attachment 1.

Outfall 610
*Flow rate and pH*
Monitoring for flow rate and pH is proposed to continue in order to evaluate the performance of the treatment plant.

*Total suspended solids*
The limit recommended for total suspended solids is based on the ELGs found in 40 CFR Part 423.12(b)(9), best practicable control technology currently available for coal pile runoff. All ELG limits are shown in Attachment 1.

Outfall 612
*Flow rate and oil and grease*
Monitoring for flow rate and oil and grease is proposed to continue from the existing permit and is based on best technical judgment.

**Intake Monitoring**

Outfall 800
*Temperature*
Temperature is proposed to continue from the existing permit and is based on best technical judgment.

## OTHER REQUIREMENTS

**Cooling Water Intake Structure Compliance**
Under Section 316(b) of the federal CWA, cooling water intake structures (CWISs) are required to use best technology available (BTA) to minimize adverse environmental impact resulting from the operation of the intake. New rules were promulgated on October 14, 2014, and facilities with permits that expire after July 18, 2018 must be in compliance with the new rules. The CWIS is considered an existing unit at an existing facility and therefore must comply with 40 CFR 125, Subpart J.

A compliance schedule in Part 1.C of the permit is proposed for the Avon Lake Generating Station to submit the impingement and entrainment information required in 40 CFR 122.21 by February 1, 2020. Avon Lake Generating Station is in the midst of a two-year entrainment study in preparation of the submittal. Some of the relevant information to be submitted includes:

- Design intake flow rate.
- Maximum design intake flow rate of pumps.
- Percentage of intake flow rate used for cooling purposes.
- Through-screen design intake velocity.
- Impingement/entrainment data.
- Operation of the cooling water system.

- Description of screens, technologies, and operations measures used to reduce impingement and entrainment.

40 CFR 125, Subpart J also requires the Director to make an interim BTA determination. The Avon Lake Generating Station operates two boilers for power generation: Unit 7 and Unit 9. Both utilize 3/8-inch mesh vertical water screens along nine ten-foot wide bays. One additional bay with fixed screens are utilized for the screen wash pumps. Unit 7 uses two 52,000 gallons per minute (gpm) pumps for cooling water. Unit 9 utilizes three 110,000 gpm circulating water pumps. Unit 7 was re-designated as a Limited Use Boiler in April 2016 and is used only for steam support. In 2016 and 2017, the Avon Lake Generating Station was operating at less than 30% of its equivalent availability capacity.

According to the impingement and entrainment conducted by the Avon Lake Power Plant in 2006, 25.8 million larval and juvenile-size fish were estimated to be entrained annually in 2006. The annual rate of impingement is estimated to be 12.2 million fish using actual withdrawal rates in 2006. The through-screen intake flow velocity is 1.5 feet per second at maximum capacity.

Ohio EPA has determined that the current intake structure does not represent BTA to minimize adverse environmental impact. In addition to the entrainment study, a one-year compliance schedule is proposed for NRG Avon Lake Generating to investigate the feasibility of reducing flow during times the plant is not in operation. Reducing flows combined with the lower utilization capacity will result in a determination that the intake represents BTA while the impingement and entrainment characterization study is being produced.

**Bottom Ash Transport Water**

The federal rule revising the Steam Electric Power Generating Effluent Guidelines was finalized on September 30, 2015. The rule identifies zero discharge of bottom ash transport water as the Best Available Technology Economically Achievable (BAT) based on dry handling of bottom ash or complete recycle of transport water.

The rule required implementation as soon as possible beginning November 1, 2018, but no later than December 31, 2023. However, on April 25, 2017, the U.S. EPA published a stay in the federal register of compliance dates that have not yet passed. On September 17, 2017, U.S. EPA published another final rule that extended as soon as possible two years, or November 1, 2020, for bottom ash transport water and flue gas desulfurization waste streams. Within the preamble of the rule, the U.S. EPA included a footnote which indicated that the rule was being reconsidered and that if a new rule is not promulgated prior to November 1, 2020, that U.S. EPA would postpone the compliance dates again.

The Director may establish a later date than November 1, 2020, based on four factors [40 CFR 423.11(t)] including the time it takes to design and raise capital as well as *other factors as appropriate*. Due to the uncertainty of the rule regarding bottom ash transport water, the Director has determined that as soon as possible is December 31, 2023. Additional language is proposed to capture the potential for different timelines and/or different final ELGs depending on additional rule-making by U.S. EPA.

Regarding the current discharge of bottom ash transport water, the facility currently recycles the bottom ash transport water and requires makeup water when the unit is operating. The discharge of bottom ash transport water typically occurs in one of three ways:

- When the unit is not operating, the make-up water continues to be added and comes in contact with transport water within the bottom ash recycle tank.

- Decanted bottom ash from the hydrobins is occasionally stored on a concrete storage pad and storm water may come into contact with the bottom ash and be discharged.

- The bottom ash transport water recycle system is inoperable.

In the interim, the requirements of legacy bottom ash transport water remain in effect. The legacy best practicable control technology limits for total suspended solids and oil and grease are included at outfall 002 and are being renewed from the previous permit. Avon Lake Generating Station is also required to continue to minimize the discharge of bottom ash transport water and to notify Ohio EPA of bypasses or shutdowns of the bottom ash transport water recycle system.

**Analytical detection levels**
To ensure that data is obtained that allows Ohio EPA to make water quality-related decisions; a special condition is proposed in Part II of the permit that provides guidance on the MDLs the permittee must use in analyzing contaminants.

**Mercury variance renewal**
The Avon Lake Generating Station permit was renewed on June 28, 2011 to include a mercury variance, and variance-based limits for mercury. Based on the monitoring results from April 2012 to April 2017, and the new application information, the Avon Lake Generating Station has determined that the facility will not meet the 30-day average permit limit of 1.3 ng/L. However, the effluent data shows that the permittee can meet the mercury annual average value of 12 ng/L. The permittee's application has also demonstrated to the satisfaction of Ohio EPA that there is no readily apparent means of complying with the WQBEL without constructing prohibitively expensive end-of-pipe controls for mercury. Based upon these demonstrations, the Avon Lake Generating Station is eligible for the mercury variance under OAC 3745-33-07(D)(10)(a).

Avon Lake Generating Station submitted information supporting the renewal of the variance. The permittee identified predominant sources of mercury, implemented housekeeping improvements and procedural changes for better control of the Ash Filter backwashing cycles, and tested polymers to evaluate enhancing solids/mercury removal to reduce the amount of mercury being discharged. The calculation of the $PEQ_{avg}$ value from 2012 to 2017 compared to the $PEQ_{avg}$ calculated at the time the original variance was issued shows a reduction from 13.34 ng/L to 2.41 ng/L. The Pollutant Minimization Program (PMP) schedule developed from the original variance continues to be implemented, and further reductions in mercury may be possible.

Ohio EPA has reviewed the mercury variance application and has determined that it meets the requirements of the OAC. A condition in Part II of the NPDES permit lists the provisions of the mercury variance, and includes the following requirements:

- A variance-based monthly average effluent limit of 3.7 ng/L, which was developed from sampling data submitted by the permittee;
- A requirement that the permittee make reasonable progress to meet the WQBEL for mercury by implementing the plan of study, which has been developed as part of the PMP;
- Low-level mercury monitoring of the plant's influent and effluent;
- A requirement that the annual average mercury effluent concentration is less than or equal to 12 ng/L as specified in the plan of study;
- A summary of the elements of the plan of study;
- A requirement to submit an annual report on implementation of the PMP; and
- A requirement for submittal of a certification stating that all permit conditions related to implementing the plan of study and the PMP have been satisfied, but that compliance with the monthly average WQBEL for mercury has not been achieved.

**Storm Water Compliance**

Parts IV, V, and VI have been included with the draft permit to ensure that any storm water flows from the facility site are properly regulated and managed. As an alternative to complying with Parts IV, V, and VI, the Avon Lake Generating Station may seek permit coverage under the general permit for industrial storm water permit or submit a "No Exposure Certification." Parts IV, V, and VI will be removed from the final permit if: 1) the Avon Lake Generating Station submits a Notice of Intent (NOI) for coverage under the general permit for industrial storm water or submits a No Exposure Certification, 2) Ohio EPA determines that the facility is eligible for coverage under the general permit or meets the requirements for a No Exposure Certification, and 3) the determination by Ohio EPA can be made prior to the issuance of the final permit.

**Outfall Signage**
Part II of the permit includes requirements for the permittee to place and maintain a sign at each outfall to Lake Erie providing information about the discharge. Signage at outfalls is required pursuant to OAC 3745-33-08(A).

**Bis(2-ethylhexyl) phthalate Sampling**
Part II of the permit includes a condition specifying sampling procedures for bis(2-ethlyhexyl) phthalate.

**Public Water Supply Notification**
An addition to OAC 3745-33-08 requires that permittees discharging wastewater within three thousand feet of a public water supply intake, must develop spill (or bypass) notification procedures in conjunction with the downstream public water supply operator. Since the City of Avon Lake Public Water Supply operates a public water supply intake less than three thousand feet from the Avon Lake Generating Station, an item in Part II of the permit requires the development of notification procedures within six months after the effective date of the permit.

**Whole Effluent Toxicity Reasonable Potential**
The three acute toxicity results (see Table 7) showed the discharge from Outfall 004 was not toxic. Reasonable potential for toxicity is not demonstrated. No monitoring is proposed at this time.

**Part III**
Part III of the permit details standard conditions that include monitoring, reporting requirements, compliance responsibilities, and general requirements.

**Figure 1. Location of Avon Lake Generating Station**

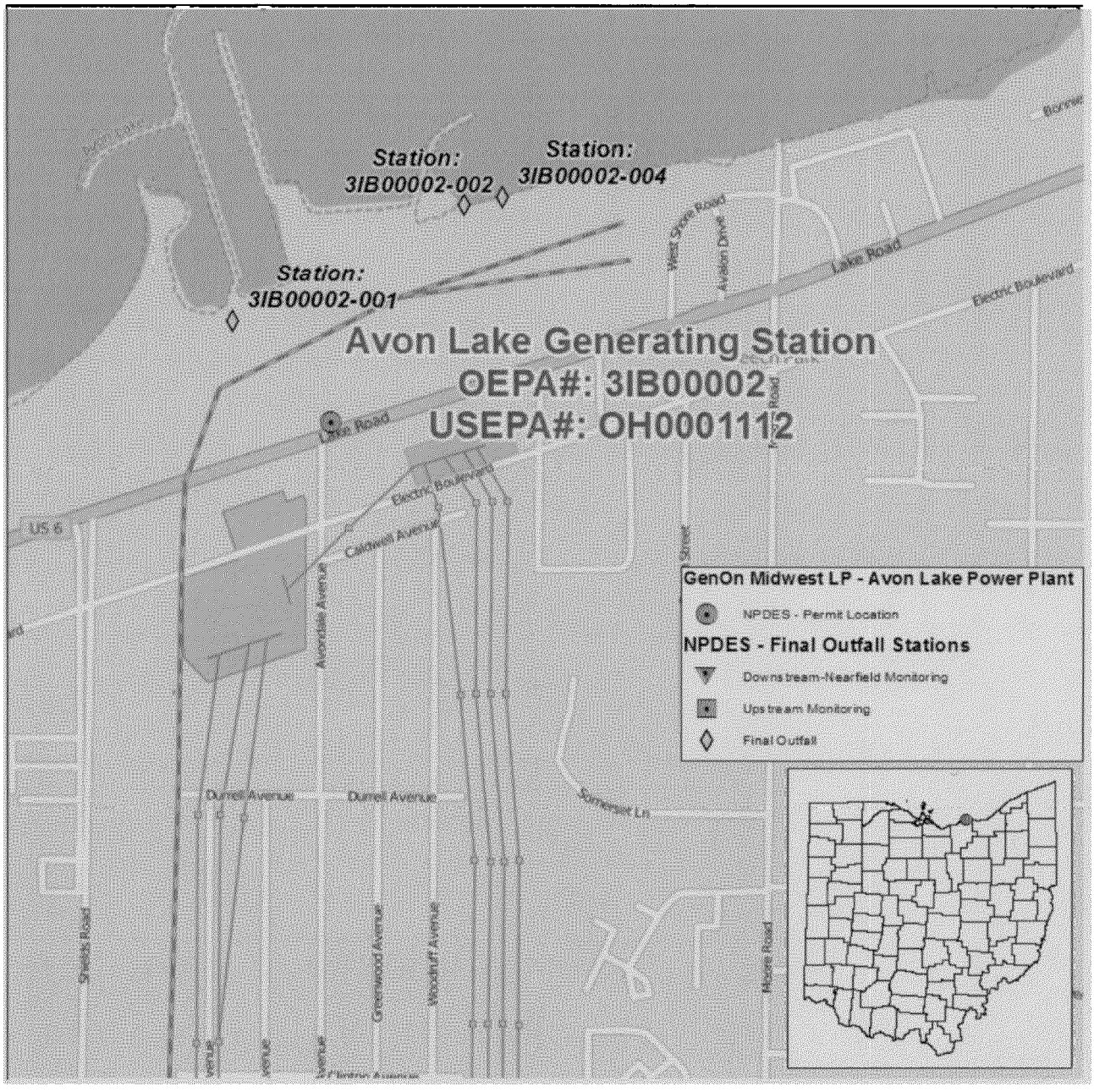


**Figure 2. Water Balance Diagram**

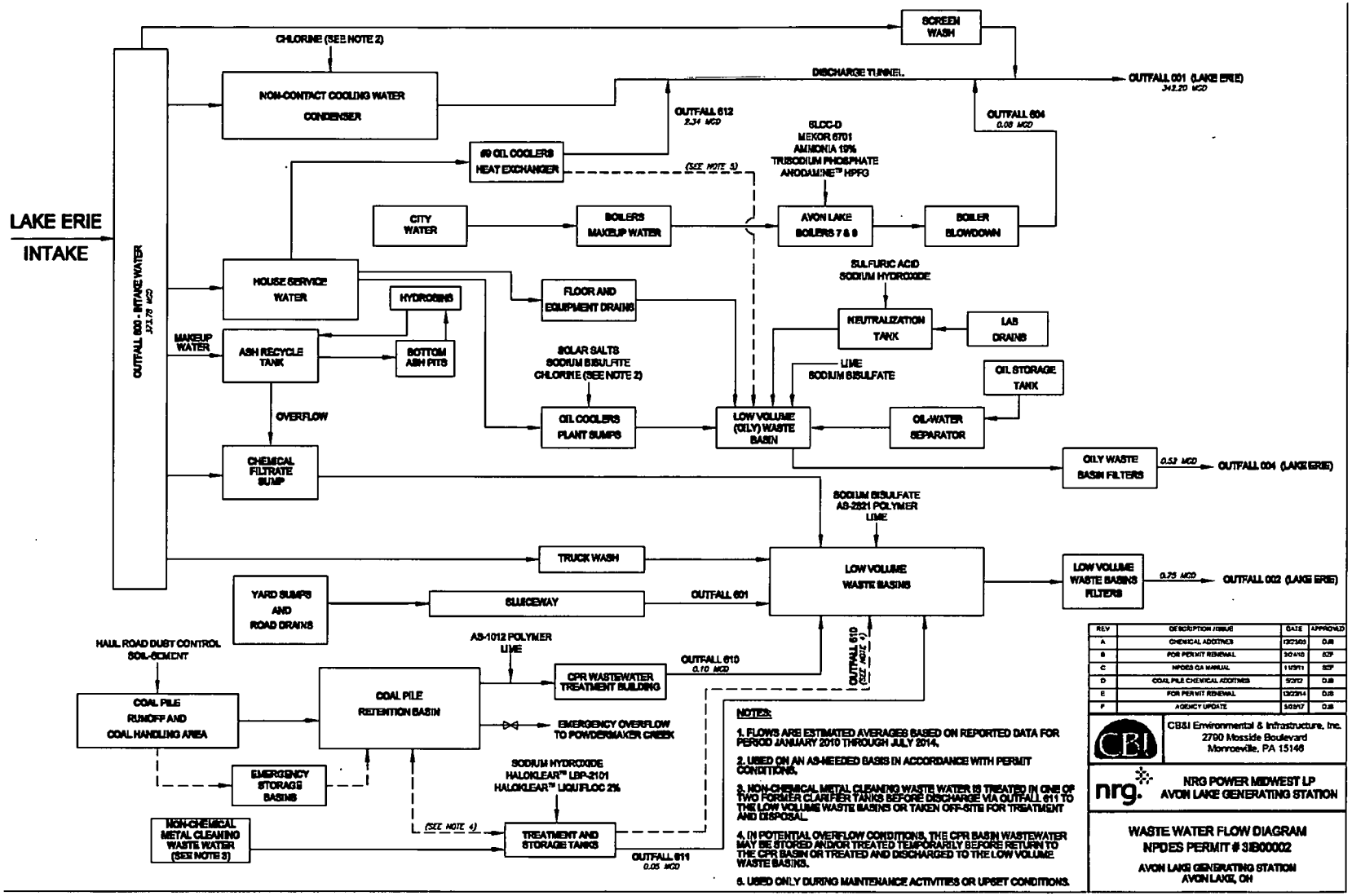


**Table 1. Summary of Avon Lake Generating Station Outfalls**

| Station | Wastewater Source | Treatment Utilized | Receiving Stream | Average Flow Rate (MGD)* | Applied FEG (40 CFR) |
|---|---|---|---|---|---|
| 001 | Once-thru cooling water discharge, boiler blowdown, heat exchanger | Chlorine disinfection | Lake Erie | 527 | 423.13 (b) |
| 002 | Ash transport water, coal pile runoff, metal cleaning | Sedimentation, chemical precipitation, neutralization, gravity filtration | Lake Erie | 1.03 | 423.12 (b) |
| 004 | Low volume waste system, oily water separator, floor drains | Sedimentation, chlorine disinfection, neutralization, gravity filtration | Lake Erie | 0.91 | 423.12 (b)(3) |
| 601 | Ash recycle water overflow | -- | 002 | -- | -- |
| 604 | Boiler blowdown | -- | 001 | 0.29 | 423.12 (b)(3) |
| 610 | Coal pile runoff | Neutralization, chemical precipitation, pressure filtration | 002 | 0.22 | 423.12 (b)(9) |
| 611[A] | Treated metal cleaning wastewater | Neutralization, chemical precipitation, pressure filtration | 002 | 0.081 | 423.12 (b)(5) |
| 612 | Non-contact cooling water | -- | 001 | 3.4 | -- |

*Average flow rate shown is 95th percentile of monthly averages.
[A] – Proposed to no longer be monitored.

**Table 2. Effluent Violations**

| PARAMETER | 2012 | 2013 | 2014 | 2015 | 2016 | 2017 |
|---|---|---|---|---|---|---|
| Outfall 004 - Oil and Grease, Total | 1 | 0 | 0 | 0 | 0 | 0 |

**Table 3. Average Annual Effluent Flow Rates**

| | Flow Rate (Million Gallons per Day) | | | | |
|---|---|---|---|---|---|
| **Outfall** | **Year** | **# obs.** | **Median** | **95th Percentile** | **Maximum** |
| 001 | 2012 | 275 | 358 | 599 | 599 |
| | 2013 | 365 | 393 | 475.1 | 599 |
| | 2014 | 364 | 316.8 | 440.6 | 440.6 |
| | 2015 | 365 | 316.8 | 599 | 599 |
| | 2016 | 366 | 158.4 | 475.1 | 475.1 |
| | 2017 | 90 | 158.4 | 316.755 | 368.5 |
| 002 | 2012 | 273 | 0.68 | 0.954 | 1.26 |
| | 2013 | 365 | 0.68 | 1.22 | 2.18 |
| | 2014 | 364 | 0.55 | 1.1985 | 2.98 |
| | 2015 | 364 | 0.465 | 0.9685 | 1.34 |
| | 2016 | 364 | 0.23 | 0.64 | 1.14 |
| | 2017 | 90 | 0.195 | 0.592 | 0.7 |
| 004 | 2012 | 275 | 0.46 | 1.529 | 1.97 |
| | 2013 | 365 | 0.39 | 0.698 | 1.36 |
| | 2014 | 364 | 0.355 | 0.67 | 1.48 |
| | 2015 | 365 | 0.46 | 1.304 | 1.61 |
| | 2016 | 366 | 0.34 | 0.73 | 1.01 |
| | 2017 | 90 | 0.345 | 0.5975 | 0.74 |
| 604 | 2012 | 61 | 0.06 | 0.2 | 0.28 |
| | 2013 | 86 | 0.06 | 0.195 | 0.43 |
| | 2014 | 92 | 0.06 | 0.2345 | 0.48 |
| | 2015 | 188 | 0.11 | 0.3 | 0.45 |
| | 2016 | 84 | 0.07 | 0.347 | 0.5 |
| 610 | 2012 | 109 | 0.11 | 0.216 | 0.22 |
| | 2013 | 176 | 0.12 | 0.1825 | 0.22 |
| | 2014 | 168 | 0.13 | 0.23 | 0.24 |
| | 2015 | 129 | 0.16 | 0.21 | 0.51 |
| | 2016 | 84 | 0.15 | 0.21 | 0.22 |
| | 2017 | 36 | 0.17 | 0.2875 | 0.31 |
| 611 | 2012 | 5 | 0.0432 | 0.08062 | 0.081 |
| 612 | 2012 | 8 | 2.55 | 3.4 | 3.4 |
| | 2013 | 12 | 1.7 | 3.4 | 3.4 |
| | 2014 | 12 | 1.7 | 3.4 | 3.4 |
| | 2015 | 12 | 1.7 | 3.29 | 3.4 |
| | 2016 | 9 | 3.4 | 3.4 | 3.4 |
| | 2017 | 2 | 1.7 | 1.7 | 1.7 |

**Table 4. Effluent Characterization Based on Form 2C Data**

| Parameter | Units | 001 | 002 | 004 |
|---|---|---|---|---|
| Nitrate + Nitrite | mg/L | 0.08 | 0.47 | 0.21 |
| Aluminum | ug/L | 83 | 130 | <200 |
| Barium | ug/L | 19 | 31 | 26 |
| Boron | ug/L | 57 | 120 | 34 |
| Iron | ug/L | 110 | 60 | 120 |
| Molybdenum | ug/L | 9.9 | 4 | 3 |
| Manganese | ug/L | 7.6 | <10 | 6.9 |
| Antimony | ug/L | <3 | 0.33 | 0.15 |
| Titanium | ug/L | <10 | 6 | 4 |
| Arsenic | ug/L | 0.4 | 5 | 0.93 |
| Cadmium | ug/L | 0.034 | 0.08 | <0.5 |
| Copper | ug/L | <10 | 4.1 | 7.8 |
| Lead | ug/L | 0.076 | 0.1 | <2 |
| Nickel | ug/L | 1.6 | 2.9 | 2.0 |
| Thallium | ug/L | <1 | 0.35 | <1 |
| Zinc | ug/L | <10 | 3 | 3.7 |
| Total Phenols | ug/L | 0.02 | <50 | <50 |
| Bis(2-ethylhexyl)Phthalate | ug/L | 89.2[A] | <5 | <5 |

[A] =This is believed to be an outlier. The sample was taken using plastic tubing within the facility's 24-hour composite sampler. The facility resampled on dates using glass containers to take samples when the plant was off-line and generating which resulted in <2.06 ug/L on May 31, 2017, and <2.08 ug/L on June 12, 2017, respectively. This value is excluded from PEQ development.

**Table 5. Effluent Characterization Using Self-Monitoring Data**

| Parameter | Calculation Type | Units | Day Max | 30 Day Max | Obs. | 50th | 95th | Data Range |
|---|---|---|---|---|---|---|---|---|
| **Outfall 001** | | | | | | | | |
| Water Temperature | Temp. | F | | | 1815 | 64.9 | 95.7 | 34.2-101 |
| pH | Conc. | S.U. | 6.0 - 9.0 | | 61 | 7.51 | 8.23 | 7-8.33 |
| Oxidants, Total Residual | Conc. | mg/l | 0.05 | | 0 | | | - |
| Flow Rate | Flow | MGD | | | 1825 | 317 | 506 | .5-599 |
| Chlorine, Total Residual | Conc. | mg/l | 0.2 | | 0 | | | - |
| Chlorination/Bromination Duration | Time | Minutes | 120 | | 0 | | | - |
| **Outfall 002** | | | | | | | | |
| Total Suspended Solids | Conc. | mg/l | 100 | 30 | 241 | 2 | 11 | 1-36 |
| Oil and Grease, Total | Conc. | mg/l | 20 | 15 | 61 | 2.55 | 2.7 | 1.1-5.9 |
| Copper, Total Recoverable | Conc. | ug/l | | | 61 | 5 | 5 | 5-11 |
| Flow Rate | Flow | MGD | | | 1820 | 0.51 | 1.07 | .01-2.98 |
| Mercury, Total (Low Level) | Loading | kg/day | 0.043 | 0.00010 | 62 | 0.00000192 | 0.00000546 | .00000000946-.0000124 |
| Mercury, Total (Low Level) | Conc. | ng/l | 3400 | 8.0 | 62 | 0.997 | 3.77 | .25-6.06 |
| pH Range Excursion, Maximum Duration | Time | Minutes | 60 | | 1826 | 0 | 0 | 0-3 |
| pH, Maximum | Conc. | S.U. | | | 1824 | 7.93 | 8.4 | 7.2-10.4 |
| pH, Minimum | Conc. | S.U. | | | 1824 | 7.2 | 7.2 | 4.03-7.56 |
| pH Range Excursions, > 60 Minutes | Count | Number/Day | 0 | | 1826 | 0 | 0 | 0-0 |
| pH Range Excursions, Monthly Total Duration | Time | Minutes | 446 | | 60 | 0 | 1.05 | 0-6 |
| **Outfall 004** | | | | | | | | |
| Total Suspended Solids | Conc. | mg/l | 100 | 30 | 480 | 2 | 8.81 | 1-48 |
| Oil and Grease, Total | Conc. | mg/l | 20 | 15 | 480 | 2.55 | 2.7 | 1.05-21 |

| Parameter | Calculation Type | Units | Day Max | 30 Day Max | Obs. | 50th | 95th | Data Range |
|---|---|---|---|---|---|---|---|---|
| Copper, Total Recoverable | Conc. | ug/l | | | 241 | 5 | 12 | 5-24 |
| Oxidants, Total Residual | Conc. | mg/l | 0.01 | | 0 | | | - |
| Flow Rate | Flow | MGD | | | 1825 | 0.4 | 0.946 | .01-1.97 |
| Chlorine, Total Residual | Conc. | mg/l | 0.038 | | 0 | | | - |
| pH Range Excursion, Maximum Duration | Time | Minutes | 60 | | 1826 | 0 | 0 | 0-10 |
| pH, Maximum | Conc. | S.U. | | | 1826 | 7.48 | 7.89 | 7.2-10.4 |
| pH, Minimum | Conc. | S.U. | | | 1824 | 7.18 | 7.2 | 3.8-7.2 |
| pH Range Excursions, > 60 Minutes | Count | Number/Day | 0 | | 1826 | 0 | 0 | 0-0 |
| pH Range Excursions, Monthly Total Duration | Time | Minutes | 446 | | 60 | 0 | 2 | 0-10 |
| **Outfall 601** | | | | | | | | |
| Mercury, Total (Low Level) | Conc. | ng/l | | | 30 | 1.47 | 54.3 | 0.25-146 |
| **Outfall 604** | | | | | | | | |
| pH | Conc. | S.U. | | | 46 | 9.13 | 9.72 | 8.1-9.76 |
| Total Suspended Solids | Conc. | mg/l | 100 | 30 | 46 | 2 | 13.9 | 1-40 |
| Oil and Grease, Total | Conc. | mg/l | 20 | 15 | 45 | 2.55 | 2.69 | 2.5-2.8 |
| Flow Rate | Flow | MGD | | | 511 | 0.07 | 0.29 | .01-.5 |
| **Outfall 610** | | | | | | | | |
| pH | Conc. | S.U. | | | 149 | 8.64 | 9.3 | 7.14-11.4 |
| Total Suspended Solids | Conc. | mg/l | 50 | | 149 | 4.2 | 14.6 | 1-32 |
| Flow Rate | Flow | MGD | | | 702 | 0.13 | 0.22 | .01-.51 |
| **Outfall 611** | | | | | | | | |
| pH | Conc. | S.U. | | | 5 | 8.3 | 8.64 | 7.14-8.7 |
| Total Suspended Solids | Conc. | mg/l | 100 | 30 | 2 | 1.5 | 1.95 | 1-2 |
| Oil and Grease, Total | Conc. | mg/l | 20 | 15 | 2 | 5.5 | 8.2 | 2.5-8.5 |

| Parameter | Calculation Type | Units | Day Max | 30 Day Max | Obs. | 50th | 95th | Data Range |
|---|---|---|---|---|---|---|---|---|
| Iron, Total Recoverable | Conc. | ug/l | 1000 | 1000 | 2 | 86 | 126 | 42-130 |
| Copper, Total Recoverable | Conc. | ug/l | 1000 | 1000 | 2 | 5 | 5 | 5-5 |
| Flow Rate | Flow | MGD | | | 5 | 0.0432 | 0.0806 | .0083-.081 |
| **Outfall 612** | | | | | | | | |
| Oil and Grease, Total | Conc. | mg/l | | | 55 | 2.6 | 5.43 | 1.2-9 |
| Flow Rate | Flow | MGD | | | 55 | 1.7 | 3.4 | .85-3.4 |
| **Outfall 800** | | | | | | | | |
| Water Temperature | Temp. | F | | | 1823 | 55.6 | 79.4 | 33.2-85.8 |

**Table 6. Projected Effluent Quality**

| Parameter | Units | Number of Samples | Number > MDL | PEQ Average | PEQ Maximum |
|---|---|---|---|---|---|
| Outfall 001 | | | | | |
| Thallium | ug/l | 10 | 0 | -- | -- |
| Nitrite Plus Nitrate | mg/l | 1 | 1 | 0.3621 | 0.496 |
| Sulfate | mg/l | 1 | 1 | 95.05 | 130.2 |
| Aluminum | ug/l | 1 | 1 | 375.7 | 514.6 |
| Barium | ug/l | 1 | 1 | 85.99 | 117.8 |
| Boron | ug/l | 1 | 1 | 258 | 353.4 |
| Iron | ug/l | 1 | 1 | 497.9 | 682 |
| Magnesium | ug/l | 1 | 1 | 39830 | 54560 |
| Molybdenum | ug/l | 1 | 1 | 44.81 | 61.38 |
| Manganese | ug/l | 1 | 1 | 34.4 | 47.12 |
| Arsenic | ug/l | 1 | 1 | 1.797 | 2.461 |
| Cadmium | ug/l | 1 | 1 | 0.1539 | 0.2108 |
| Lead | ug/l | 1 | 1 | 0.344 | 0.4712 |
| Nickel | ug/l | 1 | 1 | 7.242 | 9.92 |
| Phenol | ug/l | 1 | 1 | 0.09052 | 0.124 |
| Outfall 002 | | | | | |
| Total Suspended Solids | mg/l | 241 | 110 | 9.7853 | 13.861 |
| Oil and Grease | mg/l | 61 | 1 | 4.307 | 5.9 |
| Copper | ug/l | 61 | 1 | 8.03 | 11 |
| Mercury | ng/l | 62 | 53 | 2.4142 | 3.7155 |
| Nitrite Plus Nitrate | mg/l | 1 | 1 | 2.127 | 2.914 |
| Sulfate | mg/l | 1 | 1 | 1177 | 1612 |
| Aluminum | ug/l | 1 | 1 | 586.6 | 803.5 |
| Barium | ug/l | 1 | 1 | 140.3 | 192.2 |
| Boron | ug/l | 1 | 1 | 543.1 | 744 |
| Iron | ug/l | 1 | 1 | 271.6 | 372 |
| Magnesium | ug/l | 1 | 1 | 43400 | 59460 |
| Molybdenum | ug/l | 1 | 1 | 18.1 | 24.8 |
| Titanium | ug/l | 1 | 1 | 27.16 | 37.2 |
| Antimony | ug/l | 1 | 1 | 1.494 | 2.046 |
| Arsenic | ug/l | 1 | 1 | 22.63 | 31 |
| Cadmium | ug/l | 1 | 1 | 0.353 | 0.4836 |
| Lead | ug/l | 1 | 1 | 0.4707 | 0.6448 |
| Nickel | ug/l | 1 | 1 | 13.13 | 17.98 |
| Thallium | ug/l | 1 | 1 | 1.584 | 2.17 |
| Zinc | ug/l | 1 | 1 | 13.58 | 18.6 |

| Parameter | Units | Number of Samples | Number > MDL | PEQ Average | PEQ Maximum |
|---|---|---|---|---|---|
| Outfall 004 | | | | | |
| Total Suspended Solids | mg/l | 480 | 210 | 6.0473 | 10.525 |
| Oil and Grease, Total | mg/l | 480 | 12 | 2.2661 | 3.726 |
| Selenium, Total Recoverable | ug/l | 11 | 0 | -- | -- |
| Copper, Total Recoverable | ug/l | 241 | 16 | 8.4105 | 12.329 |
| pH Range Excursion, Maximum Duration | Minutes | 1339 | 2 | 0.876 | 1.2 |
| Acute Toxicity, *Ceriodaphnia dubia* | $TU_a$ | 3 | 0 | -- | -- |
| Acute Toxicity, *Pimephales promelas* | $TU_a$ | 3 | 0 | -- | -- |
| Nitrite Plus Nitrate | mg/l | 1 | 1 | 0.9505 | 1.302 |
| Sulfate | mg/l | 1 | 1 | 176.5 | 241.8 |
| Barium | ug/l | 1 | 1 | 117.7 | 161.2 |
| Boron | ug/l | 1 | 1 | 153.9 | 210.8 |
| Iron | ug/l | 1 | 1 | 543.1 | 744 |
| Magnesium | ug/l | 1 | 1 | 43090 | 59020 |
| Molybdenum | ug/l | 1 | 1 | 13.58 | 18.6 |
| Manganese | ug/l | 1 | 1 | 31.23 | 42.78 |
| Titanium | ug/l | 1 | 1 | 18.1 | 24.8 |
| Antimony | ug/l | 1 | 1 | 0.6789 | 0.93 |
| Arsenic | ug/l | 1 | 1 | 4.209 | 5.766 |
| Nickel | ug/l | 1 | 1 | 9.052 | 12.4 |
| Zinc | ug/l | 1 | 1 | 16.75 | 22.94 |

MDL = analytical method detection limit
PEQ = projected effluent quality

**Table 7. Summary of Acute and Toxicity Results – Outfall 004**

| | *Ceriodaphnia dubia* (water flea) | *Pimephales promelas* (fathead minnow) |
|---|---|---|
| **Date** | **$TU_a$** | **$TU_a$** |
| 12/8/2010 | AA | AA |
| 3/2/2011 | AA | AA |
| 6/9/2011 | AA | AA |

AA = non-detection; analytical method detection limit of 0.2 $TU_a$
$TU_a$ = acute toxicity unit

**Table 8. Water Quality Criteria in the Study Area**

| Parameter | Units | Outside Mixing Zone Criteria Average Wildlife | Human Health | Agri-culture | Aquatic Life | Maximum Aquatic Life | Inside Mixing Zone Maximum |
|---|---|---|---|---|---|---|---|
| Aluminum | ug/l | -- | 4500 | -- | -- | -- | -- |
| Antimony | ug/l | -- | 780 | -- | 190 | 900 | 1800 |
| Arsenic | ug/l | -- | 580 | 100 | 150 | 340 | 680 |
| Barium | ug/l | -- | 160000 | -- | 220 | 2000 | 4000 |
| Bis(2-ethylhexyl)phthalate | ug/l | -- | 32c | -- | 8.4 | 1100 | 2100 |
| Boron | ug/l | -- | 200000 | -- | 3900 | 33000 | 65000 |
| Cadmium | ug/l | -- | 730 | 50 | 3.2 | 6.6 | 13 |
| Copper | ug/l | -- | 64000 | 500 | 12 | 19 | 38 |
| Iron | ug/l | -- | -- | 5000 | -- | -- | -- |
| Lead | ug/l | -- | -- | 100 | 9.9 | 190 | 380 |
| Manganese | ug/l | -- | 61000 | -- | -- | -- | -- |
| Mercury | ng/l | 1.3 | 3.1 | 10000 | 910 | 1700 | 3400 |
| Molybdenum | ug/l | -- | 10000 | -- | 20000 | 190000 | 370000 |
| Nickel | ug/l | -- | 43000 | 200 | 69 | 620 | 1200 |
| Nitrate + Nitrite | mg/l | -- | -- | 100 | -- | -- | -- |
| Phenol | ug/l | -- | 2400 | -- | 400 | 4700 | 9400 |
| Selenium | ug/l | -- | 3100 | 50 | 5 | -- | -- |
| Zinc | ug/l | -- | 35000 | 25000 | 160 | 160 | 320 |

**Table 9. Instream Conditions and Discharger Flow**

| Parameter | Units | Season | Value | Basis |
|---|---|---|---|---|
| *Hardness* | mg/l | annual | 140 | BWQR |
| *Avon Lake Generating flow* | cfs | annual | 814.8 | 95th percentile of monthly averages |
| *Background Water Quality* | | | | |
| Aluminum | ug/l | | 330 | BWQR; 1988; n=640; 146<MDL; Statewide 50th percentile. |
| Arsenic - TR | ug/l | | 0 | No representative data available. |
| Barium | ug/l | | 68 | BWQR; 1999-03; n=1729; 0<MDL; Statewide 50th percentile. |
| Bis(2-ethylhexyl)phthalate | ug/l | | 0 | No representative data available. |
| Boron | ug/l | | 0 | No representative data available. |
| Cadmium - TR | ug/l | | 0.25 | BWQR; 1999-03; n=1696; 1365<MDL; Statewide 50th percentile. |
| Iron - TR | ug/l | | 650 | BWQR; 1999-03; n=3018; 15<MDL; Statewide 50th percentile. |
| Lead - TR | ug/l | | 2 | BWQR; 1999-03; n=2814; 1458<MDL; Statewide 50th percentile. |
| Magnesium | mg/l | | 0 | No representative data available. |
| Manganese - TR | ug/l | | 0 | No representative data available. |
| Molybdenum | ug/l | | 0 | No representative data available. |
| Nickel - TR | ug/l | | 20 | BWQR; 1999-03; n=1259; 1105<MDL; Statewide 50th percentile. |
| Nitrate-N + Nitrite-N | mg/l | | 0.73 | BWQR; 1999-03; n=5852; 515<MDL; Statewide 50th percentile. |
| Phenol (wwh,ewh,mwh) | ug/l | | 0 | No representative data available. |
| Sulfates | mg/l | | 0 | No representative data available. |

MDL = analytical method detection limit
n = number of samples

**Table 10. Summary of Effluent Limits to Maintain Applicable Water Quality Criteria**

| | | Outside Mixing Zone Criteria | | | | | Inside Mixing Zone Maximum |
|---|---|---|---|---|---|---|---|
| | | | Average | | | Maximum | |
| Parameter | Units | Wildlife | Human Health | Agri-culture | Aquatic Life | Aquatic Life | |
| *Outfall 001* | | | | | | | |
| Aluminum | ug/l | -- | 46200 | -- | -- | -- | -- |
| Arsenic | ug/l | -- | 6380 | 1100 | 1650 | -- | 680 |
| Barium | ug/l | -- | 1759320 | -- | 1740 | -- | 4000 |
| Bis(2-ethylhexyl)phthalate | ug/l | -- | 352 | -- | 92 | -- | 2100 |
| Boron | ug/l | -- | 2200000 | -- | 42900 | -- | 65000 |
| Cadmium | ug/l | -- | 8028 | 548 | 33 | -- | 13 |
| Iron | ug/l | -- | -- | 48500 | -- | -- | -- |
| Lead | ug/l | -- | -- | 1080 | 89 | -- | 380 |
| Manganese | ug/l | -- | 671000 | -- | -- | -- | -- |
| Molybdenum | ug/l | -- | 110000 | -- | 220000 | -- | 370000 |
| Nickel | ug/l | -- | 472800 | 2000 | 559 | -- | 1200 |
| Nitrate + Nitrite | mg/l | -- | -- | 1093 | -- | -- | -- |
| Phenol | ug/l | -- | 26400 | -- | 4400 | -- | 9400 |
| *Outfall 002* | | | | | | | |
| Aluminum | ug/l | -- | 46200 | -- | -- | -- | -- |
| Arsenic | ug/l | -- | 6380 | 1100 | 1650 | -- | 680 |
| Barium | ug/l | -- | 1759320 | -- | 1740 | -- | 4000 |
| Boron | ug/l | -- | 2200000 | -- | 42900 | -- | 65000 |
| Cadmium | ug/l | -- | 8028 | 548 | 33 | -- | 13 |
| Iron | ug/l | -- | -- | 48500 | -- | -- | -- |
| Lead | ug/l | -- | -- | 1080 | 89 | -- | 380 |
| Manganese | ug/l | -- | 671000 | -- | -- | -- | -- |
| Molybdenum | ug/l | -- | 110000 | -- | 220000 | -- | 370000 |
| Nickel | ug/l | -- | 472800 | 2000 | 559 | -- | 1200 |
| Nitrate + Nitrite | mg/l | -- | -- | 1093 | -- | -- | -- |
| Phenol | ug/l | -- | 26400 | -- | 4400 | -- | 9400 |
| Copper | ug/l | -- | 703950 | 5450 | 82 | -- | 38 |
| Mercury | ng/l | 1.3 | 3.1 | 10000 | 910 | -- | 1700 |
| *Outfall 004* | | | | | | | |
| Aluminum | ug/l | -- | 49500 | -- | -- | -- | -- |
| Arsenic | ug/l | -- | 6380 | 1100 | 1650 | -- | 680 |
| Barium | ug/l | -- | 1759320 | -- | 1740 | -- | 4000 |
| Boron | ug/l | -- | 2200000 | -- | 42900 | -- | 65000 |
| Iron | ug/l | -- | -- | 48500 | -- | -- | -- |
| Molybdenum | ug/l | -- | 110000 | -- | 220000 | -- | 370000 |
| Nickel | ug/l | -- | 472800 | 2000 | 559 | -- | 1200 |
| Nitrate + Nitrite | mg/l | -- | -- | 1093 | -- | -- | -- |
| Antimony | ug/l | -- | 8580 | -- | 2090 | -- | 1800 |
| Copper | ug/l | -- | 703950 | 5450 | 82 | -- | 38 |

| Parameter | Units | Outside Mixing Zone Criteria | | | | | Inside Mixing Zone Maximum |
|---|---|---|---|---|---|---|---|
| | | | Average | | | Maximum | |
| | | Wildlife | Human Health | Agri-culture | Aquatic Life | Aquatic Life | |
| Zinc | ug/l | -- | 384850 | 274850 | 1610 | -- | 320 |
| Manganese | ug/l | -- | 671000 | -- | -- | -- | -- |
| Selenium - TR | ug/l | -- | 34100 | 550 | 55 | -- | -- |

**Table 11. Parameter Assessment**

Outfall 001

*Group 1:* Due to a lack of criteria, the following parameters could not be evaluated at this time.

| | |
|---|---|
| Magnesium | Sulfates |

*Group 2:* PEQ < 25 percent of WQS or all data below minimum detection limit.
WLA not required. No limit recommended; monitoring optional.

| | | |
|---|---|---|
| Aluminum | Arsenic | Boron |
| Cadmium | Iron | Lead |
| Manganese | Molybdenum | Nickel |
| Nitrate + Nitrite | Phenol | Bis(2-ethylhexyl)phthalate |

*Group 3:* $PEQ_{max}$ < 50 percent of maximum PEL and $PEQ_{avg}$ < 50 percent of average PEL.
No limit recommended; monitoring optional.

Barium

*Group 4:* $PEQ_{max}$ >= 50 percent, but < 100 percent of the maximum PEL or
$PEQ_{avg}$ >= 50 percent, but < 100 percent of the average PEL. Monitoring is appropriate.

No Group 4 Parameters.

*Group 5:* Maximum PEQ >= 100 percent of the maximum PEL or average PEQ >= 100 percent of the average PEL, or either the average or maximum PEQ is between 75 and 100 percent of the PEL and certain conditions that increase the risk to the environment are present. Limit recommended.

Limits to Protect Numeric Water Quality Criteria

| Parameter | Units | Recommended Effluent Limits Average | Maximum |
|---|---|---|---|

PEL = preliminary effluent limit
PEQ = projected effluent quality
WLA = wasteload allocation
WQS = water quality standard

*Group 1:* Due to a lack of criteria, the following parameters could not be evaluated at this time.

| | |
|---|---|
| Magnesium | Sulfates |

*Group 2:* PEQ < 25 percent of WQS or all data below minimum detection limit.
WLA not required. No limit recommended; monitoring optional.

| | | |
|---|---|---|
| Aluminum | Arsenic | Boron |
| Cadmium | Iron | Lead |
| Manganese | Molybdenum | Nickel |
| Nitrate + Nitrite | Phenol | |

*Group 3:* $PEQ_{max}$ < 50 percent of maximum PEL and $PEQ_{avg}$ < 50 percent of average PEL.
No limit recommended; monitoring optional.

| | |
|---|---|
| Barium | Copper |

*Group 4:* $PEQ_{max}$ >= 50 percent, but < 100 percent of the maximum PEL or
$PEQ_{avg}$ >= 50 percent, but < 100 percent of the average PEL. Monitoring is appropriate.

No Group 4 Parameters.

*Group 5:* Maximum PEQ >= 100 percent of the maximum PEL or average PEQ >= 100 percent of the average PEL, or either the average or maximum PEQ is between 75 and 100 percent of the PEL and certain conditions that increase the risk to the environment are present. Limit recommended.

Limits to Protect Numeric Water Quality Criteria

| | | Recommended Effluent Limits | |
|---|---|---|---|
| Parameter | Units | Average | Maximum |
| Mercury | ng/l | 1.3 | 1700 |

PEL = preliminary effluent limit
PEQ = projected effluent quality
WLA = wasteload allocation
WQS = water quality standard

*Group 1:* Due to a lack of criteria, the following parameters could not be evaluated at this time.

| | | |
|---|---|---|
| Magnesium | Sulfates | Titanium |

*Group 2:* PEQ < 25 percent of WQS or all data below minimum detection limit.
WLA not required. No limit recommended; monitoring optional.

| | | |
|---|---|---|
| Aluminum | Arsenic | Boron |
| Iron | Molybdenum | Nickel |
| Nitrate + Nitrite | Antimony | Zinc |
| Manganese | Selenium | |

*Group 3:* $PEQ_{max}$ < 50 percent of maximum PEL and $PEQ_{avg}$ < 50 percent of average PEL.
No limit recommended; monitoring optional.

| | |
|---|---|
| Barium | Copper |

*Group 4:* $PEQ_{max}$ >= 50 percent, but < 100 percent of the maximum PEL or
$PEQ_{avg}$ >= 50 percent, but < 100 percent of the average PEL. Monitoring is appropriate.

No Group 4 Parameters.

*Group 5:* Maximum PEQ >= 100 percent of the maximum PEL or average PEQ >= 100 percent of the average PEL, or either the average or maximum PEQ is between 75 and 100 percent of the PEL and certain conditions that increase the risk to the environment are present. Limit recommended.

Limits to Protect Numeric Water Quality Criteria

| | | Recommended Effluent Limits | |
|---|---|---|---|
| Parameter | Units | Average | Maximum |

No Group 5 Parameters.

PEL = preliminary effluent limit
PEQ = projected effluent quality
WLA = wasteload allocation
WQS = water quality standard

**Table 12. Final Effluent Limits**

| Parameter | Units | Concentration 30 Day Average | Concentration Daily Maximum | Loading (kg/day)[a] 30 Day Average | Loading (kg/day)[a] Daily Maximum | Basis[b] |
|---|---|---|---|---|---|---|
| Outfall 001 | | | | | | |
| Water Temperature | °F | ---------- Monitor ---------- | | | | M |
| pH | S.U. | 6.0 - 9.0 | | -- | -- | WQS |
| Total Residual Oxidants | mg/L | | 0.05 | | | IMZM |
| Flow Rate | MGD | ---------- Monitor ---------- | | | | M |
| Chlorine, Total Residual | mg/L | -- | 0.2 | -- | -- | BAT |
| Chlorination/Brominatio n Duration | Minutes | -- | 120 | -- | -- | IMZM / BPJ |
| Outfall 002 | | | | | | |
| Total Suspended Solids | mg/L | 30 | 100 | -- | -- | BPT |
| Oil and Grease | mg/L | 15 | 20 | -- | -- | BPT |
| Copper | ug/L | ---------- Monitor ---------- | | | | M |
| Flow Rate | MGD | ---------- Monitor ---------- | | | | M |
| Mercury | ng/L | 3.7 | 1700 | 0.000042 | 0.0192 | VAR, WLA |
| pH Range Excursions Duration | Minutes | -- | 60 | -- | -- | ELG |
| pH | S.U. | 6.0 - 9.0 | | -- | -- | BPT |
| pH Range Excursions > 60 Minutes | No./Day | -- | 0 | -- | -- | ELG |
| pH Range Excursions Monthly Duration | Minutes | -- | 446 | -- | -- | ELG |
| Outfall 004 | | | | | | |
| Total Suspended Solids | mg/L | 30 | 100 | -- | -- | BPT |
| Oil and Grease | mg/L | 15 | 20 | -- | -- | BPT |
| Copper | ug/L | ---------- Monitor ---------- | | | | M |
| Total Residual Oxidants | mg/L | | 0.01 | -- | -- | BTJ |
| Flow Rate | MGD | ---------- Monitor ---------- | | | | M |
| Total Residual Chlorine | mg/L | -- | 0.038 | -- | -- | WQS |
| pH Range Excursions Duration | Minutes | -- | 60 | -- | -- | BTJ |
| pH | S.U. | 6.0 - 9.0 | | -- | -- | BPT |
| pH Range Excursions > 60 Minutes | No./Day | -- | 0 | -- | -- | BTJ |
| pH Range Excursions Monthly Duration | Minutes | -- | 446 | -- | -- | BTJ |
| Internal Monitoring Station 601 | | | | | | |
| Mercury | ng/L | ---------- Monitor ---------- | | | | M |

| Parameter | Units | Concentration | | Loading (kg/day)[a] | | Basis[b] |
|---|---|---|---|---|---|---|
| | | 30 Day Average | Daily Maximum | 30 Day Average | Daily Maximum | |
| Internal Monitoring Station 604 | | | | | | |
| pH | S.U. | ---------- Monitor ---------- | | | | M |
| Total Suspended Solids | mg/L | 30 | 100 | -- | -- | BPT |
| Oil and Grease | mg/L | 15 | 20 | -- | -- | BPT |
| Flow Rate | MGD | ---------- Monitor ---------- | | | | M |
| Internal Monitoring Station 610 | | | | | | |
| pH | S.U. | ---------- Monitor ---------- | | | | M |
| Total Suspended Solids | mg/L | -- | 50 | -- | -- | BPT |
| Flow Rate | MGD | ---------- Monitor ---------- | | | | M |
| Internal Monitoring Station 612 | | | | | | |
| Oil and Grease | mg/L | ---------- Monitor ---------- | | | | M |
| Flow Rate | MGD | ---------- Monitor ---------- | | | | M |
| Internal Monitoring Station 800 | | | | | | |
| Water Temperature | F | ---------- Monitor ---------- | | | | M |

[a] Effluent loadings based on:
Outfall 002: 2.98 MGD

[b] Definitions:

BAT = Best Available Technology Economically Achievable, Federal Effluent Guidelines, 40 CFR Part 423.13
BPJ = Best Professional Judgment
BPT = Best Practicable Control Technology Currently Available, Federal Effluent Guidelines, 40 CFR 423.12
BTJ = Best Technical Judgment
M = BTJ of Permit Guidance 2: Determination of Sampling Frequency Formula for Industrial Waste Discharges
VAR = Mercury variance (OAC 3745-33-07(D)(10)(a))
WLA = Wasteload Allocation procedures (OAC 3745-2)
WQS = Ohio Water Quality Standards (OAC 3745-1)

**Attachment 1. Applicable Federal Effluent Limitation Guidelines**

**40 CFR 423.12 - Best Practicable Control Technology Currently Available**

| Parameter (mg/L) | Daily Maximum | 30-Day Average |
|---|---|---|
| Low Volume Waste Sources (b)(3) including non-chemical metal cleaning wastes | | |
| Total Suspended Solids | 100 | 30 |
| Oil & Grease | 20 | 15 |
| Coal Pile Runoff (b)(9) | | |
| Total Suspended Solids | 50 | -- |

**40 CFR 423.13 - Best Available Technology Economically Achievable**

| Parameter (mg/L) | Daily Maximum | 30-Day Average |
|---|---|---|
| Once Through Cooling Water (b)(1) | | |
| Total Residual Chlorine | 0.2 | -- |

Total residual chlorine may not be discharged from any single generating unit for more than two hours per day.

**Attachment 2. List of Boiler/Cooling Water System Additives**

| AVON LAKE GENERATING STATION<br>CHEMICAL ADDITIVES LIST | | | |
|---|---|---|---|
| **NO.** | **CHEMICAL** | **USE** | **STORAGE LOCATION** |
| | | | |
| 1 | AMMONIA 19% | BOILER PH CONTROL | 5676 GAL BULK OUTSIDE STORAGE TANK LOCATED IN TRANSFORMER YARD |
| | | | |
| 2A | SODIUM HYDROXIDE (CAUSTIC) | REGENERATION OF CONDENSATE POLISHER RESINS & PH ADJUST MENT ON NEUTRALIZATION TANK | 4,000 GAL AUX. BULK STORAGE TANK<br>5,000 GAL MAIN BULK STORAGE TANK<br>UNIT 9 SOUTHSIDE |
| 2B | SODIUM HYDROXIDE (CAUSTIC) | NON-CHEMICAL METAL CLEANING WASTEWATER PH ADJUSTMENT | 250-GAL TOTES IN PACKAGE BOILER ROOM |
| | | | |
| 3 | SULFURIC ACID | REGENERATION OF CONDENSATE POLISHER RESINS & PH ADJUST MENT ON NEUTRALIZATION TANK | 5,000 GAL BULK OUTSIDE STORAGE TANK LOCATED IN TRANSFORMER YARD |
| | | | |
| 4 | COARSE SOLAR SALT | R/O SOFTENER REGENERATION | 30 TON BULK OUTSIDE STORAGE TANK LOCATED IN TRANSFORMER YARD |
| | | | |
| 5 | AS-2821 POLYMER | ASH POND TSS TREATMENT | 200 GALLON TOTES, UNIT 7 ID FAN HOUSE |
| | | | |
| 6 | AS-1012 POLYMER | COAL PILE RUNOFF POND TREATMENT | 50 LB. BAGS, CPRO TREATMENT BUILDING |
| | | | |
| 7A | LIME | COAL PILE RUNOFF POND TREATMENT | BULK LIME SILO, CPRO TREATMENT BUILDING |
| 7B | LIME | OILY POND PH CONTROL | 50 LB BAGS IN STORAGE SHED |
| 7C | LIME | ASH BASIN PH CONTROL | 50 LB BAGS IN STORAGE SHED |
| | | | |
| 8 | MEKOR 6701 CORROSION INHIBITOR | FEEDWATER TREATMENT, UNIT 7 BOILER | 120 GALLON TOTES, UNIT 7 TURBINE BASEMENT SOUTHSIDE |
| | | | |
| 9 | SLCC-D | PH CONTROL, UNIT 7 BOILER | 120 GALLON TOTES, UNIT 7 TURBINE BASEMENT SOUTHSIDE |
| | | | |
| 10A | SODIUM BISULFATE | OILY POND PH CONTROL | 50 LB BAGS IN STORAGE SHED |
| 10B | SODIUM BISULFATE | ASH POND PH CONTROL | 50 LB BAGS IN STORAGE SHED |
| | | | |

| AVON LAKE GENERATING STATION<br>CHEMICAL ADDITIVES LIST | | | |
|---|---|---|---|
| NO. | CHEMICAL | USE | STORAGE LOCATION |
| 11 | SODIUM BISULFITE | DECHLORINATION OF R/O FEED | 50 LB BAGS |
| | | | |
| 12 | TRISODIUM PHOSPHATE | UNIT 7 BOILER TREATMENT | 50 LB BAGS |
| | | | |
| 13A | CHLORINE | CHLORINATION OF FEEDWATER FOR NON-CONTACT COOLING | (NOT CURRENTLY STORED ON SITE) |
| 13B | CHLORINE | UNIT 9 MAIN TURBINE OIL COOLER | (NOT CURRENTLY STORED ON SITE) |
| | | | |
| 14 | SOIL-SEMENT | CRUSTING AGENT FOR COAL PILE | (NOT CURRENTLY STORED ON SITE – APPLIED BY CONTRACTOR) |
| | | | |
| 15 | HAUL ROAD DUST CONTROL | DUST SUPRESSANT FOR COAL PILE AREA AND HAUL ROAD | 55-GAL DRUMS NEAR BEARING SEAL WATER TANK |
| | | | |
| 16 | HALOKLEAR™ LBP-2101 | NON-CHEMICAL METAL CLEANING WASTEWATER FLOCCULATION AND CLARIFICATION | (NOT CURRENTLY STORED ON SITE – CONTRACTOR SUPPLIES IN 250-GAL TOTE) |
| | | | |
| 17 | HALOKLEAR™ LIQUIFLOC 2% | NON-CHEMICAL METAL CLEANING WASTEWATER FLOCCULATION | 250-GAL TOTE IN PACKAGE BOILER ROOM |
| | | | |
| 18 | ANODAMINE™ HPFG | CORROSION PROTECTION DURING LAYUP OF BOILER | 250-GAL TOTES IN UNIT 7 TURBINE BASIN |

**Addendum 1. Acronyms**

| | |
|---|---|
| ABS | Anti-backsliding |
| BAT | Best Available Technology Economically Achievable |
| BCT | Best Conventional Pollutant Control Technology |
| BPJ | Best professional judgment |
| BPT | Best Practicable Control Technology Currently Available |
| BTJ | Best technical judgment |
| CFR | Code of Federal Regulations |
| CONSWLA | Conservative substance wasteload allocation |
| CWA | Clean Water Act |
| CWIS | Cooling water intake structure |
| DMR | Discharge Monitoring Report |
| DMT | Dissolved metal translator |
| ELG | Federal effluent limitation guideline |
| gpm | Gallons per minute |
| IMZM | Inside mixing zone maximum |
| MDL | Analytical method detection limit |
| MGD | Million gallons per day |
| NPDES | National Pollutant Discharge Elimination System |
| NSPS | New source performance standards |
| OAC | Ohio Administrative Code |
| Ohio EPA | Ohio Environmental Protection Agency |
| ORC | Ohio Revised Code |
| ORSANCO | Ohio River Valley Water Sanitation Commission |
| PEL | Preliminary effluent limit |
| PEQ | Projected effluent quality |
| PMP | Pollution Minimization Program |
| PPE | Plant performance evaluation |
| SIC | Standard Industrial Classification |
| TBEL | Technology-based effluent limit |

| | |
|---|---|
| TMDL | Total Daily Maximum Load |
| TRE | Toxicity reduction evaluation |
| TU | Toxicity unit |
| U.S. EPA | United States Environmental Protection Agency |
| WET | Whole effluent toxicity |
| WLA | Wasteload allocation |
| WQBEL | Water-quality-based effluent limit |
| WQS | Water Quality Standards |

Ohio Environmental Protection Agency

# Division of Surface Water
# Response to Comments

**Facility: NRG Power Midwest LP – Avon Lake Generating Station**
**Permit #: 3IB00002**

**Agency Contacts for this Project**

Division District Contact: Zorica Dejanovic, (330) 963-1222,
Zorica.dejanovic@epa.ohio.gov
Central Office Contact: Cole Miller, (614) 728-3846, cole.miller@epa.ohio.gov

Ohio EPA held a courtesy preview period from August 18 to September 1, 2017, regarding NRG Power Midwest LP – Avon Lake Generating Station.

Ohio EPA subsequently provided revised language on September 28, 2017, based on new U.S. EPA rule promulgation and provided additional time for comment. Ohio EPA received an additional response on October 11, 2017. This document summarizes the comments and questions received during the associated comment period.

Copper monitoring

**Comment 1:** **The permittee requests that copper monitoring be eliminated for outfalls 002 and 004. If Ohio EPA does not agree, the permittee proposes quarterly sampling.**

**Response 1:** Outfalls 002 and 004 copper monitoring have been changed to quarterly monitoring. Outfall 002 was previously monthly and Outfall 004 was previously weekly.

Monthly flow rates for Outfalls 002 and 004

**Comment 2:** **The permittee requested that the previous 3.38 MGD be used for Outfall 002 and 3.35 MGD be used for Outfall 004 to calculate respective loadings. In a follow-up discussion, the permittee alternatively proposed 2.98 MGD for Outfall 002 which corresponds with the maximum flow value for the last 5 years.**

**The permittee provided analysis indicating that the unit has been at lower capacity for the last five years and that 2.98 MGD only corresponds with 24% of the design flow of the combined wastewater treatment system.**

**Response 2:** The loadings for Outfall 002 have been changed to correspond with 2.98 MGD. Ohio EPA agrees to this change on the basis that flows may be higher in the future.

The footnote for Outfall 004 related to flow has been removed as there are no loadings for this table.

Mercury Intake Credit

**Comment 3:** **The permittee requests a net intake credit for mercury on the basis that the intake mercury concentration was 2.4 ng/L compared to the proposed limit of 3.7 ng/L.**

**Response 3:** This change has not been made. Federal and Ohio rules allow for a "no net addition" intake credit (see OAC 3745-2-06(C).) Certain requirements must be met to qualify, including that the discharger is not contributing any additional mass to the waste water. Ohio EPA believes that the bottom ash transport water may contribute some mercury although the reported concentrations are typically lower than 2.0 ng/L

The permittee may comment during the public comment period on the applicability of the "no net addition" intake credit. But the rules do not allow for a net intake with additions (i.e., the permittee would report the effluent minus the intake).

Monitoring Station 611 Removal

**Comment 4:** **The permittee requests that internal monitoring station 611 for non-chemical metal cleaning wastes be removed. The station is tributary to 002 and the limits are redundant.**

**Response 4:** This change has been made. Outfall 611 has been removed from the permit.

Interim Compliance with 316(b)

**Comment 5:** **The permittee requested that the interim requirement to determine the feasibility of variable speed pumps be removed. In lieu of the requirement, the permittee proposes to determine the feasibility of reducing flow when the station is offline.**

**Response 5:** This change has been made.

Bottom Ash Transport Water ELG

**Comment 6:** **The permittee requests that the zero-discharge of the bottom ash transport water ELG be removed due to the stated intentions of the U.S. EPA to reconsider the rule and further delay the "as soon as possible" date if a revised rule has not been promulgated.**

**Response 6:** Ohio EPA has revised the "as soon as possible" date within the permit to no later than December 31, 2023. Additional language is proposed if the ELGs are modified. See the fact sheet and permit part II language for more discussion.

Other changes

**Comment 7:** **The permittee provided the appropriate permittee name (NRG Power Midwest LP), an updated list of approved boiler / cooling water system additives, an updated wastewater flow diagram, and a clarification of the location of station 3IB00002601.**

**Response 7:** These changes were all made.

**End of Response to Comments**

Sincerely,

Cole Miller
Division of Surface Water

cc: Zorica Dejanovic, NEDO-DSW
permit file 3IB00002

Ohio EPA
State of Ohio Environmental Protection Agency

Director's Office Number: _____

# COVER MEMO

☐ Director's Signature (Stamp) ☐ DRAFT – Governor's Signature ☐ Assistant Director's Signature
"Highlight"

☐ Deputy Director's Signature ☐ Background Investigation Report – CONFIDENTIAL

Subject: (MCR# _____ ) Draft NPDES Renewal for NRG Avon Lake w/Factsheet

Prepared by: Debbie Stiteler Division: DSW Date: 10 / 26 / 2017

Blind Copies: Cole Miller

| NECESSARY APPROVALS | APPROVED BY | DATE |
|---|---|---|
| ☐ Assistant Director (Factor) | | / / |
| ☐ Chief Legal Counsel (Anderson) | | / / |
| ☐ Deputy Director, Communication | | / / |
| ☐ Deputy Director for Water Resources | | / / |
| ☐ Deputy Director for Business Relations | | / / |
| ☐ Director's Office, Rules Coordinator | | / / |
| ☒ Legal Please return to DSW after review | Bill Ph | 11 / 22 / 17 |
| ☐ Other | | / / |
| ☐ Other | | / / |

| DISTRICT PERSONNEL INFORMATION | | | DIVISION PERSONNEL INFORMATION | | |
|---|---|---|---|---|---|
| Approvals: | | Date: | Approvals: | w/comments | Date: |
| Supervisor | | / / | Unit Supervisor | Ashley Wand | 11 / 21 / 2017. |
| Manager | | / / | Section Manager | | / / |
| Assistant Dist. Chief | | / / | Assistant Chief | | / / |
| District Chief | | / / | Chief | | / / |
| Other | | / / | Other | | / / |
| Other | | / / | Other | | / / |

RETURN ALL SUPPORTING DOCUMENTS TO:

Name: Debbie Stiteler Division: DSW

Document Name: _____ WPS Initials _____ Date: / /

Attachments: CC: ☐ Yes ☐ No BC: ☐ Yes ☐ No

Other: _____ PDF emailed to: _____

Revised: July 2017

Debbie,

FS & SWIMS have been changed.
I'll e'mail the documents.

Cole

Potential appeal

# LEGAL SHEET

| | |
|---|---|
| Facility: | NRG Avon Lake |
| Permit Number: | 3IB00002 |
| Date: | 10/18/2017 |
| Staff: | Cole Miller |

| QUESTION: | RESPONSE: |
|---|---|
| Identify key changes to permit's terms and conditions from previous permit | Implementation of new ELGs and 316(b) requirements.<br>The permittee is required to eliminate bottom ash transport water by December 31, 2023.<br>The permittee is required to submit all 316(b) requirements by February 1, 2020, and, within 12 months of permit issuance, determine the feasibility of reducing intake flow when the plant is not operating. |
| Did permittee comment on the draft permit? | Yes. The permittee commented on the preview period. |
| Did Ohio EPA make changes based on comments? If so, identify. | Yes.<br>• Copper monitoring was reduced to quarterly<br>• Flow used for loading calculations was modified.<br>• An internal monitoring outfall was removed which duplicated the final effluent limits.<br>• The interim 316(b) requirements were changed from a variable speed pump to only reducing flow during times when the plant was not operating. |
| Identify issues that were not changed based on comments? | • The permittee requested the ELG bottom ash transport water requirement to be removed and for Ohio EPA to instead have a re-opener clause to modify the permit when the rules were revised.<br>• The permittee requested an additions intake credit which is not allowable under Ohio rules.<br>• The permittee requested copper monitoring be eliminated and that an even higher flow be used. |
| Are there changes in the permit from the draft to final that the permittee is unaware of or that are so significant that they could argue that they did not have an opportunity to comment on? | N/A. |
| Based on your knowledge of this permit and the permittee, do you anticipate an appeal of any terms and conditions of the permit? | The bottom ash transport water elimination could potentially be appealed. |
| Did US EPA comment on the proposed permit? Did we make any changes to the permit based on comments? Are there any continuing concerns? | N/A. They will review it during the PN period. |
| Are there any concerns regarding 208 issues? | No. |
| For WQBELs, does record include documentation of economic/technical considerations? | Yes. |
| For non-governmental entities, confirmation of legal status of | Yes. |

| QUESTION: | RESPONSE: |
|---|---|
| Was permit renewal application submitted at least 180 days prior to expiration? If no, how many days was it submitted prior to expiration? | Yes. |
| Are there terms and conditions in the permit that reference or tie in legal authority of other governmental agencies? | No. |
| Are there any outstanding/continuing violations of the previous permit? | No. |
| Do you have any other legal concerns about the terms and conditions? | No. |

318-2

**Peterson, Katrina**

**From:** Miles Horton <miles.horton@sierraclub.org>
**Sent:** Friday, June 10, 2016 1:28 PM
**To:** Peterson, Katrina
**Subject:** FirstEnergy Bay Shore NPDES Renewal Service List

Dear Katrina:

Hope all is well. Thank you again for your help a couple months back putting me on the Avon Lake service list.

Would it be possible to also put myself and tony.mendoza@sierraclub.org on the list to be notified when a draft NPDES permit for the FirstEnergy Bay Shore station (facility ID no. 0448020006) is published for public comment? Thank you in advance!

Regards,

Miles

--

Miles Horton
Legal Assistant
Sierra Club Environmental Law Program
2101 Webster Street, Suite 1300
Oakland, CA 94612
Phone: 415-977-5629

~~3P0~~ - 2

3IB-2

**Peterson, Katrina**

**From:** Miles Horton <miles.horton@sierraclub.org>
**Sent:** Friday, May 13, 2016 2:49 PM
**To:** Peterson, Katrina
**Subject:** Re: Avon Lake NPDES Renewal Service List

Katrina -

Thanks for following up! Would you be able to get us on to the service list for the NRG permit? (Just to be clear, we want to be notified when the draft permit is issued, not only the final permit.) If not, who should I reach out to? Appreciate your help.

Regards,

Miles

On Fri, May 13, 2016 at 11:42 AM, katrina.peterson@epa.ohio.gov <katrina.peterson@epa.ohio.gov> wrote:

It has not yet been drafted internally. Will probably be a couple months or longer.

**From:** Miles Horton [mailto:miles.horton@sierraclub.org]
**Sent:** Friday, May 13, 2016 2:32 PM

**To:** Peterson, Katrina
**Subject:** Re: Avon Lake NPDES Renewal Service List

Hi Katrina,

Wanted to reach out - realized that this is not the permit we are looking for. Sierra Club is hoping to obtain a copy of the NRG Avon Lake power plant draft NPDES permit, as well as the fact sheet, any related documents, and the comment deadline. (I have attached the facility's Form 1 below so that there will be no confusion as to the facility ID.) Would you be able to pass that along as soon as you get a chance? Thank you in advance!

Regards,

Miles

OhioEPA

John R. Kasich, Governor
Mary Taylor, Lt. Governor
Craig W. Butler, Director

October 06, 2014

RE: Renewal of OEPA Permit No. 3IB00002*KD
App. No. OH0001112
Expiring Jul-31-2015

NRG Power Midwest LP - Avon Lake Power Plant
121 Champion Way, Suite 200
Canonsburg, PA 15317

Dear Environmental Dept. Representative:

Enclosed is one copy of Form 1 and 2Capplications for renewal of your National Pollutant Discharge Elimination System (NPDES) permit. If the facility discharges storm water associated with industrial activity, excluding construction and that wastestream is to be authorized by the renewal permit then you must also submit a Form 2F. If a different form is needed it may be obtained by calling (614) 644-2001 or by going to the Ohio EPA website http://www.epa.state.oh.us/dsw/permits/npdesform.html.

In the space provided for "EPA I.D. number" in the application, use the NPDES number, which for your permit, is 3IB00002 . File two paper copies of the application with the appropriate Ohio EPA District Office - Northeast District Office 2110 East Aurora Rd, Twinsburg, OH 44087. Do not file the paper application with the U.S. EPA.

Filing of this application for the NPDES permit does not relieve you of the responsibility of filing applications for other permits that may be appropriate. Regulation requires this application to be signed only by the person authorized as described in the instructions Section B, Form 1. The application must be received by the Ohio EPA no later than 180 days prior to the expiration date of your permit, unless the permit contains an earlier submittal date.

Revised Code 3745.11 requires that a non-refundable application fee of $200.00 accompany the application. The check should be made payable to the "Treasurer of the State of Ohio".

In order to address issues related to OAC 3745-1-05 (Antidegradation Rule), also complete and submit the enclosed antidegradation addendum.

Should there be any questions regarding this matter, please feel free to contact the Northeast District Office at 330-963-1200.

Sincerely,

Ed Swindall

91 7108 2133 3934 6272 0368

Ed Swindall, Supervisor
Permit Processing Unit
Division of Surface Water

Certified Mail
Enclosures: Antidegradation , Form 1 and 2C

cc: DSW- NEDO, Lorain County Contact

OhioEPA

John R. Kasich, Governor
Mary Taylor, Lt. Governor
Craig W. Butler, Director

03/13/2015

NRG Power Midwest LP
Attn: Nate Rozic
33570 Lake Road
Avon Lake, OH 44012

RE: Findings and Orders
NPDES
Lorain County
NPDES Permit 3IB00002

Transmitted herewith is one copy of the Director's Final Findings and Orders in the referenced matter.

You are hereby notified that this action of the Director is final and may be appealed to the Environmental Review Appeals Commission pursuant to Section 3745.04 of the Ohio Revised Code. The appeal must be in writing and set forth the action complained of and the grounds upon which the appeal is based. The appeal must be filed with the Commission within thirty (30) days after notice of the Director's action. The appeal must be accompanied by a filing fee of $70.00, made payable to "Ohio Treasurer Josh Mandel", which the Commission, in its discretion, may reduce if by affidavit you demonstrate that payment of the full amount of the fee would cause extreme hardship. Notice of the filing of the appeal shall be filed with the Director within three (3) days of filing with the Commission. Ohio EPA requests that a copy of the appeal be served upon the Ohio Attorney General's Office, Environmental Enforcement Section. An appeal may be filed with the Environmental Review Appeals Commission at the following address:

Environmental Review Appeals Commission
17th Floor, 77 South High Street
Columbus, OH 43215

Ed Swindall

Ed Swindall, Supervisor
Permit Processing Unit
Division of Surface Water

91 7108 2133 3937 4601 6897

ERS/SH
Certified Mail

cc: T. Parry, DSW/NEDO
S. Hise, DSW
Permit File (3IB00002)
Journal Room

Date Issued: March 13, 2015
Date Effective: March 13, 2015

OHIO E.P.A.
MAR 13 2015

BEFORE THE
OHIO ENVIRONMENTAL PROTECTION AGENCY

In the matter of: NRG Power Midwest LP : Director's Final Findings
Boiler Water Additive Request : and Orders

Pursuant to the Ohio Revised Code Section 6111.03(H)(4), the Director of the Ohio Environmental Protection Agency (Ohio EPA) hereby makes the following Findings and issues the following Orders:

## FINDINGS

1. NRG Power Midwest LP owns and operates Avon Lake Generating Station, a steam-electric power generating facility, located on 33570 Lake Road, Avon Lake, Ohio.

2. NRG Power Midwest LP currently holds an NPDES permit (No. 3IB00002, OH0001112) for the discharge of wastewater to Lake Erie.

3. Part II, Other Requirements, C of the aforementioned NPDES permit requires that, "In the event that the permittee's operation shall require the use of cooling or boiler water treatment additives that are discharged to surface waters of the state, written permission must be obtained from the Ohio Environmental Protection Agency prior to use. Reporting and testing requirements to apply for permission to use additives can be obtained from the Ohio EPA, Central Office, Division of Surface Water, Water Resources Management Section. Reported information will be used to evaluate whether the use of the additive(s) at the concentrations expected in the final discharge will be harmful or inimical to aquatic life."

4. On January 5, 2015, NRG Power Midwest LP applied to the Ohio EPA to receive written permission for the use Anodamine Inc.'s Anodamine HPFG in the boiler water make-up system as a corrosion inhibitor. All discharges are through Outfall 001, which discharges to Lake Erie.

5. The proposed discharge concentrations of the Anodamine HPFG additive entering Lake Erie is 0.0 mg/L.

6. The static acute bioassay information contained in NRG Power Midwest LP's January 5, 2015 application adequately demonstrates the proposed discharge concentrations listed above should not be harmful or inimical to aquatic life, as determined by the procedures in OAC Rules 3745-1-36 and OAC Chapter 3745-2.

This is an electronic copy of the official documents as filed in the records of the Ohio Environmental Protection Agency.

7. The Director has given consideration to, and based his determination on, evidence relating to the technical feasibility and economic reasonableness of complying with these Orders and to evidence relating to conditions calculated to result from compliance with these Orders, and its relation to the benefits to the people of the State to be derived from such compliance in accomplishing the purposes of Chapter 6111 of the Revised Code.

## ORDERS

1. The proposed use of the additive at NRG Power Midwest LP is approved and is subject to compliance with all applicable laws, rules, regulations, standards, and the conditions contained herein.

   A. Ohio EPA recognizes that the authorized discharge concentration the additive in these Findings and Orders is less than the analytical quantification level for these product residuals. NRG Power Midwest LP shall control dosing, recycle rates and any treatment to ensure that the discharge will achieve the discharge concentrations.

2. In order to make an alternative proposal, or if additional cooling water additives are needed, a separate request must be submitted to the Ohio EPA, Division of Surface Water, Permit and Compliance Section, Industrial Permits Unit.

3. The cooling water additive treatment program may only be applied in accordance with the proposal approved by the Director of the Ohio Environmental Protection Agency. There may be no deviation from the approved proposal without the express, written approval of the Agency. Any deviation from the proposal or the above conditions may lead to revocation of these Findings and Orders and/or other sanctions and penalties provided under Ohio law. Approval of this proposal does not constitute an assurance that the cooling water additive treatment program will operate in compliance with all Ohio laws and regulations. Additionally, the terms and conditions of this approval do not relieve a permitted facility from complying with all monitoring requirements and effluent limitations that have been established in its NPDES permit.

IT IS SO ORDERED:

Ohio Environmental Protection Agency

Craig W. Butler
Director

3-11-15
Date

Ohio EPA
State of Ohio Environmental Protection Agency

Director's Office Number: 38457

## COVER MEMO

☒ Director's Signature ☐ DRAFT – Governor's Signature ☐ Assistant Director's Signature

☐ Deputy Director's Signature ☐ Background Investigation Report – CONFIDENTIAL

Subject: (MCR# _____) NRG Power Midwest LP - Additive Request

Prepared by: Sara Hise Division: DSW Date: 02 / 23 / 2015

Blind Copies:

| NECESSARY APPROVALS | APPROVED BY | DATE |
|---|---|---|
| ☐ Assistant Director (Factor) | | / / |
| ☐ Assistant Director (Canepa) | | / / |
| ☐ Chief Legal Counsel | | / / |
| ☐ Deputy Director, Communication | | / / |
| ☐ Deputy Director for Water Resources | | / / |
| ☐ Director's Office, Rules Coordinator | | 3/5/15 |
| ☒ Legal | Bill Ahl w/ quest | / / |
| ☐ Other | | / / |
| ☐ Other | | / / |

| DISTRICT PERSONNEL INFORMATION | | | DIVISION PERSONNEL INFORMATION | | |
|---|---|---|---|---|---|
| Approvals: | | Date: | Approvals: | | Date: |
| Supervisor | | / / | Unit Supervisor | | / / |
| ...anager | | / / | Section Manager | | 3/4/15 |
| Assistant Dist. Chief | | / / | Assistant Chief | | 3/9/15 |
| District Chief | | / / | Chief | | 3/9/15 |
| Other | | / / | Other | | / / |
| Other | | / / | Other | | / / |

RETURN ALL SUPPORTING DOCUMENTS TO:

Name: Marie Barnett (614)-644-2139 Division: DSW

Document Name: WPS Initials Date: / /

Attachments: CC: ☐ Yes ☐ No BC: ☐ Yes ☐ No

Other: PDF emailed to:

OhioEPA

**John R. Kasich**, Governor
**Mary Taylor**, Lt. Governor
**Craig W. Butler**, Director

91 7108 2133 3937 4602 0399

April 8, 2015

Re: NPDES Permit Transfer/Name Change
Ohio EPA Permit No.3IB00002*KD
Application No.OH0001112
Facility Name: Avon Lake Generating Station

Daniel A. Rogatto
NRG Power Midwest LP
33570 Lake Road
Avon Lake OH 44012

Ladies and Gentlemen:

Ohio EPA has received a notice of intent to transfer the above permit. Pursuant to Ohio Revised Code 6111.03(J) and Ohio Administrative Code 3745-33-04, the proposed transfer of the Ohio National Pollutant Discharge Elimination System permit is hereby approved. In accordance with the terms and conditions conveyed in the agreement to transfer the permit, the effective date of the transfer shall be April 28, 2013

NRG Power Midwest LP, the permittee, shall assume all responsibility, coverage, and liability specified in the permit.

Sincerely,

Ed Swindall

Ed Swindall, Supervisor
Administrative Officer 1

ERS/kep

Enclosure

**CERTIFIED MAIL**

cc: Mike Stevens, NEDO
Journal Room
File

Application No. OH0001112

Issue Date: June 28, 2011

Effective Date: August 1, 2011

Expiration Date: July 31, 2015

Ohio Environmental Protection Agency
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., hereinafter referred to as the "Act"), and the Ohio Water Pollution Control Act (Ohio Revised Code Section 6111),

NRG Power Midwest LP
Avon Lake Generating Station

is authorized by the Ohio Environmental Protection Agency, hereinafter referred to as "Ohio EPA," to discharge from the Avon Lake Generating Station wastewater treatment works located at 33570 Lake Road, Avon Lake, Ohio, Lorain County and discharging to Lake Erie in accordance with the conditions specified in Parts I, II, III, IV, V, and VI of this permit.

This permit is conditioned upon payment of applicable fees as required by Section 3745.11 of the Ohio Revised Code.

This permit and the authorization to discharge shall expire at midnight on the expiration date shown above. In order to receive authorization to discharge beyond the above date of expiration, the permittee shall submit such information and forms as are required by the Ohio EPA no later than 180 days prior to the above date of expiration.

Craig W. Butler
Director

Total Page: 47

Application No. OH0001112

Issue Date: June 28, 2011

Effective Date: August 1, 2011

Expiration Date: July 31, 2015

RECEIVED
JUN 30 2011
OHIO EPA NEDO

Ohio Environmental Protection Agency
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., hereinafter referred to as the "Act"), and the Ohio Water Pollution Control Act (Ohio Revised Code Section 6111),

~~GenOn Power Midwest, L.P.~~
~~Avon Lake Power Plant~~
NRG Power Midwest LP
dba
Avon Lake Generating Station

is authorized by the Ohio Environmental Protection Agency, hereinafter referred to as "Ohio EPA," to discharge from the wastewater treatment works located at 33570 Lake Road, Avon Lake, Ohio, Lorain County and discharging to Lake Erie in accordance with the conditions specified in Parts I, II, III, IV, V, and VI of this permit.

This permit is conditioned upon payment of applicable fees as required by Section 3745.11 of the Ohio Revised Code.

This permit and the authorization to discharge shall expire at midnight on the expiration date shown above. In order to receive authorization to discharge beyond the above date of expiration, the permittee shall submit such information and forms as are required by the Ohio EPA no later than 180 days prior to the above date of expiration.

Scott J. Nally
Director

Total Page: 47

NRG Power Midwest LP
Avon Lake Generating Station
33570 Lake Road
Avon Lake, OH 44012

March 31, 2015

*VIA ELECTRONIC SUBMITTAL*

Mr. Tomas Parry
Environmental Engineer II
Ohio EPA Northeast District Office
Division of Surface Water
2110 E. Aurora Road
Twinsburg, Ohio 44087-1924

**Re: Transfer of NPDES Permit Number 3IB00002**
**NRG Power Midwest LP Avon Lake Generating Station**

Dear Mr. Parry,

In response to your 3/30/15 request, please find enclosed an application form to transfer the above permit from GenOn Power Midwest, L.P. to NRG Power Midwest LP.

As mentioned, prior coordination and communication with the agency occurred regarding the name change; however this submission fulfills the formal request to complete the transfer form. This was a name change only that became effective 5/28/13. There was no change in owner/ operator of the facility.

If you have any questions regarding this submittal, please contact Scott Cameron at (440) 930-6564 or via email at scott.cameron@nrg.com, or Nate Rozic at (724) 597-8630 or via email at nathan.rozic@nrg.com.

Respectfully submitted,

Daniel A. Rogatto
Plant Manager
Avon Lake Generating Station

Enclosure

cc: Scott Cameron- Avon Lake Generating Station
Nate Rozic- NRG Energy, Inc.

| For Agency Use | Facility Name: | Date Received (yy/mm/dd): |
|---|---|---|
| | Ohio EPA Permit Number: | Application No.: |

OhioEPA

# Division of Surface Water
# Application for Transfer of Ohio NPDES Permit

*Instructions: Submit the completed form below with the original signatures of the previous and new owners or those responsible for the permit. A letter will be sent to the transferee and a copy of the letter will be sent to the transferor after the application is reviewed.*

**A. Existing Permit Holder Information (Transferor)**

1. Facility Permit Number: 3IB00002

2. Application Number: OH 0001112

3. Permittee Name: GenOn Power Midwest, L.P.

4. Facility Name: Avon Lake Power Plant

5. Mailing Address After Transfer: 33570 Lake Road Avon Lake, OH 44012

**B. Proposed Permit Holder Information (Transferee)**

1. Permittee Name (New): NRG Power Midwest LP

2. Phone Number: (440) 930-6426

3. Facility Name (New): Avon Lake Generating Station

4. Mailing Address for all permit related correspondence: 33570 Lake Road Avon Lake, OH 44012

5. Facility Mailing Address (if different):

6. Individual authorized to sign applications and Transfer Agreement pursuant to OAC 3745-33-03(F) (principal executive officer, vice president or higher for a corporation; a general partner of a partnership; the proprietor of a proprietorship; principal executive officer, ranking elected official or duly authorized employee of a public entity):

William Lee Davis, President of NRG Power Midwest GP LLC, NRG Power Midwest LP's general partner

Authorized Individual

7. Authorization: Pursuant to 40 CFR Part 122.22(b), the individual or position, identified in this space is duly authorized by the individual in Item 6 to sign all reports required by permit and other information that may be required by the Director:
Daniel A. Rogatto / Plant Manager Avon Lake Generating Station

Name/Title/Position

8. Operator of Facility

Name: NRG Power Midwest LP

Address: 121 Champion Way Suite 300 Canonsburg, PA 15317

9. Contact Person for facility information or inspections:

| Name: Scott Cameron | Phone: (440) 930-6564 |
|---|---|

10. Describe any material modifications to production or facilities, subsequent to the transfer, which may alter the volume or characteristics of this discharge: *(Attach additional pages as necessary)*
N/A

10. Continued

**Agreement to Transfer Permit**

GenOn Power Midwest, L.P. *(Transferor)* as the holder of an NPDES Permit which stipulates responsibilities, coverage and liability for operations involving discharges of wastewater from the facility located at 33570 Lake Road Avon Lake, OH 44012 *(Facility Location)* hereby applies for approval of the Director to transfer the permit responsibility, coverage and liability to NRG Power Midwest LP *(Transferee)*.

GenOn Power Midwest, L.P. *(Transferor)* agrees to continue to assume the responsibility for compliance with all terms, limitations and conditions and any coverage or liability thereunder for the period ending on May 28, 2013 *(Date)*. NRG Power Midwest LP *(Name of New Permitee)* as the proposed new permittee, hereby agrees to assume the responsibility for compliance with the entirety of the coverage, responsibility and liability of the permit commencing on May 28, 2013 *(Date)*.

In witness whereof, the parties have executed this Agreement on May 28, 2013 *(Date)*, it is so agreed.

| Transferor *(Company name)*: GenOn Power Midwest, L.P. | Transferee *(Company name)*: NRG Power Midwest LP by NRG Power Midwest |
|---|---|
| By *(Company Representative signature)*: | By *(Company Representative signature)*: |
| Title: Plant Mgr | Title: Plant Mgr |

12. By signing this form, I (transferee), certify and acknowledge that I have read and fully understood terms and conditions of NPDES Permit Number: 3IB00002 .

I certify under penalty of law that the information submitted is 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.

Transferee Signature:

Title: Plant Manager

Date: 3-31-15

# INTER-OFFICE COMMUNICATION

TO: **Ed Swindall, DSW, Columbus**

FROM: Permits & Compliance, DSW NEDO

Date to CO: 4/1/15

SUBJECT/Entity: NRG Power Midwest LP *KP

NPDES No.: 3IB00002

| ANTIDEGRADATION STATUS | ANTIDEG ☐ NON ANTIDEG ☑ | | |
|---|---|---|---|
| Permit Action | NEW___ REV__ MOD___ NPR__ REN____ TRAN / | Major / Minor ___ | Agent T. Parry |

## THE FOLLOWING ITEMS ARE INCLUDED IN THIS NPDES PACKAGE

☐ Draft Permit Action

2. ☐ Limitation Justification Report - NEDO File Only

3. ☐ Reasonable Potential Calculation

4. ☐ Antidegradation SEJ

5. ☐ Application Updates/Additions

6. Other: Name change/ Transfer

## ADDITIONAL INFORMATION

-permit Inspection Date: N/A

Pre-permit Letter Sent: Yes ____ No ____

Flow Data:

| Outfall | Flow (gpd)* | Outfall | Flow (gpd) |
|---|---|---|---|
| | | | |
| N/A | | | |
| | | | |
| | | | |

* value used for loading calculation

Compliance Status with Expired Permit => ☐ Compliance ☐ Noncompliance ☐ Significant ☑ NA

Comments: changing name from GenOn Power Midwest LP to NRG Power Midwest LP

**Supervisor:** Dean Stidd **Date:** 3/31/15

10 EPA-DSW
JAN 28 PM 1:24

**NRG Power Midwest LP**
**Avon Lake Generating Station**
33570 Lake Road
Avon Lake, OH 44012

**VIA TRACKED DELIVERY**

January 19, 2015

Mr. Eric Nygaard
Ohio Environmental Protection Agency
Division of Surface Water
50 West Town Street, Suite 700
Columbus, OH 43216

**NRG Power Midwest LP**
**Avon Lake Generating Station**
**NPDES Permit No. 3IB00002*KD**
**General Mercury Variance**
**Fourth Annual PMP Progress Report**

Dear Mr. Nygaard:

As per the requirements of Items K.1.g.i. through K.1.g.iv. of Part II of the Avon Lake Generating Station's NPDES Permit No. 3IB00002*KD, NRG Power Midwest LP (NRG Power), as a subsidiary of NRG Energy, Inc. (NRG), is providing this report to comply with the obligations for submittal of an annual Pollutant Minimization Program (PMP) progress report by March 1 of each Calendar Year. This correspondence represents the fourth annual report submitted to the Ohio Environmental Protection Agency (OEPA), following the effective date of the General Mercury Variance on August 1, 2011 (as part of the renewed NPDES Permit). It is further noted that the current report has been prepared slightly in advance of the "normal" timeframe for submittal (typically by March 1 of each subsequent Calendar Year). This has been done in order to satisfy Item M.2. of the NPDES Permit, specific to one component of the documentation necessary to apply for renewal of the General Mercury Variance.

The initial annual progress report (dated February 24, 2012) summarized the status of activities through the first seven months of Year 1 of the variance. The second annual progress report (dated February 14, 2013) summarized the activities performed during the final five months of Year 1 (March 2012 thru July 2012), and the first seven months of Year 2 (August 2012 thru February 2013). The third annual progress report (dated February 19, 2014) summarized the activities performed during the final five months of Year 2 (March 2013 thru July 2013), and the first seven months of Year 3 (August 2013 thru February 2014). The current report summarizes the activities performed during the final five months of Year 3 (March 2014 thru July 2014), and the first five months of Year 4 (August 2014 thru December 2014).

**Overview of Completed/Ongoing Activities:**
At the time of last year's PMP progress report submittal (February 2014), planning and preparations were underway in support of agreed upon pilot-scale testing to examine the possible benefits of polymer injection into two different wastewater streams which were deemed to be the major contributing sources

of mercury. Based on the findings as documented in the "Wastewater Sampling and Engineering Study Summary Report," (submitted to OEPA in July 2013), the two streams selected for polymer injection included Yard Sump No. 1 and the Ash Filter Backwash, utilizing KlarAid PC2700 (a product of GE Power & Water [GE]). In support of the pilot-scale testing program, baseline sampling (prior to active polymer injection) was intended to begin during early-March 2014, focusing on the collection/analysis of paired-samples (using total suspended solids [TSS] as a surrogate indicator for particulate mercury) from the inlet of the Primary Ash Settling Basin and the outlet of the Secondary Ash Settling Basin. Following weather impacts, completion of a scheduled maintenance outage, and unanticipated repairs to the Unit #9 boiler, baseline sampling actually commenced during the week of June 9, 2014. After an approximate one-month period without significant operational interruptions, the final round of baseline samples was collected during the week of July 7, 2014. Overall, a total of 51 discrete pairs of samples were collected as part of the baseline sampling effort.

In preparation for the polymer injection phase of the pilot-testing program, Station personnel and GE representatives installed the required chemical feed equipment on the Yard Sump No. 1 and Ash Filter Backwash wastewater streams during the week of July 22, 2014. Following confirmation that the equipment was functioning as intended, polymer injection and associated sample collection were initiated during the week of August 4, 2014, with a similar one-month data collection period targeted. Shortly thereafter, the Station was taken offline for economic considerations and operated intermittently during the latter half of August and remained down for the majority of September and into mid-October. Consequently, the required sampling for the polymer injection phase was not able to be completed until the week of November 3, 2014. Overall, a total of 80 discrete pairs of samples were collected during the polymer injection phase of the pilot-testing program.

**Monitoring Results [Item K.1.g.i. of NPDES Permit]:**

Since submittal of the February 2014 PMP progress report, the only data generated specific to the General Mercury Variance implementation has been associated with performance of the pilot-scale polymer injection program as described above. Summaries of the data are attached hereto and are further discussed under the "Current/Planned Actions" section of this report. Notwithstanding, the Station's monthly NPDES Permit monitoring results as related to compliance with the General Mercury Variance requirement to achieve and maintain an annual average mercury effluent concentration (AAMEC) $\leq$ 12 ng/L at Outfall 002, have been summarized below commensurate with prior PMP progress report submittals.

The table (based on monthly DMR data) shows the progression of the 12-month running average for mercury in the Outfall 002 effluent. The initial column reflects the AAMEC (with a value of 1.33 ng/L) which was the final tabulated entry included in the February 2014 PMP progress report. The remaining columns account for subsequently calculated AAMEC values since that PMP submittal, arriving at the most recent AAMEC value of 0.64 ng/L. As shown, the mercury concentrations at Outfall 002 have maintained consistent compliance with this AAMEC objective ($\leq$ 12 ng/L), with the present value being approximately 52% lower than a year ago and nearly 75% lower than the initially cited value of 2.50 ng/L from the February 2012 PMP progress report.

**Outfall 002—AAMEC Tabulation**

| Date | Total Hg (ng/L) | | | | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| February 2013 | 4.44 | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- |
| March 2013 | 3.14 | 3.14 | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- |
| April 2013 | 0.76 | 0.76 | 0.76 | --- | --- | --- | --- | --- | --- | --- | --- | --- |
| May 2013 | 1.03 | 1.03 | 1.03 | 1.03 | --- | --- | --- | --- | --- | --- | --- | --- |
| June 2013 | 0.75 | 0.75 | 0.75 | 0.75 | 0.75 | --- | --- | --- | --- | --- | --- | --- |
| July 2013 | 0.97 | 0.97 | 0.97 | 0.97 | 0.97 | 0.97 | --- | --- | --- | --- | --- | --- |
| August 2013 | 0.83 | 0.83 | 0.83 | 0.83 | 0.83 | 0.83 | 0.83 | --- | --- | --- | --- | --- |
| September 2013 | 0.95 | 0.95 | 0.95 | 0.95 | 0.95 | 0.95 | 0.95 | 0.95 | --- | --- | --- | --- |
| October 2013 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | --- | --- | --- |
| November 2013 | 1.06 | 1.06 | 1.06 | 1.06 | 1.06 | 1.06 | 1.06 | 1.06 | 1.06 | 1.06 | --- | --- |
| December 2013 | 1.35 | 1.35 | 1.35 | 1.35 | 1.35 | 1.35 | 1.35 | 1.35 | 1.35 | 1.35 | 1.35 | --- |
| January 2014 | 0.63 | 0.63 | 0.63 | 0.63 | 0.63 | 0.63 | 0.63 | 0.63 | 0.63 | 0.63 | 0.63 | 0.63 |
| February 2014 | --- | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 |
| March 2014 | --- | --- | 1.19 | 1.19 | 1.19 | 1.19 | 1.19 | 1.19 | 1.19 | 1.19 | 1.19 | 1.19 |
| April 2014 | --- | --- | --- | 1.58 | 1.58 | 1.58 | 1.58 | 1.58 | 1.58 | 1.58 | 1.58 | 1.58 |
| May 2014 | --- | --- | --- | --- | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 |
| June 2014 | --- | --- | --- | --- | --- | 0.72 | 0.72 | 0.72 | 0.72 | 0.72 | 0.72 | 0.72 |
| July 2014 | --- | --- | --- | --- | --- | --- | 1.32 | 1.32 | 1.32 | 1.32 | 1.32 | 1.32 |
| August 2014 | --- | --- | --- | --- | --- | --- | --- | 0.73 | 0.73 | 0.73 | 0.73 | 0.73 |
| September 2014 | --- | --- | --- | --- | --- | --- | --- | --- | 0.00 | 0.00 | 0.00 | 0.00 |
| October 2014 | --- | --- | --- | --- | --- | --- | --- | --- | --- | 0.00 | 0.00 | 0.00 |
| November 2014 | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | 0.54 | 0.54 |
| December 2014 | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | 0.00 |
| **AAMEC** | **1.33** | **1.04** | **0.88** | **0.95** | **0.86** | **0.86** | **0.89** | **0.88** | **0.80** | **0.80** | **0.76** | **0.64** |

Note: Zero values used to represent non-detects.

**Preliminary Identification of Mercury Sources [Item K.1.g.ii. of NPDES Permit]:**

The efforts conducted in support of the 2013 Engineering Study allowed for confirmation that the Yard Sump No.1 and the Ash Filter Backwash streams are the major contributing sources for mercury in the ash handling wastewaters. In turn, this source determination supported the implementation of the pilot-scale polymer testing program on both of these streams between the period of June thru November 2014.

**Current/Planned Actions to Meet Mercury Effluent Limits [Items K.1.g.iii. & K.1.g.iv. of NPDES Permit]:**

As documented in the February 2014 PMP progress report, a fixed-interval backwashing frequency of the Anthracite Filters remains in effect (based on differential pressure set-points), and analysis of monthly NPDES Permit compliance samples continues under contract with the laboratory (Alloway) that was transitioned to in mid-2012. This backwashing procedure has resulted in an increased level of operational control, and minimized the potential for introduction of widely variable slugs of solids into the Primary Ash Basin. Consistent use of the Alloway laboratory and their familiarity with Station operations has further served to reduce the potential for reporting of anomalous mercury data. Correspondingly, it is recognized that the 12-month running average mercury discharge concentrations at Outfall 002 (as evidenced by the AAMEC values tabulated above) are currently at the lowest levels that have been tracked since the August 2011 effective date of the General Mercury Variance, and affirm the Station's ongoing commitment to mercury reduction.

With respect to the recently completed pilot-scale program, the attached spreadsheets provide a summary of the TSS data collected prior to the addition of polymer (Table 1) as well as that collected during the polymer addition (Table 2). The TSS parameter was selected for evaluation since the ability to remove suspended/particulate matter would be expected to translate into co-removal of the particulate-phase mercury, although no direct mathematical removal equivalent/correlation was derived for the study. For each phase of the testing, collection of a minimum number of samples was targeted in an attempt to account for variability in the analytical results and to offer a sufficient data population upon which conclusions could be drawn with reasonable statistical confidence.

From review of Table 1 (results prior to polymer addition), the observed TSS removal across the Primary and Secondary Ash Basins was found to be on the order of approximately 65% based on the arithmetic average values for the inlet and outlet samples. Similar review of Table 2 (results with polymer addition) shows TSS removal of approximately 71%, again utilizing the arithmetic average values for the inlet and outlet samples. Comparison of the data via the corresponding geometric means (since the data better conform to a lognormal distribution) provides a more pronounced difference of approximately 55% TSS removal (Table 1 without polymer) vs. approximately 83% TSS removal (Table 2 with polymer).

Despite a rather high degree of persistent variability, these standalone results (from the geometric mean comparison) tentatively suggested a generally favorable outcome with use of the polymer, with predictions that increased TSS removal would lead to enhanced mercury removal from the wastewaters. However, during the latter stages of the polymer addition program (around the October 2014 timeframe), a notable change in the operational performance of the existing Anthracite Filters began to emerge. This change was highlighted by an inability of the filters to return to their baseline differential pressure following a backwashing cycle. Current speculation (to be further evaluated through planned visual inspection of the anthracite media) has focused on possible accumulation of the polymer within the filter vessels, thus leading to decreased pore space and residually elevated pressures across the filters. This potential drawback, combined with other fuel considerations (discussed below) and the Station's already demonstrated reductions in effluent mercury concentrations, have caused NRG Power to lean away from any further examination of the polymer at this point in time.

**Upcoming Year 4 Activities:**

Throughout the remainder of Year 4 (concluding on July 31, 2015), NRG Power will first focus on assembling the appropriate documentation and certifications necessary to request renewal of the General Mercury Variance, of which this PMP progress report will be a part. This information will be integrated into the overall NPDES Permit Renewal Application package and submitted to OEPA on or before January 31, 2015. Beyond that, the Station will continue to evaluate potential alternative fuel options as part of future operations, leading to a possible transition by early to mid-2016. Irrespective of which alternative fuel source proves most viable, it remains the Station's focus to continue the progress made thus far under the initial term of the General Mercury Variance. As noted above, other near-term activities will include visual inspection of the Anthracite Filters to gain a further understanding of the potential "clotting" effects that may have been induced by the polymer. Even if the polymer is not determined as the cause of the filters' differential pressure issues, NRG Power maintains that any benefits from its future use are overshadowed by the Station's mercury reductions to date (achieved without polymer) and the ongoing evaluation of alternative fuel options.

We trust that this submittal is in accordance with OEPA's expectations regarding annual PMP reporting, and will further serve as one of the required pieces of documentation to support NRG Power's request for renewal of the General Mercury Variance at the Avon Lake Generating Station. Should you have any questions or concerns regarding this matter, please contact Nate Rozic directly at (724) 597-8630 or via email at Nathan.Rozic@nrg.com.

Respectfully submitted,

Daniel A. Rogatto
Plant Manager

cc: Scott Cameron, – Avon Lake Generating Station
Nate Rozic, NRG-Southpointe
David Shott, CB&I

**Table 1**
**Avon Lake Polymer Pilot Test**
**TSS Summary--Prior to Polymer Addition**

| **Raw Data** | | | | | | | | | | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Date | 6/9/2014 | 6/9/2014 | 6/9/2014 | 6/10/2014 | 6/10/2014 | 6/10/2014 | 6/10/2014 | 6/11/2014 | 6/11/2014 | 6/11/2014 | 6/11/2014 | 6/12/2014 | 6/12/2014 | 6/12/2014 | 6/12/2014 | 6/13/2014 | 6/13/2014 |
| Time | 11:05:00 AM | 1:05:00 PM | 3:05:00 PM | 9:05:00 AM | 11:05:00 AM | 1:05:00 PM | 3:05:00 PM | 9:05:00 AM | 11:05:00 AM | 1:05:00 PM | 3:05:00 PM | 9:05:00 AM | 11:05:00 AM | 1:05:00 PM | 3:05:00 PM | 9:05:00 AM | 11:05:00 AM |
| TSS Primary Ash Basin Inlet (mg/L) | 41 | 63 | 33 | 190 | 69 | 22 | 9.4 | 31 | 19 | 17 | 17 | 14 | 26 | 32 | 20 | 12 | 11 |
| TSS Secondary Ash Basin Outlet (mg/L) | 23 | 50 | 14 | 35 | 8.4 | 7.6 | 8 | 20 | 15 | 16 | 12 | 11 | 7 | 8 | 8.2 | 7.4 | 6.6 |
| TSS Inlet - TSS Outlet (mg/L) | 18 | 13 | 19 | 155 | 60.6 | 14.4 | 1.4 | 11 | 4 | 1 | 5 | 3 | 19 | 24 | 11.8 | 4.6 | 4.4 |
| Removal (%) | 44 | 21 | 58 | 82 | 88 | 65 | 15 | 35 | 21 | 6 | 29 | 21 | 73 | 75 | 59 | 38 | 40 |
| **Raw Data** | | | | | | | | | | | | | | | | | |
| Date | 6/13/2014 | 6/13/2014 | 6/16/2014 | 6/16/2014 | 6/16/2014 | 6/16/2014 | 6/17/2014 | 6/17/2014 | 6/17/2014 | 6/17/2014 | 6/18/2014 | 6/18/2014 | 6/18/2014 | 6/18/2014 | 6/19/2014 | 6/19/2014 | 6/19/2014 |
| Time | 1:05:00 PM | 3:05:00 PM | 9:05:00 AM | 11:05:00 AM | 1:05:00 PM | 3:05:00 PM | 9:05:00 AM | 11:05:00 AM | 1:05:00 PM | 3:05:00 PM | 9:05:00 AM | 11:05:00 AM | 1:05:00 PM | 3:05:00 PM | 9:05:00 AM | 11:05:00 AM | 1:05:00 PM |
| TSS Primary Ash Basin Inlet (mg/L) | 50 | 14 | 34 | 21 | 55 | 39 | 46 | 41 | 22 | 25 | 14 | 170 | 43 | 240 | 23 | 22 | 18 |
| TSS Secondary Ash Basin Outlet (mg/L) | 10 | 8.4 | 16 | 33 | 18 | 30 | 13 | 11 | 12 | 11 | 7.4 | 10 | 12 | 12 | 13 | 15 | 14 |
| TSS Inlet - TSS Outlet (mg/L) | 40 | 5.6 | 18 | 0 | 37 | 9 | 33 | 30 | 10 | 14 | 6.6 | 160 | 31 | 228 | 10 | 7 | 4 |
| Removal (%) | 80 | 40 | 53 | 0 | 67 | 23 | 72 | 73 | 45 | 56 | 47 | 94 | 72 | 95 | 43 | 32 | 22 |
| **Raw Data** | | | | | | | | | | | | | | | | | |
| Date | 6/19/2014 | 6/20/2014 | 6/20/2014 | 6/20/2014 | 6/20/2014 | 7/3/2014 | 7/3/2014 | 7/3/2014 | 7/3/2014 | 7/4/2014 | 7/4/2014 | 7/4/2014 | 7/4/2014 | 7/7/2014 | 7/7/2014 | 7/7/2014 | 7/7/2014 |
| Time | 3:05:00 PM | 9:05:00 AM | 11:05:00 AM | 1:05:00 PM | 3:05:00 PM | 9:05:00 AM | 11:05:00 AM | 1:05:00 PM | 3:05:00 PM | 9:05:00 AM | 11:05:00 AM | 1:05:00 PM | 3:05:00 PM | 9:05:00 AM | 11:05:00 AM | 1:05:00 PM | 3:05:00 PM |
| TSS Primary Ash Basin Inlet (mg/L) | 17 | 25 | 21 | 14 | 22 | 31 | 33 | 35 | 40 | 23 | 22 | 11 | 14 | 9.2 | 4.6 | 4.8 | 210 |
| TSS Secondary Ash Basin Outlet (mg/L) | 12 | 9.6 | 17 | 35 | 12 | 12 | 8.6 | 9.4 | 8.2 | 12 | 12 | 17 | 10 | 5.6 | 8 | 5.6 | 6 |
| TSS Inlet - TSS Outlet (mg/L) | 5 | 15.4 | 4 | 0 | 10 | 19 | 24.4 | 25.6 | 31.8 | 11 | 10 | 0 | 4 | 3.6 | 0 | 0 | 204 |
| Removal (%) | 29 | 62 | 19 | 0 | 45 | 61 | 74 | 73 | 80 | 48 | 45 | 0 | 29 | 39 | 0 | 0 | 97 |
| **Statistical Metrics** | | | | | | | | | | | | | | | | | |
| | Arithmetic Average | Arithmetic Standard Deviation | Geometric Mean | Geometric Standard Deviation | | | | | | | | | | | | | |
| TSS Primary Ash Basin Inlet (mg/L) | 40.0 | 50.4 | 26.5 | 2.3 | | | | | | | | | | | | | |
| TSS Secondary Ash Basin Outlet (mg/L) | 13.8 | 8.7 | 12.0 | 1.6 | | | | | | | | | | | | | |
| TSS Inlet - TSS Outlet (mg/L) | 26.2 | | 14.5 | | | | | | | | | | | | | | |
| Removal (%) | 65.5 | | 54.7 | | | | | | | | | | | | | | |

**Table 2**
**Avon Lake Polymer Pilot Test**
**TSS Summary--With Polymer Addition**

| **Raw Data** | | | | | | | | | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Date | 8/6/2014 | 8/6/2014 | 8/6/2014 | 8/6/2014 | 8/8/2014 | 8/8/2014 | 8/8/2014 | 8/8/2014 | 8/11/2014 | 8/11/2014 | 8/11/2014 | 8/11/2014 | 8/12/2014 | 8/12/2014 | 8/12/2014 | 8/12/2014 |
| Time | 9:00:00 AM | 11:00:00 AM | 1:00:00 PM | 3:00:00 PM | 9:00:00 AM | 11:00:00 AM | 1:00:00 PM | 3:00:00 PM | 9:00:00 AM | 11:00:00 AM | 1:00:00 PM | 3:00:00 PM | 9:00:00 AM | 11:00:00 AM | 1:00:00 PM | 3:00:00 PM |
| TSS Primary Ash Basin Inlet (mg/L) | 9.6 | 14 | 97 | 96 | 13 | 16 | 39 | 63 | 19 | 41 | 27 | 160 | 55 | 45 | 11 | 48 |
| TSS Secondary Ash Basin Outlet (mg/L) | 90 | 57 | 3.8 | 17 | 6.8 | 5.2 | 5.2 | 6.2 | 5.6 | 4 | 4.4 | 3 | 12 | 13 | 7.6 | 17 |
| TSS Inlet - TSS Outlet (mg/L) | 0 | 0 | 93.2 | 79 | 6.2 | 10.8 | 33.8 | 56.8 | 13.4 | 37 | 22.6 | 157 | 43 | 32 | 3.4 | 31 |
| Removal (%) | 0 | 0 | 96 | 82 | 48 | 68 | 87 | 90 | 71 | 90 | 84 | 98 | 78 | 71 | 31 | 65 |
| **Raw Data** | | | | | | | | | | | | | | | | |
| Date | 8/13/2014 | 8/13/2014 | 8/13/2014 | 8/13/2014 | 8/25/2014 | 8/25/2014 | 8/25/2014 | 8/25/2014 | 9/3/2014 | 9/3/2014 | 9/3/2014 | 9/3/2014 | 9/4/2014 | 9/4/2014 | 9/4/2014 | 9/4/2014 |
| Time | 9:00:00 AM | 11:00:00 AM | 1:00:00 PM | 3:00:00 PM | 9:00:00 AM | 11:00:00 AM | 1:00:00 PM | 3:00:00 PM | 9:00:00 AM | 11:00:00 AM | 1:00:00 PM | 3:00:00 PM | 9:00:00 AM | 11:00:00 AM | 1:00:00 PM | 3:00:00 PM |
| TSS Primary Ash Basin Inlet (mg/L) | 84 | 21 | 16 | 23 | 56 | 26 | 49 | 39 | 94 | 10 | 16 | 15 | 8.6 | 6.6 | 11 | 15 |
| TSS Secondary Ash Basin Outlet (mg/L) | 6 | 4.6 | 4.8 | 5 | 4.2 | 2.2 | 2 | 3 | 16 | 3.2 | 0.001 | 3.2 | 2.2 | 16 | 5.6 | 8 |
| TSS Inlet - TSS Outlet (mg/L) | 78 | 16.4 | 11.2 | 18 | 51.8 | 23.8 | 47 | 36 | 78 | 6.8 | 16 | 11.8 | 6.4 | 0 | 5.4 | 7 |
| Removal (%) | 93 | 78 | 70 | 78 | 93 | 92 | 96 | 92 | 83 | 68 | 100 | 79 | 74 | 0 | 49 | 47 |
| **Raw Data** | | | | | | | | | | | | | | | | |
| Date | 9/5/2014 | 9/5/2014 | 9/5/2014 | 9/5/2014 | 10/20/2014 | 10/20/2014 | 10/20/2014 | 10/20/2014 | 10/21/2014 | 10/21/2014 | 10/21/2014 | 10/21/2014 | 10/22/2014 | 10/22/2014 | 10/22/2014 | 10/22/2014 |
| Time | 9:00:00 AM | 11:00:00 AM | 1:00:00 PM | 3:00:00 PM | 9:00:00 AM | 11:05:00 AM | 1:05:00 PM | 15:00:00 PM | 9:00:00 AM | 11:00:00 AM | 1:00:00 PM | 3:00:00 PM | 9:00:00 AM | 11:00:00 AM | 1:00:00 PM | 3:00:00 PM |
| TSS Primary Ash Basin Inlet (mg/L) | 26 | 28 | 36 | 52 | 20 | 19 | 95 | 25 | 17 | 25 | 94 | 21 | 28 | 6.2 | 30 | 54 |
| TSS Secondary Ash Basin Outlet (mg/L) | 4.2 | 19 | 6.4 | 5.4 | 8.4 | 14 | 13 | 5.6 | 5.6 | 6 | 0.001 | 13 | 8.2 | 150 | 6 | 6.2 |
| TSS Inlet - TSS Outlet (mg/L) | 21.8 | 9 | 29.6 | 46.6 | 11.6 | 5 | 82 | 19.4 | 11.4 | 19 | 94 | 8 | 19.8 | 0 | 24 | 47.8 |
| Removal (%) | 84 | 32 | 82 | 90 | 58 | 26 | 86 | 78 | 67 | 76 | 100 | 38 | 71 | 0 | 80 | 89 |
| **Raw Data** | | | | | | | | | | | | | | | | |
| Date | 10/23/2014 | 10/23/2014 | 10/23/2014 | 10/23/2014 | 10/24/2014 | 10/24/2014 | 10/24/2014 | 10/24/2014 | 10/27/2014 | 10/27/2014 | 10/27/2014 | 10/27/2014 | 10/28/2014 | 10/28/2014 | 10/28/2014 | 10/28/2014 |
| Time | 9:00:00 AM | 11:05:00 AM | 1:05:00 PM | 15:00:00 PM | 9:05:00 AM | 11:05:00 AM | 1:05:00 PM | 15:00:00 PM | 9:00:00 AM | 11:05:00 AM | 15:00:00 PM | 15:05:00 PM | 9:00:00 AM | 11:00:00 AM | 1:05:00 PM | 15:00:00 PM |
| TSS Primary Ash Basin Inlet (mg/L) | 67 | 100 | 24 | 100 | 4.4 | 45 | 19 | 12 | 10 | 13 | 18 | 88 | 19 | 34 | 18 | 44 |
| TSS Secondary Ash Basin Outlet (mg/L) | 4.6 | 5 | 0.001 | 18 | 6.6 | 0.001 | 4 | 4 | 7 | 44 | 6.6 | 6.8 | 7.2 | 19 | 12 | 25 |
| TSS Inlet - TSS Outlet (mg/L) | 62.4 | 95 | 24 | 82 | 0 | 45 | 15 | 8 | 3 | 0 | 11.4 | 81.2 | 11.8 | 15 | 6 | 19 |
| Removal (%) | 93 | 95 | 100 | 82 | 0 | 100 | 79 | 67 | 30 | 0 | 63 | 92 | 62 | 44 | 33 | 43 |
| **Raw Data** | | | | | | | | | | | | | | | | |
| Date | 10/29/2014 | 10/29/2014 | 10/29/2014 | 10/29/2014 | 10/30/2014 | 10/30/2014 | 10/30/2014 | 10/30/2014 | 10/31/2014 | 10/31/2014 | 10/31/2014 | 10/31/2014 | 11/3/2014 | 11/3/2014 | 11/3/2014 | 11/3/2014 |
| Time | 9:00:00 AM | 11:00:00 AM | 1:05:00 PM | 15:00:00 PM | 9:05:00 AM | 11:00:00 AM | 13:00:00 PM | 15:00:00 PM | 9:00:00 AM | 11:00:00 AM | 13:00:00 PM | 15:00:00 PM | 9:05:00 AM | 11:00:00 AM | 13:00:00 PM | 15:00:00 PM |
| TSS Primary Ash Basin Inlet (mg/L) | 56 | 91 | 90 | 270 | 31 | 22 | 20 | 13 | 42 | 18 | 35 | 16 | 37 | 120 | 49 | 64 |
| TSS Secondary Ash Basin Outlet (mg/L) | 15 | 13 | 11 | 14 | 11 | 12 | 7.2 | 8.2 | 6.2 | 13 | 9 | 8.2 | 20 | 12 | 17 | 11 |
| TSS Inlet - TSS Outlet (mg/L) | 41 | 78 | 79 | 256 | 20 | 10 | 12.8 | 4.8 | 35.8 | 5 | 26 | 7.8 | 17 | 108 | 32 | 53 |
| Removal (%) | 73 | 86 | 88 | 95 | 65 | 45 | 64 | 37 | 85 | 28 | 74 | 49 | 46 | 90 | 65 | 83 |
| **Statistical Metrics** | | | | | | | | | | | | | | | | |
| | Arithmetic Average | Arithmetic Standard Deviation | Geometric Mean | Geometric Standard Deviation | | | | | | | | | | | | |
| TSS Primary Ash Basin Inlet (mg/L) | 42.6 | 40.8 | 30.3 | 2.3 | | | | | | | | | | | | |
| TSS Secondary Ash Basin Outlet (mg/L) | 12.2 | 19.9 | 5.3 | 8.4 | | | | | | | | | | | | |
| TSS Inlet - TSS Outlet (mg/L) | 30.4 | | 25.0 | | | | | | | | | | | | | |
| Removal (%) | 71.4 | | 82.5 | | | | | | | | | | | | | |

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**NRG Power Midwest LP**
**Avon Lake Generating Station**
33570 Lake Road
Avon Lake, OH 44012

**VIA TRACKED DELIVERY**

January 19, 2015

Mr. Eric Nygaard
Ohio Environmental Protection Agency
Division of Surface Water
50 West Town Street, Suite 700
Columbus, OH 43216

**NRG Power Midwest LP**
**Avon Lake Generating Station**
**NPDES Permit No. 3IB00002*KD**
**General Mercury Variance**
**Fourth Annual PMP Progress Report**

Dear Mr. Nygaard:

As per the requirements of Items K.1.g.i. through K.1.g.iv. of Part II of the Avon Lake Generating Station's NPDES Permit No. 3IB00002*KD, NRG Power Midwest LP (NRG Power), as a subsidiary of NRG Energy, Inc. (NRG), is providing this report to comply with the obligations for submittal of an annual Pollutant Minimization Program (PMP) progress report by March 1 of each Calendar Year. This correspondence represents the fourth annual report submitted to the Ohio Environmental Protection Agency (OEPA), following the effective date of the General Mercury Variance on August 1, 2011 (as part of the renewed NPDES Permit). It is further noted that the current report has been prepared slightly in advance of the "normal" timeframe for submittal (typically by March 1 of each subsequent Calendar Year). This has been done in order to satisfy Item M.2. of the NPDES Permit, specific to one component of the documentation necessary to apply for renewal of the General Mercury Variance.

The initial annual progress report (dated February 24, 2012) summarized the status of activities through the first seven months of Year 1 of the variance. The second annual progress report (dated February 14, 2013) summarized the activities performed during the final five months of Year 1 (March 2012 thru July 2012), and the first seven months of Year 2 (August 2012 thru February 2013). The third annual progress report (dated February 19, 2014) summarized the activities performed during the final five months of Year 2 (March 2013 thru July 2013), and the first seven months of Year 3 (August 2013 thru February 2014). The current report summarizes the activities performed during the final five months of Year 3 (March 2014 thru July 2014), and the first five months of Year 4 (August 2014 thru December 2014).

**Overview of Completed/Ongoing Activities:**

At the time of last year's PMP progress report submittal (February 2014), planning and preparations were underway in support of agreed upon pilot-scale testing to examine the possible benefits of polymer injection into two different wastewater streams which were deemed to be the major contributing sources

of mercury. Based on the findings as documented in the "Wastewater Sampling and Engineering Study Summary Report," (submitted to OEPA in July 2013), the two streams selected for polymer injection included Yard Sump No. 1 and the Ash Filter Backwash, utilizing KlarAid PC2700 (a product of GE Power & Water [GE]). In support of the pilot-scale testing program, baseline sampling (prior to active polymer injection) was intended to begin during early-March 2014, focusing on the collection/analysis of paired-samples (using total suspended solids [TSS] as a surrogate indicator for particulate mercury) from the inlet of the Primary Ash Settling Basin and the outlet of the Secondary Ash Settling Basin. Following weather impacts, completion of a scheduled maintenance outage, and unanticipated repairs to the Unit #9 boiler, baseline sampling actually commenced during the week of June 9, 2014. After an approximate one-month period without significant operational interruptions, the final round of baseline samples was collected during the week of July 7, 2014. Overall, a total of 51 discrete pairs of samples were collected as part of the baseline sampling effort.

In preparation for the polymer injection phase of the pilot-testing program, Station personnel and GE representatives installed the required chemical feed equipment on the Yard Sump No. 1 and Ash Filter Backwash wastewater streams during the week of July 22, 2014. Following confirmation that the equipment was functioning as intended, polymer injection and associated sample collection were initiated during the week of August 4, 2014, with a similar one-month data collection period targeted. Shortly thereafter, the Station was taken offline for economic considerations and operated intermittently during the latter half of August and remained down for the majority of September and into mid-October. Consequently, the required sampling for the polymer injection phase was not able to be completed until the week of November 3, 2014. Overall, a total of 80 discrete pairs of samples were collected during the polymer injection phase of the pilot-testing program.

**Monitoring Results [Item K.1.g.i. of NPDES Permit]:**

Since submittal of the February 2014 PMP progress report, the only data generated specific to the General Mercury Variance implementation has been associated with performance of the pilot-scale polymer injection program as described above. Summaries of the data are attached hereto and are further discussed under the "Current/Planned Actions" section of this report. Notwithstanding, the Station's monthly NPDES Permit monitoring results as related to compliance with the General Mercury Variance requirement to achieve and maintain an annual average mercury effluent concentration (AAMEC) $\leq$ 12 ng/L at Outfall 002, have been summarized below commensurate with prior PMP progress report submittals.

The table (based on monthly DMR data) shows the progression of the 12-month running average for mercury in the Outfall 002 effluent. The initial column reflects the AAMEC (with a value of 1.33 ng/L) which was the final tabulated entry included in the February 2014 PMP progress report. The remaining columns account for subsequently calculated AAMEC values since that PMP submittal, arriving at the most recent AAMEC value of 0.64 ng/L. As shown, the mercury concentrations at Outfall 002 have maintained consistent compliance with this AAMEC objective ($\leq$ 12 ng/L), with the present value being approximately 52% lower than a year ago and nearly 75% lower than the initially cited value of 2.50 ng/L from the February 2012 PMP progress report.

**Outfall 002—AAMEC Tabulation**

| Date | Total Hg (ng/L) | | | | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| February 2013 | 4.44 | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- |
| March 2013 | 3.14 | 3.14 | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- |
| April 2013 | 0.76 | 0.76 | 0.76 | --- | --- | --- | --- | --- | --- | --- | --- | --- |
| May 2013 | 1.03 | 1.03 | 1.03 | 1.03 | --- | --- | --- | --- | --- | --- | --- | --- |
| June 2013 | 0.75 | 0.75 | 0.75 | 0.75 | 0.75 | --- | --- | --- | --- | --- | --- | --- |
| July 2013 | 0.97 | 0.97 | 0.97 | 0.97 | 0.97 | 0.97 | --- | --- | --- | --- | --- | --- |
| August 2013 | 0.83 | 0.83 | 0.83 | 0.83 | 0.83 | 0.83 | 0.83 | --- | --- | --- | --- | --- |
| September 2013 | 0.95 | 0.95 | 0.95 | 0.95 | 0.95 | 0.95 | 0.95 | 0.95 | --- | --- | --- | --- |
| October 2013 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | --- | --- | --- |
| November 2013 | 1.06 | 1.06 | 1.06 | 1.06 | 1.06 | 1.06 | 1.06 | 1.06 | 1.06 | 1.06 | --- | --- |
| December 2013 | 1.35 | 1.35 | 1.35 | 1.35 | 1.35 | 1.35 | 1.35 | 1.35 | 1.35 | 1.35 | 1.35 | --- |
| January 2014 | 0.63 | 0.63 | 0.63 | 0.63 | 0.63 | 0.63 | 0.63 | 0.63 | 0.63 | 0.63 | 0.63 | 0.63 |
| February 2014 | --- | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 |
| March 2014 | --- | --- | 1.19 | 1.19 | 1.19 | 1.19 | 1.19 | 1.19 | 1.19 | 1.19 | 1.19 | 1.19 |
| April 2014 | --- | --- | --- | 1.58 | 1.58 | 1.58 | 1.58 | 1.58 | 1.58 | 1.58 | 1.58 | 1.58 |
| May 2014 | --- | --- | --- | --- | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 |
| June 2014 | --- | --- | --- | --- | --- | 0.72 | 0.72 | 0.72 | 0.72 | 0.72 | 0.72 | 0.72 |
| July 2014 | --- | --- | --- | --- | --- | --- | 1.32 | 1.32 | 1.32 | 1.32 | 1.32 | 1.32 |
| August 2014 | --- | --- | --- | --- | --- | --- | --- | 0.73 | 0.73 | 0.73 | 0.73 | 0.73 |
| September 2014 | --- | --- | --- | --- | --- | --- | --- | --- | 0.00 | 0.00 | 0.00 | 0.00 |
| October 2014 | --- | --- | --- | --- | --- | --- | --- | --- | --- | 0.00 | 0.00 | 0.00 |
| November 2014 | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | 0.54 | 0.54 |
| December 2014 | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | 0.00 |
| **AAMEC** | **1.33** | **1.04** | **0.88** | **0.95** | **0.86** | **0.86** | **0.89** | **0.88** | **0.80** | **0.80** | **0.76** | **0.64** |

Note: Zero values used to represent non-detects.

**Preliminary Identification of Mercury Sources [Item K.1.g.ii. of NPDES Permit]:**

The efforts conducted in support of the 2013 Engineering Study allowed for confirmation that the Yard Sump No.1 and the Ash Filter Backwash streams are the major contributing sources for mercury in the ash handling wastewaters. In turn, this source determination supported the implementation of the pilot-scale polymer testing program on both of these streams between the period of June thru November 2014.

**Current/Planned Actions to Meet Mercury Effluent Limits [Items K.1.g.iii. & K.1.g.iv. of NPDES Permit]:**

As documented in the February 2014 PMP progress report, a fixed-interval backwashing frequency of the Anthracite Filters remains in effect (based on differential pressure set-points), and analysis of monthly NPDES Permit compliance samples continues under contract with the laboratory (Alloway) that was transitioned to in mid-2012. This backwashing procedure has resulted in an increased level of operational control, and minimized the potential for introduction of widely variable slugs of solids into the Primary Ash Basin. Consistent use of the Alloway laboratory and their familiarity with Station operations has further served to reduce the potential for reporting of anomalous mercury data. Correspondingly, it is recognized that the 12-month running average mercury discharge concentrations at Outfall 002 (as evidenced by the AAMEC values tabulated above) are currently at the lowest levels that have been tracked since the August 2011 effective date of the General Mercury Variance, and affirm the Station's ongoing commitment to mercury reduction.

With respect to the recently completed pilot-scale program, the attached spreadsheets provide a summary of the TSS data collected prior to the addition of polymer (Table 1) as well as that collected during the polymer addition (Table 2). The TSS parameter was selected for evaluation since the ability to remove suspended/particulate matter would be expected to translate into co-removal of the particulate-phase mercury, although no direct mathematical removal equivalent/correlation was derived for the study. For each phase of the testing, collection of a minimum number of samples was targeted in an attempt to account for variability in the analytical results and to offer a sufficient data population upon which conclusions could be drawn with reasonable statistical confidence.

From review of Table 1 (results prior to polymer addition), the observed TSS removal across the Primary and Secondary Ash Basins was found to be on the order of approximately 65% based on the arithmetic average values for the inlet and outlet samples. Similar review of Table 2 (results with polymer addition) shows TSS removal of approximately 71%, again utilizing the arithmetic average values for the inlet and outlet samples. Comparison of the data via the corresponding geometric means (since the data better conform to a lognormal distribution) provides a more pronounced difference of approximately 55% TSS removal (Table 1 without polymer) vs. approximately 83% TSS removal (Table 2 with polymer).

Despite a rather high degree of persistent variability, these standalone results (from the geometric mean comparison) tentatively suggested a generally favorable outcome with use of the polymer, with predictions that increased TSS removal would lead to enhanced mercury removal from the wastewaters. However, during the latter stages of the polymer addition program (around the October 2014 timeframe), a notable change in the operational performance of the existing Anthracite Filters began to emerge. This change was highlighted by an inability of the filters to return to their baseline differential pressure following a backwashing cycle. Current speculation (to be further evaluated through planned visual inspection of the anthracite media) has focused on possible accumulation of the polymer within the filter vessels, thus leading to decreased pore space and residually elevated pressures across the filters. This potential drawback, combined with other fuel considerations (discussed below) and the Station's already demonstrated reductions in effluent mercury concentrations, have caused NRG Power to lean away from any further examination of the polymer at this point in time.

**Upcoming Year 4 Activities:**

Throughout the remainder of Year 4 (concluding on July 31, 2015), NRG Power will first focus on assembling the appropriate documentation and certifications necessary to request renewal of the General Mercury Variance, of which this PMP progress report will be a part. This information will be integrated into the overall NPDES Permit Renewal Application package and submitted to OEPA on or before January 31, 2015. Beyond that, the Station will continue to evaluate potential alternative fuel options as part of future operations, leading to a possible transition by early to mid-2016. Irrespective of which alternative fuel source proves most viable, it remains the Station's focus to continue the progress made thus far under the initial term of the General Mercury Variance. As noted above, other near-term activities will include visual inspection of the Anthracite Filters to gain a further understanding of the potential "clotting" effects that may have been induced by the polymer. Even if the polymer is not determined as the cause of the filters' differential pressure issues, NRG Power maintains that any benefits from its future use are overshadowed by the Station's mercury reductions to date (achieved without polymer) and the ongoing evaluation of alternative fuel options.

We trust that this submittal is in accordance with OEPA's expectations regarding annual PMP reporting, and will further serve as one of the required pieces of documentation to support NRG Power's request for renewal of the General Mercury Variance at the Avon Lake Generating Station. Should you have any questions or concerns regarding this matter, please contact Nate Rozic directly at (724) 597-8630 or via email at Nathan.Rozic@nrg.com.

Respectfully submitted,

Daniel A. Rogatto
Plant Manager

cc: Scott Cameron, – Avon Lake Generating Station
Nate Rozic, NRG-Southpointe
David Shott, CB&I

**Table 1**
**Avon Lake Polymer Pilot Test**
**TSS Summary--Prior to Polymer Addition**

| **Raw Data** | | | | | | | | | | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Date | 6/9/2014 | 6/9/2014 | 6/9/2014 | 6/10/2014 | 6/10/2014 | 6/10/2014 | 6/10/2014 | 6/11/2014 | 6/11/2014 | 6/11/2014 | 6/11/2014 | 6/12/2014 | 6/12/2014 | 6/12/2014 | 6/12/2014 | 6/13/2014 | 6/13/2014 |
| Time | 11:05:00 AM | 1:05:00 PM | 3:05:00 PM | 9:05:00 AM | 11:05:00 AM | 1:05:00 PM | 3:05:00 PM | 9:05:00 AM | 11:05:00 AM | 1:05:00 PM | 3:05:00 PM | 9:05:00 AM | 11:05:00 AM | 1:05:00 PM | 3:05:00 PM | 9:05:00 AM | 11:05:00 AM |
| TSS Primary Ash Basin Inlet (mg/L) | 41 | 63 | 33 | 190 | 69 | 22 | 9.4 | 31 | 19 | 17 | 17 | 14 | 26 | 32 | 20 | 12 | 11 |
| TSS Secondary Ash Basin Outlet (mg/L) | 23 | 50 | 14 | 35 | 8.4 | 7.6 | 8 | 20 | 15 | 16 | 12 | 11 | 7 | 8 | 8.2 | 7.4 | 6.6 |
| TSS Inlet - TSS Outlet (mg/L) | 18 | 13 | 19 | 155 | 60.6 | 14.4 | 1.4 | 11 | 4 | 1 | 5 | 3 | 19 | 24 | 11.8 | 4.6 | 4.4 |
| Removal (%) | 44 | 21 | 58 | 82 | 88 | 65 | 15 | 35 | 21 | 6 | 29 | 21 | 73 | 75 | 59 | 38 | 40 |
| **Raw Data** | | | | | | | | | | | | | | | | | |
| Date | 6/13/2014 | 6/13/2014 | 6/16/2014 | 6/16/2014 | 6/16/2014 | 6/16/2014 | 6/17/2014 | 6/17/2014 | 6/17/2014 | 6/17/2014 | 6/18/2014 | 6/18/2014 | 6/18/2014 | 6/18/2014 | 6/19/2014 | 6/19/2014 | 6/19/2014 |
| Time | 1:05:00 PM | 3:05:00 PM | 9:05:00 AM | 11:05:00 AM | 1:05:00 PM | 3:05:00 PM | 9:05:00 AM | 11:05:00 AM | 1:05:00 PM | 3:05:00 PM | 9:05:00 AM | 11:05:00 AM | 1:05:00 PM | 3:05:00 PM | 9:05:00 AM | 11:05:00 AM | 1:05:00 PM |
| TSS Primary Ash Basin Inlet (mg/L) | 50 | 14 | 34 | 21 | 55 | 39 | 46 | 41 | 22 | 25 | 14 | 170 | 43 | 240 | 23 | 22 | 18 |
| TSS Secondary Ash Basin Outlet (mg/L) | 10 | 8.4 | 16 | 33 | 18 | 30 | 13 | 11 | 12 | 11 | 7.4 | 10 | 12 | 12 | 13 | 15 | 14 |
| TSS Inlet - TSS Outlet (mg/L) | 40 | 5.6 | 18 | 0 | 37 | 9 | 33 | 30 | 10 | 14 | 6.6 | 160 | 31 | 228 | 10 | 7 | 4 |
| Removal (%) | 80 | 40 | 53 | 0 | 67 | 23 | 72 | 73 | 45 | 56 | 47 | 94 | 72 | 95 | 43 | 32 | 22 |
| **Raw Data** | | | | | | | | | | | | | | | | | |
| Date | 6/19/2014 | 6/20/2014 | 6/20/2014 | 6/20/2014 | 6/20/2014 | 7/3/2014 | 7/3/2014 | 7/3/2014 | 7/3/2014 | 7/4/2014 | 7/4/2014 | 7/4/2014 | 7/4/2014 | 7/7/2014 | 7/7/2014 | 7/7/2014 | 7/7/2014 |
| Time | 3:05:00 PM | 9:05:00 AM | 11:05:00 AM | 1:05:00 PM | 3:05:00 PM | 9:05:00 AM | 11:05:00 AM | 1:05:00 PM | 3:05:00 PM | 9:05:00 AM | 11:05:00 AM | 1:05:00 PM | 3:05:00 PM | 9:05:00 AM | 11:05:00 AM | 1:05:00 PM | 3:05:00 PM |
| TSS Primary Ash Basin Inlet (mg/L) | 17 | 25 | 21 | 14 | 22 | 31 | 33 | 35 | 40 | 23 | 22 | 11 | 14 | 9.2 | 4.6 | 4.8 | 210 |
| TSS Secondary Ash Basin Outlet (mg/L) | 12 | 9.6 | 17 | 35 | 12 | 12 | 8.6 | 9.4 | 8.2 | 12 | 12 | 17 | 10 | 5.6 | 8 | 5.6 | 6 |
| TSS Inlet - TSS Outlet (mg/L) | 5 | 15.4 | 4 | 0 | 10 | 19 | 24.4 | 25.6 | 31.8 | 11 | 10 | 0 | 4 | 3.6 | 0 | 0 | 204 |
| Removal (%) | 29 | 62 | 19 | 0 | 45 | 61 | 74 | 73 | 80 | 48 | 45 | 0 | 29 | 39 | 0 | 0 | 97 |
| **Statistical Metrics** | | | | | | | | | | | | | | | | | |
| | Arithmetic Average | Arithmetic Standard Deviation | Geometric Mean | Geometric Standard Deviation | | | | | | | | | | | | | |
| TSS Primary Ash Basin Inlet (mg/L) | 40.0 | 50.4 | 26.5 | 2.3 | | | | | | | | | | | | | |
| TSS Secondary Ash Basin Outlet (mg/L) | 13.8 | 8.7 | 12.0 | 1.6 | | | | | | | | | | | | | |
| TSS Inlet - TSS Outlet (mg/L) | 26.2 | | 14.5 | | | | | | | | | | | | | | |
| Removal (%) | 65.5 | | 54.7 | | | | | | | | | | | | | | |

**Table 2**
**Avon Lake Polymer Pilot Test**
**TSS Summary--With Polymer Addition**

| **Raw Data** | | | | | | | | | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Date | 8/6/2014 | 8/6/2014 | 8/6/2014 | 8/6/2014 | 8/8/2014 | 8/8/2014 | 8/8/2014 | 8/8/2014 | 8/11/2014 | 8/11/2014 | 8/11/2014 | 8/11/2014 | 8/12/2014 | 8/12/2014 | 8/12/2014 | 8/12/2014 |
| Time | 9:00:00 AM | 11:00:00 AM | 1:00:00 PM | 3:00:00 PM | 9:00:00 AM | 11:00:00 AM | 1:00:00 PM | 3:00:00 PM | 9:00:00 AM | 11:00:00 AM | 1:00:00 PM | 3:00:00 PM | 9:00:00 AM | 11:00:00 AM | 1:00:00 PM | 3:00:00 PM |
| TSS Primary Ash Basin Inlet (mg/L) | 9.6 | 14 | 97 | 96 | 13 | 16 | 39 | 63 | 19 | 41 | 27 | 160 | 55 | 45 | 11 | 48 |
| TSS Secondary Ash Basin Outlet (mg/L) | 90 | 57 | 3.8 | 17 | 6.8 | 5.2 | 5.2 | 6.2 | 5.6 | 4 | 4.4 | 3 | 12 | 13 | 7.6 | 17 |
| TSS Inlet - TSS Outlet (mg/L) | 0 | 0 | 93.2 | 79 | 6.2 | 10.8 | 33.8 | 56.8 | 13.4 | 37 | 22.6 | 157 | 43 | 32 | 3.4 | 31 |
| Removal (%) | 0 | 0 | 96 | 82 | 48 | 68 | 87 | 90 | 71 | 90 | 84 | 98 | 78 | 71 | 31 | 65 |
| **Raw Data** | | | | | | | | | | | | | | | | |
| Date | 8/13/2014 | 8/13/2014 | 8/13/2014 | 8/13/2014 | 8/25/2014 | 8/25/2014 | 8/25/2014 | 8/25/2014 | 9/3/2014 | 9/3/2014 | 9/3/2014 | 9/3/2014 | 9/4/2014 | 9/4/2014 | 9/4/2014 | 9/4/2014 |
| Time | 9:00:00 AM | 11:00:00 AM | 1:00:00 PM | 3:00:00 PM | 9:00:00 AM | 11:00:00 AM | 1:00:00 PM | 3:00:00 PM | 9:00:00 AM | 11:00:00 AM | 1:00:00 PM | 3:00:00 PM | 9:00:00 AM | 11:00:00 AM | 1:00:00 PM | 3:00:00 PM |
| TSS Primary Ash Basin Inlet (mg/L) | 84 | 21 | 16 | 23 | 56 | 26 | 49 | 39 | 94 | 10 | 16 | 15 | 8.6 | 6.6 | 11 | 15 |
| TSS Secondary Ash Basin Outlet (mg/L) | 6 | 4.6 | 4.8 | 5 | 4.2 | 2.2 | 2 | 3 | 16 | 3.2 | 0.001 | 3.2 | 2.2 | 16 | 5.6 | 8 |
| TSS Inlet - TSS Outlet (mg/L) | 78 | 16.4 | 11.2 | 18 | 51.8 | 23.8 | 47 | 36 | 78 | 6.8 | 16 | 11.8 | 6.4 | 0 | 5.4 | 7 |
| Removal (%) | 93 | 78 | 70 | 78 | 93 | 92 | 96 | 92 | 83 | 68 | 100 | 79 | 74 | 0 | 49 | 47 |
| **Raw Data** | | | | | | | | | | | | | | | | |
| Date | 9/5/2014 | 9/5/2014 | 9/5/2014 | 9/5/2014 | 10/20/2014 | 10/20/2014 | 10/20/2014 | 10/20/2014 | 10/21/2014 | 10/21/2014 | 10/21/2014 | 10/21/2014 | 10/22/2014 | 10/22/2014 | 10/22/2014 | 10/22/2014 |
| Time | 9:00:00 AM | 11:00:00 AM | 1:00:00 PM | 3:00:00 PM | 9:00:00 AM | 11:05:00 AM | 1:05:00 PM | 15:00:00 PM | 9:00:00 AM | 11:00:00 AM | 1:00:00 PM | 3:00:00 PM | 9:00:00 AM | 11:00:00 AM | 1:00:00 PM | 3:00:00 PM |
| TSS Primary Ash Basin Inlet (mg/L) | 26 | 28 | 36 | 52 | 20 | 19 | 95 | 25 | 17 | 25 | 94 | 21 | 28 | 6.2 | 30 | 54 |
| TSS Secondary Ash Basin Outlet (mg/L) | 4.2 | 19 | 6.4 | 5.4 | 8.4 | 14 | 13 | 5.6 | 5.6 | 6 | 0.001 | 13 | 8.2 | 150 | 6 | 6.2 |
| TSS Inlet - TSS Outlet (mg/L) | 21.8 | 9 | 29.6 | 46.6 | 11.6 | 5 | 82 | 19.4 | 11.4 | 19 | 94 | 8 | 19.8 | 0 | 24 | 47.8 |
| Removal (%) | 84 | 32 | 82 | 90 | 58 | 26 | 86 | 78 | 67 | 76 | 100 | 38 | 71 | 0 | 80 | 89 |
| **Raw Data** | | | | | | | | | | | | | | | | |
| Date | 10/23/2014 | 10/23/2014 | 10/23/2014 | 10/23/2014 | 10/24/2014 | 10/24/2014 | 10/24/2014 | 10/24/2014 | 10/27/2014 | 10/27/2014 | 10/27/2014 | 10/27/2014 | 10/28/2014 | 10/28/2014 | 10/28/2014 | 10/28/2014 |
| Time | 9:00:00 AM | 11:05:00 AM | 1:05:00 PM | 15:00:00 PM | 9:05:00 AM | 11:05:00 AM | 1:05:00 PM | 15:00:00 PM | 9:00:00 AM | 11:05:00 AM | 15:00:00 PM | 15:05:00 PM | 9:00:00 AM | 11:00:00 AM | 1:05:00 PM | 15:00:00 PM |
| TSS Primary Ash Basin Inlet (mg/L) | 67 | 100 | 24 | 100 | 4.4 | 45 | 19 | 12 | 10 | 13 | 18 | 88 | 19 | 34 | 18 | 44 |
| TSS Secondary Ash Basin Outlet (mg/L) | 4.6 | 5 | 0.001 | 18 | 6.6 | 0.001 | 4 | 4 | 7 | 44 | 6.6 | 6.8 | 7.2 | 19 | 12 | 25 |
| TSS Inlet - TSS Outlet (mg/L) | 62.4 | 95 | 24 | 82 | 0 | 45 | 15 | 8 | 3 | 0 | 11.4 | 81.2 | 11.8 | 15 | 6 | 19 |
| Removal (%) | 93 | 95 | 100 | 82 | 0 | 100 | 79 | 67 | 30 | 0 | 63 | 92 | 62 | 44 | 33 | 43 |
| **Raw Data** | | | | | | | | | | | | | | | | |
| Date | 10/29/2014 | 10/29/2014 | 10/29/2014 | 10/29/2014 | 10/30/2014 | 10/30/2014 | 10/30/2014 | 10/30/2014 | 10/31/2014 | 10/31/2014 | 10/31/2014 | 10/31/2014 | 11/3/2014 | 11/3/2014 | 11/3/2014 | 11/3/2014 |
| Time | 9:00:00 AM | 11:00:00 AM | 1:05:00 PM | 15:00:00 PM | 9:05:00 AM | 11:00:00 AM | 13:00:00 PM | 15:00:00 PM | 9:00:00 AM | 11:00:00 AM | 13:00:00 PM | 15:00:00 PM | 9:05:00 AM | 11:00:00 AM | 13:00:00 PM | 15:00:00 PM |
| TSS Primary Ash Basin Inlet (mg/L) | 56 | 91 | 90 | 270 | 31 | 22 | 20 | 13 | 42 | 18 | 35 | 16 | 37 | 120 | 49 | 64 |
| TSS Secondary Ash Basin Outlet (mg/L) | 15 | 13 | 11 | 14 | 11 | 12 | 7.2 | 8.2 | 6.2 | 13 | 9 | 8.2 | 20 | 12 | 17 | 11 |
| TSS Inlet - TSS Outlet (mg/L) | 41 | 78 | 79 | 256 | 20 | 10 | 12.8 | 4.8 | 35.8 | 5 | 26 | 7.8 | 17 | 108 | 32 | 53 |
| Removal (%) | 73 | 86 | 88 | 95 | 65 | 45 | 64 | 37 | 85 | 28 | 74 | 49 | 46 | 90 | 65 | 83 |
| **Statistical Metrics** | | | | | | | | | | | | | | | | |
| | Arithmetic Average | Arithmetic Standard Deviation | Geometric Mean | Geometric Standard Deviation | | | | | | | | | | | | |
| TSS Primary Ash Basin Inlet (mg/L) | 42.6 | 40.8 | 30.3 | 2.3 | | | | | | | | | | | | |
| TSS Secondary Ash Basin Outlet (mg/L) | 12.2 | 19.9 | 5.3 | 8.4 | | | | | | | | | | | | |
| TSS Inlet - TSS Outlet (mg/L) | 30.4 | | 25.0 | | | | | | | | | | | | | |
| Removal (%) | 71.4 | | 82.5 | | | | | | | | | | | | | |

**NRG Energy**
121 Champion Way
Canonsburg, PA 15321
724-597-8026

January 22, 2013

Overnight Mail

Ohio Environmental Protection Agency
Division of Surface Water, Permit and Compliance Section
Lazarus Government Center
PO Box 1049
Columbus, OH 43216-1049

***RE: NPDES Signatory Authorization***
***GenOn Power Midwest, LP***
***Avon Lake Generating Station-Permit No. 31B00002*KD***
***Niles Generating Station-Permit No. 31B00007*LD***

Dear Division of Surface Water, Permit and Compliance Section:

Effective December 14, 2012, NRG Energy, Inc. (NRG) and GenOn Energy, Inc. (GenOn) have combined and will retain the name NRG Energy, Inc. As a result of the merger, all GenOn entities are now wholly owned subsidiaries of NRG. Although the parent corporations, NRG and GenOn, have merged, the entities have not merged or changed names. You can find additional information about NRG and the merger on the website: www.nrgenergy.com.

The owner or operator holding the permits for these facilities has not changed ownership or name. At this time, NRG does not plan to submit requests for name changes for affected permits. When available and where required, we will update corporate organization charts and addresses to reflect the changes in structure affected by the merger.

As a responsible corporate officer for GenOn Power Midwest GP, LLC, a General Partner of GenOn Power Midwest, LP; I hereby delegate signatory authority for all reports required by the permits and other information requested by the Department in accordance with 40CFR §122.22 and §123.25 and Ohio Administrative Code Chapter 3745, Section 33, Paragraph 03 and Chapter 42, Paragraph 03 to the following:

- Vice President, Plant Operations
- General Manager
- Plant/Asset Manager (or the operation equivalent)

If you have any questions about the signatory delegation, please contact Karen McClelland at (724) 597-8026 or karen.mcclelland@nrgenergy.com.

Sincerely,

William Lee Davis
Senior Vice President and Regional President-East

cc: District Offices
M. Gouveia / M. Kohan / D. Rogatto / E. Russell (via email)
K. Schmidt / S. Cameron / T. Senedak / N. Rozic / S. Frank (via email)

## Nygaard, Eric

**From:** Rozic, Nathan J <Nathan.Rozic@genon.com>
**Sent:** Tuesday, February 28, 2012 9:57 AM
**To:** Nygaard, Eric; Stevens, Mike
**Cc:** Kathy Hall; Frank, Stephen; Cameron, Scott; Stuhlfauth, Gary
**Subject:** GenOn Power Midwest, LP Avon Lake Power Plant Thermal Mixing Zone Study outline , Permit #31B00002*KD
**Attachments:** AvonLake_Thermal_Approach.docx

Eric/ Mike,

Attached is a proposed technical approach developed by our consultant (LimnoTech) to address the thermal mixing zone study requirements of the Avon Lake Station NPDES permit. We would like to discuss the proposed approach with you prior to development of the Plan of Study, which is due May 1, 2012. After you have reviewed the attached document, we suggest a meeting at the facility (or OEPA regional office) to receive your initial comments and answer any questions you might have regarding the proposal. If you prefer a conference call to discuss, that is also a viable option.

Please either email or call me at the number below once you have reviewed and are prepared to coordinate further dialogue.

Thanks for your time.


**Nate Rozic**

Manager, Environmental Operations & Compliance
PJM North & Southeast

GenOn Energy, Inc.
121 Champion Way
Suite 200
Canonsburg, PA 15317

Tel: 724-597-8630
Cell: 724-554-6208
Fax: 724-597-8870

Nathan.Rozic@genon.com

GenOn

**Please note new Company name and Email Address**

LimnoTech
Water | Environment | Scientists | Engineers

# MEMORANDUM

FROM: Kathy Hall

DATE: February 17, 2012
PROJECT: ALTHERM

TO: Nate Rozic
Scott Cameron
Steve Frank

**SUBJECT: Technical Approach for Avon Lake Generating Station Thermal Mixing Zone Study**

This memorandum presents a summarized description of the approach being proposed to assess thermal impacts in Lake Erie associated with GenOn's Avon Lake power facility. The document is designed to serve as a starting point for discussions with Ohio EPA, prior to preparation of a formal study plan. A formal study plan will be prepared and submitted to OEPA for review and approval prior to proceeding with the project.

## Proposed Approach

The facility's NPDES permit includes requirements for a thermal mixing zone study to determine the extent of the impact of the thermal discharge, including characterization of the size, areal extent, and depth of the discharge plume during the summer and winter seasons and under a range of conditions. LimnoTech has developed a proposed approach that will meet these requirements and provide a technically sound assessment of the thermal plume in a cost-effective manner. To accomplish these objectives, we intend to make use of existing data and satellite imagery and a steady-state modeling approach to characterize the plume under a range of conditions, as described below.

### *Monitoring*

To meet the permit requirements to characterize thermal discharges under a range of environmental conditions, we propose to conduct a series of monitoring investigations on Lake Erie in the vicinity of the discharge. These investigations will include analysis of remote sensing data for initial plume characterization, a manual boat survey for more detailed characterization of plume extent, and additional evaluations of remote sensing data for model verification.

#### Remote Sensing Analysis

We propose to initiate data collection by analyzing thermal satellite images collected by NASA's Landsat earth observing program. During cloud-free days, the Landsat 5 and 7 satellites provide a high resolution thermal image (120 m native pixel size) of the nearshore waters of Lake Erie in the vicinity of the Avon Lake Plant. Figure 1 provides preliminary examples of these images representing various time periods from the summer of 2011. Prior to finalizing the field sampling plan, we propose to analyze cloud-free images from a previous year to visualize the typical plume extent and directions of plume migration. This data will be used to define the spatial range of the manual boat survey. The thermal satellite images will also be used during modeling activities to compare predicted thermal plume size with actual plume size as identified in the satellite images.

501 Avis Drive
Ann Arbor, MI 48108
734-332-1200

### Manual Boat Survey

A manual boat survey will be conducted to supplement the areal mapping of satellite data, which shows only surface temperatures, by characterizing the three-dimensional structure of the thermal plume during a specific time period. We propose a manual boat survey during the spring of 2013. A temperature and depth logger will be raised and lowered through the water column while trolling along set transects across the thermal plume. In addition, vertical thermal profiles will be taken at fixed locations. The design of the manual boat survey will be adjusted in the field to ensure that the extent of the plume is mapped fully. A high precision Global Positioning System (GPS) will be installed on the boat and operated continuously. The GPS data will be used to later map the thermal conditions observed during the survey. Results of the manual boat survey will also be used to ground-truth the remote sensing data, via comparison of surface temperatures observed on the boat to those reported via the Landsat imagery and to estimate the total volume of the plume.

## *Modeling*

The mixing zone study must characterize the size, areal extent and depth of the discharge plume under a range of ambient conditions, and must also determine these characteristics when the plant is operating at peak capacity. Because of the range of conditions to be evaluated, the use of a model will be necessary to fully satisfy the study requirements. The modeling approach will need to account for both near-field plume behavior, which is dominated by the characteristics of the discharge, and far-field behavior where movement of the plume is governed chiefly by ambient conditions in the lake. Ambient temperature and velocity conditions in the lake will be characterized using results from the monitoring section above in conjunction with model results from an existing high resolution NOAA model of Lake Erie (Great Lakes Coastal Forecasting System).

Both near-field and far-field plume characteristics can be simulated by CORMIX, which is a United States Environmental Protection Agency (USEPA) supported mixing zone model and decision support system for environmental impact assessment of regulatory mixing zones resulting from continuous point source discharges. CORMIX is an 'expert system' that classifies discharges according to a complex system of length scale calculations using discharge and receiving water characteristics. Once classified, plume dilution and trajectory are calculated using the appropriate analytical solution, developed from extensive prior laboratory and field studies. CORMIX is applicable to a wide variety of discharge and receiving water conditions and has been validated under a variety of actual field conditions.

CORMIX simulations of plume dilution away from the discharge will be compared to field and satellite observations of plume area, so as to verify the appropriateness of the modeling assumptions. The model will then be applied via a series of steady-state simulations representing a range of ambient conditions, including temperature, water velocity, and surface wind speed/direction, to characterize the variability of the discharge plume and identify the most sensitive conditions. A report will be prepared that summarizes the modeling and assesses the significance of the plume under a range of ambient conditions.

*Figure 1: Examples of surface temperature sensed by Landsat 5 on July 1, August 18, and September 3, 2011 for Avon Lake, OH on Lake Erie.*

GenOn

121 Champion Way
Canonsburg, PA 15317
(724) 597-8630

**VIA TRACKED DELIVERY**

July 30, 2012

Mr. Eric Nygaard
Ohio Environmental Protection Agency
Division of Surface Water
50 West Town Street, Suite 700
Columbus, OH 43216

**Avon Lake Power Plant**
**NPDES Permit No. 3IB00002*KD**
**General Mercury Variance**
**Mercury Source Evaluation Report**

Dear Mr. Nygaard:

As per the requirements of Condition K, Item 1(d)(i) of Part II of the Avon Lake Power Plant's NPDES Permit No. 3IB00002*KD, GenOn Power Midwest, LP [as a wholly-owned subsidiary of GenOn Energy, Inc. (GenOn)] is providing the enclosed document to comply with the obligation for preparation of a Mercury Source Evaluation Report. This obligation specifically references submittal of the Report on or before August 1, 2012, which corresponds to 12 months from the August 1, 2011 effective date of the recently renewed NPDES Permit. Accordingly, this Source Evaluation Report presents our current understanding of the materials, processes and operations which provide the most significant and quantifiable contributions of mercury to the Outfall 002 discharge. The findings from this Report will serve to guide certain aspects of the upcoming Engineering Evaluation which will be conducted during Year 2 (August 1, 2012 thru July 31, 2013) of the Mercury Variance Implementation period.

We trust that this submittal is in accordance with OEPA's expectations regarding the Mercury Source Evaluation Report. Should you have any questions or concerns on the enclosed document, please contact me directly at (724) 597-8630 or via email at Nathan.Rozic@genon.com.

In closing, please note that GenOn's plans (as announced earlier this year) remain in effect for the 2015 deactivation of the Avon Lake Power Plant.

Respectfully submitted,

Nathan J. Rozic

Nathan J. Rozic
Manager, Environmental Operations & Compliance

cc: Scott Cameron, GenOn – Avon Lake
Steve Frank, GenOn – Southpointe
David Shott, Shaw Environmental

# *Mercury Source Evaluation*
# *Avon Lake Power Plant*
# *NPDES Permit No. 3IB00002*KD*

**Prepared for:**

GenOn

GenOn Energy, Inc.
121 Champion Way, Suite 300
Canonsburg, PA 15317

**Prepared by:**

Shaw® Shaw Environmental, Inc.

Shaw Environmental, Inc.
2790 Mosside Blvd
Monroeville, PA 15146

**July 2012**

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# 1.0 Introduction

GenOn Power Midwest, L.P., a wholly-owned subsidiary of GenOn Energy, Inc., (GenOn) operates a coal-fired, electric generating station (the Facility) in Avon Lake, Ohio, that discharges into Lake Erie. The Ohio Environmental Protection Agency (OEPA) has issued the Facility a National Pollutant Discharge Elimination System (NPDES) Permit (Permit No. 3IB00002*KD, effective through July 31, 2015) which includes several authorized discharge points, with Outfall 002 specifically designated as the discharge from the Ash Settling Basins.

Part II, Condition K of the NPDES Permit grants the Facility a General Mercury Variance for Outfall 002 in accordance with the provisions of Ohio Administrative Code (OAC) 3745-33-07(D). GenOn demonstrated that it is currently unable to comply with the monthly average water quality based effluent limit of 1.3 nanograms per liter (ng/L) without construction of expensive end-of-pipe controls more stringent that those required by Sections 301(b) and 306 of the Clean Water Act. The Facility is currently able to achieve an annual average mercury effluent concentration (AAMEC) of 12 ng/L at Outfall 002. For General Mercury Variance purposes, the AAMEC is defined as the average of the most recent 12 months of effluent data.

Pursuant to Condition K, Item 1(d)(i) of the NPDES Permit, GenOn is required to submit the results of a comprehensive evaluation of mercury sources by August 1, 2012. Accordingly, this report provides the results of the mercury source evaluation. This evaluation documents information regarding potential sources of mercury, including known concentrations of trace mercury in chemical additives; the concentration of mercury in coal provided by various suppliers; and water quality data for the various waste streams that contribute to the ash wastewater treatment system associated with Outfall 002.

GenOn has announced that the Facility will be deactivated in April 2015.

## 1.1 Facility Operation

A review of the Facility was performed to evaluate possible sources of mercury. This review resulted in the following six (6) target areas for mercury contribution to Outfall 002, as shown in Figure 1, the Ash Settling Basin Wastewater Flow Diagram:

- Coal Pile Retention Basin
- Ash Recycle Tank
- Chemical Filtrate Sump
- Ash Sluiceway
- Primary Ash Settling Basin
- Secondary Ash Settling Basin

An initial screening evaluation program was developed to determine the major sources of mercury in the Facility wastewater. Sampling of these sources was performed and is further discussed in Section 2.3.

## 2.0 General Sources of Mercury

An inventory of potential mercury sources was conducted at the Facility as listed below:

- Low-mercury fluorescent bulbs – Fluorescent bulbs are stored and disposed of in accordance with universal waste regulations and are not exposed to the environment. This is not believed to be a source of mercury in the Outfall 002 effluent.
- Other mercury-containing equipment – All mercury manometers and most mercury-containing gauges and switches have been removed during the course of routine maintenance, and the remaining equipment will be replaced with non-mercury components as the equipment reaches end-of-life. This is not believed to be a source of mercury in the Outfall 002 effluent.
- Dormant/decommissioned equipment – Any mercury-containing equipment in decommissioned plant areas is protected from exposure; should this equipment be dismantled or otherwise handled, any mercury-containing components will be recycled or disposed of properly. This is not believed to be a source of mercury in the Outfall 002 effluent.
- Chemical additives – The facility uses bulk amounts of sulfuric acid and sodium hydroxide, which are known to have trace amounts of metals, including mercury. GenOn purchases technical grade additives to help minimize the concentration of impurities in the chemicals. This is not believed to be a source of mercury in the Outfall 002 effluent.
- Public water – In addition to lake water, the facility uses city water, which may contain trace amounts of mercury. Based on the 2012 Water Quality Report issued by Avon Lake Municipal Utilities, mercury was not included as a detected contaminant. This is not believed to be a source of mercury in the Outfall 002 effluent.
- Coal product and ash – Coal and ash are known to contain trace amounts of mercury and other metals. The concentrations of mercury vary depending on coal sources and preparation; the amount of mercury released or captured during the combustion process varies depending on these factors, as well as operating conditions. The mercury concentration in coal, summarized in Table 1 and Figure 2, is further discussed in Section 2.1. This represents a potential source of mercury in the Outfall 002 discharge.
- Intake water from Lake Erie – As summarized in Table 2 (Section 2.2), water drawn from Lake Erie contains trace amounts of mercury in concentrations often exceeding those in the Facility's discharge from Outfall 002. This represents a potential source of mercury in the Outfall 002 effluent.
- Stormwater runoff - Stormwater runoff from coal product storage is treated at the Facility in the Coal Pile Runoff Pond and the bottom ash treatment ponds prior to discharge. Wastewater from the bottom ash treatment system also is treated prior to discharge. Incidental spills or tracking of coal and ash are minimized through spill prevention control measures and housekeeping practices. Facility operations, including wastewater generation and treatment, are further discussed in Section 2.3. This represents a potential source of mercury in the Outfall 002 discharge.

Based on the results of this inventory, the following three (3) sources were determined to be potential sources of mercury in the Outfall 002 discharge:

- Coal
- Lake Erie Service Water
- Facilities Operation (Wastewater Generation)

This section describes each of these sources.

### 2.1 Mercury in Coal

From January 2012 through April 2012, samples of coal delivered to the Facility were collected and analyzed for mercury. Table 1 provides the data from these analyses, and Figure 2 presents these data graphically. Coal from Bailey Mine (representing the majority of the coal materials delivered during this period) had an average mercury concentration of 0.12 micrograms per gram (µg/g), and coal from Nelms #2 had an average mercury concentration of 0.39 µg/g. The overall mercury concentration in coal was 0.17 µg/g. The mercury concentration in the Nelms #2 coal is higher (4 samples) than the coal from the Bailey Mine (18 samples).

### 2.2 Lake Erie Service Water

Table 2 provides the influent and effluent mercury concentrations from sampling conducted since September 2006. Samples collected from the plant intake (Outfall 800) and Outfall 002 discharge were tabulated for comparison. These data are submitted to OEPA in the monthly NPDES Discharge Monitoring Report (DMR).

The data for this time period indicate an average mercury concentration of 4.18 ng/L in the Lake Erie intake water and an average discharge concentration of 2.10 ng/L in the Outfall 002 effluent. Of the sampling events in which mercury concentration data exists for the Lake Erie intake and Outfall 002 sampling points, approximately 64 percent of the results show a decrease or the same level of mercury at the outfall compared to the intake. Using the long-term average discharge rate of 0.94 MGD at Outfall 002 for the period of monitoring, the average mass loading is approximately 0.000017 pounds per day of mercury to Lake Erie.

**Table 1. Coal Mercury Concentration**

| Sample ID | Date | Mercury Concentration, µg/g | Coal Source |
|---|---|---|---|
| OHA 21 | 1/9/2012 | 0.10 | Bailey Mine |
| OHA 22 | 1/16/2012 | 0.11 | Bailey Mine |
| OHA-23 | 1/20/2012 | 0.40 | Nelms #2 |
| OHA-24 | 1/30/2012 | 0.13 | Bailey Mine |
| OHA-25 | 2/5/2012 | 0.11 | Bailey Mine |
| OHA-26 | 2/13/2012 | 0.13 | Bailey Mine |
| OHA-27 | 2/21/2012 | 0.11 | Bailey Mine |
| OHA-29 | 2/24/2012 | 0.41 | Nelms #2 |
| OHA-28 | 2/27/2012 | 0.12 | Bailey Mine |
| OHA-30 | 3/1/2012 | 0.11 | Bailey Mine |
| OHA-31 | 3/5/2012 | 0.11 | Bailey Mine |
| OHA-32 | 3/8/2012 | 0.10 | Bailey Mine |
| OHA-33 | 3/13/2012 | 0.11 | Bailey Mine |
| OHA-34 | 3/16/2012 | 0.13 | Bailey Mine |
| OHA-35 | 3/20/2012 | 0.13 | Bailey Mine |
| OHA-36 | 3/23/2012 | 0.13 | Bailey Mine |
| OHA-37 | 3/27/2012 | 0.14 | Bailey Mine |
| OHA-38 | 3/31/2012 | 0.35 | Nelms #2 |
| OHA-39 | 4/3/2012 | 0.15 | Bailey Mine |
| OHA-40 | 4/7/2012 | 0.10 | Bailey Mine |
| OHA-41 | 4/14/2012 | 0.11 | Bailey Mine |
| OHA-47 | 4/30/2012 | 0.40 | Nelms #2 |
| | **AVERAGE** | **0.17** | |
| | **ST. DEV.** | **0.11** | |

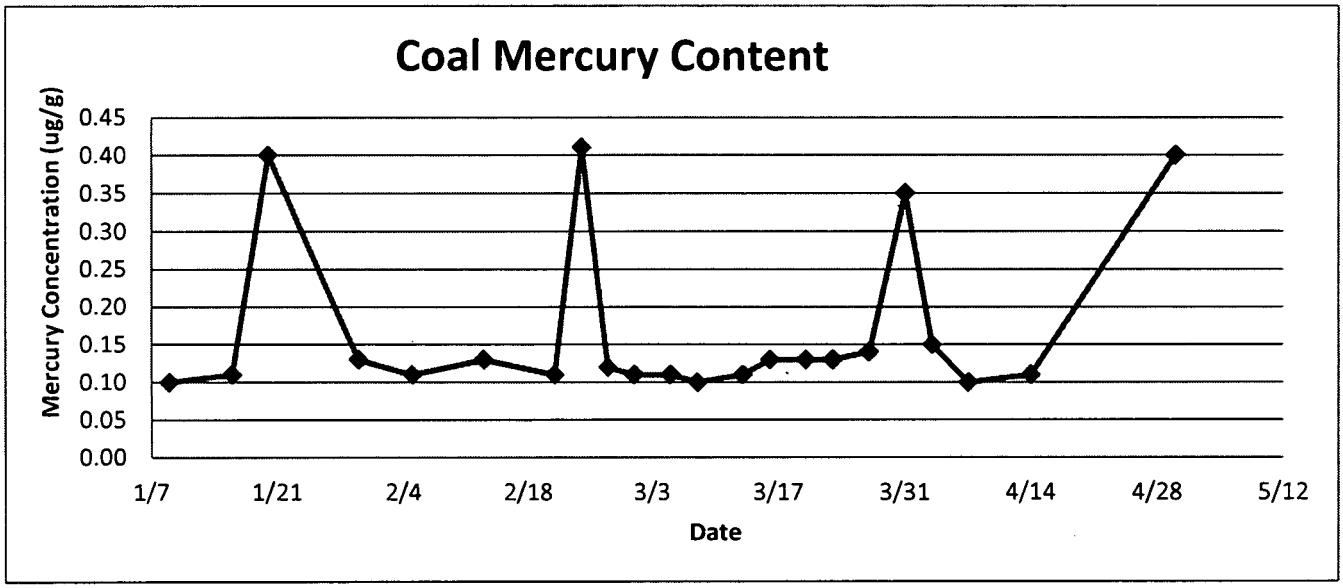



**Figure 2. Coal Mercury Content**

## Table 2. Influent and Effluent Total Mercury Concentrations

| Date | Mercury Concentrations (ng/L) | |
|---|---|---|
| | Lake Erie Intake (Outfall 800) | Plant Discharge (Outfall 002) |
| Sept. 2006 | N/A | 1.3 |
| Nov. 2006 | 0.53 | 1.26 |
| Jan. 2007 | 2.2 | 1.0 |
| Mar. 2007 | <0.50 | <0.50 |
| May 2007 | <0.50 | 5.36 |
| July 2007 | <0.50 | <0.50 |
| Sept. 2007 | 13.7 | <0.50 |
| Nov. 2007 | 0.71 | <0.50 |
| Jan. 2008 | 1.7 | <0.50 |
| Mar. 2008 | 7.64 | <0.50 |
| May 2008 | 1.6 | 1.55 |
| July 2008 | 2.89 | 2.12 |
| Sept. 2008 | 0.80 | 6.47 |
| Nov. 2008 | 2.02 | 0.86 |
| Jan. 2009 | 0.97 | 15.2 |
| Mar. 2009 | 5.32 | 2.15 |
| May 2009 | 1.49 | 2.11 |
| July 2009 | <0.50 | 2.2 |
| Sept. 2009 | 69.5 | 0.93 |
| Nov. 2009 | 4.9 | 0.92 |
| Jan. 2010 | 0.78 | <0.50 |
| Mar. 2010 | 0.95 | <0.50 |
| May 2010 | 3.48 | 2.08 |
| July 2010 | 1.9 | <0.50 |
| Sept. 2010 | <0.50 | 0.60 |
| Nov. 2010 | 1.71 | 0.81 |
| Jan. 2011 | 11.3 | 1.14 |
| Mar. 2011 | N/A | <0.50 |
| May 2011 | 1.18 | 0.67 |
| July 2011 | 1.09 | 0.93 |
| Aug. 2011 | 0.87 | 1.59 |
| Sept. 2011 | 9.53 | 4.09 |
| Oct. 2011 | 1.09 | 5.15 |
| Nov. 2011 | 0.52 | 5.56 |
| Dec. 2011 | 3.83 | 3.41 |
| Jan. 2012 | 0.82 | 0.40 |
| Feb. 2012 | 2.1 | 5.89 |
| Mar. 2012 | 2.17 | <0.50 |
| Apr. 2012 | 1.27 | 3.34 |
| May 2012 | 1.93 | 6.06 |
| June 2012 | 0.60 | 1.11 |
| **AVERAGE** | **4.18** | **2.10** |

N/A – Data not available.

### *2.3 Facility Operations (Wastewater Generation)*

Using the information from the development of Figure 1, an initial screening evaluation program was implemented to determine the major sources of mercury in the Facility wastewater. Seven samples were collected from December 2011 through March 2012 (bi-monthly) from the following nine locations:

- Outfall 800 (Lake Erie intake)
- IMP-601 (Ash Recycle Tank)
- Chemical Filtrate Sump
- Ash Sluiceway
- Coal Pile Retention Basin
- Coal Pile IMP-610 (WWTP effluent)
- Primary Ash Settling Basin
- Secondary Ash Settling Basin
- Outfall 002 (Lake Erie discharge)

Table 3 provides the total mercury concentration in each wastewater stream for the screening evaluation program. During the study period, only Unit #9 was operating. In accordance with the practice followed in reporting mercury concentrations for Outfall 002 in the DMR, the mercury concentration in the blank samples was subtracted from the mercury concentration in the wastewater samples. All of the aqueous samples were analyzed by Precision Analytical, with the exception of the 2/22/2012 samples, which were analyzed by Mercury One Ltd.

**Table 3. Wastewater Total Mercury Concentration (ng/L)**
**(Sample Mercury Concentrations minus Blank Mercury Concentrations)**

| Wastewater Stream | 12/21/11 | 1/12/12 | 1/26/12 | 2/8/12 | 2/22/12 | 3/14/12 | 3/21/12 | Average |
|---|---|---|---|---|---|---|---|---|
| Outfall 800 (Lake Erie Intake) | 1.05 | 1.109 | ND | 2.08 | 1.1 | 2.838 | 0.541 | 1.25 |
| IMP-601 (Ash Recycle Tank) | 2.015 | 0.513 | ND | 0.97 | 1.36 | 0.399 | 0.734 | 0.86 |
| Chemical Filtrate Sump | 3.48 | 0.786 | 0.888 | 0.861 | 2.04 | 1.091 | 0.761 | 1.42 |
| Ash Sluiceway | 0.731 | 0.39 | 3.68 | 0.875 | 8.38 | 6.31 | 6.54 | 3.84 |
| Coal Pile Retention Basin | 0.63 | ND | ND | ND | ND | 2.81 | 0.629 | 0.58 |
| Coal Pile IMP-610 (WWTP eff.) | ND | ND | ND | ND | ND | ND | 0.521 | 0.07 |
| Primary Ash Settling Basin | 7.37 | 5.61 | 4.379 | 1.96 | 6.15 | 3.15 | 0.829 | 4.21 |
| Secondary Ash Settling Basin | 0.773 | 5.412 | 2.92 | 5.54 | 12.4 | 2.55 | ND | 4.23 |
| Outfall 002 (Lake Erie discharge) | ND | 0.791 | ND | 0.885 | 10.9 | ND | ND | 1.80 |

ND – not detected.

Table 4 shows the dissolved mercury concentrations at the various locations sampled. In this case, mercury concentrations in the blank samples were not subtracted from the sample concentration. These data show that the dissolved mercury concentrations in the Outfall 002 effluent were nearly all non-detect.

**Table 4. Wastewater Dissolved Mercury Concentration (ng/L)**

| Wastewater Stream | 12/21/2011 | 1/12/2012 | 1/26/2012 | 2/8/2012 | 2/22/2012 | 3/14/2012 | 3/21/2012 |
|---|---|---|---|---|---|---|---|
| Outfall 800 (Lake Erie Intake) | ND | ND | ND | 1.29 | 0.96 | 0.89 | ND |
| IMP-601 (Ash Recycle Tank) | 0.805 | ND | ND | ND | 0.96 | ND | ND |
| Chemical Filtrate Sump | ND | 0.935 | ND | 0.69 | 1.63 | 0.593 | 0.606 |
| Ash Sluiceway | 0.642 | 0.961 | 0.574 | 0.552 | 2.54 | 0.559 | ND |
| Coal Pile Retention Basin | ND | NS | ND | NS | NS | ND | 0.571 |
| Coal Pile IMP-610 (WWTP eff.) | ND | NS | ND | NS | NS | ND | ND |
| Primary Ash Settling Basin | ND | 1.93 | 0.758 | 0.988 | 1.63 | ND | ND |
| Secondary Ash Settling Basin | ND | 2.5 | ND | 2.43 | 1.12 | ND | ND |
| Outfall 002 (Lake Erie discharge) | ND | ND | ND | ND | 1.57 | ND | ND |

ND – not detected
NS – not sampled

Based on the data presented in Tables 3 and 4, the treated coal pile runoff stream (IMP-610) is not a significant contributor of mercury. Over the study period, the total mercury concentrations in the Lake Erie Intake averaged 1.25 ng/L. Lastly, the highest average total mercury concentrations were reported in the Ash Sluiceway effluent (3.84 ng/L), the Primary Settling Basin (4.21 ng/L), and the Secondary Settling Basin effluent (4.23 ng/L).

Figure 3 shows the total mercury concentration for each sampling location over the sampling period, and Figure 4 shows the same data but with the mercury concentrations in the Lake Erie Intake (Outfall 800) plotted on a different scale as the secondary axis on the right. These graphs do not exhibit any discernible correlation between mercury concentrations in the Lake Erie intake and the wastewater.

Figure 5 shows the total mercury concentration by location and demonstrates that the Ash Sluiceway and the Ash Settling Basins (primary and secondary) have higher concentrations of mercury than the other sample locations. These locations will be discussed further in Section 3.0.

Figure 6 shows the water and coal mercury concentrations, and Figure 7 shows the total mercury concentration vs. time along with precipitation data for the Avon Lake region. Although the coal concentration for the February 21 sampling event appears to show a high mercury concentration in both the wastewater and the coal, overall there is no statistical correlation between the wastewater mercury concentration and either the coal composition or area precipitation data (which would affect yard runoff volumes).

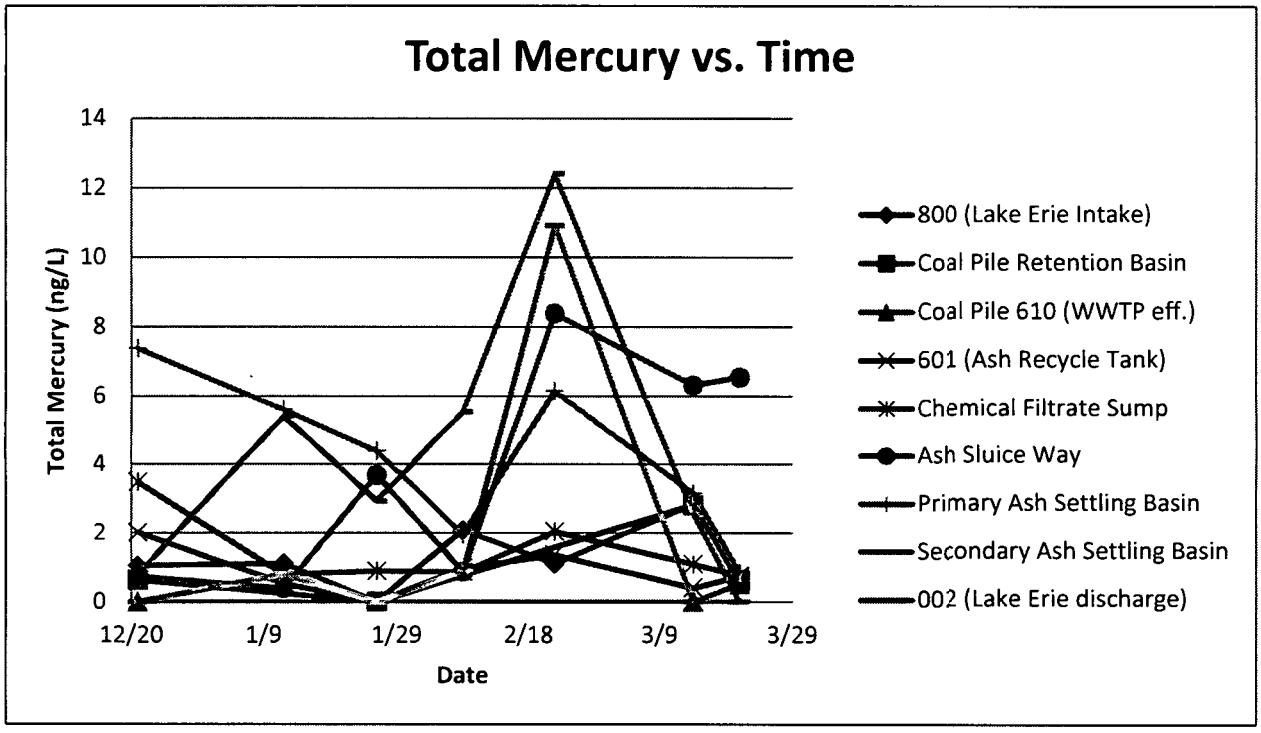



**Figure 3. Total Mercury vs. Time**

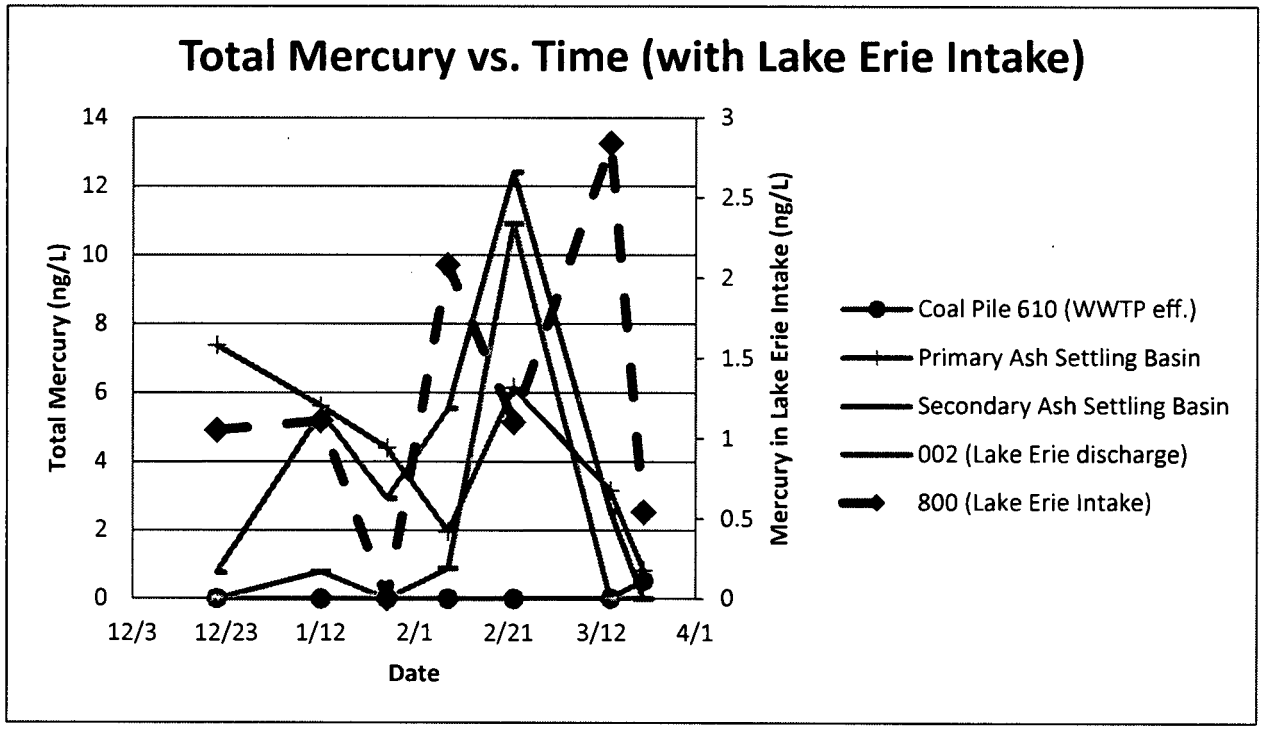



**Figure 4. Total Mercury vs. Time (with Lake Erie Intake)**

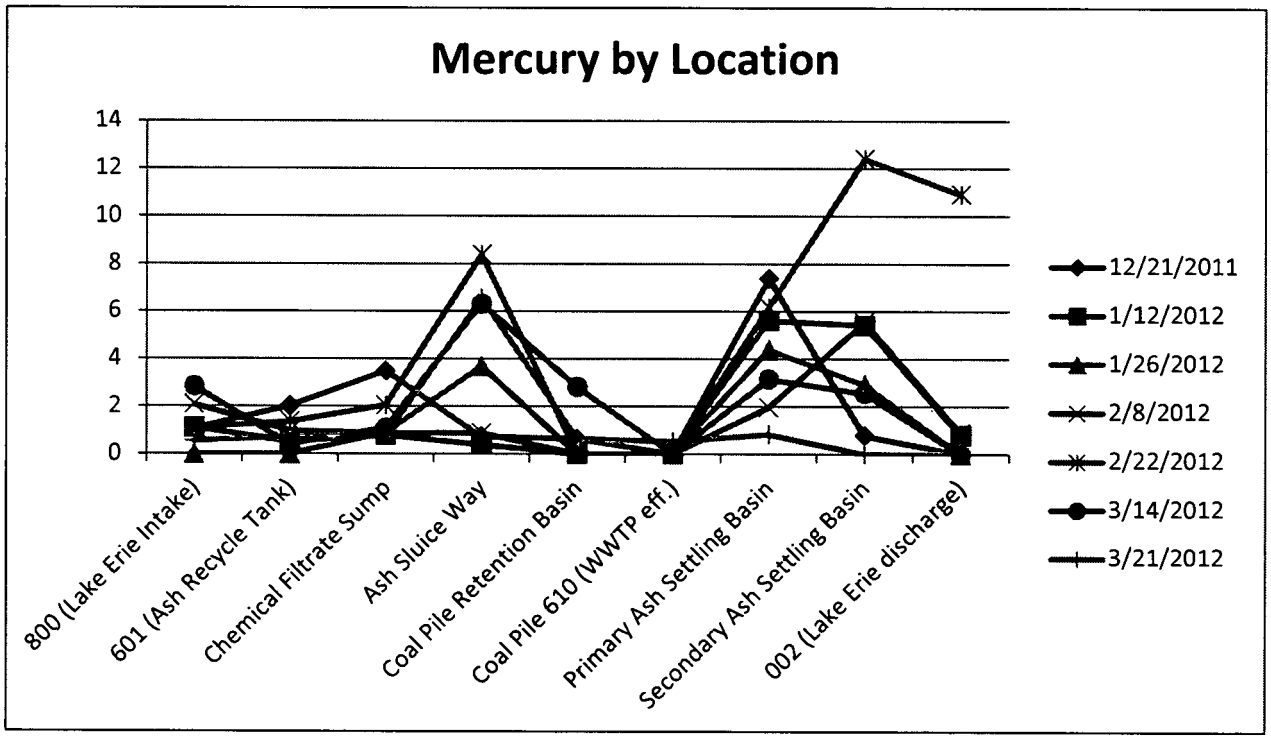



**Figure 5. Mercury by Location**

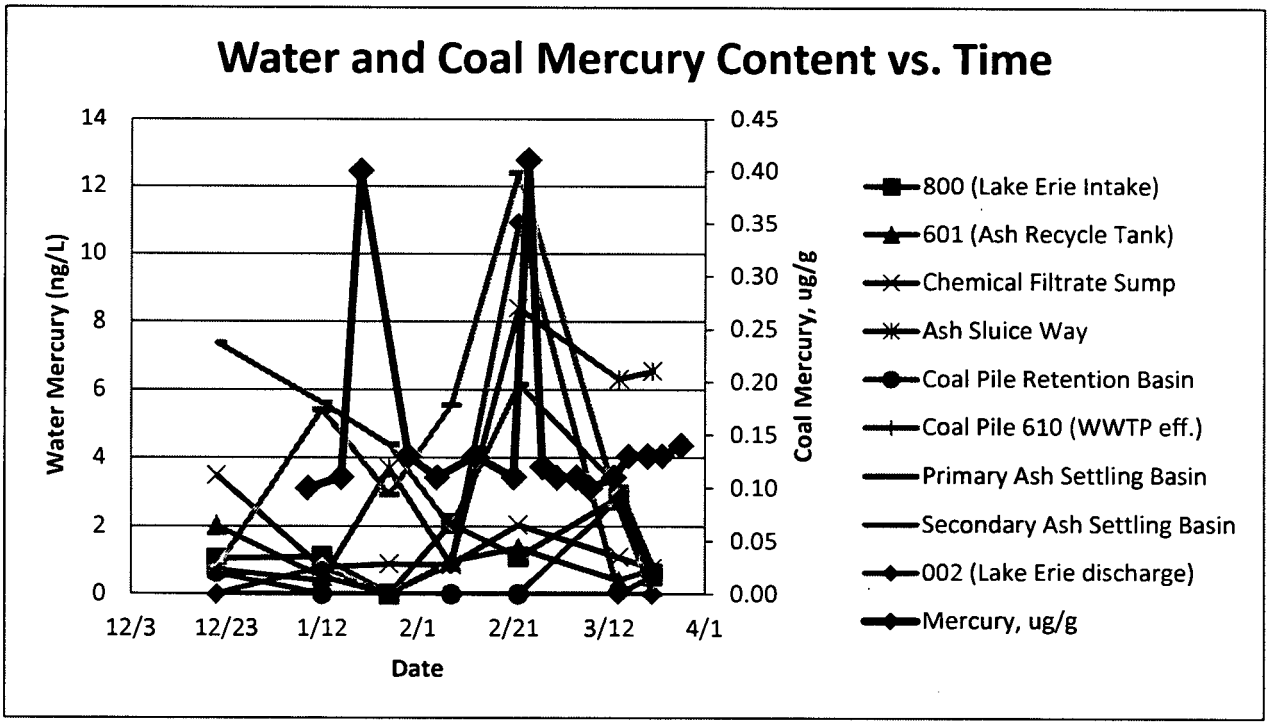



**Figure 6. Water and Coal Mercury Content vs. Time**

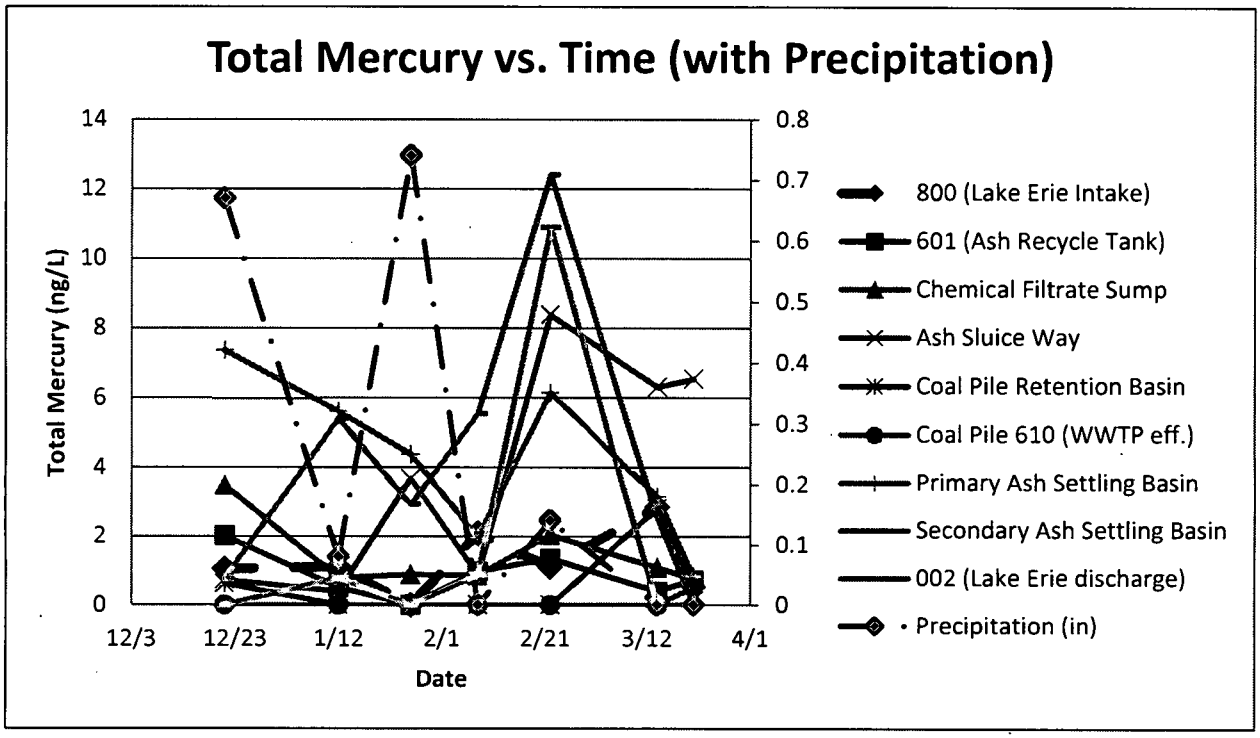



**Figure 7. Total Mercury vs. Time (with Precipitation)**

# 3.0 Conclusions and Future Testing

Based on the evaluation presented herein, it is evident that the coal received at the Facility is the major source of mercury at the Avon Lake Power Plant. In turn, the fly ash and bottom ash generated from burning the coal and the subsequent wastewaters generated from conveying and handling these ash streams are the cause of mercury in the Outfall 002 effluent. Thus, all future activity for mercury reduction will be focused on the ash handling wastewaters.

Based on the wastewater analyses discussed in Section 2.3, the Ash Sluiceway was found to be a major contributor of mercury to Outfall 002. Two primary sources of wastewater to the Ash Sluiceway were identified: #1 Yard Sump (generated from fly ash loading) and #6 Yard Sump (generated from bottom ash loading).

A sampling program has been designed to collect wastewater samples and flow rates from #1 Yard Sump and #6 Yard Sump. Wastewater samples will also be collected from the Ash Sluiceway, the Anthracite Filter backwash water, and Outfall 002. These data will be used to better understand the process and evaluate potential locations where meaningful reductions in mercury can possibly be accomplished either through best management practices, operational adjustments, or consideration of new or improved treatment applications.

On a parallel path, GenOn will be implementing the components of an Engineering Evaluation Work Plan which is intended to make use of the data from the sampling program above, along with review of the current operational practices within the Ash Settling Basins and the Anthracite Filters. Limited work in this regard is already underway in the form of bench-scale testing of polymers to determine if additional benefits can be derived from their application at the Facility. These activities will be performed in conjunction with the plans for facility deactivation in April 2015.

Ohio | Environmental Protection Agency

Ted Strickland, Governor
Lee Fisher, Lt. Governor
Chris Korleski, Director

AUG 0 9 REC'D

August 8, 2011

Re: Ohio EPA Permit No.3IB00002*KD
Application No.OH0001112
Facility Name: Avon Lake Power Plant

Robert Laeng, Environmental LPO
Orion Power Midwest, L.P.
121 Champion Way, Suite 200
Canonsburg, PA 15317

Rec'd kep DSW
8-29-11

Ladies and Gentlemen:

We propose to make to following minor modification to the above referenced permit.

Correction

Add Part I, C. - Schedule of Compliance and renumber remaining pages

If you consent to this change, please sign below and incorporate the corrected page into your permit. The proposed minor modification will become effective on the date we receive this signed letter from you at the following address: Ohio Environmental Protection Agency, Division of Surface Water, Permit Administration Section, P. O. Box 1049, Columbus, Ohio 43266-0149.

Sincerely,

Patti L. Smith

Patti L. Smith, Supervisor
Permit Processing Unit
Division of Surface Water

PLS/ kep

Enclosure

**CERTIFIED MAIL**

*I consent to the minor modification.*

Nathan J. Rozic
*Name*

Manager Environmental Operations + Compliance
*Title*

8-22-11
*Date*

50 West Town Street, Suite 700 614 | 644 3020

## Part I, C. SCHEDULE OF COMPLIANCE

1. Thermal Mixing Zone Study

a. Within 9 Months after the effective date of the permit, the permittee shall submit two copies of a Plan of Study to determine the extent of the impact of the thermal discharge from outfall 3IB00002001. The Plan, at a minimum, shall define the requirements of the study necessary to characterize the size, areal extent, and depth of the discharge plume from outfall 3IB00002001 for temperature during the summer and winter seasons. Additionally, the Plan of Study shall include the following components (Event Code: 34099):

i. A proposed sampling schedule for temperature at the intake station 3IB00002800, the outfall 3IB00002001, and within and along the discharge plume and mixing zone for outfall 3IB00002001.

ii. Sampling shall occur during months which will allow characterization of the thermal mixing zone during summer and winter seasons under a range of conditions, including wet and dry rainfall conditions, high and low background water temperatures, and variable wind patterns;

iii. A description of the process that will be used to determine and justify the sampling locations and the number of sampling locations within and along the discharge plume and mixing zone for outfall 3IB00002001. The mixing zone is defined as the area and depth within which the effluent discharge and the receiving waters mix, and the extent or edge of the mixing zone is the area in which the water temperatures have decreased sufficiently to meet ambient or background temperatures;

iv. A description of procedures which will be used to evaluate of the impact of weather conditions on the size and areal extent of the discharge plume, the mixing zone, and the area in which temperature returns to background levels. The size and areal extent of the discharge plume and mixing zone shall also be determined based upon the plant operating at peak capacity;

v. A description of the procedures which will be used to determine the location where discharge induced mixing ceases; and

vi. If applicable, a description of a U.S. EPA-approved (or equivalent) model which will be used to characterize the mixing zone.

b. A copy of the Plan of Study shall be submitted for review and comment to the Northeast District Office and to the Central Office of Ohio EPA at Lazarus Government Center, P.O. Box 1049, Columbus, Ohio 43216-1049.

c. The permittee shall modify the Plan of Study in accordance with Ohio EPA comments. Ohio EPA comments shall not include adding more parameters for sampling, or increases in the range of conditions under which sampling must occur, unless Ohio EPA demonstrates that additional sampling is necessary to characterize the thermal mixing zone properly. Also, Ohio EPA comments shall not expand the number of proposed sampling events or sampling stations to numbers greater than that which would be considered sufficient and reasonable based upon previous studies of this type in similar bodies of water. The permittee shall implement the modified Plan of Study.

d. Within 20 Months after the effective date of the permit, the permittee shall submit a status report which describes the progress being made in implementing the Plan of Study. (Event code 95999)

e. Within 30 Months after the effective date of the permit, the permittee shall submit a status report which describes the progress being made in implementing the Plan of Study. (Event code 95999)

f. Within 36 Months after the effective date of the permit, the permittee shall submit a final report to the Northeast District Office and the Central Office of Ohio EPA which includes the following information (Event Code 21599):

i. A summary and conclusions of the findings of this study;

ii. All sampling data for all locations;

iii. Sampling data for the intake station compared to sampling data for outfall 3IB00002001 and the discharge plume and mixing zone;

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GenOn

121 Champion Way, Suite 200
Canonsburg, PA 15317
Office Number (724) 597-8630

August 23, 2011

***VIA CERTIFIED MAIL***
7009 0960 0000 0315 0255

Ohio Environmental Protection Agency
Division of Surface Water
Permit Administration Section
P.O. Box 1049
Columbus, OH 43266-0149

RE: Ohio EPA Permit No.31B00002*KD
Application No. OH0001112
Facility Name: Avon Lake Power Plant
Proposed minor permit modification

To Whom It May Concern,

Attached please find the signed document providing consent to the proposed minor permit modification.

On 12/3/2010, RRI Energy, Inc. and Mirant Corporation completed a merger to form GenOn Energy, Inc. In connection with the merger, the wholly-owned subsidiary and holder of the referenced permit (Orion Power Midwest, LP) changed its name to GenOn Power Midwest, LP.

There is no change in the Avon Lake Power Plant owner, operator or control. Furthermore, there is no change in facility operation, property or any other conditions represented in the referenced permit.

If you have any questions regarding this matter, please contact me at the above listed number or via email at Nathan.Rozic@genon.com.

Sincerely,

Nathan J. Rozic
Manager Environmental Operations and Compliance
GenOn Energy, Inc.

Enclosure

cc: Scott Cameron - Avon Lake Power Plant

**Environmental Protection Agency**

Ted Strickland, Governor
Lee Fisher, Lt. Governor
Chris Korleski, Director

91 7108 2133 3938 0301 6365

August 8, 2011

Re: Ohio EPA Permit No.3IB00002*KD
Application No.OH0001112
Facility Name: Avon Lake Power Plant

Robert Laeng, Environmental LPO
Orion Power Midwest, L.P.
121 Champion Way, Suite 200
Canonsburg, PA 15317

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Sincerely,

Patti L. Smith

Patti L. Smith, Supervisor
Permit Processing Unit
Division of Surface Water

PLS/ kep

Enclosure

**CERTIFIED MAIL**

*I consent to the minor modification.*

_____ _____
*Name* *Title*

_____
*Date*

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v. A description of the procedures which will be used to determine the location where discharge induced mixing ceases; and

vi. If applicable, a description of a U.S. EPA-approved (or equivalent) model which will be used to characterize the mixing zone.

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c. The permittee shall modify the Plan of Study in accordance with Ohio EPA comments. Ohio EPA comments shall not include adding more parameters for sampling, or increases in the range of conditions under which sampling must occur, unless Ohio EPA demonstrates that additional sampling is necessary to characterize the thermal mixing zone properly. Also, Ohio EPA comments shall not expand the number of proposed sampling events or sampling stations to numbers greater than that which would be considered sufficient and reasonable based upon previous studies of this type in similar bodies of water. The permittee shall implement the modified Plan of Study.

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e. Within 30 Months after the effective date of the permit, the permittee shall submit a status report which describes the progress being made in implementing the Plan of Study. (Event code 95999)

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i. A summary and conclusions of the findings of this study;

ii. All sampling data for all locations;

iii. Sampling data for the intake station compared to sampling data for outfall 3IB00002001 and the discharge plume and mixing zone;

iv. A graphical representation of the discharge plume and the mixing zone for outfall 3IB00002001 under wet and dry weather, as well as high and low background water temperatures, and variable wind patterns, and the area in which temperature returns to background levels as determined by the study; and

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3182_KD
mm

**Peterson, Katrina**

**From:** U.S._Postal_Service_ <U.S._Postal_Service@usps.com>
**Sent:** Monday, August 22, 2011 9:31 AM
**To:** Peterson, Katrina
**Subject:** USPS Shipment Info for 7108 2133 3938 0301 6365

This is a post-only message. Please do not respond.

Current Track & Confirm e-mail information provided by the U.S. Postal Service.

Label Number: 7108 2133 3938 0301 6365

Service Type: 71

| Shipment Activity | Location | Date & Time |
|---|---|---|
| ectronic Shipping Info Received | | 08/16/11 |

USPS has not verified the validity of any email addresses submitted via its online Track & Confirm tool.

For more information, or if you have additional questions on Track & Confirm services and features, please visit the Frequently Asked Questions (FAQs) section of our Track & Confirm site at http://www.usps.com/shipping/trackandconfirmfaqs.htm

MINOR MODIFICATION LETTER
(MACRO 0001i)

DATE: 8.9.11

PERMIT #: 3IB00002*kD

OH #: OH0001112

FACILITY NAME: Gen On Midwest LP - Avon Lake Power Plant

NAME OF OWNER: Gen On Power Midwest LP

ADDRESS OF OWNER: 121 Champion Way Suite 200

ADDRESS OF OWNER:

CITY, STATE, ZIP: Canonburg PA 15317

CHANGES:

Add Part I.C. Schedule of Compliance and

renumber remaining pages

| ACCESS: |
| --- |

**Smith, Patti**

**From:** Nygaard, Eric
**Sent:** Wednesday, August 03, 2011 10:08 AM
**To:** Smith, Patti
**Cc:** Stevens, Mike
**Subject:** GenOn minor mod. 31800002

The revisions are done and are ready for minor mod. The only change that I made was to add a requirement to conduct a thermal mixing zone study to Part I. C.

Ohio | **Environmental Protection Agency**
John R. Kasich, **Governor**
Mary Taylor, **Lt. Governor**
Scott J. Nally, **Director**

June 24, 2011

Thomas Cmar
Natural Resources Defense Council
2 N. Riverside Plaza, Suite. 2250
Chicago, IL 60606

RE: Comments Submitted Regarding Avon Lake Power Plant NPDES Draft Permit

Dear Mr. Cmar:

I am to writing to you in response to comments which you submitted with regard to the Avon Lake Power Plant NPDES permit renewal (permit no. 3IB00002*KD). We received your comments in a letter dated April 25, 2011. Your comments are paraphrased below in *italics*, followed by our response.

Comment 1: **BTA Determination for 316(b)**. *"Ohio must make a determination of the Best Available Technology to reduce fish killed...before reissuing the NPDES permit...Ohio EPA's proposal to defer requiring compliance with Section 316(b) is contrary to the Clean Water Act...the public should have an opportunity to review and comment on any final BTA determination made for the Avon Lake plant by Ohio EPA...any determination under Section 316(b) for this facility must explicitly consider whether wet or dry cooling towers (or an equivalent technology that is at least as effective) represent BTA for the Avon Lake plant's cooling water intake structure."*

Based upon the impingement and entrainment data which has been submitted, and the availability of other information pertaining to the intake structure and the receiving waters, we have determined that the current intake structure represents best technology available at this time. The permit has been revised accordingly.

Comment 2: **Mercury Variance**. *"Orion Power's requested variance from compliance with permit limitations based on Lake Erie Water Quality Standards for mercury should be denied because the company has failed to provide adequate support for the contention in its variance application that it is unable to meet the water quality standards without end-of-pipe treatment to remove mercury from the effluent...the application fails to provide any engineering analysis or detailed explanation of potential additional or alternative treatment technologies or practices that might be applied either upstream of Outfall 002 to remove mercury from the effluent. There is no discussion of what level of mercury reduction such alternative or additional technologies or practices could achieve or how much it would cost...We understand that Ohio EPA intends to rely on the*

*1997 rulemaking and study to grant mercury variances to dozens of facilities that discharge into Lake Erie, and we have serious concerns that such reliance is legally and factually unsupported and will create a major obstacle to restoration of the Lake."*

Ohio EPA is required to follow the provisions in all applicable laws and regulations, including the currently effective mercury variance rule found in Ohio Administrative Code (OAC) 3745-33-07(D)(10). It is true that much of the current rule became effective in 1997, however, portions of this rule have also been revised in 2002 and again in 2007.

Applicants seeking coverage under the mercury variance must submit the information required under paragraphs (D)(10)(a)(i) through (D)(10)(a)(iv) of rule 3745-33-07 of the OAC. Once the application is submitted, it is then the Director's decision (based upon the submittal) to determine whether or not there are other means by which the permittee could comply with the water quality-based effluent limit (WQBEL). In this case, a review of the application, including influent and effluent data, a discussion of existing programs to identify potential sources of mercury, and a description of current practices to manage known sources of mercury, did not indicate any strategy which could be undertaken by the Avon Lake Power Plant at this time to guarantee compliance with the WQBEL within a typical time period of two to three years.

It is true that mercury removal technologies are available, and research continues to provide advances in this field since the Foster-Wheeler study was conducted in 1997 for Ohio EPA. This research is ongoing as a number of companies continue to investigate more efficient approaches for removing mercury. However, the information available to Ohio EPA at this time shows that:

- The efficiency of removal is dependent upon the pollutants in the wastestream. For example, wastestreams which are high in chlorides or wastestreams containing a high percentage of dissolved mercury tend to present more difficulty.
- Removal technology currently being considered is typically evaluated for relatively low flow rates (i.e., much less than 1 million gallons per day).
- Vendors for mercury removal technology are generally unwilling (and perhaps unable) to guarantee effluent concentrations less than 12 ng/l, and especially less than 1.3 ng/l, based upon the use of their systems.

In summary, we agree that technology for mercury removal has improved and certainly more options are available compared to 1997. However, we also believe that there is currently no proven technology that can reliably remove mercury to concentrations of 1.3 ng/l. Although we have required mercury removal systems to be installed at other power plants, these are facilities which operate Flue Gas Desulfurization

(or FGD) treatment systems which produce a small flow of wastewater, but in relatively high concentrations often exceeding 100 nanograms per liter (ng/l).

The conditions of the Pollutant Minimization Program (PMP) require prevention of mercury contamination, maximizing the removal capability of the current treatment system, and an evaluation whether mercury in the effluent is suspended and therefore treatable. These evaluations, including a survey of available treatment options, may lead to additional controls in the next permit renewal.

The development of the mercury variance has been predicated on the conclusion that source reduction should decrease mercury concentrations in wastewater discharges. However, it is not known whether source reduction can meet the water quality standard (WQS) for mercury. Even though the power company has proposed a strategy for reducing the mercury discharge at the Avon Lake facility, the success of this strategy is not guaranteed. There is a limited amount of experience to draw upon from other facilities which have attempted to reduce mercury concentrations through implementation of best management practices (BMPs) and pollutant minimization programs.

Comment 3: **Technology Limits for Mercury**. *"Section 301 of the Clean Water Act requires Ohio EPA to set Best Available Technology limits for mercury at outfall 002."*

We disagree that application of Best Available Technology (or BAT) requires a review of end-of-pipe treatment technologies for each NPDES permit where a mercury variance is granted. The application of technology standards was addressed when our mercury variance rules and procedures were adopted. The development of Ohio's mercury variance rule included an evaluation of the treatability of mercury in the nanogram per liter range, and concluded that existing treatment plants of various types could generally meet 12 ng/l as an annual average; discharge levels lower than 12 ng/l could not be met by treatment because (1) additional treatment could not reliably meet lower limits; and (2) even if reverse osmosis could meet the limit, it could not be added to large numbers of dischargers without causing widespread social and economic impact.

Comment 4: **Technology Limits for Heat**. *"Section 301 of the Clean Water Act requires Ohio EPA to set Best Available Technology limits for heat at outfall 001."*

We believe that development of a site-specific limit for the discharge of heat is not warranted at this time. (See our response to comment #5.)

Comment 5: **Water Quality Standards for Temperature**. *"Ohio EPA must revise the draft permit to ensure that the Avon Lake Plant's discharges comply with Lake Erie water quality standards for temperature."*

We have revised the permit and incorporated a requirement in the Schedule of Compliance to conduct a study to characterize the size, areal extent, and depth of the thermal discharge plume from outfall 001 at the Avon Lake Power Plant. The results of this study must be submitted to Ohio EPA within two and one-half years after the effective date of the permit. At that time, we will evaluate these results and determine if additional requirements should be imposed in the subsequent NPDES permit, including restricting the size of the mixing zone.

Comment 6: **Technology Limits for Other Pollutants in the TRI Report**. *"Section 301 of the Clean Water Act requires Ohio EPA to set Best Available Technology limits for other pollutants that Orion Power has reported discharging in Avon Lake's Toxics Release Inventory Report."*

Other pollutants as identified in your comment were evaluated during the development of the federal effluent guidelines and technology-based limits for steam-electric plants. Based upon this evaluation, it was determined that: 1) additional technology-based limits were unnecessary due to the low potential for the presence and discharge of certain pollutants; or 2) pollutants would be removed sufficiently at the facility by complying with the other technology-based limits for total suspended solids.

Comment 7: **Water Quality-Based Limits for Total Residual Chlorine**. *"Ohio EPA must impose a WQBEL for TRC at Outfall 001...Although the Draft Permit limits TRC discharges at Outfall 001 to two hours per day, this is not in and of itself adequate to ensure that aquatic life will be protected...We are unaware of any evidence that demonstrates that regular two hour acute exposures to TRC that exceed the applicable numeric criterion will not be deleterious to aquatic life..."*

Alternative effluent limits of 0.2 mg/l for discharges of total residual chlorine (TRC) less than two hours per day have been included in NPDES permits at least since the 1980s. A number of studies were conducted in the 1970s and 1980s showing that relatively short-term exposure to TRC at concentrations up to 0.2 mg/l (and in some cases 0.3 mg/l) were protective for warmwater fish species. While most of the literature refers to discharges of 120 minutes, some documents indicate that testing was performed based upon exposure times of 160 minutes. Several other states in U.S. EPA Region 5 (e.g., Minnesota, Michigan, and Wisconsin) use higher alternative effluent limits for TRC based upon less than two hours discharge per day.

I have also enclosed a copy of the letter which we sent to the permittee to respond to their comments on the draft permit. I am assuming that you will share this mailing with the co-signees of the April 25, 2011 comment letter. Thank you for your interest in the NPDES permit for this facility.

Sincerely,

Paul G. Novak, P.E.
Manager, Permits and Compliance Section
Division of Surface Water

enclosure

cc: Mike Stevens, NEDO, Ohio EPA
File

Ohio | Environmental Protection Agency
John R. Kasich, Governor
Mary Taylor, Lt. Governor
Scott J. Nally, Director

Stephen M. Frank, Senior Environmental Specialist
GenOn Power Midwest, L.P.
121 Champion Way
Canonsburg, Pennsylvania 15317

RE: Comments Submitted for the Avon Lake Power Plant Draft NPDES Permit - Permit # 3IB00002*KD

Dear Mr. Frank:

I am to writing to you in response to comments which you submitted on behalf of the Avon Lake Power Plant regarding the NPDES permit renewal for this facility (permit no. 3IB00002*KD). We received your comments in a letter dated April 21, 2011. Your comments are paraphrased below in *italics*, followed by our response which also reflects our telephone conference with company representatives on May 27, 2011.

Comment #1: **Outfall 001, Total Residnal Chlorine (TRC) & Total Residual Oxidants (TRO) Significant Figures**. *"The Discharge Limitations for the Maximum Concentrations for TRO and TRC are identified as 0.050 milligrams per liter (mg/l) and 0.20 mg/l.... The existing discharge limitations for TRO and TRC are also 0.05 mg/l and 0.2 mg/l, respectively, for Outfall 001...GenOn requests that OEPA retain the same number of significant figures in Part I,A as provided for in the Factsheet and the existing Permit....."*

We have revised the permit as requested.

Comment #2: **Outfall 002 Total Suspended Solids (TSS) Sampling Frequency**. *"...the current permit requires sampling three times per week. GenOn requests the reduction to once per week in the sampling frequency for TSS at Outfall 002 because we have no history of serious compliance problems..."*

We have revised the permit as requested.

Comment #3: **Outfall 002 & Internal Monitoring Station 601 Mercury Sample**. *"...The draft Permit requires that samples for mercury at Outfall 002 be collected one detention time after samples are collected for Internal Monitoring Station 601. Calculating the detention time before each sampling event will be complicated and burdensome.. GenOn requests that the Agency modify the text on Page 5 to read, 'Samples for mercury at this station shall be collected 18 hours (approximately one detention time) after samples are collected for Station 601.'... GenOn requests that OEPA include a note under this station that indicates that the representative sampling point shall be located at the Ash Recycle Tank*

*prior to discharge to the Primary Ash Pond... the note that describes 'bimonthly sampling' is no longer relevant for Outfall 002, but is relevant for Internal Monitoring Station 601."*

We have revised the permit as requested.

Comment #4: **Outfall 002 TRC Monitoring & Reporting Condition**. *"The draft Permit requires monitoring for TRC at Outfall 002... three samples were collected and analyzed on April 12, 13, and 15, 2011, and the results were 0.03 ppm, 0.02 ppm, and 0.03 ppm, respectively. Based on our findings and the results of more recent TRC sampling, we request that the condition for monitoring and reporting TRC at outfall 002 be removed from the Permit."*

We have removed the limits and monitoring requirements from the permit for this parameter.

Comment #5: **Outfall 004 TRO Significant Figures**. *"The Discharge Limitation for the Maximum Concentration for TRO is identified as 0.010 mg/l... The existing discharge limitation for TRO is also 0.01 mg/l for Outfall 004. GenOn requests that OEPA retain the same number of significant figures... as provided for in the Factsheet and the existing Permit."*

We have revised the permit as requested.

Comment #6: **Outfall 610 Redundant TSS Limitation**. *"GenOn requests that the Agency remove the monthly average limit of 50 mg/L TSS for Outfall 610 because a more stringent daily maximum limit of 50 m/g/L is already imposed at this Outfall.."*

We have revised the permit as requested.

Comment #7: **Outfall 611 Metal Cleaning Wastewater**. *"...waste streams from various sources are not combined prior to treatment and discharge at Internal Monitoring Station 611. Therefore, GenOn requests that, at a minimum, the discharge sampling point be located following the coal pile runoff treatment system... copper and iron concentrations...have not always been compliant following treatment in the coal pile runoff treatment system... GenOn requests that OEPA provide a three year compliance schedule so that we can ensure adequate treatment is provided prior to discharge at this internal monitoring station...GenOn also requests OEPA concurrence that the second and subsequent rinses and hydrostatic testing water from chemical cleaning activities are considered low volume wastewater and do not need to be monitored at Internal Monitoring Point 611."*

It is our understanding that the metal cleaning wastewater is discharged into the coal pile runoff basin prior to treatment, and prior to sampling for compliance with Station 611 effluent limits. Although you have indicated that the coal pile runoff basin "...is emptied to the maximum extent possible..." prior to the discharge of metal cleaning wastewater, some

dilution of the metal cleaning wastewater with other wastewaters seems inevitable. The federal effluent guidelines for steam-electric plants require the limits which are imposed at Station 611 [see 40 CFR Parts 423.12(b)(5) and 423.13(e)], and these limits cannot be met with the benefit of dilution from other wastestreams. As a result, sampling to determine compliance with Station 611 must occur prior to mixing of metal cleaning wastewater with other wastestreams.

You have also requested a compliance schedule in order to meet the effluent limits imposed at Station 611. Compliance schedules to meet technology-based limits in the federal effluent guidelines are not permissible. [See Section 301(b)(2)(c) of the Clean Water Act.]

In order to address this issue, you proposed during our telephone conference to change the wastewater flow so that treatment of metal cleaning wastewater would occur in existing treatment units which would not include other wastestreams. You also indicated that some new piping would be required as well as new locations for pH adjustment to implement this solution. We believe that this proposal will meet the requirements in the federal effluent guidelines for metal cleaning wastewater. The description of Station 611 in the permit has been modified slightly to reflect these changes.

Finally, you have asked for concurrence that the second and subsequent rinses and hydrostatic testing water from chemical cleaning be considered as low volume wastewater. In an attempt to answer this quesiton, we consulted the development document[1] for steam electric power plants and have found no references to a discussion of second and subsequent rinses and hydrostatic testing water with regard to metal cleaning wastewater or low volume wastewater. Furthermore, the development document defines low volume wastewater as boiler blowdown, wastestreams from water treatment, and effluent from floor and yard drains. The definition of low volume waste sources in 40 CFR Part 423.11 does not specifically address your question, but states that low volme wastes include "...wastewater from all sources except those for which specific limitations are otherwise established in this part..."

In conclusion, we believe that "second and subsequent rinses and hydrostatic testing water" should be considered as metal cleaning wastewater if they result from metal cleaning processes. However, as discussed during our telephone conference, if the second rinse (or hydrostatic testing water) is tested and meets the federal effluent guideline limits, it would not need to be processed through the metal cleaning treatment units.

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[1] *Development Document for Effluent Limitations Guidelines and Standards and Pretreatment Standards for the Steam Electric Point Source Category*, EPA-440/1-82/029, November 1982.

Comment #8: **General Mercury Variance**. *"...the draft Permit requires that all recommendations from surveys and studies associated with the plan of study be implemented in 42 months... GenOn plans to adhere to this schedule, however requests that OEPA recognize that... challenges may still exist with respect to compliance with the proposed implementation schedule."*

We recognize that unforeseen circumstances do arise occasionally which delay implementation schedules. If this occurs with respect to the mercury variance plan of study, you may request a revision of the implementation schedule through a permit modification.

Comment #9: **Permit Expiration Date**. *"...it is requested that the expiration date of the final permit...be five-years from the issue date..."*

The facility will be implementing a PMP for mercury and conducting a thermal mixing zone study during the term of this permit. These are important issues which may necessitate the need for additional permit requirements in the subsequent permit renewal, depending upon the information obtained over the next three to four years. As a result, we believe that it may be important to begin re-visiting the discharge of mercury and the thermal discharge in 2015 rather than extending the expiration date for a year until 2016.

A copy of a letter prepared to respond to other comments submitted with regard to the draft permit is enclosed. You will notice within this letter that we have included a condition in Part II of the permit stating that the current cooling water intake structure represents best technology available in accordance with Section 316(b) requirements in the Clean Water Act. In addition, this letter explains that we have included a requirement in the permit's Schedule of Compliance to conduct a mixing zone study in order to determine the size of the thermal plume. The information from this study will be used to evaluate the need for restrictions with regard to the mixing zone or other controls with regard to the thermal discharge.

I hope that we have adequately addressed your concerns regarding the NPDES permit renewal. If you have further questions or concerns, please contact Mike Stevens (330) 963-1143 in Ohio EPA's Northeast District Office. The final permit will be issued in the near future.

Sincerely,

Paul G. Novak, P.E.
Manager, Permits and Compliance Section
Division of Surface Water

enclosure

cc: Mike Stevens, NEDO, Ohio EPA
File 3IB00002

Ohio | Environmental Protection Agency
John R. Kasich, **Governor**
Mary Taylor, **Lt. Governor**
Scott J. Nally, **Director**

June 28, 2011

RE: Ohio EPA Permit No: 3IB00002*KD
Facility Name: Avon Lake Power Plant

GenOn Midwest LP
121 Champion Way, Suite 200
Canonsburg, PA 15317

Ladies and Gentlemen:

Transmitted herewith is one copy of the final National Pollutant Discharge Elimination System permit referenced above.

You are hereby notified that this action of the Director is final and may be appealed to the Environmental Review Appeals Commission pursuant to Section 3745.04 of the Ohio Revised Code. The appeal must be in writing and set forth the action complained of and the grounds upon which the appeal is based. The appeal must be filed with the Commission within thirty (30) days after notice of the Director's action. The appeal must be accompanied by a filing fee of $70.00, made payable to "Ohio Treasurer Josh Mandel", which the Commission, in its discretion, may reduce if by affidavit you demonstrate that payment of the full amount of the fee would cause extreme hardship. Notice of the filing of the appeal shall be filed with the Director within three (3) days of filing with the Commission. Ohio EPA requests that a copy of the appeal be served upon the Ohio Attorney General's Office, Environmental Enforcement Section. An appeal may be filed with the Environmental Review Appeals Commission at the following address:

Environmental Review Appeals Commission
309 South Fourth Street, Room 222
Columbus, OH 43215

Sincerely,

Patti L. Smith

Patti L. Smith, Supervisor
Permit Processing Unit
Division of Surface Water

PLS/dks

91 7108 2133 3938 0301 0059

Enclosure

**CERTIFIED MAIL**

50 West Town Street, Suite 700
P.O. Box 1049
614 | 644 3020
614 | 644 3184 (fax)

# Ohio EPA Invoice/Receipt

**Date Printed:** June 28, 2011

**Revenue ID:** 814208

***Please include this Revenue ID with all correspondence.***

**Organization ID:** 60490

**Information:** Orion Power Midwest LP
121 Champion Way Ste 200
Canonsburg , PA 15317-

**Due Date:** August 16, 2011

**Amount Due:** $1,500.00

**Effective Date:** August 01, 2011

**Revenue Description:** DSW- NPDES Permit Issuance

**Program Name:** Surface Water Programs

**Reason:** NPDES Permit Issuance for Avon Lake Power Plant 3IB00002*KD

***For some Revenues, Interest and/or Penalties may be charged for late payment.***

**Next Interest Date (if applicable):** September 15, 2011

**Next Penalty Date (if applicable):**

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**Remittance Advice** | **Detach Here - Please Return This Portion With Your Payment**

**Organization ID:** 60490

**Information:** Orion Power Midwest LP
121 Champion Way Ste 200
Canonsburg , PA 15317-

**Due Date:** Aug 16, 2011

**Amount Due:** $1,500.00

**Secondary Type/Id:** SNPDE / 3IB00002

**Revenue Type:** PTONI

**Amount Enclosed:** $_____

**Please write this number on your check. Revenue ID: 814208**
**Make check or money order payable to "Treasurer, State of Ohio"**

**Remit to:** **Ohio Environmental Protection Agency - OFA**
**Department L-2711**
**Columbus, OH 43260-2711**

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**For Ohio EPA use only**

**Check ID:** _____

**Check Date:** _____

**Check Number:** _____

**Check Amount:** $_____

| | | | | |
|---|---|---|---|---|
| 60490 | Orion Power Midwest LP | 150000 | PTONI | 814208 |

Application No. OH0001112

Issue Date: June 28, 2011

Effective Date: August 1, 2011

Expiration Date: July 31, 2015

Ohio Environmental Protection Agency
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., hereinafter referred to as the "Act"), and the Ohio Water Pollution Control Act (Ohio Revised Code Section 6111),

GenOn Power Midwest, L.P.
Avon Lake Power Plant

is authorized by the Ohio Environmental Protection Agency, hereinafter referred to as "Ohio EPA," to discharge from the wastewater treatment works located at 33570 Lake Road, Avon Lake, Ohio, Lorain County and discharging to Lake Erie in accordance with the conditions specified in Parts I, II, III, IV, V, and VI of this permit.

This permit is conditioned upon payment of applicable fees as required by Section 3745.11 of the Ohio Revised Code.

This permit and the authorization to discharge shall expire at midnight on the expiration date shown above. In order to receive authorization to discharge beyond the above date of expiration, the permittee shall submit such information and forms as are required by the Ohio EPA no later than 180 days prior to the above date of expiration.

Scott J. Nally
Director

Total Page: 47

Part I, A. - FINAL EFFLUENT LIMITATIONS AND MONITORING REQUIREMENTS

1. During the period beginning on the effective date of this permit and lasting until the expiration date, the permittee is authorized to discharge in accordance with the following limitations and monitoring requirements from outfall 3IB00002001. See Part II, OTHER REQUIREMENTS, for locations of effluent sampling.

Table - Final Outfall - 001 - Final

| Effluent Characteristic | Discharge Limitations | | | | | | | Monitoring Requirements | | |
|---|---|---|---|---|---|---|---|---|---|---|
| | Concentration Specified Units | | | | Loading* kg/day | | | | | |
| Parameter | Maximum | Minimum | Weekly | Monthly | Daily | Weekly | Monthly | Measuring Frequency | Sampling Type | Monitoring Months |
| 00011 - Water Temperature - F | - | - | - | - | - | - | - | 1/Day | Continuous | All |
| 00400 - pH - S.U. | 9.0 | 6.0 | - | - | - | - | - | 1/Month | Grab | All |
| 34044 - Oxidants, Total Residual - mg/l | 0.05 | - | - | - | - | - | - | 1/Day | Grab | All |
| 50050 - Flow Rate - MGD | - | - | - | - | - | - | - | 1/Day | Continuous | All |
| 50060 - Chlorine, Total Residual - mg/l | 0.2 | - | - | - | - | - | - | 1/Day | Grab | All |
| 78739 - Chlorination/Bromination Duration - Minutes | 120 | - | - | - | - | - | - | 1/Day | Total | All |

Note for station 3IB00002001:

- The Total Residual Chlorine (TRC) and Total Residual Oxidants (TRO) limits are the maximum allowed at the outfall at any time. TRC and TRO may not be discharged from this outfall for more than two hours per day. Simultaneous multi-unit chlorination and/or bromination is permitted. Analyses are to be performed by amperometric titration, Orion Residual Chlorine Electrode, or other EPA approved methods during chlorination and/or bromination. The daily grab samples for TRC and TRO shall represent the maximum concentration discharged during chlorination and/or bromination.

- Water temperature requires intake (3IB00002800) monitoring for outfall 3IB00002001. Report intake/outfall temperature estimated to correspond to a maximum temperature differential sustained for one hour.

- Total Residual Oxidants reflects the use of bromine compounds. Bromine can be used separately or in combination with chlorine. These limits are effective when bromine is used. Discharge limitations for TRO may be met using a dehalogenation agent, if necessary. Dehalogenation shall then be achieved by using stoichiometric calculations to determine the amount of dehalogenating agent necessary to completely estimate the residual.

- Total Residual Oxidants are to be reported on days when bromine compounds are used with or without chlorine. Report "AH" on the monthly operating report on days when no bromine compounds are used and explain in the remarks section.

- For total residual chlorine, report on days when only chlorine compounds are used (i.e. no bromine compounds). Report "AH" on the monthly operating report if bromine (or a combination of bromine and chlorine) is used and explain in remarks section.

- For chlorination/bromination duration, monitoring is to be performed only on days when using chlorine and/or bromine treatment. On days when treatment is not used, report "AH" on the monthly operating report and explain in remarks section.

- Sampling shall be performed when discharging. If NO DISCHARGE OCCURS DURING THE ENTIRE MONTH, eDMR users should select the " No Discharge " check box on the data entry form. PIN the eDMR.

- Samples taken in compliance with monitoring requirements specified above shall be taken at Sampling Stations described in Part II, OTHER REQUIREMENTS.

Part I, A. - FINAL EFFLUENT LIMITATIONS AND MONITORING REQUIREMENTS

2. During the period beginning on the first day of the the effective date of this permit and lasting until the expiration date, the permittee is authorized to discharge in accordance with the following limitations and monitoring requirements from outfall 3IB00002002. See Part II, OTHER REQUIREMENTS, for locations of effluent sampling.

Table - Final Outfall - 002 - Final

| Effluent Characteristic | Discharge Limitations | | | | | | | Monitoring Requirements | | |
|---|---|---|---|---|---|---|---|---|---|---|
| | Concentration Specified Units | | | | Loading* kg/day | | | Measuring | Sampling | Monitoring |
| Parameter | Maximum | Minimum | Weekly | Monthly | Daily | Weekly | Monthly | Frequency | Type | Months |
| 00530 - Total Suspended Solids - mg/l | 100 | - | - | 30 | 1279 | - | 384 | 1/Week | 24hr Composite | All |
| 00550 - Oil and Grease, Total - mg/l | 20 | - | - | 15 | 256 | - | 192 | 1/Month | Grab | All |
| 01119 - Copper, Total Recoverable - ug/l | - | - | - | - | - | - | - | 1/Month | Grab | All |
| 50050 - Flow Rate - MGD | - | - | - | - | - | - | - | 1/Day | Continuous | All |
| 50092 - Mercury, Total (Low Level) - ng/l | 3400 | - | - | 8.0 | 0.043 | - | 0.00010 | 1/Month | Grab | All |
| 51600 - pH Range Excursion, Maximum Duration - Minutes | 60. | - | - | - | - | - | - | 1/Day | Total | All |
| 61941 - pH, Maximum - S.U. | - | - | - | - | - | - | - | Continuous | Continuous | All |
| 61942 - pH, Minimum - S.U. | - | - | - | - | - | - | - | Continuous | Continuous | All |
| 82581 - pH Range Excursions, > 60 Minutes - Number/Day | 0 | - | - | - | - | - | - | 1/Day | Total | All |
| 82582 - pH Range Excursions, Monthly Total Duration - Minutes | 446 | - | - | - | - | - | - | 1/Month | Total | All |

Notes for station 3IB00002002:

* Effluent loadings based on average design flow of 3.38 MGD.

- Spray down waters from the new synthetic fuel facility is permitted to be discharged through this outfall.

- Sampling shall be performed when discharging. If NO DISCHARGE OCCURS DURING THE ENTIRE MONTH, eDMR users should select the " No Discharge " check box on the data entry form. PIN the eDMR.

- See Part II, Item I. for Mercury monitoring. Samples for mercury at this station shall be collected 18 hours (approximately one detention time) after samples collected for Station 601.

- Bimonthly sampling requires sample collection in January, March, May, July, September, and November.

- Samples taken in compliance with monitoring requirements specified above shall be taken at Sampling Stations described in Part II, OTHER REQUIREMENTS.

- For pH, the maximum limit is 9.0 and the minimum limit is 6.0 S.U. Violations will occur if:

1) total minutes of excursions from these limits exceed 7 hours and 26 minutes (or 446 minutes) during a single month. See pH Range Excursions, Monthly Total Duration (in minutes), Reporting Code 82582. If no excursions occurred during the month, report "0"; or

2) an individual excursion event continues uninterrupted for more than 60 minutes. See:
a) pH Range Excursions, Maximum Duration (in minutes), Reporting Code 51600. If no excursions occurred, report "0";
b) pH Range Excursions, > 60 Minutes (Number/Day), Reporting Code 82581. Enter the number of excursions each day which exceeded 60 minutes in duration.

Part I, A. - FINAL EFFLUENT LIMITATIONS AND MONITORING REQUIREMENTS

3. During the period beginning on the effective date of this permit and lasting until the expiration date, the permittee is authorized to discharge in accordance with the following limitations and monitoring requirements from outfall 3IB00002004. See Part II, OTHER REQUIREMENTS, for locations of effluent sampling.

Table - Final Outfall - 004 - Final

| Effluent Characteristic | Discharge Limitations | | | | | | | Monitoring Requirements | | |
|---|---|---|---|---|---|---|---|---|---|---|
| | Concentration Specified Units | | | | Loading* kg/day | | | | | |
| Parameter | Maximum | Minimum | Weekly | Monthly | Daily | Weekly | Monthly | Measuring Frequency | Sampling Type | Monitoring Months |
| 00530 - Total Suspended Solids - mg/l | 100 | - | - | 30 | 1268 | - | 380 | 2/Week | 24hr Composite | All |
| 00550 - Oil and Grease, Total - mg/l | 20 | - | - | 15 | 254 | - | 190 | 2/Week | Grab | All |
| 01119 - Copper, Total Recoverable - ug/l | - | - | - | - | - | - | - | 1/Week | Grab | All |
| 34044 - Oxidants, Total Residual - mg/l | 0.01 | - | - | - | - | - | - | 1/Day | Grab | All |
| 50050 - Flow Rate - MGD | - | - | - | - | - | - | - | 1/Day | Continuous | All |
| 50060 - Chlorine, Total Residual - mg/l | 0.038 | - | - | - | - | - | - | 1/Day | Grab | All |
| 51600 - pH Range Excursion, Maximum Duration - Minutes | 60 | - | - | - | - | - | - | 1/Day | Total | All |
| 61941 - pH, Maximum - S.U. | - | - | - | - | - | - | - | Continuous | Continuous | All |
| 61942 - pH, Minimum - S.U. | - | - | - | - | - | - | - | Continuous | Continuous | All |
| 82581 - pH Range Excursions, > 60 Minutes - Number/Day | 0 | - | - | - | - | - | - | 1/Day | Total | All |
| 82582 - pH Range Excursions, Monthly Total Duration - Minutes | 446 | - | - | - | - | - | - | 1/Month | Total | All |

Notes for station 3IB00002004:

* Effluent loadings based on average design flow of 3.35 MGD.

- The Total Residual Chlorine (TRC) and Total Residual Oxidants (TRO) limits are the maximum allowed at the outfall at any time. Analyses are to be performed by amperometric titration, Orion Residual Chlorine Electrode, or other EPA approved methods during chlorination and/or bromination. The daily grab samples for TRC and TRO shall represent the maximum concentration discharged during chlorination and/or bromination.

- Total Residual Oxidants reflects the use of bromine compounds. Bromine can be used separately or in combination with chlorine. These limits are effective when bromine is used. Discharge limitations for TRO may be met using a dehalogenation agent, if necessary. Dehalogenation shall then be achieved by using stoichiometric calculations to determine the amount of dehalogenating agent necessary to completely estimate the residual.

- Total Residual Oxidants are to be reported on days when bromine compounds are used with or without chlorine. Report "AH" on the monthly operating report on days when no bromine compounds are used and explain in the remarks section.

- Total Residual Chlorine is to be reported on days when only chlorine compounds are used (i.e. no bromine compounds). Report "AH" on the monthly operating report if bromine (or a combination of bromine and chlorine) is used and explain in the remarks section.

- Sampling shall be performed when discharging. If NO DISCHARGE OCCURS DURING THE ENTIRE MONTH, eDMR users should select the " No Discharge " check box on the data entry form. PIN the eDMR.

- Samples taken in compliance with monitoring requirements specified above shall be taken at Sampling Stations described in Part II, OTHER REQUIREMENTS.

- For pH, the maximum limit is 9.0 and the minimum limit is 6.0 S.U. Violations will occur if:

1) total minutes of excursions from these limits exceed 7 hours and 26 minutes (or 446 minutes) during a single month. See pH Range Excursions, Monthly Total Duration (in minutes), Reporting Code 82582. If no excursions occurred during the month, report "0"; or

2) an individual excursion event continues uninterrupted for more than 60 minutes. See:

a) pH Range Excursions, Maximum Duration (in minutes), Reporting Code 51600. If no excursions occurred, report "0";

b) pH Range Excursions, > 60 Minutes (Number/Day), Reporting Code 82581. Enter the number of excursions each day which exceeded 60 minutes in duration.

Part I, A. - FINAL EFFLUENT LIMITATIONS AND MONITORING REQUIREMENTS

4. During the period beginning on the effective date of the permit and lasting until the expiration date, the permittee is authorized to discharge in accordance with the following limitations and monitoring requirements from outfall 3IB00002601. See Part II, OTHER REQUIREMENTS, for locations of effluent sampling.

Table - Internal Monitoring Station - 601 - Final

| Effluent Characteristic | Discharge Limitations | | | | | | | Monitoring Requirements | | |
|---|---|---|---|---|---|---|---|---|---|---|
| | Concentration Specified Units | | | | Loading* kg/day | | | Measuring | Sampling | Monitoring |
| Parameter | Maximum | Minimum | Weekly | Monthly | Daily | Weekly | Monthly | Frequency | Type | Months |
| 50092 - Mercury, Total (Low Level) - ng/l | - | - | - | - | - | - | - | 1/2 months | Grab | Bimonthly |

Notes for station 3IB00002601:
- See Part II, Item K for mercury monitoring requirements. Samples for mercury at this station shall be collected one detention time before samples collected for Outfall 002.

Part I, A. - FINAL EFFLUENT LIMITATIONS AND MONITORING REQUIREMENTS

5. During the period beginning on the effective date of this permit and lasting until the expiration date, the permittee is authorized to discharge in accordance with the following limitations and monitoring requirements from outfall 3IB00002604. See Part II, OTHER REQUIREMENTS, for locations of effluent sampling.

Table - Internal Monitoring Station - 604 - Final

| Effluent Characteristic | Discharge Limitations | | | | | | | Monitoring Requirements | | |
|---|---|---|---|---|---|---|---|---|---|---|
| | Concentration Specified Units | | | | Loading* kg/day | | | Measuring | Sampling | Monitoring |
| Parameter | Maximum | Minimum | Weekly | Monthly | Daily | Weekly | Monthly | Frequency | Type | Months |
| 00400 - pH - S.U. | - | - | - | - | - | - | - | 1/Month | Grab | All |
| 00530 - Total Suspended Solids - mg/l | 100 | - | - | 30 | - | - | - | 1/Month | Grab | All |
| 00550 - Oil and Grease, Total - mg/l | 20 | - | - | 15 | - | - | - | 1/Month | Grab | All |
| 50050 - Flow Rate - MGD | - | - | - | - | - | - | - | 1/Day | 24hr Total Estimate | All |

Notes for station 3IB00002604:

- Flowrate monitoring is required daily when discharging boiler blowdown water. If no boiler blowdown water is discharged during the month, report "AL" in the first row of the first column on form 4500 (monthly operating report form). A signature is still required. If there is at least one discharge during the month, report "AH" for flow rate for each day when there is no discharge.

- Samples taken in compliance with monitoring requirements specified above shall be taken at Sampling Stations described in Part II, OTHER REQUIREMENTS.

Part I, A. - FINAL EFFLUENT LIMITATIONS AND MONITORING REQUIREMENTS

6. During the period beginning on the effective date of this permit and lasting until the expiration date, the permittee is authorized to discharge in accordance with the following limitations and monitoring requirements from outfall 3IB00002610. See Part II, OTHER REQUIREMENTS, for locations of effluent sampling.

Table - Internal Monitoring Station - 610 - Final

| Effluent Characteristic | Discharge Limitations | | | | | | | Monitoring Requirements | | |
|---|---|---|---|---|---|---|---|---|---|---|
| | Concentration Specified Units | | | | Loading* kg/day | | | | | |
| Parameter | Maximum | Minimum | Weekly | Monthly | Daily | Weekly | Monthly | Measuring Frequency | Sampling Type | Monitoring Months |
| 00400 - pH - S.U. | - | - | - | - | - | - | - | 1/Week | Grab | All |
| 00530 - Total Suspended Solids - mg/l | 50 | - | - | - | - | - | - | 1/Week | 24hr Composite | All |
| 50050 - Flow Rate - MGD | - | - | - | - | - | - | - | 1/Day | 24hr Total | All |

Notes for station 3IB00002610:

- This facility is designed, constructed and operated to treat a volume of coal pile runoff associated with a 10-year, 24-hour rainfall event. Any untreated overflow from this facility resulting from a rainfall event greater than a 10-year, 24-hour storm shall not be subject to the above effluent limitations.

- Sampling shall be performed when discharging. If no discharge occurs during the month, report "AL" in the first row of the first column on form 4500 (monthly operating report form). A signature is still required. If there is at least one discharge during the month, report "AH" for each day when there is no discharge.

- Samples taken in compliance with monitoring requirements specified above shall be taken at Sampling Stations described in Part II, OTHER REQUIREMENTS.

Part I, A. - FINAL EFFLUENT LIMITATIONS AND MONITORING REQUIREMENTS

7. During the period beginning on the effective date of this permit and lasting until the expiration date, the permittee is authorized to discharge in accordance with the following limitations and monitoring requirements from outfall 3IB00002611. See Part II, OTHER REQUIREMENTS, for locations of effluent sampling.

Table - Internal Monitoring Station - 611 - Final

| Effluent Characteristic | Discharge Limitations | | | | | | | Monitoring Requirements | | |
|---|---|---|---|---|---|---|---|---|---|---|
| | Concentration Specified Units | | | | Loading* kg/day | | | Measuring | Sampling | Monitoring |
| Parameter | Maximum | Minimum | Weekly | Monthly | Daily | Weekly | Monthly | Frequency | Type | Months |
| 00400 - pH - S.U. | - | - | - | - | - | - | - | 3/Week | Grab | All |
| 00530 - Total Suspended Solids - mg/l | 100 | - | - | 30 | - | - | - | 1/Week | 24hr Composite | All |
| 00550 - Oil and Grease, Total - mg/l | 20 | - | - | 15 | - | - | - | 1/Week | Grab | All |
| 00980 - Iron, Total Recoverable - ug/l | 1000 | - | - | 1000 | - | - | - | 1/Week | 24hr Composite | All |
| 01119 - Copper, Total Recoverable - ug/l | 1000 | - | - | 1000 | - | - | - | 1/Week | 24hr Composite | All |
| 50050 - Flow Rate - MGD | - | - | - | - | - | - | - | 1/Day | 24hr Total | All |

Notes for station 3IB00002611:

- Samples collected for this outfall shall be collected prior to metal cleaning wastes being discharged into the coal pile runoff treatment system.

- Sampling shall be performed when discharging. If no wastewater is discharged during the month, report "AL" in the first row of the first column on form 4500 (monthly operating report form). A signature is still required. If there is at least one discharge during the month, report "AH" for each day when there is no discharge.

- Samples taken in compliance with monitoring requirements specified above shall be taken at Sampling Stations described in Part II, OTHER REQUIREMENTS

Part I, A. - FINAL EFFLUENT LIMITATIONS AND MONITORING REQUIREMENTS

8. During the period beginning on the effective date of this permit and lasting until the expiration date, the permittee is authorized to discharge in accordance with the following limitations and monitoring requirements from outfall 3IB00002612. See Part II, OTHER REQUIREMENTS, for locations of effluent sampling.

Table - Internal Monitoring Station - 612 - Final

| Effluent Characteristic | Discharge Limitations | | | | | | | Monitoring Requirements | | |
|---|---|---|---|---|---|---|---|---|---|---|
| | Concentration Specified Units | | | | Loading* kg/day | | | | | |
| Parameter | Maximum | Minimum | Weekly | Monthly | Daily | Weekly | Monthly | Measuring Frequency | Sampling Type | Monitoring Months |
| 00550 - Oil and Grease, Total - mg/l | - | - | - | - | - | - | - | 1/Month | Grab | All |
| 50050 - Flow Rate - MGD | - | - | - | - | - | - | - | 1/Month | 24hr Total | All |

Notes for station 3IB00002612:

- Sampling shall be performed when discharging. If no wastewater is discharged during the month, report "AL" in the first row of the first column on form 4500 (monthly operating report form). A signature is still required.

- Samples taken in compliance with monitoring requirements specified above shall be taken at sampling stations described in Part II, OTHER REQUIREMENTS.

Part I, B. - INTAKE MONITORING REQUIREMENTS

1. Intake Monitoring. During the period beginning on the effective date of this permit and lasting until the expiration date, the permittee shall monitor the Intake at Station Number 3IB00002800, and report to the Ohio EPA in accordance with the following table. See Part II, OTHER REQUIREMENTS, for location of sampling.

Table - Intake Monitoring - 800 - Final

| Effluent Characteristic | Discharge Limitations | | | | | | | Monitoring Requirements | | |
|---|---|---|---|---|---|---|---|---|---|---|
| | Concentration Specified Units | | | | Loading* kg/day | | | | | |
| Parameter | Maximum | Minimum | Weekly | Monthly | Daily | Weekly | Monthly | Measuring Frequency | Sampling Type | Monitoring Months |
| 00011 - Water Temperature - F | - | - | - | - | - | - | - | 1/Day | Continuous | All |

Notes for station 3IB00002800:

- Samples taken in compliance with monitoring requirements specified above shall be taken at Sampling Stations described in Part II, OTHER REQUIREMENTS.

Part II, OTHER REQUIREMENTS

A. Description of the location of the required sampling stations are as follows:

| Sampling Station | Description of Location |
|---|---|
| 3IB00002001 | Condenser cooling water and boiler blowdown representative of station 3IB00002604. At combined discharge into discharge channel to Lake Erie. (Lat: 41 N 30 ' 15 "; Long: 82 W 03 ' 00 ") |
| 3IB00002002 | Combined wastewater treatment system at discharge from filters prior to Lake Erie, includes 3IB00002610 and 3IB00002611. |
| 3IB00002004 | Low volume wastewater treatment system. At discharge of low volume wastewater system prior to Lake Erie. |
| 3IB00002601 | Internal monitoring station for influent to ash pond. |
| 3IB00002604 | Boiler blowdown water. At points representative of boiler blowdown. |
| 3IB00002610 | Coal pile runoff treatment system prior to discharge to combined treatment basin (outfall 3IB00002002). |
| 3IB00002611 | Treated metal cleaning wastewater prior to mixing with any other wastewater. |
| 3IB00002612 | At the discharge of Unit # 9 heat exchanger non-contact cooling water prior to entering outfall 3IB00002001. |
| 3IB00002800 | Intake water at inlet to plant from Lake Erie. |

B. This permit shall be modified, or alternatively, revoked and reissued, to 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.

The permit as modified or reissued under this paragraph shall also contain any other requirements of the Act then applicable.

C. In the event that the permittee's operation requires the use of cooling or boiler water treatment additives that are discharged to surface waters of the state, written permission must be obtained from the director of the Ohio EPA prior to use. Discharges of these additives must meet Ohio Water Quality Standards and shall not be harmful or inimical to aquatic life. Reporting and testing requirements to apply for permission to use additives can be obtained from the Ohio EPA, Central Office, Division of Surface Water, Industrial Permits Unit. This information is also available on the DSW website:

http://www.epa.ohio.gov/portals/35/policy/01_22u2.pdf.

D. Permit limitations may be revised in order to meet water quality standards after a stream use determination and waste load allocation are completed and approved. This permit may be modified, or alternatively, revoked and reissued, to comply with any applicable water quality effluent limitations.

E. Best Management Plan: Bottom Ash Transport System

The Avon Lake ash recycle system shall be operated in a manner consistent with the following:

1. The permittee will maintain in good working order and operate as efficiently as possible the bottom ash transport recycle system installed and used at the Avon Lake generating station. The bottom ash transport recycle system shall be operated to prevent overflow of the combined wastewater treatment basin and solids overload of the combined wastewater treatment system filters, except as provided in the paragraph of Part III, General Conditions, entitled, "UNAUTHORIZED DISCHARGE"

2. Bypasses or shutdown of the bottom ash transport recycle system in excess of 48 hours duration shall be reported as specified in the paragraph of Part III, General Conditions, entitled "UNAUTHORIZED DISCHARGE"

3. All bypasses or shutdowns of the bottom ash transport recycle system that result in overflow of the combined wastwater treatment basin or the low volume wastewater treatment basin shall be reported as per the paragraph of Part III, General Conditions, entitled, "UNAUTHORIZED DISCHARGE".

4. All bypasses or shutdowns of the bottom ash transport recycle system that result in noncompliance with effluent limitations of Part I shall be reported as per the paragraph of Part III, General Conditions, entitled, "NONCOMPLIANCE NOTIFICATION".

F. There shall not be a discharge of any polychlorinated biphenyl compounds attributable to the permittee's operations.

G. The parameters below have had effluent limitations established that are below the Ohio EPA Quantification Level (OEPA QL) for the 40 CFR 136 promulgated analytical procedure for those parameters. In accordance with the ORC Section 6111.13 and OAC Rule 3745-33-07(C), if a discharge limit is set below the OEPA QL, any analytical result reported less than the OEPA QL shall be considered to be in compliance with that limit. OEPA QLs may be expressed as Practical Quantification Levels (PQL) or Minimum Levels (ML).

The permittee must utilize the lowest available detection method currently approved under 40 CFR Part 136 for monitoring these parameters.

REPORTING:

All analytical results, even those below the OEPA QL (listed below), shall be reported. Analytical results are to be reported as follows:

1. Results above the QL: Report the analytical result for the parameter of concern.

2. Results above the MDL, but below the QL: Report the analytical result, even though it is below the QL.

3. Results below the MDL: Analytical results below the method detection limit shall be reported as "below detection" using the reporting code "AA".

The following table of quantification levels will be used to determine compliance with NPDES permit limits:

| Parameter | PQL | ML |
|---|---|---|
| Chlorine, Total Residual | 0.050 mg/l | -- |
| Total Residual Oxidants | 0.050 mg/l | -- |

This permit may be modified, or alternatively, revoked and reissued, to include more stringent effluent limits or conditions if information generated as a result of the conditions of this permit indicate the presence of these pollutants in the discharge at levels above the water quality based effluent limit (WQBEL).

H. Analytical Detection Levels

The permittee shall use analytical procedures approved under 40 CFR 136 with MDL (method detection levels) less than or equal to one-third of the most stringent applicable waste load allocations for each parameter.

I. Section 316(b) Requirements

The permittee shall comply with Section 316(b) of the federal Clean Water Act (33 U.S.C. section 1326) and any rules promulgated to implement Section 316(b).

J. All parameters, except flow, need not be monitored on days when the plant is not normally staffed (Saturdays, Sundays, and Holidays). On those days, report "AN" on the monthly report form.

K. General Mercury Variance

The permittee is granted a general mercury variance under the provisions of Rule 3745-33-07(D)(10) of the Ohio Administrative Code. The Avon Lake Power Plant has demonstrated that the facility is currently unable to comply with the monthly average water quality based effluent limit of 1.3 ng/l without construction of expensive end-of-pipe controls more stringent than those required by sections 301(b) and 306 of the Clean Water Act. The Avon Lake Power Plant is currently able to achieve or projects it can achieve an annual average mercury concentration of 12 ng/l within 5 years. For general mercury variance purposes, the annual average mercury effluent concentration is defined as the average of the most recent 12 months of effluent data.

One of the conditions of the general mercury variance is that the permittee make reasonable progress towards attaining the water quality based effluent limits for mercury (1.b, below). To accomplish this the permittee is required to implement a pollutant minimization program (PMP) for mercury. The elements of a PMP include: a control strategy to locate, identify and, where cost-effective, reduce levels of mercury that contribute to discharge levels; periodic monitoring of sources and the treatment system; and annual reporting of results.

The plan of study that was part of the permittee's application for coverage under the general mercury variance includes items associated with developing a control strategy and initial implementation of a PMP. Condition 1.d, below, requires the permittee to implement the plan of study. By implementing the plan of study and meeting other conditions of this NPDES permit, the permittee is taking actions consistent with a PMP for mercury.

1. As conditions of this variance, the permittee shall meet the following requirements:

a. The permittee shall comply with the effluent limitations for mercury at outfall 3IB00002002 given in Part I, A of this permit.

b. The permittee shall make reasonable progress towards attaining the monthly average water quality based effluent limit for mercury by complying with the general mercury variance conditions included in this NPDES permit.

c. The permittee shall use EPA Method 1631 to comply with the influent and effluent mercury monitoring requirements of this permit.

d. The permittee shall implement the plan of study as included in the permittee's mercury variance application submitted initially in April 2010 and a revision submitted in December 2010, including the following summary of requirements:

i. Within 12 months of the effective date of the permit, submit the results of a comprehensive evaluation of mercury sources;

ii. Evaluation of of ash ponds treatment system, including maximizing settling efficiency, maximizing hydraulic retention time, and minimizing transport of dissolved or particulate mercury from the ash ponds;

iii. Optimization of ash ponds filters;

iv. Within 24 months of the effective date of the permit, submit results of wastewater sampling and engineering study, including survey of potential treatment technology;

v. Within 42 months of the effective date of the permit, all recommendations from surveys and studies associated with the plan of study shall be implemented.

e. The permittee shall assess the impact of the mercury variance on public health, safety, and welfare by, as a minimum, monitoring for mercury in the facility's influent and effluent as required by this NPDES permit.

f. The permittee shall achieve an annual average mercury effluent concentration equal to or less than 12 ng/l, as specified in the plan of study submitted with the permittee's mercury variance application.

g. On or prior to March 1st of each year, the permittee shall submit two copies of an annual PMP report to Ohio EPA, Division of Surface Water, Pretreatment Unit, P.O. Box 1049, Columbus, OH, 43216-1049. The annual PMP report shall include:

i. All minimization program monitoring results for the year

ii. A list of potential sources of mercury

iii. A summary of all actions taken to meet the effluent limits for mercury

iv. Any updates of the control strategy, including actions planned to reduce the levels of mercury in the treatment plant's final effluent.

h. Upon completion of the actions identified in the plan of study as required in Part II, Item K.1.d. of this permit or upon submittal of the permittee's NPDES permit renewal application, whichever comes first, the permittee shall submit to Ohio EPA's Northeast District Office a certification stating that all permit conditions imposed to implement the plan of study and the PMP have been satisfied and whether compliance with the monthly average water quality based effluent limit for mercury has been achieved and can be maintained. This certification shall be accompanied by the following:

i. All available mercury influent and effluent data for the most recent 12 month period.

ii. Data documenting all known significant sources of mercury and the steps that have been taken to reduce or eliminate those sources; and

iii. A determination of the lowest mercury concentration that currently available data indicate can be reliably achieved through implementation of the PMP.

2. Exceedance of annual average limit of 12 ng/l.

a. If at any time after the date specified in this variance by which the permittee must meet an average annual mercury effluent concentration of 12 ng/l or after the Director's final approval of a variance renewal, whichever is earlier, the permittee's annual average mercury effluent concentration exceeds 12 ng/l, the permittee shall:

i. Notify Ohio EPA's Northeast District Office not later than 30 days from the date of the exceedance.

ii. Submit an individual variance application, if a variance is desired, not later than 6 months from the date of the exceedance; or

iii. Request a permit modification not later than 6 months from the date of the exceedance for a compliance schedule to attain compliance with the water quality based effluent limits for mercury.

b. If the permittee complies with either 2.a.ii or 2.a.iii, above, the general mercury variance conditions included in this NPDES permit will remain in effect until the date that the Director acts on the individual variance application or the date that the permit modification becomes effective.

c. If the permittee does not comply with either 2.a.ii or 2.a.iii, above, a monthly water-quality based effluent limit for mercury of 1.3 ng/l shall apply at outfall 3IB00002002 beginning 6 months from the date of the exceedance.

3. The requirements of Part II, Item K.2 shall not apply if the permittee demonstrates to the satisfaction of the Director that the mercury concentration in the permittee's effluent exceeds 12 ng/l due primarily to the presence of mercury in the permittee's intake water.

L. Permit Reopener for Mercury Variance Revisions

Ohio EPA may reopen and modify this permit at any time based upon Ohio EPA water quality standard revisions to the mercury variance granted in Part II, Item K of this permit.

M. Renewal of Mercury Variance

For renewal of the mercury variance authorized in this permit, the permittee shall include the following information with the submittal of the subsequent NPDES permit renewal application:

1. the certification described under Part II, Item K.1.h., and all information required under Part II, Item K.1.h.i. through Part II, Item K.1.h.iii;

2. a status report on the progress being made implementing the pollutant minimization program (PMP). This information may be included in the annual PMP report required under Part II, Item K.1.g;

3. a listing of the strategies and/or programs in the PMP which will be continued under the next renewal of this permit; and

4. a statement requesting the renewal of the mercury variance.

N. Outfall Signage

Not later than 4 months from the effective date of this permit, the permittee shall post a permanent marker on the shoreline at each outfall that is regulated under this NPDES permit where a marker does not currently exist. This includes final outfalls, bypasses, and combined sewer overflows. The marker shall consist at a minimum of the name of the establishment to which the permit was issued, the Ohio EPA permit number, and the outfall number and a contact telephone 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 ground level. The sign shall not be obstructed such that persons in boats or persons swimming on the river or someone fishing or walking along the shore cannot read the sign. Vegetation shall be periodically removed to keep the sign visible. If the outfall is normally submerged the sign shall indicate that. If the outfall is a combined sewer outfall, the sign shall indicate that untreated human sewage may be discharged from the outfall during wet weather and that harmful bacteria may be present in the water. When an existing marker is replaced or reset, the new marker shall comply with the requirements of this section.

O. Notification to Public Water Supply Operators.

1. As required by the Ohio Administrative Code 3745-33-08(F), permits for facilities designated by the director as major discharges, in the following locations, shall require the permittee to notify the public water supply operator as soon as practicable after a discharge begins that results from a spill, separate sewer overflow, bypass, upset, or combined sewer overflow that reaches waters of the state:

a. Discharges within three thousand feet of a public water supply intake located in a lake; or

b. Discharges within ten stream miles upstream of a public water supply intake located in a reservoir or any other surface water of the state.

2. Public water supply operators meeting the criteria in Part II, Item O.1 above for the Avon Lake Power Plant are:

City of Avon Lake Public Water Supply
Avon Lake Municipal Utilities
201 Miller Road
Avon Lake, Ohio 44012

3. Within 6 months of the effective date of this permit, the permittee shall develop notification procedures between the wastewater system operator and public water supply operator[s] listed above in Part II, Item O.2 that defines the specific notification requirements to the public water supply operator and what constitutes notification "as soon as practicable".

PART III - GENERAL CONDITIONS

1. DEFINITIONS

"Daily discharge" means the discharge of a pollutant measured during a calendar day or any 24-hour period that reasonably represents the calendar day for purposes of sampling. For pollutants with limitations expressed in units of mass, the "daily discharge" is calculated as the total mass of the pollutant discharged over the day. For pollutants with limitations expressed in other units of measurement, the "daily discharge" is calculated as the average measurement of the pollutant over the day.

"Average weekly" discharge limitation means the highest allowable average of "daily discharges" over a calendar week, calculated as the sum of all "daily discharges" measured during a calendar week divided by the number of "daily discharges" measured during that week. Each of the following 7-day periods is defined as a calendar week: Week 1 is Days 1 - 7 of the month; Week 2 is Days 8 - 14; Week 3 is Days 15 - 21; and Week 4 is Days 22 - 28. If the "daily discharge" on days 29, 30 or 31 exceeds the "average weekly" discharge limitation, Ohio EPA may elect to evaluate the last 7 days of the month as Week 4 instead of Days 22 - 28. Compliance with fecal coliform bacteria or E coli bacteria limitations shall be determined using the geometric mean.

"Average monthly" discharge limitation means the highest allowable average of "daily discharges" over a calendar month, calculated as the sum of all "daily discharges" measured during a calendar month divided by the number of "daily discharges" measured during that month. Compliance with fecal coliform bacteria or E coli bacteria limitations shall be determined using the geometric mean.

"85 percent removal" means the arithmetic mean of the values for effluent samples collected in a period of 30 consecutive days shall not exceed 15 percent of the arithmetic mean of the values for influent samples collected at approximately the same times during the same period.

"Absolute Limitations" Compliance with limitations having descriptions of "shall not be less than," "nor greater than," "shall not exceed," "minimum," or "maximum" shall be determined from any single value for effluent samples and/or measurements collected.

"Net concentration" shall mean the difference between the concentration of a given substance in a sample taken of the discharge and the concentration of the same substances in a sample taken at the intake which supplies water to the given process. For the purpose of this definition, samples that are taken to determine the net concentration shall always be 24-hour composite samples made up of at least six increments taken at regular intervals throughout the plant day.

"Net Load" shall mean the difference between the load of a given substance as calculated from a sample taken of the discharge and the load of the same substance in a sample taken at the intake which supplies water to given process. For purposes of this definition, samples that are taken to determine the net loading shall always be 24-hour composite samples made up of at least six increments taken at regular intervals throughout the plant day.

"MGD" means million gallons per day.

"mg/l" means milligrams per liter.

"ug/l" means micrograms per liter.

"ng/l" means nanograms per liter.

"S.U." means standard pH unit.

"kg/day" means kilograms per day.

"Reporting Code" is a five digit number used by the Ohio EPA in processing reported data. The reporting code does not imply the type of analysis used nor the sampling techniques employed.

"Quarterly (1/Quarter) sampling frequency" means the sampling shall be done in the months of March, June, August, and December, unless specifically identified otherwise in the Effluent Limitations and Monitoring Requirements table.

"Yearly (1/Year) sampling frequency" means the sampling shall be done in the month of September, unless specifically identified otherwise in the effluent limitations and monitoring requirements table.

"Semi-annual (2/Year) sampling frequency" means the sampling shall be done during the months of June and December, unless specifically identified otherwise.

"Winter" shall be considered to be the period from November 1 through April 30.

"Bypass" means the intentional diversion of waste streams from any portion of the treatment facility.

"Summer" shall be considered to be the period from May 1 through October 31.

"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.

"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.

"Sewage sludge" means a solid, semi-solid, or liquid residue generated during the treatment of domestic sewage in a treatment works as defined in section 6111.01 of the Revised Code. "Sewage sludge" includes, but is not limited to, scum or solids removed in primary, secondary, or advanced wastewater treatment processes. "Sewage sludge" does not include ash generated during the firing of sewage sludge in a sewage sludge incinerator, grit and screenings generated during preliminary treatment of domestic sewage in a treatment works, animal manure, residue generated during treatment of animal manure, or domestic septage.

"Sewage sludge weight" means the weight of sewage sludge, in dry U.S. tons, including admixtures such as liming materials or bulking agents. Monitoring frequencies for sewage sludge parameters are based on the reported sludge weight generated in a calendar year (use the most recent calendar year data when the NPDES permit is up for renewal).

"Sewage sludge fee weight" means the weight of sewage sludge, in dry U.S. tons, excluding admixtures such as liming materials or bulking agents. Annual sewage sludge fees, as per section 3745.11(Y) of the Ohio Revised Code, are based on the reported sludge fee weight for the most recent calendar year.

2. GENERAL EFFLUENT LIMITATIONS

The effluent shall, at all times, be free of substances:

A. In amounts that will settle to form putrescent, or otherwise objectionable, sludge deposits; or that will adversely affect aquatic life or water fowl;

B. Of an oily, greasy, or surface-active nature, and of other floating debris, in amounts that will form noticeable accumulations of scum, foam or sheen;

C. In amounts that will alter the natural color or odor of the receiving water to such degree as to create a nuisance;

D. In amounts that either singly or in combination with other substances are toxic to human, animal, or aquatic life;

E. In amounts that are conducive to the growth of aquatic weeds or algae to the extent that such growths become inimical to more desirable forms of aquatic life, or create conditions that are unsightly, or constitute a nuisance in any other fashion;

F. In amounts that will impair designated instream or downstream water uses.

3. FACILITY OPERATION AND QUALITY CONTROL

All wastewater treatment works shall be operated in a manner consistent with the following:

A. At all times, the permittee shall maintain in good working order and operate as efficiently as possible all treatment or control facilities or systems installed or used by the permittee necessary to achieve compliance with the terms and conditions of this permit. Proper operation and maintenance also includes adequate laboratory controls and appropriate quality assurance procedures. This provision requires the operation of back-up or auxiliary facilities or similar systems which are installed by a permittee only when the operation is necessary to achieve compliance with conditions of the permit.

B. The permittee shall effectively monitor the operation and efficiency of treatment and control facilities and the quantity and quality of the treated discharge.

C. Maintenance of wastewater treatment works that results in degradation of effluent quality shall be scheduled during non-critical water quality periods and shall be carried out in a manner approved by Ohio EPA as specified in the Paragraph in the PART III entitled, "UNAUTHORIZED DISCHARGES".

4. REPORTING

A. Monitoring data required by this permit shall be submitted on Ohio EPA 4500 Discharge Monitoring Report (DMR) forms using the electronic DMR (e-DMR) internet application. e-DMR allows permitted facilities to enter, sign, and submit DMRs on the internet. e-DMR information is found on the following web page:

http://www.epa.ohio.gov/dsw/edmr/eDMR.aspx

Alternatively, if you are unable to use e-DMR due to a demonstrated hardship, monitoring data may be submitted on paper DMR forms provided by Ohio EPA. Monitoring data shall be typed on the forms. Please contact Ohio EPA, Division of Surface Water at (614) 644-2050 if you wish to receive paper DMR forms.

B. DMRs shall be signed by a facility's Responsible Official or a Delegated Responsible Official (i.e. a person delegated by the Responsible Official). The Responsible Official of a facility is defined as:

1. For corporations - a president, secretary, treasurer, or vice-president of the corporation in charge of a principal business function, or any other person who performs similar policy or decision making functions for the corporation; or the manager of one or more manufacturing, production or operating facilities, provided the manager is authorized to make management decisions which govern the operation of the regulated facility including having explicit or implicit duty of making 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 partnerships - a general partner;

3. For a sole proprietorship - the proprietor; or,

4. For a municipality, state or other public facility - a principal executive officer, a ranking elected official or other duly authorized employee.

For e-DMR, the person signing and submitting the DMR will need to obtain an eBusiness Center account and Personal Identification Number (PIN). Additionally, Delegated Responsible Officials must be delegated by the Responsible Official, either on-line using the eBusiness Center's delegation function, or on a paper delegation form provided by Ohio EPA. For more information on the PIN and delegation processes, please view the following web page:

http://www.epa.ohio.gov/dsw/edmr/eDMRpin.aspx

C. DMRs submitted using e-DMR shall be submitted to Ohio EPA by the 20th day of the month following the month-of-interest. DMRs submitted on paper must include the original signed DMR form and shall be mailed to Ohio EPA at the following address so that they are received no later than the 15th day of the month following the month-of-interest:

Ohio Environmental Protection Agency
Lazarus Government Center
Division of Surface Water - PCU
P.O. Box 1049
Columbus, Ohio 43216-1049

D. Regardless of the submission method, a paper copy of the submitted Ohio EPA 4500 DMR shall be maintained onsite for records retention purposes (see Section 7. RECORDS RETENTION). For e-DMR users, view and print the DMR from the Submission Report Information page after each original or revised DMR is submitted. For submittals on paper, make a copy of the completed paper form after it is signed by a Responsible Official or a Delegated Responsible Official.

E. 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 in Section 5. SAMPLING AND ANALYTICAL METHODS, the results of such monitoring shall be included in the calculation and reporting of the values required in the reports specified above.

F. Analyses of pollutants not required by this permit, except as noted in the preceding paragraph, shall not be reported to the Ohio EPA, but records shall be retained as specified in Section 7. RECORDS RETENTION.

5. SAMPLING AND ANALYTICAL METHOD

Samples and measurements taken as required herein shall be representative of the volume and nature of the monitored flow. Test procedures for the analysis of pollutants shall conform to regulation 40 CFR 136, "Test Procedures For The Analysis of Pollutants" unless other test procedures have been specified in this permit. The permittee shall periodically calibrate and perform maintenance procedures on all monitoring and analytical instrumentation at intervals to insure accuracy of measurements.

6. RECORDING OF RESULTS

For each measurement or sample taken pursuant to the requirements of this permit, the permittee shall record the following information:

A. The exact place and date of sampling; (time of sampling not required on EPA 4500)

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

C. The date the analyses were performed on those samples;

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

E. The analytical techniques or methods used; and

F. The results of all analyses and measurements.

7. RECORDS RETENTION

The permittee shall retain all of the following records for the wastewater treatment works for a minimum of three years except those records that pertain to sewage sludge disposal, use, storage, or treatment, which shall be kept for a minimum of five years, including:

A. All sampling and analytical records (including internal sampling data not reported);

B. All original recordings for any continuous monitoring instrumentation;

C. All instrumentation, calibration and maintenance records;

D. All plant operation and maintenance records;

E. All reports required by this permit; and

F. Records of all data used to complete the application for this permit for a period of at least three years, or five years for sewage sludge, from the date of the sample, measurement, report, or application.

These periods will be extended during the course of any unresolved litigation, or when requested by the Regional Administrator or the Ohio EPA. The three year period, or five year period for sewage sludge, for retention of records shall start from the date of sample, measurement, report, or application.

8. AVAILABILITY OF REPORTS

Except for data determined by the Ohio EPA to be entitled to confidential status, all reports prepared in accordance with the terms of this permit shall be available for public inspection at the appropriate district offices of the Ohio EPA. Both the Clean Water Act and Section 6111.05 Ohio Revised Code state that effluent data and receiving water quality data shall not be considered confidential.

9. DUTY TO PROVIDE INFORMATION

The permittee shall furnish to the Director, within a reasonable time, any information which the Director may request to determine whether cause exists for modifying, revoking, and reissuing, or terminating the permit, or to determine compliance with this permit. The permittee shall also furnish to the Director, upon request, copies of records required to be kept by this permit.

10. RIGHT OF ENTRY

The permittee shall allow the Director or an authorized representative upon presentation of credentials and other documents as may be required by law to:

A. Enter upon the permittee's premises where a regulated facility or activity is located or conducted, or where records must be kept under the conditions of this permit.

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

C. Inspect at reasonable times any facilities, equipment (including monitoring and control equipment), practices, or operations regulated or required under this permit.

D. Sample or monitor at reasonable times, for the purposes of assuring permit compliance or as otherwise authorized by the Clean Water Act, any substances or parameters at any location.

11. UNAUTHORIZED DISCHARGES

A. 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 assure efficient operation. These bypasses are not subject to the provisions of paragraphs 11.B and 11.C.

B. Notice

1. Anticipated Bypass - If the permittee knows in advance of the need for a bypass, it shall submit prior notice, if possible at least ten days before the date of the bypass.

2. Unanticipated Bypass - The permittee shall submit notice of an unanticipated bypass as required in paragraph 12.B (24 hour notice).

C. Prohibition of Bypass

1. Bypass is prohibited, and the Director may take enforcement action against a permittee for bypass, unless:

a. Bypass was unavoidable to prevent loss of life, personal injury, or severe property damage;

b. 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 which occurred during normal periods of equipment downtime or preventive maintenance; and

c. The permittee submitted notices as required under paragraph 11.B.

2. The Director may approve an anticipated bypass, after considering its adverse effects, if the Director determines that it will meet the three conditions listed above in paragraph 11.C.1.

12. NONCOMPLIANCE NOTIFICATION

A. Exceedance of a Daily Maximum Discharge Limit

1. The permittee shall report noncompliance that is the result of any violation of a daily maximum discharge limit for any of the pollutants listed by the Director in the permit by e-mail or telephone within twenty-four (24) hours of discovery.

The permittee may report to the appropriate Ohio EPA district office e-mail account as follows (this method is preferred):

Southeast District Office: sedo24hournpdes@epa.state.oh.us
Southwest District Office: swdo24hournpdes@epa.state.oh.us
Northwest District Office: nwdo24hournpdes@epa.state.oh.us
Northeast District Office: nedo24hournpdes@epa.state.oh.us
Central District Office: cdo24hournpdes@epa.state.oh.us
Central Office: co24hournpdes@epa.state.oh.us

The permittee shall attach a noncompliance report to the e-mail. A noncompliance report form is available on the following web site:

http://www.epa.ohio.gov/dsw/permits/permits.aspx

Or, the permittee may report to the appropriate Ohio EPA district office by telephone toll-free between 8:00 AM and 5:00 PM as follows:

Southeast District Office: (800) 686-7330
Southwest District Office: (800) 686-8930
Northwest District Office: (800) 686-6930
Northeast District Office: (800) 686-6330
Central District Office: (800) 686-2330
Central Office: (614) 644-2001

The permittee shall include the following information in the telephone noncompliance report:

a. The name of the permittee, and a contact name and telephone number;

b. The limit(s) that has been exceeded;

c. The extent of the exceedance(s);

d. The cause of the exceedance(s);

e. The period of the exceedance(s) including exact dates and times;

f. If uncorrected, the anticipated time the exceedance(s) is expected to continue; and,

g. Steps taken to reduce, eliminate or prevent occurrence of the exceedance(s).

B. Other Permit Violations

1. The permittee shall report noncompliance that is the result of any unanticipated bypass resulting in an exceedance of any effluent limit in the permit or any upset resulting in an exceedance of any effluent limit in the permit by e-mail or telephone within twenty-four (24) hours of discovery.

The permittee may report to the appropriate Ohio EPA district office e-mail account as follows (this method is preferred):

Southeast District Office: sedo24hournpdes@epa.state.oh.us
Southwest District Office: swdo24hournpdes@epa.state.oh.us
Northwest District Office: nwdo24hournpdes@epa.state.oh.us
Northeast District Office: nedo24hournpdes@epa.state.oh.us
Central District Office: cdo24hournpdes@epa.state.oh.us
Central Office: co24hournpdes@epa.state.oh.us

The permittee shall attach a noncompliance report to the e-mail. A noncompliance report form is available on the following web site:

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Northwest District Office: (800) 686-6930
Northeast District Office: (800) 686-6330
Central District Office: (800) 686-2330
Central Office: (614) 644-2001

The permittee shall include the following information in the telephone noncompliance report:

a. The name of the permittee, and a contact name and telephone number;

b. The time(s) at which the discharge occurred, and was discovered;

c. The approximate amount and the characteristics of the discharge;

d. The stream(s) affected by the discharge;

e. The circumstances which created the discharge;

f. The name and telephone number of the person(s) who have knowledge of these circumstances;

g. What remedial steps are being taken; and,

h. The name and telephone number of the person(s) responsible for such remedial steps.

2. The permittee shall report noncompliance that is the result of any spill or discharge which may endanger human health or the environment within thirty (30) minutes of discovery by calling the 24-Hour Emergency Hotline toll-free at (800) 282-9378. The permittee shall also report the spill or discharge by e-mail or telephone within twenty-four (24) hours of discovery in accordance with B.1 above.

C. When the telephone option is used for the noncompliance reports required by A and B, the permittee shall submit to the appropriate Ohio EPA district office a confirmation letter and a completed noncompliance report within five (5) days of the discovery of the noncompliance. This follow up report is not necessary for the e-mail option which already includes a completed noncompliance report.

D. If the permittee is unable to meet any date for achieving an event, as specified in a schedule of compliance in their permit, the permittee shall submit a written report to the appropriate Ohio EPA district office within fourteen (14) days of becoming aware of such a situation. The report shall include the following:

1. The compliance event which has been or will be violated;

2. The cause of the violation;

3. The remedial action being taken;

4. The probable date by which compliance will occur; and,

5. The probability of complying with subsequent and final events as scheduled.

E. The permittee shall report all other instances of permit noncompliance not reported under paragraphs A or B of this section on their monthly DMR submission. The DMR shall contain comments that include the information listed in paragraphs A or B as appropriate.

F. If the permittee becomes aware that it failed to submit an application, or submitted incorrect information in an application or in any report to the director, it shall promptly submit such facts or information.

13. RESERVED

14. DUTY TO MITIGATE

The permittee shall take all reasonable steps to minimize or prevent any discharge in violation of this permit which has a reasonable likelihood of adversely affecting human health or the environment.

15. AUTHORIZED DISCHARGES

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 by this permit shall constitute a violation of the terms and conditions of this permit. Such violations may result in the imposition of civil and/or criminal penalties as provided for in Section 309 of the Act and Ohio Revised Code Sections 6111.09 and 6111.99.

16. DISCHARGE CHANGES

The following changes must be reported to the appropriate Ohio EPA district office as soon as practicable:

A. For all treatment works, any significant change in character of the discharge which the permittee knows or has reason to believe has occurred or will occur which would constitute cause for modification or revocation and reissuance. The permittee shall give advance notice to the Director of any planned changes in the permitted facility or activity which may result in noncompliance with permit requirements. Notification of permit changes or anticipated noncompliance does not stay any permit condition.

B. For publicly owned treatment works:

1. Any proposed plant modification, addition, and/or expansion that will change the capacity or efficiency of the plant;

2. The addition of any new significant industrial discharge; and

3. Changes in the quantity or quality of the wastes from existing tributary industrial discharges which will result in significant new or increased discharges of pollutants.

C. For non-publicly owned treatment works, any proposed facility expansions, production increases, or process modifications, which will result in new, different, or increased discharges of pollutants.

Following this notice, modifications to the permit may be made to reflect any necessary changes in permit conditions, including any necessary effluent limitations for any pollutants not identified and limited herein. A determination will also be made as to whether a National Environmental Policy Act (NEPA) review will be required. Sections 6111.44 and 6111.45, Ohio Revised Code, require that plans for treatment works or improvements to such works be approved by the Director of the Ohio EPA prior to initiation of construction.

D. In addition to the reporting requirements under 40 CFR 122.41(l) and per 40 CFR 122.42(a), all existing manufacturing, commercial, mining, and silvicultural dischargers must notify the Director as soon as they know or have reason to believe:

1. That any 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 "notification levels" specified in 40 CFR Sections 122.42(a)(1)(i) through 122.42(a)(1)(iv).

2. 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 "notification levels" specified in 122.42(a)(2)(i) through 122.42(a)(2)(iv).

17. TOXIC POLLUTANTS

The permittee shall comply with effluent standards or prohibitions established under Section 307 (a) of the Clean Water Act for toxic pollutants within the time provided in the regulations that establish these standards or prohibitions, even if the permit has not yet been modified to incorporate the requirement. Following establishment of such standards or prohibitions, the Director shall modify this permit and so notify the permittee.

18. PERMIT MODIFICATION OR REVOCATION

A. After notice and opportunity for a hearing, this permit may be modified or revoked, by the Ohio EPA, in whole or in part during its term for cause including, but not limited to, the following:

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

2. Obtaining this permit by misrepresentation or failure to disclose fully all relevant facts; or

3. Change in any condition that requires either a temporary or permanent reduction or elimination of the permitted discharge.

B. Pursuant to rule 3745-33-04, Ohio Administrative Code, the permittee may at any time apply to the Ohio EPA for modification of any part of this permit. The filing of a request by the permittee for a permit modification or revocation does not stay any permit condition. The application for modification should be received by the appropriate Ohio EPA district office at least ninety days before the date on which it is desired that the modification become effective. The application shall be made only on forms approved by the Ohio EPA.

19. TRANSFER OF OWNERSHIP OR CONTROL

This permit may be transferred or assigned and a new owner or successor can be authorized to discharge from this facility, provided the following requirements are met:

A. The permittee shall notify the succeeding owner or successor of the existence of this permit by a letter, a copy of which shall be forwarded to the appropriate Ohio EPA district office. The copy of that letter will serve as the permittee's notice to the Director of the proposed transfer. The copy of that letter shall be received by the appropriate Ohio EPA district office sixty (60) days prior to the proposed date of transfer;

B. A written agreement containing a specific date for transfer of permit responsibility and coverage between the current and new permittee (including acknowledgement that the existing permittee is liable for violations up to that date, and that the new permittee is liable for violations from that date on) shall be submitted to the appropriate Ohio EPA district office within sixty days after receipt by the district office of the copy of the letter from the permittee to the succeeding owner;

At anytime during the sixty (60) day period between notification of the proposed transfer and the effective date of the transfer, the Director may prevent the transfer if he concludes that such transfer will jeopardize compliance with the terms and conditions of the permit. If the Director does not prevent transfer, he will modify the permit to reflect the new owner.

20. 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 is or may be subject under Section 311 of the Clean Water Act.

21. SOLIDS DISPOSAL

Collected grit and screenings, and other solids other than sewage sludge, shall be disposed of in such a manner as to prevent entry of those wastes into waters of the state, and in accordance with all applicable laws and rules.

22. CONSTRUCTION AFFECTING NAVIGABLE WATERS

This permit does not authorize or approve the construction of any onshore or offshore physical structures or facilities or the undertaking of any work in any navigable waters.

23. CIVIL AND CRIMINAL LIABILITY

Except as exempted in the permit conditions on UNAUTHORIZED DISCHARGES or UPSETS, nothing in this permit shall be construed to relieve the permittee from civil or criminal penalties for noncompliance.

24. STATE LAWS AND REGULATIONS

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.

25. 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 any injury to private property or any invasion of personal rights, nor any infringement of federal, state, or local laws or regulations.

26. UPSET

The provisions of 40 CFR Section 122.41(n), relating to "Upset," are specifically incorporated herein by reference in their entirety. For definition of "upset," see Part III, Paragraph 1, DEFINITIONS.

27. SEVERABILITY

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 circumstance, is held invalid, the application of such provision to other circumstances, and the remainder of this permit, shall not be affected thereby.

28. SIGNATORY REQUIREMENTS

All applications submitted to the Director shall be signed and certified in accordance with the requirements of 40 CFR 122.22.

All reports submitted to the Director shall be signed and certified in accordance with the requirements of 40 CFR Section 122.22.

29. OTHER INFORMATION

A. 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 Director, it shall promptly submit such facts or information.

B. ORC 6111.99 provides that any person who falsifies, tampers with, or knowingly renders inaccurate any monitoring device or method required to be maintained under this permit shall, upon conviction, be punished by a fine of not more than $25,000 per violation.

C. ORC 6111.99 states 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 $25,000 per violation.

D. ORC 6111.99 provides that any person who violates Sections 6111.04, 6111.042, 6111.05, or division (A) of Section 6111.07 of the Revised Code shall be fined not more than $25,000 or imprisoned not more than one year, or both.

30. NEED TO HALT OR REDUCE ACTIVITY

40 CFR 122.41(c) states that 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 conditions of this permit.

31. APPLICABLE FEDERAL RULES

All references to 40 CFR in this permit mean the version of 40 CFR which is effective as of the effective date of this permit.

32. AVAILABILITY OF PUBLIC SEWERS

Not withstanding the issuance or non-issuance of an NPDES permit to a semi-public disposal system, whenever the sewage system of a publicly owned treatment works becomes available and accessible, the permittee operating any semi-public disposal system shall abandon the semi-public disposal system and connect it into the publicly owned treatment works.

## Part IV. STORM WATER POLLUTION PREVENTION PLANS

A storm water pollution prevention plan (plan) shall be developed to address each outfall that discharges to waters of the state that contains storm water associated with industrial activity. Storm water pollution prevention plans shall be prepared in accordance with good engineering practices. The plan shall 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. In addition, the plan shall describe and ensure the implementation of practices which are to be used to reduce the pollutants in storm water discharges associated with industrial activity at the facility and to assure compliance with the terms and conditions of this permit. Facilities must implement the provisions of the storm water pollution prevention plan required under this part as a condition of this permit.

### A. Deadlines for Plan Preparation and Compliance.

1. The plan for a storm water discharge associated with industrial activity:

   a. shall be prepared within six months of the effective date of this permit (and updated as appropriate);
   b. shall provide for implementation and compliance with the terms of the plan within twelve months of the effective date of this permit.

2. Upon a showing of good cause, the Director may establish a later date for preparing and compliance with a plan for a storm water discharge associated with industrial activity.

### B. Signature and Plan Review.

1. The plan shall be signed in accordance with Part VI, and be retained on-site at the facility which generates the storm water discharge.

2. The permittee shall make plans available upon request to the Ohio EPA Director, or authorized representative, or Regional Administrator of U.S. EPA, or in the case of a storm water discharge associated with industrial activity which discharges through a municipal separate storm sewer system, to the operator of the municipal system.

3. The Director may notify the permittee at any time that the plan does not meet one or more of the minimum requirements of this Part. Within 30 days of such notification from the Director, the permittee shall make the required changes to the plan and shall submit to the Director a written certification that the requested changes have been made.

4. All storm water pollution prevention plans required under this permit are considered reports that shall be available to the public under Section 308(b) of the Act. The permittee may claim any portion of a storm water pollution plan as confidential in accordance with 40 CFR Part 2 and does not have to release any portion of the plan describing facility security measures (such as provided for in Part IV.D.7.b.(8) of this permit). An interested party wishing a copy of a discharger's SWP3 will have to contact the Ohio EPA to obtain a copy.

### C. Keeping Plans Current.

The permittee shall amend the plan whenever there is a change in design, construction, operation, or maintenance, that has a significant effect on the potential for the discharge of pollutants to the waters of the State or if the storm water pollution prevention plan proves to be ineffective in eliminating or significantly minimizing pollutants from sources identified under Part IV.D.2 of this permit, or otherwise achieving the general objectives of controlling pollutants in storm water discharges associated with industrial activity. Amendments to the plan may be reviewed by Ohio EPA in the same manner as Part IV.B above.

**D. Contents of Plan.** The plan shall include, at a minimum, the following items:

1. Pollution Prevention Team - Each plan shall identify a specific individual or individuals within the facility organization as members of a storm water Pollution Prevention Team that are responsible for developing the storm water pollution prevention plan and assisting the facility or plant manager in its implementation, maintenance, and revision. The plan shall clearly identify the responsibilities of each team member. The activities and responsibilities of the team shall address all aspects of the facility's storm water pollution prevention plan.

2. Description of Potential Pollutant Sources. Each plan shall provide a description of potential sources which may reasonably be expected to add significant amounts of pollutants to storm water discharges or which may result in the discharge of pollutants during dry weather from separate storm sewers draining the facility. Each plan shall identify all activities and significant materials which may potentially be significant pollutant sources. Each plan shall include, at a minimum:

**Part IV. STORM WATER POLLUTION PREVENTION PLANS (continued)**

D. (continued)

a. Drainage.

(1) A site map indicating an outline of the drainage area of each storm water outfall, each existing structural control measure to reduce pollutants in storm water runoff, surface water bodies, locations where significant materials are exposed to precipitation, locations where major spills or leaks identified under Part IV.D.2.c of this permit have occurred, and the locations of the following activities where such activities are exposed to precipitation: fueling stations, vehicle

and equipment maintenance and/or cleaning areas, loading/unloading areas, locations used for the treatment, storage or disposal of wastes, liquid storage tanks, processing areas and storage areas.

(2) For each area of the facility that generates storm water discharges associated with industrial activity with a reasonable potential for containing significant amounts of pollutants, a prediction of the direction of flow, and an estimate of the types of pollutants which are likely to be present in storm water discharges associated with industrial activity. Flows with a significant potential for causing erosion shall be identified.

b. Inventory of Exposed Materials. An inventory of the types of materials handled at the site that potentially may be exposed to precipitation. Such inventory shall include a narrative description of significant materials that have been handled, treated, stored or disposed in a manner to allow exposure to storm water between the time of three years prior to the date of the issuance of this permit and the present; method and location of on-site storage or disposal; materials management practices employed to minimize contact of materials with storm water runoff between the time of three years prior to the date of the issuance of this permit and the present; the location and a description of existing structural and non-structural control measures to reduce pollutants in storm water runoff; and a description of any treatment the storm water receives.

c. Spills and Leaks. A list of significant spills and significant leaks of toxic or hazardous pollutants that occurred at the facility after the date of three years prior to the effective date of this permit.

d. Sampling Data. A summary of existing discharge sampling data describing pollutants in storm water discharges from the facility.

e. Risk Identification and Summary of Potential Pollutant Sources. A narrative description of the potential pollutant sources at the following areas: loading and unloading operations; outdoor storage activities; outdoor manufacturing or processing activities; significant dust or particulate generating processes; and on-site waste disposal practices. The description shall specifically list any significant potential source of pollutants at the site and for each potential source, any pollutant or pollutant parameter (e.g. biochemical oxygen demand, etc.) of concerns shall be identified.

3. Measures and Controls. Each facility covered by this permit shall develop a description of storm water management controls appropriate for the facility, and implement such controls. The appropriateness and priorities of controls in a plan shall reflect identified potential sources of pollutants at the facility. The description of storm water management controls shall address the following minimum components, including a schedule for implementing such controls:

a. Good Housekeeping - Good housekeeping requires the maintenance of a clean, orderly facility.

b. Preventive Maintenance - A preventive maintenance program shall involve inspection and maintenance of storm water management devices (e.g. cleaning oil/water separators, catch basins) as well as inspecting and testing facility equipment and systems to uncover conditions that could cause breakdowns or failures resulting in discharges of pollutants to surface waters, and ensuring appropriate maintenance of such equipment and systems.

c. Spill Prevention and Response Procedures - Areas where potential spills can occur, and their accompanying drainage points shall be identified clearly in the storm water pollution prevention plan. Where appropriate, specifying material handling procedures, storage requirements, and use of equipment such as diversion valves in the plan should be considered. Procedures for cleaning up spills shall be identified in the plan and made available to the appropriate personnel. The necessary equipment to implement a clean up should be available to personnel.

**Part IV. STORM WATER POLLUTION PREVENTION PLANS** (continued)

D. (continued)

d. Inspections - In addition to or as part of the comprehensive site evaluation required under Part IV.4. of this permit, qualified facility personnel shall be identified to inspect designated equipment and areas of the facility at appropriate intervals specified in the plan. A set of tracking or follow-up procedures shall be used to ensure that appropriate actions are taken in response to the inspections. Records of inspections shall be maintained.

e. Employee Training - Employee training programs shall inform personnel at all levels of responsibility of the components and goals of the storm water pollution prevention plan. Training should address topics such as spill response, good housekeeping and material management practices. The plan shall identify periodic dates for such training.

f. Recordkeeping and Internal Reporting Procedures - A description of incidents such as spills, or other discharges, along with other information describing the quality and quantity of storm water discharges shall be included in the plan required under this part. Inspections and maintenance activities shall be documented and records of such activities shall be incorporated into the plan.

g. Non-Storm Water Discharges

(1) The plan shall include a certification that the discharge has been tested or evaluated for the presence of non-storm water discharges. The certification shall include the identification of potential significant sources of non-storm water at the site, a description of the results of any test and/or evaluation for the presence of non-storm water discharges, the evaluation criteria or testing method used, the date of any testing and/or evaluation, and the on-site drainage points that were directly observed during the test. Such certification may not be feasible if the facility operating the storm water discharge associated with industrial activity does not have access to an outfall, manhole, or other point of access to the ultimate conduit which receives the discharge. In such cases, the source identification section of the storm water pollution plan shall indicate why the certification required by this part was not feasible, along with the identification of potential significant sources of non-storm water at the site. A discharger that is unable to provide the certification required by this paragraph must notify in accordance with Part IV.A of this permit.

(2) Except for flows from fire fighting activities, sources of non-storm water listed in Part VI of this permit that are combined with storm water discharges associated with industrial activity must be identified in the plan. The plan shall identify and ensure the implementation of appropriate pollution prevention measures for the non-storm water component(s) of the discharge.

h. Sediment and Erosion Control - The plan shall identify areas which, due to topography, activities, or other factors, have a high potential for significant soil erosion, and identify measures to limit erosion.

i. Management of Runoff - The plan shall contain a narrative consideration of the appropriateness of traditional storm water management practices (practices other than those which control the source of pollutants) used to divert, infiltrate, reuse, or otherwise manage storm water runoff in a manner that reduces pollutants in storm water discharges from the site. The plan shall provide that measures determined to be reasonable and appropriate shall be implemented and maintained. The potential of various sources at the facility to contribute pollutants to storm water discharges associated with industrial activity (see Parts IV.D.2.(b), (d) and (e) of this permit) shall be considered when determining reasonable and appropriate measures. Appropriate measures may include: including vegetative swales and practices, reuse of collected storm water (such as for a process or as an irrigation source), inlet controls (such as oil/water separators), snow management activities, infiltration devices, and wet detention/retention devices.

4. Comprehensive Site Compliance Evaluation. Qualified personnel shall conduct site compliance evaluations at appropriate intervals specified in the plan, but, except as provided in paragraph IV.D.4.d, in no case less than once a year. Such evaluations shall provide:

a. Material handling areas and other potential sources of pollution identified in the plan in accordance with paragraph IV.D.2 of this permit shall be visually inspected for evidence of, or the potential for, pollutants entering the drainage system. Structural storm water management measures, sediment and 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.

**Part IV. STORM WATER POLLUTION PREVENTION PLANS** (continued)

D. (continued)

b. Based on the results of the inspection, the description of potential pollutant sources identified in the plan in accordance with paragraph IV.D.2 of this permit and pollution prevention measures and controls identified in the plan in accordance with paragraph IV.D.3 of this permit shall be revised as appropriate within two weeks of such inspection and shall provide for implementation of any changes to the plan in a timely manner, but in no case more than twelve weeks after the inspection.

c. A report summarizing the scope of the inspection, personnel making 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 paragraph IV.D.4.b of the permit shall be made and retained as part of the storm water pollution prevention plan for at least three years. The report shall be signed in accordance with Part VI.B of this permit.

5. Additional requirements for storm water discharges associated with industrial activity through municipal separate storm sewer systems serving a population of 100,000 or more.

   In addition to the applicable requirements of this permit, facilities covered by this permit must comply with applicable requirements in municipal storm water management programs developed under NPDES permits issued for the discharge of the municipal separate storm sewer system that receives the facility's discharge, provided the discharger has been notified of such conditions.

6. Consistency with other plans. Storm water pollution prevention plans may reflect requirements for Spill Prevention Control and Countermeasure (SPCC) plans developed for the facility under section 311 of the Act or Best Management Practices (BMP) Programs otherwise required by a NPDES permit for the facility as long as such requirement is incorporated into the storm water pollution prevention plan.

7. Additional requirements for storm water discharges associated with industrial activity from facilities subject to SARA Title III, Section 313 requirements are not applicable to Section 313 water priority chemicals in gaseous or non-soluble liquid or solid [at atmospheric pressure and temperature] forms. In addition to the requirements of Parts IV.D.1 through 4 of this permit and other applicable conditions of this permit, storm water pollution prevention plans for facilities subject to reporting requirements under SARA Title III, Section 313 for chemicals which are classified as "Section 313 water priority chemicals" in accordance with the definition in Part VI of this permit, shall describe and ensure the implementation of practices which are necessary to provide for conformance with the following guidelines:

   a. In areas where Section 313 water priority chemicals are stored, processed or otherwise handled, appropriate containment, drainage control and/or diversionary structures shall be provided. At a minimum, one of the following preventive systems or its equivalent shall be used:

      (1) Curbing, culverting, gutters, sewers or other forms of drainage control to prevent or minimize the potential for storm water run-on to come into contact with significant sources of pollutants; or
      (2) Roofs, covers or other forms of appropriate protection to prevent storage piles from exposure to storm water, and wind blowing.

   b. In addition to the minimum standards listed under Part IV.D.7.a of this permit, the storm water pollution prevention plan shall include a complete discussion of measures taken to conform with the following applicable guidelines, other effective storm water pollution prevention procedures, and applicable State rules, regulations and guidelines:

      (1) Liquid storage areas where storm water comes into contact with any equipment, tank, container, or other vessel used for Section 313 water priority chemicals.

         (a) No tank or container shall be used for the storage of a Section 313 water priority chemical unless its material and construction are compatible with the material stored and conditions of storage such as pressure and temperature, etc.

         (b) Liquid storage areas for Section 313 water priority chemicals shall be operated to minimize discharges of Section 313 chemicals. Appropriate measures to minimize discharges of Section 313 chemicals may include secondary containment provided for at least the entire contents of the largest single tank plus sufficient freeboard to allow for precipitation, a strong spill contingency and integrity testing plan, and/or other equivalent measures.

**Part IV. STORM WATER POLLUTION PREVENTION PLANS** (continued)

D. (continued)

(2) Material storage areas for Section 313 water priority chemicals other than liquids. Material storage areas for Section 313 water priority chemicals other than liquids which are subject to runoff, leaching, or wind blowing shall incorporate drainage or other control features which will minimize the discharge of Section 313 water priority chemicals by reducing storm water contact with Section 313 water priority chemicals.

(3) Truck and rail car loading and unloading areas for liquid Section 313 water priority chemicals shall be operated to minimize discharges of Section 313 water priority chemicals. Appropriate measures to minimize discharges of Section 313 chemicals may include: the placement and maintenance of drip pans where spillage may occur (such as hose connections, hose reels and filler nozzles) for use when making and breaking hose connections; a strong spill contingency and integrity testing plan; and/or other equivalent measures.

(4) In facility areas where Section 313 water priority chemicals are transferred, processed or otherwise handled. Processing equipment and materials handling equipment shall be operated so as to minimize discharges of Section 313 water priority chemicals. Materials used in piping and equipment shall be compatible with the substances handled. Drainage from process and materials handling areas shall be designed as described in paragraphs (a), (b) and (c) of this section. Additional protection such as covers or guards to prevent wind blowing, spraying or releases from pressure relief vents from causing a discharge of Section 313 water priority chemicals to the drainage system, and overhangs or door skirts to enclose trailer ends at truck loading/unloading docks shall be provided as appropriate. Visual inspections or leak tests shall be provided for overhead piping conveying Section 313 water priority chemicals without secondary containment.

(5) Discharges from areas covered by paragraphs (1), (2), (3) or (4).

(a) Drainage from areas covered by paragraphs (1), (2), (3) or (4) of this part should be restrained by valves or other positive means to prevent the discharge of a spill or other excessive leakage of Section 313 water priority chemicals. Where containment units are employed, such units may be emptied by pumps or ejectors; however, these shall be manually activated.

(b) Flapper-type drain valves shall not be used to drain containment areas. Valves used for the drainage of containment areas should, as far as is practical, be of manual, open-and-closed design.

(c) If facility drainage is not engineered as above, the final discharge of all in-facility storm sewers shall be equipped to be equivalent with a diversion system that could, in the event of an uncontrolled spill of Section 313 water priority chemicals, return the spilled material to the facility.

(d) Records shall be kept of the frequency and estimated volume (in gallons) of discharges from containment areas.

(6) Facility site runoff other than from areas covered by (1), (2), (3) or (4). Other areas of the facility (those not addressed in paragraphs (1), (2), (3) or (4)), from which runoff which may contain Section 313 water priority chemicals or spills of Section 313 water priority chemicals could cause a discharge shall incorporate the necessary drainage or other control features to prevent discharge of spilled or improperly disposed material and ensure the mitigation of pollutants in runoff or leachate.

**Part IV. STORM WATER POLLUTION PREVENTION PLANS** (continued)

D. (continued)

(7) Preventive maintenance and housekeeping. All areas of the facility shall be inspected at specific intervals for leaks or conditions that could lead to discharges of Section 313 water priority chemicals or direct contact of storm water with raw materials, intermediate materials, waste materials or products. In particular, facility piping, pumps, storage tanks and bins, pressure vessels, process and material handling equipment, and material bulk storage area shall be examined for any conditions or failures which could cause a discharge. Inspection shall include examination for leaks, wind blowing, corrosion, support or foundation failure, or other forms of deterioration or non-containment. Inspection intervals shall be specified in the plan and shall be based on design and operational experience. Different areas may require different inspection intervals. Where a leak or other condition is discovered which may result in significant releases of Section 313 water priority chemicals to the drainage system, corrective action shall be immediately taken or the unit or process shut down until corrective action can be taken. When a leak or non-containment of a Section 313 water priority chemical has occurred, contaminated soil, debris, or other material must be promptly removed and disposed in accordance with Federal, State, and local requirements and as described in the plan.

(8) Facility security. Facilities shall have the necessary security systems to prevent accidental or intentional entry which could cause a discharge. Security systems described in the plan shall address fencing, lighting, vehicular traffic control, and securing of equipment and buildings.

(9) Training. Facility employees and contractor personnel using the facility shall be trained in and informed of preventive measures at the facility. Employee training shall be conducted at intervals specified in the plan, but not less than once per year, in matters of pollution control laws and regulations, and in the storm water pollution prevention plan and the particular features of the facility and its operation which are designed to minimize discharges of Section 313 water priority chemicals. The plan shall designate a person who is accountable for spill prevention at the facility and who will set up the necessary spill emergency procedures and reporting requirements so that spills and emergency releases of Section 313 water priority chemicals can be isolated and contained before a discharge of a Section 313 water priority chemical can occur. Contractor or temporary personnel shall be informed of facility operation and design features in order to prevent discharges or spills from occurring.

8. Additional Requirements for Salt Storage. Storage piles of salt used for deicing or other commercial or industrial purposes and which generate a storm water discharge associated with industrial activity which is discharged to surface waters of the State shall be enclosed or covered to prevent exposure to precipitation, except for exposure resulting from adding or removing materials from the pile within two years of the effective date of this permit. Piles do not need to be enclosed or covered where storm water from the pile is not discharged to surface waters of the State.

## Part V. NUMERIC EFFLUENT LIMITATIONS AND MONITORING REQUIREMENTS

### A. RESERVED.

**B. Monitoring Requirements.** Only the activjties described in the following matrix and associated definitions are required to conduct monitoring. The monitoring required in the following matrix shall be conducted annually. Monitoring shall be initiated within twelve months of the effective date of this permit and henceforth on an annual basis, weather conditions permitting. A permittee may, in lieu of annual monitoring, certify that industrial materials are not exposed to storm water; such certification shall be submitted to the Ohio EPA upon request of the Director.

1. MONITORING REQUIREMENTS MATRIX

| Reporting Units | Parameter | INDUSTRIAL ACTIVITY CATEGORIES | | | | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | | a | b[1,3] | c | d | e | f | g | h | i[2] | j | k | l[1] |
| mg/l | Oil and Grease | | X | X | X | X | X | X | X | X | X | X | X |
| mg/l | 5-day Biochemical Oxygen Demand | | X | | | | | | | X | | X | |
| mg/l | Chemical Oxygen Demand | | X | X | X | X | X | | X | X | | | X |
| mg/l | Total Suspended Solids | | X | | X | X | X | X | X | X | X | X | X |
| mg/l | Total Kjeldahl Nitrogen | | | X | | | | | | | | X | |
| mg/l | Phosphorus | | | | | | | | | | | X | |
| S.U. | pH | | X | X | X | X | X | X | X | X | X | X | X |
| TU, | Acute Toxicity | | | | | | | | | | | | |
| Hours | Duration of Storm Event | | X | X | X | X | X | X | X | X | X | X | X |
| Inches | Precipitation | | X | X | X | X | X | X | X | X | X | X | X |
| Hours | Duration Between Storm Events* | | X | X | X | X | X | X | X | X | X | X | X |
| Gallons | Volume (est) | | X | X | X | X | X | X | X | X | X | X | X |
| mg/l | Nitrate-Nitrogen | | | | | | | | | | | | |
| mg/l | Nitrite-Nitrogen | | | | | | | | | | | | |
| ug/l | Lead, Total | | X | X | | | | | X | | | | |
| ug/l | Cadmium, Total | | X[3] | X | | | | | | | | | |
| ug/l | Copper, Total | | X[3] | | | | X | X | X | | X | | |
| ug/l | Arsenic, Total | | X[3] | X | | | X | | | | | | |
| ug/l | Chromium, Total | | X[3] | X | | | X | | | | | | |
| mg/l | Ammonia | | | | | | | | | | | | |
| ug/l | Magnesium, Total | | | X | | | | | | | | | |

## Part V. NUMERIC EFFLUENT LIMITATIONS AND MONITORING REQUIREMENTS (continued)

B. (continued)

| Reporting Units | Parameter | INDUSTRIAL ACTIVITY CATEGORIES | | | | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | | a | b[1,3] | c | d | e | f | g | h | i[2] | j | k | l[1] |
| ug/l | Magnesium, Dissolved | | | X | | | | | | | | | |
| mg/l | Total Dissolved Solids | | | X | | | | | | | | | |
| mg/l | Total Organic Carbon | | | X | | | | | | | | | |
| ug/l | Barium, Total | | | X | | | | | | | | | |
| mg/l | Cyanide, Total | | | X | | | | | | | | | |
| ug/l | Mercury, Total | | | X | | | | | | | | | |
| ug/l | Selenium, Total | | | X | | | | | | | | | |
| ug/l | Silver, Total | | | X | | | | | | | | | |
| ug/l | Pentachlorophenol | | | | X | | | | | | | | |
| ug/l | Nickel, Total | | | | | | | X | | | X | | |
| ug/l | Zinc, Total | | | | | | | X | | | X | | |
| #/100ml | Fecal Coliform | | | | | | | | | | | X | |

* Time between the storm event when sampling is being conducted and the last storm event producing rainfall greater than 0.1 inches.
(1) and any pollutant limited in an effluent guideline or categorical pretreatment standard which the facility is subject.
(2) and the primary ingredient used in the deicing materials used at the site (e.g., ethylene glycol, urea, etc.).
(3) Facilities that are classified as SIC 33 only because they manufacture pure silicon and/or semiconductor grade silicon are not required to monitor for this parameter.

2. Industrial Activity Categories Definitions

a. Section 313 of SARA Title III Facilities. As of the effective date of this permit, facilities with storm water discharges associated with industrial activity that are subject to requirements to report releases into the environment under Section 313 of SARA Title III for chemicals which are classified as 'Section 313 water priority chemicals' are not (as they may have been in a previous permit) required to monitor storm water that is discharged from the facility unless required by paragraphs V.B.2.b through B.2.l.

b. Primary Metal Industries. Facilities with storm water discharges associated with industrial activity classified as Standard Industrial Classification (SIC) 33 (Primary Metal Industry) are required to monitor such storm water that is discharged from the facility.

c. Land Disposal Units/Incinerators/BIFs. Facilities with storm water discharges associated with industrial activity from any active or inactive landfill, land application sites or open dump without a stabilized final cover that has received any industrial wastes from a facility with a Standard Industrial Classification (SIC) of between 20-39 (manufacturing); and incinerators (including Boilers and Industrial Furnaces (BIFs)) that burn hazardous waste and operate under interim status or a permit under Subtitle C of RCRA, are required to monitor such storm water that is discharged from the facility.

d. Wood Treatment Using Chlorophenolic Formulations. Facilities with storm water discharges associated with industrial activity from areas that are used for wood treatment, wood surface application or storage of treated or surface protected wood at any wood preserving or wood surface facilities are required to monitor such storm water that is discharged from the facility.

e. Wood Treatment Using Creosote Formulations. Facilities with storm water discharges associated with industrial activity from areas that are used for wood treatment, wood surface application or storage of treated or surface protected wood at any wood preserving or wood surface facilities are required to monitor such storm water that is discharged from the facility.

**Part V. NUMERIC EFFLUENT LIMITATIONS AND MONITORING REQUIREMENTS** (continued)

B. (continued)

f. Wood Treatment Using Chromium-Arsenic Formulations. Facilities with storm water discharges associated with industrial activity from areas that are used for wood treatment, wood surface application or storage of treated or surface protected wood at any wood preserving or wood surface facilities are required to monitor such storm water that is discharged from the facility.

g. Coal Pile Runoff. Facilities with storm water discharges associated with industrial activity from coal pile runoff are required to monitor such storm water that is discharged from the facility.

h. Battery Reclaimers. Facilities with storm water discharges associated with industrial activity from areas used for storage of lead acid batteries, reclamation products, or waste products, and areas used for lead acid battery reclamation (including material handling activities) at facilities that reclaim lead acid batteries are required to monitor such storm water that is discharged from the facility.

i. Airports. At airports with over 50,000 flight operations per year, facilities with storm water discharges associated with industrial activity from areas where aircraft or airport deicing operations occur (including runways, taxiways, ramps, and dedicated aircraft deicing stations) are required to monitor such storm water that is discharged from the facility.

j. Coal-fired Steam Electric Facilities. Facilities with storm water discharges associated with industrial activity from coal handling sites at coal fired steam electric power generating facilities (other than discharges in whole or in part from coal piles subject to storm water effluent guidelines at 40 CFR 423 - which are not eligible for coverage under this permit) are required to monitor such storm water that is discharged from the facility.

k. Animal Handling / Meat Packing. Facilities with storm water discharges associated with industrial activity from animal handling areas, manure management (or storage) areas, and production waste management (or storage) areas that are exposed to precipitation at meat packing plants, poultry packing plants, and facilities that manufacture animal and marine fats and oils, are required to monitor such storm water that is discharged from the facility.

l. Additional Facilities. Facilities with storm water discharges associated with industrial activity that:

(1) come in contact with storage piles for solid chemicals used as raw materials that are exposed to precipitation at facilities classified as SIC 30 (Rubber and Miscellaneous Plastics Products) or SIC 28 (Chemicals and Allied Products);

(2) are from those areas at automobile junkyards with any of the following: (A) over 250 auto/truck bodies with drivelines (engine, transmission, axles, and wheels), 250 drivelines, or any combination thereof (in whole or in parts) are exposed to storm water; (B) over 500 auto/truck units (bodies with or without drivelines in whole or in parts) are stored exposed to storm water; or (C) over 100 units per year are dismantled and drainage or storage of automotive fluids occurs in areas exposed to storm water;

(3) come into contact with lime storage piles that are exposed to storm water at lime manufacturing facilities;

(4) are from oil handling sites at oil fired steam electric power generating facilities;

(5) are from cement manufacturing facilities and cement kilns (other than discharges in whole or in part from material storage piles subject to storm water effluent guidelines at 40 CFR 411 - which are not eligible for coverage under this permit);

(6) are from ready-mixed concrete facilities; or

(7) are from ship building and repairing facilities;

are required to monitor such storm water discharged from the facility.

**Part V. NUMERIC EFFLUENT LIMITATIONS AND MONITORING REQUIREMENTS** (continued)

B. (continued)

3. Sample Type. Take a minimum of one grab sample from the discharge resulting from a storm event that is greater than 0.1 inches in magnitude and that occurs at least 72 hours from the previously measurable (greater than 0.1 inch rainfall) storm event. The grab sample shall be taken during the first thirty minutes of the discharge. If the collection of a grab sample during the first thirty minutes is impracticable, a grab sample can be taken during the first hour of the discharge, and the discharger shall submit with the monitoring report a description of why a grab sample during the first thirty minutes was impracticable.

4. Sampling Waiver. When a discharger is unable to collect samples due to adverse climatic conditions, the discharger must submit in lieu of sampling data a description of why samples could not be collected, including available documentation of the event. Adverse climatic conditions which may prohibit the collection of samples includes weather conditions that create dangerous conditions for personnel (such as local flooding, high winds, hurricane, tornadoes, electrical storms, etc.) or otherwise make the collection of a sample impracticable (drought, extended frozen conditions, etc.).

5. Representative Discharge. When a facility has two or more outfalls that, based on a consideration of features and activities within the area drained by the outfall, the permittee reasonably believes discharge substantially identical effluents, the permittee may test the effluent of one of such outfalls and report that the quantitative data also applies to the substantially identical outfalls. In addition, for each outfall that the permittee believes is representative, an estimate of the size of the drainage area (in square feet) and an estimate of the runoff coefficient of the drainage area (e.g. low (under 40%), medium (40% to 65%) or high (above 65%)) shall be provided.

**C. Toxicity Testing.** Not Required.

**D. Alternative Certification of "Not Present or No Exposure."** You are not subject to the analytical monitoring requirement of this part provided: you make a certification for a given outfall, or on a pollutant-by-pollutant basis in lieu of monitoring required under this part, that material handling equipment or activities, raw materials, intermediate products, final products, waste materials, by-products, industrial machinery or operations, or significant materials from past industrial activity that are located in areas of the facility within the drainage area of the outfall are not presently exposed to storm water and are not expected to be exposed to storm water for the certification period; and your certification is signed in accordance with Attachment VI.G and retained in the SWP3. If you cannot certify for an entire period, you must note the date exposure was eliminated and perform any monitoring required up until that date.

## Part VI. OTHER STORM WATER REQUIREMENTS, DEFINITIONS AND AUTHORIZATION

**A. Failure to Certify.** Any facility that is unable to provide the certification required under paragraph IV.D.3.g.(1) (testing for non-storm water discharges), must notify the Director within 180 days of the effective date of this permit. Such notification shall describe: the procedure of any test conducted for the presence of non-storm water discharges; the results of such test or other relevant observations; potential sources of non-storm water discharges to the storm sewer; and why adequate tests for such storm sewers were not feasible.

**B. Signatory Requirements.** See Part III.28.

**C. Definitions.**

"Section 313 water priority chemical" means a chemical or chemical categories which are: 1) are listed at 40 CFR 372.65 pursuant to Section 313 of Title III of the Superfund Amendments and Reauthorization Act (SARA) of 1986, also titled the Emergency Planning and Community Right-to-Know Act of 1986; 2) are present at or above threshold levels at a facility subject to SARA Title III, Section 313 reporting requirements; and 3) that meet at least one of the following criteria: (i) are listed in Appendix D of 40 CFR 122 on either Table II (organic priority pollutants), Table III (certain metals, cyanides, and phenols) or Table V (certain toxic pollutants and hazardous substances); (ii) are listed as a hazardous substance pursuant to section 311(b)(2)(A) of the Act at 40 CFR 116.4; or (iii) are pollutants for which EPA has published acute or chronic water quality criteria.

"Significant materials" includes, but is not limited to: raw materials; fuels; materials such as solvents, detergents, and plastic pellets; finished materials such as metallic products; raw materials used in food processing or production; hazardous substances designated under section 101(14) of CERCLA; any chemical the facility is required to report pursuant to Section 313 of Title III of SARA; fertilizers; pesticides; and waste products such as ashes, slag and sludge that have the potential to be released with storm water discharges.

"Significant spills" includes, but is not limited to: releases of oil or hazardous substances in excess of reportable quantities under section 311 of the Clean Water Act (see 40 CFR 110.10 and CFR 117.21) or section 102 of CERCLA (see 40 CFR 302.4).

"Storm Water" means storm water runoff, snow melt runoff, and surface runoff and drainage.

"Definition of Storm Water Associated with Industrial Activity" means the discharge from any conveyance which is used for collecting and conveying storm water and which is directly related to manufacturing, processing or raw materials storage areas at an industrial plant. The term does not include discharges from facilities or activities excluded from the NPDES program. For the categories of industries identified in subparagraphs (i) through (x) of this subsection, the term includes, but is not limited to, storm water discharges from industrial plant yards; 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; material handling sites; refuse sites; sites used for the application or disposal of process waste waters (as defined at 40 CFR 401); sites used for the storage and maintenance of material handling equipment; sites used for residual treatment, storage, or disposal; shipping and receiving areas; manufacturing buildings; storage areas (including tank farms) for raw materials, and intermediate and finished products; and areas where industrial activity has taken place in the past and significant materials remain and are exposed to storm water. For the categories of industries identified in subparagraph (xi), the term includes only storm water discharges from all areas listed in the previous sentence (except access roads) where material handling equipment or activities, raw materials, intermediate products, final products, waste materials, by-products, or industrial machinery are exposed to storm water. For the purposes of this paragraph, material handling activities include the: storage, loading and unloading, transportation, or conveyance of any raw material, intermediate product, finished product, by-product or waste product. The term excludes areas located on plant lands separate from the plant's industrial activities, such as office buildings and accompanying parking lots as long as the drainage from the excluded areas is not mixed with storm water drained from the above described areas. Industrial facilities (including industrial facilities that are Federally or municipally owned or operated that meet the description of the facilities listed in this paragraph (i)-(xi)) include those facilities designated under 40 CFR 122.26(a)(1)(v). The following categories of facilities are considered to be engaging in "industrial activity" for purposes of this subsection:

(i) Facilities subject to storm water effluent limitations guidelines, new source performance standards, or toxic pollutant effluent standards under 40 CFR Subchapter N (except facilities with toxic pollutant effluent standards which are exempted under category (xi) of this paragraph);

(ii) Facilities classified as Standard Industrial Classifications 24 (except 2434), 26 (except 265 and 267), 28 (except 283 and 285) 29, 311, 32 (except 323), 33, 3441, 373;

**Part VI. OTHER STORM WATER REQUIREMENTS, DEFINITIONS AND AUTHORIZATION** (continued)

C. (continued)

(iii) Facilities classified as Standard Industrial Classifications 10 through 14 (mineral industry) including active or inactive mining operations (except for areas of coal mining operations meeting the definition of a reclamation area under 40 CFR 434.11(l)) and oil and gas exploration, production, processing, or treatment operations, or transmission facilities that discharge storm water contaminated by contact with or that has come into contact with, any overburden, raw material, intermediate products, finished products, byproducts or waste products located on the site of such operations; inactive mining operations are mining sites that are not being actively mined, but which have an identifiable owner/operator;

(iv) Hazardous waste treatment, storage, or disposal facilities, including those that are operating under interim status or a permit under Subtitle C of RCRA;

(v) Landfills, land application sites, and open dumps that have received any industrial wastes (waste that is received from any of the facilities described under this subsection) including those that are subject to regulation under Subtitle D of RCRA;

(vi) Facilities involved in the recycling of materials, including metal scrapyards, battery reclaimers, salvage yards, and automobile junkyards, including but not limited to those classified as Standard Industrial Classification 5015 and 5093;

(vii) Steam electric power generating facilities, including coal handling sites;

(viii) Transportation facilities classified as Standard Industrial Classifications 40, 41, 42 (except 4221-25), 43, 44, 45, and 5171 which have vehicle maintenance shops, equipment cleaning operations, or airport deicing operations. Only those portions of the facility that are either involved in vehicle maintenance (including vehicle rehabilitation, mechanical repairs, painting, fueling, and lubrication), equipment cleaning operations, airport deicing operations, or which are otherwise identified under paragraphs (i)-(vii) or (ix)-(xi) of this subsection are associated with industrial activity;

(ix) Treatment works treating domestic sewage or any other sewage sludge or wastewater treatment device or system, used in the storage treatment, recycling, and reclamation of municipal or domestic sewage, including land dedicated to the disposal of sewage sludge that are located within the confines of the facility, with a design flow of 1.0 mgd or more, or required to have an approved pretreatment program under 40 CFR 403. Not included are farm lands, domestic gardens or lands used for sludge management where sludge is beneficially reused and which are not physically located in the confines of the facility, or areas that are in compliance with 40 CFR 503;

(x) Construction activity - This category of industrial activity is not regulated under this permit.

(xi) Facilities under Standard Industrial Classifications 20, 21, 22, 23, 2434, 25, 265, 267, 27, 283, 285, 30, 31 (except 311), 34 (except 3441), 35, 36, 37 (except 373), 38, 39, 4221-25, (and which are not otherwise included within categories (ii)-(x)).

"SWPPP" means storm water pollution prevention plan to be completed as a condition of this permit (see Part IV of this permit).

"Time-weighted composite" means a composite sample consisting of a mixture of equal volume aliquots collected at a constant time interval.

"Waste pile" means any non-containerized accumulation of solid, non-flowing waste that is used for treatment or storage.

"10-year, 24-hour precipitation event" means the maximum 24-hour precipitation event with a probable reoccurrence interval of once in 10 years. This information is available in "Weather Bureau Technical Paper No. 40,", May 1961 and "NOAA Atlas 2," 1973 for the 11 Western States, and may be obtained from the National Climatic Center of the Environmental Data Service, National Oceanic and Atmospheric Administration, U.S. Department of Commerce.

"Bypass" means the intentional diversion of waste streams from any portion of the treatment facility.

"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.

**OHIO EPA**
State of Ohio Environmental Protection Agency

**Director's Office Number** 28960

## COVER MEMO

( X ) Director's Signature
( ) DRAFT - Governor's Signature
( ) Background Investigation Report - CONFIDENTIAL
( ) Assistant Director's Signature
( ) Deputy Director's Signature

Subject: (MCR# ) NPDES Permit Renewal – Avon Lake Power Plant – Comments received – briefing memo attached

Prepared by: Patti Smith Division: Surface Water Date: 6-24-2011

Blind Copies:

| NECESSARY APPROVALS | APPROVED BY | DATE |
|---|---|---|
| ( ) Assistant Director | | ___/___/___ |
| ( X ) Deputy Director, Legal Affairs | Marc C. Cook | 6/27/11 |
| ( ) Deputy Director, Communication | | ___/___/___ |
| ( ) Director's Office, Rules Coordinator | | ___/___/___ |
| ( ) Legal | | ___/___/___ |
| ( ) Other | | ___/___/___ |
| ( ) Other | | ___/___/___ |

| District Personnel Information | | | Division Personnel Information | | |
|---|---|---|---|---|---|
| **Approvals:** | | **Date:** | **Approvals:** | | **Date:** |
| Supervisor | | ___/___/___ | Unit Supervisor | | ___/___/___ |
| Manager | | ___/___/___ | Section Manager | | ___/___/___ |
| ssistant Dist. Chief | | ___/___/___ | Assistant Chief | | ___/___/___ |
| District Chief | | ___/___/___ | Chief | Chris Elmer | 6/27/11 |
| Other | | ___/___/___ | Other | | ___/___/___ |

**RETURN ALL SUPPORTING DOCUMENTS TO:**

Name: Patti Smith Division: Surface Water

Document Name: WPS Initials/Date:

**Attachments:** CC: ☐ Yes ☐ No BC: ☐ Yes ☐ No

Other:

DWP

# Interoffice Memorandum

TO: Scott J. Nally, Director

FROM: Mike McCullough thru Paul Novak, Manager, Permits and Compliance Section, Division of Surface Water

DATE: June 24, 2011

SUBJECT: NPDES Permit Renewal, Avon Lake Power Plant

---

The renewal of the NPDES permit for the Avon Lake Power Plant was public noticed on March 25, 2011 and the permittee submitted comments regarding the proposed permit in a letter dated April 21, 2011. Comments were also submitted regarding the draft permit from environmental groups. The comments submitted and the proposed responses by the Division of Surface Water (DSW) are as follows (comments and responses are grouped by the source of the comments):

**Comments from the Permittee**

Comment #1: The permittee requests that the new permit limits for total residual chlorine and total residual oxidants include the same number of significant digits as the existing permit.

Response #1: We have revised the permit as requested.

Comment #2: The permittee requests that the sampling frequency for total suspended solids at Outfall 002 be reduced to once per week since there is no history of serious compliance problems.

Response #2: We have revised the permit as requested.

Comment #3: The permittee requests that the permit is revised so that samples for mercury at Outfall 002 can be collected 18 hours (approximately one detention time) after samples are collected for Station 601.

Response #3: We have revised the permit as requested.

Comment #4: Based on the results of more recent sampling for total residual chlorine, the requests that monitoring for this parameter at Outfall 002 (bottom ash pond) be removed from the permit.

Response #4: We have revised the permit as requested.

Comment #5: The permittee requests that the permit limit for total residual oxidants at Outfall 004 include the same number of significant as the existing permit.

Response #5: We have revised the permit as requested.

Comment #6: The permittee requests that the monthly average limit of 50 mg/L total suspended solids be removed for Outfall 610 because a more stringent daily maximum limit of 50 m/g/L is already imposed at this outfall.

Response #6: We have revised the permit as requested.

Comment #7: The permittee requests that the discharge sampling point for the metal cleaning wasterwater be located following the coal pile runoff treatment system. The permittee also requests that the permit include a three year compliance schedule to ensure adequate treatment is provided prior to discharge at this internal monitoring station.

Response #7: Metal cleaning wastewater at steam electric power plants is subject to federal effluent guideline limits, which prohibit the dilution of the regulated wastestream with other wastestreams, prior to the compliance monitoring location. As a result, the monitoring/sampling location for Station 611 cannot be located following the coal runoff treatment system. Federal regulations also prohibit granting a compliance schedule to meet federal effluent guideline limits.

During a telephone conference with the permittee on May 27th, the company proposed installing new piping at the facility which would allow treatment of the metal cleaning wastestream in existing treatment units without the benefit of dilution. We believe that this will be a good solution to the problem, and have slightly modified the permit description of Station 611 to accommodate necessary changes in the treatment process.

Comment #8: The permittee requests that Ohio EPA recognize that challenges may exist with respect to compliance with the proposed implementation schedule for the mercury variance plan of study.

Response #8: We recognize that unforeseen circumstances do arise occasionally which delay implementation schedules, and have suggested that the permittee can request a revision of the implementation schedule through a permit modification, if necessary.

Comment #9: The permittee requests that the expiration date of the final permit be extended to five years from the issue date.

Response #9: The facility will be implementing a pollutant minimization program for mercury and conducting a thermal mixing zone study during the term of this permit. These are important issues which may necessitate the need for additional permit requirements in the subsequent permit renewal, depending upon the information obtained over the next three to four years. As a result, we believe that it may be important to begin re-visiting the discharge of mercury and the thermal discharge in 2015 rather than extending the expiration date for a year until 2016.

**Comments from Environmental Groups**

Comment #1: Ohio must make a determination of the Best Available Technology to reduce fish impingement and entrainment before reissuing the NPDES permit. Ohio EPA's proposal to defer requiring compliance with Section 316(b) is contrary to the Clean Water Act.

Response #1: Based upon the impingement and entrainment data which has been submitted, and the availability of other information pertaining to the intake structure and the receiving waters, we have determined that the current intake structure represents best technology available at this time. We have revised the permit to include this determination.

Comment #2: The permittee's requested mercury variance should be denied because the company has failed to provide adequate documentation that it is unable to meet the water quality standards without end-of-pipe treatment to remove mercury from the effluent.

Response #2: A review of the application, including influent and effluent data, a discussion of existing programs to identify potential sources of mercury, and a description of current practices to manage known sources of mercury, did not indicate any strategy which could be undertaken by the Avon Lake Power Plant at this time to guarantee compliance with the WQBEL within a typical time period of two to three years. We believe that granting a mercury variance under this permit is appropriate, and therefore, the permit has not been revised.

Comment #3: Section 301 of the Clean Water Act requires Ohio EPA to set Best Available Technology limits for mercury at outfall 002.

Response #3: We disagree that application of Best Available Technology (or BAT) requires a review of end-of-pipe treatment technologies for each NPDES permit where a mercury variance is granted. The application of technology standards was addressed when our mercury variance rules and procedures were adopted. We have not revised the permit with respect to this issue.

Comment #4: Section 301 of the Clean Water Act requires Ohio EPA to set Best Available Technology limits for heat at outfall 001.

Response #4: We believe that development of a site-specific limit for the discharge of heat is not warranted at this time. However, we have included a requirement in the permit for the company to characterize the thermal mixing zone which will provide more information to evaluate the impact from the discharge. (See the following comment and response.)

Comment #5: Ohio EPA must revise the draft permit to ensure that the Avon Lake Plant's discharges comply with Lake Erie water quality standards for temperature.

Response #5: We have revised the permit and incorporated a requirement in the Schedule of Compliance to conduct a study to characterize the size, areal extent, and depth of the thermal discharge plume from outfall 001 at the Avon Lake Power Plant. The results of this study must be submitted to Ohio EPA within two and one-half years after the effective date of the permit. At that time, we will evaluate these results and determine if additional requirements should be imposed in the subsequent NPDES permit, including restricting the size of the mixing zone.

Comment #6: Section 301 of the Clean Water Act requires Ohio EPA to set Best Available Technology limits for other pollutants that Orion Power has reported discharging in Avon Lake's Toxics Release Inventory Report.

Response #6: These other pollutants identified in the comment were evaluated during the development of the federal effluent guidelines and technology-based limits for steam-electric plants. Based upon this evaluation, it was determined that: 1) additional technology-based limits were unnecessary due to the low potential for the presence and discharge of certain pollutants; or 2) pollutants would be removed sufficiently at the facility by complying with the other technology-based limits for total suspended solids. We do not believe limits for these other pollutants are necessary or required.

Comment #7: Ohio EPA must impose a WQBEL for total residual chlorine (TRC) at Outfall 001. Although the draft permit limits TRC discharges at Outfall 001 to two hours per day, this is not in and of itself adequate to ensure that aquatic life will be protected.

Response #7: Alternative effluent limits of 0.2 mg/l for discharges of total residual chlorine (TRC) less than two hours per day have been included in NPDES permits at least since the 1980s. A number of studies were conducted in the 1970s and 1980s showing that relatively short-term exposure to TRC at concentrations up to 0.2 mg/l (and in some cases 0.3 mg/l) were protective for warmwater fish species. We have not revised the permit with respect to this issue.

The revised permit is attached for your review and signature.

attachment

Major [redacted] Add Mercury Language to PN

Facility List: GenOn Midwest LP - Avon Lake Power Plant | 3IB00002*KD | OH0001112

Generate Public Notice | Generate Cover Letter

**Public Notice No.:** 11-03-062

**Public Notice Issue Date:** 3.25.11

**New Permit:** ☐

## Facility Address Information

### Mailing Information

**Contact:** Robert Laeng

**Address:** 121 Champion Way, Suite 200

Canonsburg | PA | 15317

### Location Information

**Owner Name:** Orion Power Midwest, L.P.

**Address:** 33570 Lake Road

**City, County:** Avon Lake | Lorain | 47/NE

## Current SWIMS Facility Information

Nature of Business

Electrical power generation plant

Outfall Flow Info

| Outfall | Avg. Flow | | Latitude | Longitude |
|---|---|---|---|---|
| 1 | | gpd | 41 N 30' 30 | 82W 3'28" |
| 2 | 3380000 | gpd | 41 N 30' 36 | 82W 3'7" |
| 4 | 3350000 | gpd | 41 N 30' 36 | 82W 3'4" |

Receiving Stream:
(Double click Outfall to add PN)

| Outfall | Receiving Steam |
|---|---|
| 1 | Lake Erie |
| 2 | Lake Erie |
| 4 | Lake Erie |

Limited Paramaters
(Double click Outfall to add PN)

| Outfall N | Paramater |
|---|---|
| 611 | Oil and Grease, Total |
| 2 | Mercury, Total (Low Level) |
| 2 | Oil and Grease, Total |
| 604 | Total Suspended Solids |
| 1 | Chlorine, Total Residual |
| 4 | Oxidants, Total Residual |
| 2 | pH Range Excursions, > 60 Minutes |
| 611 | Copper, Total Recoverable |
| 611 | Iron, Total Recoverable |
| 1 | pH |

## Public Notice Information

Public Notice Nature of Business:

Electrical power generation plant

Public Notice Outfall List:

| Outfall No. | Avg. Flow | Latitude | Longitude |
|---|---|---|---|
| 1☐ | gpd☐ | 41 N 30' 30"☐ | 82W 3'28" |
| ☐2☐ | 3380000 gpd☐ | 41 N 30' 36"☐ | 82W 3'7" |
| ☐4☐ | 3350000 gpd☐ | 41 N 30' 36"☐ | 82W 3'4" |

PERSON ID:
PLACE ID: 150
DOCUMENT ID: 150
ORGANIZATION ID:
REVENUE ID: 15

Public Notice Receiving Stream List:

1☐Lake Erie
2☐Lake Erie
4☐Lake Erie

Public Notice Parameter List:

Oil and Grease, Total, Mercury, Total (Low Level), Total Suspended Solids, Chlorine, Total Residual , Oxidants, Total Residual, pH Range Excursions, > 60 Minutes, Iron, Total Recoverable, Copper, Total Recoverable, pH, pH Range Excursion, Maximum Duration, Chlorination/Bromination Duration, pH Range Excursions, Monthly Total Duration, pH Range Excursion, Maximum Duration

PN DRAFT PERMIT: MP MP 3.4.11
ACCESS DRAFT:
PN FINAL PERMIT:

Please issue
final.

Thanks

Eric

Application No. OH0001112

Issue Date:

Effective Date:

Ohio EPA
Draft Copy
Subject to Revision

Expiration Date: July 15, 2015 (proposed)

Ohio Environmental Protection Agency
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., hereinafter referred to as the "Act"), and the Ohio Water Pollution Control Act (Ohio Revised Code Section 6111),

GenOn Power Midwest, L.P.
Avon Lake Power Plant

is authorized by the Ohio Environmental Protection Agency, hereinafter referred to as "Ohio EPA," to discharge from the wastewater treatment works located at 33570 Lake Road, Avon Lake, Ohio, Lorain County and discharging to Lake Erie in accordance with the conditions specified in Parts I, II, III, IV, V, and VI of this permit.

This permit is conditioned upon payment of applicable fees as required by Section 3745.11 of the Ohio Revised Code.

This permit and the authorization to discharge shall expire at midnight on the expiration date shown above. In order to receive authorization to discharge beyond the above date of expiration, the permittee shall submit such information and forms as are required by the Ohio EPA no later than 180 days prior to the above date of expiration.

Scott J. Nally
Director

Total Page: 47

PERSON ID: 26084
PLACE ID: 24651
DOCUMENT ID: 60490
ORGANIZATION ID:
REVENUE ID: 814208

Part I, A. - FINAL EFFLUENT LIMITATIONS AND MONITORING REQUIREMENTS

1. During the period beginning on the effective date of this permit and lasting until the expiration date, the permittee is authorized to discharge in accordance with the following limitations and monitoring requirements from outfall 3IB00002001. See Part II, OTHER REQUIREMENTS, for locations of effluent sampling.

Table - Final Outfall - 001 - Final

| Effluent Characteristic | Discharge Limitations | | | | | | | Monitoring Requirements | | |
|---|---|---|---|---|---|---|---|---|---|---|
| | Concentration Specified Units | | | | Loading* kg/day | | | | | |
| Parameter | Maximum | Minimum | Weekly | Monthly | Daily | Weekly | Monthly | Measuring Frequency | Sampling Type | Monitoring Months |
| 00011 - Water Temperature - F | - | - | - | - | - | - | - | 1/Day | Continuous | All |
| 00400 - pH - S.U. | 9.0 | 6.0 | - | - | - | - | - | 1/Month | Grab | All |
| 34044 - Oxidants, Total Residual - mg/l | 0.050 | - | - | - | - | - | - | 1/Day | Grab | All |
| 50050 - Flow Rate - MGD | - | - | - | - | - | - | - | 1/Day | Continuous | All |
| 50060 - Chlorine, Total Residual - mg/l | 0.20 | - | - | - | - | - | - | 1/Day | Grab | All |
| 78739 - Chlorination/Bromination Duration - Minutes | 120 | - | - | - | - | - | - | 1/Day | Total | All |

Note for station 3IB00002001:

- The Total Residual Chlorine (TRC) and Total Residual Oxidants (TRO) limits are the maximum allowed at the outfall at any time. TRC and TRO may not be discharged from this outfall for more than two hours per day. Simultaneous multi-unit chlorination and/or bromination is permitted. Analyses are to be performed by amperometric titration, Orion Residual Chlorine Electrode, or other EPA approved methods during chlorination and/or bromination. The daily grab samples for TRC and TRO shall represent the maximum concentration discharged during chlorination and/or bromination.

- Water temperature requires intake (3IB00002800) monitoring for outfall 3IB00002001. Report intake/outfall temperature estimated to correspond to a maximum temperature differential sustained for one hour.

- Total Residual Oxidants reflects the use of bromine compounds. Bromine can be used separately or in combination with chlorine. These limits are effective when bromine is used. Discharge limitations for TRO may be met using a dehalogenation agent, if necessary. Dehalogenation shall then be achieved by using stoichiometric calculations to determine the amount of dehalogenating agent necessary to completely estimate the residual.

- Total Residual Oxidants are to be reported on days when bromine compounds are used with or without chlorine. Report "AH" on the monthly operating report on days when no bromine compounds are used and explain in the remarks section.

- For total residual chlorine, report on days when only chlorine compounds are used (i.e. no bromine compounds). Report "AH" on the monthly operating report if bromine (or a combination of bromine and chlorine) is used and explain in remarks section.

- For chlorination/bromination duration, monitoring is to be performed only on days when using chlorine and/or bromine treatment. On days when treatment is not used, report "AH" on the monthly operating report and explain in remarks section.

- Sampling shall be performed when discharging. If NO DISCHARGE OCCURS DURING THE ENTIRE MONTH, eDMR users should select the " No Discharge " check box on the data entry form. PIN the eDMR.

- Samples taken in compliance with monitoring requirements specified above shall be taken at Sampling Stations described in Part II, OTHER REQUIREMENTS.

Part I, A. - FINAL EFFLUENT LIMITATIONS AND MONITORING REQUIREMENTS

2. During the period beginning on the first day of the the effective date of this permit and lasting until the expiration date, the permittee is authorized to discharge in accordance with the following limitations and monitoring requirements from outfall 3IB00002002. See Part II, OTHER REQUIREMENTS, for locations of effluent sampling.

Table - Final Outfall - 002 - Final

| Effluent Characteristic | Discharge Limitations | | | | | | | Monitoring Requirements | | |
|---|---|---|---|---|---|---|---|---|---|---|
| | Concentration Specified Units | | | | Loading* kg/day | | | | | |
| Parameter | Maximum | Minimum | Weekly | Monthly | Daily | Weekly | Monthly | Measuring Frequency | Sampling Type | Monitoring Months |
| 00530 - Total Suspended Solids - mg/l | 100 | - | - | 30 | 1279 | - | 384 | 3/Week | 24hr Composite | All |
| 00550 - Oil and Grease, Total - mg/l | 20 | - | - | 15 | 256 | - | 192 | 1/Month | Grab | All |
| 01119 - Copper, Total Recoverable - ug/l | - | - | - | - | - | - | - | 1/Month | Grab | All |
| 50050 - Flow Rate - MGD | - | - | - | - | - | - | - | 1/Day | Continuous | All |
| 50060 - Chlorine, Total Residual - mg/l | - | - | - | - | - | - | - | 1/Day | Grab | All |
| 50092 - Mercury, Total (Low Level) - ng/l | 3400 | - | - | 8.0 | 0.043 | - | 0.00010 | 1/Month | Grab | All |
| 51600 - pH Range Excursion, Maximum Duration - Minutes | 60. | - | - | - | - | - | - | 1/Day | Total | All |
| 61941 - pH, Maximum - S.U. | - | - | - | - | - | - | - | Continuous | Continuous | All |
| 61942 - pH, Minimum - S.U. | - | - | - | - | - | - | - | Continuous | Continuous | All |
| 82581 - pH Range Excursions, > 60 Minutes - Number/Day | 0 | - | - | - | - | - | - | 1/Day | Total | All |
| 82582 - pH Range Excursions, Monthly Total Duration - Minutes | 446 | - | - | - | - | - | - | 1/Month | Total | All |

Notes for station 3IB00002002:

* Effluent loadings based on average design flow of 3.38 MGD.

- Spray down waters from the new synthetic fuel facility is permitted to be discharged through this outfall.

- Sampling shall be performed when discharging. If NO DISCHARGE OCCURS DURING THE ENTIRE MONTH, eDMR users should select the " No Discharge " check box on the data entry form. PIN the eDMR.

- See Part II, Item I. for Mercury monitoring. Samples for mercury at this station shall be collected one detention time after samples collected for Station 601.

- Bimonthly sampling requires sample collection in January, March, May, July, September, and November.

- Samples taken in compliance with monitoring requirements specified above shall be taken at Sampling Stations described in Part II, OTHER REQUIREMENTS.

- For pH, the maximum limit is 9.0 and the minimum limit is 6.0 S.U. Violations will occur if:

1) total minutes of excursions from these limits exceed 7 hours and 26 minutes (or 446 minutes) during a single month. See pH Range Excursions, Monthly Total Duration (in minutes), Reporting Code 82582. If no excursions occurred during the month, report "0"; or

2) an individual excursion event continues uninterrupted for more than 60 minutes. See:
a) pH Range Excursions, Maximum Duration (in minutes), Reporting Code 51600. If no excursions occurred, report "0";
b) pH Range Excursions, > 60 Minutes (Number/Day), Reporting Code 82581. Enter the number of excursions each day which exceeded 60 minutes in duration.

Part I, A. - FINAL EFFLUENT LIMITATIONS AND MONITORING REQUIREMENTS

3. During the period beginning on the effective date of this permit and lasting until the expiration date, the permittee is authorized to discharge in accordance with the following limitations and monitoring requirements from outfall 3IB00002004. See Part II, OTHER REQUIREMENTS, for locations of effluent sampling.

Table - Final Outfall - 004 - Final

| Effluent Characteristic | Discharge Limitations | | | | | | | Monitoring Requirements | | |
|---|---|---|---|---|---|---|---|---|---|---|
| | Concentration Specified Units | | | | Loading* kg/day | | | | | |
| Parameter | Maximum | Minimum | Weekly | Monthly | Daily | Weekly | Monthly | Measuring Frequency | Sampling Type | Monitoring Months |
| 00530 - Total Suspended Solids - mg/l | 100 | - | - | 30 | 1268 | - | 380 | 2/Week | 24hr Composite | All |
| 00550 - Oil and Grease, Total - mg/l | 20 | - | - | 15 | 254 | - | 190 | 2/Week | Grab | All |
| 01119 - Copper, Total Recoverable - ug/l | - | - | - | - | - | - | - | 1/Week | Grab | All |
| 34044 - Oxidants, Total Residual - mg/l | 0.010 | - | - | - | - | - | - | 1/Day | Grab | All |
| 50050 - Flow Rate - MGD | - | - | - | - | - | - | - | 1/Day | Continuous | All |
| 50060 - Chlorine, Total Residual - mg/l | 0.038 | - | - | - | - | - | - | 1/Day | Grab | All |
| 51600 - pH Range Excursion, Maximum Duration - Minutes | 60 | - | - | - | - | - | - | 1/Day | Total | All |
| 61941 - pH, Maximum - S.U. | - | - | - | - | - | - | - | Continuous | Continuous | All |
| 61942 - pH, Minimum - S.U. | - | - | - | - | - | - | - | Continuous | Continuous | All |
| 82581 - pH Range Excursions, > 60 Minutes - Number/Day | 0 | - | - | - | - | - | - | 1/Day | Total | All |
| 82582 - pH Range Excursions, Monthly Total Duration - Minutes | 446 | - | - | - | - | - | - | 1/Month | Total | All |

Notes for station 3IB00002004:

* Effluent loadings based on average design flow of 3.35 MGD.

- The Total Residual Chlorine (TRC) and Total Residual Oxidants (TRO) limits are the maximum allowed at the outfall at any time. Analyses are to be performed by amperometric titration, Orion Residual Chlorine Electrode, or other EPA approved methods during chlorination and/or bromination. The daily grab samples for TRC and TRO shall represent the maximum concentration discharged during chlorination and/or bromination.

- Total Residual Oxidants and Total Residual Chlorine are to be sampled during the treatment event.

- Total Residual Oxidants reflects the use of bromine compounds. Bromine can be used separately or in combination with chlorine. These limits are effective when bromine is used. Discharge limitations for TRO may be met using a dehalogenation agent, if necessary. Dehalogenation shall then be achieved by using stoichiometric calculations to determine the amount of dehalogenating agent necessary to completely estimate the residual.

- Total Residual Oxidants are to be reported on days when bromine compounds are used with or without chlorine. Report "AH" on the monthly operating report on days when no bromine compounds are used and explain in the remarks section.

- Total Residual Chlorine is to be reported on days when only chlorine compounds are used (i.e. no bromine compounds). Report "AH" on the monthly operating report if bromine (or a combination of bromine and chlorine) is used and explain in the remarks section.

- Sampling shall be performed when discharging. If NO DISCHARGE OCCURS DURING THE ENTIRE MONTH, eDMR users should select the " No Discharge " check box on the data entry form. PIN the eDMR.

- Samples taken in compliance with monitoring requirements specified above shall be taken at Sampling Stations described in Part II, OTHER REQUIREMENTS.

- For pH, the maximum limit is 9.0 and the minimum limit is 6.0 S.U. Violations will occur if:

1) total minutes of excursions from these limits exceed 7 hours and 26 minutes (or 446 minutes) during a single month. See pH Range Excursions, Monthly Total Duration (in minutes), Reporting Code 82582. If no excursions occurred during the month, report "0"; or

2) an individual excursion event continues uninterrupted for more than 60 minutes. See:

a) pH Range Excursions, Maximum Duration (in minutes), Reporting Code 51600. If no excursions occurred, report "0";

b) pH Range Excursions, > 60 Minutes (Number/Day), Reporting Code 82581. Enter the number of excursions each day which exceeded 60 minutes in duration.

Part I, A. - FINAL EFFLUENT LIMITATIONS AND MONITORING REQUIREMENTS

4. During the period beginning on the effective date of the permit and lasting until the expiration date, the permittee is authorized to discharge in accordance with the following limitations and monitoring requirements from outfall 3IB00002601. See Part II, OTHER REQUIREMENTS, for locations of effluent sampling.

Table - Internal Monitoring Station - 601 - Final

| Effluent Characteristic | Discharge Limitations | | | | | | | Monitoring Requirements | | |
|---|---|---|---|---|---|---|---|---|---|---|
| | Concentration Specified Units | | | | Loading* kg/day | | | Measuring | Sampling | Monitoring |
| Parameter | Maximum | Minimum | Weekly | Monthly | Daily | Weekly | Monthly | Frequency | Type | Months |
| 50092 - Mercury, Total (Low Level) - ng/l | - | - | - | - | - | - | - | 1/2 months | Grab | Bimonthly |

Notes for station 3IB00002601:
- See Part II, Item K for mercury monitoring requirements. Samples for mercury at this station shall be collected one detention time before samples collected for Outfall 002.

Part I, A. - FINAL EFFLUENT LIMITATIONS AND MONITORING REQUIREMENTS

5. During the period beginning on the effective date of this permit and lasting until the expiration date, the permittee is authorized to discharge in accordance with the following limitations and monitoring requirements from outfall 3IB00002604. See Part II, OTHER REQUIREMENTS, for locations of effluent sampling.

Table - Internal Monitoring Station - 604 - Final

| Effluent Characteristic | Discharge Limitations | | | | | | | Monitoring Requirements | | |
|---|---|---|---|---|---|---|---|---|---|---|
| | Concentration Specified Units | | | | Loading* kg/day | | | Measuring | Sampling | Monitoring |
| Parameter | Maximum | Minimum | Weekly | Monthly | Daily | Weekly | Monthly | Frequency | Type | Months |
| 00400 - pH - S.U. | - | - | - | - | - | - | - | 1/Month | Grab | All |
| 00530 - Total Suspended Solids - mg/l | 100 | - | - | 30 | - | - | - | 1/Month | Grab | All |
| 00550 - Oil and Grease, Total - mg/l | 20 | - | - | 15 | - | - | - | 1/Month | Grab | All |
| 50050 - Flow Rate - MGD | - | - | - | - | - | - | - | 1/Day | 24hr Total Estimate | All |

Notes for station 3IB00002604:

- Flowrate monitoring is required daily when discharging boiler blowdown water. If no boiler blowdown water is discharged during the month, report "AL" in the first row of the first column on form 4500 (monthly operating report form). A signature is still required. If there is at least one discharge during the month, report "AH" for flow rate for each day when there is no discharge.

- Samples taken in compliance with monitoring requirements specified above shall be taken at Sampling Stations described in Part II, OTHER REQUIREMENTS.

Part I, A. - FINAL EFFLUENT LIMITATIONS AND MONITORING REQUIREMENTS

6. During the period beginning on the effective date of this permit and lasting until the expiration date, the permittee is authorized to discharge in accordance with the following limitations and monitoring requirements from outfall 3IB00002610. See Part II, OTHER REQUIREMENTS, for locations of effluent sampling.

Table - Internal Monitoring Station - 610 - Final

| Effluent Characteristic | Discharge Limitations | | | | | | | Monitoring Requirements | | |
|---|---|---|---|---|---|---|---|---|---|---|
| | Concentration Specified Units | | | | Loading* kg/day | | | Measuring | Sampling | Monitoring |
| Parameter | Maximum | Minimum | Weekly | Monthly | Daily | Weekly | Monthly | Frequency | Type | Months |
| 00400 - pH - S.U. | - | - | - | - | - | - | - | 1/Week | Grab | All |
| 00530 - Total Suspended Solids - mg/l | 50 | - | - | 50 | - | - | - | 1/Week | 24hr Composite | All |
| 50050 - Flow Rate - MGD | - | - | - | - | - | - | - | 1/Day | 24hr Total | All |

Notes for station 3IB00002610:

- This facility is designed, constructed and operated to treat a volume of coal pile runoff associated with a 10-year, 24-hour rainfall event. Any untreated overflow from this facility resulting from a rainfall event greater than a 10-year, 24-hour storm shall not be subject to the above effluent limitations.

- Sampling shall be performed when discharging. If no discharge occurs during the month, report "AL" in the first row of the first column on form 4500 (monthly operating report form). A signature is still required. If there is at least one discharge during the month, report "AH" for each day when there is no discharge.

- Samples taken in compliance with monitoring requirements specified above shall be taken at Sampling Stations described in Part II, OTHER REQUIREMENTS.

Part I, A. - FINAL EFFLUENT LIMITATIONS AND MONITORING REQUIREMENTS

7. During the period beginning on the effective date of this permit and lasting until the expiration date, the permittee is authorized to discharge in accordance with the following limitations and monitoring requirements from outfall 3IB00002611. See Part II, OTHER REQUIREMENTS, for locations of effluent sampling.

Table - Internal Monitoring Station - 611 - Final

| Effluent Characteristic | Discharge Limitations | | | | | | | Monitoring Requirements | | |
|---|---|---|---|---|---|---|---|---|---|---|
| | Concentration Specified Units | | | | Loading* kg/day | | | Measuring | Sampling | Monitoring |
| Parameter | Maximum | Minimum | Weekly | Monthly | Daily | Weekly | Monthly | Frequency | Type | Months |
| 00400 - pH - S.U. | - | - | - | - | - | - | - | 3/Week | Grab | All |
| 00530 - Total Suspended Solids - mg/l | 100 | - | - | 30 | - | - | - | 1/Week | 24hr Composite | All |
| 00550 - Oil and Grease, Total - mg/l | 20 | - | - | 15 | - | - | - | 1/Week | Grab | All |
| 00980 - Iron, Total Recoverable - ug/l | 1000 | - | - | 1000 | - | - | - | 1/Week | 24hr Composite | All |
| 01119 - Copper, Total Recoverable - ug/l | 1000 | - | - | 1000 | - | - | - | 1/Week | 24hr Composite | All |
| 50050 - Flow Rate - MGD | - | - | - | - | - | - | - | 1/Day | 24hr Total | All |

Notes for station 3IB00002611:

- Outfall 3IB00002611 is a fictitious outfall. It is to be used when the coal pile runoff treatment system (outfall 3IB00002610) is used to treat metal cleaning wastes. Metal cleaning wastewater is to be free from chemical additives prior to entering the coal pile runoff basin.

- Samples collected for this outfall shall be collected prior to metal cleaning wastes being discharged into the coal pile runoff treatment system.

- Sampling shall be performed when discharging. If no wastewater is discharged during the month, report "AL" in the first row of the first column on form 4500 (monthly operating report form). A signature is still required. If there is at least one discharge during the month, report "AH" for each day when there is no discharge.

- Samples taken in compliance with monitoring requirements specified above shall be taken at Sampling Stations described in Part II, OTHER REQUIREMENTS

Part I, A. - FINAL EFFLUENT LIMITATIONS AND MONITORING REQUIREMENTS

8. During the period beginning on the effective date of this permit and lasting until the expiration date, the permittee is authorized to discharge in accordance with the following limitations and monitoring requirements from outfall 3IB00002612. See Part II, OTHER REQUIREMENTS, for locations of effluent sampling.

Table - Internal Monitoring Station - 612 - Final

| Effluent Characteristic | Discharge Limitations | | | | | | | Monitoring Requirements | | |
|---|---|---|---|---|---|---|---|---|---|---|
| | Concentration Specified Units | | | | Loading* kg/day | | | Measuring | Sampling | Monitoring |
| Parameter | Maximum | Minimum | Weekly | Monthly | Daily | Weekly | Monthly | Frequency | Type | Months |
| 00550 - Oil and Grease, Total - mg/l | - | - | - | - | - | - | - | 1/Month | Grab | All |
| 50050 - Flow Rate - MGD | - | - | - | - | - | - | - | 1/Month | 24hr Total | All |

Notes for station 3IB00002612:

- Sampling shall be performed when discharging. If no wastewater is discharged during the month, report "AL" in the first row of the first column on form 4500 (monthly operating report form). A signature is still required.

- Samples taken in compliance with monitoring requirements specified above shall be taken at sampling stations described in Part II, OTHER REQUIREMENTS.

Part I, B. - INTAKE MONITORING REQUIREMENTS

1. Intake Monitoring. During the period beginning on the effective date of this permit and lasting until the expiration date, the permittee shall monitor the Intake at Station Number 3IB00002800, and report to the Ohio EPA in accordance with the following table. See Part II, OTHER REQUIREMENTS, for location of sampling.

Table - Intake Monitoring - 800 - Final

| Effluent Characteristic | Discharge Limitations | | | | | | | Monitoring Requirements | | |
|---|---|---|---|---|---|---|---|---|---|---|
| | Concentration Specified Units | | | | Loading* kg/day | | | | | |
| Parameter | Maximum | Minimum | Weekly | Monthly | Daily | Weekly | Monthly | Measuring Frequency | Sampling Type | Monitoring Months |
| 00011 - Water Temperature - F | - | - | - | - | - | - | - | 1/Day | Continuous | All |

Notes for station 3IB00002800:

- Samples taken in compliance with monitoring requirements specified above shall be taken at Sampling Stations described in Part II, OTHER REQUIREMENTS.

Part II, OTHER REQUIREMENTS

A. Description of the location of the required sampling stations are as follows:

| Sampling Station | Description of Location |
|---|---|
| 3IB00002001 | Condenser cooling water and boiler blowdown representative of station 3IB00002604. At combined discharge into discharge channel to Lake Erie. (Lat: 41 N 30 ' 15 "; Long: 82 W 03 ' 00 ") |
| 3IB00002002 | Combined wastewater treatment system at discharge from filters prior to Lake Erie, includes 3IB00002610 and 3IB00002611. |
| 3IB00002004 | Low volume wastewater treatment system. At discharge of low volume wastewater system prior to Lake Erie. |
| 3IB00002601 | Internal monitoring station for influent to ash pond. |
| 3IB00002604 | Boiler blowdown water. At points representative of boiler blowdown. |
| 3IB00002610 | Coal pile runoff treatment system prior to discharge to combined treatment basin (outfall 3IB00002002). |
| 3IB00002611 | A fictitious station used when the coal pile runoff system is used to treat metal cleaning wastes, discharged through station 3IB00002610. |
| 3IB00002612 | At the discharge of Unit # 9 heat exchanger non-contact cooling water prior to entering outfall 3IB00002001. |
| 3IB00002800 | Intake water at inlet to plant from Lake Erie. |

B. This permit shall be modified, or alternatively, revoked and reissued, to 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.

The permit as modified or reissued under this paragraph shall also contain any other requirements of the Act then applicable.

C. In the event that the permittee's operation requires the use of cooling or boiler water treatment additives that are discharged to surface waters of the state, written permission must be obtained from the director of the Ohio EPA prior to use. Discharges of these additives must meet Ohio Water Quality Standards and shall not be harmful or inimical to aquatic life. Reporting and testing requirements to apply for permission to use additives can be obtained from the Ohio EPA, Central Office, Division of Surface Water, Industrial Permits Unit. This information is also available on the DSW website:

http://www.epa.ohio.gov/portals/35/policy/01_22u2.pdf.

D. Permit limitations may be revised in order to meet water quality standards after a stream use determination and waste load allocation are completed and approved. This permit may be modified, or alternatively, revoked and reissued, to comply with any applicable water quality effluent limitations.

E. Best Management Plan: Bottom Ash Transport System

The Avon Lake ash recycle system shall be operated in a manner consistent with the following:

1. The permittee will maintain in good working order and operate as efficiently as possible the bottom ash transport recycle system installed and used at the Avon Lake generating station. The bottom ash transport recycle system shall be operated to prevent overflow of the combined wastewater treatment basin and solids overload of the combined wastewater treatment system filters, except as provided in the paragraph of Part III, General Conditions, entitled, "UNAUTHORIZED DISCHARGE"

2. Bypasses or shutdown of the bottom ash transport recycle system in excess of 48 hours duration shall be reported as specified in the paragraph of Part III, General Conditions, entitled "UNAUTHORIZED DISCHARGE"

3. All bypasses or shutdowns of the bottom ash transport recycle system that result in overflow of the combined wastwater treatment basin or the low volume wastewater treatment basin shall be reported as per the paragraph of Part III, General Conditions, entitled, "UNAUTHORIZED DISCHARGE".

4. All bypasses or shutdowns of the bottom ash transport recycle system that result in noncompliance with effluent limitations of Part I shall be reported as per the paragraph of Part III, General Conditions, entitled, "NONCOMPLIANCE NOTIFICATION".

F. There shall not be a discharge of any polychlorinated biphenyl compounds attributable to the permittee's operations.

G. The parameters below have had effluent limitations established that are below the Ohio EPA Quantification Level (OEPA QL) for the 40 CFR 136 promulgated analytical procedure for those parameters. In accordance with the ORC Section 6111.13 and OAC Rule 3745-33-07(C), if a discharge limit is set below the OEPA QL, any analytical result reported less than the OEPA QL shall be considered to be in compliance with that limit. OEPA QLs may be expressed as Practical Quantification Levels (PQL) or Minimum Levels (ML).

The permittee must utilize the lowest available detection method currently approved under 40 CFR Part 136 for monitoring these parameters.

REPORTING:

All analytical results, even those below the OEPA QL (listed below), shall be reported. Analytical results are to be reported as follows:

1. Results above the QL: Report the analytical result for the parameter of concern.

2. Results above the MDL, but below the QL: Report the analytical result, even though it is below the QL.

3. Results below the MDL: Analytical results below the method detection limit shall be reported as "below detection" using the reporting code "AA".

The following table of quantification levels will be used to determine compliance with NPDES permit limits:

| Parameter | PQL | ML |
|---|---|---|
| Chlorine, Total Residual | 0.050 mg/l | -- |
| Total Residual Oxidants | 0.050 mg/l | -- |

This permit may be modified, or alternatively, revoked and reissued, to include more stringent effluent limits or conditions if information generated as a result of the conditions of this permit indicate the presence of these pollutants in the discharge at levels above the water quality based effluent limit (WQBEL).

H. Analytical Detection Levels

The permittee shall use analytical procedures approved under 40 CFR 136 with MDL (method detection levels) less than or equal to one-third of the most stringent applicable waste load allocations for each parameter.

I. Section 316(b) Requirements

The permittee shall comply with Section 316(b) of the federal Clean Water Act (33 U.S.C. section 1326) and any rules promulgated to implement Section 316(b).

J. All parameters, except flow, need not be monitored on days when the plant is not normally staffed (Saturdays, Sundays, and Holidays). On those days, report "AN" on the monthly report form.

K. General Mercury Variance

The permittee is granted a general mercury variance under the provisions of Rule 3745-33-07(D)(10) of the Ohio Administrative Code. The Avon Lake Power Plant has demonstrated that the facility is currently unable to comply with the monthly average water quality based effluent limit of 1.3 ng/l without construction of expensive end-of-pipe controls more stringent than those required by sections 301(b) and 306 of the Clean Water Act. The Avon Lake Power Plant is currently able to achieve or projects it can achieve an annual average mercury concentration of 12 ng/l within 5 years. For general mercury variance purposes, the annual average mercury effluent concentration is defined as the average of the most recent 12 months of effluent data.

One of the conditions of the general mercury variance is that the permittee make reasonable progress towards attaining the water quality based effluent limits for mercury (1.b, below). To accomplish this the permittee is required to implement a pollutant minimization program (PMP) for mercury. The elements of a PMP include: a control strategy to locate, identify and, where cost-effective, reduce levels of mercury that contribute to discharge levels; periodic monitoring of sources and the treatment system; and annual reporting of results.

The plan of study that was part of the permittee's application for coverage under the general mercury variance includes items associated with developing a control strategy and initial implementation of a PMP. Condition 1.d, below, requires the permittee to implement the plan of study. By implementing the plan of study and meeting other conditions of this NPDES permit, the permittee is taking actions consistent with a PMP for mercury.

1. As conditions of this variance, the permittee shall meet the following requirements:

a. The permittee shall comply with the effluent limitations for mercury at outfall 3IB00002002 given in Part I, A of this permit.

b. The permittee shall make reasonable progress towards attaining the monthly average water quality based effluent limit for mercury by complying with the general mercury variance conditions included in this NPDES permit.

c. The permittee shall use EPA Method 1631 to comply with the influent and effluent mercury monitoring requirements of this permit.

d. The permittee shall implement the plan of study as included in the permittee's mercury variance application submitted initially in April 2010 and a revision submitted in December 2010, including the following summary of requirements:

i. Within 12 months of the effective date of the permit, submit the results of a comprehensive evaluation of mercury sources;

ii. Evaluation of of ash ponds treatment system, including maximizing settling efficiency, maximizing hydraulic retention time, and minimizing transport of dissolved or particulate mercury from the ash ponds;

iii. Optimization of ash ponds filters;

iv. Within 24 months of the effective date of the permit, submit results of wastewater sampling and engineering study, including survey of potential treatment technology;

v. Within 42 months of the effective date of the permit, all recommendations from surveys and studies associated with the plan of study shall be implemented.

e. The permittee shall assess the impact of the mercury variance on public health, safety, and welfare by, as a minimum, monitoring for mercury in the facility's influent and effluent as required by this NPDES permit.

f. The permittee shall achieve an annual average mercury effluent concentration equal to or less than 12 ng/l, as specified in the plan of study submitted with the permittee's mercury variance application.

g. On or prior to March 1st of each year, the permittee shall submit two copies of an annual PMP report to Ohio EPA, Division of Surface Water, Pretreatment Unit, P.O. Box 1049, Columbus, OH, 43216-1049. The annual PMP report shall include:

i. All minimization program monitoring results for the year

ii. A list of potential sources of mercury

iii. A summary of all actions taken to meet the effluent limits for mercury

iv. Any updates of the control strategy, including actions planned to reduce the levels of mercury in the treatment plant's final effluent.

h. Upon completion of the actions identified in the plan of study as required in Part II, Item K.1.d. of this permit or upon submittal of the permittee's NPDES permit renewal application, whichever comes first, the permittee shall submit to Ohio EPA's Northeast District Office a certification stating that all permit conditions imposed to implement the plan of study and the PMP have been satisfied and whether compliance with the monthly average water quality based effluent limit for mercury has been achieved and can be maintained. This certification shall be accompanied by the following:

i. All available mercury influent and effluent data for the most recent 12 month period.

ii. Data documenting all known significant sources of mercury and the steps that have been taken to reduce or eliminate those sources; and

iii. A determination of the lowest mercury concentration that currently available data indicate can be reliably achieved through implementation of the PMP.

2. Exceedance of annual average limit of 12 ng/l.

a. If at any time after the date specified in this variance by which the permittee must meet an average annual mercury effluent concentration of 12 ng/l or after the Director's final approval of a variance renewal, whichever is earlier, the permittee's annual average mercury effluent concentration exceeds 12 ng/l, the permittee shall:

i. Notify Ohio EPA's Northeast District Office not later than 30 days from the date of the exceedance.

ii. Submit an individual variance application, if a variance is desired, not later than 6 months from the date of the exceedance; or

iii. Request a permit modification not later than 6 months from the date of the exceedance for a compliance schedule to attain compliance with the water quality based effluent limits for mercury.

b. If the permittee complies with either 2.a.ii or 2.a.iii, above, the general mercury variance conditions included in this NPDES permit will remain in effect until the date that the Director acts on the individual variance application or the date that the permit modification becomes effective.

c. If the permittee does not comply with either 2.a.ii or 2.a.iii, above, a monthly water-quality based effluent limit for mercury of 1.3 ng/l shall apply at outfall 3IB00002002 beginning 6 months from the date of the exceedance.

3. The requirements of Part II, Item K.2 shall not apply if the permittee demonstrates to the satisfaction of the Director that the mercury concentration in the permittee's effluent exceeds 12 ng/l due primarily to the presence of mercury in the permittee's intake water.

L. Permit Reopener for Mercury Variance Revisions

Ohio EPA may reopen and modify this permit at any time based upon Ohio EPA water quality standard revisions to the mercury variance granted in Part II, Item K of this permit.

M. Renewal of Mercury Variance

For renewal of the mercury variance authorized in this permit, the permittee shall include the following information with the submittal of the subsequent NPDES permit renewal application:

1. the certification described under Part II, Item K.1.h., and all information required under Part II, Item K.1.h.i. through Part II, Item K.1.h.iii;

2. a status report on the progress being made implementing the pollutant minimization program (PMP). This information may be included in the annual PMP report required under Part II, Item K.1.g;

3. a listing of the strategies and/or programs in the PMP which will be continued under the next renewal of this permit; and

4. a statement requesting the renewal of the mercury variance.

N. Outfall Signage

Not later than 4 months from the effective date of this permit, the permittee shall post a permanent marker on the shoreline at each outfall that is regulated under this NPDES permit where a marker does not currently exist. This includes final outfalls, bypasses, and combined sewer overflows. The marker shall consist at a minimum of the name of the establishment to which the permit was issued, the Ohio EPA permit number, and the outfall number and a contact telephone 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 ground level. The sign shall not be obstructed such that persons in boats or persons swimming on the river or someone fishing or walking along the shore cannot read the sign. Vegetation shall be periodically removed to keep the sign visible. If the outfall is normally submerged the sign shall indicate that. If the outfall is a combined sewer outfall, the sign shall indicate that untreated human sewage may be discharged from the outfall during wet weather and that harmful bacteria may be present in the water. When an existing marker is replaced or reset, the new marker shall comply with the requirements of this section.

O. Notification to Public Water Supply Operators.

1. As required by the Ohio Administrative Code 3745-33-08(F), permits for facilities designated by the director as major discharges, in the following locations, shall require the permittee to notify the public water supply operator as soon as practicable after a discharge begins that results from a spill, separate sewer overflow, bypass, upset, or combined sewer overflow that reaches waters of the state:

a. Discharges within three thousand feet of a public water supply intake located in a lake; or

b. Discharges within ten stream miles upstream of a public water supply intake located in a reservoir or any other surface water of the state.

2. Public water supply operators meeting the criteria in Part II, Item O.1 above for the Avon Lake Power Plant are:

City of Avon Lake Public Water Supply
Avon Lake Municipal Utilities
201 Miller Road
Avon Lake, Ohio 44012

3. Within 6 months of the effective date of this permit, the permittee shall develop notification procedures between the wastewater system operator and public water supply operator[s] listed above in Part II, Item O.2 that defines the specific notification requirements to the public water supply operator and what constitutes notification "as soon as practicable".

# NPDES Permit Quality Review Checklist - For Industrial Facilities

**Facility Name** Orion Power / Avon Lake Power Plant
**NPDES Permit Number** 3IB00002*KD

| ***Pre-Review Information*** | |
|---|---|
| 1. | Name of Reviewer Mr. Stuhlfauth |
| 2. | Date of review (MM/DD/YYYY) 3/8/11 |
| 3. | Reviewer examined previous permit, application, fact sheet, previous comment letters and responses? (Y/N/NA) Y |
| 4. | Reviewer examined modeling file (Y/N) Y |

| ***Factsheet Review*** | |
|---|---|
| 5. | Does the factsheet include the name, phone number, and email address for an Ohio EPA contact who can answer questions about the factsheet and permit? Y |
| 6. | Does the factsheet include all the necessary sections (e.g., description of the facility and treatment processes, discussion of the water quality of receiving waters, whole effluent toxicity, standard tables, etc.)? Y |
| 7. | Is the information in the factsheet consistent with the modeling file (e.g. the groupings table, etc.)? Y Has the WLA been reviewed? Y |
| 8. | Have appropriate limits and monitoring requirements been continued from the existing permit? Y |
| 9. | If any application requirements have been waived for this permittee, are these discussed in the factsheet? NA |
| 10. | Are all the limits and monitoring requirements in each effluent table and monitoring station adequately explained and justified? Just about See p. 14+16 mtgs. |
| 11. | If the permittee is subject to federal effluent guidelines (FEGs), are these requirements discussed in factsheet, adequately explained, and FEG limits calculated correctly (e.g. incorporating production information, pro-rating limits based upon the discharge of non-process wastewater at the outfall, etc.)? Y |

| Factsheet Review | |
|---|---|
| 12. | For final outfalls, does the fact sheet describe the basis of final limits in the permit (e.g., that a comparison of FEGs and water quality-based limits was performed, if applicable, and the most stringent limit selected)? (Y/N)<br>Y |
| 13. | If the permit includes a limit for an indicator pollutant (see factsheet template), does the factsheet adequately explain the basis for the limit?<br>NA |
| 14. | Does the factsheet adequately explain the impact of the mixing zone phaseout with regard to all applicable BCCs?<br>Y |
| 15. | Does the factsheet adequately address monitoring requirements and limits for nutrients, including phosphorus?<br>NA |
| 16. | If two or more carcinogenic parameters are placed in reasonable potential Groups 3, 4, or 5, does the factsheet adequately discuss additivity?<br>NA |
| 17. | If FEG or technology-based limits are applied at an internal station, have these limits been compared with water quality-based limits (WQBELs) at the final outfall? If limits at the internal station are less stringent than the WQBELs, have WQBELs been included at the final outfall?<br>I think this is ok. |
| 18. | If applicable, is the non-contact cooling water reasonable potential rule adequately discussed? If parameters discharged in cooling water are not allocated because they are present in equal or greater concentrations in the intake water, is adequate explanation provided? Y<br>→ NA? NA discussed. |
| 19. | Have monitoring waivers been granted for this permittee associated with FEG requirements? If so, are these adequately explained in the factsheet?<br>NA? |
| 20. | For loading limits based upon flow, does the factsheet discuss and justify the flow used to calculate the loadings? Does the flow represent a "reasonable measure of average"? Y Y<br>from renewal app, Table 2 confirms |
| 21. | If applicable, does the factsheet adequately address anti-degradation and anti-backsliding? If this is a new discharger or involves a new source, have all issues associated with the receiving water quality and meeting WQS been appropriately addressed? (See factsheet template for further explanation)<br>NA |
| 22. | Receiving Water Quality – Does the factsheet adequately discuss water quality of the receiving waters and indicate whether or not the receiving waters are impaired (i.e., that the |

| Factsheet Review | |
|---|---|
| | receiving water is listed on the State's 303(d) list)? (Y/N)<br>Y |
| 23. | If a TMDL has been completed (or in progress), does the factsheet discuss the TMDL and incorporate its recommendations for this facility?<br>NA |
| 24. | Does the factsheet describe (list) the designated uses of the water body to which the facility discharges (e.g., contact recreation, aquatic life use)? (Y/N)<br>Y |
| 25. | If the facility operates a surface water intake, does the factsheet adequately discuss the evaluation of the intake with respect to Section 316(b) compliance?<br>Y |
| 26. | If a dissolved metal translator (DMT) has been used to derive effective water quality criteria, does the factsheet provide adequate discussion of this topic? ____ Is there a need to require updated sampling for the metal in order to continue using the DMT for the subsequent permit renewal?<br>NA |
| 27. | Does the factsheet discuss stormwater issues for the facility and include appropriate requirements?<br>? SW not discussed. SW outfalls on map. |
| 28. | Does the factsheet include discussion of all necessary compliance schedules and justification of timelines? Do the series of milestones in the compliance schedule justify the timelines?<br>NA |
| 29. | If the permit proposes to authorize or renew a mercury variance, does the factsheet include all the necessary language for this subject? Y Are the units of measure for mercury correct throughout the factsheet? Y |
| 30. | If any other limits or monitoring requirements are based upon a variance [e.g. 301(g), 316(a), etc.], does the factsheet adequately discuss the variance and provide justification for its inclusion in the permit?<br>NA |
| 31. | If a mixing zone study has been conducted to justify a level of dilution available in the receiving waters higher than the default values, have the results of the study been adequately discussed in the factsheet? ___ Is there any need to update the mixing zone study?<br>NA |
| 32. | If applicable, does the factsheet discuss all WWTP bypasses and any necessary requirements related to reducing or eliminating bypass occurences?<br>NA ~ But what about outfall 610 provision ??? |
| 33. | If applicable, does the factsheet discuss permit requirements associated with a downstream public water supply intake?<br>NA |

| Factsheet Review | |
|---|---|
| 34. | Does the factsheet include a discussion of reasonable potential for whole effluent toxicity? If "yes", have the procedures defined in 40 CFR Part 132, Appendix F, Procedure 6, been followed for dischargers located in the Lake Erie basin? Y NA |
| 35. | If this is a privately-owned treatment works which treats wastes from users/clients, have appropriate permit conditions been explained in the factsheet? (See factsheet template.) NA |

| Permit Review | |
|---|---|
| Cover Page | |
| 36. | Is the permit term consistent with the permit tracking spreadsheet? (Y/N) Y |
| 37. | Are the permittee and name of the receiving waters properly identified on the cover page? Y |
| 38. | If applicable, is appropriate anti-degradation language included on the cover page? NA |
| 39. | Does the cover page include the correct signature line? Y |
| Part I.A and I.B – Effluent Table(s) and Other Monitoring Station Tables | |
| 40. | Are tables for all outfalls (including non-process, storm water, etc.) and other monitoring stations included in the permit? (Y/N) Is the inclusion of tables consistent with the existing permit? Y (N) Station 601, for Hg, is missing. |
| 41. | Are the requirements in the final effluent table consistent with the factsheet? the existing permit, where appropriate? 002, 004 no pH limits + new parameters pH exclusions OK 004 pH limits and notes. Y |
| 42. | If this is a direct discharge to Lake Erie which includes sanitary wastewater, does the final effluent table contain limits and a compliance schedule for E.coli? NA |
| 43. | Are monitoring frequencies, monitoring months, and sample types appropriate and consistent with the existing permit? Y |
| 44. | Does the permit require at least annual monitoring for all limited parameters? (Y/N) If no, does the factsheet indicate that the facility applied for and was granted a monitoring waiver, AND, does the permit specifically incorporate this waiver? (Y/N) Y |
| 45. | Does the permit include all the appropriate sludge stations? (Y/N) NA Do the sludge station tables include the correct limits, monitoring requirements, and footnotes? (Y/N) |

| Permit Review | |
|---|---|
| | |
| Part I., C – Schedule of Compliance | |
| 46. | Does Part I., C include schedules for implementation of a TMDL, meeting a final effluent limit, conducting a special study, etc., if applicable? (Y/N) |
| 47. | Is the duration between milestones no more than 12 months for all compliance schedules? (Y/N) |
| 48. | If a compliance schedule extends beyond the expiration date of the permit, is appropriate language included to incorporate these elements into the next permit? (Y/N) |
| 49. | Are compliance schedules included for any parameters with water quality criteria which was developed prior to 1977? |
| 50. | Have the proper event codes been included for each compliance schedule milestone? |
| Part II – Other Requirements | |
| 51. | Does the permit include all the appropriate language for:<br>- cooling water additive approval ✓<br>- Operator certification and operator of record (if applicable) NA<br>- Sludge requirements (if applicable) NA<br>- Outfall signage — NO → Inaccessible??<br>- Biomonitoring (if applicable) NA |
| 52. | Are all outfalls and monitoring stations listed in Part II, with appropriate descriptions of their locations and sample collection? (Y/N)<br>601 is missing/no table either |
| 53. | If the permit authorizes or renews a mercury variance, is all the appropriate language included in Part II? (Y/N)<br>Y |
| 54. | If applicable, does the permit include appropriate language for Section 316(b) compliance?<br>pll fs say we're not making a determination - so nothing in Part 2? |
| 55. | If applicable, does the permit include language authorizing or renewing a 316(a) variance, a 301(g) variance, etc.?<br>NA |

NA

| ***Permit Review*** | |
|---|---|
| QA/QC | |
| 56. | Have you run the QA/QC spreadsheet? Are there any critical errors in the permit? Oh yeah. Nope |

**Natural Resources Defense Council • Sierra Club • Lake Erie Waterkeeper • Alliance for the Great Lakes • Ohio Environmental Council**

Via Electronic and First-Class Mail

April 25, 2011

Mike McCullough
Ohio EPA, DSW
Permits & Compliance Section
P.O. Box 1049
Columbus, OH 43126-1049
mike.mccullough@epa.state.oh.us

OHIO EPA-DSW
2011 APR 28 AM 9:05

**Re: Comments on Proposed Renewal of Clean Water Act Permit for Avon Lake Power Plant (OEPA Permit No. 3IB00002)**

Dear Mr. McCullough:

Please accept these comments submitted on behalf of the Natural Resources Defense Council, Sierra Club, Lake Erie Waterkeeper, Alliance for the Great Lakes, and Ohio Environmental Council, regarding the Ohio Environmental Protection Agency's ("Ohio EPA") proposed renewal of the Clean Water Act National Pollutant Discharge Elimination System ("NPDES") permit for the Avon Lake Power Plant (OEPA Permit No. 3IB00002) (hereinafter "Draft Permit") operated by Orion Power Midwest, L.P. ("Orion Power").

As explained below, the Ohio EPA must deny the requested permit renewal on the present record. If Ohio EPA continues to process the Draft Permit, the Agency must revise the terms and conditions of the Draft Permit substantially, and the revised draft must be re-noticed and the public must have a full and fair opportunity to comment and request a hearing on the revised draft. Pursuant to the U.S. EPA regulations covering required state program elements for the issuance of NPDES permits, 40 C.F.R. § 124.17, if the Ohio EPA issues a final Permit, a written responsiveness summary must be provided addressing all specific comments made in this submittal, along with all other public comments filed during the comment period.

## I. Ohio EPA Must Make a Determination of the Best Available Technology to Reduce Fish Killed by Avon Lake's Cooling Water Intake Structure Before Reissuing the NPDES Permit.

The Draft Permit does not require adequate measures to minimize the adverse environmental impact on Lake Erie caused by the Avon Lake plant's killing fish with its cooling

water intake structure, either because they are slammed and caught against its cooling water intake screens (called impingement) or because they are sucked into the plant itself through the intake (called entrainment). At present, by Orion Power's own estimates, the Avon Lake plant's cooling water intake impinges an estimated 12.2 million fish per year and entrains an estimated 25.8 million juvenile fish and larvae per year. (AECOM, *CWA §316(b) Impingement Study Interim Data Report Orion Power Midwest, LP Avon Lake Generating Station* (June 2010), at 3-4, attached as Ex. A.)[1] These fish kills are the direct consequence of Avon Lake being allowed to continue using an antiquated once-through cooling system that withdraws up to 688 million gallons of water per day from Lake Erie.

Section 316(b) of the Clean Water Act requires that the "location, design, construction, and capacity of cooling water intake structures reflect the best technology available for minimizing adverse environmental impact." 33 U.S.C. § 1326(b). With regard to the Avon Lake plant, "Ohio EPA has determined that the current intake structure does not represent 'best technology available' (or BTA) as required by the Clean Water Act." (Fact Sheet at 11.) At the same time, however, Ohio EPA is not proposing to require that any changes be made to Avon Lake's cooling system at this time pursuant to Section 316(b), stating instead that it intends to defer requiring compliance with Section 316(b) in this permit pending "further information from the permittee" as well as possible further guidance or regulatory action from U.S. EPA. (*Id.*)

Ohio EPA's proposal to defer requiring compliance with Section 316(b) is contrary to the Clean Water Act. Section 316(b) explicitly incorporates Section 301 of the Act, which required full compliance with technology-based requirements by the long-past deadline of March 31, 1989. *See* 33 U.S.C. § 1311(b); *see also Cronin v. Browner*, 898 F.Supp. 1052, 1059 (S.D.N.Y. 1995). Further, all NPDES permits must require compliance with Section 316(b) at the time of issuance. This is made clear in the Clean Water Act itself, as well as U.S. EPA regulations implementing the Act and case law interpreting it. *See* 33 U.S.C. § 1342(a)(1) (requiring that NPDES permits condition permission to discharge upon compliance with Section 316(b) and other applicable Clean Water Act requirements); 40 C.F.R. § 122.44(b)(3) (requiring that "each NPDES permit shall include . . . [r]equirements applicable to cooling water intake structures under section 316(b) of the CWA"); *U.S. Steel Corp. v. Train*, 556 F.2d 822, 850 (1977) ("§ 402(a)(1) [of the Clean Water Act] implicitly requires the Administrator to ensure compliance with § 316(b) [of the Clean Water Act] as one of the permit conditions.").

Although U.S. EPA recently published a proposed rule in the Federal Register that would create new regulations implementing Section 316(b) at existing power plants such as Avon Lake, *see* 76 Fed. Reg. 22,174 (April 20, 2011), those regulations (in their current proposed form) do nt displace the legal requirement that states use their Best Professional Judgment ("BPJ") to implement Section 316(b) until the regulations are finalized. *See* National Pollutant Discharge Elimination System--Suspension of Regulations Establishing Requirements for Cooling Water Intake Structures at Phase II Existing Facilities, 72 Fed. Reg. 37,107 (July 9, 2007) (suspending prior U.S. EPA regulations in response to court decision and noting that permitting authorities

[1] If the Avon Lake plant were to operate at its maximum design flow rate, its impingement estimate would increase to 21.9 million fish per year and its entrainment estimate would increase to 33 million juvenile fish and larvae per year. (Fact Sheet at 10-11.)

should ensure compliance with Section 316(b) through case-by-case BPJ analyses of BTA).[2]

Accordingly, the Draft Permit must be substantially revised before it can be issued to ensure that impingement and entrainment of fish from Avon Lake's cooling water intake structure is reduced, as soon as possible, to at least the level achievable using BTA. Further, the public should have an opportunity to review and comment on any final BTA determination made for the Avon Lake plant by Ohio EPA.

In addition, any determination under Section 316(b) for this facility must explicitly consider whether wet or dry cooling towers (or an equivalent technology that is at least as effective) represent BTA for the Avon Lake plant's cooling water intake structure. A recent technical review of technological options for compliance with Clean Water Act Section 316(a) and 316(b) for the Bayshore Power Plant in Oregon, Ohio found that wet cooling towers were the most cost-effective option for reducing both thermal discharges and fish kills from the plant's cooling system. (Tetratech, *Bay Shore Power Plant: Intake and Thermal Discharge NPDES Compliance Option Evaluation* (Feb. 2009) [hereinafter "Tetratech Report"], at A-1, attached as Ex. B.) The study found that implementing wet cooling towers at the Bayshore plant would result in 95-98% reduction in *both* impingement and entrainment as a result of the reduced water use in a closed-cycle cooling system. (*Id.* at A-1.) Moreover, closed-cycle cooling already has been demonstrated to be readily available and achievable, with hundreds of facilities nationwide using closed-cycle cooling. In light of this local and national information on the feasibility of closed-cycle cooling, not only should Ohio EPA find that closed cycle cooling represents BPJ/BTA at the Avon Lake facility, but, should it decide that anything other than closed-cycle cooling constitutes BPJ/BTA in this context, Ohio EPA must explain and support with ample evidence its substantive rationale for such a decision.

## II. The Mercury Variance Must Be Denied Because Orion Power Has Not Adequately Demonstrated That "There Is No Readily Available Means of Compliance Without End-of-Pipe Controls."

Orion Power's requested variance from compliance with permit limitations based on Lake Erie Water Quality Standards for mercury should be denied because the company has failed to provide adequate support for the contention in its variance application that it is unable to meet the water quality standards without end-of-pipe treatment to remove mercury from the effluent.

Consistent with U.S. EPA's Great Lakes Initiative ("GLI"), Ohio has adopted stringent water quality standards for Lake Erie covering a range of Bioaccumulative Chemicals of Concern ("BCCs"), including mercury. Mercury is the most prevalent BCC in the Great Lakes Basin and poses a significant threat to human health and wildlife. The goal of the GLI is to

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[2] Moreover, in their current proposed form, U.S. EPA's new regulations would require the states to continue determining BTA on a case-by-case basis, subject only to certain "impingement mortality" standards. *See* 40 C.F.R. §§ 124.85-124.98 (proposed). The undersigned intend to submit comments to U.S. EPA during the public comment period on the proposed rule that urge U.S. EPA to revise the proposal to establish stronger national performance standards for BTA, such as those U.S. EPA defines in the "Option 3" described in the preamble to the proposed rule. *See* 76 Fed. Reg. at 22,206.

implement the Great Lakes Water Quality Agreement between U.S. and Canada, which aims to prohibit the discharge of pollution in toxic amounts, and virtually eliminate dangerous, persistent toxic substances in the Basin.

Ohio EPA proposes to grant Orion Power a mercury variance from water quality-based effluent limitations ("WQBELs") derived from the GLI pursuant to a streamlined variance process created through a 1997 Ohio EPA rulemaking, which is now codified at O.A.C. 3745-33-07(D)(10). Specifically, Ohio EPA found in 1997 that "the average cost to reduce mercury below twelve ng/l from a waste stream through end-of-pipe treatment is in excess of ten million dollars per pound of mercury removed." O.A.C. 3745-33-07(D)(10). Further, Ohio EPA found in 1997 that "requiring removal of mercury by construction of end-of-pipe controls to attain mercury [water quality standards that are] more stringent than those required by sections 301(b) and 306 of the [federal Clean Water Act] would result in substantial and widespread social and economic impact." *Id.* Accordingly, Ohio EPA established by rule in 1997 that it may grant a variance from GLI-derived WQBELs for mercury where "the permittee is not currently complying with the WQBEL and information available from the application required in paragraph (D)(10)(b) of this rule indicates that there is no readily apparent means of complying with the WQBEL without constructing end-of-pipe controls more stringent than those required by sections 301 (b) and 306 of the [federal Clean Water Act]," *id.* 3745-33-07(D)(10)(a)(ii), and "the discharger is currently able to achieve or projects that it can achieve an annual average mercury effluent concentration of twelve ng/l within five years of the date that the variance is granted," *id.* 3745-33-07(D)(10)(a)(iii).

The 1997 mercury variance rule as codified clearly places the burden of proof on the permit applicant to provide information, in its application, regarding "whether there are other means by which the permittee could comply with the WQBEL without constructing end-of-pipe treatment." O.A.C. 3745-33-07(D)(10). Although the 1997 mercury variance rule has been approved by U.S. EPA as part of Ohio's federally delegated Clean Water Act NPDES program, U.S. EPA has specifically noted that, while "Ohio's mercury variance relieves individual dischargers of the responsibility to demonstrate social and economic impacts of complying with the mercury criteria[,] [i]ndividual dischargers must still demonstrate that end of pipe treatment is the only viable compliance option." Water Quality Criteria: Notice of Availability of Water Quality Criterion for the Protection of Human Health: Methylmercury, 66 Fed. Reg. 1344, 1350-51 (Jan. 8, 2001).

The 1997 mercury variance rule further provides that, in the absence of an adequate demonstration by the permit applicant that there are no available means of compliance without end-of-pipe controls, Ohio EPA "*shall deny*" the mercury variance application. O.A.C. 3745-33-07(D)(10)(c) (emphasis added). U.S. EPA concurs with this interpretation of the rule, having noted that "[w]here the discharger demonstration is inadequate (including an inadequate demonstration that end of pipe treatment is the only readily available option for complying), Ohio denies the applicability of the mercury variance to the individual discharge." 66 Fed. Reg. at 1351.

Orion Power's April 2010 mercury variance application fails to meet the burden required by O.A.C. 3745-33-07(D)(10) of substantiating the company's entitlement to a mercury variance. Although the application generally describes the sources of mercury and current operating practices at the Avon Lake plant, the application fails to provide any engineering analysis or detailed explanation of potential additional or alternative treatment technologies or practices that might be applied either upstream of Outfall 002 to remove mercury from the effluent. There is no discussion of what level of mercury reduction such alternative or additional technologies or practices could achieve or how much it would cost. Nor is there any indication that Ohio EPA requested such an analysis or explanation from Orion Power, let alone performed its own independent analysis. Without a detailed, plant-specific analysis of whether additional mercury reductions could be achieved upstream of Outfall 002 through additional or expanded wastewater treatment, Orion Power may not lawfully obtain a mercury variance under the plain language of O.A.C. 3745-33-07(D)(10). The draft permit's proposed provision that Orion Power follow a Pollutant Minimization Plan pursuant to the mercury variance rule is no substitute for requiring the company to engage in a rigorous, site-specific analysis of available technologies as a prerequisite to receiving a variance, as the rule itself requires.

In the documents constituting the publicly available record for this permitting decision, both Orion Power and Ohio EPA appear to be relying on the analysis of mercury treatment technologies undertaken in connection with the 1997 rulemaking as providing additional support for Orion Power's contention that there are no alternative means available to meet the GLI-derived WQBELs. As we understand it, the basis of the 1997 rulemaking was a study conducted by the Foster-Wheeler engineering firm which found that it would be prohibitively expensive to remove mercury from wastewater effluent through end-of-pipe treatment. (*See* Assessing the Economic Impacts of the Proposed Ohio EPA Water Rules on the Ohio Economy (April 24, 1997), attached as Ex. A.)

This 13-year old study is not an adequate basis to circumvent the GLI's critical water quality standards. Pollution control technologies for coal-fired power plants have evolved rapidly over the last 13 years, and U.S. EPA is currently in the process of revising its Effluent Limitation Guideline for coal-fired power plants to reflect these technological advances. *See* U.S. Environmental Protection Agency, *Steam Electric Power Generating Point Source Category: Final Detailed Study Report* (2009), *available at* http://www.epa.gov/waterscience/guide/steam/finalreport.pdf. The 1997 Foster-Wheeler contains only a cursory overview of the capabilities of mercury control technologies, focused on the question of whether – at that time, in 1997 – it was cost-effective to "polish" mercury discharges through end-of-pipe treatment to levels that could comply with GLI standards of 1.3 ppt for wildlife. (*Id.* at 7-8, 23-24.) There is no discussion in the study of the possibility of employing a combination of treatment technologies upstream of the end-of-pipe discharge points, nor is there any discussion of zero liquid discharge systems. (*Id.*) Further, it is our understanding that, other than observing a few pilot projects, little to no evaluation of these and other mercury control technologies, either at end-of-pipe or at internal treatment points, has been undertaken by Ohio EPA since 1997. Whether or not the 1997 rulemaking and study were based on valid information and assumptions at the time, in light of the availability of new information and the 1997 rulemaking's lack of focus on mercury controls upstream of the end-of-pipe, the 1997 rulemaking and study do not

provide an adequate factual basis for granting mercury variances to the Avon Lake plant and other plants discharging into Lake Erie.

Fundamentally, we will never have a clean Lake Erie as long as Ohio EPA permits coal-fired power plants to discharge mercury into the Lake in excess of water quality standards derived from the GLI. We would appreciate the opportunity to continue a dialogue regarding how to improve Ohio's mercury variance program so that it ensures that Lake Erie is adequately protected. We understand that Ohio EPA intends to rely on the 1997 rulemaking and study to grant mercury variances to dozens of facilities that discharge into Lake Erie, and we have serious concerns that such reliance is legally and factually unsupported and will create a major obstacle to restoration of the Lake.

## III. Section 301 of the Clean Water Act Requires Ohio EPA to Set Best Available Technology Limits for Mercury at Outfall 002.

With respect to toxic pollutants such as mercury, Clean Water Act Section 301 requires that NPDES permits "shall require application of" Best Available Technology ("BAT") to reduce pollutant discharges to the maximum extent "technologically and economically achievable," including "elimination of discharges of all pollutants" if it is achievable. 33 U.S.C. § 1311(b)(2)(A)(i); *see also id.* §§ 1311(b)(2)(C), 1317(a) (listing procedures for toxic pollutants); 40 C.F.R. § 401.15 (listing toxic pollutants, including mercury). Federal regulations promulgated by U.S. EPA also require that "[t]echnology-based treatment requirements under Section 301(b) of the [CWA] represent the minimum level of control that *must be imposed*" in a NPDES permit. 40 C.F.R. § 125.3(a) (emphasis added). BAT is a stringent treatment standard that has been held to represent "a commitment of the maximum resources economically possible to the ultimate goal of eliminating all polluting discharges." *EPA v. Nat'l Crushed Stone Ass'n*, 449 U.S. 64, 74 (1980).

Technology-based effluent limitations ("TBELs") are a necessary minimum requirement for a permit "regardless of a discharge's effect on water quality." *Am. Petroleum Inst. v. EPA*, 661 F.2d 340, 344 (5th Cir. 1981); *see also PUD No. 1 Jefferson County v. Wash. Dep't of Ecology*, 511 U.S. 700, 704 (1994) (state water quality standards are "supplementary" to required individual TBELs) (citing *EPA v. Calif.* ex. rel. *Water Res. Control Bd.*, 426 U.S. 200, 205 n.12 (1976)); *Hooker Chems. & Plastics Corp. v. Train*, 537 F.2d 620, 623 (2d Cir. 1976) (CWA "predicate[s] pollution control on the application of control technology on the plants themselves rather than on the measurement of water quality."). Federal regulations require state permitting authorities to establish BAT effluent limits in individual NPDES permits on a case-by-case basis, using Best Professional Judgment ("BPJ"), "to the extent that EPA-promulgated effluent limitations are inapplicable." 40 C.F.R. § 125.3(c)(2), (d); *see also* O.R.C. 6111.042 (authorizing the Director to make BPJ determinations in NPDES permits); O.A.C. 3745-33-05(A)(1)(e) (Director shall set "[a]ny more stringent limitations" in NPDES permits "required to comply with any other state or federal law or regulation"); *Northern Cheyenne Tribe v. Montana Dep't of Envtl. Quality*, --P.3d--, 2010 WL 1997421 (Mont. May 18, 2010). The use of the word "shall" in both the federal statute and regulations does not leave the Director with any discretion as to whether TBELs should be established. *See Bennett v. Spear*, 520 U.S. 154, 172 (1997) (the

imperative "shall" makes clear that the agency action specified is obligatory, not discretionary); *see also Alabama v. Bozeman*, 533 U.S. 146, 153 (2001) ("The word 'shall' is ordinarily the language of command.") (internal quotations and citations omitted).

As such, the statement in the Fact Sheet for the Draft Permit that "the director *may* establish technology-based limits based on Best Professional Judgment (BPJ)" (Fact Sheet at 1 (emphasis added)) is legally incorrect. The Clean Water Act requires BAT limits for mercury in this permit at Outfall 002. Because the U.S. EPA Effluent Limitation Guideline – which has not been updated since 1982 – does not address mercury discharges, Ohio EPA is under a non-discretionary duty here to independently evaluate the available pollutant control technologies and require stringent permit limits that, as a minimum level of control, reflect the stringent nature of BAT and the Act's goal that pollutant discharges be eliminated.

An evaluation of BAT for Avon Lake's mercury discharges from Outfall 002 would require consideration of both the potential for additional or expanded wastewater treatment to reduce mercury concentrations upstream of Outfall 002, as discussed above, and also consideration of additional end-of-pipe treatment measures before this permit is issued – not at some point in the future, after the permit issues. Thus, although we support immediate implementation of a Pollutant Minimization Plan at Avon Lake, as an interim measure, the Clean Water Act BAT provisions require more stringent alternatives to be considered, and required if available, before this NPDES permit can be lawfully renewed.

Nor can Orion Power and Ohio EPA simply rely on the 1997 Foster-Wheeler study as a substitute for a BAT analysis here. Reliance on a 13-year old rulemaking and study that does not incorporate the newest generation of pollutant control technologies, does not perform a plant-specific analysis of potential technologies and options for mercury at Outfall 002 of the Avon Lake facility, and does not address controls upstream of the end-of-pipe discharge point is inconsistent with the Clean Water Act and the non-discretionary mandate to require BAT.

## IV. Section 301 of the Clean Water Act Requires Ohio EPA to Set Best Available Technology Limits for Heat at Outfall 001.

Based on the fact sheet for the draft permit and other information that the undersigned commenters have been able to obtain about Avon Lake's thermal discharges, Ohio EPA has not issued a thermal variance to the plant under Clean Water Act Section 316(a).[3] In the absence of such a variance, the Clean Water Act requires that heat be treated as any other pollutant and be subject to technology-based effluent limitations ("TBELs") that reflect BAT. *See* 33 U.S.C. § 1311(b)(2)(A)(i) (NPDES permits "shall require application of" Best Available Technology ("BAT") to reduce pollutant discharges to the maximum extent "technologically and economically achievable," including "elimination of discharges of all pollutants" if it is achievable); *id.* § 1362(6) (defining "pollutant" to include "heat"); *U.S. Steel Corp. v. Train*, 556

[3] Section 316(a) of the Clean Water Act authorizes state permitting authorities to grant variances from thermal discharge limits only when the permit applicant has demonstrated that a less stringent standard is available "that will assure the protection and propagation of a balanced, indigenous population of shellfish, fish, and wildlife in and on that body of water." 33 U.S.C. § 1326(a).

F.2d 822, 840 n.27 (7th Cir. 1977) (noting that Section 301(b) of the Act requires effluent limitations on thermal discharges); *see also In re Dominion Energy Brayton Point, L.L.C.*, NPDES Appeal 03-12, 2006 WL 3361084, slip op. at 85 (E.A.B. Feb. 1, 2006) ("[T]hermal pollutants will be regulated as any other pollutant unless an owner or operator of a point source can prove that a modified thermal limitation can be applied which will assure protection and propagation of a balanced indigenous population.") (citing Clean Water Act legislative history). Because, as with mercury discharges, U.S. EPA's applicable effluent limitation guideline – which has not been updated since 1982 – does not address thermal pollution, Ohio EPA is required to set a TBEL in this permit for thermal discharges based on its determination of BAT using BPJ.

Nothing in the available record indicates that an analysis of BAT for thermal discharges has ever been done for the Avon Lake plant, let alone that any thermal BAT analysis was revisited in connection with the current NPDES permit renewal process. The Avon Lake plant uses antiquated once-through cooling techniques that almost certainly do not represent BAT. Conducting the legally required BAT analysis for the plant's thermal discharges would almost certainly require making changes to the plant's cooling system.

As noted above, a recent technical review of technological options for compliance with Clean Water Act Section 316(a) and 316(b) for FirstEnergy's Bayshore Power Plant in Oregon, Ohio found that wet cooling towers were the most cost-effective option for reducing both thermal discharges and fish kills from the plant's cooling system. (*See* Tetratech Report at A-1, attached as Ex. B.) This study found that "wet cooling towers may reduce the volume of water withdrawn from a particular source by as much as 98 percent depending on various site-specific characteristics and design specifications," with a directly proportional reduction of thermal discharges as a result. (*Id.* at 26.) A similar analysis of the available technologies and options for reducing thermal discharges at the Avon Lake plant must be conducted before its NPDES permit can be lawfully renewed.

## V. Ohio EPA Must Revise the Draft Permit to Ensure that the Avon Lake Plant's Discharges Comply with Lake Erie Water Quality Standards for Temperature.

Ohio EPA has failed to ensure that the Avon Lake plant's thermal discharges meet the Ohio water quality standards for Lake Erie. These standards require that, outside of a properly defined "thermal mixing zone," "[t]here shall be no water temperature changes as a result of human activity that cause mortality, long-term avoidance or exclusion from habitat, or adversely affect the reproductive success of representative aquatic species." O.A.C. 3745-1-31(B)(1). The standards also establish maximum monthly temperatures for the central basin of Lake Erie. *Id.* tbl. 31-1(B).[4]

To establish a lawful thermal mixing zone in a NPDES permit, Ohio EPA must "define

[4] In addition to these numeric thermal water quality standards, the Avon Lake permit is also governed by Ohio's narrative water quality standards at O.A.C. 3745-1-04, and it also must protect Lake Erie's existing uses and designated uses. *See* O.A.C. 3745-1-31(A) (designating Lake Erie uses of exceptional warmwater habitat, superior high quality water, public water supply, agricultural water supply, industrial water supply and bathing waters).

the location where discharge-induced mixing ceases," O.A.C. 3745-2-08(C)(2); must "[d]emonstrate that the mixing zone would not otherwise interfere with the designated or existing uses of the receiving water or downstream waters," *id.* 3745-2-08(C)(7); and must "[d]emonstrate that the mixing zone does not interfere with or prevent the recovery of an aquatic community or species population that could reasonably be expected when previously limiting water quality conditions improve," *id.* 3745-2-08(C)(15). Ohio EPA must also ensure that daily average numeric temperature criteria are met, *id.* 3745-2-08(M), and that the thermal mixing zone complies with "Guidelines for the Submittal of Demonstrations Pursuant to Sections 316(a) and 316(b) of the Clean Water Act and Chapter 3745-1 of the Administrative Code," a guidance document issued in 1978, *id.* 3745-1-03(A)(4).[5]

There is no indication that either Orion Power or Ohio EPA has ever conducted the kind of rigorous, site-specific evaluation of Avon Lake's thermal discharges that these rules require to establish a lawful thermal mixing zone that ensures compliance with thermal water quality standards. The Avon Lake draft NPDES permit does not even attempt to define a thermal mixing zone for the plant, let alone does it contain any of the rigorous analysis that is required in connection with establishing a properly defined thermal mixing zone or otherwise ensuring that water quality standards are met. Nor does the draft permit contain any Btu/hour effluent limitation for the plant's thermal discharges.

Rather, the fact sheet for the draft permit inexplicably asserts that "Ohio EPA believes that reasonable potential for temperature is not triggered at outfall 001 by this discharge." (Fact Sheet at 14.) At the same time, the fact sheet notes that Avon Lake's thermal discharges can be as much as 25 degrees Fahrenheit greater than the intake water temperature and sometimes exceed 100 degrees Fahrenheit – well above the daily maximum and average temperature criteria for the central basin of Lake Erie, even during the warmest summer months. (*Compare id. with* O.A.C. 3745-1-31 tbl. 31-1(B).) In addition to exceeding these numeric criteria, Avon Lake's thermal discharge may be causing other harms to representative aquatic species – but neither Orion Power nor Ohio EPA appear to have ever even defined the "representative aquatic species" that need to be protected by thermal discharge standards.[6]

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[5] The 1978 guidance document further provides that thermal mixing zones will be defined by setting a Btu/hr effluent limitation on specific point sources depending on "the effect that the size of the mixing zone has on the populations and communities of the receiving water bodies." (1978 Guidance Document at 28.) Such effluent limitations should be determined taking into account the following factors: "1) site-specific biological, chemical, and physical information provided by the applicant; 2) temperature standards or other temperature criteria applicable to receiving water body; and, 3) how well information submitted by an applicant demonstrates that a thermal mixing zone will ensure the protection and propagation of a balanced, indigenous community." (*Id.*)

[6] *See In re Entergy Nuclear Vermont Yankee Discharge Permit 3-1199*, -- A.2d --, 2009 WL 4878507, ¶ 38 (Vt. Dec. 18, 2009) (noting that U.S. EPA guidance "recommends the selection of between five and twelve species" to define a representative population, "giv[ing] special consideration" to "[t]he most thermally sensitive species") (citations and internal quotation marks omitted); *see also In re Dominion Energy Brayton Point, L.L.C.*, NPDES Appeal 03-12, 2006 WL 3361084, slip op. at 89-93 (E.A.B. Feb. 1, 2006) (interpreting U.S. EPA regulations to require that a permitting authority must consider as "representative" aquatic species those species that would inhabit the receiving water body if it were not degraded by thermal discharges); *See In re Pub. Serv. Co. of Ind., Inc.*, 1 E.A.D. 590, 604 (Adm'r 1979) (interpreting U.S. EPA regulations as requiring, at a minimum, that state water quality standards not permit thermal discharges to cause "shifts . . . from a thermally sensitive to thermally tolerant species").

On the present record, the Avon Lake NPDES permit does not ensure that thermal water quality standards are met. Therefore, the Avon Lake NPDES permit may not be lawfully renewed. *See* O.A.C. 3745-33-05(A)(1)(a) ("for each point source from which pollutants are discharged, the director shall determine and specify in the permit the maximum levels of pollutants that may be discharged to ensure compliance with . . . [a]pplicable water quality standards"); *see also Citizens Committee to Preserve Lake Logan v. Williams*, Case No. EBR 75-40, 1977 WL 10269, at *14 (Ohio E.B.R. May 27, 1977) (holding that all effluent limitations in NPDES permits must include "explicit verification" that water quality standards will not be violated); *Am. Paper Inst. v. U.S. EPA*, 996 F.2d 346, 350 (D.C. Cir. 1993) ("[O]nce a water quality standard has been promulgated, section 301 of the CWA requires *all* NPDES permits for point sources to incorporate discharge limitations necessary to satisfy that standard.") (emphasis added).

## VI. Section 301 of the Clean Water Act Requires Ohio EPA to Set Best Available Technology Limits for Other Pollutants that Orion Power Has Reported Discharging in Avon Lake's Toxics Release Inventory Report.

In addition to mercury and thermal pollution, Ohio EPA must also evaluate whether other pollutants not currently addressed in Avon Lake's NPDES permit require TBELs based on BPJ. Specifically, there are a number of pollutants that Orion Power reports discharging to surface water in Avon Lake's Toxics Release Inventory report that are not currently addressed in the NPDES permit. For example, for the year 2009, Orion Power reported discharging to surface water 4 pounds of arsenic, 31 pounds of barium, 1.54 pounds of lead, 5 pounds of manganese, 3 pounds of nickel, and 5 pounds of vanadium. (*See* U.S. EPA, Toxics Release Inventory Program, *at* http://www.epa.gov/tri/ (electronic database of Toxics Release Inventory reports).) None of these pollutants are currently subject to any effluent limitations in Avon Lake's draft NPDES permit, nor are any of these pollutants addressed in U.S. EPA's Effluent Limitation Guideline.

Therefore, as noted above, Ohio EPA must set TBELs for these pollutants by determining BAT using BPJ. Although Avon Lake does not appear to be discharging these pollutants in amounts that would implicate the applicable water quality standard or otherwise require a WQBEL, the Clean Water Act still requires that they be subject to TBELs. *See, e.g.*, *PUD No. 1 Jefferson County*, 511 U.S. at 704; *Am. Petroleum Inst.*, 661 F.2d at 344; *Hooker Chems. & Plastics Corp.*, 537 F.2d at 623. While the pollutants at issue here are being discharged only in small amounts, the Clean Water Act requires that "the discharge of any pollutant by any person shall be unlawful" except, in pertinent part, if it is authorized by a NPDES permit. 33 U.S.C. § 1311(a) (citing *id.* § 1342). The Act further defines "discharge of a pollutant" to mean "any addition of any pollutant to navigable waters from any point source." *Id.* § 1362(12). Requiring effluent limitations for even discharges of pollutants that occurring only in small amounts is consistent with the Clean Water Act's statutory goal of "elimination of discharges of all pollutants." 33 U.S.C. § 1311(b)(2)(A)(i); *see also EPA v. Nat'l Crushed Stone Ass'n*, 449 U.S. at 74.

Accordingly, although the pollutants reported in Avon Lake's Toxics Release Inventory report are being discharged only in small amounts, they still constitute "discharges of a pollutant" that are illegal under the Clean Water Act unless subject to appropriate TBELs. Ohio EPA must revise the draft permit to incorporate such TBELs before Avon Lake's NPDES permit can be lawfully renewed.

## VII. Ohio EPA Must Impose a WQBEL for TRC at Outfall 001.

The Draft Permit contains an effluent limitation for Total Residual Chlorine ("TRC") at Outfall 001 of 0.20 mg/l, restricted to no more than 2 hours of discharge per day. (Draft Permit at 2.) According to the Fact Sheet for the Draft Permit, this effluent limitation is derived from "Federal Effluent Guidelines for steam-electric power plants." (Fact Sheet at 14.) Indeed, as a TBEL, this provision in the Draft Permit is consistent with U.S. EPA regulations establishing Effluent Limitation Guidelines for the steam-electric power source category. *See* 40 C.F.R. § 423.13(b)(1)-(2) (setting TBEL of 0.20 mg/l for TRC, restricted to 2 hours per day, for facilities greater than 25 MW).

However, where a more stringent state water quality standard exists, as it does in Ohio, a NPDES permit must adhere to the stricter state water quality standard. 33 U.S.C. §§ 1311(b)(1)(C), 1370; 40 C.F.R. § 122.44(d)(1); *EPA v. State Water Resources Control Board*, 426 U.S. 200, 205 (1976). As noted in Table 7 of the Fact Sheet for the Draft Permit, for TRC discharges into Lake Erie, the Inside Mixing Zone Maximum water quality criterion in the Waste Load Allocation model is 0.038 mg/l, the Maximum Aquatic Life water quality criterion is 0.019 mg/l, and the Aquatic Life water quality criterion is 0.011 mg/l. (Fact Sheet at 26.) No explanation is provided as to why a WQBEL was not set for TRC at Outfall 001. Nor is there any indication that a variance from the applicable water quality standard has ever been issued for TRC at Outfall 001.

Although the Draft Permit limits TRC discharges at Outfall 001 to two hours per day, this is not in and of itself adequate to ensure that aquatic life will be protected. Chlorine is an acute toxin that could be very harmful to aquatic life. We are unaware of any evidence that demonstrates that regular two hour acute exposures to TRC that exceed the applicable numeric criterion will not be deleterious to aquatic life. Moreover, the federal Clean Water Act and its U.S. EPA and Ohio implementing regulations clearly provide that the discharge must meet the water quality criteria inside the mixing zone unless authorized by a variance, which has not been issued here. *See* O.A.C. 3745-33-05(A)(1)(a) ("for each point source from which pollutants are discharged, the director shall determine and specify in the permit the maximum levels of pollutants that may be discharged to ensure compliance with . . . [a]pplicable water quality standards"); *see also Citizens Committee to Preserve Lake Logan v. Williams*, Case No. EBR 75-40, 1977 WL 10269, at *14 (Ohio E.B.R. May 27, 1977) (holding that all effluent limitations in NPDES permits must include "explicit verification" that water quality standards will not be violated); *Am. Paper Inst. v. U.S. EPA*, 996 F.2d 346, 350 (D.C. Cir. 1993) ("[O]nce a water quality standard has been promulgated, section 301 of the CWA requires *all* NPDES permits for point sources to incorporate discharge limitations necessary to satisfy that standard.") (emphasis added).

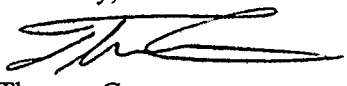
Accordingly, there is no legal or factual basis for concluding that the TBEL in the Draft Permit for TRC at Outfall 001 will adequately protect water quality standards. Ohio EPA must set a WQBEL for TRC at Outfall 001.

## VIII. Conclusion

For at least the foregoing reasons, Ohio EPA must either deny the application for renewal of the Avon Lake NPDES permit, and the application for a mercury variance, or at a minimum issue a substantially revised draft permit for public review and comment. If you have any questions, please contact Thomas Cmar at 312-651-7906 or tcmar@nrdc.org.

Thank you for providing us with this opportunity to comment.

Sincerely,



Thomas Cmar
Midwest Program Attorney
Natural Resources Defense Council

Nachy Kanfer
Campaign Representative, Midwest States
Sierra Club Beyond Coal Campaign

Sandy Bihn
Executive Director/Waterkeeper
Lake Erie Waterkeeper

Lyman Welch
Water Quality Program Manager
Alliance for the Great Lakes

Trent A. Dougherty
Director of Legal Affairs
Ohio Environmental Council

CC: Sean Ramach, U.S. EPA Region V

# Exhibit A

AECOM

Prepared for:
**RRI Energy**



# CWA §316(b) Impingement Study
# Interim Data Report
# Orion Power Midwest, LP
# Avon Lake Generating Station

**NPDES Permit # 31B00002*JD**

AECOM
June 2010
Document No.: 10267-049-4300

AECOM

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# 1.0 Introduction

Among the requirements of the Comprehensive Demonstration Study (CDS) under the CWA §316(b) Phase II rule, prior to the 2nd Circuit Court decision, is the characterization of impingement mortality and entrainment. This characterization may be used to assess the performance of the current CWIS as well as evaluate additional potential technologies and measures. RRI Energy, Inc. (formerly Reliant Energy) completed a one year impingement and entrainment sampling program to support this characterization.

This report provides an initial summary of impingement and entrainment sampling completed in accordance with the Proposal for Information Collection (PIC) submitted to the Ohio Environmental Protection Agency (OEPA) in November 2005.

# 2.0 Methods

Impingement and entrainment sampling was conducted at Avon Lake Generating Station from January through December 2006. Figure 1 provides a schematic drawing illustrating sample locations. Figure 2 provides an aerial photograph of the site including the 1000 foot intake canal through which cooling water is withdrawn from Lake Erie.

## 2.1 Operations and Water Quality Data Collection

At the time of arrival on-site, the sampling date and start time, initials of the sampling team and plant operation information are recorded. Plant operational information recorded includes:

- Number of pumps running
- Number of screens running
- Time of unit or pump shut down if shut down during the 24-hour sampling period
- Plant load
- Whether warm water was being recirculated

Temperature, pH, dissolved oxygen, and conductivity were measured with a water quality meter at the beginning and end of entrainment sample collection, if not using continuous recording water quality data sonde. Weather conditions and cloud cover were also recorded.

## 2.2 Impingement Sampling

Impingement samples were collected on a monthly basis from January through March and biweekly (every other week) through October and sampling returned to a monthly basis in November and December. Each sampling event was approximately 24-hours in duration. Avon Lake's cooling water intake structure (CWIS) has 9 operating intake bays, each equipped with a traveling screen. The screenwash for all screens is discharged to a common sluiceway. The station typically only rotates a subset (2 – 4) of the 9 screens at any given time, although most or all of the screens may be rotated when debris load is particularly high. Impingement samples were collected from the operating intake screens over the 24-hour sampling event, which includes four discrete 6-hour sampling periods. Screens may be rotated intermittently at 1 – 6 hour intervals when debris load is light. If screens were operating continuously (due to high debris load), a sub-sampling program was completed. Subsampling involved the deployment of nets for shorter duration (up to 5 minutes); usually 4 times during the 6 hour sampling interval. If a screen which had been previously idle began rotating during the sampling event, subsampling was completed after the screen had been rotating for at least one hour so as to be sampling in a consistent manner to other screens

operating during the event. Photographs illustrating the sample collection process are provided in Appendix A. Samples were collected and processed as described in the Sampling work plan submitted with the PIC.

### 2.3 Entrainment Sampling

RRI completed monthly entrainment sampling in January and February consistent with the PIC submitted to OEPA. Based on OEPA comments on the PIC, entrainment sampling was continued from late March to early September of 2006. Sampling frequency increased to biweekly from June through the first week of September. Two entrainment samples were collected at the shoreline intake during the 24-hour sampling event, including one day and one night collection (Figure 1). Samples were collected in duplicate using a dual bongo net (505-µm mesh; 0.5 meter diameter mouth) suspended in front of the shoreline intake structure. Photographs illustrating the sample collection process are provided in Appendix A. Samples were collected and processed according to the methods described in the sampling work plan included in the PIC.

### 2.4 Data Management

The following data management protocols were followed to ensure accurate management of the data collected. Field datasheets and lab bench sheets were scanned and placed in labeled folders for input into an electronic database maintained by the identification lab. Prior to processing the data, the Field Manager or assignee reviewed the forms for completeness and accuracy. Each form has a signature and date block to track data processing. After the data were entered into the database, the data forms were signed, dated, and returned to the folder for verification. Printouts of entered data were verified against corresponding field datasheets and lab bench sheets to ensure that information was accurately transferred. For large datasets entered (e.g., more than 100 entries), a subset of 20 percent of the data entries selected at random were checked. If errors were detected in more than 10 percent of the subset, then corrections were made, and another subset checked. Missing information was added and errors corrected. The forms were then initialed and dated by the verifying party. Following data verification the original data forms were segregated by sampling date and archived for the life of the project.

## 3.0 Results

### 3.1 Operations Data

Table 1 summarizes key operations data pertinent to the ongoing impingement and entrainment sampling program for each steam generating unit. Data includes the number of operating pumps and screens, changes in operations (addition/subtraction of units, pumps or screens), and total event withdrawal. Operational changes occurred during events on February 27-28 and March 27-28. Mid-event operational changes indicate a change in operating status of one or more units or pumps. All five circulating water pumps, for both units combined, were never operating simultaneously. Maximum circulating water pump withdrawal for Units 7 and 9 is 625 mgd; with service water the total withdrawal is 688 mgd. For some sampling events, one unit may have been using all of its available circulating pumps, however the other unit was not in operation. A majority of events were completed at 51 – 88% of the design intake capacity, with three events being completed at 12% - 27% of design capacity because of pump or unit shut downs for maintenance. With the exception of a single event (May 30), all other events were completed when traveling screens were operating continuously.

### 3.2 Lake Conditions

Avon Lake is located in Lorain County on the south shore of Lake Erie's Central Basin, approximately 20 miles west of Cleveland, Ohio. Because Avon Lake is located on Lake Erie, the plant is subject to the Great Lakes performance standards for impingement mortality and entrainment. Figure 3 provides a plot of monthly lake water levels as measured at the NOAA Great Lakes Gage in Cleveland Ohio.

## 3.3 Impingement Data

Impingement sampling was completed on a monthly basis from January through March, then increased to every other week from April through October, and returned to monthly sampling during November and December. A total of 26,898 fish were collected in 117.5 hours of sampling completed over nineteen sampling events (Table 3). The dominant fish impinged were emerald shiner and gizzard shad (96% of the total number collected). Other species collected include white perch, smelt, round goby, and bluegill. A mudpuppy and crayfish were also caught in separate sampling events as well as several zebra mussel. Photographs of representative specimens are included in Appendix A.

The number of dead specimens collected as a percent of total catch was highly variable ranging from 0 – 56% of the total catch. Overall, approximately 24% of the catch was classified as dead at the time of collection. Specimens were classified as dead on collection if they exhibited characteristics indicating death at least 3 hours prior to collection (e.g., evidence of decomposition, discoloration of eyes). Fish classified as dead on collection indicates that the fish were dead prior to impingement, and therefore do not reflect an impingement loss.

Table 4 presents impingement rates expressed in fish per day by species, reflecting an adjustment to values based on actual time sampled. In addition, these values have been adjusted for the percent of fish caught that were characterized as dead at the time of impingement.

Avon Lake did not rotate all nine traveling screens during the course of the sampling event. While a subset of screens were rotated and sampled during the event, one can conservatively assume that impingement may be occurring across all of the screens. Adjusted event impingement rates for each event were calculated by dividing the total event impingement by the fraction of the total number of screens that were rotating and sampled. For example, on January 30, 2 screens were operating during the sampling event. Therefore the total impingement of 585 was divided by the fraction of screens operating (= 2/9 = 0.222) for a total adjusted impingement rate of 2,633 fish per day. It is likely that intake velocities and water flow through at the rotating screens is greater than across the non-rotating screens. In addition, it is possible that through screen velocities at the non-rotating screens may be less than 0.5 fps, which would result in negligible impingement on those screens.

The total impingement rates, extrapolated from the actual sample catch, for Avon Lake Generating Station ranged from approximately 144 – 291,369[1] fish per day, with the highest rate observed during the February 27 event. The average rate of impingement recorded over the entire study period was approximately 19,763 fish per day, and the median number approximately 923. Excluding the February 27 event, the average impingement rate was approximately 4,673 fish per day. Approximately 82% of the annualized impingement is related to the February 27 event which had impingement rates an order of magnitude greater than the next highest event, and 100 times greater than the average of all other events. As only a single sampling event occurred during the month of February, it is possible that the extraordinarily high impingement rates were associated with an episodic event and are not representative of impingement over the entire inter-event period.

On an annualized basis when adjusted for estimated actual plant withdrawals, the initial estimated impingement for the 2006 sampling year was approximately 12.2 million[2] fish assuming that impingement occurs equally across all traveling screens regardless of whether such screens are static or rotating at the time of sampling. It should be emphasized, that this is a highly conservative estimate. Additional evaluation may reveal that a majority of impingement occurs at the rotating screens, with no or much lower rates of impingement at those that are static. In that case, estimated annualized impingement is approximately 3.9 million fish.

---

[1] Adjusted for actual time sampled, percent of catch dead at the time of impingement, and for number of screens operating at the time of sampling.

[2] Based on actual operations flows at the time of sampling and inter-event flow estimated based on the total water withdrawal for the month.

Table 5 presents average, minimum and maximum length and weight by species for individual impinged specimens collected. Estimated impingement for the 19 sampled events by weight is presented in Table 6, and totaled approximately 4,964.4 kg. When event data are extrapolated for actual water withdrawals throughout the study year, total annualized impingement is conservatively estimated to be approximately 168,312 kg, but may be as low as 54,300 kg.

### 3.4 Entrainment Data

Entrainment sampling was completed during each sampling event during the months of January through September 5, 2006, with one sample collected during darkness and one during daylight. Samples collected from March, April and the September 5 event contained no ichthyoplankton (Table 7). Peak entrainment was observed during the June 26 sampling event, with 21.88 larvae per 100 $m^3$ entrained. By the July 10th event, entrainment had declined to 10.95 larvae per 100 $m^3$. Most larvae and juveniles were entrained during events between May 15 and July 24, with a small secondary peak of 7.95 larvae/juveniles per 100 $m^3$ during the August 21-22 sampling event. Approximately 88% of all entrainment occurred between May and July.

With the exception of entrainment of several adult gizzard shad during the January and February sampling events, no eggs, larvae or juveniles were entrained. Because it was not possible to sample behind the traveling screen, sample nets were deployed in front of the trash rack. As such, some fish of an impingeable size may have been collected in entrainment samples. It is likely that the adult gizzard shad collected in the entrainment nets in January and February would have been sufficiently large so as to be impinged rather than entrained.

A majority of all ichthyoplankton entrained were larval stage fish; no eggs were entrained. The peak entrainment observed during the June 26-27 sampling event was dominated by emerald shiner. The dominant species entrained in 2006 were emerald shiner (63%), yellow perch (13%), gizzard shad (6%) and an unidentified species (6%).

Average entrainment during peak entrainment periods (May - August) was 10.65 larvae/juveniles/adults per 100 $m^3$; while average entrainment during the remainder of the year was less than 0.07 per 100 $m^3$.

When data are extrapolated for actual water withdrawal during the inter-event periods during 2006 the estimated annual entrainment is approximately 25.8 million ichthyoplankton. Again, this likely overestimates actual entrainment because sampling in front of the traveling screens results in collection of organisms that would be too large to actually become entrained. Actual water withdrawal for 2006 was approximately 70% of the design intake volume (including circulating and service water pumps).

As observed during the 2006 study, shiners likewise dominated entrainment during the historical studies (54%). Carp and minnows represented approximately 17% of total entrainment in the historical study. However, no carp or minnows were entrained in the 2006 study.

### 3.5 Quality Assurance

No significant quality assurance issues have been identified during the course of sampling. Problems with in-net flow meters providing inconsistent measurements were encountered during the initial sampling events. After further investigation it was determined that the meters were not consistently yielding accurate measurements when compared to a hand held flow meter. Measurement of flow using a separate hand held meter replaced use of the in-net flow meters. Intake velocities measured with the in-net meters prior to the switch will be verified based on the number of pumps operating and subsequent field measurements under similar operating scenarios.

## 4.0 Summary

Impingement and entrainment sampling initiated in January 2006 and ending December 2006, has documented moderate impingement and entrainment rates. As given in Section 3.4, average entrainment during peak entrainment

periods (May - August) was 10.65 larvae/juveniles/adults per 100 m3; while average entrainment during the remainder of the year was less than 0.07 per 100 m3. Estimated annual entrainment extrapolated for actual water withdrawal during the inter-event periods of 2006 was approximately 25.8 million ichthyoplankton. The estimated annualized impingement at Avon Lake station during 2006 may range from 3.9 to 12.2 million fish.The dominant species impinged were emerald shiner and gizzard shad, comprising 96% of the total species collected.

Ichthyoplankton were absent in samples collected during the March, April and the September 5 events. The peak in entrainment occurred in late June with a secondary peak in late July. The dominant species entrained included emerald shiner, yellow perch, gizzard shad, and an unidentified species. No eggs were entrained during the study. The initial estimate of annualized entrainment in 2006 was a factor of 10 lower than the baseline entrainment estimate presented in the PIC which was developed using historical study data.

The data collected as part of this monitoring work will support a more detailed characterization of impingement and entrainment. That characterization will likely include more detailed analysis of data including statistical analysis, evaluation of data for diel or seasonal patterns, and analysis at maximum and sampling year operations.

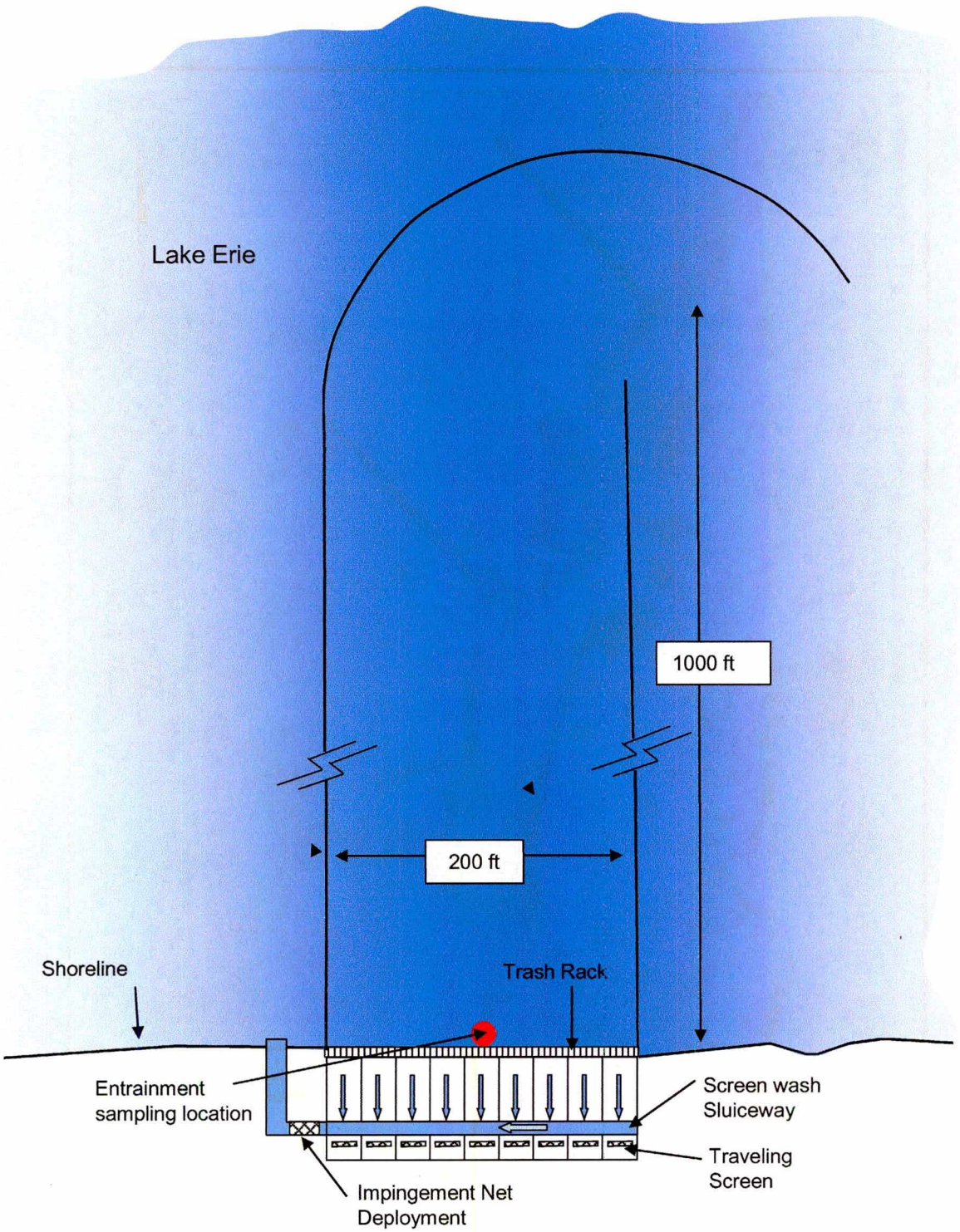



**Figure 1**

**Impingement and Entrainment Sampling Location Schematic (not to scale)**




X: 2323X01.JPG
L: ON=*, OFF=REF
P: PAGESET/PLT-AP1
5/17/05 SYR-BS-LJP
2323001/AERIAL/2323B01.DWG

RELIANT ENERGY
AVON LAKE GENERATING STATION
**PROPOSAL FOR INFORMATION COLLECTION**

**AERIAL PHOTO - SITE LAYOUT**

BBL BLASLAND, BOUCK & LEE, INC. engineers, scientists, economists

FIGURE 2

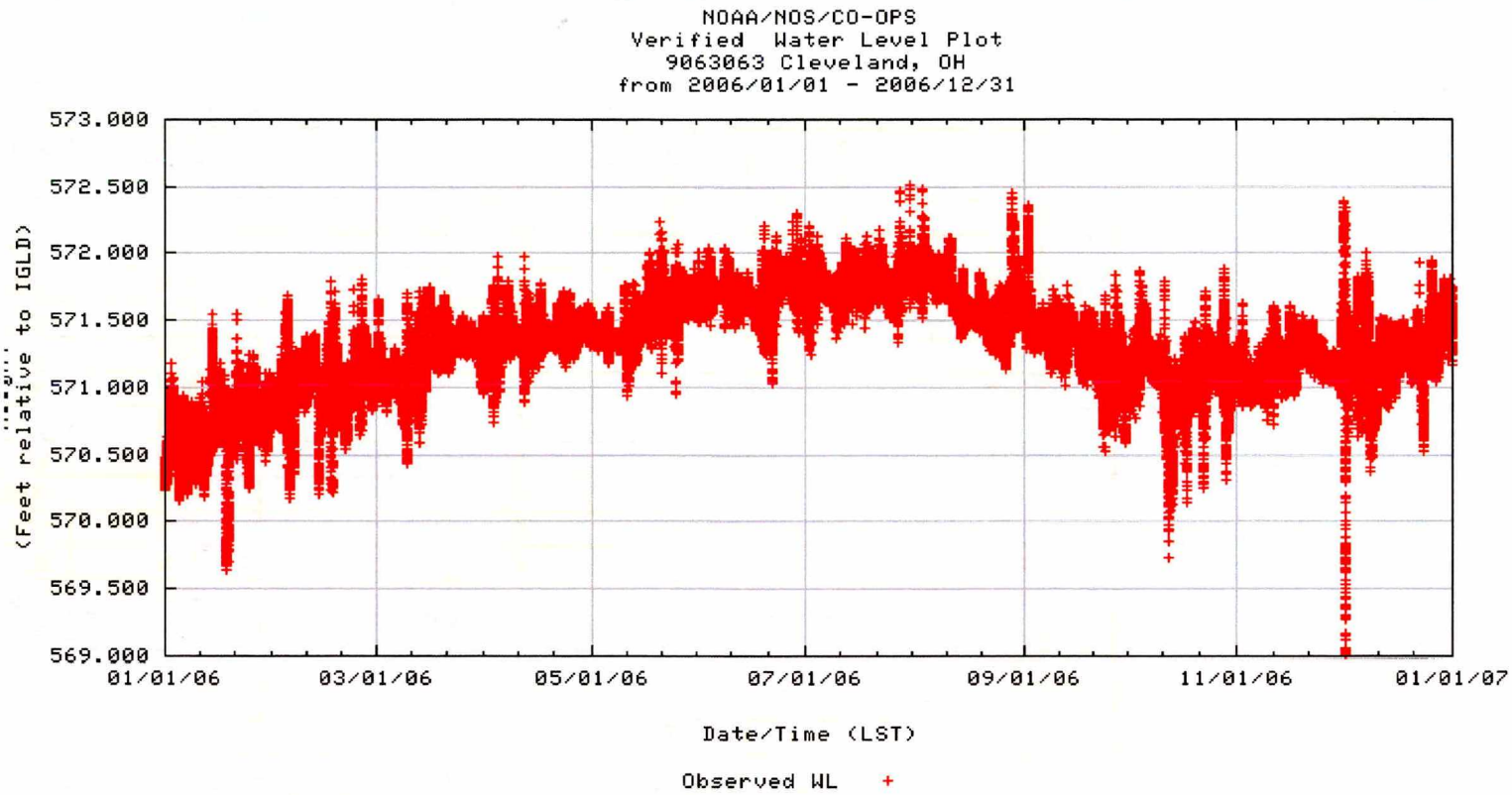



**Figure 3**
**Monthly Water Level -Lake Erie (NOAA Great Lakes Gage – Cleveland 9063063)**

http://tidesandcurrents.noaa.gov/data_menu.shtml?bdate=20060101&edate=20061231&wl_sensor_hist=W3&relative=&datum=0&unit=1&shift=s&stn=9063063+Cleveland%2C+OH&type=Historic+Great+Lakes+Water+Level+Data&format=View+Plot

**Table 1. Operations Information – Avon Generating Station (January 2006 – December 2006)**

| Event ID | Warm Water Circulation | Op Change Mid Event? | Units Operating | Max # of Pumps | Max # Screens Operating | Total withdrawal (MG) |
|---|---|---|---|---|---|---|
| AVL013006 Y | | N | 1 | 1 | 2 | 158.4 |
| AVL022706 | Y Y | | 1 | 2 | 3 | 316.8 |
| AVL032706 | Y Y | | 2 | 3 | 2 | 391.7 |
| AVL041006 | N N | | 2 | 3 | 2 | 391.7 |
| AVL042406 | N N | | 2 | 3 | 3 | 391.7 |
| AVL051506 | N N | | 1 | 1 | 3 | 74.9 |
| AVL053006 | N N | | 2 | 2 | 6 | 233.3 |
| AVL061206 | N N | | 2 | 3 | 2 | 391.7 |
| AVL062606 | N N | | 2 | 4 | 2 | 466.6 |
| AVL071006 | N N | | 1 | 3 | 2 | 475.2 |
| AVL072406 | N N | | 2 | 3 | 2 | 308.2 |
| AVL080706 | N N | | 1 | 3 | 2 | 475.2 |
| AVL082106 | N N | | 2 | 3 | 3 | 391.7 |
| AVL090506 | N N | | 2 | 3 | 7 | 391.7 |
| AVL091806 | N N | | 1 | 2 | 3 | 316.8 |
| AVL100206 | N N | | 1 | 4 | 3 | 550.1 |
| AVL101606 | N N | | 1 | 2 | 3 | 316.8 |
| AVL112006 | N N | | 2 | 4 | 4 | 466.6 |
| AVL121806 | N N | | 1 | 2 | 4 | 316.8 |

Note: 625 mgd equals maximum circulating water pump design capacity

**Table 2. Water temperature and weather conditions during each sampling event.**

| Event ID | Average Temperature(C) | Weather |
|---|---|---|
| AVL013006 | 3.2 | Partly/mostly cloudy, 36-40 deg F, winds 5 mph |
| AVL022706 | 2.5 | Mid to low 20's deg F, snow |
| AVL032706 | 2.8 | Clear, 45 deg F |
| AVL041006 | 8.3 | Clear, low 50's deg F |
| AVL042406 | 6.2 | Partly cloudy, 50-60's deg F |
| AVL051506 | 6.6 | Rain, wind 5-15 mph, mid 50's deg F |
| AVL053006 | 17.9 | Warm, hazy, upper 80's deg F |
| AVL061206 | 12.3 | Partly cloudy, low 70's deg F |
| AVL062606 | 22.0 NR | |
| AVL071006 | 23.8 | Breezy, spotty showers, overcast, 70's deg F |
| AVL072406 | 25.5 | Clear, 80, no precip, light wind |
| AVL080706 | 26.9 Party | cloudy |
| AVL082106 | 24.4 | Clear, sunny, mid 70's deg F |
| AVL090506 | NR Partly | cloudy w/sun, slight breeze, 70's deg F |
| AVL091806 | 21.1 | Mostly cloudy, low 70's deg F |
| AVL100206 | 17.6 | Rain, overcast, 65-70 deg F |
| AVL101606 | 13.5 | Light drizzle, cloudy, 50's deg F |
| AVL112006 | 8.8 | Rain/snow, mostly cloudy, mod wind, 30-40's deg F |
| AVL121806 | 7.0 | Light rain, mostly cloudy, mod wind, 50's deg F |

**Table 3. Impingement by Event and Species (actual catch) - Avon Lake Generating Station (1/06 – 12/06)**

| Common Species Name | 30-Jan | 27-Feb | 27-Mar | 10-Apr | 24-Apr | 15-May | 30-May | 12-Jun | 26-Jun | 10-Jul | 24-Jul |
|---|---|---|---|---|---|---|---|---|---|---|---|
| alewife | | 1 | | | | | | | | | |
| bluegill | | 7 | 1 | | 1 | 1 | | | | | |
| brook silverside | | 3 | 5 | | | | | | | | |
| channel catfish | | | | | | | | | | | |
| emerald shiner | 3 | 9599 | 2218 | 380 | 852 | 469 | 1100 | 35 | 6 | 5 | 3 |
| freshwater drum | | 4 | | | | 17 | 152 | 2 | 3 | 4 | 3 |
| gizzard shad | 60 | 9135 | 1286 | 239 | 14 | 11 | 29 | 2 | 1 | | 2 |
| golden redhorse | | | | | | | 1 | | | | |
| green sunfish | | | | | | | 1 | | | | |
| largemouth bass | | 1 | | | | | | | | | |
| rainbow smelt | | | | | | 9 | | | | 4 | 2 |
| rock bass | | | | | 1 | 1 | | | | | |
| round goby | | | | | 4 | 7 | | | 1 | | 1 |
| smallmouth bass | | | | | | | | | | | |
| spottail shiner | | | | | | | 1 | | | | |
| trout-perch | | 8 | | | 2 | 2 | | 1 | | | |
| unknown goby | | | 1 | 3 | | | | | | | 1 |
| unknown smelt | | 114 | 9 | 1 | 1 | | | | | | |
| white bass | | | 1 | | | 3 | 6 | | 1 | | |
| white perch | | 150 | 48 | 5 | 12 | 141 | 107 | 28 | 6 | 2 | 1 |
| yellow bullhead | | | | | | | | | | | |
| yellow perch | | | | | 1 | 1 | 2 | 1 | | | |
| **Total Fish** | **63** | **19022** | **3569** | **628** | **888** | **662** | **1399** | **69** | **18** | **15** | **13** |
| **Dead (% of Total Catch)** | 36% | 11% | 33% | 30% | 20% | 27% | 56% | 28% | 6% | 13% | 15% |
| **Other Aquatic/Semi-Aquatic Species** | | | | | | | | | | | |
| crayfish | | | | | | | | | | | |
| mudpuppy | | | 1 | | | | | | | | |
| zebra mussel | | | | | | | | | | 8 | |
| **Total # of Samples/24 hrs** | 4 | 16 | 17 | 16 | 15 | 16 | 4 | 16 | 16 | 16 | 16 |
| **Sample Duration** | 1.7 | 4.1 | 5.7 | 5.3 | 5.0 | 5.3 | 26.2 | 5.8 | 5.3 | 5.3 | 5.3 |

**Table 3. Impingement by Event and Species (actual catch) - Avon Lake Generating Station (1/06 – 12/06)**

| Common Species Name | 7-Aug | 21-Aug | 5-Sep | 18-Sep | 2-Oct | 16-Oct | 20-Nov | 18-Dec | Total |
|---|---|---|---|---|---|---|---|---|---|
| alewife | | | | | | | | | 1 |
| bluegill | | | | | | 1 | 1 | | 12 |
| brook silverside | | | | | | | | | 8 |
| channel catfish | | | | | 1 | | | | 1 |
| emerald shiner | 1 | 9 | | 5 | 3 | 7 | 4 | 7 | 14706 |
| freshwater drum | 2 | 2 | 1 | | | 4 | 1 | 1 | 196 |
| gizzard shad | | 8 | 2 | 2 | 1 | 55 | 195 | 76 | 11118 |
| golden redhorse | | | | | | | | | 1 |
| green sunfish | | | | | | | | | 1 |
| largemouth bass | | | | | | | | | 1 |
| rainbow smelt | | 4 | 19 | 15 | | | 1 | | 54 |
| rock bass | | | | | | | | | 2 |
| round goby | 2 | 3 | 1 | 1 | 1 | | | | 21 |
| smallmouth bass | 1 | | | | | | | | 1 |
| spottail shiner | | | | | | | | | 1 |
| trout-perch | | | | | | | | | 13 |
| unknown goby | | | | | | | | | 5 |
| unknown smelt | | | | | | | | | 125 |
| white bass | 1 | 2 | 3 | | 3 | 23 | | | 43 |
| white perch | 3 | 2 | 4 | 3* | 1 | 6 | 6 | 56 | 581 |
| yellow bullhead | | | | | | | 1 | | 1 |
| yellow perch | 1 | | | | | | | | 6 |
| **Total Fish** | **11** | **30** | **30** | **26** | **10** | **96** | **209** | **140** | **26898** |
| **Dead (% of Total Catch)** | 27% | 20% | 17% | 15% | 0% | 14% | 6% | 31% | 24% |
| **Other Aquatic/Semi-Aquatic Species** | | | | | | | | | |
| crayfish | | | | 1 | | | | | 1 |
| mudpuppy | | | | | | | | | 1 |
| zebra mussel | 9 | | | | | | | | 17 |
| **Total # of Samples/24 hrs** | 16 | 16 | 16 | 16 | 16 | 16 | 16 | 16 | 280 |
| **Sample Duration** | 5.3 | 5.0 | 5.3 | 5.3 | 5.3 | 5.4 | 5.3 | 5.3 | 117.5 |

**Table 4. Impingement Sampling by Event and Species (fish per day) – Avon Lake Generating Station (1/06 – 12/06)**

| Common Species Name | 1/30 | 2/27 | 3/27 | 4/10 | 4/24 | 5/15 | 5/30 | 6/12 | 6/26 | 7/10 | 7/24 | 8/7 |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| alewife | 0 | 6 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| bluegill | 0 | 41 | 4 | 0 | 5 | 5 | 0 | 0 | 0 | 0 | 0 | 0 |
| brook silverside | 0 | 18 | 17 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| channel catfish | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| emerald shiner | 14 | 47843 | 8024 | 1128 | 3261 | 1537 | 434 | 86 | 23 | 18 | 14 | 5 |
| freshwater drum | 0 | 24 | 0 | 0 | 0 | 59 | 72 | 8 | 14 | 14 | 5 | 9 |
| gizzard shad | 571 | 47651 | 2435 | 797 | 48 | 27 | 1 | 4 | 5 | 0 | 9 | 0 |
| golden redhorse | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| green sunfish | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| largemouth bass | 0 | 6 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| rainbow smelt | 0 | 0 | 0 | 0 | 0 | 27 | 0 | 0 | 0 | 18 | 9 | 0 |
| rock bass | 0 | 0 | 0 | 0 | 5 | 5 | 0 | 0 | 0 | 0 | 0 | 0 |
| round goby | 0 | 0 | 0 | 0 | 19 | 32 | 0 | 0 | 5 | 0 | 5 | 9 |
| smallmouth bass | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 5 |
| spottail shiner | 0 | 0 | 0 | 0 | 0 | 0 | 1 | 0 | 0 | 0 | 0 | 0 |
| trout-perch | 0 | 41 | 0 | 0 | 10 | 9 | 0 | 4 | 0 | 0 | 0 | 0 |
| unknown goby | 0 | 0 | 4 | 14 | 0 | 0 | 0 | 0 | 0 | 0 | 5 | 0 |
| unknown smelt | 0 | 664 | 34 | 5 | 5 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| white bass | 0 | 0 | 4 | 0 | 0 | 14 | 3 | 0 | 5 | 0 | 0 | 5 |
| white perch | 0 | 829 | 178 | 14 | 43 | 455 | 62 | 103 | 27 | 9 | 5 | 5 |
| yellow bullhead | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| yellow perch | 0 | 0 | 0 | 0 | 5 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| **Total impingement (fish per day)** | 585 | 97123 | 10700 | 1958 | 3401 | 2170 | 573 | 205 | 79 | 59 | 52 | 38 |
| **Max # of screens operating** | 2 | 3 | 2 | 2 | 3 | 3 | 6 | 2 | 2 | 2 | 2 | 2 |
| **Adjusted Impingement (fish per day)** | 2633 | 291369 | 48150 | 8811 | 10203 | 6510 | 860 | 923 | 356 | 266 | 234 | 171 |

Individual species values not adjusted for # of screens operating during the event; values adjusted for percent of collected individuals characterized as dead prior to impingement

Impingement not adjusted for collection efficiency, design flow, or percent dead prior to impingement

**Table 4. Impingement Sampling by Event and Species (fish per day) – Avon Lake Generating Station (1/06 – 12/06)**

| Common Species Name | 8/21 | 9/5 | 9/18 | 10/2 | 10/16 | 11/20 | 12/18 | Total |
|---|---|---|---|---|---|---|---|---|
| alewife | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 6 |
| bluegill | 0 | 0 | 0 | 0 | 4 | 5 | 0 | 64 |
| brook silverside | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 35 |
| channel catfish | 0 | 0 | 0 | 5 | 0 | 0 | 0 | 5 |
| emerald shiner | 38 | 0 | 23 | 14 | 18 | 18 | 27 | 62525 |
| freshwater drum | 0 | 0 | 0 | 0 | 18 | 5 | 0 | 228 |
| gizzard shad | 24 | 9 | 0 | 5 | 212 | 823 | 158 | 52779 |
| golden redhorse | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| green sunfish | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| largemouth bass | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 6 |
| rainbow smelt | 19 | 72 | 59 | 0 | 0 | 5 | 0 | 209 |
| rock bass | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 10 |
| round goby | 14 | 5 | 5 | 5 | 0 | 0 | 0 | 99 |
| smallmouth bass | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 5 |
| spottail shiner | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 1 |
| trout-perch | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 64 |
| unknown goby | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 23 |
| unknown smelt | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 708 |
| white bass | 10 | 14 | 0 | 14 | 94 | 0 | 0 | 163 |
| white perch | 10 | 14 | 14 | 5 | 22 | 23 | 248 | 2066 |
| yellow bullhead | 0 | 0 | 0 | 0 | 0 | 5 | 0 | 5 |
| yellow perch | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 5 |
| **Total impingement (fish per day)** | 115 | 114 | 101 | 48 | 368 | 884 | 433 | 119006 |
| **Max # of screens operating** | 3 | 7 | 3 | 3 | 3 | 4 | 4 | |
| **Adjusted Impingement (fish per day)** | 345 | 147 | 303 | 144 | 1104 | 1989 | 974 | 375489 |

Impingement not adjusted for collection efficiency, design flow, or percent dead prior to impingement

**Table 5. Length and Weight of Impinged Species Descriptive Statistics – Avon Lake Generating Station (1/06 – 12/06)**

| | | *Length (cm)* | | | *Weight (g)* | | |
|---|---|---|---|---|---|---|---|
| **Common Species Name** | **Count** | **Average** | **Minimum** | **Maximum** | **Average** | **Minimum** | **Maximum** |
| alewife | 1 | 10.5 | 10.5 | 10.5 | 9.0 | 9.0 | 9.0 |
| bluegill | 12 | 6.7 | 4.0 | 11.0 | 5.9 | 1.0 | 22.0 |
| brook silverside | 7 | 7.6 | 6.5 | 8.0 | 1.4 | 1.0 | 2.0 |
| channel catfish | 1 | 11.5 | 11.5 | 11.5 | 12.0 | 12.0 | 12.0 |
| emerald shiner | 1403 | 7.3 | 1.5 | 11.5 | 2.5 | 0.1 | 8.0 |
| freshwater drum | 62 | 23.7 | 5.5 | 44.0 | 208.6 | 2.0 | 1044.0 |
| gizzard shad | 972 | 12.9 | 1.0 | 40.0 | 21.8 | 1.0 | 342.0 |
| largemouth bass | 1 | 14.0 | 14.0 | 14.0 | 36.0 | 36.0 | 36.0 |
| rainbow smelt | 46 | 6.3 | 3.5 | 15.0 | 2.4 | 0.5 | 16.0 |
| rock bass | 2 | 5.0 | 5.0 | 5.0 | 3.0 | 3.0 | 3.0 |
| round goby | 21 | 7.4 | 5.0 | 11.5 | 7.5 | 1.0 | 22.7 |
| smallmouth bass | 1 | 9.0 | 9.0 | 9.0 | 13.6 | 13.6 | 13.6 |
| spottail shiner | 1 | 13.5 | 13.5 | 13.5 | 18.0 | 18.0 | 18.0 |
| trout-perch | 12 | 8.0 | 7.0 | 9.0 | 4.1 | 3.0 | 7.0 |
| unknown goby | 5 | 9.6 | 6.0 | 14.5 | 17.8 | 3.0 | 51.0 |
| unknown smelt | 123 | 13.5 | 12.0 | 16.0 | 13.1 | 9.0 | 22.0 |
| white bass | 38 | 10.1 | 6.0 | 18.0 | 13.2 | 2.0 | 68.0 |
| white perch | 402 | 9.9 | 5.0 | 30.0 | 15.6 | 2.0 | 361.0 |
| yellow bullhead | 1 | 6.5 | 6.5 | 6.5 | 5.0 | 5.0 | 5.0 |
| yellow perch | 1 | 16.0 | 16.0 | 16.0 | 40.0 | 40.0 | 40.0 |

*Reported for live and fresh dead specimens only

**Table 6. Monthly, 12-Month and Annualized Impinged Fish by Weight – Avon Lake Generating Station (1/06 – 12/06)**

| Common Species Name | 1/30 | 2/27 | 3/27 | 4/10 | 4/24 | 5/15 | 5/30 | 6/12 | 6/26 | 7/10 | 7/24 | 8/7 |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| alewife | 0.00 | 0.05 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 |
| bluegill | 0.00 | 0.12 | 0.02 | 0.00 | 0.11 | 0.02 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 |
| brook silverside | 0.00 | 0.02 | 0.03 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 |
| channel catfish | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 |
| emerald shiner | 0.03 | 140.81 | 22.63 | 2.84 | 6.50 | 2.73 | 1.14 | 0.34 | 0.04 | 0.05 | 0.07 | 0.00 |
| freshwater drum | 0.00 | 4.33 | 0.00 | 0.00 | 0.00 | 23.00 | 13.76 | 1.44 | 0.42 | 2.20 | 0.07 | 0.43 |
| gizzard shad | 16.97 | 1201.38 | 76.19 | 15.49 | 0.86 | 0.62 | 0.02 | 0.23 | 0.26 | 0.00 | 1.03 | 0.00 |
| largemouth bass | 0.00 | 0.21 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 |
| rainbow smelt | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.32 | 0.00 | 0.00 | 0.00 | 0.01 | 0.01 | 0.00 |
| rock bass | 0.00 | 0.00 | 0.00 | 0.00 | 0.01 | 0.01 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 |
| round goby | 0.00 | 0.00 | 0.00 | 0.00 | 0.06 | 0.32 | 0.00 | 0.00 | 0.01 | 0.00 | 0.06 | 0.12 |
| smallmouth bass | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.06 |
| spottail shiner | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.02 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 |
| trout-perch | 0.00 | 0.15 | 0.00 | 0.00 | 0.03 | 0.06 | 0.00 | 0.02 | 0.00 | 0.00 | 0.00 | 0.00 |
| unknown goby | 0.00 | 0.00 | 0.06 | 0.28 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.06 | 0.00 |
| unknown smelt | 0.00 | 8.77 | 0.43 | 0.04 | 0.04 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 |
| white bass | 0.00 | 0.00 | 0.17 | 0.00 | 0.00 | 0.23 | 0.08 | 0.00 | 0.31 | 0.00 | 0.00 | 0.01 |
| white perch | 0.00 | 10.92 | 1.99 | 1.70 | 0.45 | 5.93 | 3.45 | 1.37 | 0.22 | 0.12 | 0.10 | 0.02 |
| yellow bullhead | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 |
| yellow perch | 0.00 | 0.00 | 0.00 | 0.00 | 0.19 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 |
| **Total impingement (kg fish per day)** | 17.00 | 1366.77 | 101.51 | 20.35 | 8.25 | 33.25 | 18.46 | 3.40 | 1.26 | 2.38 | 1.39 | 0.64 |
| **Max # of screens operating** | 2 | 3 | 2 | 2 | 3 | 3 | 6 | 2 | 2 | 2 | 2 | 2 |
| **Adjusted Impingement (fish per day)** | 76.51 | 4100.30 | 456.79 | 91.59 | 24.75 | 99.74 | 27.69 | 15.31 | 5.69 | 10.71 | 6.26 | 2.89 |

Individual species values not adjusted for # of screens operating during the event; values adjusted for percent of collected individuals characterized as dead prior to impingement

**Table 6. Monthly, 12-Month and Annualized Impinged Fish by Weight – Avon Lake Generating Station (1/06 – 12/06)**

| Common Species Name | 8/21 | 9/5 | 9/18 | 10/2 | 10/16 | 11/20 | 12/18 | Total |
|---|---|---|---|---|---|---|---|---|
| alewife | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.05 |
| bluegill | 0.00 | 0.00 | 0.00 | 0.00 | 0.08 | 0.00 | 0.00 | 0.35 |
| brook silverside | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.05 |
| channel catfish | 0.00 | 0.00 | 0.00 | 0.05 | 0.00 | 0.00 | 0.00 | 0.05 |
| emerald shiner | 0.08 | 0.00 | 0.01 | 0.04 | 0.02 | 0.04 | 0.04 | 177.42 |
| freshwater drum | 0.00 | 0.00 | 0.00 | 0.00 | 0.89 | 1.44 | 0.00 | 47.97 |
| gizzard shad | 0.28 | 0.15 | 0.00 | 1.54 | 0.66 | 8.18 | 2.09 | 1325.96 |
| largemouth bass | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.21 |
| rainbow smelt | 0.02 | 0.06 | 0.06 | 0.00 | 0.00 | 0.02 | 0.00 | 0.51 |
| rock bass | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.03 |
| round goby | 0.11 | 0.01 | 0.01 | 0.02 | 0.00 | 0.00 | 0.00 | 0.72 |
| smallmouth bass | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.06 |
| spottail shiner | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.02 |
| trout-perch | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.26 |
| unknown goby | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.40 |
| unknown smelt | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 9.28 |
| white bass | 0.24 | 0.14 | 0.00 | 0.18 | 0.60 | 0.00 | 0.00 | 1.95 |
| white perch | 0.03 | 0.08 | 0.35 | 0.02 | 0.12 | 0.09 | 1.10 | 28.07 |
| yellow bullhead | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.02 | 0.00 | 0.02 |
| yellow perch | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.19 |
| **Total impingement (kg fish per day)** | 0.75 | 0.44 | 0.43 | 1.86 | 2.38 | 9.80 | 3.24 | 1593.57 |
| **Max # of screens operating** | 3 | 7 | 3 | 3 | 3 | 4 | 4 | |
| **Adjusted Impingement (fish per day)** | 2.25 | 0.57 | 1.30 | 5.58 | 7.13 | 22.05 | 7.29 | 4964.39 |

**Table 7. Entrainment per 100 $m^3$ by Event, Species and Life Stage – Avon Lake Generating Station (1/06 – 9/06)**

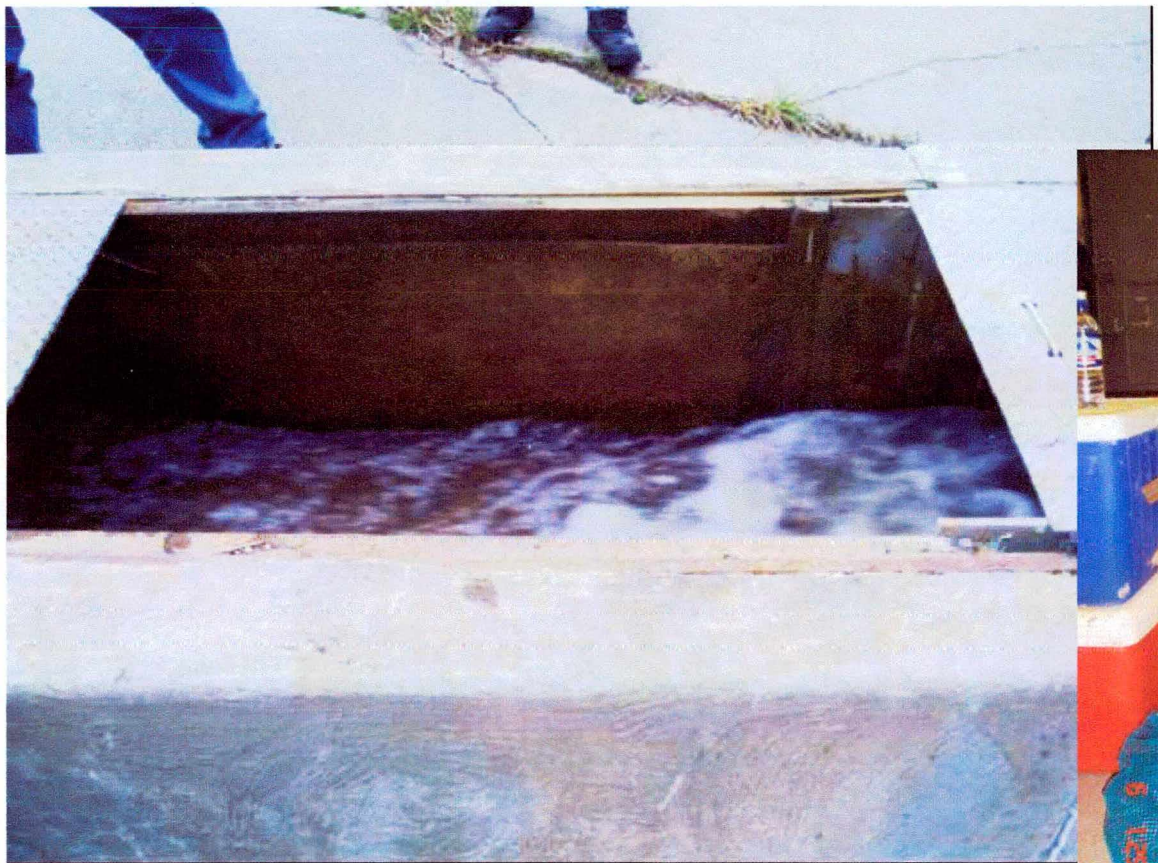
| Common Name | Life stage | 30-Jan | 27-Feb | 27-Mar | 10-Apr | 24-Apr | 15-May | 30-May | 12-Jun | 26-Jun | 10-Jul | 24-Jul | 7-Aug | 21-Aug | 5-Sep | Total |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| alewife | L | | | | | | | | | | 0.54 | | | | | 0.54 |
| bluegill | L | | | | | | | | | 0.25 | | | | | | 0.25 |
| brook silverside | L | | | | | | | | | | 0.27 | | | | | 0.27 |
| emerald shiner | A | | | | | | | 0.11 | | | | | | | | 0.11 |
| emerald shiner | J | | | | | | | | | | 0.81 | 11.01 | | 7.95 | | 19.77 |
| emerald shiner | L | | | | | | | | 10.39 | 16.72 | 6.50 | | 0.71 | | | 34.32 |
| emerald shiner | YSL | | | | | | | | | | 0.22 | | | | | 0.22 |
| freshwater drum | L | | | | | | | | | | | 2.94 | | | | 2.94 |
| freshwater drum | YSL | | | | | | | | | | | 0.24 | 0.47 | | | 0.72 |
| gizzard shad | A | 0.38 | 0.07 | | | | | | | | | | | | | 0.45 |
| gizzard shad | J | | | | | | | | | | | 0.24 | | | | 0.24 |
| gizzard shad | L | | | | | | | | 0.10 | 2.21 | 2.06 | | | | | 4.37 |
| lake whitefish | L | | | | 0.07 | | | | | | | | | | | 0.07 |
| quillback | L | | | | | | | 0.55 | | | | | | | | 0.55 |
| rainbow smelt | J | | | | | | | | | | 0.27 | | 0.74 | | | 1.01 |
| spottail shiner | L | | | | | | | | 0.05 | | | | | | | 0.05 |
| unidentified | J | | | | | | | | | | | 0.24 | | | | 0.24 |
| unidentified | L | | | | | | 3.61 | | 0.29 | | | 0.73 | | | | 4.63 |
| unidentified | UNK | | | | | | | | | | 0.27 | | | | | 0.27 |
| unknown perch | L | | | | | | | | 0.05 | 2.46 | | 0.24 | | | | 2.75 |
| unknown perch | YSL | | | | | | | | | 0.25 | | | | | | 0.25 |
| walleye | L | | | | | | | 0.47 | | | | | | | | 0.47 |
| yellow perch | L | | | | | | 8.57 | 1.40 | | | | | | | | 9.97 |
| yellow perch | YSL | | | | | | 1.27 | | | | | | | | | 1.27 |
| **Total entrainment (per 100$m^3$)** | | **0.38** | **0.07** | **0.00** | **0.07** | **0.00** | **13.45** | **2.53** | **10.87** | **21.88** | **10.95** | **15.66** | **1.93** | **7.95** | **0.00** | **85.74** |

Average based on analysis of four samples (typically a daylight event in duplicate and a night event in duplicate)

Life stage: YSL = yolk-sac larvae; L = larvae; E = egg; J = juvenile; A = adult; UNK = unknown

AECOM

# Avon Lake Impingement Sampling Location





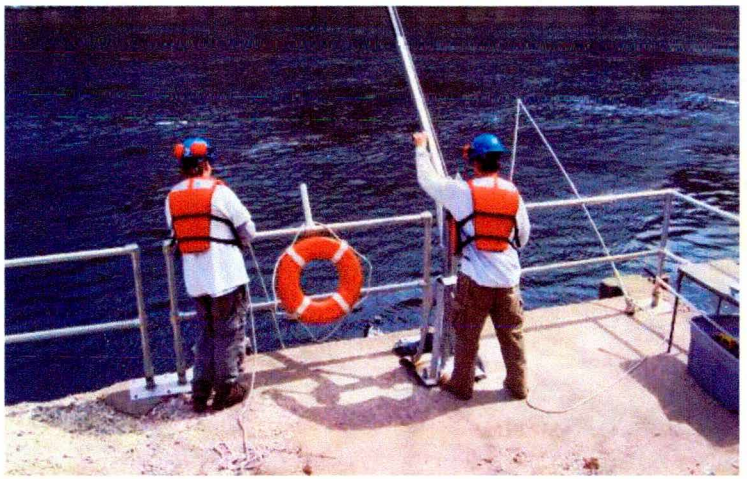
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# Avon Lake Entrainment Sampling Location



AECOM

# Example Entrainment Sampling Procedure – Direct Net Deployment



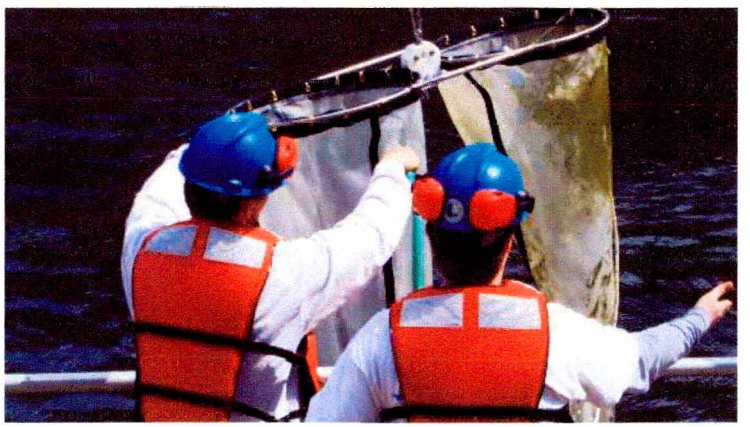
1. Nets are deployed by lowering net into water (usually behind the trash rack, but in some cases in front of trash racks)



2. Nets remain deployed for a sufficient period to achieve the target filter volume of 100 m3 of water; may be deployed at multiple depths or depth of max intake velocity



3. Nets are retrieved



4. Nets are rinsed after retrieval and entrainment sample collected from dolphin jar and preserved for analysis at the lab

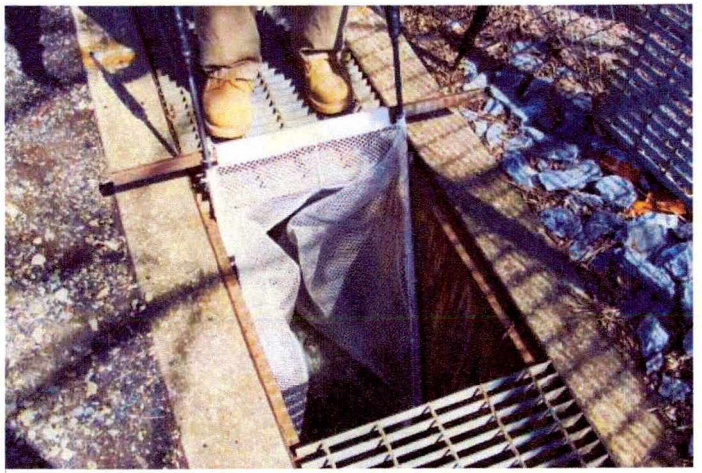
Photos by Tom Barron, PADEP

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# Example Impingement Sampling Procedures



1. Sampling net ready for deployment



2. Sampling net deployed in screenwash sluiceway



3. Sample sorting to collect fish and other aquatic/semi-aquatic organisms

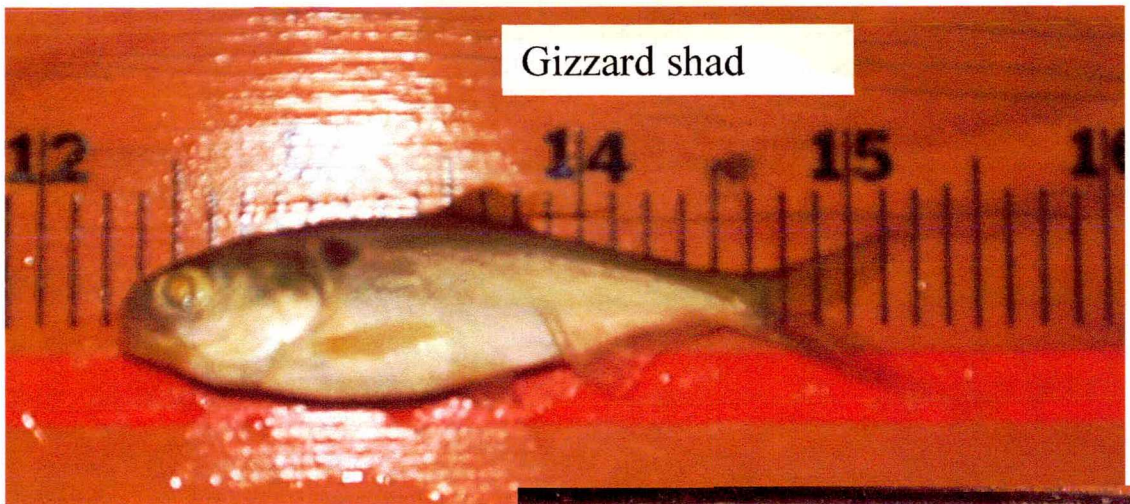


4. Recording species ID, length, and weight for collected species

Photos by Tom Barron, PADEP

AECOM

# Representative Fish Species Collected



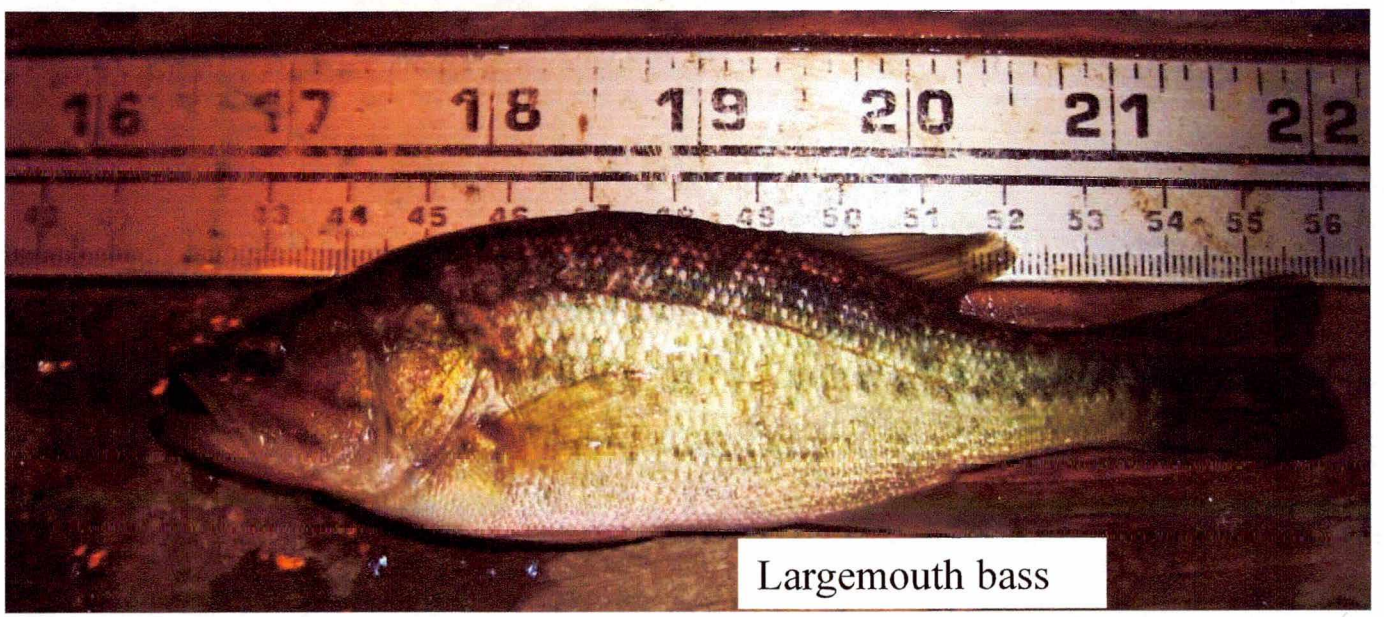



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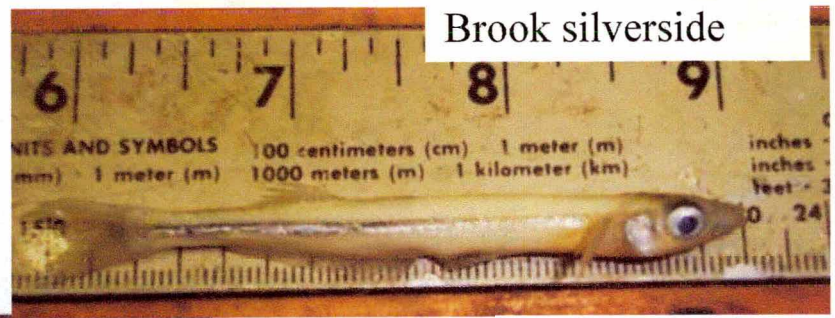



Bluegill



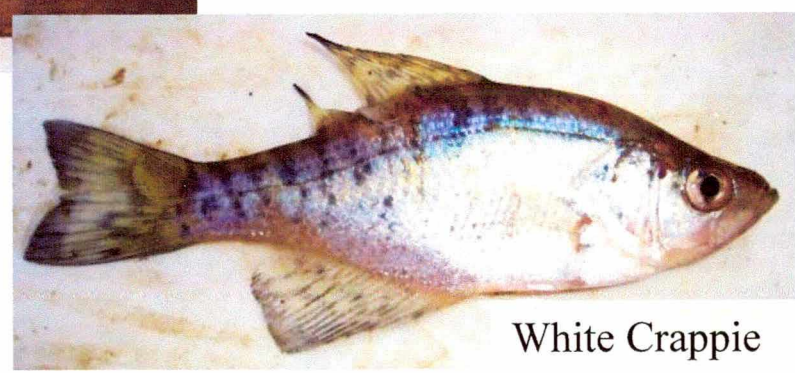

Largemouth bass

# Representative Fish Species Collected



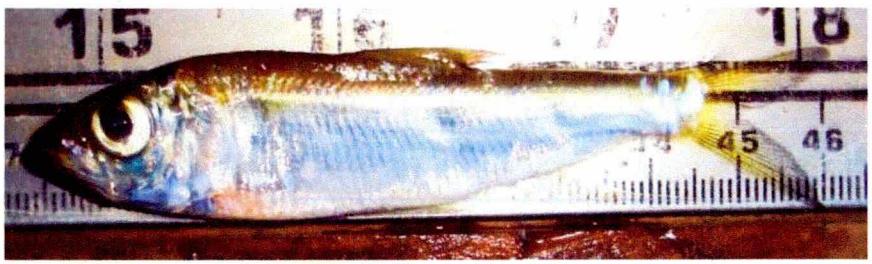




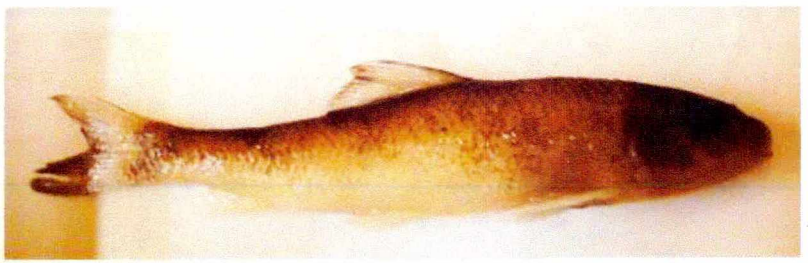


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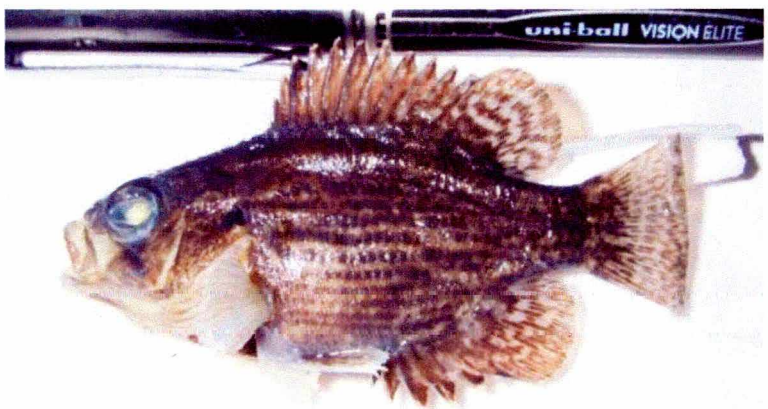
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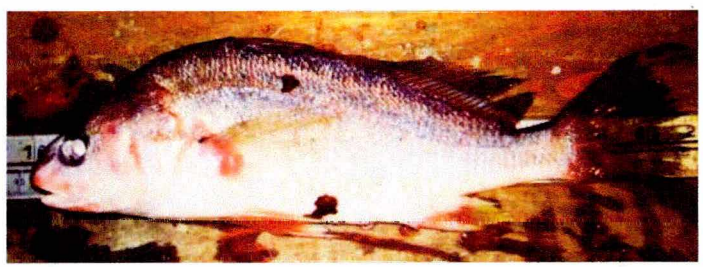

Alewife



Golden redhorse




Rock bass



Freshwater drum

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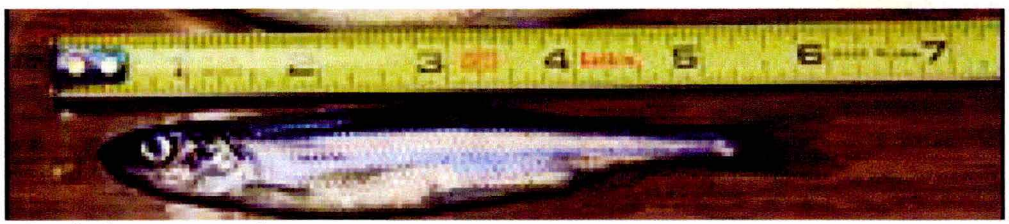
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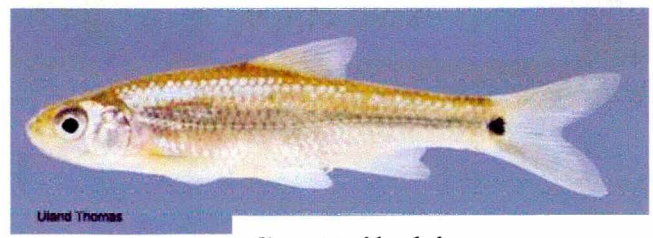
Green sunfish

Round goby





Rainbow smelt



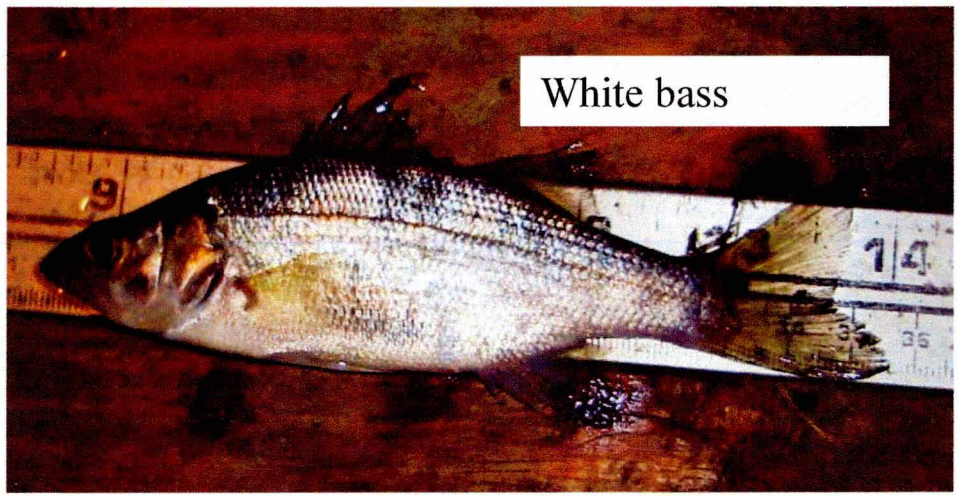

Spottail shiner

AECOM

# Representative Fish Species Collected

Trout-perch





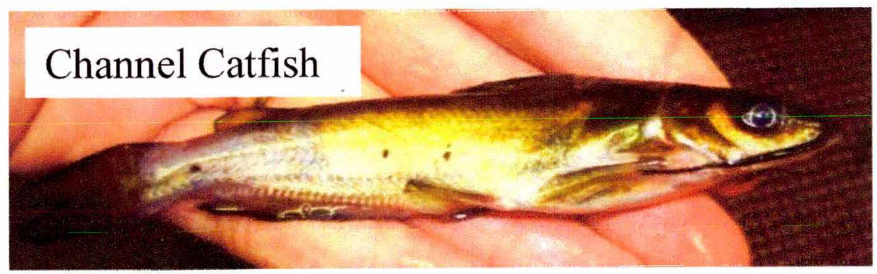


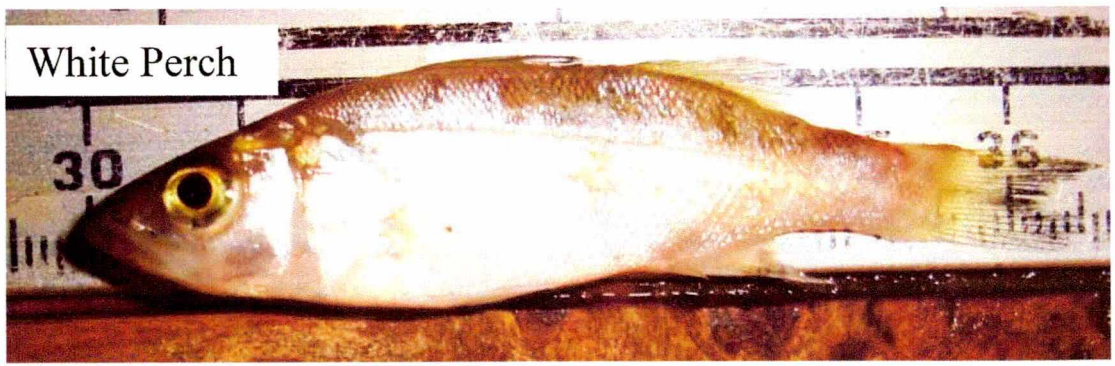

Yellow bullhead

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# Representative Fish Species Collected



# Exhibit B

# BAY SHORE POWER PLANT

## *INTAKE AND THERMAL DISCHARGE NPDES COMPLIANCE OPTION EVALUATION*

## 1.0 INTRODUCTION

Under contract EP-C-05-046, Tetra Tech was tasked by USEPA's Office of Wastewater Management and EPA Region 5 to evaluate data and documentation submitted by FirstEnergy in support of Ohio EPA's ongoing efforts to develop appropriate NPDES permit conditions for FirstEnergy's Bay Shore Power Plant (BSPP) located near Oregon, OH. This effort focuses on impacts that may occur from cooling water withdrawal in the Maumee River estuary and elevated temperature waste discharges to Maumee Bay—two distinct, but related, aspects of the NPDES program.

Section 316(b) of the Clean Water Act (CWA) requires facilities to employ the best technology available (BTA) to minimize adverse environmental impact (AEI) from cooling water intakes. Ohio EPA is currently in the process of reviewing BSPP's current cooling water intake structure (CWIS) operation against the technology-based standard in the statute and will incorporate any necessary changes or improvements into a compliance schedule that will be part of the renewed NPDES permit for the facility.

The Ohio Administrative Code (OAC) establishes numeric water quality criteria for thermal discharges to state waters as well as narrative criteria that are designed to protect the designated uses of the receiving water (OAC Rule 3745-1-07). Mixing zones are permitted for thermal discharges but the discharger must demonstrate that certain conditions are met in order to ensure compliance with all applicable criteria are met (OAC Rule 3745-2-08). Through existing NPDES permit requirements, Ohio EPA has directed BSPP to conduct studies and collect additional data describing the facility's thermal discharge in order to determine if the mixing zone's size should be restricted or whether additional measures must be taken to ensure compliance with the appropriate water quality standards.

### 1.1 SCOPE OF WORK AND TASK ORDER SUMMARY

Tasks 1-4 direct Tetra Tech to review the facility's Proposal for Information Collection (PIC), all impingement mortality and entrainment (IM/E) sampling data and supporting documentation, and all data related to the thermal discharge, including the 2003 *Thermal Mixing Zone Study.*

Task 5 and its subtasks address Section 316(b) requirements and direct Tetra Tech to a) determine if IM/E estimates are reasonable and representative; b) determine if proposals (if available) for reducing IM/E are adequate and appropriate; c) recommend a level of IM/E reduction representing BTA for this facility; and d) recommend improvements and/or operational changes at the facility that will meet BTA.[1]

Task 6 directs Tetra Tech to develop recommendations, conclusions, and/or suggestions regarding the possible impact of the thermal discharge and the need to and justification for restricting the size of the thermal mixing zone.

[1] BSPP did not submit detailed information regarding any proposed technologies or operational measures designed to reduce IM/E, except brief mentions of five technology categories proposed for further study in its Proposal for Information Collection (PIC). The PIC does not discuss the evaluation methods to be used or any data already collected or conclusions reached. As such, Tetra Tech did not conduct any determination under Task 5.b.

## 1.2 REPORT BASIS AND ORGANIZATION

Tetra Tech prepared this final report based on data collected and evaluated by BSPP and its contractors, as well as additional information gathered from other state resource agencies and provided by Ohio EPA. Tetra Tech did not collect any biological or temperature data as part of this effort nor was Tetra Tech involved in the process that evaluated BSPP's proposed study plans prior to those activities. All biological and temperature data specific to BSPP and discussed in this report were collected at the facility's direction with oversight by Ohio EPA and should be cited accordingly. Tetra Tech reviewed the adequacy of all available information and provided a summary to Ohio EPA by memoranda dated September 30, 2008 and December 12, 2008.

This final report evaluates the potential efficacy of several technology-based compliance options and their applicability at BSPP in the event Ohio EPA determines additional measures are necessary to comply with existing regulations. Options are reviewed according to accepted criteria used by Tetra Tech, US EPA and industry organizations such as EPRI when conducting the same type of evaluation at other facilities nationwide. Similar accepted practices are used in those instances where option cost estimates are also developed, although any estimate must be further refined with more detailed facility information if the option is selected for implementation.

The remainder of this report is organized as follows:

- Section 2 provides a brief overview of the BSPP facility, its operations and cooling water withdrawals.
- Section 3 discusses the various state and federal regulatory programs that address cooling water withdrawal and thermal discharge impacts.
- Section 4 summarizes data submitted by BSPP and describes how any identified deficiencies affect the final analysis.
- Section 5 presents the screening criteria used for this report and analysis results for several widely used technology-based options.
- Section 6 provides further detail and cost estimates for an evaporative cooling tower retrofit at BSPP.
- Appendix A contains a summary table of all options considered.
- Appendix B provides additional detail on the methods used to develop performance and cost estimates for an evaporative cooling tower retrofit.

## 2.0 FACILITY BACKGROUND AND DESCRIPTION

The Bay Shore Power Station is located on the south shore of Lake Erie near the confluence of the Maumee River and Maumee Bay near the city of Oregon (Figure 1). The facility operates four conventional steam boiler generating units with a combined nameplate rating of 631 MWe. Unit 1 has a circulating fluidized bed boiler while units 2-4 have either wall or vertical dry bottom boilers. Unit 1 was retrofitted in 2000 to consume petroleum coke generated at the nearby BP refinery. The remaining three units consume coal (Unit 1 is capable of burning coal if necessary) (EIA 2007). All four units are operated with once through cooling systems, wherein cooling water is withdrawn from a source, passed through a surface condenser to remove waste heat, and discharged to a receiving water.

BSPP operates as a baseload facility, which means it generates electricity for delivery to the grid more or less continuously for extended periods in order to meet minimum electrical demand. Baseload facilities may be inactive for normal maintenance periods or when electrical demand is low but generally operate year-round. Figure 2 shows the 3-year (2005-2007) monthly and cumulative average gross load for each unit expressed as a percentage of each unit's nameplate capacity. The facility-wide average gross load for the time period is 83% of BSPP's total capacity (USEPA 2007).

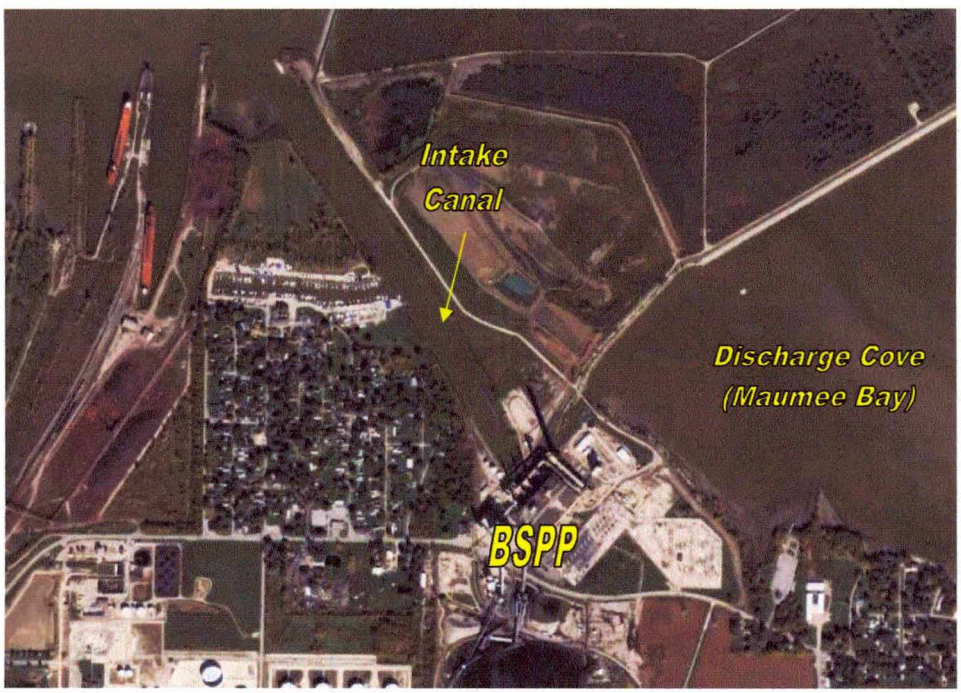



Figure 1. Facility Location

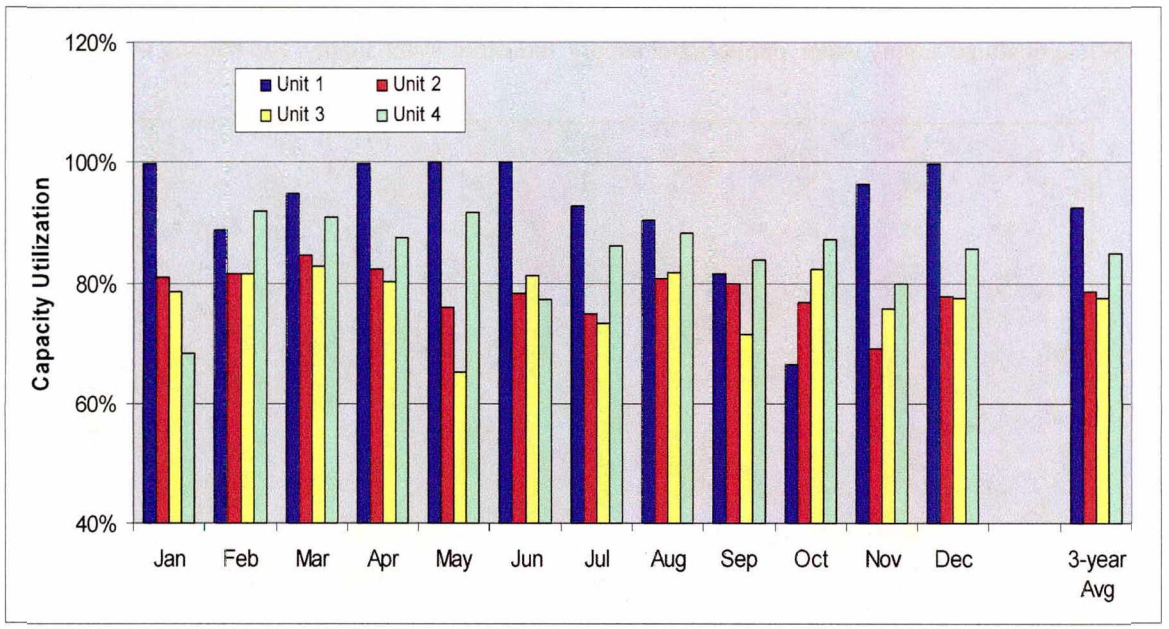



Figure 2. 2005-2007 Average Gross Load

BSPP operates one common CWIS to provide cooling water to each unit. Water is withdrawn from the Maumee River estuary via an intake canal extending 3,700 feet southeast to the facility, where the canal divides to nine individual intake bays. Each bay consists of bar racks that prevent larger debris from entering the cooling system and a vertical traveling screen fitted with 3/8-inch mesh panels to screen smaller debris. Screen #4 operates only 15 minutes per day while screen #7 operates for 30 minutes during each 12-hour shift (Kinetrics 2008). Operating information for the other screens is not available but presumed to include periodic rotations to remove accumulated items. Screens are washed during a rotation cycle with a high pressure (50 psi) spray that removes any impinged debris, including fish, which is then discharged to a common sluiceway that empties into Maumee Bay (Figure 3). The design through screen velocity is estimated at 2.58 fps (FirstEnergy 2004).

Each unit is served by two circulating water pumps, each with the capacity of 64,000 gpm, or 92 mgd, for a facility total of 512,000 gpm, or 737 mgd.[2,3] Cooling water is drawn through a single pass surface condenser fitted with 90-10 copper-nickel tubes and combined with other in-plant wastes before final discharge to Maumee Bay through one of three permitted outfalls. This section of Maumee Bay is

[2] Information submitted in the PIC lists the combined intake capacity at 810 mgd while other reports identify maximum intake volumes of 745 mgd. The difference between the reported circulating pump capacity and actual withdrawal rates (see Kinetrics 2008, Table 4.1) may reflect additional volumes from service water or condensate pumps used for purposes indirectly related to steam condensation. Tetra Tech notes that the surface condenser capacity (128,000 gpm) is equal to each unit's total circulating pump capacity

[3] Information provided by BSPP describing the surface condensers ("Knowledge Requirement Answers for Circulating Water Systems") does not specify the corresponding generating unit or whether all units share the same pump and condenser specifications. Without additional information, Tetra Tech assumed the specifications were applicable to all units.

currently designated for the following uses: exceptional warm water habitat (EWH), state resource water (SRW), agricultural supply water, public water supply, industrial water supply, and bathing waters.[4]

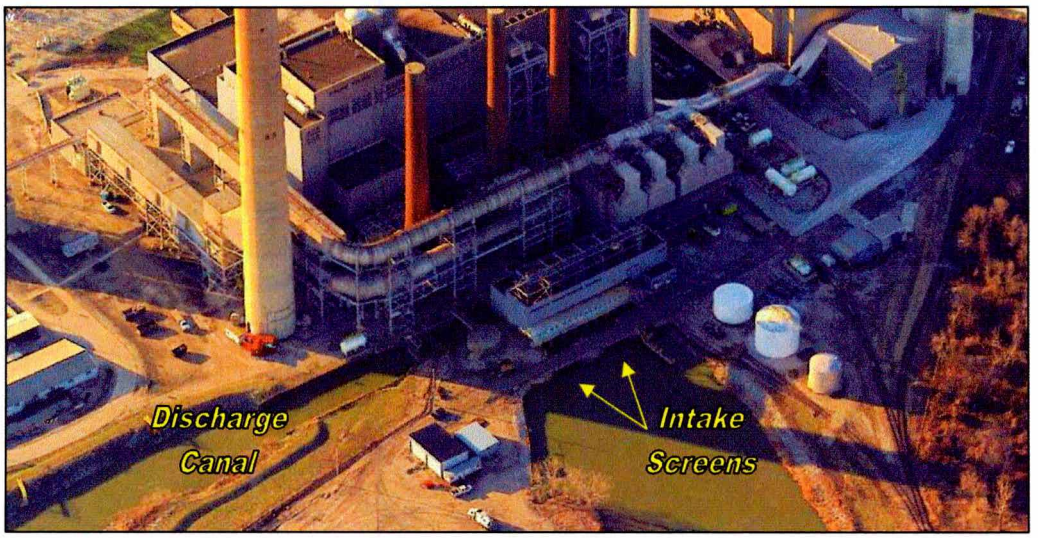



Figure 3. Intake and Discharge Locations

# 3.0 FEDERAL AND STATE REGULATORY REQUIREMENTS

## 3.1 COOLING WATER WITHDRAWALS

CWA Section 316(b) establishes a statutory requirement that CWIS location, design, capacity and construction reflect the best technology available for minimizing adverse environmental impact. Authority for implementing Section 316(b) resides with EPA and is addressed through the issuance of National Pollutant Discharge Elimination System (NPDES) permits. States may assume this responsibility if they implement an approved permitting program. Ohio was granted this authority in 1974.

In 1976 USEPA published a final rule implementing Section 316(b). Following a lawsuit filed by a group of utility companies, the Court of Appeals for the Fourth Circuit remanded the rule citing EPA's failure to comply with the Administrative Procedures Act by not properly publicizing the rule's supporting documentation. USEPA later withdrew most of the final rule, although a draft guidance document developed during the rulemaking—*Guidance for Evaluating the Adverse Impact of Cooling Water Intake Structures on the Aquatic Environment: Section 316(b)* ["1977 USEPA Guidance"]—was released and served as the basis for implementing Section 316(b) using best professional judgment (BPJ).

After entering into a consent decree with plaintiffs who challenged the lack of national technology-based standards, USEPA began developing section 316(b) implementing regulations in three phases. The Phase I rule, applicable to new steam electric facilities—was issued in 2001. The Phase II rule was adopted in

[4] NPDES Fact Sheet OEPA Permit 21B00000*QD.

2004 and was to apply to most existing steam electric facilities, including BSPP. Following a court challenge, however, USEPA effectively suspended the Phase II rule on March 20, 2007 and directed permitting authorities to continue implementing section 316(b) statutory requirements on a BPJ basis (Grumbles 2007).

BSPP's previous permit was developed and issued during the interim period between the adoption of the Phase II rule in 2004 and its suspension in 2007. At the time, Phase II compliance was based on a multi-year process that involved the collection and submittal of various source water and biological characterization data, which might include new IM/E sampling efforts, as well as a plan of study for evaluating proposed compliance methods. The first step, the Proposal for Information Collection (PIC), would serve as an outline and study plan for any activities the facility would conduct prior to a final determination of BTA and the different methods it proposes to evaluate as possible compliance options.

The facility would then prepare a Comprehensive Demonstration Study (CDS) that evaluated the efficacy of any existing IM/E reduction measures and any additional measures that would be necessary to comply with the Phase II performance standards. BSPP submitted its PIC in 2004 and conducted impingement sampling, survival studies, and entrainment sampling over a 15-month period during 2005 and 2006. A final CDS was not prepared in light of USEPA's suspension of the Phase II rule.

### 3.1.1 DETERMINING ADVERSE ENVIRONMENTAL IMPACT

In 1978 Ohio EPA published *Guidelines for the Submittal of Demonstrations Pursuant to Sections 316(a) and 316(b) of the Clean Water Act and Chapter 3745-1 of the Ohio Administrative Code* ["Ohio 316 Guidelines"] that outlined policy procedures and objectives addressing both thermal and intake impacts. Specific to IM/E, the document states that the "primary objective of any 316(b) evaluation should be to determine if an existing or proposed cooling water intake structure minimizes adverse environmental impact" (OEPA 1978, p. 45).

Similar to the approach in the 1977 USEPA Guidance, Ohio EPA defines AEI as "damage that occurs whenever there is entrainment or impingement of aquatic organisms as a result of the operation of a CWIS" (OEPA 1978, p. 36) and provides guidance for determining whether the damage is acceptable by considering

1. the number of organisms entrained and impinged.
2. the percentage of each representative species lost due to entrainment and impingement damage.
3. the magnitude of damage to endangered species, or to commercially, recreationally, or ecologically valuable species.
4. whether the observed IM/E damage contributes to community unbalance.

Ultimately, IM/E impacts are considered unacceptable "if the maintenance of existing balanced communities or the recovery of perturbed or unbalanced communities are impaired or prohibited, or the magnitude of damage to endangered, commercial, sport, and/or ecologically valuable species interferes with an existing or planned use of the source water body" (OEPA 1978, p. 37).

### 3.1.2 QUALIFYING AND QUANTIFYING INTAKE DAMAGE

Furthermore, the Ohio 316 Guidelines provide instruction on what factors should be considered when attempting to quantify the level of impact that may be occurring and place it within the appropriate

context. Facilities that withdraw cooling water from surface waters are classified as either high risk or low risk based on several possible characteristics, including the source water designation and intake capacity. BSPP, which withdraws water from the Maumee River estuary, is automatically considered a "high risk" facility regardless of its intake capacity because it is located on a Lake Erie estuary (OEPA 1978, p. 38 no. 4).

A facility's risk classification does not equate to more or less stringent criteria for determining BTA. Rather, the guidelines direct Ohio EPA and the facility to a conduct all data collection and analyses using an increasing level of preciseness and sophistication that corresponds to a facility's level of risk. Specifically, "the precision with which [intake damage] assessments and evaluations are made should increase proportionally with risk" (OEPA 1978, p. 47) and should

1. Estimate the numbers (with accompanying confidence limits) of fishes impinged and eggs and larvae entrained (by species) during each year of sampling.
2. Estimate the percent of each representative fish species population lost due to entrainment and impingement mortality (applicable to high risk intakes).
3. Evaluate the significance of the estimated losses to the representative fish species populations and existing fisheries in the source water body.

## 3.2 THERMAL DISCHARGES

BSPP is classified as point source discharge (and subject to NPDES permitting requirements) with a thermal component to its discharge. As such, BSPP is subject to both technology- and water quality-based effluent limitations pursuant to CWA Sections 301 and 306, including those established for temperature. OAC Rule 3745-1-07 contains water quality standards and numeric criteria for temperature applicable to discharges to Maumee Bay, while OAC Rule 3745-1-04 contains general narrative criteria prohibiting, to every extent practical and possible, discharges that cause nuisance conditions in surface waters, including mixing zones. OAC Rule 3745-2-08(c) lists various sizing and demonstration requirements for the purpose of establishing a mixing zone, subject to Ohio EPA's review.

Ohio EPA's *Section 316 Guidelines* provide further information for establishing the appropriate thermal effluent limitation and determining the mixing zone's size. When a thermal mixing zone applies to a facility's discharge, temperature limitations are expressed in terms of the net plant heat rejection rate (BTU/hr) rather than through an areal or volumetric description. For an existing thermal mixing zone, the review process evaluates the effects that the zone's total size has on the populations and communities of the receiving water body (OEPA 1978, p.28) and is based on

1. Site-specific biological, chemical, and physical information provided by the applicant.
2. Temperature standards or other temperature criteria applicable to the receiving water body.
3. Demonstration that the mixing zone will assure protection and propagation of a balanced indigenous community.

The current permit for BSPP (21B00000*QD) was issued on June 29, 2007 and expired on January 31, 2009. Permit conditions require FirstEnergy to conduct a thermal mixing zone benthic survey to supplement information provided in the *2003 Thermal Mixing Zone* study. The survey includes sampling for 2 years from 2008 through 2009. The most recent progress report, including a summary of the sampling results, was submitted to OEPA on December 31, 2008.

# 4.0 DATA SUMMARY, PERFORMANCE AND LIMITATIONS

The studies and data submitted by BSPP in support of thermal mixing zone and cooling water intake impacts reflect ongoing permit compliance efforts dating back several years, with study plans for IM/E sampling and thermal plume modeling having been previously approved by Ohio EPA. BSPP has submitted interim reports updating Ohio EPA staff on its activities and preliminary data thus allowing for continued input from staff on the direction of future activities.

Tetra Tech conducted an initial review of the information set and submitted its initial findings to Ohio EPA on 9/30/2008, which were then forwarded to FirstEnergy with a request to provide additional information. Tetra Tech reviewed FirstEnergy's response and additional data provided by Ohio EPA and submitted a follow up review on 12/18/2008. These memoranda provide a more detailed discussion of Tetra Tech's review.

Tetra Tech identified several critical missing elements to various reports, particularly the *2003 Thermal Mixing Zone Study*, and suggested additional data for collection to augment any final BAT/BTA determinations made for BSPP.[5] A brief summary and a discussion of how any deficiencies affect the overall analysis is provided below.

## 4.1 IMPINGEMENT AND ENTRAINMENT

Tetra Tech reviewed data provided by BSPP from its 2005-2006 sampling effort. These data provide the basis for BSPP's estimates of the annual numbers of fish impinged on the facility's intake screens and the numbers of eggs and larvae entrained through the cooling system. The dataset is insufficient, however, to estimate the proportional losses that result from IM/E or discuss the impact to critical or important species in the proper context (see section 3.1.2). It is not clear if these deficiencies conflict with data collection requirements for "high risk" facilities (see section 3.1.1).

These concerns do not preclude Tetra Tech from conducting a detailed evaluation of different technology-based compliance options. Sufficient information is available to analyze the design and implementation constraints of multiple options against known logistical obstacles. Likewise, proportional IM/E reduction estimates for BSPP can be made based on performance data collected at other installations.

### 4.1.1 IMPINGEMENT

BSPP conducted 104 impingement sampling events between May 2005 and December 2006 to enumerate and classify impinged fish. Six survival studies were also conducted to evaluated mortality for fish removed from the screens and discharged through the debris sluiceway to Maumee Bay (see section 4.1.3). Data available from the 2005-2006 sampling event demonstrate BSPP impinges a high number of fish against its intake screens, both in terms of individuals (46,030,006 fish) and biomass (270,296 kg).

[5] BSPP continues to collect benthic monitoring samples from the discharge area as part of the overall thermal impacts assessment. This effort, as required by the facility's current NPDES permit, had not concluded at the time this report was finalized.

Table 1 summarizes total impingement estimates for species with impingement values in excess of 50,000 during the sampling period. Fifty five species and/or species groups were observed in impingement samples collected during the 2005/2006 sampling period. Annual estimates of impingement values ranged from more than 24 million for emerald shiner to less than 100 rainbow trout.

To obtain its final estimate of 46,030,006 fish impinged on an annual basis, BSPP first averaged the numbers of impinged fish for months that were sampled during both 2005 and 2006 (May, October, November, and December), then summed these averages with the numbers of impinged fish for the months sampled only once, yielding an annual total (Kinetrics 2008). (Alternatively, a simple annual average based on 15 months of sampling data yields an annual impingement estimate of approximately 52 million fish.)

Table 1. BSPP Estimated Annual Impingement

| Species | # Impinged[a] |
|---|---|
| emerald shiner | 24,080,877 |
| gizzard shad | 14,313,113 |
| white perch | 4,769,163 |
| white bass | 1,593,199 |
| spottail shiner | 313,326 |
| freshwater drum | 225,706 |
| trout-perch | 159,379 |
| yellow perch | 123,405 |
| round goby | 93,918 |
| walleye | 77,812 |
| channel catfish | 77,469 |
| logperch | 51,547 |

[a] Annual estimate based on 2005-2006 sampling effort for species with more than 50,000 individuals impinged. All data obtained from Kinetrics (2008).

BSPP categorized impinged fish according to condition: alive and healthy; alive but stressed; recently dead; and long dead. Alive and healthy fish swam upright with good coordination and speed, avoided attempts to capture them, and struggled when handled. Alive but stressed fish swam poorly or were barely moving, but had a heartbeat upon internal examination. Recently dead fish had clear eyes, red gills, fresh mucous covering the skin, and firm flesh. Long dead fish had cloudy eyes, light pink or white gills, spotty or non-existent mucous covering the skin, pale body coloration, and might be in rigor mortis or some stage of decomposition. Long dead fish may have died of natural causes: the body could easily be transported by currents or the water intake flow, and become impinged. Additionally, longer-term impingement, especially during warmer weather, might also produce fish exhibiting "long dead" characteristics.

Reference data provided by BSPP describing general population estimates for emerald shiner, walleye and yellow perch are incomplete and are not directly relevant to calculating impingement losses as a proportion of the source water population. These data describe population statistics for the entirety of Lake Erie rather than the more appropriate localized population zone of Maumee Bay or, perhaps, the Western Erie Basin, without adequate justification. The scale of the Lake Erie basin, at nearly 10,000 square miles with 850 miles of shoreline, strongly suggests that habitat areas for the same species may be more or less independent from one another, and should be evaluated against a more realistic source population. Likewise, references to historic impingement rates from the 1977 study provide little context and, given the significant changes in reported species composition between the 1977 and 2005, seem only to underscore the inutility of any comparison.

Short of adequate source water sampling, other methods may be used to estimate source populations. One approach is to scale impacts by defining the habitat within the area of hydraulic influence and sampling within that area to estimate the population, although it is difficult to establish a level of confidence for the result without adequately characterizing the habitat and accounting for migratory/spawning patterns that may influence the number of individuals present at a given time. Another method would approximate the local habitat area as a percentage of the whole basin and use existing population estimates to quantify

impact. This method is likely to be less accurate since it assumes a random distribution of fish, which is not true.

Ultimately, the data as presented do not permit an easily quantifiable estimate of impingement losses with respect to source water populations in the Western Erie Basin or Maumee Bay, even for popular sport fish species such as walleye and yellow perch where additional data is available from annual harvest reports.

### 4.1.2 ENTRAINMENT

In general, the sample collection methods and calculations used to estimate the number of eggs and larvae entrained annually appear adequate. BSPP estimates that 208,565,490 fish eggs, 2,247,249,020 fish larvae, and 13,824,022 juvenile fish (of sufficiently small size) are entrained on an annual basis. Table 2 summarizes the total larvae and juvenile entrainment for the 2005-2006 sampling event and BSPP's estimated population loss for larvae.

Table 2. Estimated Annual Larvae and Juvenile Entrainment

| Species | Larvae[a] | Population loss [b] (% of total larvae) | Juveniles[a] |
|---|---|---|---|
| freshwater drum | 977,426,912 | 10.1 | 155,542 |
| rainbow smelt/Clupeidae | 536,265,835 | 10.9 | 4,365,674 |
| Unidentifiable[c] | 465,945,050 | 10.2 | — |
| Morone sp. | 137,549,760 | 10.8 | — |
| logperch | 32,763,640 | 11.0 | 1,328,768 |
| white sucker | 29,196,575 | 11.3 | — |
| emerald shiner | 19,001,574 | 9.6 | 3,915,565 |
| white bass | 17,840,256 | 10.1 | 1,097,805 |
| walleye | 8,157,828 | 9.8 | 663,715 |
| Cyprinidae | 7,484,343 | 10.2 | — |
| Notropis sp. | 4,707,966 | 9.8 | 17,405 |
| yellow perch | 3,180,492 | 12.3 | — |
| Percidae | 2,300,638 | 10.8 | — |
| common carp/goldfish | 2,143,190 | 10.7 | — |
| walleye/yellow perch | 511,779 | 10.0 | — |

[a] Annual estimate based on 2005-2006 sampling effort for species with more than 100,000 larvae. All data obtained from Kinetrics (2008).
[b] Population loss calculated as a percentage of the estimated Maumee River population extrapolated from larval densities in the intake canal.
[c] Although the Kinetrics (2008) report does not discuss the unidentifiable portion of entrainment samples, this category typically includes intact larvae that cannot be identified to species with certainty as well as larvae that have been damaged beyond recognition as a result of either natural causes or sampling efforts. The Kinetrics report does not offer any conclusive explanation as to why so many larvae were unidentifiable, nor does it explain how this can be translated to a population loss estimate.

BSPP asserts that, although the raw numbers of egg and larvae entrainment are high and have increased since the 1976-1977 study, the total remains low as a percentage of the estimated Maumee River population. Background sampling to characterize the river population was not conducted during the 2005/2006 sampling events. Instead, BSPP assumed that egg and larval densities are roughly equivalent

(or perhaps higher) between the river and intake canal and extrapolated a flow-based population estimate that assumes a uniform distribution throughout the water body (Kinetrics 2008).

Several key issues affect the ability to quantify the entrainment-related impact with respect to the fish populations in the Maumee Bay and Maumee River. The assumption that larval densities in the Maumee River are the same or higher than the intake canal, and can thus be extrapolated from canal samples, discounts the potentially significant differences in ichthyoplankton spatial distribution that may reflect variations in bathymetry, temperature and flow between the river and canal. Likewise, normal temporal variations may not have been captured for certain species that spawn during part of the period in which entrainment samples were not collected (lake trout, northern pike and cisco).[6]

This extrapolation method may be even less accurate during low flow periods for the Maumee River, when stream flows entering the bay exert minimal influence over water turnover rates. During these periods, wind-drive tides or seiches play a greater role in determining water levels in Maumee Bay, which may introduce a different species distribution than might be present during periods of higher river flow.[7]

Finally, comparisons between 1977 and 2005/2006 entrainment estimates as a proportion of the estimated river population do not provide any usable context for the current analysis. Data in FirstEnergy's own report (Kinetrics 2008) shows the significant changes in both population densities and species makeup that have occurred in western Lake Erie in the intervening period and underscore the need for current data.

### 4.1.3 EXISTING IMPINGEMENT MORTALITY CONTROLS

BSPP does not employ any technologies that are typically considered effective for reducing impingement mortality, although FirstEnergy contends that the CWIS, as currently configured, partially reduces IM and does not result in 100 percent mortality for all impinged fish as had long been assumed. Rather, some impinged fish may survive screen impingement and removal and are returned alive to Maumee Bay. In support of this claim, BSPP conducted six impingement survival studies during the course of its 2005-2006 impingement sampling effort. The six studies evaluated the 48-hour survival rate for fish captured alive off the intake screens during sampling events. Reported rates varied significantly based on species and sampling event (Kinetrics 2008).

The sample methodology and collection procedures, however, raise questions about the accuracy of impingement survival estimates at BSPP, which cannot be considered representative of current performance. Stresses during the collection process, such as hand picking fish from buckets, might unduly stress fish and artificially reduce survival rates. More problematic, however, is the impingement sampling location near the traveling screens themselves. Samples collected at this location do not account for the potentially negative effects that impinged fish might also suffer during transit through the debris sluiceway or temperature shock encountered when released into the thermal plume. This plume extends several thousand feet east of the intake, and may make fish more susceptible to predation or restrict a fish's ability to recover from other stresses.

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[6] Excerpts from an untitled and undated document provided by BSPP show no observable relationship between river flows and entrainment. The table entitled "Maumee River Discharge Versus Larval Entrainment" is prefaced by the statement "No clear relationship was observed between entrainment and river flow."

[7] BSPP's maximum intake flow (745 mgd) can exceed the river's discharge volume several times over, particularly during traditional low flow periods of late summer and early fall. This information alone, however, does not support the claim that BSPP necessarily withdraws the entire volume of the Maumee River under these conditions. Grassy Island (Island 18) divides the Maumee River as it enters the open bay and may divert a portion of the river flow away from the intake's influence.

The American Society of Civil Engineers' *Design of Water Intake Structures for Fish Protection* (ASCE 1982) considers numerous design criteria for fish return systems with the explicit goal of (a) minimizing the contact time between captured fish and any structural component (by continuously rotating screens), and (b) minimizing the stresses endured during capture, transport and release. These standards include the shape and size of collection buckets attached to screen panels, removal mechanism (low pressure spray [<20 psi]), construction materials that minimize turbulence and abrasive contact, flow channels without sharp turns or hydraulic jumps, and an intake location that approximates the source water conditions without subjecting fish to temperature shock or other stresses.

BSPP's collection and return system, as described, does not contain any components that specifically target IM, nor does the existing system conform to widely accepted design standards for a fish collection and return system. Intake screens at BSPP do not have modern Ristroph/Fletcher collection buckets, nor are they continuously rotated to minimize retention time. Fish are removed from the screens with a high pressure spray (50 psi) that also removes any impinged debris (trash, sticks, algae) to a common debris return trough. The return conduit is concrete and contains several sharp turns before a significant drop to the discharge sluiceway. Finally, the intake location is less than ideal considering the already significant stresses endured during collection and transport.

## 4.2 THERMAL DISCHARGE

Once through cooling water discharged to Maumee Bay contains a significant amount of waste heat discharged from each unit's surface condenser. The area of Maumee Bay to which this waste heat is discharged is partially enclosed cove bounded by BSPP, the south shore of Maumee Bay, and the Confined Disposal Facility (CDF) to the north (Figure 1). This area is approximately 500 acres with an average depth of 3 feet, although the thermal plume can extend well beyond this area at different times of the year and under different meteorological conditions. A plume measured in the summer of 2002 measured approximately 2,000 acres (LMS 2003).

The primary and overriding concern identified in the *2003 Thermal Mixing Zone Study* was how "delta T" was defined and how it was used to delineate the maximum extent of the thermal mixing zone. Generally, delta T refers to the difference between two temperature measurements, but when used to evaluate thermal discharges (and not to determine compliance), the term is defined as the difference between the discharge temperature at some point in the plume and at a point in the receiving water body outside the plume's influence. In this report, delta T was defined as the difference between the appropriate maximum water quality standard for temperature (which varied with date) and the temperature in the discharge or discharge plume.

Using this definition, the thermal mixing zone measured, modeled, and discussed in the 2003 study is the regulatory mixing zone rather than the physical mixing zone. Thus, the thermal plume described in this report is the area within which the temperature exceeds the OEPA temperature criterion and not the area within which the temperature exceeds some measure of background temperature. Because of the way delta T and the thermal plume were defined, the information provided in this report does not describe the areal extent of the thermal plume.

Figure 4 is an example of the facility's thermal plume and its influence on water temperatures relative to background measurements in Maumee Bay for a single day. Data provided by Ohio EPA for this date (August 21, 2002) show that BSPP was discharging wastewater at a rate of 745 mgd and at a temperature

of 79°F. This was 11.9°F higher than the measured intake temperature.[8] A distinct temperature gradient extends more than 2 miles northeast from the discharge. Average and maximum discharge temperature differences for 2005-2008 are shown in Figure 5.

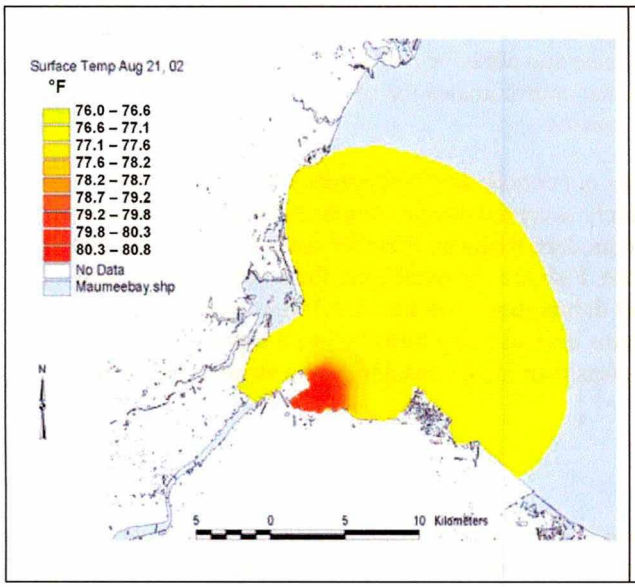



Figure 4. Thermal Plume—August 21, 2002

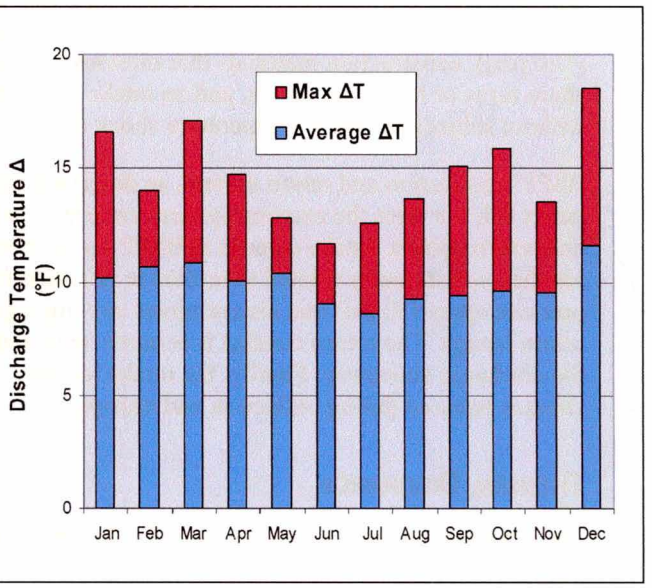



Figure 5. 2005-2008 Temperature Difference

## 4.3 LIMITS FOR TECHNOLOGY ANALYSIS

### 4.3.1 THERMAL DISCHARGE

The inability to accurately quantify the thermal mixing zone's areal extent represents a fundamental deficiency that limits Tetra Tech's ability to complete the objectives under Task 6 as originally directed. Without a clear understanding of the *physical* mixing zone (rather than one based on compliance standards) any estimate of the mixing zone's impacts would be incomplete and fail to meet the decision criteria for evaluating alternative thermal effluent limitations (see section 3.1).

Additionally, no data or bases are provided that describe the thermal tolerances of species of concern that might reside within the thermal plume. The report does not include any discussion regarding portions of the receiving water that may potentially be areas of exclusion for those species as a result of the thermal discharge. Without such information it is not possible to evaluate potential thermal impacts to the biota of Maumee Bay.

Tetra Tech notes Ohio EPA's concern that the existing thermal discharge may conflict with the narrative standards of OAC Rule 3745-1-04 by contributing to the algal blooms that have occurred repeatedly over the last several years.

[8] It was not clear where the discharge temperature is measured. Condenser temperature rise estimates show the difference at 9.61°F.

Despite these limitations, this analysis includes a general discussion of potential technologies that can minimize thermal discharge impacts and have proven successful at other facilities. Some of these technologies address thermal impacts alone while others are effective at reducing both thermal and IM/E impacts and are discussed accordingly.

### 4.3.2 IMPINGEMENT AND ENTRAINMENT

Impingement and entrainment data are lacking in several key areas that limit Tetra Tech's ability to quantify the impact BSPP's CWIS is having on the source water populations. Cumulatively, however, the information is sufficient to reasonably support a determination by Ohio EPA that BSPP's current intake configuration does not meet the technology-based standard for minimizing AEI. Ohio EPA's *Section 316 Guidelines* give the agency discretion when evaluating BTA on a site-specific basis using BPJ and allow the agency to consider the relative importance of several factors, including:

- BSPP's lack of proven IM/E reduction technologies, design measures or operational practices that have been demonstrated effective for these purposes at BSPP or elsewhere.
- High rates of impingement mortality and entrainment.
- The location of the BSPP intake at the entrance to upstream spawning grounds in the Maumee River.
- Relative size of BSPP's intake capacity to the available source water volume, especially during low river flow periods.
- Commercial and recreational importance of local fisheries, particularly the renowned walleye runs of late winter and early spring.

In this case, the appropriate BTA standard may be guided by performance data collected for various technologies and measures that have been successfully deployed at other locations. This report, therefore, evaluates technology-based options that may be used to satisfy BTA requirements without defining a facility-specific threshold for AEI or quantifying specific rate reductions that would meet the applicable performance standard. All options are evaluated using BPJ.

## 5.0 OPTION SCREENING AND SUMMARY

This analysis follows a BPJ process in evaluating different technologies and operational measures for BSPP. BPJ is a sequential approach to determining BTA at a particular facility in lieu of national technology-based performance standards. The initial steps characterize the environmental setting and quantify AEI in the appropriate context. Subsequent steps identify the various technology-based options and assess their availability, performance and feasibility at a particular location while giving appropriate consideration to secondary environmental impacts and financial costs.

As discussed previously, Tetra Tech did not characterize AEI or establish a target IM/E reduction for BSPP. This report does not reach any qualitative assessment about the appropriateness or preference for any one technology at BSPP over another. Each technology is objectively evaluated using the criteria described below and weighed against the known information describing the BSPP facility.

## 5.1 SCREENING CRITERIA

Section 316(b)'s focus on minimizing adverse impacts before they occur makes it somewhat unique within the NPDES program. Technology-based options are evaluated by assessing their ability to minimize IM/E impacts to the local aquatic community, but these impacts, or the options to control them, can vary from one location to another. Thus, a technology's performance at one facility is not automatically transferrable to another. Modified Ristroph traveling screens, for example, have been shown to significantly reduce IM although the performance may range from 40 to 95 percent at one location versus another. The cause of this variation is often attributable to site-specific factors that must be addressed locally, particularly the target species the technology is intended to protect.

The influence of site specific factors such as species composition is less important for some options where IM/E performance can be estimated with a high degree of confidence based on objective physical properties. Reductions associated with flow reduction measures can be more readily quantified since the exact volume by which flow is reduced is knowable and predictable given adequate physical data.[9] Likewise, cylindrical wedgewire screens have proven consistently effective at multiple locations because their performance is primarily driven by physical properties like ambient current velocities rather than fragility of the target species.

Technologies and operational measures evaluated as BTA options for BSPP are limited to those with a proven capability to achieve measurable and consistent IM and/or E reductions and have been evaluated by other agencies and organizations. Except as noted, performance estimates for BSPP are based on data compiled by USEPA for the Phase II Rule (USEPA 2004) and EPRI's *Fish Protection at Cooling Water Intakes: Status Report* (EPRI 1999).

Options were evaluated using the following general criteria:

1. *Is there documented evidence demonstrating the option has achieved satisfactory results at similar facilities or under rigorous laboratory conditions?*

   In order to be a valid option in this analysis, a technology or operational measure must have a record that supports satisfactory performance results and allows for a reasonable assumption that similar performance would be achieved at BSPP.

   Options that are experimental, too highly dependent on unique site-specific characteristics, or have limited supporting data are eliminated from further consideration.

2. *Is the option logistically feasible?*

   The size and complexity of some options increases the possibility that they may encounter significant logistical obstacles that preclude their use at BSPP. Examples might include insufficient space for cooling towers or interference with waterborne navigation from intake screening technologies. Options are eliminated from further consideration if logistical obstacles are considered insurmountable.

3. *What factors might limit performance at BSPP and must be addressed prior to a final decision?*

[9]USEPA and industry organizations have accepted the general premise that impingement and entrainment rates are directly proportional to flow for the purposes of estimating performance for closed-cycle systems although other factors such as spawning/migratory periods and intake velocity also influence IM/E.

Option performance is not automatically transferrable from one facility to another. Site-specific obstacles might influence a logistically feasible option's performance and may require mitigation or redesign to ensure successful deployment. For example, modified Ristroph screens and a properly designed return system may significantly reduce impingement mortality, but the system's performance would be greatly enhanced by a lower through-screen velocity that would require expanding the intake's total area.

Options with limiting factors are not eliminated from the analysis. Limitations are discussed but quantified.

4. *Are there significant secondary costs/impacts that might require mitigation?*

   In some cases options may cause their own environmental or performance impacts that require mitigation or consideration. The most prominent example of this is the expected energy penalty that would be incurred if BSPP retrofitted to a closed-cycle cooling system. An ongoing financial cost would be incurred from the reduced net generating capacity, which would have to be made up either on site or at other facilities. Depending on how the lost capacity is supplemented, air emissions may increase (on a per-kWh basis).

   Options with secondary impacts are not eliminated from the analysis. Impacts are quantified to the degree possible.

5. *Is there another option that achieves the same or substantially similar performance but at a significantly lower cost?*

   This step evaluates the cost-effectiveness of different feasible options only if performance is reasonably similar to another technology but at disproportionate cost. Cost-effectiveness compares technologies such as dry cooling and natural and mechanical draft wet cooling towers and eliminates dry cooling and natural draft wet cooling towers from consideration because the notably greater financial cost and additional impacts do not justify the marginal IM/E reductions they would achieve.

## 5.2 OPTION EVALUATION SUMMARY

Tetra Tech's evaluation of different technology-based options identified three feasible options (Ristroph screens, wet cooling towers, and intake velocity reductions) and one possible option (cylindrical wedgewire screens) that requires significant investigation to ascertain its feasibility, but it cannot be ruled out at this time. Cooling ponds may also be feasible when combined with additional measures such as a helper tower or spray ponds. A summary table of all technologies evaluated and the results of the screening process is available in Appendix A.

## 5.3 IMPINGEMENT AND ENTRAINMENT CONTROLS

### 5.3.1 BARRIER NETS

Fish barrier nets are constructed of wide-mesh fabric panels and configured to completely encircle the cooling water intake structure inlet from the bottom of the water column to the surface. The relatively large slot sizes (1/2 inch) combined with the larger overall area of the net reduce impingement mortality by preventing physical contact with the main intake structure and by maintaining a low through-net

velocity (0.2 fps or less). Other Great Lakes facilities have successfully deployed barrier nets, including the JR Whiting facility located approximately 7 miles north of BSPP in Erie, MI. Impingement rates have dropped by more than 90 percent compared to rates before the net was deployed (USEPA 2004).

Barrier nets are most effective when they are placed in relatively calm water and not subject to high debris loads, tides, or currents that might compromise the net's integrity. A large, unobstructed area is required in the source water in order to accommodate barrier net's relatively large size.

At an average through-net flow of 25 gpm/ft$^2$, a barrier net at BSPP would be approximately 20,500 ft$^2$ in total area. The intake canal's location and other local uses limit possible configurations. A net installed at the mouth of the canal (where the canal joins the Maumee River) would restrict access to the marina (see Figure 1). Installation in the canal downstream from the marina would require a wedge-shaped configuration with an approximate linear length of 2,500 feet (assuming a canal depth of 8 feet).

The facility notes that high debris loads are sometimes present during spring runoff and after storm events, which lead to large debris accumulating in front of the intake screens (see Figure 6 [date unknown]). Debris of this size and volume are likely to cause significant damage to any net installed in the intake canal.

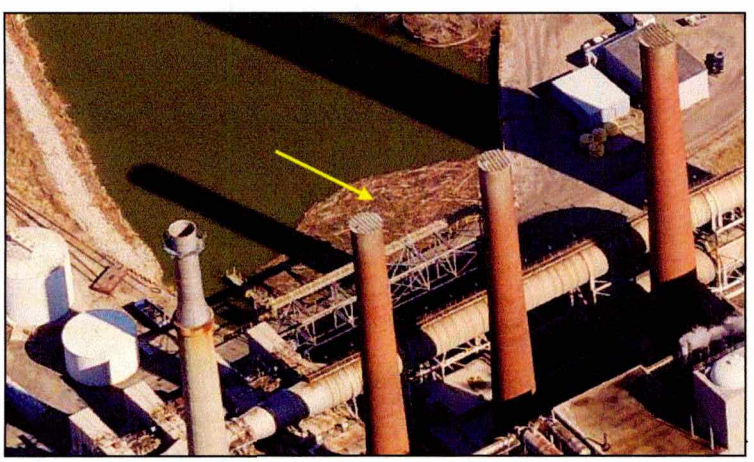


Figure 6. Buildup of Large Debris at CWIS

***Analysis Result:*** Infeasible. Lack of space and potential damage from large debris preclude barrier net installation at BSPP.

### 5.3.2 AQUATIC FILTRATION BARRIERS

Aquatic filtration barriers (AFBs) are fabric panels constructed of small-pore (< 20 microns) materials and deployed in front of an intake structure much like a barrier net. The small openings in the fabric allow water to pass through while screening out most organisms, including those that are susceptible to entrainment. Deployment considerations are similar to barrier nets, although a significantly larger area is required. At average flow of 10 gpm/ft$^2$, and AFB at BSPP would be approximately 51,000 ft$^2$ in total area and extend more than a mile in length (assuming an average depth of 8 feet).

Any limitations that preclude installing a barrier net are only more pronounced for an AFB.

***Analysis Result:*** Infeasible. Lack of space and potential damage from large debris preclude AFB installation at BSPP.

### 5.3.3 CYLINDRICAL WEDGEWIRE SCREENS (FINE OR COARSE MESH)

Cylindrical wedgewire screens reduce impingement by maintaining a low through-screen velocity (0.5 fps), which allows larger organisms to avoid the intake current. Entrainment is reduced when the screen mesh slot size is small enough to prevent eggs and larvae from passing through.[10] Hydrodynamics resulting from the cylindrical shape of the screen aids in the removal of small "entrainable" organisms that become caught against the screen. The low through-screen velocity is quickly dissipated and allows organisms to escape the system's influence provided there is a sufficient ambient current present to carry freed objects away from the screen. Organisms that are impinged against the screens are released through the action of a periodic airburst cleaning system and carried away by the ambient current.

Wedgewire screen performance is driven by physical parameters describing the location where the screens are installed, while biological characteristics are less critical. As a passive technology, wedgewire screens rely on ambient currents to sweep any impinged organisms off the screen face and cannot be placed in slack or stagnant waters. The water depth must be sufficient to overtop the screens by several feet at all times. The Western Erie Basin is relatively shallow across its entire expanse (see Figure 7). Maumee Bay is even shallower with depths ranging from 3 to 15 feet in many areas. The Maumee River Toledo Shipping Channel is routinely dredged to 23 feet, although placement in the channel would likely interfere with ship navigation.

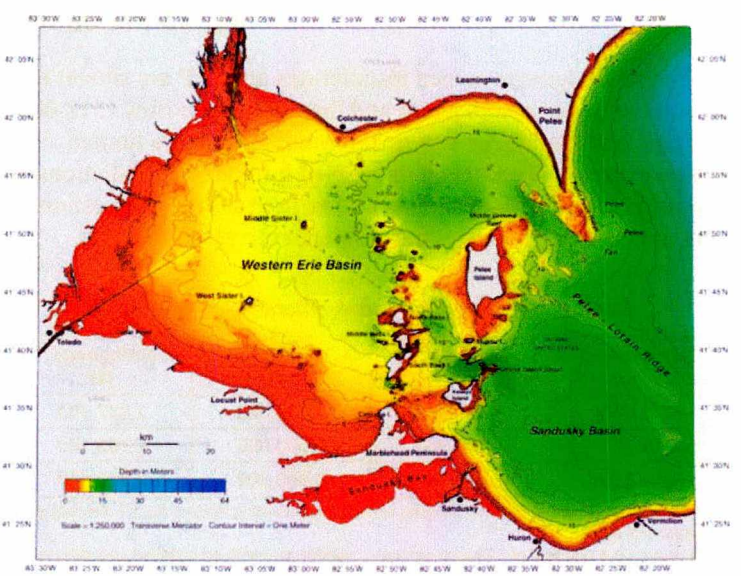



Figure 7. Western Erie Basin Bathymetry

[10] Screens with slot sizes ranging from 1 to 2 mm are generally considered to be "fine mesh," although the effective size in each installation must be determined based on the target species in the affected water body.

Placement in the discharge cove east of the facility is not feasible given the shallow depths (2-4 feet), the probable lack of sufficient ambient current, and likelihood that warm water from the discharge would be recirculated through the facility and impact turbine performance and exacerbate any thermal discharge effects. It is conceivable to place intake screens in the discharge cove if the discharge is relocated, but relocation is not considered feasible as discussed in section 5.4.1.

It is conceivable that a location northeast of the CDF could be dredged and maintained to a sufficient depth for the required number of wedgewire screens (see Figure 8). Ambient currents are more likely in this area but must be verified before proceeding. This location would avoid conflicts with shipping traffic in the main channel but may interfere with commercial and recreational boaters who frequent the area to access popular sport fisheries. Access to the CDF and use of any particular area is unknown at this time. Finally, the distance from the intake screens, at approximately 8,000 feet, would increase initial capital costs to account for the long pipe runs and additional pumping capacity required to deliver water to the facility.

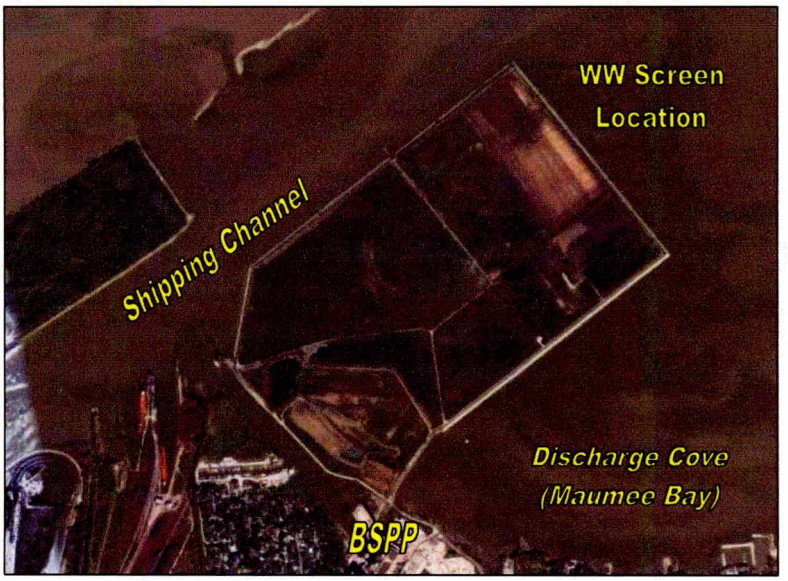



Figure 8. Potential WW Screen Location

Estimated costs for different wedgewire screen installations at BSPP are shown in Table 3. Differences are dependent on the number of screens required and the total intake flow (512,000 gpm). Larger screens can be installed at less cost but may not be practical if water depths are limited. Screen installation and piping costs are based on estimates Tetra Tech developed for similar installations at two power plants in California, adjusted to reflect local considerations (Tetra Tech 2008). Cost estimates are based on limited information describing the bathymetry, uses, and ambient currents in the area.

Table 3. Estimated Wedgewire Screen Installation Cost

| # Screens | Screen size (OD x L) | Screens [a] ($) | Piping [b] ($) | Contingency [c] ($) | Total ($) |
|---|---|---|---|---|---|
| 8 | 84" x 300" | 3,788,800 | 9,600,000 | 2,677,760 | **16,066,560** |
| 12-14 | 72" x 262" | 4,300,800 | 9,600,000 | 2,780,160 | **16,680,960** |
| 19-22 | 60" x 220" | 4,582,400 | 9,600,000 | 2,836,480 | **17,018,880** |

[a] Screen cost includes installation at the final location and airburst cleaning system for 1.2 mm slot screens. Screen cost decreases with larger slot sizes.
[b] Pipe costs are based on 8,000 feet of 120-inch concrete cylinder pipe with an installed cost estimate of $1,200 per linear foot.
[c] Contingency cost is calculated at 20 percent of all capital costs and covers unforeseen expenditures and additional pump capacity.

***Analysis Result:*** Possible, although additional information is necessary to make a final estimate. Physical attributes of Maumee Bay limit possible siting areas. Unclear if sufficient ambient currents are present

Distance from facility represents significant capital cost increase compared with an installation closer to the existing intake.

***Estimated IM/E Reduction:*** Impingement: 90-95%; Entrainment: 85-90%. Performance is based on successful deployments in estuaries (Eddystone) and Lake Michigan (JH Campbell) as well as laboratory analyses that document performance under optimal conditions (USEPA 2004).

### 5.3.4 RISTROPH SCREENS WITH FISH RETURN

Section 4.1.3 discusses the existing CWIS configuration and the reasons why it does not conform to an acceptable design standard that seeks to minimize impingement mortality. Some fish do survive capture and removal from the traveling screens, but this is a secondary effect of the system's original intent: debris removal. This is evidenced by lack of fish collection buckets and a separate fish return trough.

It is feasible, however, to modify the existing coarse mesh traveling screens with elements designed specifically for fish protection. These modifications include low turbulence fish buckets attached to the screen baskets, upgrading screen motors to accommodate continuous screen rotation, a low pressure fish removal spray, a separate fish return trough, and a relocated return location.

Of these items, constructing a new fish return trough and return location presents the most significant cost component and logistical challenge. The existing return is a debris trough that subjects fish to numerous potential injuries. It is not clear to what extent the existing trough could be upgraded to acceptably mitigate these concerns; the more likely approach would be to construct a new, separate fish trough.

The exact point at which fish are returned to the discharge canal is not clear, but they are likely subjected to temperature shock that presents an additional stress and may compromise survival rates. Ideally, the return would be located in an area outside the influence of either the intake or thermal plume, but relocating the return to a point offshore in the discharge cove may avoid contact with the highest effluent temperatures and may be sufficient.

The estimated capital cost for the upgrades described above is shown in Table 4. This cost is calculated using cost models developed by USEPA during the Phase I rulemaking effort and updated to $2008 (USEPA 2001).

**Table 4. Estimated Ristroph Screen and Fish Return System Capital Cost**

| Element | Capital Cost ($) |
|---|---|
| Upgrade traveling screens with fish protection technologies; new fish return system | 13,037,000 |

***Analysis Result:*** Feasible as IM control only. Requires evaluation of different return locations

***Estimated IM/E Reduction:*** Impingement: 80-95%; Entrainment: 0%. Performance is based on numerous estuary and freshwater installations (USEPA 2004).

***Additional Considerations:*** The design through-screen velocity is reported at 2.58 fps, although it is unclear if changes to the canal (sedimentation) or screen fouling have altered this value. The 1982 ASCE Guidance notes that reducing through screen velocity should be a primary consideration when designing this type of system. The Phase I rule recognizes the relationship between intake velocity and impingement

by setting a 0.5 fps through screen velocity as an impingement compliance option. Reducing intake velocity to this level would require substantially expanding the existing intake structure by installing new intake bays and screens, but even a 50 percent reduction would contribute to higher survival rates and less impingement overall.

The capital costs for an intake expansion cannot be quantified without additional information describing land availability in the area around the CWIS and a better understanding of any underground obstacles that may be present and the existing pipe/pump configurations.

### 5.3.5 FINE MESH TRAVELING SCREENS WITH FISH RETURNS

The basic feasibility considerations for fine mesh traveling screens are the same as for coarse mesh Ristroph screens (see section 5.3.4), but are more acutely limited by the screen mesh size and the need to accommodate entrainable organisms (eggs and larvae) in addition to larger juveniles and adults. Entrainment reductions can range as high as 90 percent or more when fine-mesh panels are used in conjunction with a return system. What is less understood, however, is the viability of eggs and larvae that are impinged against a fine-mesh screen and returned to the water body. Few studies have been conducted that evaluate viability, primarily because few facilities that have installed fine-mesh traveling screens.[11] Screened organisms, although they have been prevented from being entrained through a cooling water system, may suffer serious injury or mortality, which effectively results in the same adverse impact as if they had been entrained in the first place.

At BSPP this concern is further complicated by lack of acceptable return locations. Returning captured organisms to the Maumee River estuary, at a minimum distance of 4,500 feet, is likely to result in a significant portion being re-entrained, especially during periods when the intake volume exceeds the Maumee River flow and water is drawn from the bay as well. The current return location to the discharge cove subjects eggs and larvae to temperature shock and relocates them to an area of Maumee Bay that may not share the same characteristics as the intake location. Other locations, possibly northeast of the CDF, are not considered due to the long return distances.

Screen slot sizes typically need to be within the range of 1–2 mm, or perhaps smaller, in order to be effective as an entrainment reduction measure, although the size used at BSPP would be dependent on the target species. With a smaller open area per square foot than standard coarse mesh screens, fine-mesh screens require a larger overall intake structure in order to maintain desirable intake velocities. Simply replacing the existing panels with fine mesh would increase the through-screen velocity by 50 percent or more, resulting in fewer large organisms being able to escape and higher mortality rates for any organism captured against the screen.

***Analysis Result:*** Infeasible. Egg and larvae survival rates are poorly documented. BSPP lacks an acceptable return location that could reasonably ensure survival.

### 5.3.6 VARIABLE SPEED DRIVES

A variable frequency drive (VFD) (similar to variable speed pumps [VSPs]) allows a facility to lower the cooling water withdrawal rate by reducing the electrical load to the pump motor. The pump speed can be tailored to suit the cooling water demands at a certain time or under certain conditions. VFDs can throttle

[11] Big Bend Power Plant in Tampa Bay conducted a viability analysis that showed that latent survival rates for eggs and larvae impinged against the fine-mesh screen and returned to the water were comparable to the control sample (EPRI 1999).

a pump's flow rate more precisely according to operating conditions, but must operate at a minimum flow rate in order to maintain sufficient head and prevent damage to the pump from cavitation.

Actual flow reductions with a VFD vary throughout the year depending on seasonal conditions and facility operations. At their maximum efficiency, VFDs enable a facility to withdraw the same volume of water as conventional circulating water pumps, thereby negating any potential benefit. Baseload units would not be ideal candidates for this technology, since they operate in the upper range of their load capacity for significant portions of the year. Units that are designated for peak or intermittent dispatch are more likely to accrue benefits from this method of flow reduction. In these situations, the use of VFDs must be evaluated against the operational profile of that facility and any seasonal variations in the makeup or abundance of affected species in the water body.

***Analysis Result:*** Ineffective. BSPP's status as a baseload or load-following facility results in capacity utilization rates averaging 83% (see Figure 2). Operating profile indicates pumps would run at or near maximum capacity most of the year.

### 5.3.7 INTAKE VELOCITY REDUCTION

See "Additional Considerations" discussion for Ristroph screens (section 5.3.4).

***Analysis Result:*** Feasible. The scope of any expansion is likely to be large in order to realize any significant benefit and may require the doubling or tripling of the existing intake, depending on the target through-screen velocity. Capital costs are not estimated because data describing the existing intake is insufficient but would be approximated using the same cost model for Ristroph screen modifications

## 5.4 THERMAL DISCHARGE CONTROLS

### 5.4.1 DISCHARGE RELOCATION

In some cases the discharge may be relocated to less sensitive areas with a greater capacity to dissipate waste heat quickly—essentially a larger heat sink. Typically, this involves constructing a discharge conduit that extends far off shore and terminates in deeper, colder waters. Maumee Bay is relatively shallow compared to other sections of Lake Erie and the Western Erie Basin (see Figure 7), with an average depth of approximately 5 feet outside of the 23-foot deep Maumee River Toledo Shipping Channel. Deeper waters begin at the 16.5 foot contour that is approximately 3 miles northeast of Cedar Point, nearly 8 miles northeast of BSPP.

The shallow depths of the rest Maumee Bay and size of BSPP discharge indicate that any thermal impacts would not be mitigated by discharging to other locations. Rather, the impacts would likely be relocated along with the discharge.

### 5.4.2 FLOW REVERSAL

Suggestions have been made that BSPP might be able to reduce its thermal impact, and possibly reduce some IM/E impacts, by exchanging the existing intake and discharge locations with one another. Reversing the flow configuration is not a complicated effort, especially at a facility like BSPP where intake and source waters locations are easily accessible. By making the source water the receiving water, and vice versa, it is conceivable that some technology-based options considered infeasible under the existing configuration might become feasible under a reversed flow regimen.

The only apparent advantage this option offers is the larger source water area that might accommodate technologies such as barrier nets and AFBs whereas the existing configuration does not support their deployment. Limitations would remain for fine mesh traveling screens, cylindrical wedgewire screens, and variable speed pumps.

In a scenario where flow is reversed and a barrier net or AFB is installed, the facility remains a once-through cooled system discharging up to 745 mgd of heated water to a receiving water (Maumee River) with a volume that is 50 percent less than the current discharge cove, with much of that volume contained in the shipping channel. The new discharge thermal plume would be more confined than in the existing discharge cove while still discharging the same amount of heat. This might result in more pronounced isotherms across the mouth of the Maumee River. Steeper temperature gradients in this area might create a blocking effect for migrating fish that spawn in the river and estuary.

BSPP's turbine and condenser performance are designed around 60° F cooling water. While temperatures naturally fluctuate throughout the year, the current discharge cove likely has higher ambient temperatures than the Maumee River, which is continually fed by cooler water from a large drainage basin. Reversing the cooling water flow would likely create an energy penalty similar one that would result from converting to closed-cycle cooling.

Lastly, IM/E impacts can not be immediately quantified because the new source water has likely been altered due to the existing thermal discharge. It is difficult to characterize the hypothetical indigenous population or aquatic community if the area were allowed to return to its unaffected condition, nor is it possible to predict how long a reclamation of this sort would take.

Reversing the intake flow offers no identifiable benefits over other options and might unnecessarily exacerbate or create other impacts.

### 5.4.3 MULTIPORT DIFFUSERS

A multiport diffuser consists of a submerged conduit extending into the receiving water with a large number of ports or jets extending from the main pipe at various angles. Heated water is discharged through these ports at high velocity, creating turbulence and inducing rapid mixing with the surrounding water. In shallow waters, such as Maumee Bay, thermal discharges through multiport diffusers often result in complete mixing through the water column in the area around the diffuser. Diffusers do not reduce the net plant heat rejection rate since the "volume" of heat remains the same. Rather, diffusers encourage a more rapid dissipation of heat into the heat sink, which can have the effect of reducing the areal extent of the thermal plume. At BSPP, for example, a diffuser placed into the center of the discharge cove might reduce the plume's effects on the shoreline areas to the north and south.

Any estimate of a diffuser's effect on the thermal plume can only be calculated through advanced modeling that accounts for all necessary variables such as water volume, temperature, bathymetry, other sources, and meteorological conditions.

### 5.4.4 HELPER TOWERS

Helper towers are an evaporative cooling system that is designed to disperse waste heat from the effluent prior to discharge without recycling the water back for use in the cooling system. The design, structure, and function of these towers are fundamentally no different from wet cooling towers that would be part of a closed-cycle recirculating system, except that the overall tower size would be smaller because the same

cooling capacity is not necessary. The basic cost elements are also similar and are largely a function of the desired temperature reduction and the corresponding tower size.

Helper towers would reduce the thermal plume from BSPP and could be scaled to be larger or smaller depending on the target reduction. This type of system does not address IM/E impacts because the cooling water system essentially continues to function using once-through cooling water in the same volume as before.

## 5.5 COMBINED IMPINGEMENT/ENTRAINMENT AND THERMAL CONTROLS

### 5.5.1 SEASONAL OPERATION

Considerations for seasonal operation are similar to those for variable speed drives (see section 5.3.6).

***Analysis Result:*** Ineffective. BSPP's status as a baseload or load-following facility results in capacity utilization rates averaging 83% (see Figure 2). Operating profile indicates water withdrawals occur throughout the year.

### 5.5.2 SURFACE COOLING PONDS

Cooling ponds function in a manner similar to evaporative cooling systems (see section 5.5.4) in that they dissipate heat to the atmosphere through evaporation, but at a less efficient rate. Cooling ponds are less expensive than mechanical or natural draft towers but require large amounts of stable land that can be excavated and converted to water storage.

Pond systems are infrequently used to provide large cooling water volumes because of the large land areas that they occupy. A rough approximation of the total required pond area can be made by assuming the pond's thermal capacity is 2 MWt per acre (Jirka et al. 1978). Assuming BSPP's efficiency is 35 percent, and allowing for a 10 to 15 percent stack loss, the facility would discharge approximately 1000 MWt through its surface condenser at maximum capacity and require a cooling pond system roughly 500 acres in total size.[12]

This is a low confidence estimate that does not account for local conditions that may place limits on individual pond sizes or depths. Furthermore, auxiliary systems like aerators and spray nozzles can increase the pond's thermal capacity and reduce the necessary size. A hybrid system may also be employed that increases the inflow of colder makeup water to the ponds or uses a helper tower to more efficiently reject heat.

Costs for a surface cooling pond system at BSPP were not developed for this report because of the lack of sufficient information describing several factors, such as land availability and soil conditions, as well as the numerous potential configurations that might be used at BSPP. Costs for this technology are driven by land acquisition (if necessary), excavation, additional engineering to ensure pond integrity, and piping runs that may extend several thousand feet in total. Incorporating a helper tower would increase initial capital costs depending on how many tower cells were installed.

[12] Condenser specifications provided by BSPP report a steam duty of 614,500,000 BTU/hr, which translates to 180 MWt per unit, or 720 MWt for the entire facility. At 33 percent efficiency, this would correspond to a stack loss of 28 percent, which is outside the normal range for a coal-fired facility.

***Analysis Result:*** Feasible (partially). The BSPP parcel has large undeveloped sections that could be used for cooling ponds, but does not have access to 500 acres. Some form of a hybrid system as described above would have to be employed to achieve the desired result.

***Estimated IM/E Reduction:*** Impingement: 80-95%; Entrainment: 80-95%.

***Additional Considerations:*** A cooling pond system would exact an energy penalty on the facility because of higher condensing temperatures. The penalty's value would be calculated in the same manner as for evaporative cooling towers (see section 5.5.4).

### 5.5.3 DRY COOLING

Dry cooling systems are so named because the removal of heat from the steam cycle is accomplished through sensible heat transfer (convection and radiation) rather than through latent heat transfer (evaporation) that is characteristic of wet cooling systems. By relying solely on sensible heat transfer, dry cooling systems eliminate the need for a continuous supply of cooling water to the condenser, thus reducing many of the environmental concerns associated with once-through or wet cooling systems—such as adverse impact on aquatic ecosystems, consumptive use of water resources, and plume or drift emissions.

Dry cooling systems can be broadly categorized as either direct or indirect. Direct systems, also know as air-cooled condensers (ACC), feed the turbine exhaust steam through sealed ducts directly to a fin tube array where air is drawn across and heat is rejected to the surrounding atmosphere, much like a radiator in a car. Indirect dry cooled systems incorporate a surface condenser as an intermediate step between the turbine exhaust and cooling tower. Heat is transferred from the turbine exhaust to the circulating water in the condenser and dispersed to the atmosphere through a fin tube array in a tower, much like the operation of a wet cooling tower. The difference is that, like the ACC, the condenser circulating water is not exposed to the outside air and instead runs in a continuous loop from the turbine to the tower.

Indirect dry cooling is the most likely option for retrofitting a once-through cooled system with dry cooling since the surface condenser is already present and can be more readily modified to a closed-loop heat exchanger. This configuration, however, is the principal disadvantage of an indirect dry cooling system that uses a two-step process to reject heat. The added thermal resistance from the surface condenser reduces the overall heat transfer efficiency of the system. In order to achieve a comparable level of cooling, an indirect system will require a much larger cooling surface area, at increased capital and operational cost, than would be expected for a similar ACC system.

Dry cooling systems do not reject heat as efficiently as evaporative cooling towers, especially in a retrofit scenario. This reduced efficiency translates to higher condensing temperatures and increased turbine backpressure, which reduces the turbine's overall efficiency. Comparatively, a dry system retrofit will always have a higher energy penalty than an evaporative cooling retrofit for the same facility, and at a much higher cost.

Retrofitting to dry cooling at BSPP is technically feasible but impractical when weighed against the higher initial capital cost and higher energy penalty compared to evaporative cooling, especially considering the IM/E reductions are substantially similar (>99% for dry cooling; 97-99% for evaporative cooling).

***Analysis Result:*** Feasible, but impractical. Dry cooling's marginally better IM/E reduction is more than offset by higher capital costs and greater efficiency loss compared to evaporative cooling.

### 5.5.4 EVAPORATIVE COOLING

Evaporative cooling systems, more often referred to as "wet cooling towers", function by transferring waste heat to the surrounding air through the evaporation of water, thus enabling the reuse of a smaller volume of water several times to achieve the desired cooling effect. Compared to a once-through cooling system, wet cooling towers may reduce the volume of water withdrawn from a particular source by as much as 98 percent depending on various site-specific characteristics and design specifications.

Wet cooling towers are classified into two broad categories depending on the mechanism used to induce draft—the flow of cooler, drier air through the tower. Natural draft towers rely on ambient atmospherics while mechanical draft towers use fans to create the necessary air flow.

Natural draft towers (the classic hyperbolic cooling tower) rely on the chimney effect that results from the temperature difference between warm, moist air exiting the top of the tower and cooler outside air drawn in near ground level. These towers must be fairly tall to achieve the desired temperature differential, typically reaching heights of 500 feet or more, and can result in a significant visual impact for any nearby communities.

Mechanical draft cooling towers rely on motorized fans to draw air through the tower structure and into contact with the water. Without the same need for height as natural draft towers, the mechanical draft design presents a much lower visual profile against the surrounding area with typical heights ranging from 30 to 75 feet. The overall area devoted to cooling towers, however, may be comparable to natural draft units since one mechanical draft unit, or "cell", has a smaller cooling capacity. Mechanical systems are arranged into multi-cell units, which are collectively referred to as the cooling tower, and can be placed in a single row (inline) or back to back. Although often more feasible, and in some cases more practical, than natural draft towers, mechanical systems place an added draw on the facility's net generating output in order to operate the fans that induce the draft.

Natural draft cooling towers have higher initial capital costs due to their scale and complexity and are more economically competitive with mechanical draft towers when selected for high volume, baseload facilities with utilization rates greater than 90%. Operating costs are lower for natural draft towers over the long term because they do not draw electricity to power fans; mechanical draft towers can consume as much as 1 percent of a facility's generating capacity to operate the fans.

The principal advantages of mechanical draft cooling towers are their significantly lower cost compared to natural draft towers and the greater number of design and configuration options based on a simpler, multi-cell configuration. The capital cost for a natural draft tower can be 2 to 4 times greater than a comparable mechanical draft tower while not adding any significant benefit in terms of impingement or entrainment reductions. Both systems would achieve similar performance with respect to IM/E and thermal discharges, but mechanical draft towers are significantly less expensive.

This report does not evaluate natural draft towers because, on a cost-effectiveness basis, they offer no notable advantages over mechanical draft towers that would justify their higher costs. Wet cooling towers are evaluated in detail as a retrofit option for BSPP in the following section.

# 6.0 BSPP EVAPORATIVE COOLING TOWER RETROFIT

This section evaluates the overall costs and considerations that would be incurred if BSPP retrofitted its existing once-through cooling system with a mechanical draft, closed-cycle wet cooling tower system. Existing system information provided by FirstEnergy is supplemented with assumptions and models developed for other analyses to develop a conceptual model of a wet cooling tower configuration. This configuration is then used to calculate initial capital costs and long term costs, including the energy penalty, and annual costs.

## 6.1 DESIGN CONDITIONS

The wet cooling tower conceptual design selected for BSPP is based on the assumption that the condenser flow rate and thermal load to each will remain unchanged from the current system. Condenser modifications can reduce the thermal efficiency penalty but are expensive and can require a facility to shut down for extended periods. Parameters used in the development of the cooling tower design are summarized in Table 5 and Table 6.

Table 5. Condenser and Turbine Design Conditions

| | Units 1-4 [a] |
|---|---|
| Thermal load (MMBTU/hr) | 614.5 |
| Surface area ($ft^2$) | 85,000 |
| Condenser flow rate (gpm) | 128,000 |
| Tube material | CuNi 90-10 |
| Heat transfer coefficient ($U_d$) | 511 |
| Cleanliness factor | 0.85 |
| Inlet temperature (°F) | 60 |
| Temperature rise (°F) | 9.61 |
| Steam condensate temperature (°F) | 78.4 |
| Turbine exhaust pressure (in. HgA) | 0.98 |
| Turbine Inlet Temp (°F) [b] | 850 |
| Turbine Inlet Pressure (psia) [b] | 1,000 |
| Full load heat rate (BTU/kWh) [b] | 9,800 |

[a] Condenser information provided by FirstEnergy did not specify which unit. Tetra Tech assumed all units share same characteristics.
[b] Facility specific data not available. Values represent averages for subcritical coal facilities.

Table 6. Surface Water and Ambient Wet Bulb Temperatures

| | Surface (°F) | Ambient Wet Bulb (°F) |
|---|---|---|
| **January** | 40.1 | 24.5 |
| **February** | 39.0 | 26.9 |
| **March** | 43.0 | 35.4 |
| **April** | 50.8 | 47.4 |
| **May** | 60.4 | 61.8 |
| **June** | 70.0 | 73.5 |
| **July** | 79.7 | 77.6 |
| **August** | 73.8 | 76.3 |
| **September** | 68.8 | 65.8 |
| **October** | 57.7 | 51.6 |
| **November** | 48.4 | 39.6 |
| **December** | 40.7 | 29.3 |

### 6.1.1 CONCEPTUAL DESIGN

Based on the design conditions discussed above, a three-tower conceptual design was developed for BSPP. The design reflects the similar dispatch profiles for units 2 and 3 by combining their cooling towers into a single complex, which allows for small cost savings.

Table 7. Wet Cooling Tower Conceptual Design

| | Tower 1 Unit 1 | Tower 2 Units 2 & 3 | Tower 3 Unit 4 |
|---|---|---|---|
| Thermal load (MMBTU/hr) | 614.5 | 1,229 | 614.5 |
| Circulating flow (gpm) | 128,000 | 256,000 | 128,000 |
| # Cells | 11 | 22 | 11 |
| Tower type | Mechanical Draft | Mechanical Draft | Mechanical Draft |
| Flow orientation | Counterflow | Counterflow | Counterflow |
| Fill type | Modular splash | Modular splash | Modular splash |
| Arrangement | Inline | Inline | Inline |
| Primary tower material | FRP | FRP | FRP |
| Tower dimensions (L x W x H) (ft) | 506 x 55 x 50 | 1012 x 55 x 50 | 506 x 55 x 50 |

### 6.1.2 COOLING TOWER LOCATION

BSPP is located on a 329 acre parcel north of City of Oregon WWTP and east of the BP refinery. Toledo Edison owns the switchyard area immediately north and east of the generating units. The northernmost section of the parcel is shown in Figure 9.



Figure 9. Bay Shore Power Plant Location

The most practical location for the three cooling towers would be south of the current coal pile storage area and north of the City of Oregon WWTP. Sufficient area exists to place three inline mechanical draft cooling towers without significant disruption to facility operations or local activities. These towers would be located at an approximate distance of 2,500 feet from the existing CWIS. An approximate layout of the three towers and supply/return piping is shown in Figure 10.

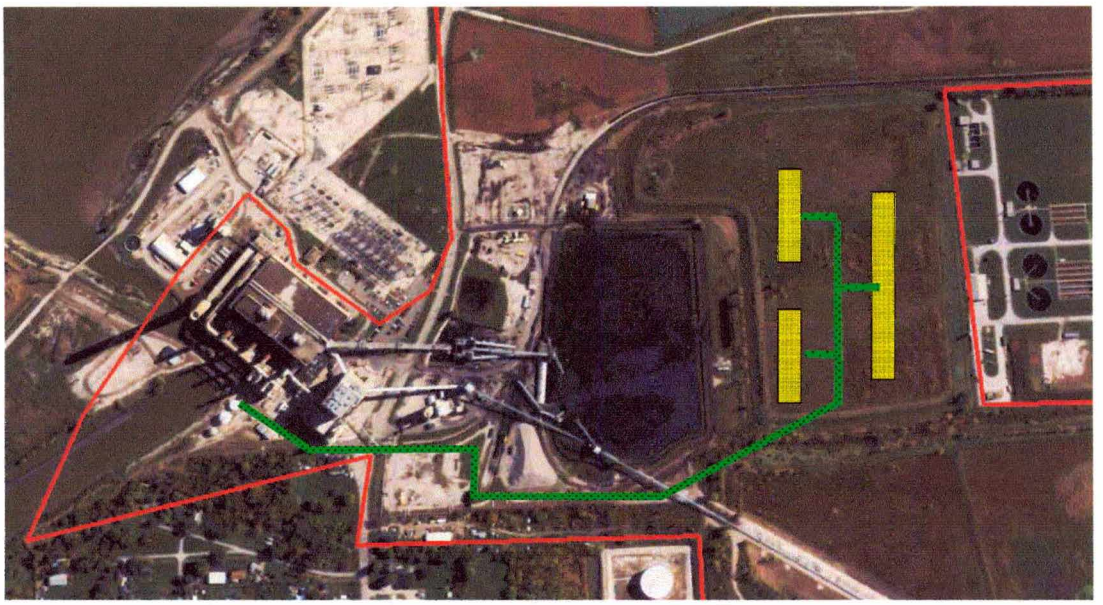


Figure 10. Conceptual Wet Cooling Tower Layout

## 6.2 COST ESTIMATE

### 6.2.1 INITIAL CAPITAL

Capital cost estimates may be developed using one of two methods. The facility-specific approach ("bottom-up") calculates the total cost based on as much specific information as is readily available. The model approach ("top down") aggregates different cost evaluations that have been conducted for many different facilities and attempts to develop a correlation that can be applied to most facilities based on a shared characteristic.

USEPA and EPRI have used the model based approach to estimate initial capital costs for cooling tower retrofits. The EPRI cost model divides facilities into three separate categories based on the relative difficulty expected for the project (see Figure 11) (EPRI 2007). BSPP has a large section of available land and no obvious mitigating circumstances that would indicate the retrofit capital cost estimate should be based on a "difficult" facility model. Based on the information available for this analysis, Tetra Tech assumed the facility would fall somewhere between the easy and average models and selected a capital cost multiplier of $190/gpm, or $97,000,000.

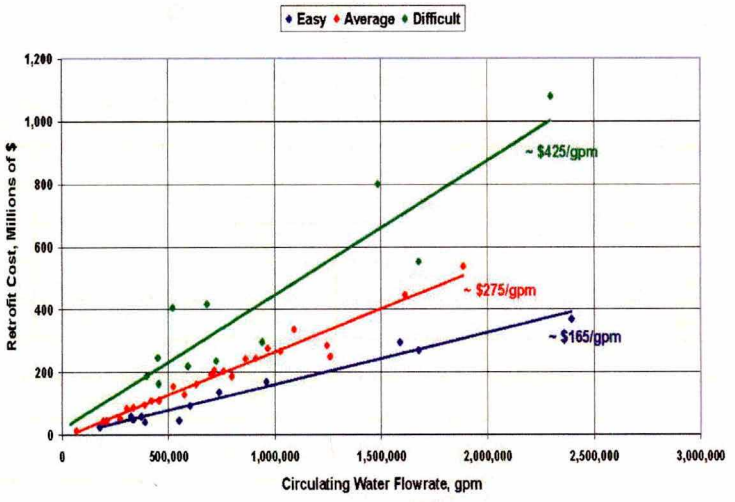



Figure 11. Retrofit Cost Models

### 6.2.2 ENERGY PENALTY COMPONENTS

The energy penalty is divided into two components: increased parasitic use resulting from the additional electrical demand of cooling tower fans and pumps; and the decrease in thermal efficiency resulting from elevated turbine backpressure values. Figure 12 shows the monthly efficiency loss calculated for BSPP.[13]

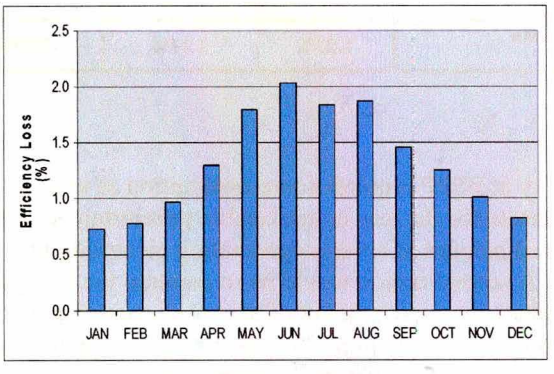



Figure 12. Average Monthly Energy Penalty

[13] Notable difference between July and June/August values in Figure 12 is likely the result of insufficient or inaccurate climate or water temperature data. More facility-specific information will be necessary to properly size each cooling tower and calculate the precise loss in efficiency.

Table 8 and Table 9 show the estimated parasitic use for fans and pumps.

Table 8. Fan Parasitic Use

| | Tower 1 | Tower 2 | Tower 3 | BSPP Total |
|---|---|---|---|---|
| Units served | Unit 1 | Units 2 & 3 | Unit 4 | -- |
| Generating capacity (MW) | 136 | 280 | 215 | **631** |
| # Fans (one per cell) | 11 | 22 | 11 | **44** |
| Motor power per fan (hp) | 211 | 211 | 211 | -- |
| Total motor power (hp) | 2,316 | 4,632 | 2,316 | **9,263** |
| MW total | 1.73 | 3.45 | 1.73 | **6.91** |
| **Fan Parasitic Use (% of Capacity)** | **1.27%** | **1.23%** | **0.80%** | **1.09%** |

Table 9. Pump Parasitic Use

| | Tower 1 | Tower 2 | Tower 3 | BSPP Total |
|---|---|---|---|---|
| Units served | Unit 1 | Units 2 & 3 | Unit 4 | -- |
| Generating capacity (MW) | 136 | 280 | 215 | **631** |
| Existing pump configuration (hp) | 816 | 1,632 | 816 | **3,264** |
| New pump Configuration (hp) | 3,055 | 6,009 | 3,055 | **12,118** |
| Difference (hp) | 2,239 | 4,377 | 2,239 | **8,854** |
| Difference (MW) | 1.7 | 3.3 | 1.7 | **6.6** |
| **Net Pump Parasitic Use (% of Capacity)** | **1.23%** | **1.17%** | **0.78%** | **1.05%** |

### 6.2.3 ENERGY PENALTY COST

Monetizing the energy penalty at BSPP requires some assumption as to how the facility will choose to alter its operations to compensate for the loss in marketable generating capacity, if at all. One option would be to accept the reduced amount of revenue-generating electricity available for sale and absorb the economic loss ("Option 1"). A second option would be to increase the firing rate to the turbine (i.e., consume more fuel) and produce the same amount of revenue-generating electricity as had been obtained with the once-through cooling system ("Option 2"). The degree to which a facility is able, or prefers, to operate at a higher firing rate, however, produces the more likely scenario—some combination of the two.

Ultimately, the decision to alter operations to address efficiency changes is driven by considerations unknown to this study (e.g., corporate strategy, contractual obligations, and turbine pressure tolerances). For simplicity, the monetized value of the energy penalty assumes the facility will increase the firing rate to the turbine to compensate for reduced efficiency and generate the amount of electricity equivalent to the once-through system. In general, the increased fuel option is less costly, in nominal dollars, than the production loss option, but may not reflect long-term costs, such as increased maintenance, that may result from the continued high firing of the turbine.

Table 10 summarizes the cumulative energy penalty cost assuming BSPP would not increase the thermal input to the boiler and instead absorb the loss directly (Option 1). Using this approach the energy penalty cost is $10 million. By comparison, the energy penalty cost using Option 2 would be $1.7 million.[14]

Table 10. Cumulative Energy Penalty Cost—Option 1

| Month | Wholesale Price ($/MWh)[a] | Net Gen (MWh) | Energy Penalty (%) | | | | MWh Equivalent | Net Cost ($) |
|---|---|---|---|---|---|---|---|---|
| | | | Efficiency Loss | Fan | Pump | Total | | |
| JAN | 45.17 | 376,950 | 0.73 | 1.09 | 1.05 | 2.87 | 10,824 | 488,898 |
| FEB | 78.00 | 367,468 | 0.78 | 1.09 | 1.05 | 2.92 | 10,736 | 837,387 |
| MAR | 67.67 | 415,878 | 0.97 | 1.09 | 1.05 | 3.11 | 12,923 | 874,452 |
| APR | 75.13 | 397,301 | 1.30 | 1.09 | 1.05 | 3.44 | 13,652 | 1,025,631 |
| MAY | 62.17 | 395,410 | 1.79 | 1.09 | 1.05 | 3.94 | 15,561 | 967,361 |
| JUN | 54.00 | 378,706 | 2.03 | 1.09 | 1.05 | 4.18 | 15,814 | 853,978 |
| JUL | 90.93 | 386,543 | 1.84 | 1.09 | 1.05 | 3.99 | 15,407 | 1,400,914 |
| AUG | 64.00 | 402,201 | 1.87 | 1.09 | 1.05 | 4.01 | 16,113 | 1,031,257 |
| SEP | 55.00 | 362,490 | 1.45 | 1.09 | 1.05 | 3.60 | 13,032 | 716,752 |
| OCT | 49.25 | 372,960 | 1.25 | 1.09 | 1.05 | 3.39 | 12,638 | 622,401 |
| NOV | 48.25 | 364,708 | 1.02 | 1.09 | 1.05 | 3.16 | 11,514 | 555,552 |
| DEC | 55.25 | 400,325 | 0.83 | 1.09 | 1.05 | 2.97 | 11,877 | 656,228 |
| | | | | | | | **BSPP Total** | **10,030,811** |

[a] Based on 2008 weighted wholesale electricity prices reported at the Cinergy trading hub.

### 6.2.4 NET PRESENT VALUE

The net present value (NPV) reflects the cumulative cost of all yearly expenses over the projects lifespan (20 years). These expenses are discounted according to the year in which they were incurred and the selected discount rate. Facility-specific financial data were not available for FirstEnergy; therefore, the appropriate discount rate cannot be determined. The discount rate used in this study (7 percent) is based on federal government guidelines for developing economic analyses of proposed regulations and is a conservative estimate of the average pre-tax rate of return for private investment (OMB 2007). USEPA used the same rate in developing its cost analysis for the Phase II rule (USEPA 2002). Table 11 shows the 20-year NPV calculation for a wet cooling tower retrofit at BSPP using the production loss option described above (Option 1). The NPV using the increased fuel option (Option 2) is $153 million.

[14] Fuel costs based on the 2008 average monthly delivery price of coal for independent power producers expressed as $/MMBTU (US EIA 2008). Unit 1 uses petroleum coke cost as its primary fuel but costs were not publicly available. Average coal prices were used instead.

Table 11. Net Present Value Calculation—Option 1

| Project Year | Capital / Startup ($) | O & M ($) | Energy Penalty ($) | Total ($) | Annual Discount Factor | Present Value ($) |
|---|---|---|---|---|---|---|
| 0 | 97,000,000 | -- | -- | 97,000,000 | 1 | 97,000,000 |
| 1 | -- | 2,048,000 | 10,020,363 | 12,068,363 | 0.9346 | 11,279,092 |
| 2 | -- | 2,088,960 | 10,604,551 | 12,693,511 | 0.8734 | 11,086,512 |
| 3 | -- | 2,130,739 | 11,222,796 | 13,353,535 | 0.8163 | 10,900,491 |
| 4 | -- | 2,173,354 | 11,877,085 | 14,050,439 | 0.7629 | 10,719,080 |
| 5 | -- | 2,216,821 | 12,569,519 | 14,786,340 | 0.7130 | 10,542,660 |
| 6 | -- | 2,261,157 | 13,302,322 | 15,563,479 | 0.6663 | 10,369,946 |
| 7 | -- | 2,306,381 | 14,077,847 | 16,384,228 | 0.6227 | 10,202,459 |
| 8 | -- | 2,352,508 | 14,898,586 | 17,251,094 | 0.5820 | 10,040,137 |
| 9 | -- | 2,399,558 | 15,767,173 | 18,166,732 | 0.5439 | 9,880,885 |
| 10 | -- | 2,447,550 | 16,686,399 | 19,133,949 | 0.5083 | 9,725,786 |
| 11 | -- | 2,496,501 | 17,659,216 | 20,155,717 | 0.4751 | 9,575,981 |
| 12 | -- | 3,028,992 | 18,688,749 | 21,717,741 | 0.4440 | 9,642,677 |
| 13 | -- | 3,089,572 | 19,778,303 | 22,867,875 | 0.4150 | 9,490,168 |
| 14 | -- | 3,151,363 | 20,931,378 | 24,082,741 | 0.3878 | 9,339,287 |
| 15 | -- | 3,214,391 | 22,151,677 | 25,366,068 | 0.3624 | 9,192,663 |
| 16 | -- | 3,278,678 | 23,443,120 | 26,721,798 | 0.3387 | 9,050,673 |
| 17 | -- | 3,344,252 | 24,809,854 | 28,154,106 | 0.3166 | 8,913,590 |
| 18 | -- | 3,411,137 | 26,256,268 | 29,667,405 | 0.2959 | 8,778,585 |
| 19 | -- | 3,479,360 | 27,787,009 | 31,266,369 | 0.2765 | 8,645,151 |
| 20 | -- | 3,548,947 | 29,406,991 | 32,955,938 | 0.2584 | 8,515,814 |
| Total | | | | | | 292,891,638 |

### 6.2.5 ANNUALIZED COST

An annualized cost estimates the constant annual value of financial expenditures and revenue losses due to a particular project over time; this can also be considered a facility's annual cost of compliance. It presents the annual economic impact a facility can expect to sustain due to amortized capital costs, O&M, and the energy penalty.

Operations and maintenance (O&M) costs for a wet cooling tower system at BSPP include routine maintenance activities; chemicals and treatment systems to control fouling and corrosion in the towers; management and labor; and an allowance for spare parts and replacement. Annual costs are calculated based on the combined tower flow rate using a base cost of $4.00/gpm in Year 1 and $5.80/gpm in Year 12, with an annual escalator of 2 percent (USEPA 2001). Year 12 costs increase based on the assumption that maintenance needs, particularly for spare parts and replacements, will be greater for years 12–20. The annual cost for a wet cooling tower retrofit is the sum of annual amortized capital costs plus the annual average of O&M and energy penalty expenditures. Capital costs are amortized at a 7 percent discount rate over 20 years.

Table 12 and Table 13Table 1 show the range of estimated annualized costs under Option 1 (production loss) or Option 2 (increased fuel consumption).

Table 12. Option 1 Annualized Cost

| Estimated Gross Annual Revenue [a] ($) | Initial Capital | | O&M | | Energy Penalty | | Total Annual Cost | |
|---|---|---|---|---|---|---|---|---|
| | Cost ($) | % of Gross | Cost ($) | % of Gross | Cost ($) | % of Gross | Cost ($) | % of Gross |
| 287,600,000 | 9,200,000 | 3.2 | 2,700,000 | 0.9 | 18,100,000 | 6.3 | **30,000,000** | 10.4 |

[a] Based on 2008 weighted wholesale electricity prices reported at the Cinergy trading hub and average generating output.

Table 13. Option 2 Annualized Cost

| Estimated Gross Annual Revenue [a] ($) | Initial Capital | | O&M | | Energy Penalty | | Total Annual Cost | |
|---|---|---|---|---|---|---|---|---|
| | Cost ($) | % of Gross | Cost ($) | % of Gross | Cost ($) | % of Gross | Cost ($) | % of Gross |
| 287,600,000 | 9,200,000 | 3.2 | 2,700,000 | 0.9 | 3,500,000 | 1.2 | **15,400,000** | 5.4 |

[a] Based on 2008 weighted wholesale electricity prices reported at the Cinergy trading hub and average generating output.

### 6.2.6 ESTIMATED RATEPAYER COST

Annualized costs can be presented in terms of the average rate increase that would be expected if all costs were passed through to the rate payer. Table 14 shows the average increases for capital costs only and the high and low options. Increases range from 3.3 percent to 6.5 percent depending on the selected option.

Table 14. Estimated Ratepayer Increases

| Base Rate[a] | Capital Only Increase | | Option 1 Increase | | Option 2 Increase | |
|---|---|---|---|---|---|---|
| ¢/kWh | ¢/kWh | % | ¢/kWh | % | ¢/kWh | % |
| 8.39 | 0.17 | 2.0 | 0.54 | 6.5 | 0.28 | 3.3 |

[a] Base rate obtained from 2008 EIA market data for average retail price of electricity for all sectors (residential, commercial, industrial, and transportation) for Ohio. Residential rates are higher (10.13 ¢/kWh). http://www.eia.doe.gov/cneaf/electricity/epm/table5_6_b.html

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| Option Group | Technology or Operational Change | Logistically Feasible? | Satisfactory Performance? | Major Secondary Effects? | 316(a) and (b)? | Disqualifying Limitations? | Cost Effective? | Estimated BSPP IM/E Reduction | Result | Notes |
|---|---|---|---|---|---|---|---|---|---|---|
| Closed-Cycle Recirculating Cooling | Natural draft wet cooling towers | YES | YES | Energy penalty; aesthetics | (a) and (b) | None | NO | IM: 95-98%<br>E: 95-98% | Eliminated | Natural draft towers more expensive; mechanical draft towers achieve same result at lower cost |
| | Mechanical draft wet cooling towers | YES | YES | Energy penalty; aesthetics | (a) and (b) | None | YES | IM: 95-98%<br>E: 95-98% | FEASIBLE | Sufficient land available; requires better information to calculate energy penalty cost |
| | Dry cooling | YES | YES | Energy penalty; aesthetics | (a) and (b) | Excessive efficiency loss; | NO | IM: >99%<br>E: >99% | Eliminated | Energy penalty and high cost not justified; mechanical draft towers achieve similar result at lower cost |
| | Surface cooling ponds | POSSIBLE | YES | Energy penalty | (a) and (b) | Available land | n/a | IM: 80-95%<br>E: 80-95% | FEASIBLE (partial) | Requires large area; unlikely to achieve same result as towers, possible combination system |
| Physical Barriers | Ristroph screen with fish handling and return system | YES | YES | None | (b) only | None | n/a | IM: 80-90% | FEASIBLE | Upgrade to acceptable design could increase IM survival significantly |
| | Fine mesh traveling screens | YES | YES | None | (b) only | Lack of suitable discharge location; intake velocity | n/a | n/a | Eliminated | Unlikely to have enough room to maintain intake velocity; return location in thermal plume |
| | Cylindrical wedgewire screens | POSSIBLE | YES | None | (b) only | Possible navigation interference | n/a | IM: 90-95%<br>E: 85-90% | POSSIBLE | Canal placement infeasible; shipping channel placement unlikely; dredged areas in Maumee Bay possible |
| | Barrier net | NO | [redacted] | | | | | | Eliminated | Insufficient area in the intake canal; cannot place at the canal entrance due to boat traffic |
| | Aquatic filter barrier | NO | | | | | | | Eliminated | Insufficient area in the intake canal; cannot place at the canal entrance due to boat traffic |
| Diversion or Avoidance Technologies | Velocity cap | NO | | | | | | | Eliminated | Insufficient depth in Maumee Bay |

| Option Group | Technology or Operational Change | Logistically Feasible? | Satisfactory Performance? | Major Secondary Effects? | 316(a) and (b)? | Disqualifying Limitations? | Cost Effective? | Estimated BSPP IM/E Reduction | Result | Notes |
|---|---|---|---|---|---|---|---|---|---|---|
| | Louvers | YES | NO | | | | | | Eliminated | Species specific; lack of data |
| | Behavioral barriers (physical, electrical, light, sound) | YES | NO | | | | | | Eliminated | Species specific; lack of data |
| Operational Measures and Structural Changes | Seasonal or other flow reductions | YES | YES | None | (a) and (b) | CUR and dispatch profile | | | Eliminated | Facility operates at 80% with no seasonal downtime |
| | Variable speed pumps | YES | YES | None | (a) and (b) | CUR and dispatch profile | | | Eliminated | Facility operates at 80% with no seasonal downtime |
| | Intake velocity reduction | YES | YES | None | (b) only | None | n/a | IM: 80-90% | FEASIBLE | Expansion dependent on available space; Reduction based on sufficient size increase |
| | Swap Intake and discharge locations | YES | NA | Thermal impact to Maumee River | (a) and (b) | Impact to river likely higher than to cove | | | n/a | Smaller discharge area to Maumee River |
| | Discharge relocation | YES | YES | unknown | (a) only | unknown | | | n/a | Shallowness of Maumee Bay suggests impacts would be similar |
| | Multi-port diffusers | YES | YES | None | (a) only | unknown | | | n/a | Thermal plume would be smaller with shallow jets; reduction unknown |
| | Helper towers | YES | YES | None | (a) only | None | NO | | n/a | Unable to calculate necessary size; costs are significant and difficult to justify compared with recirculating system and added benefits |

# 1.0 THERMAL EFFICIENCY PENALTY

A wet cooling system will invariably increase the condenser inlet water temperature compared to a once-through system. This increase in temperature affects the condenser's ability to reject waste heat from the system and raises the backpressure at the turbine exhaust point. Adjustments to the turbine backpressure are a function of the change in steam condensate pressure, which is directly related to the increased circulating water temperature. To obtain the steam condensate pressure, the temperature of the saturated steam condensate must first be calculated using the following equation:

$$Q = (U_o \times F_w \times F_m \times F_c) \times A \times \left[ \frac{(T_s - T_i) - (T_s - T_o)}{\ln\left(\frac{(T_s - T_i)}{(T_s - T_o)}\right)} \right]$$

where:

$Q$ = condenser thermal load, in BTU/hr
$U_o$ = base heat transfer coefficient, in BTU/hr·ft$^2$·°F
$F_w$ = temperature correction factor
$F_m$ = tube material factor
$F_c$ = cleanliness factor
$A$ = surface area of condenser, in ft$^2$
$T_s$ = steam condensate (saturated) temperature, in °F
$T_i$ = condenser inlet temperature, in °F
$T_o$ = condenser outlet temperature, in °F

The effect the change in backpressure has on overall performance is reflected in changes to the unit's operating heat rate. Heat rate adjustments were calculated by comparing the theoretical change in available energy that occurs at different turbine exhaust backpressures, assuming the thermal load and turbine inlet pressure remain constant, i.e., at the maximum load rating. The relative change at different backpressures was compared to the value calculated for the design conditions (i.e., at design turbine inlet and exhaust backpressures) and plotted as a percentage of the maximum operating heat rate to develop estimated correction curves. A comparison was then made between the relative heat rates of the once-through and wet cooling systems for a given month. The difference between these two values represents the net increase in heat rate that would be expected in a converted system.

# 2.0 INCREASED PARASITIC USE (FANS)

Depending on ambient conditions or the operating load at a given time, a facility may be able to take one or more cooling tower cells offline and still obtain the required level of cooling. This would also reduce the cumulative electrical demand from the fans. For the purposes of this study, however, operations are evaluated at the design conditions, i.e., maximum load; no allowance is made for seasonal changes.

The fan penalty is expressed as a percentage of the total generating capacity and is calculated using the following equation:

$$F_p = \left( \frac{F_{hp} \times 0.0007457 \, MW/hp}{G} \right) \times 100$$

where:

$F_p$ = energy penalty from fan power demand, in %
$F_{hp}$ = motor power, in hp
$G$ = generating capacity, in MW

## 3.0 INCREASED PARASITIC USE (PUMPS)

Wet cooling towers require substantial pumping capacity to circulate the large volumes of water through the towers and condensers. The wet cooling system will demand more electrical power than the once-through system it replaces because the configuration and demands are somewhat different. For example, static head values will likely increase due to the height required to reach the top of the tower risers (50 feet or more for many facilities), while friction head loss may increase if the cooling towers must be located far from the condensers they serve, thereby requiring long stretches of supply and return piping.

In most cases, the change in operating demand will require new pumps with different design specifications. Where feasible, some of the existing once-through circulating water pumps will be retained to provide makeup water to the towers. The net pump penalty estimates the power demand of the new configuration versus the existing demand relative to the facility's overall generating capacity.

The pump penalty is expressed as a percentage of the total generating capacity and is calculated using the following equation:

$$P_p = \left( \frac{(P_1 - P_2 + P_3) \times 0.0007457 \ MW/hp}{G} \right) \times 100$$

where:

$P_p$ = energy penalty from net pump power demand
$P_1$ = total motor power for cooling tower pumps, in hp
$P_2$ = total motor power for existing circulating water pumps, in hp
$P_3$ = total motor power retained from existing circulating water pumps, in hp
$G$ = generating capacity, in MW

## 4.0 MONETIZED ENERGY PENALTY – PRODUCTION LOSS (OPTION 1)

The shortfall amount, per month, is summed, and multiplied by the average annual procurement cost to determine an annual estimate calculated using the following equation:

$$R = \sum_{n=1}^{12} \left( \frac{HR_{cc} - HR_{ot}}{HR_{ot}} \right) \times MWh \times P_w$$

where:

$R$ = annual revenue loss, in $
$HR_{cc}$ = heat rate with closed-cycle cooling for month $n$, in BTU/kWh
$HR_{ot}$ = heat rate with once-through cooling for month $n$, in BTU/kWh
$MWh$ = net generating output for month $n$, in MWh
$P_w$ = wholesale electricity price for month $n$, in $/MWh[15]

## 5.0 MONETIZED ENERGY PENALTY – INCREASED FUEL (OPTION 2)

Adjustments to the heat rate were calculated based on the ambient conditions for each month and reflect the estimated difference between operations with once-through and wet cooling tower systems. Using the increased fuel option, the cumulative value of the energy penalty is obtained by first calculating the relative costs of generation ($/MWh) for the once-through and wet cooling systems The cost of generation is based on the relative changes in heat rates and the average monthly wholesale natural gas cost ($/MMBTU) (ICE 2006b). The difference between these two values represents the increased cost, per MWh, that results from a wet cooling tower retrofit. The difference in cost, per month, is applied to the net MWh generated for the particular month, and summed to determine an annual estimate, using the following equation:

$$R = \sum_{n=1}^{12} \left[ \left( \frac{HR_{cc} \times F}{1000} \right) - \left( \frac{HR_{ot} \times F}{1000} \right) \right] \times MWh$$

where:

$R$ = annual revenue loss, in $
$HR_{cc}$ = heat rate with closed-cycle cooling for month $n$, in BTU/kWh
$HR_{ot}$ = heat rate with once-through cooling for month $n$, in BTU/kWh
$F$ = fuel cost for month $n$, in $/MMBTU
$MWh$ = net generating output for month $n$, in MWh

## 6.0 NET PRESENT VALUE

The net present value (NPV) is an economic valuation tool to estimate the potential for profit or loss associated with a large capital investment over a certain time period. The NPV takes into account all expected annual cash flows, both positive and negative, over the life of the project, applies a discount rate, and sums them to a single value presented in current dollars. It does not represent a cash outlay at the beginning of the project. Ordinarily, the NPV is used to measure the potential for profit, i.e., if the NPV is positive, the investment will earn money over the long term.

[15] Weighted average monthly wholesale price, 2008, Intercontinental Exchange for Cinergy trading hub.

For this study, it is assumed there is no potential to realize any discernible profit from the investment, so all cash flows will be negative and can be expressed as costs.

The discount rate used in this study (7 percent) is based on federal government guidelines used in developing economic analyses of proposed regulations and is a conservative estimate of the average pre-tax rate of return for private investment (OMB 2007). EPA used the same rate in developing its cost analysis for the Phase II rule (USEPA 2002 EBA). Higher or lower discount rates may be more appropriate for individual facilities but sufficient economic data were not available to conduct the appropriate sensitivity analysis.

This study selected a 20-year amortization period for the NPV based on the expectation that a 20-year lifespan for cooling towers is a reasonable period before degradation of the original structure becomes significant and incurs higher replacement and repair costs. The 20-year period is not based on a particular unit's projected or anticipated life span.

The NPV is calculated using the following equation:

$$NPV_{20} = \sum_{t=0}^{20} \frac{C_t}{(1+r)^t}$$

where:

$NPV_{20}$ = net present value of all costs incurred over project life span (20 years)
$t$ = project year beginning at $t = 0$
$C_t$ = cost incurred in year $t$
$r$ = discount rate (7.00 %)

## 7.0 ANNUAL COST

An annualized cost estimates the constant annual value of financial expenditures and revenue losses due to a particular project over time; this can also be considered a facility's annual cost of compliance. It presents the annual economic impact a facility can expect to sustain due to amortized capital costs, O&M, and the energy penalty.

Annualized capital costs ($C_a$) are developed according to the following equation:

$$C_a = \left[ C_t \times \left( \frac{r \times (1+r)^n}{(1+r)^n - 1} \right) \right] + R + OM_a$$

where:

$C_a$ = annualized cost
$C_t$ = total capital cost (direct, indirect, contingency)
$r$ = discount rate (7.00 %)
$n$ = amortization period (20 years)
$R$ = monetized energy penalty (Option 1 or Option 2)
$OM_a$ = annual operations and maintenance cost

Assumptions made for discount rate and amortization period are the same as for the NPC calculation.

## 8.0 COST-TO-GROSS REVENUE COMPARISON

An annualized cost-to-gross revenue comparison further illuminates the financial impact that a cooling system retrofit will have on a particular facility. Ideally, facility-level economic data are used to accurately account for company finances, contractual obligations, and generating costs. These data were not available for this study. Instead, a gross annual revenue estimate is developed based on generating output and weighted average monthly wholesale prices for electricity at the Cinergy trading hub.

This estimate represents the proportional annual cost to gross, not net, revenues. It does not account for contractual obligations, revenues received from other activities, fixed revenue requirements, operational costs, or any tax savings.

For merchant generators, the ratio is calculated by the following equation:

$$G_r = \frac{C_a}{\left(\sum_{n=1}^{12}(P_w \times MWh)\right)}$$

where:

$G_r$ = gross revenue ratio
$C_a$ = annualized cost (Option 1 or Option 2)
$P_w$ = wholesale electricity price for month $n$, in $/MWh
$MWh$ = net generating output for month $n$, in MWh

## 9.0 RATEPAYER COST INCREASE

A wet cooling tower retrofit's overall cost is often best expressed as a unit-level value that places large numbers in the proper context and allows for easier comparison between facilities of different sizes and different technology options. The ratepayer increase is calculated based on the annualized costs for Option 1 and Option 2 and the average retail price for electricity in Ohio for all user types.

GenOn

121 Champion Way
Canonsburg, PA 15317

April 21, 2011

***VIA OVERNIGHT MAIL***

Ohio Environmental Protection Agency
Lazarus Government Center
Division of Surface Water
Permits Processing Unit
50 West Town St., Suite 700
P.O. Box 1049
Columbus, Ohio 43216-1049

REC'D APR 22 2011

Ohio Environmental Protection Agency
Northeast District Office
2110 East Aurora Road
Twinsburg, Ohio 44087

Subject: **Draft Authorization to Discharge**
**Public Notice No.: 11-03-062**
**Ohio EPA Permit No.: 3IB00002*KD**
GenOn Power Midwest, L.P.
Avon Lake Power Plant
Avon Lake, Ohio

Attention: Division of Surface Water Permits and Compliance Section

Based on our review of the draft authorization to discharge under the National Pollutant Discharge Elimination System (NPDES) Ohio EPA Permit No. 3LB00002*KD (draft Permit) public noticed on March 25, 2011, GenOn Power Midwest, L.P. (GenOn) provides the following comments.

**Avon Lake Power Plant**

GenOn operates a coal-fired, electric generating station in Avon Lake, Ohio that discharges into Lake Erie. On June 22, 2006 the Ohio Environmental Protection Agency (OEPA) issued the facility a National Pollutant Discharge Elimination System Permit (NPDES), No. 31B00002*JD, which is in administrative extension until the subject draft Permit is finalized and becomes effective.

Avon Lake is a three-unit generating station situated on 107 acres along the southern shores of Lake Erie, approximately 20 miles west of downtown Cleveland. Its three units have a net capacity of 763 megawatts. Unit 9 is the largest of the three units, capable of generating 640 megawatts. It began commercial operation in 1970 and provides both base load capacity and load following capability. The unit burns eastern bituminous coals and is also capable of burning a PRB blend. Unit 7 is a 94 megawatt unit that is also utilized for base load capacity and load following capability. It began commercial operation in 1949 and burns primarily eastern bituminous coals. Unit 10 is a 29-megawatt combustion turbine, which began commercial operation in 1971. It provides both peaking capacity and black start capability and burns fuel oil.

## Comments

**Comment 1. Part I, A - Outfall 001 Total Residual Chlorine (TRC) & Total Residual Oxidants (TRO) Significant Figures.**

The Discharge Limitations for the Maximum Concentrations for TRO and TRC are identified as 0.050 milligrams per liter (mg/l) and 0.20 mg/l.

According to the Factsheet for the Avon Lake Power Plant NPDES Permit Renewal for Outfall 001: Table 11-001 (Page 14 & 33), TRC includes a limit of 0.2 mg/l, and TRO includes a limit of 0.05 mg/l. The existing discharge limitations for TRO and TRC are also 0.05 mg/l and 0.2 mg/l, respectively, for Outfall 001.

GenOn requests that OEPA retain the same number of significant figures in Part I, A as provided for in the Factsheet and the existing Permit.

**Comment 2. Part I, A - Outfall 002 Total Suspended Solids (TSS) Sampling Frequency**

This parameter is limited based on Federal Effluent Limit Guidelines (ELGs), and the current permit requires sampling three times per week. GenOn requests the reduction to once per week in the sampling frequency for TSS at Outfall 002 because we have no history of serious compliance problems, the additional data are not expected to provide further benefit, and this frequency places an unnecessary burden on the facility. A reduction to once per week is expected to be consistent with the Agency's "Permit Guidance No. 2, National Pollutant Discharge Elimination System; Determination of Sampling Frequency Formula for Industrial Waste Discharges," and supported by monthly data submitted by GenOn during the current permit cycle,

**Comment 3. Part I, A - Outfall 002 & Internal Monitoring Station 601 Mercury Sample Collection Timing, Location, & Notes.**

The draft Permit requires that samples for mercury at Outfall 002 be collected one detention time after samples are collected for Internal Monitoring Station 601.

Calculating the detention time before each sampling event will be complicated and burdensome. The actual detention time may vary from day to day due to station operations, including changes in flow rates from the multiple influents to the pond system and the quantity of bottom ash in each pond. Based on the current longterm average flow rate of 940,000 gpd and the total storage capacity for both ponds of 705,500 gallons, the average detention is approximately 18 hours.

Therefore, to provide consistency and to minimize the complexity in collecting samples at Outfall 002, GenOn requests that the Agency modify the text on Page 5 to read, "Samples for mercury at this station shall be collected 18 hours (approximately one detention time) after samples are collected for Station 601." Similarly, GenOn requests that the Agency revise the text on page 8 to read, "samples for mercury at this station shall be collected 18 hours (approximately one detention time) before samples are collected for Outfall 002."

The sample location for Internal Monitoring Station 601 is not specified. We understand that the intent of this sampling is to gather information on the mercury concentrations associated with bottom ash sluice water.

Because multiple sources of wastewater discharge to the Southwest Corner of the Primary Ash Settling Pond system, GenOn requests that OEPA include a note under this station that indicates that the representative sampling point shall be located at the Ash Recycle Tank prior to discharge to the Primary Ash Pond. The Ash Recycle Tank receives the water used in the bottom ash pushes; the water overflows from the hydro bins into the Ash Recycle Tank. The overflow from the Ash Recycle Tank enters a sump, which is pumped to the Southwest Corner of the Primary Ash Settling Pond (a second possible choice for a representative sample location).

We recommend using the Ash Recycle Tank because multiple wastewaters enter the Primary Ash Settling Pond in the southwest corner. Note that if the station is not operating, then no discharge would be present from the Ash Recycle Tank.

In addition, the note that describes "bimonthly sampling" is no longer relevant for Outfall 002, but is relevant for Internal Monitoring Station 601. GenOn requests OEPA to move this note from Outfall 002 to Internal Monitoring Station 601.

**Comment 4. Part I, A – Outfall 002 TRC Monitoring & Reporting Condition.**

The draft Permit requires monitoring for TRC at Outfall 002. TRC monitoring was required due to the detection of TRC in a sample collected on

October 1, 2009 as part of the NPDES renewal application. The power plant does not add any chlorine or chlorinated products to any wastewater inputs to outfall 002. The only potential source of chlorine could be potable water from the City of Avon Lake. GenOn conducted an evaluation of the demineralizer regeneration system and found issues with the blending process for a powdered dechlorination agent, which is used to remove the TRC present in the city potable water supply. As a result, a new liquid dechlorination system was installed for use on March 23, 2010. GenOn has since collected three samples to further assess the concentration of TRC at Outfall 002. The three samples were collected and analyzed on April 12, 13, and 15, 2011 and the results were 0.03 ppm, 0.02 ppm, and 0.03 ppm, respectively.

Based on our findings and the results of more recent TRC sampling, we request that the condition for monitoring and reporting TRC at outfall 002 be removed from the Permit.

**Comment 5. Part I, A - Outfall 004 TRO Significant Figures.**

The Discharge Limitation for the Maximum Concentration for TRO is identified as 0.010 mg/l.

According to the Factsheet for Avon Lake Power Plant NPDES Permit Renewal for Outfall 004: Table 11-004 (Page 34), TRO includes a limit of 0.01 mg/l. The existing discharge limitation for TRO is also 0.01 mg/l for Outfall 004.

GenOn requests that OEPA retain the same number of significant figures in Part I, A as provided for in the Factsheet and the existing Permit.

**Comment 6. Part I, A - Outfall 610 Redundant TSS Limitation.**

GenOn requests that the Agency remove the monthly average limit of 50 *mg/L* TSS for Outfall 610 because a more stringent daily maximum limit of 50 *mg/L* is already imposed at this Outfall. This request is consistent with the ELGs at 40 CFR §423.12(b)(9), and the redundant limit at this internal monitoring point could result in a double violation should the limit be exceeded and the pond only discharges once during a month.

**Comment 7. Part I, A - Outfall 611 Metal Cleaning Wastewater.**

Internal Monitoring Station 611 is used when the coal pile runoff treatment system is used to treat metal cleaning wastewater. Metal cleaning at the Avon Lake Station generally includes air pre-heater washes without the use of chemical cleaning compounds and only the second and subsequent rinse water associated with other chemical cleaning activities.

To minimize contact with coal pile runoff prior to treatment, the coal pile runoff basin is emptied to the maximum extent practicable prior to allowing metal cleaning wastewater to enter the basin for settling and for subsequent treatment in the coal pile runoff treatment system. Historically, the next batch of storm water runoff from the Coal Pile into the basin has also been treated as metal cleaning wastewater and monitored in accordance with Internal Monitoring Station 611 conditions to better ensure all metal cleaning residuals are processed in the treatment system. As a result, waste streams from various sources are not combined prior to treatment and discharge at Internal Monitoring Station 611. Therefore, GenOn requests that, at a minimum, the discharge sampling point be located following the coal pile runoff treatment system.

Treated metal cleaning effluent from Internal Monitoring Station 611 is then discharged to the ash pond combined wastewater treatment system and is co-treated again with other sources of low volume wastewater prior to discharge at final Outfall 002.

While copper and iron concentrations at the final Outfall 002 have been compliant with the Federal ELG limitations, these constituents have not always been compliant following treatment in the coal pile runoff treatment system when used to treat metal cleaning wastes. GenOn also has plans to upgrade this treatment system. Therefore, GenOn requests that OEPA provide a three year compliance schedule so that we can ensure adequate treatment is provided prior to discharge at this internal monitoring station and that sufficient time is afforded to design, engineer, permit, procure and install said treatment.

Lastly, GenOn also requests OEPA concurrence that the second and subsequent rinses and hydrostatic testing water from chemical cleaning activities are considered low volume wastewater and do not need to be monitored at Internal Monitoring Point 611.

**Part II, K, 1. d. v. – General Mercury Variance.**

This condition of the draft Permit requires that all recommendations from surveys and studies associated with the plan of study be implemented in 42 months, as identified in the Revised Mercury Variance Application submitted December 28, 2010.

As mentioned previously, GenOn plans to adhere to this schedule, however requests that OEPA recognize that uncertainties regarding the station's future generating schedule could ultimately impact the ability to gather necessary operations-related data (to support the sampling/engineering study phase) and/or

conduct potential pilot-scale testing to support the design/permitting of possible system improvements, and thus challenges may still exist with respect to compliance with the proposed implementation schedule.

**General:** GenOn understands that the OEPA is continuing to coordinate permitting efforts on a watershed basis; however, it is requested that the expiration date of the final permit (and future permits) be five-years from the issue date, consistent with NPDES regulations, policy, and to be consistent with other states where GenOn operates.

Please do not hesitate to contact me at (724) 597-8310 or Nate Rozic at 724-597-8630 if you have any questions or require additional information.

Respectfully Submitted,

Stephen M. Frank
Senior Environmental Specialist

cc: Scott Cameron - Avon Lake Power Plant
Nate Rozic- GenOn Energy

Ohio | Environmental Protection Agency
John R. Kasich, Governor
Mary Taylor, Lt. Governor
Scott J. Nally, Director

91 7108 2133 3932 1841 9102

March 18, 2011

RE: Ohio EPA Permit No.: 3IB00002*KD
Facility Name: Avon Lake Power Plant

GenOn Midwest LP
121 Champion Way, Suite 200
Canonsburg, PA 44012

Ladies and Gentlemen:

Transmitted herewith is one copy of the public notice, draft permit, and fact sheet if major permit in the above referenced matter.

The public has been invited to submit comments regarding this draft permit. If sufficient public interest is indicated, a public meeting will be held.

The permit as drafted will be issued as a final action unless the director revises the permit after consideration of all written comments received during the 30-day period following public notice and consideration of the record of a public meeting, if one is held, or unless the draft is disapproved by the Regional Administrator, U.S. Environmental Protection Agency.

You should note that a general condition of your permit states that issuance of a NPDES permit does not relieve you of the duty of complying with all applicable federal, state, and local laws, ordinances, and regulations.

Sincerely,

Patti L. Smith

Patti L. Smith, Supervisor
Permit Processing Unit
Division of Surface Water

PLS/kep

Enclosure

CERTIFIED MAIL

50 West Town Street, Suite 700
P.O. Box 1049
614 | 644 3020
614 | 644 3184 (fax)

3182.KD
P

UNITED STATES POSTAL SERVICE.

Date: 03/24/2011

katrina peterson:

The following is in response to your 03/24/2011 request for delivery information on your Certified Mail(TM) item number 7108 2133 3932 1841 9102. The delivery record shows that this item was delivered on 03/21/2011 at 10:55 AM in CANONSBURG, PA 15317. The scanned image of the recipient information is provided below.

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Karen M. Shulik

Address of Recipient: 121 Champion Way St 2a

Thank you for selecting the Postal Service for your mailing needs. If you require additional assistance, please contact your local Post Office or postal representative.

Sincerely,

United States Postal Service

3182.KD
NC

UNITED STATES POSTAL SERVICE.

Date: 02/07/2011

katrina peterson:

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Delivery Section

ture: Karen M Shuik

ed e: Karen M Shuik

Address of Recipient:

ery ess: 121 Champion Way 2a

Thank you for selecting the Postal Service for your mailing needs. If you require additional assistance, please contact your local Post Office or postal representative.

Sincerely,

United States Postal Service

Ohio | Environmental Protection Agency
John R. Kasich, Governor
Mary Taylor, Lt. Governor
Scott J. Nally, Director

March 18, 2011

Re: Public Notice No.: 11-03-062

Mayor and Council
Village of Avon Lake
150 Avon Belden Rd
Avon Lake, OH 44012

Ladies and Gentlemen:

Enclosed is one copy of the Public Notice referenced above regarding National Pollutant Discharge Elimination System (NPDES) permits or modifications. This notice is being advertised in a newspaper of general circulation in the county, and is being provided to certain public officials and the regulated entity.

In order to provide further public notice, we will appreciate your assistance in posting this notice in a conspicuous location for a thirty-day period starting on the date of Public Notice.

Thank you for your cooperation in this matter.

Sincerely,

Patti L. Smith

Patti L. Smith, Supervisor
Permit Processing Unit
Division of Surface Water

PLS/kep

Enclosure

50 West Town Street, Suite 700
P.O. Box 1049
614 | 644 3020
614 | 644 3184 (fax)

47/NE

Application No.: OH0001112
Ohio EPA Permit No.: 3IB00002*KD

## National Pollutant Discharge Elimination System (NPDES) Permit Program

## PUBLIC NOTICE

## NPDES Permit to Discharge to State Waters

Ohio Environmental Protection Agency
Permits Section
50 West Town St., Suite 700
P. O. Box 1049
Columbus, Ohio 43216-1049
(614) 644-2001

| | |
|---|---|
| Public Notice No.: | OEPA 11-03-062 DFT |
| Date of Issue of Public Notice: | Mar-25-2011 |
| Name and Address of Applicant: | GenOn Midwest LP, 121 Champion Way, Suite 200, Canonsburg, PA, 15317 |
| Name and Address of Facility Where Discharge Occurs: | Avon Lake Power Plant, 33570 Lake Road, Avon Lake, OH, 44012, Lorain County |
| Outfall Flow and Location List: | 002 3,380,000 GPD 41N 30' 15" 82W 03' 00"<br>004 3,350,000 GPD 41N 30' 15" 82W 03' 00" |
| Receiving Stream: | Lake Erie |
| Nature of Business: | Electrical power generation plant |
| Key parameters to be limited in the permit are as follows: | Chlorine, Total Residual, Oxidants, Total Residual, Chlorine, Total Residual, pH, Chlorination/Bromination Duration-Minutes,, Total Suspended Solids, Oil and Grease, Total, pH Range Excursion, Maximum Duration, pH Range Excursions, > 60 Minutes, pH Range Excursions, Monthly Total Duration, Mercury, Total (Low Level), Copper, Total Recoverable, Iron, Total Recoverable |
| Mercury Language: | GenOn Midwest LP (Avon Lake Power Plant) has applied for a variance from water-quality-based limits for mercury under OAC Rule 3745-33-07(D). The director is providing public notice of a preliminary decision to approve this variance request. The variance application and supporting materials can be viewed at Ohio EPA's Central Office, or copies can be obtained by contacting Mike McCullough mike.mccullough@epa.state.oh.us. Comments on Avon Lake Power Plant's application must be provided within the comment period for the NPDES permit. Further information on the variance request and draft approval is also found in the NPDES fact sheet for this permit renewal. |

On the basis of preliminary staff review and application of standards and regulations, the director of the Ohio Environmental Protection Agency will issue a permit for the discharge subject to certain effluent conditions and special conditions. The draft permit will be issued as a final action unless the director revises the draft after consideration of the record of a public meeting or written comments, or upon disapproval by the administrator of the U.S. Environmental Protection Agency. Any person may submit written comments on the draft permit and administrative record and may request a public hearing. A request for public hearing shall be in writing and shall state the nature of the issues to be raised. In appropriate cases, including cases where there is significant public interest, the director may hold a public hearing on a draft permit or permits prior to final issuance of the permit or permits. Following final action by the director, any aggrieved party has the right to appeal to the Environmental Review Appeals Commission.

Interested persons are invited to submit written comments upon the discharge permit. Comments should be submitted in person or by mail no later than 30 days after the date of this public notice. Comments should be delivered or mailed to both of the following locations: 1) Ohio Environmental Protection Agency, Lazarus Government Center, Division of Surface Water, Permits Processing Unit, 50 West Town St., Suite 700, P.O. Box 1049, Columbus, Ohio 43216-1049 and 2) Ohio Environmental Protection Agency, Northeast District Office 2110 East Aurora Road, Twinsburg, Ohio 44087.

The Ohio EPA permit number and public notice numbers should appear next to the above address on the envelope and on each page of any submitted comments. All comments received no later than 30 days after the date of this public notice will be considered.

The application, fact sheets, permit including effluent limitations, special conditions, comments received, and other documents are available for inspection and may be copied at a cost of 5 cents per page at the Ohio Environmental Protection Agency at the address shown on page one of this public notice any time between the hours of 8 a.m. and 4:30 p.m., Monday through Friday. Copies of the public notice are available at no charge at the same address.

Mailing lists are maintained for persons or groups who desire to receive public notice for all applications in the state or for certain geographical areas. Persons or groups may also request copies of fact sheets, applications, or other documents pertaining to specific applications. Persons or groups may have their names put on such a list by making a written request to the agency at the address shown above.

National Pollutant Discharge Elimination System (NPDES) Permit Program

# FACT SHEET

Regarding an NPDES Permit To Discharge to Waters of the State of Ohio
for **the Orion Power Midwest, L.P. – Avon Lake Power Plant**

Public Notice No.: 11-03-062
Public Notice Date: March 25, 2011
Comment Period Ends: April 25, 2011

OEPA Permit No.: **3IB00002*KD**
Application No.: (OH #) **OH0001112**

Name and Address of Applicant:

**Orion Power Midwest, L.P.**
**121 Champion Way, Suite 200**
**Canonsburg, Pennsylvania 15317**

Name and Address of Facility Where Discharge Occurs:

**Avon Lake Power Plant**
**33570 Lake Road**
**Avon Lake, Ohio 44012**
**Lorain County**

Receiving Water: **Lake Erie**

Subsequent Stream Network: --

## Introduction

Development of a Fact Sheet for NPDES permits is required by Title 40 of the Code of Federal Regulations, Section 124.8 and 124.56. This document fulfills the requirements established in those regulations by providing the information necessary to inform the public of actions proposed by the Ohio Environmental Protection Agency, as well as the methods by which the public can participate in the process of finalizing those actions.

This Fact Sheet is prepared in order to document the technical basis and risk management decisions that are considered in the determination of water quality based NPDES Permit effluent limitations. The technical basis for the Fact Sheet may consist of evaluations of promulgated effluent guidelines and other treatment-technology based standards, existing effluent quality, instream biological, chemical and physical conditions, and the allocations of pollutants to meet Ohio Water Quality Standards. This Fact Sheet details the discretionary decision-making process empowered to the director by the Clean Water Act and Ohio Water Pollution Control Law (ORC 6111). Decisions to award variances to Water Quality Standards or promulgated effluent guidelines for economic or technological reasons will also be justified in the Fact Sheet where necessary.

Effluent limits based on available treatment technologies are required by Section 301(b) of the Clean Water Act. Many of these have already been established by U.S. EPA in the effluent guideline regulations (a.k.a. categorical regulations) for industry categories in 40 CFR Parts 405-499. Technology-based regulations for publicly-owned treatment works are listed in the Secondary Treatment Regulations (40 CFR Part 133). If regulations have not been established for a category of dischargers, the director may establish technology-based limits based on best professional judgment (BPJ).

Ohio EPA reviews the need for water-quality-based limits on a pollutant-by-pollutant basis. Wasteload allocations are used to develop these limits based on the pollutants that have been detected in the discharge, and the receiving water's assimilative capacity. The assimilative capacity depends on the flow in the water receiving the discharge, and the concentration of the pollutant upstream. The greater the upstream flow, and the lower the upstream concentration, the greater the assimilative capacity is. Assimilative capacity may represent dilution (as in allocations for metals), or it may also incorporate the break-down of pollutants in the receiving water (as in allocations for oxygen-demanding materials).

The need for water-quality-based limits is determined by comparing the wasteload allocation for a pollutant to a measure of the effluent quality. The measure of effluent quality is called PEQ - Projected Effluent Quality. This is a statistical measure of the average and maximum effluent values for a pollutant. As with any statistical method, the more data that exists for a given pollutant, the more likely that PEQ will match the actual observed data. If there is a small data set for a given pollutant, the highest measured value is multiplied by a statistical factor to obtain a PEQ; for example if only one sample exists, the factor is 6.2, for two samples - 3.8, for three samples - 3.0. The factors continue to decline as samples sizes increase. These factors are intended to account for effluent variability, but if the pollutant concentrations are fairly constant, these factors may make PEQ appear larger than it would be shown to be if more sample results existed.

## Summary of Proposed Permit Conditions

Monitoring requirements for water temperature, total residual oxidants (TRO), pH, flow rate, total residual chlorine (TRC), and chlorination/bromination duration is proposed to continue at outfall 001. In addition, limits for TRO, TRC, and chlorination/bromination duration are also proposed to remain in the permit. Monitoring requirements for thallium have been removed.

For outfall 002, monitoring requirements are proposed to continue from the existing permit for total suspended solids (TSS), oil and grease, copper, flow rate, mercury, and pH. Limits are proposed to continue for TSS, oil and grease, and pH. Monitoring for chlorine has been added to the draft permit. Based upon an application submitted by the permittee, the permit includes a variance-based limit for mercury at outfall 002 for the average criterion. Three new parameters have been added to the effluent table for this outfall to report exceedances of pH limits.

At outfall 004, all the existing monitoring requirements and limits are proposed to continue with the exception of selenium and toxicity which have been removed. Permit requirements at other monitoring stations are proposed to continue from the existing permit. In addition, the permittee must comply with the requirements of Section 316(b) of the Clean Water Act and any rules promulgated to implement Section 316(b) regarding the use of the best technology available to minimize adverse environmental impact (i.e., fish impingement and entrainment). Finally, Part II of the permit includes a requirement to install signs at all outfalls discharging to Lake Erie, and also a requirement to develop notification procedures with regard to the City of Avon Lake since their public water supply intakes are within 3000 feet of Avon Lake Power Plant discharge locations.

This permit renewal is proposed for a term of approximately **four and one-half years**, expiring on **July 31, 2015**. This schedule will allow the Avon Lake Power Plant permit to be on a similar schedule with the other facilities within the same watershed basin.

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## Procedures for Participation in the Formulation of Final Determinations

The draft action shall be issued as a final action unless the Director revises the draft after consideration of the record of a public meeting or written comments, or upon disapproval by the Administrator of the U.S. Environmental Protection Agency.

Within thirty days of the date of the Public Notice, any person may request or petition for a public meeting for presentation of evidence, statements or opinions. The purpose of the public meeting is to obtain additional evidence. Statements concerning the issues raised by the party requesting the meeting are invited. Evidence may be presented by the applicant, the state, and other parties, and following presentation of such evidence other interested persons may present testimony of facts or statements of opinion.

Requests for public meetings shall be in writing and shall state the action of the Director objected to, the questions to be considered, and the reasons the action is contested. Such requests should be addressed to:

**Legal Records Section**
**Ohio Environmental Protection Agency**
**Lazarus Government Center**
**P.O. Box 1049**
**Columbus, Ohio 43216-1049**

Interested persons are invited to submit written comments upon the discharge permit. Comments should be submitted in person or by mail no later than 30 days after the date of this Public Notice. Deliver or mail all comments to:

**Ohio Environmental Protection Agency**
**Attention: Division of Surface Water**
**Permits and Compliance Section**
**Lazarus Government Center**
**P.O. Box 1049**
**Columbus, Ohio 43216-1049**

The OEPA permit number and Public Notice numbers should appear on each page of any submitted comments. All comments received no later than 30 days after the date of the Public Notice will be considered.

Citizens may conduct file reviews regarding specific companies or sites. Appointments are necessary to conduct file reviews because requests to review files have increased dramatically in recent years. The first 250 pages copied are free. For requests to copy more than 250 pages, there is a five-cent charge for each page copied. Payment is required by check or money order, made payable to Treasurer State of Ohio.

For additional information about this fact sheet or the draft permit, contact Mike Stevens [phone: (330) 963-1143; email: mike.stevens@epa.state.oh.us ] in Ohio EPA's Northeast District Office, or Mike McCullough [phone: (614) 644-4824; email: mike.mccullough@epa.state.oh.us ] in Ohio EPA's Central Office.

## Location of Discharge/Receiving Water Use Classification

The Avon Lake Power Plant owned by Orion Power Midwest discharges directly to Lake Erie through outfalls 001, 002, and 004. This segment of Lake Erie is described by Ohio EPA River Code 24-500, U.S. EPA River Reach # NA, and the Erie-Ontario Lake Plain (EOLP) Ecoregion. Lake Erie is presently designated for the following uses: Exceptional Warmwater Habitat (EWH), Superior High Quality Water (SHQW), Public Water Supply (PWS), Agricultural Water Supply (AWS), Industrial Water Supply (IWS), and Bathing Waters (BW). The approximate location of this facility is shown in Figure 1.

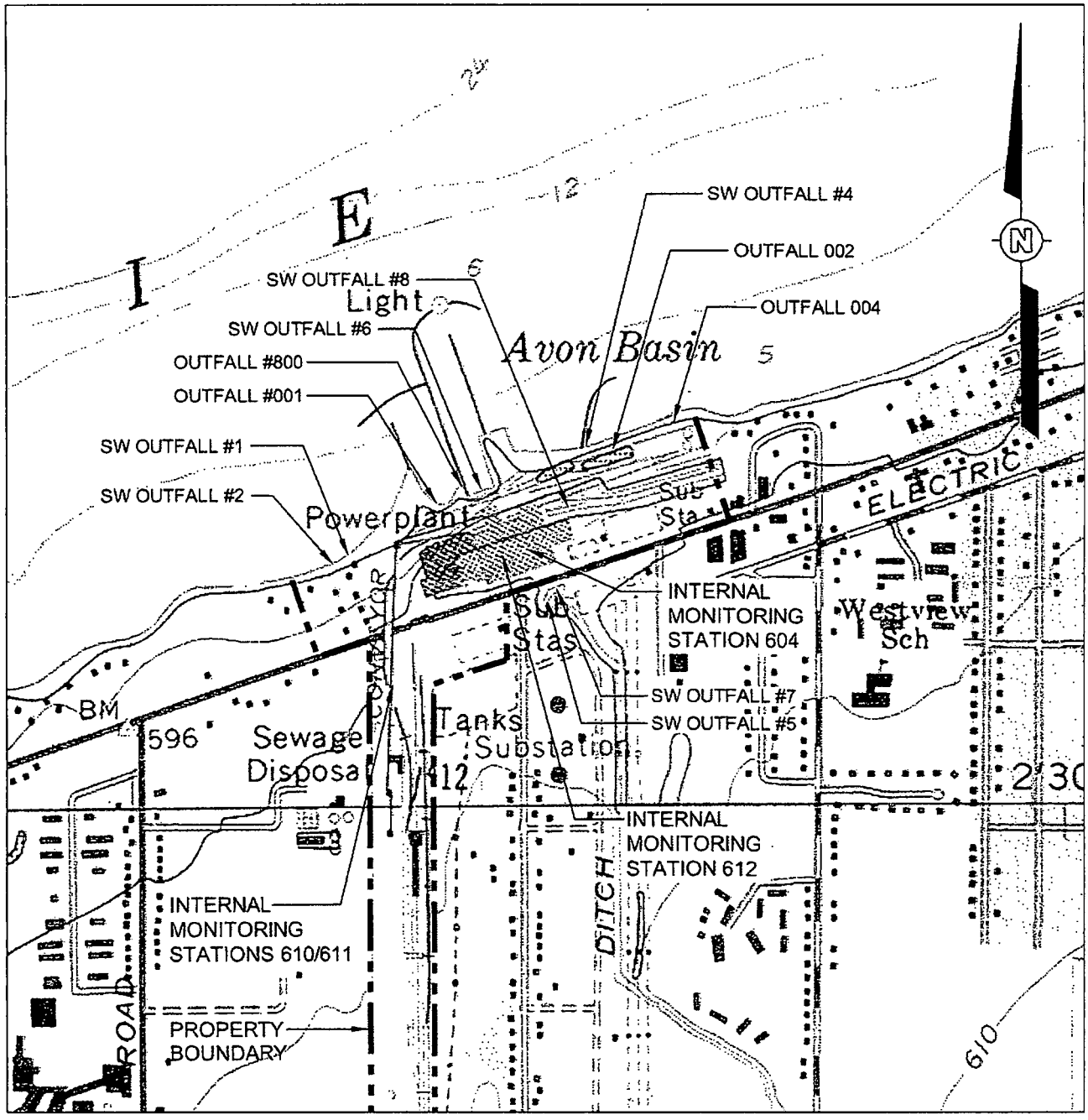



Figure 1. Location of Avon Lake Power Plant

Use designations define the goals and expectations for a waterbody. These goals are set for aquatic life protection, recreation use and water supply use, and are defined in the Ohio Water Quality Standards, or the Ohio Administrative Code (OAC 3745-1-07). The use designations for individual waterbodies are listed in rules -08 through -32 of the OAC. Once the goals are set, numeric water quality standards are developed to protect these uses; higher quality uses typically have more protective water quality criteria.

Use designations for aquatic life protection include habitats for coldwater fish and macroinvertebrates, warmwater aquatic life and waters with exceptional communities of warmwater organisms. These uses all meet the goals of the federal Clean Water Act. Ohio Water Quality Standards (WQS) also include aquatic life use designations for waterbodies which can not meet the Clean Water Act goals because of human-caused conditions that can not be remedied without causing fundamental changes to land use and widespread economic impact. The dredging and clearing of some small streams to support agricultural or urban drainage is the most common of these conditions. These streams are given Modified Warmwater or Limited Resource Water designations.

Recreation uses are defined by the depth of the waterbody and the potential for wading or swimming. Uses are defined for bathing waters, swimming/canoeing (Primary Contact) and wading only (Secondary Contact - generally waters too shallow for swimming or canoeing). Water supply uses are defined by the actual or potential use of the waterbody. Public Water Supply designations apply near existing water intakes so that waters are safe to drink with standard treatment. Most other waters are designated for agricultural and industrial water supply.

## Facility Description

The Avon Lake Plant is a coal-fired steam-electric generating station. This facility is involved in the generation, transmission, and distribution of electric power. The daily production rate is approximately 800 megawatts of electricity.

The Avon Lake Plant's processes generate wastewaters which are regulated by the federal effluent guidelines (FEGs) listed in 40 CRF Part 423, Steam Electric Power Generating Point Source Category. The process operations at this facility are also defined by the standard industrial classification (SIC) category 4911 - Electric Services.

## Discharges from the Avon Lake Power Plant

Outfall 001 discharges directly to Lake Erie at the rate of approximately 387 million gallons per day (MGD) based upon the permit renewal application. The wastewater flowing from this outfall consists of the once-through condenser cooling water and boiler blowdown.

**Table 1. Description of Avon Lake Power Plant Outfalls**

| Outfall # | Type of Wastewater | Treatment System Used | Discharge Point | Ave. Discharge (in MGD)* |
|---|---|---|---|---|
| 001 | Cooling water discharge, boiler blowdown, heat exchanger | - Disinfection | Lake Erie | 387 |
| 002 | Ash transport water, coal pile runoff, metal cleaning | - Sedimentation<br>- Chemical precipitation<br>- Gravity filtration | Lake Erie | 0.94 |
| 004 | Low volume waste system, oily water separator, floor drains | - Sedimentation<br>- Neutralization<br>- Gravity filtration<br>- Disinfection | Lake Erie | 1.17 |

*Flow rates are based upon the NPDES permit renewal application.

Outfall 002 is designed to discharge the ash transport water from the ash settling basin. This basin receives fly ash and bottom ash as well as wastewater from the metal cleaning processes and coal pile run-off. Wastewater is treated by sedimentation and gravity filtration prior to being discharged into Lake Erie. The average discharge from this outfall is 0.94 MGD according to the NPDES application.

Oily wastewater which is a constituent of the low-volume waste system is discharged through outfall 004. Prior to being discharged to Lake Erie, this wastewater is treated by sedimentation and gravity filtration. The average daily flow at this outfall has been 1.17 MGD based upon the NPDES renewal application.

Several internal outfalls contribute flow to outfalls 001 and 002. Boiler blowdown from internal outfall 604 and non-contact cooling water from the unit #9 heat exchanger (internal outfall 612) flow through external outfall 001. In addition to coal pile runoff, metal

**Table 2. Flows for Outfalls 001, 002, and 004**

| Year | Flow in MGD | | |
|---|---|---|---|
| | 50th Percentile | 95th Percentile | Maximum |
| *Outfall 001* | | | |
| 2005 | 379. | 599. | 599. |
| 2006 | 379. | 599. | 599. |
| 2007 | 391. | 599. | 599. |
| 2008 | 379. | 548. | 599. |
| 2009 | 317. | 478. | 599. |
| 2010 | 379. | 599. | 599. |
| Overall | 379. | 599. | 599. |
| *Outfall 002* | | | |
| 2005 | 0.91 | 2.31 | 4.5 |
| 2006 | 1.06 | 1.39 | 1.96 |
| 2007 | 0.77 | 1.35 | 1.98 |
| 2008 | 0.83 | 1.24 | 9.88 |
| 2009 | 0.92 | 1.45 | 6.7 |
| 2010 | 0.84 | 1.28 | 1.82 |
| Overall | 0.89 | 1.4 | 9.88 |
| *Outfall 004* | | | |
| 2005 | 1.08 | 2.43 | 2.76 |
| 2006 | 1.21 | 1.70 | 2.15 |
| 2007 | 1.24 | 1.87 | 2.42 |
| 2008 | 1.08 | 1.78 | 2.14 |
| 2009 | 1.03 | 1.49 | 2.23 |
| 2010 | 0.76 | 1.36 | 1.85 |
| Overall | 1.07 | 1.9 | 2.76 |

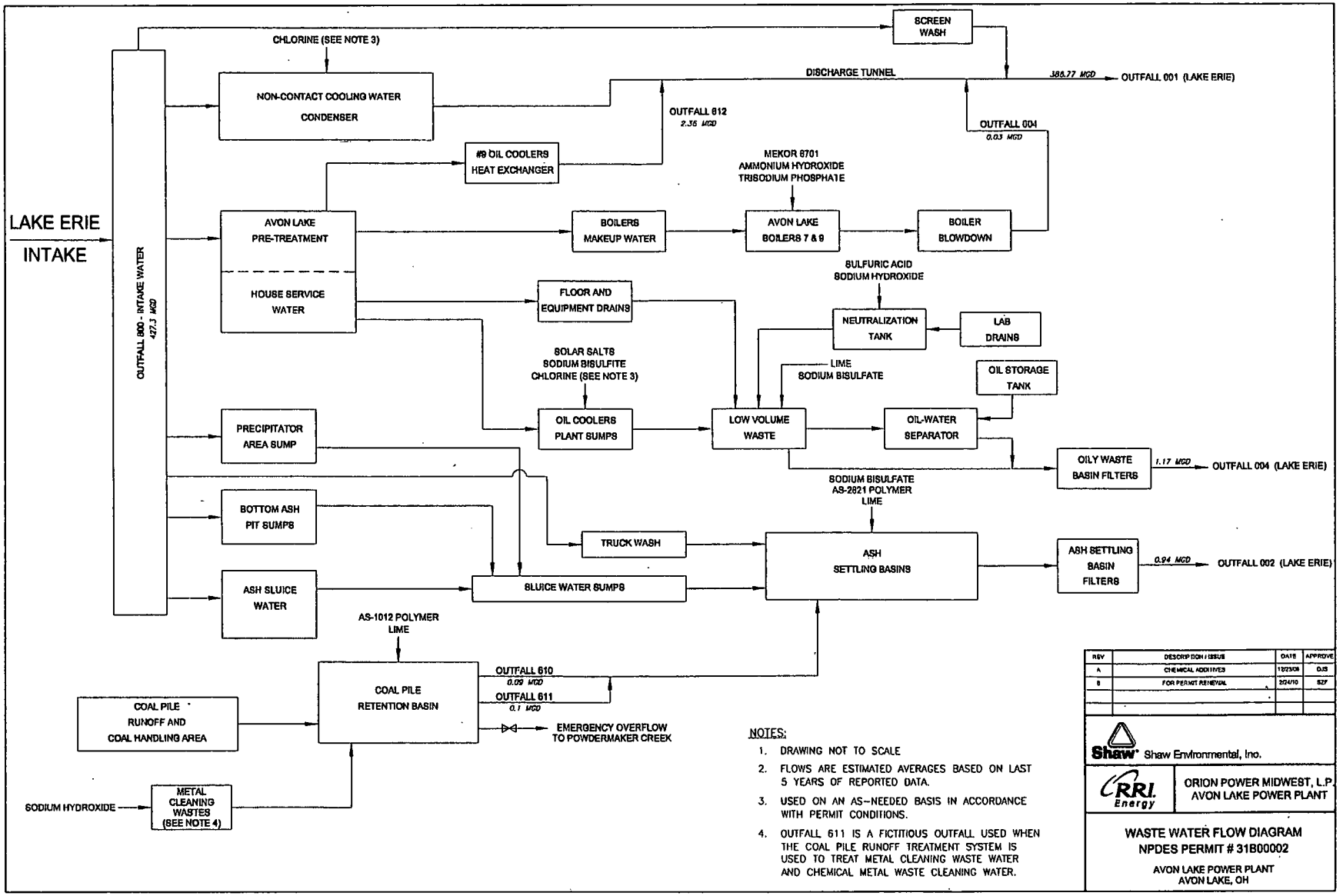



Figure 2. Wastewater Flow Diagram

cleaning wastewater is discharged into the coal pile retention basin and is treated by neutralization, chemical precipitation, and pressure filtration prior to flowing through internal monitoring station 610. Flow from internal station 610 enters the ash settling basin for ultimate discharge through external outfall 002.

The Avon Lake Plant obtains its water for cooling purposes from an intake located in Lake Erie. This water is disinfected with chlorine prior to its use in the plant. The NPDES renewal application states that the average daily flow value for intake station 800 is 427 MGD. See Figure 2 for a flow diagram of the facility outfalls and treatment systems.

**Table 3. Reported Effluent Limit Violations at Avon Lake Power Plant: 2005 – July 2010**

| Parameter | Concentration | Loadings |
|---|---|---|
| *Outfall 002* | | |
| Total suspended solids | 2 | -- |
| pH, Minimum | 8 | |
| pH, Maximum | 8 | |
| *Outfall 004* | | |
| pH, Minimum | 6 | |
| pH, Maximum | 8 | |
| *Outfall 604* | | |
| Total suspended solids | -- | 1 |
| *Outfall 610* | | |
| Total suspended solids | 2 | 10 |
| *Outfall 611* | | |
| Total suspended solids | 2 | 18 |

The wastewater discharge flow rates from 2005 through July 2010 for outfalls 001, 002, and 004 are shown in Table 2 on page 8. Reported 50$^{th}$ percentile flow rates for these outfalls have remained constant throughout this period. The 95$^{th}$ percentile discharge amounts have shown somewhat more variability.

From January 2005 through July 2010, the Avon Lake Power Plant has reported a number of sample results which were numeric violations of permit limits. (See Table 3.) Many of these violations involved the limits for total suspended solids (TSS) at internal stations 604, 610, and 611. However, numerous pH violations were reported as well at outfalls 002 and 004. The majority of the TSS violations occurred in 2005 and 2006, while pH violations occurred throughout the time period.

## Assessment of Impact on Receiving Waters

Recent biological data for Lake Erie is not available to assess the water quality impact of permitted discharges from the Avon Lake Power Plant. Figure 3 on page 11 shows the assessment of water quality based upon information in Ohio EPA's *2010 Integrated Report*.

## Impingement and Entrainment

In order to fulfill requirements under federal regulations adopted in 2004 associated with large, existing power plants[1], the Avon Lake Power Plant conducted sampling in 2006 at their cooling water intake structure (CWIS) to determine the number of fish impinged on the screens and entrained through the facility. Based upon this study, Orion Power estimated impingement to be approximately 12.2 million fish using actual flows rates to extrapolate to an annualized value. The annual rate of impingement is 21.9 million when the design flow rate (or the maximum withdrawal flow rate for the facility which is possible) is used for extrapolation. The majority of the impinged fish were identified as emerald shiner and gizzard shad.

[1] These regulations, which were adopted to implement Section 316(b) of the Clean Water Act, were suspended by U.S. EPA in 2007 after a federal court overturned significant provisions. States have been directed by U.S. EPA to use best professional judgement (BPJ) to implement the requirements of Section 316(b) in the absence of federal regulations.

Based upon actual withdrawal flow rates, the annual estimates for entrainment were approximately 25.8 million larval and juvenile-size fish. (No fish eggs were reported for the entrainment sampling.) Annual entrainment is estimated at 33 million when extrapolation is done using the design flow. Emerald shiner, yellow perch, and gizzard shad characterized the dominant species which were entrained at the Avon Lake Power Plant during 2006.

The cooling water intake structure (CWIS) at the Avon Lake Power Plant includes vertical traveling screens for nine of ten operating intake bays. The screens consist of 3/8 inch openings, and through-screen intake flow velocity is 1.5 feet per second at maximum capacity.

Ohio EPA has determined that the current intake structure does not represent "best technology available" (or BTA) as required by the Clean Water Act. However, at this time, Ohio EPA has decided to defer imposing a solution for meeting BTA for this facility, awaiting: 1) further information from the permittee regarding technical and economic analyses of possible technological and/or operational changes to reduce impingement and entrainment (I/E); 2) publication of draft federal rules addressing cooling water intake structures applicable to large power plants; and 3) possible comments and suggestions from U.S EPA for reducing I/E.

## Assessment Unit Name: Lake Erie Central Basin Shoreline

Monitoring Scheduled: 2012
TMDL Scheduled: 2015

### Aquatic Life Use Assessment

Reporting Category: 5
Sampling Years: 1999, 2000, 2002
Total Shoreline Miles: 132.4
Shoreline Miles Monitored: 72.7
Sites Monitored: 17
Sites Full Attainment: 3 (17.7%)
Sites Partial Attainment: 4 (23.5%)
Sites Non Attainment: 10 (58.8%)

***Causes of Impairment***:

- nutrients
- siltation
- direct habitat alterations
- exotic species

***Sources of Impairment***:

- municipal point sources
- combined sewer overflows
- non-irrigated crop production
- urban runoff/storm sewers
- streambank modification/destabilization
- habitat modifications other than hydromodification

Comments: No nearshore Lake Erie monitoring by the Ohio EPA has occurred since 2002.

### Recreation Use Assessment

Reporting Category: 5

### Public Drinking Water Supply Assessment

Reporting Category: 1
Nitrate Watch List: No
Pesticide Watch List: No

### Fish Tissue Assessment

Reporting Category: 5x

Figure 3. Central Basin of Lake Erie Water Quality Assessment (*Ohio EPA 2010 Integrated Report*)

## Development of Water Quality-Based Effluent Limits

Determining appropriate effluent concentrations is a multiple-step process in which parameters are identified as likely to be discharged by a facility, evaluated with respect to Ohio water quality criteria, and examined to determine the likelihood that the existing effluent could violate the calculated limits. Although the locations of the external outfalls for the Avon Lake Plant are relatively near one another, the discharges have not been modeled interactively; given the methodology which must be used to develop waste load allocations for a lake discharger, considering these outfalls to be interactive would not change the parameter assessment results. (See the section below entitled, "Waste Load Allocation".)

### *Parameter Selection*

Effluent data for the Avon Lake Power Plant were used to determine what parameters should undergo wasteload allocation. The sources of effluent data are as follows:

| | |
|---|---|
| Self-monitoring data (Discharge Monitoring Reports) | January 2005 - August 2010 |
| NPDES permit renewal application | 2010 |

The effluent data were checked for outliers and one value for copper (286 ug/l) was removed in the dataset for outfall 004. The remaining data was evaluated statistically, and Projected Effluent Quality (PEQ) values were calculated for each pollutant. $PEQ_{avg}$ values represent the 95$^{th}$ percentile of monthly average data, and $PEQ_{max}$ values represent the 95$^{th}$ percentile of all data points. The average and maximum projected effluent quality (PEQ) values are presented in Table 6. For a summary of the screening results, refer to the parameter groupings on pages 30 through 32.

PEQ values are used according to Ohio rules to compare to applicable WQS and allowable WLA values for each pollutant evaluated. Initially, PEQ values are compared to the applicable average and maximum WQS. If both PEQ values are less than 25 percent of the applicable WQS, the parameter does not have the reasonable potential to cause or contribute to exceedances of WQS, and no wasteload allocation is done for that parameter. If either the $PEQ_{avg}$ or $PEQ_{max}$ is greater than 25 percent of the applicable WQS, a wasteload allocation is conducted to determine whether the parameter exhibits reasonable potential (and needs to be limited) or if monitoring is required.

### *Wasteload Allocation*

For those parameters that require a wasteload allocation (WLA), the results are based on the uses assigned to the receiving waterbody in OAC 3745-1. Dischargers are allocated pollutant loadings/concentrations based on the Ohio Water Quality Standards (WQS - OAC 3745-1). Most pollutants are allocated by a mass-balance method because they do not degrade in the receiving water. Wasteload allocations for average criteria using this method are done using the following general equation for direct dischargers to Lake Erie: Discharger WLA = (11 x WQS) - (10 x background concentration).

For direct dischargers to lakes, the waste load allocations for maximum criteria (or Outside Mixing Zone Maximum, OMZM) are set equal to the Inside Mixing Zone Maximum criteria. The values for the OMZM are left blank in Table 8 to indicate that any limits based upon a maximum WLA are actually represented by the Inside Mixing Zone Maximum criteria. The wasteload allocation values in Table 9 would allow the Avon Lake Station to maintain all applicable water quality criteria. Allocations cannot exceed the Inside Mixing Zone Maximum criteria.

The data used in the WLA are listed in Tables 7 and 8. The wasteload allocation results to maintain all applicable criteria are presented in Table 9.

***Reasonable Potential***

After appropriate effluent limits are calculated by wasteload allocation, the lowest most restrictive average and maximum values are selected from Table 8 and are referred to as Preliminary Effluent Limits ($PEL_{avg}$ and $PEL_{max}$ respectively). The reasonable potential of the discharger to exceed the wasteload allocation (PEL values) is determined by comparing the $PEQ_{avg}$ (Table 5) to the $PEL_{avg}$ and the $PEQ_{max}$ to the $PEL_{max}$ for each parameter. Based on this comparison, each parameter is placed in a defined "group". Parameters that do not have a water quality standard (WQS) or do not require a WLA based on the initial screening are assigned to either group 1 or 2. Parameters are assigned to group 3, 4, or 5 depending on how close the PEQ value is to the allocated value or PEL. The groupings listed in Tables 9-001 and 9-003 reflect the reasonable potential hazard assessment done according to WLA procedures.

***Whole Effluent Toxicity WLA***

Whole effluent toxicity or "WET" is the total toxic effect of an effluent on aquatic life measured directly with a toxicity test. Acute WET measures short term effects of the effluent while chronic WET measures longer term and potentially more subtle effects of the effluent.

Water Quality Standards for WET are expressed in Ohio's narrative "free from" WQS rule (OAC 3745-1-04(D)). These "free froms" are translated into toxicity units (TUs) by the associated WQS Implementation Rule (OAC 3745-2-09). Wasteload allocations can then be calculated using TUs as if they were water quality criteria.

The wasteload allocation calculations for WET are similar to those for aquatic life criteria - using the chronic toxicity unit ($TU_c$) and 7Q10 flow for the average and the acute toxicity unit ($TU_a$) and 1Q10 flow for the maximum for flowing streams. However, in accordance with the Rule 3745-2-09 of the OAC, the AET for acute toxicity is set equal to 1.0 $TU_a$ for lake dischargers. For the Avon Lake Power Plant, the wasteload allocations are 1.0 $TU_a$ and 11.0 $TU_c$ for outfalls 001, 002, and 004.

## Effluent Limits/Hazard Management Decisions

The final effluent limits are determined by evaluating the groupings in conjunction with other applicable rules and regulations. Tables 11-001, 11-002, 11-004, 11-604, 11-610, 11-611 and 11-612 show the draft NPDES permit limits and monitoring requirements for the Avon Lake Power Plant.

Federal and State laws/regulation require that dischargers meet both treatment-technology-based limits and any more stringent standards needed to comply with state WQS. Permit limits are based on the more restrictive of the two. Treatment-technology-based limits for the Avon Lake Power Plant, found in 40 CFR Part 423, Steam Electric Power Generating Point Source Category, are based on the milligrams of pollutant allowed to be discharged per liter. (See Attachment A for technology-based limits applicable to the Avon Lake Power Plant.)

The limits and monitoring requirements for each outfall are discussed in detail below and the corresponding "Final Effluent Limits" table is referenced.

## Outfall 001: Table 11-001

The Ohio EPA risk assessment (Table 10-001) places total residual chlorine in Group 5, and recommends limits to protect water quality. However, the maximum daily limit of 0.038 mg/l for chlorine has not been included in the permit since the Avon Lake Power Plant restricts the use of chlorine at this outfall to less than two hours per day. (See the discussion below.)

Monitoring for water temperature, total residual oxidants, flow rate, total residual chlorine, pH, and duration of chlorination/bromination have been continued in the draft permit. Since the discharge from this outfall is non-contact cooling water, it is important to monitor the temperature of the wastewater as it enters Lake Erie. Total residual chlorine includes a limit of 0.2 milligrams per liter (mg/l), which allows chlorination at this outfall for not more than two hours each day, and is based upon the Federal Effluent Guidelines for steam-electric power plants. The limit of 0.05 mg/l for total residual oxidants, which is based upon best professional judgement regarding the relative toxicity of bromine, allows the Avon Lake Power Plant to discharge bromine, or bromine and chlorine compounds for not more than two hours per day. Limits for pH are also proposed to continue.

Figure 4 shows that the discharge temperature at outfall 001 ranges from approximately 30 °F to slightly more than 100 °F. The maximum differential between the intake and outfall temperatures is approximately 25 °F. Based upon this information, Ohio EPA believes that reasonable potential for temperature is not triggered at outfall 001 by this discharge.

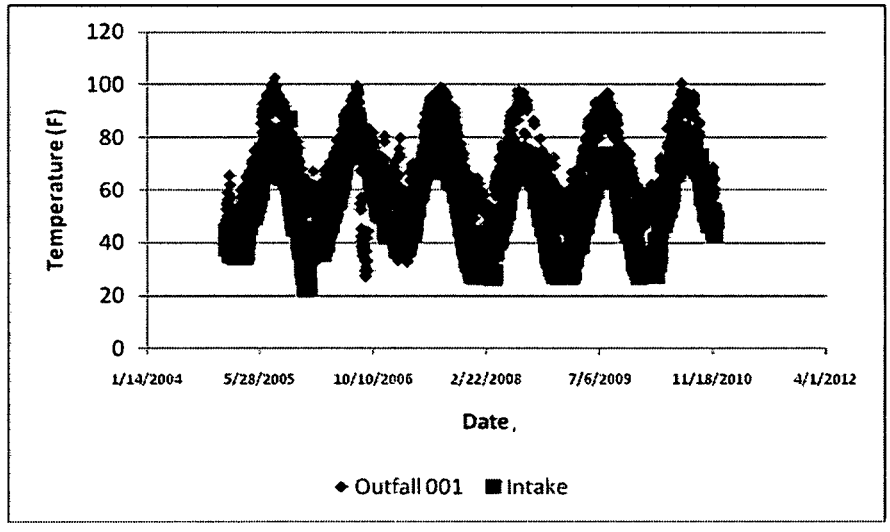



Figure 4. Temperature: Intake vs. Outfall 001 (2005 – 2010)

Several additional parameters with water quality criteria (aluminum, ammonia, barium, chromium, copper, iron, manganese, nickel, and titanium) were detected in the effluent from outfall 001, but were not allocated since the concentration of the pollutant was less than 110 percent of its concentration in the intake water.[2] This determination has been made in accordance with Rule 3745-2-06 of the Ohio Administrative Code, and has been based upon the data reported in the NPDES permit renewal application.

## Outfall 002: Table 11-002

***Total Residual Chlorine***. The Ohio EPA risk assessment (Table 10-002) places total residual chlorine in Group 5, and recommends limits to protect water quality. However, this assessment is based upon only one sample which may not be representative of effluent quality. Based on the discretion which is

[2] A threshold of 110 percent has been used in order to allow for possible sampling and/or analytical error.

granted to the Director under rule 3745-33-07(A) of the Ohio Administrative Code, monitoring only has been proposed for this parameter.

***Mercury***. Mercury has also been placed in Group 5, and in anticipation of receiving a limit for this pollutant, the permittee has applied for coverage under the general mercury variance, Rule 3745-33-07(D)(10) of the Ohio Administrative Code. Based on the results of low-level mercury monitoring, the permittee has determined that its wastewater treatment plant cannot meet the 30-day average water quality-based effluent limit (WQBEL) of 1.3 nanograms per liter (ng/l). However, the permittee believes that the plant will be able to achieve an annual average mercury effluent concentration of 12 ng/l. The variance application also demonstrated to the satisfaction of Ohio EPA that there is no readily apparent means of complying with the WQBEL without constructing prohibitively expensive end-of-pipe controls for mercury. Based on these factors, the permittee is eligible for coverage under the general mercury variance.

Ohio EPA has reviewed the mercury variance application and has determined that it meets the requirements of the Ohio Administrative Code. Items K and L in Part II of the draft NPDES permit list the provisions of the mercury variance, and includes the following requirements:

- A variance-based monthly average effluent limit of 8.0 ng/l, which was developed from sampling data submitted by the permittee;
- A requirement that the permittee make reasonable progress to meet the water-quality-based effluent limit for mercury by implementing the plan of study, which has been developed as part of the Pollutant Minimization Program (PMP);
- Low-level mercury monitoring of the plant's influent and effluent;
- A requirement that the annual average mercury effluent concentration is less than or equal to 12 ng/l as specified in the plan of study;
- A summary of the elements of the plan of study;
- A requirement to submit an annual report on implementation of the PMP; and
- A requirement for submittal of a certification stating that all permit conditions related to implementing the plan of study and the PMP have been satisfied, but that compliance with the monthly average water quality-based effluent limit for mercury has not been achieved.

The permit also includes a new monitoring station (Station 601) to record the mercury concentration of the influent of the wastewater to the ash settling basin prior to any treatment. Mercury samples for station 601 must be collected one detention time prior to samples collected for outfall 002 in order to provide data which is appropriate for determining the mercury removal rate in the ash settling basin. The Avon Lake Power Plant is required to continue using EPA Method 1631 for mercury analysis due to the phase-out of the use of mixing zones for development of wasteload allocations for pollutants such as mercury.[3]

***Copper.*** The Ohio EPA risk assessment places copper in group 4. This placement as well as the data in Tables 5 and 6 indicate that this pollutant should not pose environmental hazards and limits are not necessary to protect water quality. Monitoring for Group 4 parameters is required in accordance with the Ohio Administrative Code and has been included in the draft permit.

[3] As of November 15, 2010, the use of mixing zones to determine the waste load allocation for bioaccumulative chemicals of concern (BCCs) was no longer allowed. This means that limits for BCCs after November 2010 must meet water quality standards with no allowances for dilution. Since mercury is considered a BCC, discharges must comply with water quality standards at that time.

***pH.*** Three new parameters have been added to the effluent table for this outfall to report exceedances of pH limits. The addition of these parameters replaces the language in Part II of the permit for reporting pH exceedances.

***Total Suspended Solids and Oil & Grease.*** Limits for total suspended solids (TSS) and oil & grease at this outfall have been continued from the existing permit, and are based upon the Federal Effluent Guidelines for steam-electric generating stations. Loading limits are based upon a flow rate of 3.38 MGD.

**Outfall 004: Table 11-004**

***Total Residual Chlorine and Total Residual Oxidants***. The Ohio EPA risk assessment places total residual chlorine in Group 5. This placement as well as the data in Tables 5 and 6 indicate that limits are necessary to protect water quality. The parameter assessment for this pollutant is based upon only one sample which would not normally result in a permit limit. However, limits for both total residual chlorine and total residual oxidants were included in the existing permit to allow the discharge of additives which contain chlorine and/or bromine, and these limits are proposed to continue in this permit.

***Copper***. The Ohio EPA risk assessment places copper in group 4. This placement as well as the data in Tables 5 and 6 indicate that this pollutant should not pose environmental hazards and limits are not necessary to protect water quality. Monitoring for Group 4 parameters is required in accordance with the Ohio Administrative Code and has been included in the draft permit.

***Total Suspended Solids, Oil & Grease, pH, and Flow Rate***. Limits for total suspended solids (TSS), oil and grease, and pH have been continued at this outfall from the existing permit, and are based upon the Federal Effluent Guidelines for steam-electric generating stations. Three new parameters have been added to the effluent table for this outfall to report exceedances of pH limits. The addition of these parameters replaces the language in Part II of the permit for reporting pH exceedances.
Loading limits for TSS and oil and grease are based upon a flow rate of 3.35 MGD. Flow rate monitoring is also required.

**Outfall 604: Table 11-604**

The draft permit includes limits for total suspended solids and oil and grease, and monitoring for pH at this outfall which discharges boiler blowdown. These requirements are based upon the Federal Effluent Guidelines. The requirements for this outfall are proposed to continue from the existing permit.

**Outfall 610: Table 11-610**

This outfall discharges wastewater from coal-pile run-off. The limits for total suspended solids and the monitoring requirements for pH are based upon the Federal Effluent Guidelines. The requirements for this outfall are proposed to continue from the existing permit.

**Outfall 611: Table 11-611**

This is a fictitious outfall which is used only when the coal-pile run-off treatment system is used to treat the metal cleaning wastes. The requirements for this outfall are proposed to continue from the existing

permit. However, in order to be consistent with the Federal Effluent Guidelines, limits have also been added to this table for iron and copper.

**Outfall 612: Table 11-612**

This outfall discharges wastewater from the heat exchanger for unit #9. Based upon best engineering judgement, the monitoring requirements for this outfall are proposed to continue from the existing permit.

## Impingement/Entrainment Reductions

The permit includes a condition in Part II requiring the Avon Lake Power Plant to comply with Section 316(b) of the Clean Water Act and any rules promulgated to implement Section 316(b).

## Other Requirements

Parts IV, V, and VI have been included in the permit in order for the facility to address all storm water management issues at the site. Also, a requirement for placement of signage at all outfall locations discharging into Lake Erie has been added to Part II of the permit in accordance with rule 3745-33-08(A) of the Ohio Administrative Code.

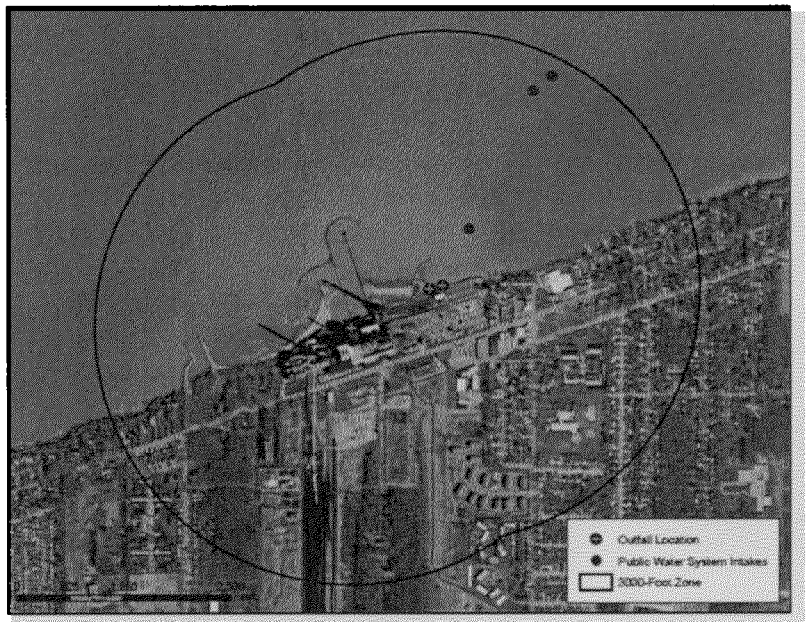


Figure 5. Avon Lake Power Plant Outfalls vs. Water Supply Intakes

An addition to rule 3745-33-08 of the Ohio Administrative Code requires that permittees discharging wastewater into a lake within 3000 feet of a public water supply intake, must develop spill (or bypass) notification procedures in conjunction with the public water supply operator. Since the City of Avon Lake operates three public water supply intakes less than 3000 feet from the power plant outfalls (see Figure , Part II, Item O of the draft permit requires the development of notification procedures within six months after the effective date of the permit.

## Whole Effluent Toxicity Reasonable Potential

During the term of the existing permit, the Avon Lake Power Plant conducted 16 acute toxicity tests using the effluent from outfall 004 using *Ceriodaphnia dubia* and fathead minnows for the test species. Only one test was reported with a value above 0.2 $TU_a$ (0.7 $TU_a$ for fathead minnows on June 20, 2007). Since the test on June 20, 2007 may not be representative of effluent quality, Ohio EPA has determined that reasonable potential for acute toxicity does not exist at this outfall, and additional toxicity monitoring is not recommended at this time.

**Table 4. Effluent Characterization Based Upon Permit Renewal Application**

| Parameter | No. of Samples | Concentration |
|---|---|---|
| | | |
| ***Outfall 001*** | | |
| Aluminum (ug/l) | 1 | 423. |
| Ammonia (mg/l) | 1 | 0.119 |
| Barium (ug/l) | 1 | 23.2 |
| Biochemical Oxygen Demand (mg/l) | 1 | 1.0 |
| Boron (ug/l) | 1 | 64.3 |
| Bromide (mg/l) | 1 | 0.017 |
| Chemical Oxygen Demand (mg/l) | 1 | 11.5 |
| Chlorine, Total Residual (mg/l) | 1 | 0.09 |
| Chromium (ug/l) | 1 | 1.1 |
| Copper (ug/l) | 1 | 7.2 |
| Fluoride (mg/l) | 1 | < 0.003 |
| Iron (ug/l) | 1 | 614 |
| Magnesium (mg/l) | 1 | 8.8 |
| Manganese (ug/l) | 1 | 20. |
| Methylene Chloride (ug/l) | 1 | 1.67 |
| Molybdenum (ug/l) | 1 | < 2.44 |
| Nickel (ug/l) | 1 | 2.35 |
| Nitrate-Nitrite as N (mg/l) | 1 | 0.132 |
| Nitrogen, Total Organic as N (mg/l) | 1 | 0.7 |
| Phosphorus (mg/l) | 1 | 0.042 |
| Sulfate (mg/l) | 1 | 42.6 |
| Thallium (ug/l) | 1 | 2.5 |
| Titanium (mg/l) | 1 | 5.85 |
| Total Orgainc Carbon (mg/l) | 1 | 3.63 |
| Total Suspended Solids (mg/l) | 1 | 18. |
| Zinc (ug/l) | 1 | 15.5 |
| | | |
| | | |
| ***Outfall 002*** | | |
| Aluminum (ug/l) | 1 | 327. |
| Ammonia (mg/l) | 1 | 0.18 |
| Arsenic (ug/l) | 1 | 3.35 |
| Barium (ug/l) | 1 | 78.8 |
| Biochemical Oxygen Demand (mg/l) | 1 | 8. |
| Boron (ug/l) | 1 | 104. |
| Bromide (mg/l) | | |
| Chemical Oxygen Demand (mg/l) | 1 | 20.8 |
| Chlorine, Total Residual (mg/l) | 1 | 0.33 |
| Chromium (ug/l) | 1 | 1.2 |
| Copper (ug/l) | 1 | 1.8 |
| Dimethyl Phthalate (ug/l) | 1 | 11.6 |
| Fluoride (mg/l) | 1 | 0.256 |
| Iron (ug/l) | 1 | 278. |

**Table 4. Effluent Characterization Based Upon Permit Renewal Application**

| Parameter | No. of Samples | Concentration |
|---|---|---|
| | | |
| Magnesium (mg/l) | 1 | 9.58 |
| Manganese (ug/l) | 1 | 7.5 |
| Molybdenum (ug/l) | 1 | 4.4 |
| Nickel (ug/l) | 1 | 1.55 |
| Nitrate-Nitrite as N (mg/l) | 1 | 2.27 |
| Nitrogen, Total Organic as N (mg/l) | 1 | 2.74 |
| Phosphorus (mg/l) | 1 | 0.076 |
| Sulfate (mg/l) | 1 | 40. |
| Titanium (mg/l) | 1 | 6.45 |
| Total Organic Carbon (mg/l) | 1 | 4.04 |
| Total Suspended Solids (mg/l) | 1 | 4. |
| | | |
| | | |
| ***Outfall 004*** | | |
| Aluminum (ug/l) | 1 | 213. |
| Barium (ug/l) | 1 | 23.2 |
| Biochemical Oxygen Demand (mg/l) | 1 | 1. |
| Boron (ug/l) | 1 | 26.4 |
| Chemical Oxygen Demand (mg/l) | 1 | 20.2 |
| Chlorine, Total Residual (mg/l) | 1 | 0.03 |
| Copper (ug/l) | 1 | 2.25 |
| Dimethyl Phthalate (ug/l) | 1 | 11.8 |
| Fluoride (mg/l) | 1 | 0.364 |
| Iron (ug/l) | 1 | 293. |
| Magnesium (mg/l) | 1 | 9.28 |
| Manganese (ug/l) | 1 | 6.35 |
| Methyl Chloride (ug/l) | 1 | 1.71 |
| Molybdenum (ug/l) | 1 | 2.6 |
| Nickel (ug/l) | 1 | 1.7 |
| Nitrate-Nitrite as N (mg/l) | 1 | 1.44 |
| Nitrogen, Total Organic as N (mg/l) | 1 | 0.61 |
| Phosphorus (mg/l) | 1 | 0.025 |
| Sulfate (mg/l) | 1 | 32.5 |
| Titanium (mg/l) | 1 | 3.3 |
| Total Organic Carbon (mg/l) | 1 | 3.26 |
| | | |
| | | |
| ***Intake Station 800*** | | |
| Aluminum (ug/l) | 1 | 650. |
| Ammonia (mg/l) | 1 | 0.16 |
| Arsenic (ug/l) | 1 | 2.1 |
| Barium (ug/l) | 1 | 23.9 |
| Biochemical Oxygen Demand (mg/l) | 1 | 1. |
| Boron (ug/l) | 1 | 24.4 |

**Table 4. Effluent Characterization Based Upon Permit Renewal Application**

| Parameter | No. of Samples | Concentration |
|---|---|---|
| | | |
| Chemical Oxygen Demand (mg/l) | 1 | 21.8 |
| Chlorine, Total Residual (mg/l) | 1 | 0.08 |
| Chromium (ug/l) | 1 | 1.15 |
| Copper (ug/l) | 1 | 7.9 |
| Dimethyl Phthalate (ug/l) | 1 | 11.7 |
| Fluoride (mg/l) | 1 | 0.195 |
| Iron (ug/l) | 1 | 1020. |
| Lead (ug/l) | 1 | 2.45 |
| Magnesium (mg/l) | 1 | 8.36 |
| Manganese (ug/l) | 1 | 38.6 |
| Nickel (ug/l) | 1 | 2.15 |
| Nitrate-Nitrite as N (mg/l) | 1 | 0.808 |
| Nitrogen, Total Organic as N (mg/l) | 1 | 0.3 |
| Phosphorus (mg/l) | 1 | 0.021 |
| Sulfate (mg/l) | 1 | 23.5 |
| Titanium (mg/l) | 1 | 9.8 |
| Total Organic Carbon (mg/l) | 1 | 3.33 |
| Total Suspended Solids (mg/l) | 1 | 35. |
| Zinc (ug/l) | 1 | 10.8 |
| | | |

**Table 5.** **Effluent Characterization and Decision Criteria: January 2005 – August 2010**

Summary of analytical results for Outfalls 001, 002, and 004, and Intake Station 800. All values are in µg/l unless otherwise indicated. ND = below detection (detection limit); NA = not analyzed. Decision Criteria: $PEQ_{avg}$ = monthly averages; $PEQ_{max}$ = daily maximum analytical results.

| Parameter | Season | Units | Current Permit Limits | | # Obs. | Percentiles | | Data Range | Decision Criteria | | |
|---|---|---|---|---|---|---|---|---|---|---|---|
| | | | 30 day | Daily | | 50th | 95th | | # Obs. | $PEQ_{avg}$ | $PEQ_{max}$ |
| **Outfall 001** | | | | | | | | | | | |
| Water Temperature | Annual | F | Monitor only | | 2069 | 68.1 | 95.1 | 27.3-200 | | | |
| pH | Annual | S.U. | 6.0 <= pH <= 9.0 | | 68 | 7.87 | 8.2 | 7.48-8.49 | | | |
| Selenium, Total Recoverable | Annual | ug/l | | | 19 | 0 | 0 | 0-0 | 19 | -- | -- |
| Selenium, Total Recoverable | Annual | kg/day | | | 19 | 0 | 0 | 0-0 | | | |
| Thallium, Total Recoverable | Annual | ug/l | Monitor only | | 68 | 0 | 0 | 0-0 | 68 | -- | -- |
| Thallium, Total Recoverable | Annual | kg/day | | | 68 | 0 | 0 | 0-0 | | | |
| Copper, Total Recoverable | Annual | ug/l | | | 19 | 0 | 0.00139 | 0-0.0139 | 10 | 0.01725 | 0.02363 |
| Copper, Total Recoverable | Annual | kg/day | | | 19 | 0 | 0.00199 | 0-0.0199 | | | |
| Flow Rate | Summer | MGD | | | 1043 | 475 | 599 | 0-599 | | | |
| Flow Rate | Winter | MGD | | | 1026 | 379 | 440 | 3.42-599 | | | |
| Flow Rate | Annual | MGD | Monitor only | | 2069 | 379 | 599 | 0-599 | | | |
| **Outfall 002** | | | | | | | | | | | |
| Total Suspended Solids | Annual | mg/l | 30 | 100 | 826 | 5 | 28 | 0-139 | 826 | 14.018 | 28.779 |
| Total Suspended Solids | Annual | kg/day | 384 | 1279 | 824 | 14.8 | 106 | 0-332 | | | |
| Oil and Grease, Total | Annual | mg/l | 15 | 20 | 275 | 0 | 0 | 0-3.22 | 37 | 2.586 | 3.542 |
| Oil and Grease, Total | Annual | kg/day | 192 | 256 | 275 | 0 | 0 | 0-12.9 | | | |
| Copper, Total Recoverable | Annual | ug/l | Monitor only | | 69 | 0 | 0 | 0-31.2 | 69 | 22.78 | 31.2 |
| Copper, Total Recoverable | Annual | kg/day | | | 69 | 0 | 0 | 0-0.1 | | | |
| Flow Rate | Summer | MGD | | | 1043 | 0.85 | 1.34 | 0.08-6.7 | | | |
| Flow Rate | Winter | MGD | | | 1022 | 0.95 | 1.52 | 0.09-9.88 | | | |
| Flow Rate | Annual | MGD | Monitor only | | 2065 | 0.89 | 1.4 | 0.08-9.88 | | | |

**Table 5.** **Effluent Characterization and Decision Criteria: January 2005 – August 2010**

Summary of analytical results for Outfalls 001, 002, and 004, and Intake Station 800. All values are in µg/l unless otherwise indicated. ND = below detection (detection limit); NA = not analyzed. Decision Criteria: $PEQ_{avg}$ = monthly averages; $PEQ_{max}$ = daily maximum analytical results.

| Parameter | Season | Units | Current Permit Limits | | # Obs. | Percentiles | | Data Range | Decision Criteria | | |
|---|---|---|---|---|---|---|---|---|---|---|---|
| | | | 30 day | Daily | | 50th | 95th | | # Obs. | $PEQ_{ave}$ | $PEQ_{max}$ |
| **Outfall 001** | | | | | | | | | | | |
| Mercury, Total (Low Level) | Annual | ng/l | Monitor only | | 24 | 0.967 | 6.3 | 0-15.2 | 24 | 8.0029 | 13.16 |
| Mercury, Total (Low Level) | Annual | kg/day | | | 24 | 3.84E-06 | 1.28E-05 | 0-0.0000575 | | | |
| pH, Maximum | Annual | S.U. | Not more than 9.0 | | 2057 | 8 | 8.48 | 7.34-11.8 | | | |
| pH, Minimum | Annual | S.U. | Not less than 6.0 | | 2056 | 7.5 | 7.5 | 3-7.98 | | | |
| **Outfall 004** | | | | | | | | | | | |
| Total Suspended Solids | Annual | mg/l | 30 | 100 | 549 | 4 | 28.2 | 0-86 | 549 | 18.262 | 31.455 |
| Total Suspended Solids | Annual | kg/day | 380 | 1268 | 549 | 16.4 | 120 | 0-376 | | | |
| Oil and Grease, Total | Annual | mg/l | 15 | 20 | 546 | 0 | 0 | 0-13.3 | 546 | 1.4273 | 2.011 |
| Oil and Grease, Total | Annual | kg/day | 190 | 254 | 546 | 0 | 0 | 0-99.2 | | | |
| Selenium, Total Recoverable | Annual | ug/l | Monitor only | | 68 | 0 | 0 | 0-1.34 | 11 | 1.663 | 2.278 |
| Selenium, Total Recoverable | Annual | kg/day | | | 68 | 0 | 0 | 0-0.0108 | | | |
| Copper, Total Recoverable | Annual | ug/l | Monitor only | | 274 | 0 | 16.7 | 0-286 | 273 | 20.318 | 26.317 |
| Copper, Total Recoverable | Annual | kg/day | | | 274 | 0 | 0.0683 | 0-0.671 | | | |
| Flow Rate | Summer | MGD | | | 1043 | 1.16 | 2.14 | 0.04-2.76 | | | |
| Flow Rate | Winter | MGD | | | 1026 | 1 | 1.54 | 0.01-1.86 | | | |
| Flow Rate | Annual | MGD | Monitor only | | 2069 | 1.07 | 1.9 | 0.01-2.76 | | | |
| Acute Toxicity, Ceriodaphnia dubia | Annual | TUa | | 1.0 | 16 | 0 | 0.05 | 0-0.2 | | | |
| Acute Toxicity, Pimephales promelas | Annual | TUa | | 1.0 | 16 | 0 | 0.325 | 0-0.7 | | | |
| pH, Maximum | Annual | S.U. | Not more than 9.0 | | 2062 | 7.74 | 8.39 | 7.45-12 | | | |
| pH, Minimum | Annual | S.U. | Not less than 6.0 | | 2055 | 7.34 | 7.5 | 3-7.5 | | | |

**Table 5.** **Effluent Characterization and Decision Criteria: January 2005 – August 2010**

Summary of analytical results for Outfalls 001, 002, and 004, and Intake Station 800. All values are in µg/l unless otherwise indicated. ND = below detection (detection limit); NA = not analyzed. Decision Criteria: $PEQ_{avg}$ = monthly averages; $PEQ_{max}$ = daily maximum analytical results.

| Parameter | Season | Units | Current Permit Limits | | # Obs. | Percentiles | | Data Range | Decision Criteria | | |
|---|---|---|---|---|---|---|---|---|---|---|---|
| | | | 30 day | Daily | | 50th | 95th | | # Obs. | $PEQ_{avg}$ | $PEQ_{max}$ |
| **Outfall 001** | | | | | | | | | | | |
| **Outfall 800** | | | | | | | | | | | |
| Water Temperature | Annual | F | | | 2047 | 52.6 | 79.2 | 22.5-88.1 | | | |
| Total Suspended Solids | Annual | mg/l | | | 298 | 9 | 85.4 | 0-222 | | | |

**Table 6. Effluent Data for the Avon Lake Power Plant**

| Parameter | Units | Number of Samples | Number > MDL | PEQ Average | PEQ Maximum |
|---|---|---|---|---|---|
| ***Outfall 001*** | | | | | |
| Boron * | ug/l | 1 | 1 | 291.0218 | 398.66 |
| Bromide * | mg/l | 1 | 1 | 0.076942 | 0.1054 |
| Copper – TR | ug/l | 10 | 1 | 0.0172499 | 0.02363 |
| Chlorine – Tres * | mg/l | 1 | 1 | 0.40734 | 0.558 |
| Magnesium * | mg/l | 1 | 1 | 39.8288 | 54.56 |
| Methylene chloride * | ug/l | 1 | 1 | 7.55842 | 10.354 |
| Selenium - TR | ug/l | 19 | 0 | -- | -- |
| Sulfates * | mg/l | 1 | 1 | 192.8076 | 264.12 |
| Thallium * | ug/l | 1 | 1 | 11.315 | 15.5 |
| Zinc – TR * | ug/l | 1 | 1 | 70.153 | 96.1 |
| ***Outfall 002*** | | | | | |
| Aluminum * | ug/l | 1 | 1 | 1480.002 | 2027.4 |
| Ammonia-S * | mg/l | 1 | 1 | 0.81468 | 1.116 |
| Arsenic – TR * | ug/l | 1 | 1 | 15.1621 | 20.77 |
| Barium * | ug/l | 1 | 1 | 356.6488 | 488.56 |
| Boron * | ug/l | 1 | 1 | 470.704 | 644.8 |
| Chlorine – Tres * | mg/l | 1 | 1 | 1.49358 | 2.046 |
| Copper – TR | ug/l | 69 | 2 | 22.776 | 31.2 |
| Dimethyl phthalate * | ug/l | 1 | 1 | 52.5016 | 71.92 |
| Fluoride * | mg/l | 1 | 1 | 1.158656 | 1.5872 |
| Magnesium * | mg/l | 1 | 1 | 43.35908 | 59.396 |
| Manganese – TR * | ug/l | 1 | 1 | 33.945 | 46.5 |
| Mercury - TR | ng/l | 24 | 15 | 8.0029 | 13.16 |
| Molybdenum * | ug/l | 1 | 1 | 19.9144 | 27.28 |
| Nickel – TR * | ug/l | 1 | 1 | 7.0153 | 9.61 |
| Nitrate-N + Nitrite-N * | mg/l | 1 | 1 | 10.27402 | 14.074 |
| Sulfates * | mg/l | 1 | 1 | 181.04 | 248 |
| ***Outfall 004*** | | | | | |
| Aluminum * | ug/l | 1 | 1 | 964.038 | 1320.6 |
| Barium * | ug/l | 1 | 1 | 105.0032 | 143.84 |
| Boron * | ug/l | 1 | 1 | 119.4864 | 163.68 |
| Chlorine – Tres * | mg/l | 1 | 1 | 0.13578 | 0.186 |
| Copper – TR | ug/l | 273 | 60 | 20.318 | 26.317 |
| Dimethyl phthalate * | ug/l | 1 | 1 | 53.4068 | 73.16 |

**Table 6. Effluent Data for the Avon Lake Power Plant**

| Parameter | Units | Number of Samples | Number > MDL | PEQ Average | PEQ Maximum |
|---|---|---|---|---|---|
| Fluoride * | mg/l | 1 | 1 | 1.647464 | 2.2568 |
| Iron – TR * | ug/l | 1 | 1 | 1326.118 | 1816.6 |
| Magnesium * | mg/l | 1 | 1 | 42.00128 | 57.536 |
| Manganese – TR * | ug/l | 1 | 1 | 28.7401 | 39.37 |
| Methyl chloride * | ug/l | 1 | 1 | 7.73946 | 10.602 |
| Molybdenum * | ug/l | 1 | 1 | 11.7676 | 16.12 |
| Nickel – TR * | ug/l | 1 | 1 | 7.6942 | 10.54 |
| Nitrate-N + Nitrite-N * | mg/l | 1 | 1 | 6.51744 | 8.928 |
| Selenium - TR | ug/l | 11 | 1 | 1.66294 | 2.278 |
| Sulfates * | mg/l | 1 | 1 | 147.095 | 201.5 |

* The dataset for this parameter is based upon the NPDES permit renewal application.

**Table 7.** **Water Quality Criteria in the Study Area**

| Parameter | Units | Outside Mixing Zone Criteria | | | | | Inside Mixing Zone Maximum |
|---|---|---|---|---|---|---|---|
| | | | Average | | | Maximum | |
| | | Wildlife | Human Health | Agri-culture | Aquatic Life | Aquatic Life | |
| Aluminum | ug/l | -- | 4500 | -- | -- | -- | -- |
| Ammonia-S | mg/l | -- | -- | -- | -- | -- | -- |
| Ammonia-W | mg/l | -- | -- | -- | -- | -- | -- |
| Arsenic - TR | ug/l | -- | 580 | 100 | 150 | 340 | 680 |
| Barium | ug/l | -- | 160000 | -- | 220 | 2000 | 4000 |
| Boron | ug/l | -- | 200000 | -- | 3900 | 33000 | 65000 |
| Bromide | mg/l | -- | -- | -- | -- | -- | -- |
| Chlorine - TRes | mg/l | -- | -- | -- | 0.011 | 0.019 | 0.038 |
| Copper - TR | ug/l | -- | 64000 | 500 | 12 | 19 | 38 |
| Dimethyl phthalate | ug/l | -- | -- | -- | 1100 | 3200 | 6400 |
| Fluoride | mg/l | -- | -- | 2 | -- | -- | -- |
| Iron - TR | ug/l | -- | -- | 5000 | -- | -- | -- |
| Lead - TR | ug/l | -- | -- | 100 | 9.9 | 190 | 380 |
| Magnesium | mg/l | -- | -- | -- | -- | -- | -- |
| Manganese - TR | ug/l | -- | 61000 | -- | -- | -- | -- |
| Mercury - TR | ng/l | 1.3 | 3.1 | 10000 | 910 | 1700 | 3400 |
| Methyl chloride | ug/l | -- | 7300[c] | -- | -- | -- | -- |
| Methylene chloride | ug/l | -- | 2600[c] | -- | 1900 | 11000 | 22000 |
| Molybdenum | ug/l | -- | 10000 | -- | 20000 | 190000 | 370000 |
| Nickel - TR | ug/l | -- | 43000 | 200 | 69 | 620 | 1200 |
| Nitrate-N + Nitrite-N | mg/l | -- | -- | 100 | -- | -- | -- |
| Selenium - TR | ug/l | -- | 3100 | 50 | 5 | -- | -- |
| Sulfates | mg/l | -- | -- | -- | -- | -- | -- |
| Thallium | ug/l | -- | -- | -- | 17 | 79 | 160 |
| Zinc - TR | ug/l | -- | 35000 | 25000 | 160 | 160 | 320 |

[c]. This criterion is based upon a carcinogenic endpoint.

**Table 8. Instream Conditions and Discharger Flow**

| Parameter | Units | Season | Value | Basis |
|---|---|---|---|---|
| *Hardness* | mg/l | annual | 140 | Background Water Quality Report |
| *Avon Lake Power Plant flow* | | | | |
| Outfall 001 | cfs | annual | 612 | Previous WLA |
| Outfall 002 | cfs | annual | 5.23 | Previous WLA |
| Outfall 004 | cfs | annual | 5.18 | Previous WLA |
| *Background Water Quality* | | | | |
| Aluminum | ug/l | | 330 | n=640; 146<MDL * |
| Ammonia-S | mg/l | | 0.05 | n=3172; 1307<MDL * |
| Ammonia-W | mg/l | | 0.025 | n=740; 336<MDL * |
| Arsenic - TR | ug/l | | 0 | No representative data available. |
| Barium | ug/l | | 67 | ** |
| Boron | ug/l | | 0 | No representative data available. |
| Bromide | mg/l | | 0 | No representative data available. |
| Chlorine - TRes | mg/l | | 0 | No representative data available. |
| Copper - TR | ug/l | | 5 | n=2867; 1597<MDL * |
| Dimethyl phthalate | ug/l | | 0 | No representative data available. |
| Fluoride | mg/l | | 0 | No representative data available. |
| Iron - TR | ug/l | | 650 | n=3018; 15<MDL * |
| Lead - TR | ug/l | | 2 | n=2814; 1458<MDL * |
| Magnesium | mg/l | | 22.5 | n=2604; 3<MDL * |
| Manganese - TR | ug/l | | 0 | No representative data available. |
| Mercury - TR | ng/l | | 0 | No representative data available. |
| Methyl chloride | ug/l | | 0 | No representative data available. |
| Methylene chloride | ug/l | | 0 | No representative data available. |
| Molybdenum | ug/l | | 0 | No representative data available. |
| Nickel - TR | ug/l | | 20 | n=1259; 1105<MDL * |
| Nitrate-N + Nitrite-N | mg/l | | 0.73 | n=5852; 515<MDL * |
| Selenium - TR | ug/l | | 0 | No representative data available. |
| Sulfates | mg/l | | 0 | No representative data available. |
| Thallium | ug/l | | 0 | No representative data available. |
| Zinc - TR | ug/l | | 15 | n=2284; 1117<MDL * |

* Source of data is the 50th percentile of statewide values from the "Background Water Quality Report." Samples were collected through February 1988.

** Source of data is the 50th percentile of Erie-Ontario Ecoregion reference sites sampled from 1999 through 2001. The 50th percentile value is based upon 348 observations.

## Table 9. Summary of Effluent Limits to Maintain Applicable WQ Criteria

| Parameter | Units | Outside Mixing Zone Criteria | | | | | Inside Mixing Zone Maximum |
|---|---|---|---|---|---|---|---|
| | | | Average | | | Maximum | |
| | | Wildlife | Human Health | Agri-culture | Aquatic Life | Aquatic Life | |
| ***Outfall 001*** | | | | | | | |
| Boron | ug/l | -- | 2200000 | -- | 42900 | -- | 65000 |
| Bromide | mg/l | -- | -- | -- | -- | -- | -- |
| Chlorine - TRes | mg/l | -- | -- | -- | 0.12 | -- | 0.038 |
| Magnesium | mg/l | -- | -- | -- | -- | -- | -- |
| Methylene chloride | ug/l | -- | 28600 | -- | 20900 | -- | 22000 |
| Selenium - TR | ug/l | -- | 34100 | 550 | 55 | -- | -- |
| Sulfates | mg/l | -- | -- | -- | -- | -- | -- |
| Thallium | ug/l | -- | -- | -- | 187 | -- | 160 |
| Zinc - TR | ug/l | -- | 384850 | 274850 | 1610 | -- | 320 |
| ***Outfall 002*** | | | | | | | |
| Aluminum | ug/l | -- | 46200 | -- | -- | -- | -- |
| Ammonia-S | mg/l | -- | -- | -- | -- | -- | -- |
| Ammonia-W | mg/l | -- | -- | -- | -- | -- | -- |
| Arsenic - TR | ug/l | -- | 6380 | 1100 | 1650 | -- | 680 |
| Barium | ug/l | -- | 1759330 | -- | 1750 | -- | 4000 |
| Boron | ug/l | -- | 2200000 | -- | 42900 | -- | 65000 |
| Chlorine - TRes | mg/l | -- | -- | -- | 0.12 | -- | 0.038 |
| Copper - TR | ug/l | -- | 703950 | 5450 | 82 | -- | 38 |
| Dimethyl phthalate | ug/l | -- | -- | -- | 12100 | -- | 6400 |
| Fluoride | mg/l | -- | -- | 22 | -- | -- | -- |
| Lead - TR | ug/l | -- | -- | 1080 | 89 | -- | 380 |
| Magnesium | mg/l | -- | -- | -- | -- | -- | -- |
| Manganese - TR | ug/l | -- | 671000 | -- | -- | -- | -- |
| Mercury - TR [1] | ng/l | 14 | 34 | 110000 | 10010 | -- | 3400 |
| Mercury - TR [2] | ng/l | 1.3 | 3.1 | 10000 | 910 | -- | 3400 |
| Molybdenum | ug/l | -- | 110000 | -- | 220000 | -- | 370000 |
| Nickel - TR | ug/l | -- | 472800 | 2000 | 559 | -- | 1200 |
| Nitrate-N + Nitrite-N | mg/l | -- | -- | 1093 | -- | -- | -- |
| Sulfates | mg/l | -- | -- | -- | -- | -- | -- |
| Zinc - TR | ug/l | -- | 384850 | 274850 | 1610 | -- | 320 |
| ***Outfall 004*** | | | | | | | |
| Aluminum | ug/l | -- | 46200 | -- | -- | -- | -- |
| Barium | ug/l | -- | 1759330 | -- | 1750 | -- | 4000 |
| Boron | ug/l | -- | 2200000 | -- | 42900 | -- | 65000 |
| Chlorine - TRes | mg/l | -- | -- | -- | 0.12 | -- | 0.038 |
| Copper - TR | ug/l | -- | 703950 | 5450 | 82 | -- | 38 |
| Dimethyl phthalate | ug/l | -- | -- | -- | 12100 | -- | 6400 |

**Table 9. Summary of Effluent Limits to Maintain Applicable WQ Criteria**

| Parameter | Units | Outside Mixing Zone Criteria | | | | | Inside Mixing Zone Maximum |
|---|---|---|---|---|---|---|---|
| | | | | Average | | Maximum | |
| | | Wildlife | Human Health | Agri-culture | Aquatic Life | Aquatic Life | |
| Fluoride | mg/l | -- | -- | 22 | -- | -- | -- |
| Iron - TR | ug/l | -- | -- | 48500 | -- | -- | -- |
| Magnesium | mg/l | -- | -- | -- | -- | -- | -- |
| Manganese - TR | ug/l | -- | 671000 | -- | -- | -- | -- |
| Methyl chloride | ug/l | -- | 80300 | -- | -- | -- | -- |
| Molybdenum | ug/l | -- | 110000 | -- | 220000 | -- | 370000 |
| Nickel - TR | ug/l | -- | 472800 | 2000 | 559 | -- | 1200 |
| Nitrate-N + Nitrite-N | mg/l | -- | -- | 1093 | -- | -- | -- |
| Selenium - TR | ug/l | -- | 34100 | 550 | 55 | -- | -- |
| Sulfates | mg/l | -- | -- | -- | -- | -- | -- |

[1] These wasteload allocations are in effect until November 1, 2010, when mixing zones can no longer be used for developing wasteload allocations for bioaccumulative chemicals of concern such as mercury.
[2] These wasteload allocations are in effect after November 1, 2010, when mixing zones can no longer be used for developing wasteload allocations for bioaccumulative chemicals of concern such as mercury.

**Table 10-001. Parameter Assessment for Outfall 001**

*Group 1:* Due to a lack of criteria, the following parameters could not be evaluated at this time.

| | | |
|---|---|---|
| Bromide | Magnesium | Sulfates |

*Group 2:* PEQ < 25 percent of WQS or all data below minimum detection limit. WLA not required. No limit recommended; monitoring optional.

| | | |
|---|---|---|
| Boron | Copper - TR | Selenium - TR |
| Methylene chloride (Dichloromethane) | | |

*Group 3:* $PEQ_{max}$ < 50 percent of maximum PEL and $PEQ_{avg}$ < 50 percent of average PEL. No limit recommended; monitoring optional.

| | |
|---|---|
| Thallium | Zinc - TR |

*Group 4:* $PEQ_{max}$ >= 50 percent, but < 100 percent of the maximum PEL or $PEQ_{avg}$ >= 50 percent, but < 100 percent of the average PEL. Monitoring is appropriate.

*Group 5:* Maximum PEQ >= 100 percent of the maximum PEL or average PEQ >= 100 percent of the average PEL, or either the average or maximum PEQ is between 75 and 100 percent of the PEL and certain conditions that increase the risk to the environment are present. Limit recommended.

Limits to Protect Numeric Water Quality Criteria

| | | | Recommended Effluent Limits | |
|---|---|---|---|---|
| Parameter | Units | Period | Average | Maximum |
| Chlorine - TRes | mg/l | | -- | 0.038 |

**Table 10-002. Parameter Assessment for Outfall 002**

*Group 1:* Due to a lack of criteria, the following parameters could not be evaluated at this time.

| | |
|---|---|
| Magnesium | Sulfates |

*Group 2:* PEQ < 25 percent of WQS or all data below minimum detection limit. WLA not required. No limit recommended; monitoring optional.

| | | |
|---|---|---|
| Arsenic - TR | Boron | Lead - TR |
| Molybdenum | Nitrate-N + Nitrite-N | Zinc - TR |
| Dimethyl phthalate | Manganese - TR | Nickel - TR |

*Group 3:* $PEQ_{max}$ < 50 percent of maximum PEL and $PEQ_{avg}$ < 50 percent of average PEL. No limit recommended; monitoring optional.

| | | |
|---|---|---|
| Barium | Fluoride | Aluminum |

*Group 4:* $PEQ_{max}$ >= 50 percent, but < 100 percent of the maximum PEL or $PEQ_{avg}$ >= 50 percent, but < 100 percent of the average PEL. Monitoring is appropriate.

| | |
|---|---|
| Copper - TR | Mercury - TR [1] |

*Group 5:* Maximum PEQ >= 100 percent of the maximum PEL or average PEQ >= 100 percent of the average PEL, or either the average or maximum PEQ is between 75 and 100 percent of the PEL and certain conditions that increase the risk to the environment are present. Limit recommended.

Limits to Protect Numeric Water Quality Criteria

| | | | Recommended Effluent Limits | |
|---|---|---|---|---|
| Parameter | Units | Period | Average | Maximum |
| Chlorine - TRes | mg/l | | -- | 0.038 |
| Mercury - TR [2] | ng/l | | 1.3 | 3400 |

[1] This grouping was in effect until November 1, 2010, when mixing zones were no longer be used for developing wasteload allocations for bioaccumulative chemicals of concern such as mercury.
[2] This grouping is in effect after November 1, 2010, when mixing zones can no longer be used for developing wasteload allocations for bioaccumulative chemicals of concern such as mercury.

**Table 10-004. Parameter Assessment for Outfall 004**

---

*Group 1:* Due to a lack of criteria, the following parameters could not be evaluated at this time.

| | | |
|---|---|---|
| Magnesium | Sulfates | |

*Group 2:* PEQ < 25 percent of WQS or all data below minimum detection limit. WLA not required. No limit recommended; monitoring optional.

| | | |
|---|---|---|
| Methyl chloride | Molybdenum | Nitrate-N + Nitrite-N |
| Aluminum | Boron | Dimethyl phthalate |
| Manganese - TR | Nickel - TR | |

*Group 3:* $PEQ_{max}$ < 50 percent of maximum PEL and $PEQ_{avg}$ < 50 percent of average PEL. No limit recommended; monitoring optional.

| | | |
|---|---|---|
| Fluoride | Selenium - TR | Barium |
| Iron - TR | | |

*Group 4:* $PEQ_{max}$ >= 50 percent, but < 100 percent of the maximum PEL or $PEQ_{avg}$ >= 50 percent, but < 100 percent of the average PEL. Monitoring is appropriate.

Copper - TR

*Group 5:* Maximum PEQ >= 100 percent of the maximum PEL or average PEQ >= 100 percent of the average PEL, or either the average or maximum PEQ is between 75 and 100 percent of the PEL and certain conditions that increase the risk to the environment are present. Limit recommended.

Limits to Protect Numeric Water Quality Criteria

| | | | Recommended Effluent Limits | |
|---|---|---|---|---|
| Parameter | Units | Period | Average | Maximum |
| Chlorine - TRes | mg/l | | -- | 0.038 |

**Table 11-001. Final Effluent Limits and Monitoring Requirements for Outfall 001**

| | | Effluent Limits | | | | |
|---|---|---|---|---|---|---|
| | | Concentration | | Loading (kg/day)[a] | | |
| Parameter | Units | 30 Day Average | Daily Maximum | 30 Day Average | Daily Maximum | Basis[b] |
| Water Temperature | °F | ---------- Monitor ---------- | | | | M[c] |
| pH | S.U. | ---------- 6.0 to 9.0 ---------- | | | | EP/BPT |
| Oxidants, Total Res. | mg/l | – | 0.05 | - | - | EP/BPJ |
| Flow | MGD | ---------- Monitor ---------- | | | | M[c] |
| Chlorine, Total Residual | mg/l | -- | 0.2 | - | - | EP/BAT |
| Chlorination/Bromination Duration | minutes | – | 120 | – | – | EP/BAT |

[b,c] See page 35 for definition of terms and explanation of monitoring requirements.

**Table 11-002. Final Effluent Limits and Monitoring Requirements for Outfall 002**

| | | Effluent Limits | | | | |
|---|---|---|---|---|---|---|
| | | Concentration | | Loading (kg/day)[a] | | |
| Parameter | Units | 30 Day Average | Daily Maximum | 30 Day Average | Daily Maximum | Basis[b] |
| Suspended Solids | mg/l | 30 | 100 | 384 | 1279 | EP/BPT |
| Oil and Grease | mg/l | 15 | 20 | 192 | 256 | EP/BPT |
| Copper | µg/l | ---------- Monitor ---------- | | | | M[c] /RP/BAT |
| Flow rate | MGD | ---------- Monitor ---------- | | | | M[c] /EP |
| Chlorine, Total Res. | mg/l | ---------- Monitor ---------- | | | | |
| Mercury | ng/l | 8.0 | 3400 | 0.00010 | 0.043 | MVAR |
| pH [d] | S.U. | ---------- Monitor ---------- | | | | EP/BPT |
| pH Range Excursions, Maximum Duration | Minutes | -- | 60 | -- | -- | BEJ |
| pH Range Excursions, > 60 min. | #/Day | -- | 0 | -- | -- | BEJ |
| pH Range Excursions, Monthly Total Duration | Minutes | -- | 446 | -- | -- | BEJ |

[a] Loadings are based upon a flow rate of 3.38 MGD.
[b,c] See page 35 for definition of terms and explanation of monitoring requirements.
[d] pH must be greater than or equal to 6.0 and less than or equal to 9.0 S.U.

**Table 11-004. Final Effluent Limits and Monitoring Requirements for Outfall 004**

| | | Effluent Limits | | | | |
|---|---|---|---|---|---|---|
| | | Concentration | | Loading (kg/day)[a] | | |
| Parameter | Units | 30 Day Average | Daily Maximum | 30 Day Average | Daily Maximum | Basis[b] |
| Suspended Solids | mg/l | 30 | 100 | 380 | 1268 | EP/BPT |
| Oil and Grease | mg/l | 15 | 20 | 190 | 254 | EP/BPT |
| Copper | µg/l | ---------- Monitor ---------- | | | | M[c] / WLA |
| Oxidants, Total Res. | mg/l | -- | 0.01 | -- | -- | EP/BPJ |
| Flow rate | MGD | ---------- Monitor ---------- | | | | M[c] /EP |
| Chlorine, Total Res. | mg/l | -- | 0.038 | -- | -- | EP/WQS |
| pH[d] | S.U. | ---------- Monitor ---------- | | | | EP/BPT |
| Chlorination/Bromination Duration | minutes | ---------- Monitor ---------- | | | | M[c] |
| pH Range Excursions, Maximum Duration | Minutes | -- | 60 | -- | -- | BEJ |
| pH Range Excursions, > 60 min. | #/Day | -- | 0 | -- | -- | BEJ |
| pH Range Excursions, Monthly Total Duration | Minutes | -- | 446 | -- | -- | BEJ |

[a] Loadings are based upon a flow rate of 3.35 MGD.
[b,c] See page 35 for definition of terms and explanation of monitoring requirements.
[d] pH must be greater than or equal to 6.0 and less than or equal to 9.0 S.U.

**Table 11-604. Final Effluent Limits and Monitoring Requirements for Outfall 604**

| | | Effluent Limits | | | | |
|---|---|---|---|---|---|---|
| | | Concentration | | Loading (kg/day)[a] | | |
| Parameter | Units | 30 Day Average | Daily Maximum | 30 Day Average | Daily Maximum | Basis[b] |
| pH | S.U. | ---------- Monitor ---------- | | | | EP/BPT |
| Suspended Solids | mg/l | 30 | 100 | -- | -- | EP/BPT |
| Oil and Grease | mg/l | 15 | 20 | -- | -- | EP/BPT |
| Flow rate | MGD | ---------- Monitor ---------- | | | | M[c] /EP |

[b,c] See page 35 for definition of terms and explanation of monitoring requirements.

**Table 11-610. Final Effluent Limits and Monitoring Requirements for Outfall 610**

| | | Effluent Limits | | | | |
|---|---|---|---|---|---|---|
| | | Concentration | | Loading (kg/day)[a] | | |
| Parameter | Units | 30 Day Average | Daily Maximum | 30 Day Average | Daily Maximum | Basis[b] |
| pH | S.U. | ---------- Monitor ---------- | | | | EP/BPT |
| Suspended Solids | mg/l | 50 | 50 | -- | -- | EP/BPT |
| Flow rate | MGD | ---------- Monitor ---------- | | | | M[c] /EP |

[b,c] See page 35 for definition of terms and explanation of monitoring requirements.

**Table 11-611. Final Effluent Limits and Monitoring Requirements for Outfall 611**

| | | Effluent Limits | | | | |
|---|---|---|---|---|---|---|
| | | Concentration | | Loading (kg/day)[a] | | |
| Parameter | Units | 30 Day Average | Daily Maximum | 30 Day Average | Daily Maximum | Basis[b] |
| pH | S.U. | ---------- Monitor ---------- | | | | EP/BPT |
| Suspended Solids | mg/l | 30 | 100 | -- | -- | EP/BPT |
| Oil and Grease | mg/l | 15 | 20 | -- | -- | EP/BPT |
| Iron | µg/l | 1000 | 1000 | -- | -- | M[c] /BPT |
| Copper | µg/l | 1000 | 1000 | -- | -- | M[c] /BPT |
| Flow rate | MGD | ---------- Monitor ---------- | | | | M[c] /EP |

[b,c] See page 3 for definition of terms and explanation of monitoring requirements.

**Table 11-612. Final Effluent Limits and Monitoring Requirements for Outfall 612**

| | | Effluent Limits | | | | |
|---|---|---|---|---|---|---|
| | | Concentration | | Loading (kg/day)[a] | | |
| Parameter | Units | 30 Day Average | Daily Maximum | 30 Day Average | Daily Maximum | Basis[b] |
| Oil and Grease | mg/l | ---------- Monitor ---------- | | | | M[c] /EP/BPT |
| Flow rate | MGD | ---------- Monitor ---------- | | | | M[c] /EP |

[b,c] See below for definition of terms and explanation of monitoring requirements.

[a] Loadings based upon an effluent flow rate of 2.3 MGD.

[b] Definitions:

**ABS** = Antibacksliding Rule (OAC 3745-33-05(E) and 40 CFR Part 122.44(l));
**AD** = Antidegradation (OAC 3745-1-05);
**BAT** = Best Available Technology economically achievable, Federal Effluent Guidelines, 40 CFR Part 423;
**BPJ** = Best Professional Judgment;
**BPT** = Best Practicable control Technology currently available, Federal Effluent Guidelines, 40 CFR, Part 423;
**EP** = Existing Permit;
**M** = Division of Surface Water Guidance #2, "National Pollutant Discharge Elimination System: Determination of Sampling Frequency Formula for Industrial Waste Discharges" recommends monitoring for this parameter;
**MVAR** = Mercury Variance-based limit [OAC 3745-33-07(D)(10)];
**PD** = Plant Design Criteria;
**RP** = Reasonable Potential for exceeding water quality standards, and requiring water quality-based effluent limits and monitoring requirements in NPDES permits (3745-33-07(A));
**WET** = Whole Effluent Toxicity (OAC 3745-33-07(B)) ;
**WLA** = Wasteload Allocation procedures (OAC 3745-2);
**WLA/IMZM** = Wasteload Allocation limited by Inside Mixing Zone Maximum;
**WQS** = Ohio Water Quality Standards (OAC 3745-1).

[c] Monitoring of flow and other indicator parameters is specified to assist in the evaluation of effluent quality and treatment plant performance.

## Attachment A. Federal Effluent Guidelines Applicable to the Avon Lake Generating Station

### 40 CFR, Part 423 Steam Electric Power Generating Point Source Category

Section 423.12(b)(3) Low Volume Waste Sources

| | Best Practicable Control Technology Available (BPT) ---------- (mg/l) ---------- | |
|---|---|---|
| Parameter | Daily Maximum | 30-Day Average |
| Total Suspended Solids | 100.0 | 30.0 |
| Oil & Grease | 20.0 | 15.0 |

Section 423.12(b)(4) Fly Ash and Bottom Ash Transport Water

| | Best Practicable Control Technology Available (BPT) ---------- (mg/l) ---------- | |
|---|---|---|
| Parameter | Daily Maximum | 30-Day Average |
| Total Suspended Solids | 100.0 | 30.0 |
| Oil & Grease | 20.0 | 15.0 |

Section 423.13(b) Once-through Cooling Water

| | Best Available Technology Economically Achievable (BPT) ---------- (mg/l) ---------- | |
|---|---|---|
| Parameter | Daily Maximum | 30-Day Average |
| Total Residual Chlorine | 0.20 | -- |

# Mike McCullough - RE: Orion Power Avon Lake Power Plant NPDES Permit

**From:** Mike McCullough
**To:** Thinglum, Kate
**Date:** 1/24/2011 12:42 PM
**Subject:** RE: Orion Power Avon Lake Power Plant NPDES Permit

---

I'll put a note in the file to email a pdf of permit to you when it's public noticed.

>>> "Kate Thinglum" <KThinglum@greatlakes.org> 1/24/2011 10:19 AM >>>

Thanks Mike! Is it possible to add me to the mailing list to be notified when the draft permit is available?

Thank you so much!

Kate

---

**From:** Mike McCullough [mailto:Mike.McCullough@epa.state.oh.us]
**Sent:** Monday, January 24, 2011 9:02 AM
**To:** Kate Thinglum
**Subject:** RE: Orion Power Avon Lake Power Plant NPDES Permit

Kate,

Your email has been forwarded to me since I'm working on this permit. We have not yet public noticed the draft permit for this renewal, so you haven't missed anything. I'm guessing it might be another month or so before that happens. Please feel free to contact me if you have additional questions.

Mike

>>> "Kate Thinglum" <KThinglum@greatlakes.org> 1/21/2011 11:37 AM >>>

Hello,

My name is Kate Thinglum and I am from the Alliance for the Great Lakes. I'm writing to inquire about the NPDES permit for Orion Power Avon Lake Power Plant (NPDES # 3IB00002; TRIF ID 44012FRSTN33570). Their permit expired on October 31, 2010. I'm wondering what the status is on their new draft permit? I'm new to this so hopefully I didn't miss something!

Thank you so much,

Ohio Environmental Protection Agency Unless otherwise provided by law, this communication and any response to it constitutes a public record. ☒

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Please type. Do not complete by hand.

FORM 1 GENERAL

# EPA

U.S. ENVIRONMENTAL PROTECTION AGENCY
## GENERAL INFORMATION
Consolidated Permits Program
(Read the "General Instructions" before starting)

**I. EPA I.D. NUMBER**
3IB00002*KD

LABEL ITEMS
- I. EPA I.D. NUMBER
- III. FACILITY NAME
- V. FACILITY MAILING ADDRESS
- VI. FACILITY LOCATION

3IB 00002*20

Check I.D. # 690932
Revenue I.D. # 1030539
Person I.D. #
Org. I.D. # 104179
OHIO EPA NEDO REVENUE

OH 0001112

If a preprinted label has been provided, affix it in the designated space. Review the information carefully; if any of it is incorrect, cross through it and enter the correct data in the appropriate fill-in below. Also, if any of the preprinted data is absent *(the area to the left of the label space lists the information that should appear)*, please provide it in the proper fill-in area(s) below. If the label is complete and correct, you need not complete Items I, III, V, and VI *(except VI-B which must be completed regardless)*. Complete all items if no label has been provided. Refer to the instructions for detailed item descriptions and for the legal authorizations under which this data is collected.

## II. POLLUTANT CHARACTERISTICS

INSTRUCTIONS: Complete A through G to determine whether you need to submit any permit application forms to the EPA. If you answer "yes" to any questions, you must submit this form and the supplemental form listed in the parenthesis following the question. Mark "X" in the box in the third column if the supplemental form is attached. If you answer "no" to each question, you need not submit any of these forms. You may answer "no" if your activity is excluded from permit requirements; see Section C of the instructions. See also, Section D of the instructions for definitions of **bold-faced terms.**

| SPECIFIC QUESTIONS | MARK 'X' YES | NO | FORM ATTACHED | SPECIFIC QUESTIONS | MARK 'X' YES | NO | FORM ATTACHED |
|---|---|---|---|---|---|---|---|
| A. Is this facility a **publicly owned treatment works** which results in a **discharge** to **waters of the U.S.?** (FORM 2A) | | X | | B. Does or will this facility *(either existing or proposed)* include a **concentrated animal feeding operation** or **aquatic animal production facility** which results in a **discharge** to **waters of the U.S.?** (FORM 2B) | | X | |
| C. Is this a facility which currently results in **discharges** to **waters of the U.S.** other than those described in A or B above? (FORM 2C) | X | | X | D. Is this a proposed facility (*other than those described in A or B above)* which will result in a **discharge** to **waters of the U.S.?** (FORM 2D) | | X | |
| E. Is this a facility which does not discharge process **wastewater?** (FORM 2E) | | X | | F. Is this a facility which discharges stormwater associated with industrial activity? (FORM 2F) | X | | X |
| G. Do you generate **sewage sludge** that is ultimately regulated by Part 503? Do you generate **sewage sludge** that is sent to another **facility** for treatment or blending? Do you process or derive material from **sewage sludge** that is disposed in a manner subject to Part 503? (FORM 2S) | | X | | | | | |

## III. NAME OF FACILITY
Avon Lake Generating Station

## IV. FACILITY CONTACT
A. NAME & TTILE *(last, first, title)*: Scott Cameron, Environmental Specialist
B. PHONE *(area code & no.)*: (440) 930 - 6564

## V. FACILITY MAILING ADDRESS
A. STREET OR P.O. BOX: 33570 Lake Road
B. CITY OR TOWN: Avon Lake
C. STATE: OH
D. ZIP CODE: 44012

## VI. FACILITY LOCATION
A. STREET, ROUTE NO. OR OTHER SPECIFIC IDENTIFIER: 33570 Lake Road
B. COUNTY NAME: Lorain
C. CITY OR TOWN: Avon Lake
D. STATE: OH
E. ZIP CODE: 44012
F. COUNTY CODE *(if known)*:

PAID
AMT 200.00 DATE 1-28-05
CK # 0501292 DATE 1-2-05



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Click both pages of this form) CLEAR

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**VII. SIC CODES** *(4-digit, in order of priority)*

| A. FIRST | | B. SECOND | |
|---|---|---|---|
| *(specify)* 4911 | | *(specify)* | |
| **C. THIRD** | | **D. FOURTH** | |
| *(specify)* | | *(specify)* | |

**VIII. OPERATOR INFORMATION**

| A. NAME | B. Is the name listed in Item VIII-A also the owner? |
|---|---|
| NRG Power Midwest LP (wholly-owned subsidiary of NRG Energy, Inc.) | ☒ Yes ☐ No |

| C. STATUS OF OPERATOR *(Enter the appropriate letter into the answer box; if "Other", specify.)* | | | D. PHONE *(area code & no.)* |
|---|---|---|---|
| F = FEDERAL<br>S = STATE<br>P = PRIVATE | M = PUBLIC *(other than federal or state)*<br>O = OTHER *(specify)* | *(specify)* P | (724) 597 - 8630 |

**E. STREET OR P.O. BOX**

121 Champion Way, Suite 300

| F. CITY OR TOWN | G. STATE | H. ZIP CODE | IX. INDIAN LAND |
|---|---|---|---|
| Canonsburg | PA | 15317 | Is this facility located on Indian lands? ☐ Yes ☒ No |

**X. EXISTING ENVIRONMENTAL PERMITS**

| A. NPDES *(Discharges to surface water)* | D. PSD *(Air emissions from proposed sources)* | |
|---|---|---|
| 3IB00002*KD | | |
| **B. UIC** *(Underground injection of fluids)* | **E. OTHER** *(specify)* | |
| | P0104694 | *(specify)* Title IV (ARP) |
| **C. RCRA** *(Hazardous waste)* | **F. OTHER** *(specify)* | |
| OHD046629648 | 0247030013 | *(specify)* Title V |

**XI. MAP**

Attach to this application a topographical map of the area extending to at least one mile beyond property boundaries. The map must show the outline of the facility, the location of each of its existing and proposed intake and discharge structures, each of its hazardous waste treatment, storage, or disposal facilities, and each well where it injects fluids underground. Include all springs, rivers, and other surface water bodies in the map area. See instructions for precise requirements.

**XII. NATURE OF BUSINESS** ***(provide a brief description)***

Electrical power generation plant

**XIII. CERTIFICATION** *(see instructions)*

*I certify under penatly of law that I have personally examined and am famimliar with the information submitted in this application and all attachments and that, based on my inquiry of those persons immediately responsible for obtaining the information contained in the application, I belive that the information is true, accurate, and complete. I am aware that there are significant penalties for submitting false information, including the possibility of fine and imprisonment.*

| A. NAME & OFFICIAL TITLE *(type or print)* | B. SIGNATURE | C. DATE SIGNED |
|---|---|---|
| Daniel A. Rogatto, Plant Manager | Daniel A Rogatto | 1-20-15 |

**COMMENTS FOR OFFICIAL USE ONLY**

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JAN 28 2015
OHIO EPA NEDO

Please print or type in the unshaded areas only.

EPA I.D. NUMBER (*copy from Item 1 of Form 1*): 3IB00002*KD

Form Approved.
OMB No. 2040-0086.
Approval expires 3-31-98.

FORM **2C** NPDES

U.S. ENVIRONMENTAL PROTECTION AGENCY
APPLICATION FOR PERMIT TO DISCHARGE WASTEWATER
**EXISTING MANUFACTURING, COMMERCIAL, MINING AND SILVICULTURE OPERATIONS**
*Consolidated Permits Program*

## I. OUTFALL LOCATION

For each outfall, list the latitude and longitude of its location to the nearest 15 seconds and the name of the receiving water.

| A. OUTFALL NUMBER (*list*) | B. LATITUDE | | | C. LONGITUDE | | | D. RECEIVING WATER (*name*) |
|---|---|---|---|---|---|---|---|
| | 1. DEG. | 2. MIN. | 3. SEC. | 1. DEG. | 2. MIN. | 3. SEC. | |
| 001 | 41 | 30 | 30 | 82 | 03 | 28 | Lake Erie |
| 002 | 41 | 30 | 36 | 82 | 03 | 07 | Lake Erie |
| 004 | 41 | 30 | 36 | 82 | 03 | 04 | Lake Erie |
| 601 | 41 | 30 | 16 | 82 | 03 | 21 | N/A (Recycled) |
| 604 | 41 | 30 | 30 | 82 | 03 | 28 | Discharge Tunnel to Lake Erie via 001 |

## II. FLOWS, SOURCES OF POLLUTION, AND TREATMENT TECHNOLOGIES

A. Attach a line drawing showing the water flow through the facility. Indicate sources of intake water, operations contributing wastewater to the effluent, and treatment units labeled to correspond to the more detailed descriptions in Item B. Construct a water balance on the line drawing by showing average flows between intakes, operations, treatment units, and outfalls. If a water balance cannot be determined (*e.g., for certain mining activities*), provide a pictorial description of the nature and amount of any sources of water and any collection or treatment measures.

B. For each outfall, provide a description of: (1) All operations contributing wastewater to the effluent, including process wastewater, sanitary wastewater, cooling water, and storm water runoff; (2) The average flow contributed by each operation; and (3) The treatment received by the wastewater. Continue on additional sheets if necessary.

| 1. OUTFALL NO. (*list*) | 2. OPERATION(S) CONTRIBUTING FLOW | | 3. TREATMENT | | |
|---|---|---|---|---|---|
| | a. OPERATION (*list*) | b. AVERAGE FLOW (*include units*) | a. DESCRIPTION | b. LIST CODES FROM TABLE 2C-1 | |
| 001 | Cooling Water Discharge | 342.20 MGD | Disinfection (Chlorine) | 2-F | |
| | | | Discharge to Surface Water | 4-A | |
| | | | | | |
| | | | | | |
| 002 | Ash Transport Water | 0.75 MGD | Sedimentation, Chemical Precipitation | 1-U | 2-C |
| | | | Neutralization, Gravity Filtration | 2-K | 1-Q |
| | | | Discharge to Surface Water | 4-A | |
| | | | Solids Disposal at Landfill | 5-Q | |
| 004 | Low Volume Waste System | 0.52 MGD | Sedimentation/Disinfection (Chlorine) | 1-U | 2-F |
| | | | Neutralization, Gravity Filtration | 2-K | 1-Q |
| | | | Discharge to Surface Water | 4-A | |
| | | | Solids Disposal at Landfill | 5-Q | |
| 601 | Ash Recycle Water Overflow | Recycled; Overflow to 002 | N/A | 1-U | |
| | | | | | |
| | | | | | |
| | | | | | |
| 604 | Boiler Blowdown | 0.08 MGD | Discharge to Surface Water via Outfall 001 | 4-A | |
| | | | | | |
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OFFICIAL USE ONLY (*effluent guidelines sub-categories*)

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C. Except for storm runoff, leaks, or spills, are any of the discharges described in Items II-A or B intermittent or seasonal?

☑ YES (*complete the following table*) ☐ NO (*go to Section III*)

| 1. OUTFALL NUMBER (*list*) | 2. OPERATION(s) CONTRIBUTING FLOW (*list*) | 3. FREQUENCY a. DAYS PER WEEK (*specify average*) | 3. FREQUENCY b. MONTHS PER YEAR (*specify average*) | 4. FLOW a. FLOW RATE (*in mgd*) 1. LONG TERM AVERAGE | 4. FLOW a. FLOW RATE (*in mgd*) 2. MAXIMUM DAILY | 4. FLOW B. TOTAL VOLUME (*specify with units*) 1. LONG TERM AVERAGE | 4. FLOW B. TOTAL VOLUME (*specify with units*) 2. MAXIMUM DAILY | 4. FLOW C. DURATION (*in days*) |
|---|---|---|---|---|---|---|---|---|
| 604 | Boiler Blowdown | 1.36 | 8.0 | 0.08 | 0.55 | | | 47 |
| 610 | Coal Pile Runoff | 3.06 | 10.6 | 0.10 | 0.28 | | | 141 |
| 611 | Treated, Non-chemical Metal Cleaning Waste | 0.02 | 0.4 | 0.05 | 0.08 | | | 0.03 |
| | NOTE: Valules based on data for last five years. | | | | | | | |

## III. PRODUCTION

A. Does an effluent guideline limitation promulgated by EPA under Section 304 of the Clean Water Act apply to your facility?

☑ YES (*complete Item III-B*) ☐ NO (*go to Section IV*)

B. Are the limitations in the applicable effluent guideline expressed in terms of production (*or other measure of operation*)?

☐ YES (*complete Item III-C*) ☑ NO (*go to Section IV*)

C. If you answered "yes" to Item III-B, list the quantity which represents an actual measurement of your level of production, expressed in the terms and units used in the applicable effluent guideline, and indicate the affected outfalls.

| 1. AVERAGE DAILY PRODUCTION a. QUANTITY PER DAY | b. UNITS OF MEASURE | c. OPERATION, PRODUCT, MATERIAL, ETC. (*specify*) | 2. AFFECTED OUTFALLS (*list outfall numbers*) |
|---|---|---|---|
| N/A | | | |

## IV. IMPROVEMENTS

A. Are you now required by any Federal, State or local authority to meet any implementation schedule for the construction, upgrading or operations of wastewater treatment equipment or practices or any other environmental programs which may affect the discharges described in this application? This includes, but is not limited to, permit conditions, administrative or enforcement orders, enforcement compliance schedule letters, stipulations, court orders, and grant or loan conditions.

☑ YES (*complete the following table*) ☐ NO (*go to Item IV-B*)

| 1. IDENTIFICATION OF CONDITION, AGREEMENT, ETC. | 2. AFFECTED OUTFALLS a. NO. | 2. AFFECTED OUTFALLS b. SOURCE OF DISCHARGE | 3. BRIEF DESCRIPTION OF PROJECT | 4. FINAL COMPLIANCE DATE a. REQUIRED | 4. FINAL COMPLIANCE DATE b. PROJECTED |
|---|---|---|---|---|---|
| Mercury variance | 002 | Ash Basin | Compliance with permit conditions under mercury variance, including pollutant minimization program and implementation of recommendations from optimization evaluation of ash pond treatment system. | Feb 1, 2015 | Feb 1, 2015 |

B. OPTIONAL: You may attach additional sheets describing any additional water pollution control programs (*or other environmental projects which may affect your discharges*) you now have underway or which you plan. Indicate whether each program is now underway or planned, and indicate your actual or planned schedules for construction.

☐ MARK "X" IF DESCRIPTION OF ADDITIONAL CONTROL PROGRAMS IS ATTACHED

Please print or type in the unshaded areas only.

EPA I.D. NUMBER (*copy from Item 1 of Form 1*)
3IB00002*KD

Form Approved.
OMB No. 2040-0086.
Approval expires 3-31-98.

FORM **2C** NPDES

EPA

U.S. ENVIRONMENTAL PROTECTION AGENCY
APPLICATION FOR PERMIT TO DISCHARGE WASTEWATER
**EXISTING MANUFACTURING, COMMERCIAL, MINING AND SILVICULTURE OPERATIONS**
*Consolidated Permits Program*

## I. OUTFALL LOCATION

For each outfall, list the latitude and longitude of its location to the nearest 15 seconds and the name of the receiving water.

| A. OUTFALL NUMBER (*list*) | B. LATITUDE | | | C. LONGITUDE | | | D. RECEIVING WATER (*name*) |
|---|---|---|---|---|---|---|---|
| | 1. DEG. | 2. MIN. | 3. SEC. | 1. DEG. | 2. MIN. | 3. SEC. | |
| 610 | 41 | 30 | 17 | 82 | 03 | 35 | Lake Erie via 002 |
| 611 | 41 | 30 | 17 | 82 | 03 | 35 | Lake Erie via 002 |
| 612 | 41 | 30 | 30 | 82 | 03 | 28 | Discharge Tunnel to Lake Erie via 001 |
| 800 | 41 | 30 | 15 | 82 | 03 | 00 | Lake Erie Intake |
| | | | | | | | |

## II. FLOWS, SOURCES OF POLLUTION, AND TREATMENT TECHNOLOGIES

A. Attach a line drawing showing the water flow through the facility. Indicate sources of intake water, operations contributing wastewater to the effluent, and treatment units labeled to correspond to the more detailed descriptions in Item B. Construct a water balance on the line drawing by showing average flows between intakes, operations, treatment units, and outfalls. If a water balance cannot be determined (*e.g., for certain mining activities*), provide a pictorial description of the nature and amount of any sources of water and any collection or treatment measures.

B. For each outfall, provide a description of: (1) All operations contributing wastewater to the effluent, including process wastewater, sanitary wastewater, cooling water, and storm water runoff; (2) The average flow contributed by each operation; and (3) The treatment received by the wastewater. Continue on additional sheets if necessary.

| 1. OUTFALL NO. (*list*) | 2. OPERATION(S) CONTRIBUTING FLOW | | 3. TREATMENT | | |
|---|---|---|---|---|---|
| | a. OPERATION (*list*) | b. AVERAGE FLOW (*include units*) | a. DESCRIPTION | b. LIST CODES FROM TABLE 2C-1 | |
| 610 | Coal Pile Runoff System | 0.10 MGD | Neutralization, Chemical Precipitation | 2-K | 2-C |
| | | | Pressure Filtration | 5-R | |
| | | | Discharge to Surface Water via Outfall 002 | 4-A | |
| | | | Solids Disposal at Landfill | 5-Q | |
| 611 | Metal Cleaning Waste; Treated in | 0.05 MGD | Neutralization, Chemical Precipitation | 2-K | 2-C |
| | Tank Before Discharge to Ash Basin | | Pressure Filtration | 5-R | |
| | | | Discharge to Surface Water via Outfall 002 | 4-A | |
| | | | Solids Disposal at Landfill | 5-Q | |
| 612 | Discharge of Unit 9 Heat Exchanger; | 2.34 MGD | Discharge to Surface Water via Outfall 001 | 4-A | |
| | Combines with Noncontact Cooling | | | | |
| | Water Discharge to Outfall 001 | | | | |
| | | | | | |
| 800 | Lake Erie Intake | 373.78 MGD | N/A | 2-F | |
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OFFICIAL USE ONLY (*effluent guidelines sub-categories*)

CONTINUED FROM PAGE 2

## V. INTAKE AND EFFLUENT CHARACTERISTICS

A, B, & C: See instructions before proceeding – Complete one set of tables for each outfall – Annotate the outfall number in the space provided.
NOTE: Tables V-A, V-B, and V-C are included on separate sheets numbered V-1 through V-9.

D. Use the space below to list any of the pollutants listed in Table 2c-3 of the instructions, which you know or have reason to believe is discharged or may be discharged from any outfall. For every pollutant you list, briefly describe the reasons you believe it to be present and report any analytical data in your possession.

| 1. POLLUTANT | 2. SOURCE | 1. POLLUTANT | 2. SOURCE |
|---|---|---|---|
| None | | | |

## VI. POTENTIAL DISCHARGES NOT COVERED BY ANALYSIS

Is any pollutant listed in Item V-C a substance or a component of a substance which you currently use or manufacture as an intermediate or final product or byproduct?

☐ YES (*list all such pollutants below*) ☑ NO (*go to Item VI-B*)

N/A

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## VII. BIOLOGICAL TOXICITY TESTING DATA

Do you have any knowledge or reason to believe that any biological test for acute or chronic toxicity has been made on any of your discharges or on a receiving water in relation to your discharge within the last 3 years?

☐ YES (*identify the test(s) and describe their purposes below*) ☑ NO (*go to Section VIII*)

(Toxicity testing is no longer required at the facility based on monitoring results from previous permit cycles.)

## VIII. CONTRACT ANALYSIS INFORMATION

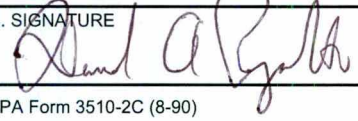
Were any of the analyses reported in Item V performed by a contract laboratory or consulting firm?

☑ YES (*list the name, address, and telephone number of, and pollutants analyzed by, each such laboratory or firm below*) ☐ NO (*go to Section IX*)

| A. NAME | B. ADDRESS | C. TELEPHONE (*area code & no.*) | D. POLLUTANTS ANALYZED (*list*) |
|---|---|---|---|
| Alloway | 1776 Marion-Waldo Road<br>Marion, OH 43302 | 740-389-5991 | Inorganic and general chemistry parameters. |
| Alloway | 1101 N. Cole Street<br>Lima, OH 45805 | 419-223-1362 | Volatile organic compounds and semi-volatile organic compounds. |

## IX. 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.*

| A. NAME & OFFICIAL TITLE (*type or print*) | B. PHONE NO. (*area code & no.*) |
|---|---|
| Daniel A. Rogatto, Plant Manager | (440) 930-6426 |
| C. SIGNATURE  | D. DATE SIGNED 1-20-05 |

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OHIO EPA NEDO

PLEASE PRINT OR TYPE IN THE UNSHADED AREAS ONLY. You may report some or all of this information on separate sheets (*use the same format*) instead of completing these pages.
SEE INSTRUCTIONS.

EPA I.D. NUMBER (*copy from Item 1 of Form 1*): 3IB00002*KD

V. INTAKE AND EFFLUENT CHARACTERISTICS *(continued from page 3 of Form 2-C)*

OUTFALL NO. 002

PART A –You must provide the results of at least one analysis for every pollutant in this table. Complete one table for each outfall. See instructions for additional details.

| 1. POLLUTANT | 2. EFFLUENT a. MAXIMUM DAILY VALUE (1) CONCENTRATION | a. MAXIMUM DAILY VALUE (2) MASS | b. MAXIMUM 30 DAY VALUE (*if available*) (1) CONCENTRATION | b. MAXIMUM 30 DAY VALUE (*if available*) (2) MASS | c. LONG TERM AVRG. VALUE (*if available*) (1) CONCENTRATION | c. LONG TERM AVRG. VALUE (*if available*) (2) MASS | d. NO. OF ANALYSES | 3. UNITS (*specify if blank*) a. CONCEN-TRATION | 3. UNITS b. MASS | 4. INTAKE (*optional*) a. LONG TERM AVERAGE VALUE (1) CONCENTRATION | 4. INTAKE a. LONG TERM AVERAGE VALUE (2) MASS | 4. INTAKE b. NO. OF ANALYSES |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| a. Biochemical Oxygen Demand (*BOD*) | 3.4* | 7.37 | | | | | 1 | mg/l | lb/day | | | |
| b. Chemical Oxygen Demand (*COD*) | <10 | -- | | | | | 1 | mg/l | -- | | | |
| c. Total Organic Carbon (*TOC*) | 1.9 | 4.12 | | | | | 1 | mg/l | lb/day | | | |
| d. Total Suspended Solids (*TSS*) | <2.0 | -- | | | | | 1 | mg/l | -- | | | |
| e. Ammonia (*as N*) | <0.05 | -- | | | | | 1 | mg/l | -- | | | |
| f. Flow | VALUE 0.26 | | VALUE -- | | VALUE -- | | 1 | MGD | -- | VALUE | | |
| g. Temperature (*winter*) | VALUE -- | | VALUE -- | | VALUE -- | | -- | °C | | VALUE | | |
| h. Temperature (*summer*) | VALUE 18.9 | | VALUE -- | | VALUE -- | | 1 | °C | | VALUE | | |
| i. pH | MINIMUM 7.35 | MAXIMUM 7.35 | MINIMUM -- | MAXIMUM -- | | | 1 | STANDARD UNITS | | | | |

PART B – Mark "X" in column 2-a for each pollutant you know or have reason to believe is present. Mark "X" in column 2-b for each pollutant you believe to be absent. If you mark column 2a for any pollutant which is limited either directly, or indirectly but expressly, in an effluent limitations guideline, you must provide the results of at least one analysis for that pollutant. For other pollutants for which you mark column 2a, you must provide quantitative data or an explanation of their presence in your discharge. Complete one table for each outfall. See the instructions for additional details and requirements.

| 1. POLLUTANT AND CAS NO. (*if available*) | 2. MARK "X" a. BELIEVED PRESENT | 2. MARK "X" b. BELIEVED ABSENT | 3. EFFLUENT a. MAXIMUM DAILY VALUE (1) CONCENTRATION | a. MAXIMUM DAILY VALUE (2) MASS | b. MAXIMUM 30 DAY VALUE (*if available*) (1) CONCENTRATION | b. MAXIMUM 30 DAY VALUE (*if available*) (2) MASS | c. LONG TERM AVRG. VALUE (*if available*) (1) CONCENTRATION | c. LONG TERM AVRG. VALUE (*if available*) (2) MASS | d. NO. OF ANALYSES | 4. UNITS a. CONCEN-TRATION | 4. UNITS b. MASS | 5. INTAKE (*optional*) a. LONG TERM AVERAGE VALUE (1) CONCENTRATION | 5. INTAKE a. LONG TERM AVERAGE VALUE (2) MASS | 5. INTAKE b. NO. OF ANALYSES |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| a. Bromide (24959-67-9) | X | | 0.073 | 0.16 | | | | | 1 | mg/l | lb/day | | | |
| b. Chlorine, Total Residual | X | | <0.01 | -- | | | | | 1 | mg/l | -- | | | |
| c. Color | X | | <5.0 | -- | | | | | 1 | Pt-Co | -- | | | |
| d. Fecal Coliform | | X | -- | -- | | | | | -- | -- | -- | | | |
| e. Fluoride (16984-48-8) | X | | 0.314 | 0.68 | | | | | 1 | mg/l | lb/day | | | |
| f. Nitrate-Nitrite (*as N*) | X | | 0.47 | 1.02 | | | | | 1 | mg/l | lb/day | | | |



* Estimated value below practical quantitation limit.

ITEM V-B CONTINUED FROM FRONT

| 1. POLLUTANT AND CAS NO. (*if available*) | 2. MARK "X" | | 3. EFFLUENT | | | | | | | 4. UNITS | | 5. INTAKE (*optional*) | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | a. BELIEVED PRESENT | b. BELIEVED ABSENT | a. MAXIMUM DAILY VALUE | | b. MAXIMUM 30 DAY VALUE (*if available*) | | c. LONG TERM AVRG. VALUE (*if available*) | | d. NO. OF ANALYSES | a. CONCENTRATION | b. MASS | a. LONG TERM AVERAGE VALUE | | b. NO. OF ANALYSES |
| | | | (1) CONCENTRATION | (2) MASS | (1) CONCENTRATION | (2) MASS | (1) CONCENTRATION | (2) MASS | | | | (1) CONCENTRATION | (2) MASS | |
| g. Nitrogen, Total Organic (*as N*) | X | | <0.50 | -- | | | | | 1 | mg/l | -- | | | |
| h. Oil and Grease | X | | <5.1 | -- | | | | | 1 | mg/l | -- | | | |
| i. Phosphorus (as P), Total (7723-14-0) | X | | 0.05 | 0.11 | | | | | 1 | mg/l | lb/day | | | |
| j. Radioactivity | | | | | | | | | | | | | | |
| (1) Alpha, Total | | X | -- | -- | | | | | -- | -- | -- | | | |
| (2) Beta, Total | | X | -- | -- | | | | | -- | -- | -- | | | |
| (3) Radium, Total | | X | -- | -- | | | | | -- | -- | -- | | | |
| (4) Radium 226, Total | | X | -- | -- | | | | | -- | -- | -- | | | |
| k. Sulfate (*as $SO_4$*) (14808-79-8) | X | | 260 | 563.8 | | | | | 1 | mg/l | lb/day | | | |
| l. Sulfide (*as S*) | X | | 0.016* | 0.03 | | | | | 1 | mg/l | lb/day | | | |
| m. Sulfite (*as $SO_3$*) (14265-45-3) | X | | <0.64 | -- | | | | | 1 | mg/l | -- | | | |
| n. Surfactants | X | | 0.048* | 0.10 | | | | | 1 | mg/l | lb/day | | | |
| o. Aluminum, Total (7429-90-5) | X | | 129.6* | 0.28 | | | | | 1 | ug/l | lb/day | | | |
| p. Barium, Total (7440-39-3) | X | | 31 | 0.07 | | | | | 1 | µg/l | lb/day | | | |
| q. Boron, Total (7440-42-8) | X | | 120 | 0.26 | | | | | 1 | µg/l | lb/day | | | |
| r. Cobalt, Total (7440-48-4) | X | | <20 | -- | | | | | 1 | µg/l | -- | | | |
| s. Iron, Total (7439-89-6) | X | | 60 | 0.13 | | | | | 1 | µg/l | lb/day | | | |
| t. Magnesium, Total (7439-95-4) | X | | 9,590 | 20.79 | | | | | 1 | µg/l | lb/day | | | |
| u. Molybdenum, Total (7439-98-7) | X | | 4.037* | 0.009 | | | | | 1 | µg/l | lb/day | | | |
| v. Manganese, Total (7439-96-5) | X | | <10 | -- | | | | | 1 | µg/l | -- | | | |
| w. Tin, Total (7440-31-5) | X | | <10 | -- | | | | | 1 | µg/l | -- | | | |
| x. Titanium, Total (7440-32-6) | X | | 6* | 0.013 | | | | | 1 | µg/l | lb/day | | | |



CONTINUE ON PAGE V-3

* Estimated value below practical quantitation limit.

| EPA I.D. NUMBER (*copy from Item 1 of Form 1*) | OUTFALL NUMBER |
|---|---|
| 3IB00002*KD | 002 |

CONTINUED FROM PAGE 3 OF FORM 2-C

PART C - If you are a primary industry and this outfall contains process wastewater, refer to Table 2c-2 in the instructions to determine which of the GC/MS fractions you must test for. Mark "X" in column 2-a for all such GC/MS fractions that apply to your industry and for ALL toxic metals, cyanides, and total phenols. If you are not required to mark column 2-a (*secondary industries, nonprocess wastewater outfalls, and nonrequired GC/MS fractions*), mark "X" in column 2-b for each pollutant you know or have reason to believe is present. Mark "X" in column 2-c for each pollutant you believe is absent. If you mark column 2a for any pollutant, you must provide the results of at least one analysis for that pollutant. If you mark column 2b for any pollutant, you must provide the results of at least one analysis for that pollutant if you know or have reason to believe it will be discharged in concentrations of 10 ppb or greater. If you mark column 2b for acrolein, acrylonitrile, 2,4 dinitrophenol, or 2-methyl-4, 6 dinitrophenol, you must provide the results of at least one analysis for each of these pollutants which you know or have reason to believe that you discharge in concentrations of 100 ppb or greater. Otherwise, for pollutants for which you mark column 2b, you must either submit at least one analysis or briefly describe the reasons the pollutant is expected to be discharged. Note that there are 7 pages to this part; please review each carefully. Complete one table (*all 7 pages*) for each outfall. See instructions for additional details and requirements.

| 1. POLLUTANT AND CAS NUMBER (*if available*) | 2. MARK "X" | | | 3. EFFLUENT | | | | | | | 4. UNITS | | 5. INTAKE (*optional*) | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | a. TESTING REQUIRED | b. BELIEVED PRESENT | c. BELIEVED ABSENT | a. MAXIMUM DAILY VALUE | | b. MAXIMUM 30 DAY VALUE (*if available*) | | c. LONG TERM AVRG. VALUE (*if available*) | | d. NO. OF ANALYSES | a. CONCENTRATION | b. MASS | a. LONG TERM AVERAGE VALUE | | b. NO. OF ANALYSES |
| | | | | (1) CONCENTRATION | (2) MASS | (1) CONCENTRATION | (2) MASS | (1) CONCENTRATION | (2) MASS | | | | (1) CONCENTRATION | (2) MASS | |
| METALS, CYANIDE, AND TOTAL PHENOLS | | | | | | | | | | | | | | | |
| 1M. Antimony, Total (7440-36-0) | X | | | 0.334* | 0.0007 | | | | | 1 | µg/l | lb/day | | | |
| 2M. Arsenic, Total (7440-38-2) | X | | | 5.0 | 0.01 | | | | | 1 | µg/l | lb/day | | | |
| 3M. Beryllium, Total (7440-41-7) | X | | | <0.50 | -- | | | | | 1 | µg/l | -- | | | |
| 4M. Cadmium, Total (7440-43-9) | X | | | 0.078* | 0.0002 | | | | | 1 | µg/l | lb/day | | | |
| 5M. Chromium, Total (7440-47-3) | X | | | <10 | -- | | | | | 1 | µg/l | -- | | | |
| 6M. Copper, Total (7440-50-8) | X | | | 4.143* | 0.009 | | | | | 1 | µg/l | lb/day | | | |
| 7M. Lead, Total (7439-92-1) | X | | | 0.104* | 0.0002 | | | | | 1 | µg/l | lb/day | | | |
| 8M. Mercury, Total (7439-97-6) | X | | | <0.500 | -- | | | | | 1 | ng/l | -- | | | |
| 9M. Nickel, Total (7440-02-0) | X | | | 2.872* | 0.006 | | | | | 1 | µg/l | lb/day | | | |
| 10M. Selenium, Total (7782-49-2) | X | | | <3.0** | -- | | | | | 1 | µg/l | -- | | | |
| 11M. Silver, Total (7440-22-4) | X | | | <5.0 | -- | | | | | 1 | µg/l | -- | | | |
| 12M. Thallium, Total (7440-28-0) | X | | | 0.352* | 0.0008 | | | | | 1 | µg/l | lb/day | | | |
| 13M. Zinc, Total (7440-66-6) | X | | | 3 | 0.007 | | | | | 1 | µg/l | lb/day | | | |
| 14M. Cyanide, Total (57-12-5) | X | | | <0.005 | -- | | | | | 1 | mg/l | -- | | | |
| 15M. Phenols, Total | X | | | <50 | -- | | | | | 1 | µg/l | -- | | | |
| DIOXIN | | | | | | | | | | | | | | | |
| 2,3,7,8-Tetra-chlorodibenzo-P-Dioxin (1764-01-6) | | | X | DESCRIBE RESULTS<br>Not detected. | | | | | | | | | | | |



* Estimated value below practical quantitation limit.

** Lab control standard recovery biased above method limits.

CONTINUED FROM THE FRONT

| 1. POLLUTANT AND CAS NUMBER (*if available*) | 2. MARK "X" | | | 3. EFFLUENT | | | | | | | 4. UNITS | | 5. INTAKE (*optional*) | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | a. TESTING REQUIRED | b. BELIEVED PRESENT | c. BELIEVED ABSENT | a. MAXIMUM DAILY VALUE | | b. MAXIMUM 30 DAY VALUE (*if available*) | | c. LONG TERM AVRG. VALUE (*if available*) | | d. NO. OF ANALYSES | a. CONCENTRATION | b. MASS | a. LONG TERM AVERAGE VALUE | | b. NO. OF ANALYSES |
| | | | | (1) CONCENTRATION | (2) MASS | (1) CONCENTRATION | (2) MASS | (1) CONCENTRATION | (2) MASS | | | | (1) CONCENTRATION | (2) MASS | |
| GC/MS FRACTION – VOLATILE COMPOUNDS | | | | | | | | | | | | | | | |
| 1V. Accrolein (107-02-8) | X | | | <50.0 | -- | | | | | 1 | µg/l | -- | | | |
| 2V. Acrylonitrile (107-13-1) | X | | | <50.0 | -- | | | | | 1 | µg/l | -- | | | |
| 3V. Benzene (71-43-2) | X | | | <5.0 | -- | | | | | 1 | µg/l | -- | | | |
| 4V. Bis (*Chloromethyl*) Ether (542-88-1) | X | | | ND* | -- | | | | | 1 | µg/l | -- | | | |
| 5V. Bromoform (75-25-2) | X | | | <5.0 | -- | | | | | 1 | µg/l | -- | | | |
| 6V. Carbon Tetrachloride (56-23-5) | X | | | <5.0 | -- | | | | | 1 | µg/l | -- | | | |
| 7V. Chlorobenzene (108-90-7) | X | | | <5.0 | -- | | | | | 1 | µg/l | -- | | | |
| 8V. Chlorodibromomethane (124-48-1) | X | | | <5.0 | -- | | | | | 1 | µg/l | -- | | | |
| 9V. Chloroethane (75-00-3) | X | | | <10.0 | -- | | | | | 1 | µg/l | -- | | | |
| 10V. 2-Chloroethylvinyl Ether (110-75-8) | X | | | <10 | -- | | | | | 1 | µg/l | -- | | | |
| 11V. Chloroform (67-66-3) | X | | | <5.0 | -- | | | | | 1 | µg/l | -- | | | |
| 12V. Dichlorobromomethane (75-27-4) | X | | | <5.0 | -- | | | | | 1 | µg/l | -- | | | |
| 13V. Dichlorodifluoromethane (75-71-8) | X | | | <10 | -- | | | | | 1 | µg/l | -- | | | |
| 14V. 1,1-Dichloroethane (75-34-3) | X | | | <5.0 | -- | | | | | 1 | µg/l | -- | | | |
| 15V. 1,2-Dichloroethane (107-06-2) | X | | | <5.0 | -- | | | | | 1 | µg/l | -- | | | |
| 16V. 1,1-Dichloroethylene (75-35-4) | X | | | <5.0 | -- | | | | | 1 | µg/l | -- | | | |
| 17V. 1,2-Dichloropropane (78-87-5) | X | | | <5.0 | -- | | | | | 1 | ug/l | -- | | | |
| 18V. 1,3-Dichloropropylene (542-75-6) | X | | | <5.0 | -- | | | | | 1 | µg/l | -- | | | |
| 19V. Ethylbenzene (100-41-4) | X | | | <5.0 | -- | | | | | 1 | µg/l | -- | | | |
| 20V. Methyl Bromide (74-83-9) | X | | | <10.0 | -- | | | | | 1 | µg/l | -- | | | |
| 21V. Methyl Chloride (74-87-3) | X | | | <10 | -- | | | | | 1 | µg/l | -- | | | |



CONTINUE ON PAGE V-5

*ND - Not detected in library search.

CONTINUED FROM PAGE V-4

| 1. POLLUTANT AND CAS NUMBER (*if available*) | 2. MARK "X" | | | 3. EFFLUENT | | | | | | | 4. UNITS | | 5. INTAKE (*optional*) | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | a. TESTING REQUIRED | b. BELIEVED PRESENT | c. BELIEVED ABSENT | a. MAXIMUM DAILY VALUE | | b. MAXIMUM 30 DAY VALUE (*if available*) | | c. LONG TERM AVRG. VALUE (*if available*) | | d. NO. OF ANALYSES | a. CONCENTRATION | b. MASS | a. LONG TERM AVERAGE VALUE | | b. NO. OF ANALYSES |
| | | | | (1) CONCENTRATION | (2) MASS | (1) CONCENTRATION | (2) MASS | (1) CONCENTRATION | (2) MASS | | | | (1) CONCENTRATION | (2) MASS | |
| GC/MS FRACTION – VOLATILE COMPOUNDS (*continued*) | | | | | | | | | | | | | | | |
| 22V. Methylene Chloride (75-09-2) | X | | | <10 | -- | | | | | 1 | µg/l | -- | | | |
| 23V. 1,1,2,2-Tetrachloroethane (79-34-5) | X | | | <5.0 | -- | | | | | 1 | µg/l | -- | | | |
| 24V. Tetrachloroethylene (127-18-4) | X | | | <5.0 | -- | | | | | 1 | µg/l | -- | | | |
| 25V. Toluene (108-88-3) | X | | | <5.0 | -- | | | | | 1 | µg/l | -- | | | |
| 26V. 1,2-Trans-Dichloroethylene (156-60-5) | X | | | <5.0 | -- | | | | | 1 | µg/l | -- | | | |
| 27V. 1,1,1-Trichloroethane (71-55-6) | X | | | <5.0 | -- | | | | | 1 | µg/l | -- | | | |
| 28V. 1,1,2-Trichloroethane (79-00-5) | X | | | <5.0 | -- | | | | | 1 | µg/l | -- | | | |
| 29V Trichloroethylene (79-01-6) | X | | | <5.0 | -- | | | | | 1 | µg/l | -- | | | |
| 30V. Trichlorofluoromethane (75-69-4) | X | | | <10 | -- | | | | | 1 | µg/l | -- | | | |
| 31V. Vinyl Chloride (75-01-4) | X | | | <10 | -- | | | | | 1 | µg/l | -- | | | |
| GC/MS FRACTION – ACID COMPOUNDS | | | | | | | | | | | | | | | |
| 1A. 2-Chlorophenol (95-57-8) | X | | | <10.0 | -- | | | | | 1 | µg/l | -- | | | |
| 2A. 2,4-Dichlorophenol (120-83-2) | X | | | <10.0 | -- | | | | | 1 | µg/l | -- | | | |
| 3A. 2,4-Dimethylphenol (105-67-9) | X | | | <10.0 | -- | | | | | 1 | µg/l | -- | | | |
| 4A. 4,6-Dinitro-O-Cresol (534-52-1) | X | | | <50.0 | -- | | | | | 1 | µg/l | -- | | | |
| 5A. 2,4-Dinitrophenol (51-28-5) | X | | | <50.0 | -- | | | | | 1 | µg/l | -- | | | |
| 6A. 2-Nitrophenol (88-75-5) | X | | | <10.0 | -- | | | | | 1 | µg/l | -- | | | |
| 7A. 4-Nitrophenol (100-02-7) | X | | | <50.0 | -- | | | | | 1 | µg/l | -- | | | |
| 8A. P-Chloro-M-Cresol (59-50-7) | X | | | <50.0 | -- | | | | | 1 | µg/l | -- | | | |
| 9A. Pentachlorophenol (87-86-5) | X | | | <50.0 | -- | | | | | 1 | µg/l | -- | | | |
| 10A. Phenol (108-95-2) | X | | | <10.0 | -- | | | | | 1 | µg/l | -- | | | |
| 11A. 2,4,6-Trichlorophenol (88-05-2) | X | | | <20.0 | -- | | | | | 1 | µg/l | -- | | | |



CONTINUE ON REVERSE

CONTINUED FROM THE FRONT

| 1. POLLUTANT AND CAS NUMBER (*if available*) | 2. MARK "X" | | | 3. EFFLUENT | | | | | | | 4. UNITS | | 5. INTAKE (*optional*) | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | a. TESTING REQUIRED | b. BELIEVED PRESENT | c. BELIEVED ABSENT | a. MAXIMUM DAILY VALUE | | b. MAXIMUM 30 DAY VALUE (*if available*) | | c. LONG TERM AVRG. VALUE (*if available*) | | d. NO. OF ANALYSES | a. CONCENTRATION | b. MASS | a. LONG TERM AVERAGE VALUE | | b. NO. OF ANALYSES |
| | | | | (1) CONCENTRATION | (2) MASS | (1) CONCENTRATION | (2) MASS | (1) CONCENTRATION | (2) MASS | | | | (1) CONCENTRATION | (2) MASS | |
| GC/MS FRACTION – BASE/NEUTRAL COMPOUNDS | | | | | | | | | | | | | | | |
| 1B. Acenaphthene (83-32-9) | X | | | <10.0 | -- | | | | | 1 | µg/l | -- | | | |
| 2B. Acenaphtylene (208-96-8) | X | | | <10.0 | -- | | | | | 1 | µg/l | -- | | | |
| 3B. Anthracene (120-12-7) | X | | | <10.0 | -- | | | | | 1 | µg/l | -- | | | |
| 4B. Benzidine (92-87-5) | X | | | <50.0 | -- | | | | | 1 | µg/l | -- | | | |
| 5B. Benzo (*a*) Anthracene (56-55-3) | X | | | <10.0 | -- | | | | | 1 | µg/l | -- | | | |
| 6B. Benzo (*a*) Pyrene (50-32-8) | X | | | <10.0 | -- | | | | | 1 | µg/l | -- | | | |
| 7B. 3,4-Benzo-fluoranthene (205-99-2) | X | | | <10.0 | -- | | | | | 1 | µg/l | -- | | | |
| 8B. Benzo (*ghi*) Perylene (191-24-2) | X | | | <10.0 | -- | | | | | 1 | µg/l | -- | | | |
| 9B. Benzo (*k*) Fluoranthene (207-08-9) | X | | | <10.0 | -- | | | | | 1 | µg/l | -- | | | |
| 10B. Bis (*2-Chloro-ethoxy*) Methane (111-91-1) | X | | | <10.0 | -- | | | | | 1 | µg/l | -- | | | |
| 11B. Bis (*2-Chloro-ethyl*) Ether (111-44-4) | X | | | <10.0 | -- | | | | | 1 | µg/l | -- | | | |
| 12B. Bis (*2-Chloroisopropyl*) Ether (102-80-1) | X | | | <10.0 | -- | | | | | 1 | µg/l | -- | | | |
| 13B. Bis (*2-Ethyl-hexyl*) Phthalate (117-81-7) | X | | | <5.0 | -- | | | | | 1 | µg/l | -- | | | |
| 14B. 4-Bromophenyl Phenyl Ether (101-55-3) | X | | | <10.0 | -- | | | | | 1 | µg/l | -- | | | |
| 15B. Butyl Benzyl Phthalate (85-68-7) | X | | | <10.0 | -- | | | | | 1 | µg/l | -- | | | |
| 16B. 2-Chloro-naphthalene (91-58-7) | X | | | <10.0 | -- | | | | | 1 | µg/l | -- | | | |
| 17B. 4-Chloro-phenyl Phenyl Ether (7005-72-3) | X | | | <10.0 | -- | | | | | 1 | µg/l | -- | | | |
| 18B. Chrysene (218-01-9) | X | | | <10.0 | -- | | | | | 1 | µg/l | -- | | | |
| 19B. Dibenzo (*a,h*) Anthracene (53-70-3) | X | | | <10.0 | -- | | | | | 1 | µg/l | -- | | | |
| 20B. 1,2-Dichloro-benzene (95-50-1) | X | | | <5.0 | -- | | | | | 1 | µg/l | -- | | | |
| 21B. 1,3-Di-chloro-benzene (541-73-1) | X | | | <5.0 | -- | | | | | 1 | µg/l | -- | | | |

CONTINUED FROM PAGE V-6

| 1. POLLUTANT AND CAS NUMBER (*if available*) | 2. MARK "X" | | | 3. EFFLUENT | | | | | | | 4. UNITS | | 5. INTAKE (*optional*) | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | a. TESTING REQUIRED | b. BELIEVED PRESENT | c. BELIEVED ABSENT | a. MAXIMUM DAILY VALUE | | b. MAXIMUM 30 DAY VALUE (*if available*) | | c. LONG TERM AVRG. VALUE (*if available*) | | d. NO. OF ANALYSES | a. CONCENTRATION | b. MASS | a. LONG TERM AVERAGE VALUE | | b. NO. OF ANALYSES |
| | | | | (1) CONCENTRATION | (2) MASS | (1) CONCENTRATION | (2) MASS | (1) CONCENTRATION | (2) MASS | | | | (1) CONCENTRATION | (2) MASS | |
| GC/MS FRACTION – BASE/NEUTRAL COMPOUNDS (*continued*) | | | | | | | | | | | | | | | |
| 22B. 1,4-Dichlorobenzene (106-46-7) | X | | | <5.0 | -- | | | | | 1 | µg/l | -- | | | |
| 23B. 3,3-Dichlorobenzidine (91-94-1) | X | | | <20.0 | -- | | | | | 1 | µg/l | -- | | | |
| 24B. Diethyl Phthalate (84-66-2) | X | | | <10.0 | -- | | | | | 1 | µg/l | -- | | | |
| 25B. Dimethyl Phthalate (131 -11-3) | X | | | <10.0 | -- | | | | | 1 | µg/l | -- | | | |
| 26B. Di-N-Butyl Phthalate (84-74-2) | X | | | <10.0 | -- | | | | | 1 | µg/l | -- | | | |
| 27B. 2,4-Dinitrotoluene (121-14-2) | X | | | <20.0 | -- | | | | | 1 | µg/l | -- | | | |
| 28B. 2,6-Dinitrotoluene (606-20-2) | X | | | <10.0 | -- | | | | | 1 | µg/l | -- | | | |
| 29B. Di-N-Octyl Phthalate (117-84-0) | X | | | <10.0 | -- | | | | | 1 | µg/l | -- | | | |
| 30B. 1,2-Diphenylhydrazine (*as Azobenzene*) (122-66-7) | X | | | <10.0 | -- | | | | | 1 | µg/l | -- | | | |
| 31B. Fluoranthene (206-44-0) | X | | | <10.0 | -- | | | | | 1 | µg/l | -- | | | |
| 32B. Fluorene (86-73-7) | X | | | <10.0 | -- | | | | | 1 | µg/l | -- | | | |
| 33B. Hexachlorobenzene (118-74-1) | X | | | <10.0 | -- | | | | | 1 | µg/l | -- | | | |
| 34B. Hexachlorobutadiene (87-68-3) | X | | | <10.0 | -- | | | | | 1 | µg/l | -- | | | |
| 35B. Hexachlorocyclopentadiene (77-47-4) | X | | | <10.0 | -- | | | | | 1 | µg/l | -- | | | |
| 36B Hexachloroethane (67-72-1) | X | | | <10.0 | -- | | | | | 1 | µg/l | -- | | | |
| 37B. Indeno (*1,2,3-cd*) Pyrene (193-39-5) | X | | | <20.0 | -- | | | | | 1 | µg/l | -- | | | |
| 38B. Isophorone (78-59-1) | X | | | <10.0 | -- | | | | | 1 | µg/l | -- | | | |
| 39B. Naphthalene (91-20-3) | X | | | <10.0 | -- | | | | | 1 | µg/l | -- | | | |
| 40B. Nitrobenzene (98-95-3) | X | | | <10.0 | -- | | | | | 1 | µg/l | -- | | | |
| 41B. N-Nitrosodimethylamine (62-75-9) | X | | | <10.0 | -- | | | | | 1 | µg/l | -- | | | |
| 42B. N-Nitrosodi-N-Propylamine (621-64-7) | X | | | <10.0 | -- | | | | | 1 | µg/l | -- | | | |

CONTINUED FROM THE FRONT

| 1. POLLUTANT AND CAS NUMBER (*if available*) | 2. MARK "X" | | | 3. EFFLUENT | | | | | | | 4. UNITS | | 5. INTAKE (*optional*) | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | a. TESTING REQUIRED | b. BELIEVED PRESENT | c. BELIEVED ABSENT | a. MAXIMUM DAILY VALUE | | b. MAXIMUM 30 DAY VALUE (*if available*) | | c. LONG TERM AVRG. VALUE (*if available*) | | d. NO. OF ANALYSES | a. CONCENTRATION | b. MASS | a. LONG TERM AVERAGE VALUE | | b. NO. OF ANALYSES |
| | | | | (1) CONCENTRATION | (2) MASS | (1) CONCENTRATION | (2) MASS | (1) CONCENTRATION | (2) MASS | | | | (1) CONCENTRATION | (2) MASS | |
| GC/MS FRACTION – BASE/NEUTRAL COMPOUNDS (*continued*) | | | | | | | | | | | | | | | |
| 43B. N-Nitrosodiphenylamine (86-30-6) | X | | | <10.0 | -- | | | | | 1 | µg/l | -- | | | |
| 44B. Phenanthrene (85-01-8) | X | | | <10.0 | -- | | | | | 1 | µg/l | -- | | | |
| 45B. Pyrene (129-00-0) | X | | | <10.0 | -- | | | | | 1 | µg/l | -- | | | |
| 46B. 1,2,4-Trichlorobenzene (120-82-1) | X | | | <10.0 | -- | | | | | 1 | µg/l | -- | | | |
| GC/MS FRACTION – PESTICIDES | | | | | | | | | | | | | | | |
| 1P. Aldrin (309-00-2) | | | X | | | | | | | -- | -- | -- | | | |
| 2P. α-BHC (319-84-6) | | | X | | | | | | | -- | -- | -- | | | |
| 3P. β-BHC (319-85-7) | | | X | | | | | | | -- | -- | -- | | | |
| 4P. γ-BHC (58-89-9) | | | X | | | | | | | -- | -- | -- | | | |
| 5P. δ-BHC (319-86-8) | | | X | | | | | | | -- | -- | -- | | | |
| 6P. Chlordane (57-74-9) | | | X | | | | | | | -- | -- | -- | | | |
| 7P. 4,4'-DDT (50-29-3) | | | X | | | | | | | -- | -- | -- | | | |
| 8P. 4,4'-DDE (72-55-9) | | | X | | | | | | | -- | -- | -- | | | |
| 9P. 4,4'-DDD (72-54-8) | | | X | | | | | | | -- | -- | -- | | | |
| 10P. Dieldrin (60-57-1) | | | X | | | | | | | -- | -- | -- | | | |
| 11P. α-Enosulfan (115-29-7) | | | X | | | | | | | -- | -- | -- | | | |
| 12P. β-Endosulfan (115-29-7) | | | X | | | | | | | -- | -- | -- | | | |
| 13P. Endosulfan Sulfate (1031-07-8) | | | X | | | | | | | -- | -- | -- | | | |
| 14P. Endrin (72-20-8) | | | X | | | | | | | -- | -- | -- | | | |
| 15P. Endrin Aldehyde (7421-93-4) | | | X | | | | | | | -- | -- | -- | | | |
| 16P. Heptachlor (76-44-8) | | | X | | | | | | | -- | -- | -- | | | |

| EPA I.D. NUMBER (*copy from Item 1 of Form 1*) | OUTFALL NUMBER |
|---|---|
| 3IB00002*KD | 002 |

CONTINUED FROM PAGE V-8

| 1. POLLUTANT AND CAS NUMBER (*if available*) | 2. MARK "X" | | | 3. EFFLUENT | | | | | | | 4. UNITS | | 5. INTAKE (*optional*) | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | a. TESTING REQUIRED | b. BELIEVED PRESENT | c. BELIEVED ABSENT | a. MAXIMUM DAILY VALUE | | b. MAXIMUM 30 DAY VALUE (*if available*) | | c. LONG TERM AVRG. VALUE (*if available*) | | d. NO. OF ANALYSES | a. CONCENTRATION | b. MASS | a. LONG TERM AVERAGE VALUE | | b. NO. OF ANALYSES |
| | | | | (1) CONCENTRATION | (2) MASS | (1) CONCENTRATION | (2) MASS | (1) CONCENTRATION | (2) MASS | | | | (1) CONCENTRATION | (2) MASS | |
| GC/MS FRACTION – PESTICIDES (*continued*) | | | | | | | | | | | | | | | |
| 17P. Heptachlor Epoxide (1024-57-3) | | | X | | | | | | | -- | -- | -- | | | |
| 18P. PCB-1242 (53469-21-9) | | | X | | | | | | | -- | -- | -- | | | |
| 19P. PCB-1254 (11097-69-1) | | | X | | | | | | | -- | -- | -- | | | |
| 20P. PCB-1221 (11104-28-2) | | | X | | | | | | | -- | -- | -- | | | |
| 21P. PCB-1232 (11141-16-5) | | | X | | | | | | | -- | -- | -- | | | |
| 22P. PCB-1248 (12672-29-6) | | | X | | | | | | | -- | -- | -- | | | |
| 23P. PCB-1260 (11096-82-5) | | | X | | | | | | | -- | -- | -- | | | |
| 24P. PCB-1016 (12674-11-2) | | | X | | | | | | | -- | -- | -- | | | |
| 25P. Toxaphene (8001-35-2) | | | X | | | | | | | -- | -- | -- | | | |

PRINT OR TYPE IN THE UNSHADED AREAS ONLY. You may report some or all of this information on separate sheets (*use the same format*) instead of completing these pages.
SEE INSTRUCTIONS.

EPA I.D. NUMBER (*copy from Item 1 of Form 1*): 3IB00002*KD

V. INTAKE AND EFFLUENT CHARACTERISTICS *(continued from page 3 of Form 2-C)*

OUTFALL NO.: INTAKE - 800

PART A –You must provide the results of at least one analysis for every pollutant in this table. Complete one table for each outfall. See instructions for additional details.

| 1. POLLUTANT | 2. EFFLUENT a. MAXIMUM DAILY VALUE (1) CONCENTRATION | a. MAXIMUM DAILY VALUE (2) MASS | b. MAXIMUM 30 DAY VALUE (*if available*) (1) CONCENTRATION | b. MAXIMUM 30 DAY VALUE (*if available*) (2) MASS | c. LONG TERM AVRG. VALUE (*if available*) (1) CONCENTRATION | c. LONG TERM AVRG. VALUE (*if available*) (2) MASS | d. NO. OF ANALYSES | 3. UNITS (*specify if blank*) a. CONCENTRATION | 3. UNITS b. MASS | 4. INTAKE (*optional*) a. LONG TERM AVERAGE VALUE (1) CONCENTRATION | 4. INTAKE a. LONG TERM AVERAGE VALUE (2) MASS | 4. INTAKE b. NO. OF ANALYSES |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| a. Biochemical Oxygen Demand (*BOD*) | 2.6* | 3,435 | | | | | 1 | mg/l | lb/day | | | |
| b. Chemical Oxygen Demand (*COD*) | 7.19* | 9,498 | | | | | 1 | mg/l | lb/day | | | |
| c. Total Organic Carbon (*TOC*) | 2.8 | 3,699 | | | | | 1 | mg/l | lb/day | | | |
| d. Total Suspended Solids (*TSS*) | 9.2 | 12,154 | | | | | 1 | mg/l | lb/day | | | |
| e. Ammonia (*as N*) | <0.05 | -- | | | | | 1 | mg/l | -- | | | |
| f. Flow | VALUE 158.4 | | VALUE -- | | VALUE -- | | 1 | MGD | -- | VALUE | | |
| g. Temperature (*winter*) | VALUE -- | | VALUE -- | | VALUE -- | | -- | °C | | VALUE | | |
| h. Temperature (*summer*) | VALUE 19.8 | | VALUE -- | | VALUE -- | | 1 | °C | | VALUE | | |
| i. pH | MINIMUM 7.27 | MAXIMUM 7.27 | MINIMUM -- | MAXIMUM -- | | | 1 | STANDARD UNITS | | | | |

PART B – Mark "X" in column 2-a for each pollutant you know or have reason to believe is present. Mark "X" in column 2-b for each pollutant you believe to be absent. If you mark column 2a for any pollutant which is limited either directly, or indirectly but expressly, in an effluent limitations guideline, you must provide the results of at least one analysis for that pollutant. For other pollutants for which you mark column 2a, you must provide quantitative data or an explanation of their presence in your discharge. Complete one table for each outfall. See the instructions for additional details and requirements.

| 1. POLLUTANT AND CAS NO. (*if available*) | 2. MARK "X" a. BELIEVED PRESENT | 2. MARK "X" b. BELIEVED ABSENT | 3. EFFLUENT a. MAXIMUM DAILY VALUE (1) CONCENTRATION | a. MAXIMUM DAILY VALUE (2) MASS | b. MAXIMUM 30 DAY VALUE (*if available*) (1) CONCENTRATION | b. MAXIMUM 30 DAY VALUE (*if available*) (2) MASS | c. LONG TERM AVRG. VALUE (*if available*) (1) CONCENTRATION | c. LONG TERM AVRG. VALUE (*if available*) (2) MASS | d. NO. OF ANALYSES | 4. UNITS a. CONCENTRATION | 4. UNITS b. MASS | 5. INTAKE (*optional*) a. LONG TERM AVERAGE VALUE (1) CONCENTRATION | 5. INTAKE a. LONG TERM AVERAGE VALUE (2) MASS | 5. INTAKE b. NO. OF ANALYSES |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| a. Bromide (24959-67-9) | X | | 0.037 | 22.46 | | | | | 1 | mg/l | lb/day | | | |
| b. Chlorine, Total Residual | X | | <0.01 | -- | | | | | 1 | mg/l | -- | | | |
| c. Color | X | | 5.0 | -- | | | | | 1 | Pt-Co | -- | | | |
| d. Fecal Coliform | | X | -- | -- | | | | | -- | -- | -- | | | |
| e. Fluoride (16984-48-8) | X | | 0.148 | 195.5 | | | | | 1 | mg/l | lb/day | | | |
| f. Nitrate-Nitrite (*as N*) | X | | 0.268* | 354.0 | | | | | 1 | mg/l | lb/day | | | |



* Estimated value below practical quantitation limit.

ITEM V-B CONTINUED FROM FRONT

| 1. POLLUTANT AND CAS NO. (*if available*) | 2. MARK "X" | | 3. EFFLUENT | | | | | | | 4. UNITS | | 5. INTAKE (*optional*) | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | a. BELIEVED PRESENT | b. BELIEVED ABSENT | a. MAXIMUM DAILY VALUE | | b. MAXIMUM 30 DAY VALUE (*if available*) | | c. LONG TERM AVRG. VALUE (*if available*) | | d. NO. OF ANALYSES | a. CONCENTRATION | b. MASS | a. LONG TERM AVERAGE VALUE | | b. NO. OF ANALYSES |
| | | | (1) CONCENTRATION | (2) MASS | (1) CONCENTRATION | (2) MASS | (1) CONCENTRATION | (2) MASS | | | | (1) CONCENTRATION | (2) MASS | |
| g. Nitrogen, Total Organic (*as N*) | X | | 0.286* | 377.8 | | | | | 1 | mg/l | lb/day | | | |
| h. Oil and Grease | X | | <5.1 | -- | | | | | 1 | mg/l | -- | | | |
| i. Phosphorus (as P), Total (7723-14-0) | X | | 0.05 | 66.05 | | | | | 1 | mg/l | lb/day | | | |
| j. Radioactivity | | | | | | | | | | | | | | |
| (1) Alpha, Total | | X | -- | -- | | | | | -- | -- | -- | | | |
| (2) Beta, Total | | X | -- | -- | | | | | -- | -- | -- | | | |
| (3) Radium, Total | | X | -- | -- | | | | | -- | -- | -- | | | |
| (4) Radium 226, Total | | X | -- | -- | | | | | -- | -- | -- | | | |
| k. Sulfate (*as $SO_4$*) (14808-79-8) | X | | 20 | 26,421 | | | | | 1 | mg/l | lb/day | | | |
| l. Sulfide (*as S*) | X | | 0.012* | 15.85 | | | | | 1 | mg/l | lb/day | | | |
| m. Sulfite (*as $SO_3$*) (14265-45-3) | X | | <0.64 | -- | | | | | 1 | mg/l | -- | | | |
| n. Surfactants | X | | 0.042* | 55.48 | | | | | 1 | mg/l | lb/day | | | |
| o. Aluminum, Total (7429-90-5) | X | | 104.5* | 138.0 | | | | | 1 | µg/l | lb/day | | | |
| p. Barium, Total (7440-39-3) | X | | 21 | 27.74 | | | | | 1 | µg/l | lb/day | | | |
| q. Boron, Total (7440-42-8) | X | | 23 | 30.38 | | | | | 1 | µg/l | lb/day | | | |
| r. Cobalt, Total (7440-48-4) | X | | <20 | -- | | | | | 1 | µg/l | -- | | | |
| s. Iron, Total (7439-89-6) | X | | 140 | 184.9 | | | | | 1 | µg/l | lb/day | | | |
| t. Magnesium, Total (7439-95-4) | X | | 8,780 | 11,599 | | | | | 1 | µg/l | lb/day | | | |
| u. Molybdenum, Total (7439-98-7) | X | | 1.859* | 2.46 | | | | | 1 | µg/l | lb/day | | | |
| v. Manganese, Total (7439-96-5) | X | | 11 | 14.53 | | | | | 1 | µg/l | lb/day | | | |
| w. Tin, Total (7440-31-5) | X | | <10 | -- | | | | | 1 | µg/l | -- | | | |
| x. Titanium, Total (7440-32-6) | X | | <10 | -- | | | | | 1 | µg/l | -- | | | |



CONTINUE ON PAGE V-3

* Estimated value below practical quantitation limit.

| EPA I.D. NUMBER (*copy from Item 1 of Form 1*) | OUTFALL NUMBER |
|---|---|
| 3IB00002*KD | INTAKE - 800 |

CONTINUED FROM PAGE 3 OF FORM 2-C

PART C - If you are a primary industry and this outfall contains process wastewater, refer to Table 2c-2 in the instructions to determine which of the GC/MS fractions you must test for. Mark "X" in column 2-a for all such GC/MS fractions that apply to your industry and for ALL toxic metals, cyanides, and total phenols. If you are not required to mark column 2-a (*secondary industries, nonprocess wastewater outfalls, and nonrequired GC/MS fractions*), mark "X" in column 2-b for each pollutant you know or have reason to believe is present. Mark "X" in column 2-c for each pollutant you believe is absent. If you mark column 2a for any pollutant, you must provide the results of at least one analysis for that pollutant. If you mark column 2b for any pollutant, you must provide the results of at least one analysis for each of these pollutants which you know or have reason to believe that you discharge in concentrations of 100 ppb or greater. Otherwise, for pollutants for which you mark column 2b, you must either submit at least one analysis or briefly describe the reasons the pollutant is expected to be discharged. Note that there are 7 pages to this part; please review each carefully. Complete one table (*all 7 pages*) for each outfall. See instructions for additional details and requirements.

| 1. POLLUTANT AND CAS NUMBER (*if available*) | 2. MARK "X" | | | 3. EFFLUENT | | | | | | | 4. UNITS | | 5. INTAKE (*optional*) | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | a. TESTING REQUIRED | b. BELIEVED PRESENT | c. BELIEVED ABSENT | a. MAXIMUM DAILY VALUE | | b. MAXIMUM 30 DAY VALUE (*if available*) | | c. LONG TERM AVRG. VALUE (*if available*) | | d. NO. OF ANALYSES | a. CONCENTRATION | b. MASS | a. LONG TERM AVERAGE VALUE | | b. NO. OF ANALYSES |
| | | | | (1) CONCENTRATION | (2) MASS | (1) CONCENTRATION | (2) MASS | (1) CONCENTRATION | (2) MASS | | | | (1) CONCENTRATION | (2) MASS | |
| METALS, CYANIDE, AND TOTAL PHENOLS | | | | | | | | | | | | | | | |
| 1M. Antimony, Total (7440-36-0) | X | | | 0.086* | 0.11 | | | | | 1 | µg/l | lb/day | | | |
| 2M. Arsenic, Total (7440-38-2) | X | | | 1.255* | 1.66 | | | | | 1 | µg/l | lb/day | | | |
| 3M. Beryllium, Total (7440-41-7) | X | | | <0.50 | -- | | | | | 1 | µg/l | -- | | | |
| 4M. Cadmium, Total (7440-43-9) | X | | | 0.065* | 0.09 | | | | | 1 | µg/l | lb/day | | | |
| 5M. Chromium, Total (7440-47-3) | X | | | 0.457* | 0.60 | | | | | 1 | µg/l | lb/day | | | |
| 6M. Copper, Total (7440-50-8) | X | | | 2.983* | 3.94 | | | | | 1 | µg/l | lb/day | | | |
| 7M. Lead, Total (7439-92-1) | X | | | 0.267* | 0.35 | | | | | 1 | µg/l | lb/day | | | |
| 8M. Mercury, Total (7439-97-6) | X | | | <0.2 | -- | | | | | 1 | µg/l | -- | | | |
| 9M. Nickel, Total (7440-02-0) | X | | | 1.599* | 2.11 | | | | | 1 | µg/l | lb/day | | | |
| 10M. Selenium, Total (7782-49-2) | X | | | 0.214* | 0.28 | | | | | 1 | µg/l | lb/day | | | |
| 11M. Silver, Total (7440-22-4) | X | | | <5.0 | -- | | | | | 1 | µg/l | -- | | | |
| 12M. Thallium, Total (7440-28-0) | X | | | <1.0 | -- | | | | | 1 | µg/l | -- | | | |
| 13M. Zinc, Total (7440-66-6) | X | | | 8.7* | 11.49 | | | | | 1 | µg/l | lb/day | | | |
| 14M. Cyanide, Total (57-12-5) | X | | | <0.005 | -- | | | | | 1 | mg/l | -- | | | |
| 15M. Phenols, Total | X | | | <50 | -- | | | | | 1 | ug/l | -- | | | |
| DIOXIN | | | | | | | | | | | | | | | |
| 2,3,7,8-Tetra-chlorodibenzo-P-Dioxin (1764-01-6) | | | X | DESCRIBE RESULTS Not detected. | | | | | | | | | | | |



* Estimated value below practical quantitation limit.

CONTINUED FROM THE FRONT

| 1. POLLUTANT AND CAS NUMBER (*if available*) | 2. MARK "X" | | | 3. EFFLUENT | | | | | | | 4. UNITS | | 5. INTAKE (*optional*) | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | a. TESTING REQUIRED | b. BELIEVED PRESENT | c. BELIEVED ABSENT | a. MAXIMUM DAILY VALUE | | b. MAXIMUM 30 DAY VALUE (*if available*) | | c. LONG TERM AVRG. VALUE (*if available*) | | d. NO. OF ANALYSES | a. CONCENTRATION | b. MASS | a. LONG TERM AVERAGE VALUE | | b. NO. OF ANALYSES |
| | | | | (1) CONCENTRATION | (2) MASS | (1) CONCENTRATION | (2) MASS | (1) CONCENTRATION | (2) MASS | | | | (1) CONCENTRATION | (2) MASS | |
| GC/MS FRACTION – VOLATILE COMPOUNDS | | | | | | | | | | | | | | | |
| 1V. Accrolein (107-02-8) | X | | | <50.0 | -- | | | | | 1 | µg/l | -- | | | |
| 2V. Acrylonitrile (107-13-1) | X | | | <50.0 | -- | | | | | 1 | µg/l | -- | | | |
| 3V. Benzene (71-43-2) | X | | | <5.0 | -- | | | | | 1 | µg/l | -- | | | |
| 4V. Bis (*Chloromethyl*) Ether (542-88-1) | X | | | ND* | -- | | | | | 1 | µg/l | -- | | | |
| 5V. Bromoform (75-25-2) | X | | | <5.0 | -- | | | | | 1 | µg/l | -- | | | |
| 6V. Carbon Tetrachloride (56-23-5) | X | | | <5.0 | -- | | | | | 1 | µg/l | -- | | | |
| 7V. Chlorobenzene (108-90-7) | X | | | <5.0 | -- | | | | | 1 | µg/l | -- | | | |
| 8V. Chlorodibromomethane (124-48-1) | X | | | <5.0 | -- | | | | | 1 | µg/l | -- | | | |
| 9V. Chloroethane (75-00-3) | X | | | <10.0 | -- | | | | | 1 | µg/l | -- | | | |
| 10V. 2-Chloroethylvinyl Ether (110-75-8) | X | | | <10 | -- | | | | | 1 | µg/l | -- | | | |
| 11V. Chloroform (67-66-3) | X | | | <5.0 | -- | | | | | 1 | µg/l | -- | | | |
| 12V. Dichlorobromomethane (75-27-4) | X | | | <5.0 | -- | | | | | 1 | µg/l | -- | | | |
| 13V. Dichlorodifluoromethane (75-71-8) | X | | | <10 | -- | | | | | 1 | µg/l | -- | | | |
| 14V. 1,1-Dichloroethane (75-34-3) | X | | | <5.0 | -- | | | | | 1 | µg/l | -- | | | |
| 15V. 1,2-Dichloroethane (107-06-2) | X | | | <5.0 | -- | | | | | 1 | µg/l | -- | | | |
| 16V. 1,1-Dichloroethylene (75-35-4) | X | | | <5.0 | -- | | | | | 1 | µg/l | -- | | | |
| 17V. 1,2-Dichloropropane (78-87-5) | X | | | <5.0 | -- | | | | | 1 | µg/l | -- | | | |
| 18V. 1,3-Dichloropropylene (542-75-6) | X | | | <5.0 | -- | | | | | 1 | µg/l | -- | | | |
| 19V. Ethylbenzene (100-41-4) | X | | | <5.0 | -- | | | | | 1 | µg/l | -- | | | |
| 20V. Methyl Bromide (74-83-9) | X | | | <10.0 | -- | | | | | 1 | µg/l | -- | | | |
| 21V. Methyl Chloride (74-87-3) | X | | | <10 | -- | | | | | 1 | µg/l | -- | | | |



CONTINUE ON PAGE V-5

*ND - Not detected in library search.

CONTINUED FROM PAGE V-4

| 1. POLLUTANT AND CAS NUMBER (*if available*) | 2. MARK "X" | | | 3. EFFLUENT | | | | | | | 4. UNITS | | 5. INTAKE (*optional*) | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | a. TESTING REQUIRED | b. BELIEVED PRESENT | c. BELIEVED ABSENT | a. MAXIMUM DAILY VALUE | | b. MAXIMUM 30 DAY VALUE (*if available*) | | c. LONG TERM AVRG. VALUE (*if available*) | | d. NO. OF ANALYSES | a. CONCENTRATION | b. MASS | a. LONG TERM AVERAGE VALUE | | b. NO. OF ANALYSES |
| | | | | (1) CONCENTRATION | (2) MASS | (1) CONCENTRATION | (2) MASS | (1) CONCENTRATION | (2) MASS | | | | (1) CONCENTRATION | (2) MASS | |
| GC/MS FRACTION – VOLATILE COMPOUNDS (*continued*) | | | | | | | | | | | | | | | |
| 22V. Methylene Chloride (75-09-2) | X | | | <10 | -- | | | | | 1 | µg/l | -- | | | |
| 23V. 1,1,2,2-Tetrachloroethane (79-34-5) | X | | | <5.0 | -- | | | | | 1 | µg/l | -- | | | |
| 24V. Tetrachloro-ethylene (127-18-4) | X | | | <5.0 | -- | | | | | 1 | µg/l | -- | | | |
| 25V. Toluene (108-88-3) | X | | | <5.0 | -- | | | | | 1 | µg/l | -- | | | |
| 26V. 1,2-Trans-Dichloroethylene (156-60-5) | X | | | <5.0 | -- | | | | | 1 | µg/l | -- | | | |
| 27V. 1,1,1-Trichloro-ethane (71-55-6) | X | | | <5.0 | -- | | | | | 1 | µg/l | -- | | | |
| 28V. 1,1,2-Trichloro-ethane (79-00-5) | X | | | <5.0 | -- | | | | | 1 | µg/l | -- | | | |
| 29V Trichloro-ethylene (79-01-6) | X | | | <5.0 | -- | | | | | 1 | µg/l | -- | | | |
| 30V. Trichloro-fluoromethane (75-69-4) | X | | | <10 | -- | | | | | 1 | µg/l | -- | | | |
| 31V. Vinyl Chloride (75-01-4) | X | | | <10 | -- | | | | | 1 | µg/l | -- | | | |
| GC/MS FRACTION – ACID COMPOUNDS | | | | | | | | | | | | | | | |
| 1A. 2-Chlorophenol (95-57-8) | X | | | <10.0 | -- | | | | | 1 | µg/l | -- | | | |
| 2A. 2,4-Dichloro-phenol (120-83-2) | X | | | <10.0 | -- | | | | | 1 | µg/l | -- | | | |
| 3A. 2,4-Dimethyl-phenol (105-67-9) | X | | | <10.0 | -- | | | | | 1 | µg/l | -- | | | |
| 4A. 4,6-Dinitro-O-Cresol (534-52-1) | X | | | <50.0 | -- | | | | | 1 | µg/l | -- | | | |
| 5A. 2,4-Dinitro-phenol (51-28-5) | X | | | <50.0 | -- | | | | | 1 | µg/l | -- | | | |
| 6A. 2-Nitrophenol (88-75-5) | X | | | <10.0 | -- | | | | | 1 | µg/l | -- | | | |
| 7A. 4-Nitrophenol (100-02-7) | X | | | <50.0 | -- | | | | | 1 | µg/l | -- | | | |
| 8A. P-Chloro-M-Cresol (59-50-7) | X | | | <50.0 | -- | | | | | 1 | µg/l | -- | | | |
| 9A. Pentachloro-phenol (87-86-5) | X | | | <50.0 | -- | | | | | 1 | µg/l | -- | | | |
| 10A. Phenol (108-95-2) | X | | | <10.0 | -- | | | | | 1 | µg/l | -- | | | |
| 11A. 2,4,6-Trichloro-phenol (88-05-2) | X | | | <20.0 | -- | | | | | 1 | µg/l | -- | | | |



CONTINUE ON REVERSE

CONTINUED FROM THE FRONT

| 1. POLLUTANT AND CAS NUMBER (*if available*) | 2. MARK "X" | | | 3. EFFLUENT | | | | | | | 4. UNITS | | 5. INTAKE (*optional*) | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | a. TESTING REQUIRED | b. BELIEVED PRESENT | c. BELIEVED ABSENT | a. MAXIMUM DAILY VALUE | | b. MAXIMUM 30 DAY VALUE (*if available*) | | c. LONG TERM AVRG. VALUE (*if available*) | | d. NO. OF ANALYSES | a. CONCENTRATION | b. MASS | a. LONG TERM AVERAGE VALUE | | b. NO. OF ANALYSES |
| | | | | (1) CONCENTRATION | (2) MASS | (1) CONCENTRATION | (2) MASS | (1) CONCENTRATION | (2) MASS | | | | (1) CONCENTRATION | (2) MASS | |
| GC/MS FRACTION – BASE/NEUTRAL COMPOUNDS | | | | | | | | | | | | | | | |
| 1B. Acenaphthene (83-32-9) | X | | | <10.0 | -- | | | | | 1 | µg/l | -- | | | |
| 2B. Acenaphtylene (208-96-8) | X | | | <10.0 | -- | | | | | 1 | µg/l | -- | | | |
| 3B. Anthracene (120-12-7) | X | | | <10.0 | -- | | | | | 1 | µg/l | -- | | | |
| 4B. Benzidine (92-87-5) | X | | | <50.0 | -- | | | | | 1 | µg/l | -- | | | |
| 5B. Benzo (*a*) Anthracene (56-55-3) | X | | | <10.0 | -- | | | | | 1 | µg/l | -- | | | |
| 6B. Benzo (*a*) Pyrene (50-32-8) | X | | | <10.0 | -- | | | | | 1 | µg/l | -- | | | |
| 7B. 3,4-Benzo-fluoranthene (205-99-2) | X | | | <10.0 | -- | | | | | 1 | µg/l | -- | | | |
| 8B. Benzo (*ghi*) Perylene (191-24-2) | X | | | <10.0 | -- | | | | | 1 | µg/l | -- | | | |
| 9B. Benzo (*k*) Fluoranthene (207-08-9) | X | | | <10.0 | -- | | | | | 1 | µg/l | -- | | | |
| 10B. Bis (*2-Chloro-ethoxy*) Methane (111-91-1) | X | | | <10.0 | -- | | | | | 1 | µg/l | -- | | | |
| 11B. Bis (*2-Chloro-ethyl*) Ether (111-44-4) | X | | | <10.0 | -- | | | | | 1 | µg/l | -- | | | |
| 12B. Bis (*2-Chloroisopropyl*) Ether (102-80-1) | X | | | <10.0 | -- | | | | | 1 | µg/l | -- | | | |
| 13B. Bis (*2-Ethyl-hexyl*) Phthalate (117-81-7) | X | | | <5.0 | -- | | | | | 1 | µg/l | -- | | | |
| 14B. 4-Bromophenyl Phenyl Ether (101-55-3) | X | | | <10.0 | -- | | | | | 1 | µg/l | -- | | | |
| 15B. Butyl Benzyl Phthalate (85-68-7) | X | | | <10.0 | -- | | | | | 1 | µg/l | -- | | | |
| 16B. 2-Chloro-naphthalene (91-58-7) | X | | | <10.0 | -- | | | | | 1 | µg/l | -- | | | |
| 17B. 4-Chloro-phenyl Phenyl Ether (7005-72-3) | X | | | <10.0 | -- | | | | | 1 | µg/l | -- | | | |
| 18B. Chrysene (218-01-9) | X | | | <10.0 | -- | | | | | 1 | µg/l | -- | | | |
| 19B. Dibenzo (*a,h*) Anthracene (53-70-3) | X | | | <10.0 | -- | | | | | 1 | µg/l | -- | | | |
| 20B. 1,2-Dichloro-benzene (95-50-1) | X | | | <5.0 | -- | | | | | 1 | µg/l | -- | | | |
| 21B. 1,3-Di-chloro-benzene (541-73-1) | X | | | <5.0 | -- | | | | | 1 | µg/l | -- | | | |



CONTINUE ON PAGE V-7

CONTINUED FROM PAGE V-6

| 1. POLLUTANT AND CAS NUMBER (*if available*) | 2. MARK "X" | | | 3. EFFLUENT | | | | | | | 4. UNITS | | 5. INTAKE (*optional*) | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | a. TESTING REQUIRED | b. BELIEVED PRESENT | c. BELIEVED ABSENT | a. MAXIMUM DAILY VALUE | | b. MAXIMUM 30 DAY VALUE (*if available*) | | c. LONG TERM AVRG. VALUE (*if available*) | | d. NO. OF ANALYSES | a. CONCENTRATION | b. MASS | a. LONG TERM AVERAGE VALUE | | b. NO. OF ANALYSES |
| | | | | (1) CONCENTRATION | (2) MASS | (1) CONCENTRATION | (2) MASS | (1) CONCENTRATION | (2) MASS | | | | (1) CONCENTRATION | (2) MASS | |
| GC/MS FRACTION – BASE/NEUTRAL COMPOUNDS (*continued*) | | | | | | | | | | | | | | | |
| 22B. 1,4-Dichlorobenzene (106-46-7) | X | | | <5.0 | -- | | | | | 1 | µg/l | -- | | | |
| 23B. 3,3-Dichlorobenzidine (91-94-1) | X | | | <20.0 | -- | | | | | 1 | µg/l | -- | | | |
| 24B. Diethyl Phthalate (84-66-2) | X | | | <10.0 | -- | | | | | 1 | µg/l | -- | | | |
| 25B. Dimethyl Phthalate (131 -11-3) | X | | | <10.0 | -- | | | | | 1 | µg/l | -- | | | |
| 26B. Di-N-Butyl Phthalate (84-74-2) | X | | | <10.0 | -- | | | | | 1 | µg/l | -- | | | |
| 27B. 2,4-Dinitrotoluene (121-14-2) | X | | | <20.0 | -- | | | | | 1 | µg/l | -- | | | |
| 28B. 2,6-Dinitrotoluene (606-20-2) | X | | | <10.0 | -- | | | | | 1 | µg/l | -- | | | |
| 29B. Di-N-Octyl Phthalate (117-84-0) | X | | | <10.0 | -- | | | | | 1 | µg/l | -- | | | |
| 30B. 1,2-Diphenylhydrazine (*as Azobenzene*) (122-66-7) | X | | | <10.0 | -- | | | | | 1 | µg/l | -- | | | |
| 31B. Fluoranthene (206-44-0) | X | | | <10.0 | -- | | | | | 1 | µg/l | -- | | | |
| 32B. Fluorene (86-73-7) | X | | | <10.0 | -- | | | | | 1 | µg/l | -- | | | |
| 33B. Hexachlorobenzene (118-74-1) | X | | | <10.0 | -- | | | | | 1 | µg/l | -- | | | |
| 34B. Hexachlorobutadiene (87-68-3) | X | | | <10.0 | -- | | | | | 1 | µg/l | -- | | | |
| 35B. Hexachlorocyclopentadiene (77-47-4) | X | | | <10.0 | -- | | | | | 1 | µg/l | -- | | | |
| 36B Hexachloroethane (67-72-1) | X | | | <10.0 | -- | | | | | 1 | µg/l | -- | | | |
| 37B. Indeno (*1,2,3-cd*) Pyrene (193-39-5) | X | | | <20.0 | -- | | | | | 1 | µg/l | -- | | | |
| 38B. Isophorone (78-59-1) | X | | | <10.0 | -- | | | | | 1 | µg/l | -- | | | |
| 39B. Naphthalene (91-20-3) | X | | | <10.0 | -- | | | | | 1 | µg/l | -- | | | |
| 40B. Nitrobenzene (98-95-3) | X | | | <10.0 | -- | | | | | 1 | µg/l | -- | | | |
| 41B. N-Nitrosodimethylamine (62-75-9) | X | | | <10.0 | -- | | | | | 1 | µg/l | -- | | | |
| 42B. N-Nitrosodi-N-Propylamine (621-64-7) | X | | | <10.0 | -- | | | | | 1 | µg/l | -- | | | |



CONTINUE ON REVERSE

CONTINUED FROM THE FRONT

| 1. POLLUTANT AND CAS NUMBER (*if available*) | 2. MARK "X" | | | 3. EFFLUENT | | | | | | | 4. UNITS | | 5. INTAKE (*optional*) | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | a. TESTING REQUIRED | b. BELIEVED PRESENT | c. BELIEVED ABSENT | a. MAXIMUM DAILY VALUE | | b. MAXIMUM 30 DAY VALUE (*if available*) | | c. LONG TERM AVRG. VALUE (*if available*) | | d. NO. OF ANALYSES | a. CONCENTRATION | b. MASS | a. LONG TERM AVERAGE VALUE | | b. NO. OF ANALYSES |
| | | | | (1) CONCENTRATION | (2) MASS | (1) CONCENTRATION | (2) MASS | (1) CONCENTRATION | (2) MASS | | | | (1) CONCENTRATION | (2) MASS | |
| GC/MS FRACTION – BASE/NEUTRAL COMPOUNDS (*continued*) | | | | | | | | | | | | | | | |
| 43B. N-Nitrosodiphenylamine (86-30-6) | X | | | <10.0 | -- | | | | | 1 | µg/l | -- | | | |
| 44B. Phenanthrene (85-01-8) | X | | | <10.0 | -- | | | | | 1 | µg/l | -- | | | |
| 45B. Pyrene (129-00-0) | X | | | <10.0 | -- | | | | | 1 | µg/l | -- | | | |
| 46B. 1,2,4-Trichlorobenzene (120-82-1) | X | | | <10.0 | -- | | | | | 1 | µg/l | -- | | | |
| GC/MS FRACTION – PESTICIDES | | | | | | | | | | | | | | | |
| 1P. Aldrin (309-00-2) | | | X | | | | | | | -- | -- | -- | | | |
| 2P. α-BHC (319-84-6) | | | X | | | | | | | -- | -- | -- | | | |
| 3P. β-BHC (319-85-7) | | | X | | | | | | | -- | -- | -- | | | |
| 4P. γ-BHC (58-89-9) | | | X | | | | | | | -- | -- | -- | | | |
| 5P. δ-BHC (319-86-8) | | | X | | | | | | | -- | -- | -- | | | |
| 6P. Chlordane (57-74-9) | | | X | | | | | | | -- | -- | -- | | | |
| 7P. 4,4'-DDT (50-29-3) | | | X | | | | | | | -- | -- | -- | | | |
| 8P. 4,4'-DDE (72-55-9) | | | X | | | | | | | -- | -- | -- | | | |
| 9P. 4,4'-DDD (72-54-8) | | | X | | | | | | | -- | -- | -- | | | |
| 10P. Dieldrin (60-57-1) | | | X | | | | | | | -- | -- | -- | | | |
| 11P. α-Enosulfan (115-29-7) | | | X | | | | | | | -- | -- | -- | | | |
| 12P. β-Endosulfan (115-29-7) | | | X | | | | | | | -- | -- | -- | | | |
| 13P. Endosulfan Sulfate (1031-07-8) | | | X | | | | | | | -- | -- | -- | | | |
| 14P. Endrin (72-20-8) | | | X | | | | | | | -- | -- | -- | | | |
| 15P. Endrin Aldehyde (7421-93-4) | | | X | | | | | | | -- | -- | -- | | | |
| 16P. Heptachlor (76-44-8) | | | X | | | | | | | -- | -- | -- | | | |



CONTINUE ON PAGE V-9

| EPA I.D. NUMBER (*copy from Item 1 of Form 1*) | OUTFALL NUMBER |
|---|---|
| 3IB00002*KD | INTAKE - 800 |

CONTINUED FROM PAGE V-8

| 1. POLLUTANT AND CAS NUMBER (*if available*) | 2. MARK "X" | | | 3. EFFLUENT | | | | | | | 4. UNITS | | 5. INTAKE (*optional*) | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | a. TESTING REQUIRED | b. BELIEVED PRESENT | c. BELIEVED ABSENT | a. MAXIMUM DAILY VALUE | | b. MAXIMUM 30 DAY VALUE (*if available*) | | c. LONG TERM AVRG. VALUE (*if available*) | | d. NO. OF ANALYSES | a. CONCENTRATION | b. MASS | a. LONG TERM AVERAGE VALUE | | b. NO. OF ANALYSES |
| | | | | (1) CONCENTRATION | (2) MASS | (1) CONCENTRATION | (2) MASS | (1) CONCENTRATION | (2) MASS | | | | (1) CONCENTRATION | (2) MASS | |
| GC/MS FRACTION – PESTICIDES (*continued*) | | | | | | | | | | | | | | | |
| 17P. Heptachlor Epoxide (1024-57-3) | | | X | | | | | | | -- | -- | -- | | | |
| 18P. PCB-1242 (53469-21-9) | | | X | | | | | | | -- | -- | -- | | | |
| 19P. PCB-1254 (11097-69-1) | | | X | | | | | | | -- | -- | -- | | | |
| 20P. PCB-1221 (11104-28-2) | | | X | | | | | | | -- | -- | -- | | | |
| 21P. PCB-1232 (11141-16-5) | | | X | | | | | | | -- | -- | -- | | | |
| 22P. PCB-1248 (12672-29-6) | | | X | | | | | | | -- | -- | -- | | | |
| 23P. PCB-1260 (11096-82-5) | | | X | | | | | | | -- | -- | -- | | | |
| 24P. PCB-1016 (12674-11-2) | | | X | | | | | | | -- | -- | -- | | | |
| 25P. Toxaphene (8001-35-2) | | | X | | | | | | | -- | -- | -- | | | |

PLEASE PRINT OR TYPE IN THE UNSHADED AREAS ONLY. You may report some or all of this information on separate sheets (*use the same format*) instead of completing these pages.
SEE INSTRUCTIONS.

EPA I.D. NUMBER (*copy from Item 1 of Form 1*): 3IB00002*KD

V. INTAKE AND EFFLUENT CHARACTERISTICS *(continued from page 3 of Form 2-C)*

OUTFALL NO. 001

PART A –You must provide the results of at least one analysis for every pollutant in this table. Complete one table for each outfall. See instructions for additional details.

| 1. POLLUTANT | 2. EFFLUENT | | | | | | 3. UNITS (*specify if blank*) | | 4. INTAKE (*optional*) | | |
|---|---|---|---|---|---|---|---|---|---|---|---|
| | a. MAXIMUM DAILY VALUE | | b. MAXIMUM 30 DAY VALUE (*if available*) | | c. LONG TERM AVRG. VALUE (*if available*) | | d. NO. OF ANALYSES | a. CONCEN-TRATION | b. MASS | a. LONG TERM AVERAGE VALUE | | b. NO. OF ANALYSES |
| | (1) CONCENTRATION | (2) MASS | (1) CONCENTRATION | (2) MASS | (1) CONCENTRATION | (2) MASS | | | | (1) CONCENTRATION | (2) MASS | |
| a. Biochemical Oxygen Demand (*BOD*) | <4.0 | -- | | | | | 1 | mg/l | -- | | | |
| b. Chemical Oxygen Demand (*COD*) | 7.19* | 21,809 | | | | | 1 | mg/l | lb/day | | | |
| c. Total Organic Carbon (*TOC*) | 3.0 | 9,100 | | | | | 1 | mg/l | lb/day | | | |
| d. Total Suspended Solids (*TSS*) | 5.4 | 16,380 | | | | | 1 | mg/l | lb/day | | | |
| e. Ammonia (*as N*) | 0.08 | 242.6 | | | | | 1 | mg/l | lb/day | | | |
| f. Flow | VALUE 363.7 | | VALUE -- | | VALUE -- | | 1 | MGD | -- | VALUE | | |
| g. Temperature (*winter*) | VALUE -- | | VALUE -- | | VALUE -- | | -- | °C | | VALUE | | |
| h. Temperature (*summer*) | VALUE 22.5 | | VALUE -- | | VALUE -- | | 1 | °C | | VALUE | | |
| i. pH | MINIMUM 7.75 | MAXIMUM 7.75 | MINIMUM -- | MAXIMUM -- | | | 1 | STANDARD UNITS | | | | |

PART B – Mark "X" in column 2-a for each pollutant you know or have reason to believe is present. Mark "X" in column 2-b for each pollutant you believe to be absent. If you mark column 2a for any pollutant which is limited either directly, or indirectly but expressly, in an effluent limitations guideline, you must provide the results of at least one analysis for that pollutant. For other pollutants for which you mark column 2a, you must provide quantitative data or an explanation of their presence in your discharge. Complete one table for each outfall. See the instructions for additional details and requirements.

| 1. POLLUTANT AND CAS NO. (*if available*) | 2. MARK "X" | | 3. EFFLUENT | | | | | | | 4. UNITS | | 5. INTAKE (*optional*) | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | a. BELIEVED PRESENT | b. BELIEVED ABSENT | a. MAXIMUM DAILY VALUE | | b. MAXIMUM 30 DAY VALUE (*if available*) | | c. LONG TERM AVRG. VALUE (*if available*) | | d. NO. OF ANALYSES | a. CONCEN-TRATION | b. MASS | a. LONG TERM AVERAGE VALUE | | b. NO. OF ANALYSES |
| | | | (1) CONCENTRATION | (2) MASS | (1) CONCENTRATION | (2) MASS | (1) CONCENTRATION | (2) MASS | | | | (1) CONCENTRATION | (2) MASS | |
| a. Bromide (24959-67-9) | X | | 0.034 | 103.1 | | | | | 1 | mg/l | lb/day | | | |
| b. Chlorine, Total Residual | X | | 0.02 | 60.67 | | | | | 1 | mg/l | lb/day | | | |
| c. Color | X | | <5.0 | -- | | | | | 1 | Pt-Co | -- | | | |
| d. Fecal Coliform | | X | -- | -- | | | | | -- | -- | -- | | | |
| e. Fluoride (16984-48-8) | X | | 0.142 | 430.7 | | | | | 1 | mg/l | lb/day | | | |
| f. Nitrate-Nitrite (*as N*) | X | | 0.08 | 242.7 | | | | | 1 | mg/l | lb/day | | | |



* Estimated value below practical quantitation limit.

ITEM V-B CONTINUED FROM FRONT

| 1. POLLUTANT AND CAS NO. (*if available*) | 2. MARK "X" | | 3. EFFLUENT | | | | | | | 4. UNITS | | 5. INTAKE (*optional*) | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | a. BELIEVED PRESENT | b. BELIEVED ABSENT | a. MAXIMUM DAILY VALUE | | b. MAXIMUM 30 DAY VALUE (*if available*) | | c. LONG TERM AVRG. VALUE (*if available*) | | d. NO. OF ANALYSES | a. CONCENTRATION | b. MASS | a. LONG TERM AVERAGE VALUE | | b. NO. OF ANALYSES |
| | | | (1) CONCENTRATION | (2) MASS | (1) CONCENTRATION | (2) MASS | (1) CONCENTRATION | (2) MASS | | | | (1) CONCENTRATION | (2) MASS | |
| g. Nitrogen, Total Organic (*as N*) | X | | <0.50 | -- | | | | | 1 | mg/l | -- | | | |
| h. Oil and Grease | X | | <5.2 | -- | | | | | 1 | mg/l | -- | | | |
| i. Phosphorus (as P), Total (7723-14-0) | X | | 0.05 | 151.7 | | | | | 1 | mg/l | lb/day | | | |
| j. Radioactivity | | | | | | | | | | | | | | |
| (1) Alpha, Total | | X | -- | -- | | | | | -- | -- | -- | | | |
| (2) Beta, Total | | X | -- | -- | | | | | -- | -- | -- | | | |
| (3) Radium, Total | | X | -- | -- | | | | | -- | -- | -- | | | |
| (4) Radium 226, Total | | X | -- | -- | | | | | -- | -- | -- | | | |
| k. Sulfate (*as $SO_4$*) (14808-79-8) | X | | 21 | 63,698 | | | | | 1 | mg/l | lb/day | | | |
| l. Sulfide (*as S*) | X | | 0.018* | 54.60 | | | | | 1 | mg/l | lb/day | | | |
| m. Sulfite (*as $SO_3$*) (14265-45-3) | X | | <0.64 | -- | | | | | 1 | mg/l | -- | | | |
| n. Surfactants | X | | <0.05 | -- | | | | | 1 | mg/l | -- | | | |
| o. Aluminum, Total (7429-90-5) | X | | 83* | 251.8 | | | | | 1 | µg/l | lb/day | | | |
| p. Barium, Total (7440-39-3) | X | | 19 | 57.63 | | | | | 1 | µg/l | lb/day | | | |
| q. Boron, Total (7440-42-8) | X | | 57 | 172.9 | | | | | 1 | µg/l | lb/day | | | |
| r. Cobalt, Total (7440-48-4) | X | | <20 | -- | | | | | 1 | µg/l | -- | | | |
| s. Iron, Total (7439-89-6) | X | | 110 | 333.7 | | | | | 1 | µg/l | lb/day | | | |
| t. Magnesium, Total (7439-95-4) | X | | 8,800 | 26,693 | | | | | 1 | µg/l | lb/day | | | |
| u. Molybdenum, Total (7439-98-7) | X | | 9.915* | 30.07 | | | | | 1 | µg/l | lb/day | | | |
| v. Manganese, Total (7439-96-5) | X | | 7.6* | 23.05 | | | | | 1 | µg/l | lb/day | | | |
| w. Tin, Total (7440-31-5) | X | | <10 | -- | | | | | 1 | µg/l | -- | | | |
| x. Titanium, Total (7440-32-6) | X | | <10 | -- | | | | | 1 | µg/l | -- | | | |



CONTINUE ON PAGE V-3

* Estimated value below practical quantitation limit.

| EPA I.D. NUMBER (*copy from Item 1 of Form 1*) | OUTFALL NUMBER |
|---|---|
| 3IB00002*KD | 001 |

CONTINUED FROM PAGE 3 OF FORM 2-C

PART C - If you are a primary industry and this outfall contains process wastewater, refer to Table 2c-2 in the instructions to determine which of the GC/MS fractions you must test for. Mark "X" in column 2-a for all such GC/MS fractions that apply to your industry and for ALL toxic metals, cyanides, and total phenols. If you are not required to mark column 2-a (*secondary industries, nonprocess wastewater outfalls, and nonrequired GC/MS fractions*), mark "X" in column 2-b for each pollutant you know or have reason to believe is present. Mark "X" in column 2-c for each pollutant you believe is absent. If you mark column 2a for any pollutant, you must provide the results of at least one analysis for that pollutant. If you mark column 2b for any pollutant, you must provide the results of at least one analysis for that pollutant if you know or have reason to believe it will be discharged in concentrations of 10 ppb or greater. If you mark column 2b for acrolein, acrylonitrile, 2,4 dinitrophenol, or 2-methyl-4, 6 dinitrophenol, you must provide the results of at least one analysis for each of these pollutants which you know or have reason to believe that you discharge in concentrations of 100 ppb or greater. Otherwise, for pollutants for which you mark column 2b, you must either submit at least one analysis or briefly describe the reasons the pollutant is expected to be discharged. Note that there are 7 pages to this part; please review each carefully. Complete one table (*all 7 pages*) for each outfall. See instructions for additional details and requirements.

| 1. POLLUTANT AND CAS NUMBER (*if available*) | 2. MARK "X" | | | 3. EFFLUENT | | | | | | | 4. UNITS | | 5. INTAKE (*optional*) | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | a. TESTING REQUIRED | b. BELIEVED PRESENT | c. BELIEVED ABSENT | a. MAXIMUM DAILY VALUE | | b. MAXIMUM 30 DAY VALUE (*if available*) | | c. LONG TERM AVRG. VALUE (*if available*) | | d. NO. OF ANALYSES | a. CONCENTRATION | b. MASS | a. LONG TERM AVERAGE VALUE | | b. NO. OF ANALYSES |
| | | | | (1) CONCENTRATION | (2) MASS | (1) CONCENTRATION | (2) MASS | (1) CONCENTRATION | (2) MASS | | | | (1) CONCENTRATION | (2) MASS | |
| METALS, CYANIDE, AND TOTAL PHENOLS | | | | | | | | | | | | | | | |
| 1M. Antimony, Total (7440-36-0) | X | | | <3.0 | -- | | | | | 1 | µg/l | -- | | | |
| 2M. Arsenic, Total (7440-38-2) | X | | | 0.397* | 1.20 | | | | | 1 | µg/l | lb/day | | | |
| 3M. Beryllium, Total (7440-41-7) | X | | | <0.50 | -- | | | | | 1 | µg/l | -- | | | |
| 4M. Cadmium, Total (7440-43-9) | X | | | 0.034* | 0.10 | | | | | 1 | µg/l | lb/day | | | |
| 5M. Chromium, Total (7440-47-3) | X | | | <10 | -- | | | | | 1 | µg/l | -- | | | |
| 6M. Copper, Total (7440-50-8) | X | | | <10 | -- | | | | | 1 | µg/l | -- | | | |
| 7M. Lead, Total (7439-92-1) | X | | | 0.076* | 0.23 | | | | | 1 | µg/l | lb/day | | | |
| 8M. Mercury, Total (7439-97-6) | X | | | <0.2 | -- | | | | | 1 | µg/l | -- | | | |
| 9M. Nickel, Total (7440-02-0) | X | | | 1.645* | 4.99 | | | | | 1 | µg/l | lb/day | | | |
| 10M. Selenium, Total (7782-49-2) | X | | | <3.0 | -- | | | | | 1 | µg/l | -- | | | |
| 11M. Silver, Total (7440-22-4) | X | | | <5.0 | -- | | | | | 1 | µg/l | -- | | | |
| 12M. Thallium, Total (7440-28-0) | X | | | <1.0 | -- | | | | | 1 | µg/l | -- | | | |
| 13M. Zinc, Total (7440-66-6) | X | | | <10 | -- | | | | | 1 | µg/l | -- | | | |
| 14M. Cyanide, Total (57-12-5) | X | | | <0.005 | -- | | | | | 1 | mg/l | -- | | | |
| 15M. Phenols, Total | X | | | 0.02* | 60.67 | | | | | 1 | mg/l | lb/day | | | |
| DIOXIN | | | | | | | | | | | | | | | |
| 2,3,7,8-Tetra-chlorodibenzo-P-Dioxin (1764-01-6) | | | X | DESCRIBE RESULTS Not detected. | | | | | | | | | | | |



* Estimated value below practical quantitation limit.

CONTINUED FROM THE FRONT

| 1. POLLUTANT AND CAS NUMBER (*if available*) | 2. MARK "X" | | | 3. EFFLUENT | | | | | | | 4. UNITS | | 5. INTAKE (*optional*) | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | a. TESTING REQUIRED | b. BELIEVED PRESENT | c. BELIEVED ABSENT | a. MAXIMUM DAILY VALUE | | b. MAXIMUM 30 DAY VALUE (*if available*) | | c. LONG TERM AVRG. VALUE (*if available*) | | d. NO. OF ANALYSES | a. CONCENTRATION | b. MASS | a. LONG TERM AVERAGE VALUE | | b. NO. OF ANALYSES |
| | | | | (1) CONCENTRATION | (2) MASS | (1) CONCENTRATION | (2) MASS | (1) CONCENTRATION | (2) MASS | | | | (1) CONCENTRATION | (2) MASS | |
| GC/MS FRACTION – VOLATILE COMPOUNDS | | | | | | | | | | | | | | | |
| 1V. Accrolein (107-02-8) | X | | | <50.0 | -- | | | | | 1 | µg/l | -- | | | |
| 2V. Acrylonitrile (107-13-1) | X | | | <50.0 | -- | | | | | 1 | µg/l | -- | | | |
| 3V. Benzene (71-43-2) | X | | | <5.0 | -- | | | | | 1 | µg/l | -- | | | |
| 4V. Bis (*Chloromethyl*) Ether (542-88-1) | X | | | ND* | -- | | | | | 1 | µg/l | -- | | | |
| 5V. Bromoform (75-25-2) | X | | | <5.0 | -- | | | | | 1 | µg/l | -- | | | |
| 6V. Carbon Tetrachloride (56-23-5) | X | | | <5.0 | -- | | | | | 1 | µg/l | -- | | | |
| 7V. Chlorobenzene (108-90-7) | X | | | <5.0 | -- | | | | | 1 | µg/l | -- | | | |
| 8V. Chlorodibromomethane (124-48-1) | X | | | <5.0 | -- | | | | | 1 | µg/l | -- | | | |
| 9V. Chloroethane (75-00-3) | X | | | <10.0 | -- | | | | | 1 | µg/l | -- | | | |
| 10V. 2-Chloroethylvinyl Ether (110-75-8) | X | | | <10 | -- | | | | | 1 | µg/l | -- | | | |
| 11V. Chloroform (67-66-3) | X | | | <5.0 | -- | | | | | 1 | µg/l | -- | | | |
| 12V. Dichlorobromomethane (75-27-4) | X | | | <5.0 | -- | | | | | 1 | µg/l | -- | | | |
| 13V. Dichlorodifluoromethane (75-71-8) | X | | | <10 | -- | | | | | 1 | µg/l | -- | | | |
| 14V. 1,1-Dichloroethane (75-34-3) | X | | | <5.0 | -- | | | | | 1 | µg/l | -- | | | |
| 15V. 1,2-Dichloroethane (107-06-2) | X | | | <5.0 | -- | | | | | 1 | µg/l | -- | | | |
| 16V. 1,1-Dichloroethylene (75-35-4) | X | | | <5.0 | -- | | | | | 1 | µg/l | -- | | | |
| 17V. 1,2-Dichloropropane (78-87-5) | X | | | <5.0 | -- | | | | | 1 | µg/l | -- | | | |
| 18V. 1,3-Dichloropropylene (542-75-6) | X | | | <5.0 | -- | | | | | 1 | µg/l | -- | | | |
| 19V. Ethylbenzene (100-41-4) | X | | | <5.0 | -- | | | | | 1 | µg/l | -- | | | |
| 20V. Methyl Bromide (74-83-9) | X | | | <10.0 | -- | | | | | 1 | µg/l | -- | | | |
| 21V. Methyl Chloride (74-87-3) | X | | | <10 | -- | | | | | 1 | µg/l | -- | | | |



CONTINUE ON PAGE V-5

*ND - Not detected in library search.

CONTINUED FROM PAGE V-4

| 1. POLLUTANT AND CAS NUMBER (*if available*) | 2. MARK "X" | | | 3. EFFLUENT | | | | | | | 4. UNITS | | 5. INTAKE (*optional*) | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | a. TESTING REQUIRED | b. BELIEVED PRESENT | c. BELIEVED ABSENT | a. MAXIMUM DAILY VALUE | | b. MAXIMUM 30 DAY VALUE (*if available*) | | c. LONG TERM AVRG. VALUE (*if available*) | | d. NO. OF ANALYSES | a. CONCENTRATION | b. MASS | a. LONG TERM AVERAGE VALUE | | b. NO. OF ANALYSES |
| | | | | (1) CONCENTRATION | (2) MASS | (1) CONCENTRATION | (2) MASS | (1) CONCENTRATION | (2) MASS | | | | (1) CONCENTRATION | (2) MASS | |
| GC/MS FRACTION – VOLATILE COMPOUNDS (*continued*) | | | | | | | | | | | | | | | |
| 22V. Methylene Chloride (75-09-2) | X | | | <10 | -- | | | | | 1 | µg/l | -- | | | |
| 23V. 1,1,2,2-Tetrachloroethane (79-34-5) | X | | | <5.0 | -- | | | | | 1 | µg/l | -- | | | |
| 24V. Tetrachloroethylene (127-18-4) | X | | | <5.0 | -- | | | | | 1 | µg/l | -- | | | |
| 25V. Toluene (108-88-3) | X | | | <5.0 | -- | | | | | 1 | µg/l | -- | | | |
| 26V. 1,2-Trans-Dichloroethylene (156-60-5) | X | | | <5.0 | -- | | | | | 1 | µg/l | -- | | | |
| 27V. 1,1,1-Trichloroethane (71-55-6) | X | | | <5.0 | -- | | | | | 1 | µg/l | -- | | | |
| 28V. 1,1,2-Trichloroethane (79-00-5) | X | | | <5.0 | -- | | | | | 1 | µg/l | -- | | | |
| 29V Trichloroethylene (79-01-6) | X | | | <5.0 | -- | | | | | 1 | µg/l | -- | | | |
| 30V. Trichlorofluoromethane (75-69-4) | X | | | <10 | -- | | | | | 1 | µg/l | -- | | | |
| 31V. Vinyl Chloride (75-01-4) | X | | | <10 | -- | | | | | 1 | µg/l | -- | | | |
| GC/MS FRACTION – ACID COMPOUNDS | | | | | | | | | | | | | | | |
| 1A. 2-Chlorophenol (95-57-8) | X | | | <10.0 | -- | | | | | 1 | µg/l | -- | | | |
| 2A. 2,4-Dichlorophenol (120-83-2) | X | | | <10.0 | -- | | | | | 1 | µg/l | -- | | | |
| 3A. 2,4-Dimethylphenol (105-67-9) | X | | | <10.0 | -- | | | | | 1 | µg/l | -- | | | |
| 4A. 4,6-Dinitro-O-Cresol (534-52-1) | X | | | <50.0 | -- | | | | | 1 | µg/l | -- | | | |
| 5A. 2,4-Dinitrophenol (51-28-5) | X | | | <50.0 | -- | | | | | 1 | µg/l | -- | | | |
| 6A. 2-Nitrophenol (88-75-5) | X | | | <10.0 | -- | | | | | 1 | µg/l | -- | | | |
| 7A. 4-Nitrophenol (100-02-7) | X | | | <50.0 | -- | | | | | 1 | µg/l | -- | | | |
| 8A. P-Chloro-M-Cresol (59-50-7) | X | | | <50.0 | -- | | | | | 1 | µg/l | -- | | | |
| 9A. Pentachlorophenol (87-86-5) | X | | | <50.0 | -- | | | | | 1 | µg/l | -- | | | |
| 10A. Phenol (108-95-2) | X | | | <10.0 | -- | | | | | 1 | µg/l | -- | | | |
| 11A. 2,4,6-Trichlorophenol (88-05-2) | X | | | <20.0 | -- | | | | | 1 | µg/l | -- | | | |



CONTINUE ON REVERSE

CONTINUED FROM THE FRONT

| 1. POLLUTANT AND CAS NUMBER (*if available*) | 2. MARK "X" | | | 3. EFFLUENT | | | | | | | 4. UNITS | | 5. INTAKE (*optional*) | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | a. TESTING REQUIRED | b. BELIEVED PRESENT | c. BELIEVED ABSENT | a. MAXIMUM DAILY VALUE | | b. MAXIMUM 30 DAY VALUE (*if available*) | | c. LONG TERM AVRG. VALUE (*if available*) | | d. NO. OF ANALYSES | a. CONCENTRATION | b. MASS | a. LONG TERM AVERAGE VALUE | | b. NO. OF ANALYSES |
| | | | | (1) CONCENTRATION | (2) MASS | (1) CONCENTRATION | (2) MASS | (1) CONCENTRATION | (2) MASS | | | | (1) CONCENTRATION | (2) MASS | |
| GC/MS FRACTION – BASE/NEUTRAL COMPOUNDS | | | | | | | | | | | | | | | |
| 1B. Acenaphthene (83-32-9) | X | | | <10.0 | -- | | | | | 1 | µg/l | -- | | | |
| 2B. Acenaphtylene (208-96-8) | X | | | <10.0 | -- | | | | | 1 | µg/l | -- | | | |
| 3B. Anthracene (120-12-7) | X | | | <10.0 | -- | | | | | 1 | µg/l | -- | | | |
| 4B. Benzidine (92-87-5) | X | | | <50.0 | -- | | | | | 1 | µg/l | -- | | | |
| 5B. Benzo (*a*) Anthracene (56-55-3) | X | | | <10.0 | -- | | | | | 1 | µg/l | -- | | | |
| 6B. Benzo (*a*) Pyrene (50-32-8) | X | | | <10.0 | -- | | | | | 1 | µg/l | -- | | | |
| 7B. 3,4-Benzo-fluoranthene (205-99-2) | X | | | <10.0 | -- | | | | | 1 | µg/l | -- | | | |
| 8B. Benzo (*ghi*) Perylene (191-24-2) | X | | | <10.0 | -- | | | | | 1 | µg/l | -- | | | |
| 9B. Benzo (*k*) Fluoranthene (207-08-9) | X | | | <10.0 | -- | | | | | 1 | µg/l | -- | | | |
| 10B. Bis (*2-Chloro-ethoxy*) Methane (111-91-1) | X | | | <10.0 | -- | | | | | 1 | µg/l | -- | | | |
| 11B. Bis (*2-Chloro-ethyl*) Ether (111-44-4) | X | | | <10.0 | -- | | | | | 1 | µg/l | -- | | | |
| 12B. Bis (*2-Chloroisopropyl*) Ether (102-80-1) | X | | | <10.0 | -- | | | | | 1 | µg/l | -- | | | |
| 13B. Bis (*2-Ethyl-hexyl*) Phthalate (117-81-7) | X | | | 53 | 160.7 | | | | | 1 | µg/l | lb/day | | | |
| 14B. 4-Bromophenyl Phenyl Ether (101-55-3) | X | | | <10.0 | -- | | | | | 1 | µg/l | -- | | | |
| 15B. Butyl Benzyl Phthalate (85-68-7) | X | | | <10.0 | -- | | | | | 1 | µg/l | -- | | | |
| 16B. 2-Chloro-naphthalene (91-58-7) | X | | | <10.0 | -- | | | | | 1 | µg/l | -- | | | |
| 17B. 4-Chloro-phenyl Phenyl Ether (7005-72-3) | X | | | <10.0 | -- | | | | | 1 | µg/l | -- | | | |
| 18B. Chrysene (218-01-9) | X | | | <10.0 | -- | | | | | 1 | µg/l | -- | | | |
| 19B. Dibenzo (*a,h*) Anthracene (53-70-3) | X | | | <10.0 | -- | | | | | 1 | µg/l | -- | | | |
| 20B. 1,2-Dichloro-benzene (95-50-1) | X | | | <5.0 | -- | | | | | 1 | µg/l | -- | | | |
| 21B. 1,3-Di-chloro-benzene (541-73-1) | X | | | <5.0 | -- | | | | | 1 | µg/l | -- | | | |



CONTINUE ON PAGE V-7

CONTINUED FROM PAGE V-6

| 1. POLLUTANT AND CAS NUMBER (*if available*) | 2. MARK "X" | | | 3. EFFLUENT | | | | | | | 4. UNITS | | 5. INTAKE (*optional*) | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | a. TESTING REQUIRED | b. BELIEVED PRESENT | c. BELIEVED ABSENT | a. MAXIMUM DAILY VALUE | | b. MAXIMUM 30 DAY VALUE (*if available*) | | c. LONG TERM AVRG. VALUE (*if available*) | | d. NO. OF ANALYSES | a. CONCENTRATION | b. MASS | a. LONG TERM AVERAGE VALUE | | b. NO. OF ANALYSES |
| | | | | (1) CONCENTRATION | (2) MASS | (1) CONCENTRATION | (2) MASS | (1) CONCENTRATION | (2) MASS | | | | (1) CONCENTRATION | (2) MASS | |
| GC/MS FRACTION – BASE/NEUTRAL COMPOUNDS (*continued*) | | | | | | | | | | | | | | | |
| 22B. 1,4-Dichlorobenzene (106-46-7) | X | | | <5.0 | -- | | | | | 1 | µg/l | -- | | | |
| 23B. 3,3-Dichlorobenzidine (91-94-1) | X | | | <20.0 | -- | | | | | 1 | µg/l | -- | | | |
| 24B. Diethyl Phthalate (84-66-2) | X | | | <10.0 | -- | | | | | 1 | µg/l | -- | | | |
| 25B. Dimethyl Phthalate (131 -11-3) | X | | | <10.0 | -- | | | | | 1 | µg/l | -- | | | |
| 26B. Di-N-Butyl Phthalate (84-74-2) | X | | | <10.0 | -- | | | | | 1 | µg/l | -- | | | |
| 27B. 2,4-Dinitrotoluene (121-14-2) | X | | | <20.0 | -- | | | | | 1 | µg/l | -- | | | |
| 28B. 2,6-Dinitrotoluene (606-20-2) | X | | | <10.0 | -- | | | | | 1 | µg/l | -- | | | |
| 29B. Di-N-Octyl Phthalate (117-84-0) | X | | | <10.0 | -- | | | | | 1 | µg/l | -- | | | |
| 30B. 1,2-Diphenylhydrazine (*as Azobenzene*) (122-66-7) | X | | | <10.0 | -- | | | | | 1 | µg/l | -- | | | |
| 31B. Fluoranthene (206-44-0) | X | | | <10.0 | -- | | | | | 1 | µg/l | -- | | | |
| 32B. Fluorene (86-73-7) | X | | | <10.0 | -- | | | | | 1 | µg/l | -- | | | |
| 33B. Hexachlorobenzene (118-74-1) | X | | | <10.0 | -- | | | | | 1 | µg/l | -- | | | |
| 34B. Hexachlorobutadiene (87-68-3) | X | | | <10.0 | -- | | | | | 1 | µg/l | -- | | | |
| 35B. Hexachlorocyclopentadiene (77-47-4) | X | | | <10.0 | -- | | | | | 1 | µg/l | -- | | | |
| 36B Hexachloroethane (67-72-1) | X | | | <10.0 | -- | | | | | 1 | µg/l | -- | | | |
| 37B. Indeno (*1,2,3-cd*) Pyrene (193-39-5) | X | | | <20.0 | -- | | | | | 1 | µg/l | -- | | | |
| 38B. Isophorone (78-59-1) | X | | | <10.0 | -- | | | | | 1 | µg/l | -- | | | |
| 39B. Naphthalene (91-20-3) | X | | | <10.0 | -- | | | | | 1 | µg/l | -- | | | |
| 40B. Nitrobenzene (98-95-3) | X | | | <10.0 | -- | | | | | 1 | µg/l | -- | | | |
| 41B. N-Nitrosodimethylamine (62-75-9) | X | | | <10.0 | -- | | | | | 1 | µg/l | -- | | | |
| 42B. N-Nitrosodi-N-Propylamine (621-64-7) | X | | | <10.0 | -- | | | | | 1 | µg/l | -- | | | |



CONTINUE ON REVERSE

CONTINUED FROM THE FRONT

| 1. POLLUTANT AND CAS NUMBER (*if available*) | 2. MARK "X" | | | 3. EFFLUENT | | | | | | | 4. UNITS | | 5. INTAKE (*optional*) | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | a. TESTING REQUIRED | b. BELIEVED PRESENT | c. BELIEVED ABSENT | a. MAXIMUM DAILY VALUE | | b. MAXIMUM 30 DAY VALUE (*if available*) | | c. LONG TERM AVRG. VALUE (*if available*) | | d. NO. OF ANALYSES | a. CONCENTRATION | b. MASS | a. LONG TERM AVERAGE VALUE | | b. NO. OF ANALYSES |
| | | | | (1) CONCENTRATION | (2) MASS | (1) CONCENTRATION | (2) MASS | (1) CONCENTRATION | (2) MASS | | | | (1) CONCENTRATION | (2) MASS | |
| GC/MS FRACTION – BASE/NEUTRAL COMPOUNDS (*continued*) | | | | | | | | | | | | | | | |
| 43B. N-Nitrosodiphenylamine (86-30-6) | X | | | <10.0 | -- | | | | | 1 | µg/l | -- | | | |
| 44B. Phenanthrene (85-01-8) | X | | | <10.0 | -- | | | | | 1 | µg/l | -- | | | |
| 45B. Pyrene (129-00-0) | X | | | <10.0 | -- | | | | | 1 | µg/l | -- | | | |
| 46B. 1,2,4-Trichlorobenzene (120-82-1) | X | | | <10.0 | -- | | | | | 1 | µg/l | -- | | | |
| GC/MS FRACTION – PESTICIDES | | | | | | | | | | | | | | | |
| 1P. Aldrin (309-00-2) | | | X | | | | | | | -- | -- | -- | | | |
| 2P. α-BHC (319-84-6) | | | X | | | | | | | -- | -- | -- | | | |
| 3P. β-BHC (319-85-7) | | | X | | | | | | | -- | -- | -- | | | |
| 4P. γ-BHC (58-89-9) | | | X | | | | | | | -- | -- | -- | | | |
| 5P. δ-BHC (319-86-8) | | | X | | | | | | | -- | -- | -- | | | |
| 6P. Chlordane (57-74-9) | | | X | | | | | | | -- | -- | -- | | | |
| 7P. 4,4'-DDT (50-29-3) | | | X | | | | | | | -- | -- | -- | | | |
| 8P. 4,4'-DDE (72-55-9) | | | X | | | | | | | -- | -- | -- | | | |
| 9P. 4,4'-DDD (72-54-8) | | | X | | | | | | | -- | -- | -- | | | |
| 10P. Dieldrin (60-57-1) | | | X | | | | | | | -- | -- | -- | | | |
| 11P. α-Enosulfan (115-29-7) | | | X | | | | | | | -- | -- | -- | | | |
| 12P. β-Endosulfan (115-29-7) | | | X | | | | | | | -- | -- | -- | | | |
| 13P. Endosulfan Sulfate (1031-07-8) | | | X | | | | | | | -- | -- | -- | | | |
| 14P. Endrin (72-20-8) | | | X | | | | | | | -- | -- | -- | | | |
| 15P. Endrin Aldehyde (7421-93-4) | | | X | | | | | | | -- | -- | -- | | | |
| 16P. Heptachlor (76-44-8) | | | X | | | | | | | -- | -- | -- | | | |



CONTINUE ON PAGE V-9

| EPA I.D. NUMBER (*copy from Item 1 of Form 1*) | OUTFALL NUMBER |
|---|---|
| 3IB00002*KD | 001 |

CONTINUED FROM PAGE V-8

| 1. POLLUTANT AND CAS NUMBER (*if available*) | 2. MARK "X" | | | 3. EFFLUENT | | | | | | | 4. UNITS | | 5. INTAKE (*optional*) | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | a. TESTING REQUIRED | b. BELIEVED PRESENT | c. BELIEVED ABSENT | a. MAXIMUM DAILY VALUE | | b. MAXIMUM 30 DAY VALUE (*if available*) | | c. LONG TERM AVRG. VALUE (*if available*) | | d. NO. OF ANALYSES | a. CONCENTRATION | b. MASS | a. LONG TERM AVERAGE VALUE | | b. NO. OF ANALYSES |
| | | | | (1) CONCENTRATION | (2) MASS | (1) CONCENTRATION | (2) MASS | (1) CONCENTRATION | (2) MASS | | | | (1) CONCENTRATION | (2) MASS | |
| GC/MS FRACTION – PESTICIDES (*continued*) | | | | | | | | | | | | | | | |
| 17P. Heptachlor Epoxide (1024-57-3) | | | X | | | | | | | -- | -- | -- | | | |
| 18P. PCB-1242 (53469-21-9) | | | X | | | | | | | -- | -- | -- | | | |
| 19P. PCB-1254 (11097-69-1) | | | X | | | | | | | -- | -- | -- | | | |
| 20P. PCB-1221 (11104-28-2) | | | X | | | | | | | -- | -- | -- | | | |
| 21P. PCB-1232 (11141-16-5) | | | X | | | | | | | -- | -- | -- | | | |
| 22P. PCB-1248 (12672-29-6) | | | X | | | | | | | -- | -- | -- | | | |
| 23P. PCB-1260 (11096-82-5) | | | X | | | | | | | -- | -- | -- | | | |
| 24P. PCB-1016 (12674-11-2) | | | X | | | | | | | -- | -- | -- | | | |
| 25P. Toxaphene (8001-35-2) | | | X | | | | | | | -- | -- | -- | | | |

PLEASE PRINT OR TYPE IN THE UNSHADED AREAS ONLY. You may report some or all of this information on separate sheets (*use the same format*) instead of completing these pages.
SEE INSTRUCTIONS.

EPA I.D. NUMBER (*copy from Item 1 of Form 1*): 3IB00002*KD

V. INTAKE AND EFFLUENT CHARACTERISTICS *(continued from page 3 of Form 2-C)*

OUTFALL NO. 604

PART A –You must provide the results of at least one analysis for every pollutant in this table. Complete one table for each outfall. See instructions for additional details.

| 1. POLLUTANT | 2. EFFLUENT | | | | | | 3. UNITS (*specify if blank*) | | 4. INTAKE (*optional*) | | |
|---|---|---|---|---|---|---|---|---|---|---|---|
| | a. MAXIMUM DAILY VALUE | | b. MAXIMUM 30 DAY VALUE (*if available*) | | c. LONG TERM AVRG. VALUE (*if available*) | | d. NO. OF ANALYSES | a. CONCENTRATION | b. MASS | a. LONG TERM AVERAGE VALUE | | b. NO. OF ANALYSES |
| | (1) CONCENTRATION | (2) MASS | (1) CONCENTRATION | (2) MASS | (1) CONCENTRATION | (2) MASS | | | | (1) CONCENTRATION | (2) MASS | |
| a. Biochemical Oxygen Demand (*BOD*) | <4.0 | -- | | | | | 1 | mg/l | -- | | | |
| b. Chemical Oxygen Demand (*COD*) | 7.19* | 7.20 | | | | | 1 | mg/l | lb/day | | | |
| c. Total Organic Carbon (*TOC*) | 0.461* | 0.46 | | | | | 1 | mg/l | lb/day | | | |
| d. Total Suspended Solids (*TSS*) | 1.8* | 1.80 | | | | | 1 | mg/l | lb/day | | | |
| e. Ammonia (*as N*) | 0.11 | 0.11 | | | | | 1 | mg/l | lb/day | | | |
| f. Flow | VALUE 0.12 | | VALUE -- | | VALUE -- | | 1 | MGD | -- | VALUE | | |
| g. Temperature (*winter*) | VALUE -- | | VALUE -- | | VALUE -- | | -- | °C | | VALUE | | |
| h. Temperature (*summer*) | VALUE 22.7 | | VALUE -- | | VALUE -- | | 1 | °C | | VALUE | | |
| i. pH | MINIMUM 9.2 | MAXIMUM 9.2 | MINIMUM -- | MAXIMUM -- | | | 1 | STANDARD UNITS | | | | |

PART B – Mark "X" in column 2-a for each pollutant you know or have reason to believe is present. Mark "X" in column 2-b for each pollutant you believe to be absent. If you mark column 2a for any pollutant which is limited either directly, or indirectly but expressly, in an effluent limitations guideline, you must provide the results of at least one analysis for that pollutant. For other pollutants for which you mark column 2a, you must provide quantitative data or an explanation of their presence in your discharge. Complete one table for each outfall. See the instructions for additional details and requirements.

| 1. POLLUTANT AND CAS NO. (*if available*) | 2. MARK "X" | | 3. EFFLUENT | | | | | | | 4. UNITS | | 5. INTAKE (*optional*) | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | a. BELIEVED PRESENT | b. BELIEVED ABSENT | a. MAXIMUM DAILY VALUE | | b. MAXIMUM 30 DAY VALUE (*if available*) | | c. LONG TERM AVRG. VALUE (*if available*) | | d. NO. OF ANALYSES | a. CONCENTRATION | b. MASS | a. LONG TERM AVERAGE VALUE | | b. NO. OF ANALYSES |
| | | | (1) CONCENTRATION | (2) MASS | (1) CONCENTRATION | (2) MASS | (1) CONCENTRATION | (2) MASS | | | | (1) CONCENTRATION | (2) MASS | |
| a. Bromide (24959-67-9) | X | | <0.010 | -- | | | | | 1 | mg/l | -- | | | |
| b. Chlorine, Total Residual | X | | 0.03 | 0.03 | | | | | 1 | mg/l | lb/day | | | |
| c. Color | X | | <5.0 | -- | | | | | 1 | Pt-Co | -- | | | |
| d. Fecal Coliform | | X | -- | -- | | | | | -- | -- | -- | | | |
| e. Fluoride (16984-48-8) | X | | 0.062* | 0.06 | | | | | 1 | mg/l | lb/day | | | |
| f. Nitrate-Nitrite (*as N*) | X | | <0.50 | -- | | | | | 1 | mg/l | -- | | | |



* Estimated value below practical quantitation limit.

ITEM V-B CONTINUED FROM FRONT

| 1. POLLUTANT AND CAS NO. (*if available*) | 2. MARK "X" | | 3. EFFLUENT | | | | | | | 4. UNITS | | 5. INTAKE (*optional*) | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | a. BELIEVED PRESENT | b. BELIEVED ABSENT | a. MAXIMUM DAILY VALUE | | b. MAXIMUM 30 DAY VALUE (*if available*) | | c. LONG TERM AVRG. VALUE (*if available*) | | d. NO. OF ANALYSES | a. CONCENTRATION | b. MASS | a. LONG TERM AVERAGE VALUE | | b. NO. OF ANALYSES |
| | | | (1) CONCENTRATION | (2) MASS | (1) CONCENTRATION | (2) MASS | (1) CONCENTRATION | (2) MASS | | | | (1) CONCENTRATION | (2) MASS | |
| g. Nitrogen, Total Organic (*as N*) | X | | <0.50 | -- | | | | | 1 | mg/l | -- | | | |
| h. Oil and Grease | X | | <5.1 | -- | | | | | 1 | mg/l | -- | | | |
| i. Phosphorus (as P), Total (7723-14-0) | X | | 1.65 | 1.65 | | | | | 1 | mg/l | lb/day | | | |
| j. Radioactivity | | | | | | | | | | | | | | |
| (1) Alpha, Total | | X | -- | -- | | | | | -- | -- | -- | | | |
| (2) Beta, Total | | X | -- | -- | | | | | -- | -- | -- | | | |
| (3) Radium, Total | | X | -- | -- | | | | | -- | -- | -- | | | |
| (4) Radium 226, Total | | X | -- | -- | | | | | -- | -- | -- | | | |
| k. Sulfate (*as $SO_4$*) (14808-79-8) | X | | 3.875* | 3.88 | | | | | 1 | mg/l | lb/day | | | |
| l. Sulfide (*as S*) | X | | 0.029* | 0.03 | | | | | 1 | mg/l | lb/day | | | |
| m. Sulfite (*as $SO_3$*) (14265-45-3) | X | | <0.64 | -- | | | | | 1 | mg/l | -- | | | |
| n. Surfactants | X | | 0.037* | 0.04 | | | | | 1 | mg/l | lb/day | | | |
| o. Aluminum, Total (7429-90-5) | X | | 139* | 0.014 | | | | | 1 | ug/l | lb/day | | | |
| p. Barium, Total (7440-39-3) | X | | 0.193* | 0.0002 | | | | | 1 | µg/l | lb/day | | | |
| q. Boron, Total (7440-42-8) | X | | 7.8* | 0.008 | | | | | 1 | µg/l | lb/day | | | |
| r. Cobalt, Total (7440-48-4) | X | | <20 | -- | | | | | 1 | µg/l | -- | | | |
| s. Iron, Total (7439-89-6) | X | | 520 | 0.52 | | | | | 1 | µg/l | lb/day | | | |
| t. Magnesium, Total (7439-95-4) | X | | <100 | -- | | | | | 1 | µg/l | -- | | | |
| u. Molybdenum, Total (7439-98-7) | X | | 1.116* | 0.001 | | | | | 1 | µg/l | lb/day | | | |
| v. Manganese, Total (7439-96-5) | X | | 5.4* | 0.005 | | | | | 1 | µg/l | lb/day | | | |
| w. Tin, Total (7440-31-5) | X | | 22 | 0.02 | | | | | 1 | µg/l | lb/day | | | |
| x. Titanium, Total (7440-32-6) | X | | <10 | -- | | | | | 1 | µg/l | -- | | | |



CONTINUE ON PAGE V-3

* Estimated value below practical quantitation limit.

| EPA I.D. NUMBER (*copy from Item 1 of Form 1*) | OUTFALL NUMBER |
|---|---|
| 3IB00002*KD | 604 |

CONTINUED FROM PAGE 3 OF FORM 2-C

PART C - If you are a primary industry and this outfall contains process wastewater, refer to Table 2c-2 in the instructions to determine which of the GC/MS fractions you must test for. Mark "X" in column 2-a for all such GC/MS fractions that apply to your industry and for ALL toxic metals, cyanides, and total phenols. If you are not required to mark column 2-a (*secondary industries, nonprocess wastewater outfalls, and nonrequired GC/MS fractions*), mark "X" in column 2-b for each pollutant you know or have reason to believe is present. Mark "X" in column 2-c for each pollutant you believe is absent. If you mark column 2a for any pollutant, you must provide the results of at least one analysis for that pollutant. If you mark column 2b for any pollutant, you must provide the results of at least one analysis for that pollutant if you know or have reason to believe it will be discharged in concentrations of 10 ppb or greater. If you mark column 2b for acrolein, acrylonitrile, 2,4 dinitrophenol, or 2-methyl-4, 6 dinitrophenol, you must provide the results of at least one analysis for each of these pollutants which you know or have reason to believe that you discharge in concentrations of 100 ppb or greater. Otherwise, for pollutants for which you mark column 2b, you must either submit at least one analysis or briefly describe the reasons the pollutant is expected to be discharged. Note that there are 7 pages to this part; please review each carefully. Complete one table (*all 7 pages*) for each outfall. See instructions for additional details and requirements.

| 1. POLLUTANT AND CAS NUMBER (*if available*) | 2. MARK "X" | | | 3. EFFLUENT | | | | | | | 4. UNITS | | 5. INTAKE (*optional*) | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | a. TESTING REQUIRED | b. BELIEVED PRESENT | c. BELIEVED ABSENT | a. MAXIMUM DAILY VALUE (1) CONCENTRATION | a. MAXIMUM DAILY VALUE (2) MASS | b. MAXIMUM 30 DAY VALUE (*if available*) (1) CONCENTRATION | b. MAXIMUM 30 DAY VALUE (*if available*) (2) MASS | c. LONG TERM AVRG. VALUE (*if available*) (1) CONCENTRATION | c. LONG TERM AVRG. VALUE (*if available*) (2) MASS | d. NO. OF ANALYSES | a. CONCENTRATION | b. MASS | a. LONG TERM AVERAGE VALUE (1) CONCENTRATION | a. LONG TERM AVERAGE VALUE (2) MASS | b. NO. OF ANALYSES |
| METALS, CYANIDE, AND TOTAL PHENOLS | | | | | | | | | | | | | | | |
| 1M. Antimony, Total (7440-36-0) | X | | | <3.0 | -- | | | | | 1 | µg/l | -- | | | |
| 2M. Arsenic, Total (7440-38-2) | X | | | 3.1 | 0.003 | | | | | 1 | µg/l | lb/day | | | |
| 3M. Beryllium, Total (7440-41-7) | X | | | <0.50 | -- | | | | | 1 | µg/l | -- | | | |
| 4M. Cadmium, Total (7440-43-9) | X | | | 0.147* | 0.0001 | | | | | 1 | µg/l | lb/day | | | |
| 5M. Chromium, Total (7440-47-3) | X | | | 2.166* | 0.002 | | | | | 1 | µg/l | lb/day | | | |
| 6M. Copper, Total (7440-50-8) | X | | | 140 | 0.14 | | | | | 1 | µg/l | lb/day | | | |
| 7M. Lead, Total (7439-92-1) | X | | | 6.6 | 0.007 | | | | | 1 | µg/l | lb/day | | | |
| 8M. Mercury, Total (7439-97-6) | X | | | <0.2 | -- | | | | | 1 | µg/l | -- | | | |
| 9M. Nickel, Total (7440-02-0) | X | | | 15 | 0.02 | | | | | 1 | µg/l | lb/day | | | |
| 10M. Selenium, Total (7782-49-2) | X | | | 0.203* | 0.0002 | | | | | 1 | µg/l | lb/day | | | |
| 11M. Silver, Total (7440-22-4) | X | | | <5.0 | -- | | | | | 1 | µg/l | -- | | | |
| 12M. Thallium, Total (7440-28-0) | X | | | <1.0 | -- | | | | | 1 | µg/l | -- | | | |
| 13M. Zinc, Total (7440-66-6) | X | | | 17 | 0.02 | | | | | 1 | µg/l | lb/day | | | |
| 14M. Cyanide, Total (57-12-5) | X | | | <0.005 | -- | | | | | 1 | mg/l | -- | | | |
| 15M. Phenols, Total | X | | | 30* | 0.03 | | | | | 1 | µg/l | lb/day | | | |
| DIOXIN | | | | | | | | | | | | | | | |
| 2,3,7,8-Tetra-chlorodibenzo-P-Dioxin (1764-01-6) | | | X | DESCRIBE RESULTS Not detected. | | | | | | | | | | | |



* Estimated value below practical quantitation limit.

CONTINUED FROM THE FRONT

| 1. POLLUTANT AND CAS NUMBER (*if available*) | 2. MARK "X" | | | 3. EFFLUENT | | | | | | | 4. UNITS | | 5. INTAKE (*optional*) | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | a. TESTING REQUIRED | b. BELIEVED PRESENT | c. BELIEVED ABSENT | a. MAXIMUM DAILY VALUE | | b. MAXIMUM 30 DAY VALUE (*if available*) | | c. LONG TERM AVRG. VALUE (*if available*) | | d. NO. OF ANALYSES | a. CONCENTRATION | b. MASS | a. LONG TERM AVERAGE VALUE | | b. NO. OF ANALYSES |
| | | | | (1) CONCENTRATION | (2) MASS | (1) CONCENTRATION | (2) MASS | (1) CONCENTRATION | (2) MASS | | | | (1) CONCENTRATION | (2) MASS | |
| GC/MS FRACTION – VOLATILE COMPOUNDS | | | | | | | | | | | | | | | |
| 1V. Accrolein (107-02-8) | X | | | <50.0 | -- | | | | | 1 | µg/l | -- | | | |
| 2V. Acrylonitrile (107-13-1) | X | | | <50.0 | -- | | | | | 1 | µg/l | -- | | | |
| 3V. Benzene (71-43-2) | X | | | <5.0 | -- | | | | | 1 | µg/l | -- | | | |
| 4V. Bis (*Chloromethyl*) Ether (542-88-1) | X | | | ND* | -- | | | | | 1 | µg/l | -- | | | |
| 5V. Bromoform (75-25-2) | X | | | <5.0 | -- | | | | | 1 | µg/l | -- | | | |
| 6V. Carbon Tetrachloride (56-23-5) | X | | | <5.0 | -- | | | | | 1 | µg/l | -- | | | |
| 7V. Chlorobenzene (108-90-7) | X | | | <5.0 | -- | | | | | 1 | µg/l | -- | | | |
| 8V. Chlorodibromomethane (124-48-1) | X | | | <5.0 | -- | | | | | 1 | µg/l | -- | | | |
| 9V. Chloroethane (75-00-3) | X | | | <10.0 | -- | | | | | 1 | µg/l | -- | | | |
| 10V. 2-Chloroethylvinyl Ether (110-75-8) | X | | | <10 | -- | | | | | 1 | µg/l | -- | | | |
| 11V. Chloroform (67-66-3) | X | | | <5.0 | -- | | | | | 1 | µg/l | -- | | | |
| 12V. Dichlorobromomethane (75-27-4) | X | | | <5.0 | -- | | | | | 1 | µg/l | -- | | | |
| 13V. Dichlorodifluoromethane (75-71-8) | X | | | <10 | -- | | | | | 1 | µg/l | -- | | | |
| 14V. 1,1-Dichloroethane (75-34-3) | X | | | <5.0 | -- | | | | | 1 | µg/l | -- | | | |
| 15V. 1,2-Dichloroethane (107-06-2) | X | | | <5.0 | -- | | | | | 1 | µg/l | -- | | | |
| 16V. 1,1-Dichloroethylene (75-35-4) | X | | | <5.0 | -- | | | | | 1 | µg/l | -- | | | |
| 17V. 1,2-Dichloropropane (78-87-5) | X | | | <5.0 | -- | | | | | 1 | ug/l | -- | | | |
| 18V. 1,3-Dichloropropylene (542-75-6) | X | | | <5.0 | -- | | | | | 1 | µg/l | -- | | | |
| 19V. Ethylbenzene (100-41-4) | X | | | <5.0 | -- | | | | | 1 | µg/l | -- | | | |
| 20V. Methyl Bromide (74-83-9) | X | | | <10.0 | -- | | | | | 1 | µg/l | -- | | | |
| 21V. Methyl Chloride (74-87-3) | X | | | <10 | -- | | | | | 1 | µg/l | -- | | | |



CONTINUE ON PAGE V-5

*ND - Not detected in library search.

CONTINUED FROM PAGE V-4

| 1. POLLUTANT AND CAS NUMBER (*if available*) | 2. MARK "X" | | | 3. EFFLUENT | | | | | | | 4. UNITS | | 5. INTAKE (*optional*) | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | a. TESTING REQUIRED | b. BELIEVED PRESENT | c. BELIEVED ABSENT | a. MAXIMUM DAILY VALUE | | b. MAXIMUM 30 DAY VALUE (*if available*) | | c. LONG TERM AVRG. VALUE (*if available*) | | d. NO. OF ANALYSES | a. CONCENTRATION | b. MASS | a. LONG TERM AVERAGE VALUE | | b. NO. OF ANALYSES |
| | | | | (1) CONCENTRATION | (2) MASS | (1) CONCENTRATION | (2) MASS | (1) CONCENTRATION | (2) MASS | | | | (1) CONCENTRATION | (2) MASS | |
| GC/MS FRACTION – VOLATILE COMPOUNDS (*continued*) | | | | | | | | | | | | | | | |
| 22V. Methylene Chloride (75-09-2) | X | | | <10 | -- | | | | | 1 | µg/l | -- | | | |
| 23V. 1,1,2,2-Tetrachloroethane (79-34-5) | X | | | <5.0 | -- | | | | | 1 | µg/l | -- | | | |
| 24V. Tetrachloro-ethylene (127-18-4) | X | | | <5.0 | -- | | | | | 1 | µg/l | -- | | | |
| 25V. Toluene (108-88-3) | X | | | <5.0 | -- | | | | | 1 | µg/l | -- | | | |
| 26V. 1,2-Trans-Dichloroethylene (156-60-5) | X | | | <5.0 | -- | | | | | 1 | µg/l | -- | | | |
| 27V. 1,1,1-Trichloro-ethane (71-55-6) | X | | | <5.0 | -- | | | | | 1 | µg/l | -- | | | |
| 28V. 1,1,2-Trichloro-ethane (79-00-5) | X | | | <5.0 | -- | | | | | 1 | µg/l | -- | | | |
| 29V Trichloro-ethylene (79-01-6) | X | | | <5.0 | -- | | | | | 1 | µg/l | -- | | | |
| 30V. Trichloro-fluoromethane (75-69-4) | X | | | <10 | -- | | | | | 1 | µg/l | -- | | | |
| 31V. Vinyl Chloride (75-01-4) | X | | | <10 | -- | | | | | 1 | µg/l | -- | | | |
| GC/MS FRACTION – ACID COMPOUNDS | | | | | | | | | | | | | | | |
| 1A. 2-Chlorophenol (95-57-8) | X | | | <10.0 | -- | | | | | 1 | µg/l | -- | | | |
| 2A. 2,4-Dichloro-phenol (120-83-2) | X | | | <10.0 | -- | | | | | 1 | µg/l | -- | | | |
| 3A. 2,4-Dimethyl-phenol (105-67-9) | X | | | <10.0 | -- | | | | | 1 | µg/l | -- | | | |
| 4A. 4,6-Dinitro-O-Cresol (534-52-1) | X | | | <50.0 | -- | | | | | 1 | µg/l | -- | | | |
| 5A. 2,4-Dinitro-phenol (51-28-5) | X | | | <50.0 | -- | | | | | 1 | µg/l | -- | | | |
| 6A. 2-Nitrophenol (88-75-5) | X | | | <10.0 | -- | | | | | 1 | µg/l | -- | | | |
| 7A. 4-Nitrophenol (100-02-7) | X | | | <50.0 | -- | | | | | 1 | µg/l | -- | | | |
| 8A. P-Chloro-M-Cresol (59-50-7) | X | | | <50.0 | -- | | | | | 1 | µg/l | -- | | | |
| 9A. Pentachloro-phenol (87-86-5) | X | | | <50.0 | -- | | | | | 1 | µg/l | -- | | | |
| 10A. Phenol (108-95-2) | X | | | <10.0 | -- | | | | | 1 | µg/l | -- | | | |
| 11A. 2,4,6-Trichloro-phenol (88-05-2) | X | | | <20.0 | -- | | | | | 1 | µg/l | -- | | | |


CONTINUE ON REVERSE

CONTINUED FROM THE FRONT

| 1. POLLUTANT AND CAS NUMBER (*if available*) | 2. MARK "X" | | | 3. EFFLUENT | | | | | | | 4. UNITS | | 5. INTAKE (*optional*) | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | a. TESTING REQUIRED | b. BELIEVED PRESENT | c. BELIEVED ABSENT | a. MAXIMUM DAILY VALUE | | b. MAXIMUM 30 DAY VALUE (*if available*) | | c. LONG TERM AVRG. VALUE (*if available*) | | d. NO. OF ANALYSES | a. CONCENTRATION | b. MASS | a. LONG TERM AVERAGE VALUE | | b. NO. OF ANALYSES |
| | | | | (1) CONCENTRATION | (2) MASS | (1) CONCENTRATION | (2) MASS | (1) CONCENTRATION | (2) MASS | | | | (1) CONCENTRATION | (2) MASS | |
| GC/MS FRACTION – BASE/NEUTRAL COMPOUNDS | | | | | | | | | | | | | | | |
| 1B. Acenaphthene (83-32-9) | X | | | <10.0 | -- | | | | | 1 | µg/l | -- | | | |
| 2B. Acenaphtylene (208-96-8) | X | | | <10.0 | -- | | | | | 1 | µg/l | -- | | | |
| 3B. Anthracene (120-12-7) | X | | | <10.0 | -- | | | | | 1 | µg/l | -- | | | |
| 4B. Benzidine (92-87-5) | X | | | <50.0 | -- | | | | | 1 | µg/l | -- | | | |
| 5B. Benzo (*a*) Anthracene (56-55-3) | X | | | <10.0 | -- | | | | | 1 | µg/l | -- | | | |
| 6B. Benzo (*a*) Pyrene (50-32-8) | X | | | <10.0 | -- | | | | | 1 | µg/l | -- | | | |
| 7B. 3,4-Benzo-fluoranthene (205-99-2) | X | | | <10.0 | -- | | | | | 1 | µg/l | -- | | | |
| 8B. Benzo (*ghi*) Perylene (191-24-2) | X | | | <10.0 | -- | | | | | 1 | µg/l | -- | | | |
| 9B. Benzo (*k*) Fluoranthene (207-08-9) | X | | | <10.0 | -- | | | | | 1 | µg/l | -- | | | |
| 10B. Bis (*2-Chloro-ethoxy*) Methane (111-91-1) | X | | | <10.0 | -- | | | | | 1 | µg/l | -- | | | |
| 11B. Bis (*2-Chloro-ethyl*) Ether (111-44-4) | X | | | <10.0 | -- | | | | | 1 | µg/l | -- | | | |
| 12B. Bis (*2-Chloroisopropyl*) Ether (102-80-1) | X | | | <10.0 | -- | | | | | 1 | µg/l | -- | | | |
| 13B. Bis (*2-Ethyl-hexyl*) Phthalate (117-81-7) | X | | | 63.5 | 0.06 | | | | | 1 | µg/l | lb/day | | | |
| 14B. 4-Bromophenyl Phenyl Ether (101-55-3) | X | | | <10.0 | -- | | | | | 1 | µg/l | -- | | | |
| 15B. Butyl Benzyl Phthalate (85-68-7) | X | | | <10.0 | -- | | | | | 1 | µg/l | -- | | | |
| 16B. 2-Chloro-naphthalene (91-58-7) | X | | | <10.0 | -- | | | | | 1 | µg/l | -- | | | |
| 17B. 4-Chloro-phenyl Phenyl Ether (7005-72-3) | X | | | <10.0 | -- | | | | | 1 | µg/l | -- | | | |
| 18B. Chrysene (218-01-9) | X | | | <10.0 | -- | | | | | 1 | µg/l | -- | | | |
| 19B. Dibenzo (*a,h*) Anthracene (53-70-3) | X | | | <10.0 | -- | | | | | 1 | µg/l | -- | | | |
| 20B. 1,2-Dichloro-benzene (95-50-1) | X | | | <5.0 | -- | | | | | 1 | µg/l | -- | | | |
| 21B. 1,3-Di-chloro-benzene (541-73-1) | X | | | <5.0 | -- | | | | | 1 | µg/l | -- | | | |



CONTINUE ON PAGE V-7

CONTINUED FROM PAGE V-6

| 1. POLLUTANT AND CAS NUMBER (*if available*) | 2. MARK "X" | | | 3. EFFLUENT | | | | | | | 4. UNITS | | 5. INTAKE (*optional*) | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | a. TESTING REQUIRED | b. BELIEVED PRESENT | c. BELIEVED ABSENT | a. MAXIMUM DAILY VALUE | | b. MAXIMUM 30 DAY VALUE (*if available*) | | c. LONG TERM AVRG. VALUE (*if available*) | | d. NO. OF ANALYSES | a. CONCENTRATION | b. MASS | a. LONG TERM AVERAGE VALUE | | b. NO. OF ANALYSES |
| | | | | (1) CONCENTRATION | (2) MASS | (1) CONCENTRATION | (2) MASS | (1) CONCENTRATION | (2) MASS | | | | (1) CONCENTRATION | (2) MASS | |
| GC/MS FRACTION – BASE/NEUTRAL COMPOUNDS (*continued*) | | | | | | | | | | | | | | | |
| 22B. 1,4-Dichlorobenzene (106-46-7) | X | | | <5.0 | -- | | | | | 1 | µg/l | -- | | | |
| 23B. 3,3-Dichlorobenzidine (91-94-1) | X | | | <20.0 | -- | | | | | 1 | µg/l | -- | | | |
| 24B. Diethyl Phthalate (84-66-2) | X | | | <10.0 | -- | | | | | 1 | µg/l | -- | | | |
| 25B. Dimethyl Phthalate (131 -11-3) | X | | | <10.0 | -- | | | | | 1 | µg/l | -- | | | |
| 26B. Di-N-Butyl Phthalate (84-74-2) | X | | | <10.0 | -- | | | | | 1 | µg/l | -- | | | |
| 27B. 2,4-Dinitrotoluene (121-14-2) | X | | | <20.0 | -- | | | | | 1 | µg/l | -- | | | |
| 28B. 2,6-Dinitrotoluene (606-20-2) | X | | | <10.0 | -- | | | | | 1 | µg/l | -- | | | |
| 29B. Di-N-Octyl Phthalate (117-84-0) | X | | | <10.0 | -- | | | | | 1 | µg/l | -- | | | |
| 30B. 1,2-Diphenylhydrazine (*as Azobenzene*) (122-66-7) | X | | | <10.0 | -- | | | | | 1 | µg/l | -- | | | |
| 31B. Fluoranthene (206-44-0) | X | | | <10.0 | -- | | | | | 1 | µg/l | -- | | | |
| 32B. Fluorene (86-73-7) | X | | | <10.0 | -- | | | | | 1 | µg/l | -- | | | |
| 33B. Hexachlorobenzene (118-74-1) | X | | | <10.0 | -- | | | | | 1 | µg/l | -- | | | |
| 34B. Hexachlorobutadiene (87-68-3) | X | | | <10.0 | -- | | | | | 1 | µg/l | -- | | | |
| 35B. Hexachlorocyclopentadiene (77-47-4) | X | | | <10.0 | -- | | | | | 1 | µg/l | -- | | | |
| 36B Hexachloroethane (67-72-1) | X | | | <10.0 | -- | | | | | 1 | µg/l | -- | | | |
| 37B. Indeno (*1,2,3-cd*) Pyrene (193-39-5) | X | | | <20.0 | -- | | | | | 1 | µg/l | -- | | | |
| 38B. Isophorone (78-59-1) | X | | | <10.0 | -- | | | | | 1 | µg/l | -- | | | |
| 39B. Naphthalene (91-20-3) | X | | | <10.0 | -- | | | | | 1 | µg/l | -- | | | |
| 40B. Nitrobenzene (98-95-3) | X | | | <10.0 | -- | | | | | 1 | µg/l | -- | | | |
| 41B. N-Nitrosodimethylamine (62-75-9) | X | | | <10.0 | -- | | | | | 1 | µg/l | -- | | | |
| 42B. N-Nitrosodi-N-Propylamine (621-64-7) | X | | | <10.0 | -- | | | | | 1 | µg/l | -- | | | |

CONTINUED FROM THE FRONT

| 1. POLLUTANT AND CAS NUMBER (*if available*) | 2. MARK "X" | | | 3. EFFLUENT | | | | | | | 4. UNITS | | 5. INTAKE (*optional*) | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | a. TESTING REQUIRED | b. BELIEVED PRESENT | c. BELIEVED ABSENT | a. MAXIMUM DAILY VALUE | | b. MAXIMUM 30 DAY VALUE (*if available*) | | c. LONG TERM AVRG. VALUE (*if available*) | | d. NO. OF ANALYSES | a. CONCENTRATION | b. MASS | a. LONG TERM AVERAGE VALUE | | b. NO. OF ANALYSES |
| | | | | (1) CONCENTRATION | (2) MASS | (1) CONCENTRATION | (2) MASS | (1) CONCENTRATION | (2) MASS | | | | (1) CONCENTRATION | (2) MASS | |
| GC/MS FRACTION – BASE/NEUTRAL COMPOUNDS (*continued*) | | | | | | | | | | | | | | | |
| 43B. N-Nitrosodiphenylamine (86-30-6) | X | | | <10.0 | -- | | | | | 1 | µg/l | -- | | | |
| 44B. Phenanthrene (85-01-8) | X | | | <10.0 | -- | | | | | 1 | µg/l | -- | | | |
| 45B. Pyrene (129-00-0) | X | | | <10.0 | -- | | | | | 1 | µg/l | -- | | | |
| 46B. 1,2,4-Trichlorobenzene (120-82-1) | X | | | <10.0 | -- | | | | | 1 | µg/l | -- | | | |
| GC/MS FRACTION – PESTICIDES | | | | | | | | | | | | | | | |
| 1P. Aldrin (309-00-2) | | | X | | | | | | | -- | -- | -- | | | |
| 2P. α-BHC (319-84-6) | | | X | | | | | | | -- | -- | -- | | | |
| 3P. β-BHC (319-85-7) | | | X | | | | | | | -- | -- | -- | | | |
| 4P. γ-BHC (58-89-9) | | | X | | | | | | | -- | -- | -- | | | |
| 5P. δ-BHC (319-86-8) | | | X | | | | | | | -- | -- | -- | | | |
| 6P. Chlordane (57-74-9) | | | X | | | | | | | -- | -- | -- | | | |
| 7P. 4,4'-DDT (50-29-3) | | | X | | | | | | | -- | -- | -- | | | |
| 8P. 4,4'-DDE (72-55-9) | | | X | | | | | | | -- | -- | -- | | | |
| 9P. 4,4'-DDD (72-54-8) | | | X | | | | | | | -- | -- | -- | | | |
| 10P. Dieldrin (60-57-1) | | | X | | | | | | | -- | -- | -- | | | |
| 11P. α-Enosulfan (115-29-7) | | | X | | | | | | | -- | -- | -- | | | |
| 12P. β-Endosulfan (115-29-7) | | | X | | | | | | | -- | -- | -- | | | |
| 13P. Endosulfan Sulfate (1031-07-8) | | | X | | | | | | | -- | -- | -- | | | |
| 14P. Endrin (72-20-8) | | | X | | | | | | | -- | -- | -- | | | |
| 15P. Endrin Aldehyde (7421-93-4) | | | X | | | | | | | -- | -- | -- | | | |
| 16P. Heptachlor (76-44-8) | | | X | | | | | | | -- | -- | -- | | | |

| EPA I.D. NUMBER (*copy from Item 1 of Form 1*) | OUTFALL NUMBER |
|---|---|
| 3IB00002*KD | 604 |

CONTINUED FROM PAGE V-8

| 1. POLLUTANT AND CAS NUMBER (*if available*) | 2. MARK "X" | | | 3. EFFLUENT | | | | | | | 4. UNITS | | 5. INTAKE (*optional*) | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | a. TESTING REQUIRED | b. BELIEVED PRESENT | c. BELIEVED ABSENT | a. MAXIMUM DAILY VALUE | | b. MAXIMUM 30 DAY VALUE (*if available*) | | c. LONG TERM AVRG. VALUE (*if available*) | | d. NO. OF ANALYSES | a. CONCENTRATION | b. MASS | a. LONG TERM AVERAGE VALUE | | b. NO. OF ANALYSES |
| | | | | (1) CONCENTRATION | (2) MASS | (1) CONCENTRATION | (2) MASS | (1) CONCENTRATION | (2) MASS | | | | (1) CONCENTRATION | (2) MASS | |
| GC/MS FRACTION – PESTICIDES (*continued*) | | | | | | | | | | | | | | | |
| 17P. Heptachlor Epoxide (1024-57-3) | | | X | | | | | | | -- | -- | -- | | | |
| 18P. PCB-1242 (53469-21-9) | | | X | | | | | | | -- | -- | -- | | | |
| 19P. PCB-1254 (11097-69-1) | | | X | | | | | | | -- | -- | -- | | | |
| 20P. PCB-1221 (11104-28-2) | | | X | | | | | | | -- | -- | -- | | | |
| 21P. PCB-1232 (11141-16-5) | | | X | | | | | | | -- | -- | -- | | | |
| 22P. PCB-1248 (12672-29-6) | | | X | | | | | | | -- | -- | -- | | | |
| 23P. PCB-1260 (11096-82-5) | | | X | | | | | | | -- | -- | -- | | | |
| 24P. PCB-1016 (12674-11-2) | | | X | | | | | | | -- | -- | -- | | | |
| 25P. Toxaphene (8001-35-2) | | | X | | | | | | | -- | -- | -- | | | |

PLEASE PRINT OR TYPE IN THE UNSHADED AREAS ONLY. You may report some or all of this information on separate sheets (*use the same format*) instead of completing these pages.
SEE INSTRUCTIONS.

EPA I.D. NUMBER (*copy from Item 1 of Form 1*): 3IB00002*KD

V. INTAKE AND EFFLUENT CHARACTERISTICS *(continued from page 3 of Form 2-C)*

OUTFALL NO. 612

PART A –You must provide the results of at least one analysis for every pollutant in this table. Complete one table for each outfall. See instructions for additional details.

| 1. POLLUTANT | 2. EFFLUENT a. MAXIMUM DAILY VALUE (1) CONCENTRATION | a. MAXIMUM DAILY VALUE (2) MASS | b. MAXIMUM 30 DAY VALUE (*if available*) (1) CONCENTRATION | b. MAXIMUM 30 DAY VALUE (*if available*) (2) MASS | c. LONG TERM AVRG. VALUE (*if available*) (1) CONCENTRATION | c. LONG TERM AVRG. VALUE (*if available*) (2) MASS | d. NO. OF ANALYSES | 3. UNITS (*specify if blank*) a. CONCENTRATION | 3. UNITS b. MASS | 4. INTAKE (*optional*) a. LONG TERM AVERAGE VALUE (1) CONCENTRATION | 4. INTAKE a. LONG TERM AVERAGE VALUE (2) MASS | 4. INTAKE b. NO. OF ANALYSES |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| a. Biochemical Oxygen Demand (*BOD*) | <4.0 | -- | | | | | 1 | mg/l | -- | | | |
| b. Chemical Oxygen Demand (*COD*) | 7.19* | 101.9 | | | | | 1 | mg/l | lb/day | | | |
| c. Total Organic Carbon (*TOC*) | 2.9 | 41.12 | | | | | 1 | mg/l | lb/day | | | |
| d. Total Suspended Solids (*TSS*) | 14 | 198.5 | | | | | 1 | mg/l | lb/day | | | |
| e. Ammonia (*as N*) | 0.06 | 0.85 | | | | | 1 | mg/l | lb/day | | | |
| f. Flow | VALUE 1.7 | | VALUE -- | | VALUE -- | | 1 | MGD | -- | VALUE | | |
| g. Temperature (*winter*) | VALUE -- | | VALUE -- | | VALUE -- | | -- | °C | | VALUE | | |
| h. Temperature (*summer*) | VALUE 25.4 | | VALUE -- | | VALUE -- | | 1 | °C | | VALUE | | |
| i. pH | MINIMUM 7.52 | MAXIMUM 7.52 | MINIMUM -- | MAXIMUM -- | | | 1 | STANDARD UNITS | | | | |

PART B – Mark "X" in column 2-a for each pollutant you know or have reason to believe is present. Mark "X" in column 2-b for each pollutant you believe to be absent. If you mark column 2a for any pollutant which is limited either directly, or indirectly but expressly, in an effluent limitations guideline, you must provide the results of at least one analysis for that pollutant. For other pollutants for which you mark column 2a, you must provide quantitative data or an explanation of their presence in your discharge. Complete one table for each outfall. See the instructions for additional details and requirements.

| 1. POLLUTANT AND CAS NO. (*if available*) | 2. MARK "X" a. BELIEVED PRESENT | 2. MARK "X" b. BELIEVED ABSENT | 3. EFFLUENT a. MAXIMUM DAILY VALUE (1) CONCENTRATION | a. MAXIMUM DAILY VALUE (2) MASS | b. MAXIMUM 30 DAY VALUE (*if available*) (1) CONCENTRATION | b. MAXIMUM 30 DAY VALUE (*if available*) (2) MASS | c. LONG TERM AVRG. VALUE (*if available*) (1) CONCENTRATION | c. LONG TERM AVRG. VALUE (*if available*) (2) MASS | d. NO. OF ANALYSES | 4. UNITS a. CONCENTRATION | 4. UNITS b. MASS | 5. INTAKE (*optional*) a. LONG TERM AVERAGE VALUE (1) CONCENTRATION | 5. INTAKE a. LONG TERM AVERAGE VALUE (2) MASS | 5. INTAKE b. NO. OF ANALYSES |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| a. Bromide (24959-67-9) | X | | 0.036 | 0.51 | | | | | 1 | mg/l | lb/day | | | |
| b. Chlorine, Total Residual | X | | 0.02 | 0.28 | | | | | 1 | mg/l | lb/day | | | |
| c. Color | X | | 11 | -- | | | | | 1 | Pt-Co | -- | | | |
| d. Fecal Coliform | | X | -- | -- | | | | | -- | -- | -- | | | |
| e. Fluoride (16984-48-8) | X | | 0.148 | 2.10 | | | | | 1 | mg/l | lb/day | | | |
| f. Nitrate-Nitrite (*as N*) | X | | 0.08 | 1.13 | | | | | 1 | mg/l | lb/day | | | |



* Estimated value below practical quantitation limit.

ITEM V-B CONTINUED FROM FRONT

| 1. POLLUTANT AND CAS NO. (*if available*) | 2. MARK "X" | | 3. EFFLUENT | | | | | | | 4. UNITS | | 5. INTAKE (*optional*) | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | a. BELIEVED PRESENT | b. BELIEVED ABSENT | a. MAXIMUM DAILY VALUE | | b. MAXIMUM 30 DAY VALUE (*if available*) | | c. LONG TERM AVRG. VALUE (*if available*) | | d. NO. OF ANALYSES | a. CONCENTRATION | b. MASS | a. LONG TERM AVERAGE VALUE | | b. NO. OF ANALYSES |
| | | | (1) CONCENTRATION | (2) MASS | (1) CONCENTRATION | (2) MASS | (1) CONCENTRATION | (2) MASS | | | | (1) CONCENTRATION | (2) MASS | |
| g. Nitrogen, Total Organic (*as N*) | X | | 0.47* | 6.66 | | | | | 1 | mg/l | lb/day | | | |
| h. Oil and Grease | X | | <5.1 | -- | | | | | 1 | mg/l | -- | | | |
| i. Phosphorus (as P), Total (7723-14-0) | X | | 0.04 | 0.57 | | | | | 1 | mg/l | lb/day | | | |
| j. Radioactivity | | | | | | | | | | | | | | |
| (1) Alpha, Total | | X | -- | -- | | | | | -- | -- | -- | | | |
| (2) Beta, Total | | X | -- | -- | | | | | -- | -- | -- | | | |
| (3) Radium, Total | | X | -- | -- | | | | | -- | -- | -- | | | |
| (4) Radium 226, Total | | X | -- | -- | | | | | -- | -- | -- | | | |
| k. Sulfate (*as $SO_4$*) (14808-79-8) | X | | 21 | 297.7 | | | | | 1 | mg/l | lb/day | | | |
| l. Sulfide (*as S*) | X | | 0.036* | 0.51 | | | | | 1 | mg/l | lb/day | | | |
| m. Sulfite (*as $SO_3$*) (14265-45-3) | X | | <0.64 | -- | | | | | 1 | mg/l | -- | | | |
| n. Surfactants | X | | 0.023* | 0.33 | | | | | 1 | mg/l | lb/day | | | |
| o. Aluminum, Total (7429-90-5) | X | | 199* | 2.82 | | | | | 1 | ug/l | lb/day | | | |
| p. Barium, Total (7440-39-3) | X | | 21 | 0.30 | | | | | 1 | µg/l | lb/day | | | |
| q. Boron, Total (7440-42-8) | X | | 24 | 0.34 | | | | | 1 | µg/l | lb/day | | | |
| r. Cobalt, Total (7440-48-4) | X | | <20 | -- | | | | | 1 | µg/l | -- | | | |
| s. Iron, Total (7439-89-6) | X | | 420 | 5.96 | | | | | 1 | µg/l | lb/day | | | |
| t. Magnesium, Total (7439-95-4) | X | | 8,160 | 115.7 | | | | | 1 | µg/l | lb/day | | | |
| u. Molybdenum, Total (7439-98-7) | X | | 2.054* | 0.029 | | | | | 1 | µg/l | lb/day | | | |
| v. Manganese, Total (7439-96-5) | X | | 13 | 0.18 | | | | | 1 | µg/l | lb/day | | | |
| w. Tin, Total (7440-31-5) | X | | <10 | -- | | | | | 1 | µg/l | -- | | | |
| x. Titanium, Total (7440-32-6) | X | | 4* | 0.056 | | | | | 1 | µg/l | lb/day | | | |



CONTINUE ON PAGE V-3

* Estimated value below practical quantitation limit.

| EPA I.D. NUMBER (*copy from Item 1 of Form 1*) | OUTFALL NUMBER |
|---|---|
| 3IB00002*KD | 612 |

CONTINUED FROM PAGE 3 OF FORM 2-C

PART C - If you are a primary industry and this outfall contains process wastewater, refer to Table 2c-2 in the instructions to determine which of the GC/MS fractions you must test for. Mark "X" in column 2-a for all such GC/MS fractions that apply to your industry and for ALL toxic metals, cyanides, and total phenols. If you are not required to mark column 2-a (*secondary industries, nonprocess wastewater outfalls, and nonrequired GC/MS fractions*), mark "X" in column 2-b for each pollutant you know or have reason to believe is present. Mark "X" in column 2-c for each pollutant you believe is absent. If you mark column 2a for any pollutant, you must provide the results of at least one analysis for that pollutant. If you mark column 2b for any pollutant, you must provide the results of at least one analysis for that pollutant if you know or have reason to believe it will be discharged in concentrations of 10 ppb or greater. If you mark column 2b for acrolein, acrylonitrile, 2,4 dinitrophenol, or 2-methyl-4, 6 dinitrophenol, you must provide the results of at least one analysis for each of these pollutants which you know or have reason to believe that you discharge in concentrations of 100 ppb or greater. Otherwise, for pollutants for which you mark column 2b, you must either submit at least one analysis or briefly describe the reasons the pollutant is expected to be discharged. Note that there are 7 pages to this part; please review each carefully. Complete one table (*all 7 pages*) for each outfall. See instructions for additional details and requirements.

| 1. POLLUTANT AND CAS NUMBER (*if available*) | 2. MARK "X" | | | 3. EFFLUENT | | | | | | | 4. UNITS | | 5. INTAKE (*optional*) | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | a. TESTING REQUIRED | b. BELIEVED PRESENT | c. BELIEVED ABSENT | a. MAXIMUM DAILY VALUE | | b. MAXIMUM 30 DAY VALUE (*if available*) | | c. LONG TERM AVRG. VALUE (*if available*) | | d. NO. OF ANALYSES | a. CONCENTRATION | b. MASS | a. LONG TERM AVERAGE VALUE | | b. NO. OF ANALYSES |
| | | | | (1) CONCENTRATION | (2) MASS | (1) CONCENTRATION | (2) MASS | (1) CONCENTRATION | (2) MASS | | | | (1) CONCENTRATION | (2) MASS | |
| METALS, CYANIDE, AND TOTAL PHENOLS | | | | | | | | | | | | | | | |
| 1M. Antimony, Total (7440-36-0) | X | | | 0.157* | 0.0022 | | | | | 1 | µg/l | lb/day | | | |
| 2M. Arsenic, Total (7440-38-2) | X | | | 0.922* | 0.013 | | | | | 1 | µg/l | lb/day | | | |
| 3M. Beryllium, Total (7440-41-7) | X | | | 0.013* | 0.0002 | | | | | 1 | µg/l | lb/day | | | |
| 4M. Cadmium, Total (7440-43-9) | X | | | 0.178* | 0.003 | | | | | 1 | µg/l | lb/day | | | |
| 5M. Chromium, Total (7440-47-3) | X | | | 0.655* | 0.0093 | | | | | 1 | µg/l | lb/day | | | |
| 6M. Copper, Total (7440-50-8) | X | | | 13 | 0.18 | | | | | 1 | µg/l | lb/day | | | |
| 7M. Lead, Total (7439-92-1) | X | | | 2.3 | 0.033 | | | | | 1 | µg/l | lb/day | | | |
| 8M. Mercury, Total (7439-97-6) | X | | | <0.2 | -- | | | | | 1 | µg/l | -- | | | |
| 9M. Nickel, Total (7440-02-0) | X | | | 2.909* | 0.041 | | | | | 1 | µg/l | lb/day | | | |
| 10M. Selenium, Total (7782-49-2) | X | | | 0.345* | 0.0049 | | | | | 1 | µg/l | lb/day | | | |
| 11M. Silver, Total (7440-22-4) | X | | | <5.0 | -- | | | | | 1 | µg/l | -- | | | |
| 12M. Thallium, Total (7440-28-0) | X | | | 0.033* | 0.0005 | | | | | 1 | µg/l | lb/day | | | |
| 13M. Zinc, Total (7440-66-6) | X | | | 14 | 0.19 | | | | | 1 | µg/l | lb/day | | | |
| 14M. Cyanide, Total (57-12-5) | X | | | 0.0019* | 0.027 | | | | | 1 | mg/l | lb/day | | | |
| 15M. Phenols, Total | X | | | <50 | -- | | | | | 1 | µg/l | -- | | | |
| DIOXIN | | | | | | | | | | | | | | | |
| 2,3,7,8-Tetra-chlorodibenzo-P-Dioxin (1764-01-6) | | | X | DESCRIBE RESULTS Not detected. | | | | | | | | | | | |



* Estimated value below practical quantitation limit.

CONTINUED FROM THE FRONT

| 1. POLLUTANT AND CAS NUMBER (*if available*) | 2. MARK "X" | | | 3. EFFLUENT | | | | | | | 4. UNITS | | 5. INTAKE (*optional*) | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | a. TESTING REQUIRED | b. BELIEVED PRESENT | c. BELIEVED ABSENT | a. MAXIMUM DAILY VALUE | | b. MAXIMUM 30 DAY VALUE (*if available*) | | c. LONG TERM AVRG. VALUE (*if available*) | | d. NO. OF ANALYSES | a. CONCENTRATION | b. MASS | a. LONG TERM AVERAGE VALUE | | b. NO. OF ANALYSES |
| | | | | (1) CONCENTRATION | (2) MASS | (1) CONCENTRATION | (2) MASS | (1) CONCENTRATION | (2) MASS | | | | (1) CONCENTRATION | (2) MASS | |
| GC/MS FRACTION – VOLATILE COMPOUNDS | | | | | | | | | | | | | | | |
| 1V. Accrolein (107-02-8) | X | | | <50.0 | -- | | | | | 1 | µg/l | -- | | | |
| 2V. Acrylonitrile (107-13-1) | X | | | <50.0 | -- | | | | | 1 | µg/l | -- | | | |
| 3V. Benzene (71-43-2) | X | | | <5.0 | -- | | | | | 1 | µg/l | -- | | | |
| 4V. Bis (*Chloromethyl*) Ether (542-88-1) | X | | | ND* | -- | | | | | 1 | µg/l | -- | | | |
| 5V. Bromoform (75-25-2) | X | | | <5.0 | -- | | | | | 1 | µg/l | -- | | | |
| 6V. Carbon Tetrachloride (56-23-5) | X | | | <5.0 | -- | | | | | 1 | µg/l | -- | | | |
| 7V. Chlorobenzene (108-90-7) | X | | | <5.0 | -- | | | | | 1 | µg/l | -- | | | |
| 8V. Chlorodibromomethane (124-48-1) | X | | | <5.0 | -- | | | | | 1 | µg/l | -- | | | |
| 9V. Chloroethane (75-00-3) | X | | | <10.0 | -- | | | | | 1 | µg/l | -- | | | |
| 10V. 2-Chloroethylvinyl Ether (110-75-8) | X | | | <10 | -- | | | | | 1 | µg/l | -- | | | |
| 11V. Chloroform (67-66-3) | X | | | <5.0 | -- | | | | | 1 | µg/l | -- | | | |
| 12V. Dichlorobromomethane (75-27-4) | X | | | <5.0 | -- | | | | | 1 | µg/l | -- | | | |
| 13V. Dichlorodifluoromethane (75-71-8) | X | | | <10 | -- | | | | | 1 | µg/l | -- | | | |
| 14V. 1,1-Dichloroethane (75-34-3) | X | | | <5.0 | -- | | | | | 1 | µg/l | -- | | | |
| 15V. 1,2-Dichloroethane (107-06-2) | X | | | <5.0 | -- | | | | | 1 | µg/l | -- | | | |
| 16V. 1,1-Dichloroethylene (75-35-4) | X | | | <5.0 | -- | | | | | 1 | µg/l | -- | | | |
| 17V. 1,2-Dichloropropane (78-87-5) | X | | | <5.0 | -- | | | | | 1 | ug/l | -- | | | |
| 18V. 1,3-Dichloropropylene (542-75-6) | X | | | <5.0 | -- | | | | | 1 | µg/l | -- | | | |
| 19V. Ethylbenzene (100-41-4) | X | | | <5.0 | -- | | | | | 1 | µg/l | -- | | | |
| 20V. Methyl Bromide (74-83-9) | X | | | <10.0 | -- | | | | | 1 | µg/l | -- | | | |
| 21V. Methyl Chloride (74-87-3) | X | | | <10 | -- | | | | | 1 | µg/l | -- | | | |



CONTINUE ON PAGE V-5

*ND - Not detected in library search.

CONTINUED FROM PAGE V-4

| 1. POLLUTANT AND CAS NUMBER (*if available*) | 2. MARK "X" | | | 3. EFFLUENT | | | | | | | 4. UNITS | | 5. INTAKE (*optional*) | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | a. TESTING REQUIRED | b. BELIEVED PRESENT | c. BELIEVED ABSENT | a. MAXIMUM DAILY VALUE | | b. MAXIMUM 30 DAY VALUE (*if available*) | | c. LONG TERM AVRG. VALUE (*if available*) | | d. NO. OF ANALYSES | a. CONCENTRATION | b. MASS | a. LONG TERM AVERAGE VALUE | | b. NO. OF ANALYSES |
| | | | | (1) CONCENTRATION | (2) MASS | (1) CONCENTRATION | (2) MASS | (1) CONCENTRATION | (2) MASS | | | | (1) CONCENTRATION | (2) MASS | |
| GC/MS FRACTION – VOLATILE COMPOUNDS (*continued*) | | | | | | | | | | | | | | | |
| 22V. Methylene Chloride (75-09-2) | X | | | <10 | -- | | | | | 1 | µg/l | -- | | | |
| 23V. 1,1,2,2-Tetrachloroethane (79-34-5) | X | | | <5.0 | -- | | | | | 1 | µg/l | -- | | | |
| 24V. Tetrachloroethylene (127-18-4) | X | | | <5.0 | -- | | | | | 1 | µg/l | -- | | | |
| 25V. Toluene (108-88-3) | X | | | <5.0 | -- | | | | | 1 | µg/l | -- | | | |
| 26V. 1,2-Trans-Dichloroethylene (156-60-5) | X | | | <5.0 | -- | | | | | 1 | µg/l | -- | | | |
| 27V. 1,1,1-Trichloroethane (71-55-6) | X | | | <5.0 | -- | | | | | 1 | µg/l | -- | | | |
| 28V. 1,1,2-Trichloroethane (79-00-5) | X | | | <5.0 | -- | | | | | 1 | µg/l | -- | | | |
| 29V Trichloroethylene (79-01-6) | X | | | <5.0 | -- | | | | | 1 | µg/l | -- | | | |
| 30V. Trichlorofluoromethane (75-69-4) | X | | | <10 | -- | | | | | 1 | µg/l | -- | | | |
| 31V. Vinyl Chloride (75-01-4) | X | | | <10 | -- | | | | | 1 | µg/l | -- | | | |
| GC/MS FRACTION – ACID COMPOUNDS | | | | | | | | | | | | | | | |
| 1A. 2-Chlorophenol (95-57-8) | X | | | <10.0 | -- | | | | | 1 | µg/l | -- | | | |
| 2A. 2,4-Dichlorophenol (120-83-2) | X | | | <10.0 | -- | | | | | 1 | µg/l | -- | | | |
| 3A. 2,4-Dimethylphenol (105-67-9) | X | | | <10.0 | -- | | | | | 1 | µg/l | -- | | | |
| 4A. 4,6-Dinitro-O-Cresol (534-52-1) | X | | | <50.0 | -- | | | | | 1 | µg/l | -- | | | |
| 5A. 2,4-Dinitrophenol (51-28-5) | X | | | <50.0 | -- | | | | | 1 | µg/l | -- | | | |
| 6A. 2-Nitrophenol (88-75-5) | X | | | <10.0 | -- | | | | | 1 | µg/l | -- | | | |
| 7A. 4-Nitrophenol (100-02-7) | X | | | <50.0 | -- | | | | | 1 | µg/l | -- | | | |
| 8A. P-Chloro-M-Cresol (59-50-7) | X | | | <50.0 | -- | | | | | 1 | µg/l | -- | | | |
| 9A. Pentachlorophenol (87-86-5) | X | | | <50.0 | -- | | | | | 1 | µg/l | -- | | | |
| 10A. Phenol (108-95-2) | X | | | <10.0 | -- | | | | | 1 | µg/l | -- | | | |
| 11A. 2,4,6-Trichlorophenol (88-05-2) | X | | | <20.0 | -- | | | | | 1 | µg/l | -- | | | |



CONTINUE ON REVERSE

CONTINUED FROM THE FRONT

| 1. POLLUTANT AND CAS NUMBER (*if available*) | 2. MARK "X" | | | 3. EFFLUENT | | | | | | | 4. UNITS | | 5. INTAKE (*optional*) | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | a. TESTING REQUIRED | b. BELIEVED PRESENT | c. BELIEVED ABSENT | a. MAXIMUM DAILY VALUE | | b. MAXIMUM 30 DAY VALUE (*if available*) | | c. LONG TERM AVRG. VALUE (*if available*) | | d. NO. OF ANALYSES | a. CONCENTRATION | b. MASS | a. LONG TERM AVERAGE VALUE | | b. NO. OF ANALYSES |
| | | | | (1) CONCENTRATION | (2) MASS | (1) CONCENTRATION | (2) MASS | (1) CONCENTRATION | (2) MASS | | | | (1) CONCENTRATION | (2) MASS | |
| GC/MS FRACTION – BASE/NEUTRAL COMPOUNDS | | | | | | | | | | | | | | | |
| 1B. Acenaphthene (83-32-9) | X | | | <10.0 | -- | | | | | 1 | µg/l | -- | | | |
| 2B. Acenaphtylene (208-96-8) | X | | | <10.0 | -- | | | | | 1 | µg/l | -- | | | |
| 3B. Anthracene (120-12-7) | X | | | <10.0 | -- | | | | | 1 | µg/l | -- | | | |
| 4B. Benzidine (92-87-5) | X | | | <50.0 | -- | | | | | 1 | µg/l | -- | | | |
| 5B. Benzo (*a*) Anthracene (56-55-3) | X | | | <10.0 | -- | | | | | 1 | µg/l | -- | | | |
| 6B. Benzo (*a*) Pyrene (50-32-8) | X | | | <10.0 | -- | | | | | 1 | µg/l | -- | | | |
| 7B. 3,4-Benzo-fluoranthene (205-99-2) | X | | | <10.0 | -- | | | | | 1 | µg/l | -- | | | |
| 8B. Benzo (*ghi*) Perylene (191-24-2) | X | | | <10.0 | -- | | | | | 1 | µg/l | -- | | | |
| 9B. Benzo (*k*) Fluoranthene (207-08-9) | X | | | <10.0 | -- | | | | | 1 | µg/l | -- | | | |
| 10B. Bis (*2-Chloro-ethoxy*) Methane (111-91-1) | X | | | <10.0 | -- | | | | | 1 | µg/l | -- | | | |
| 11B. Bis (*2-Chloro-ethyl*) Ether (111-44-4) | X | | | <10.0 | -- | | | | | 1 | µg/l | -- | | | |
| 12B. Bis (*2-Chloroisopropyl*) Ether (102-80-1) | X | | | <10.0 | -- | | | | | 1 | µg/l | -- | | | |
| 13B. Bis (*2-Ethyl-hexyl*) Phthalate (117-81-7) | X | | | 34 | 0.48 | | | | | 1 | µg/l | lb/day | | | |
| 14B. 4-Bromophenyl Phenyl Ether (101-55-3) | X | | | <10.0 | -- | | | | | 1 | µg/l | -- | | | |
| 15B. Butyl Benzyl Phthalate (85-68-7) | X | | | <10.0 | -- | | | | | 1 | µg/l | -- | | | |
| 16B. 2-Chloro-naphthalene (91-58-7) | X | | | <10.0 | -- | | | | | 1 | µg/l | -- | | | |
| 17B. 4-Chloro-phenyl Phenyl Ether (7005-72-3) | X | | | <10.0 | -- | | | | | 1 | µg/l | -- | | | |
| 18B. Chrysene (218-01-9) | X | | | <10.0 | -- | | | | | 1 | µg/l | -- | | | |
| 19B. Dibenzo (*a,h*) Anthracene (53-70-3) | X | | | <10.0 | -- | | | | | 1 | µg/l | -- | | | |
| 20B. 1,2-Dichloro-benzene (95-50-1) | X | | | <5.0 | -- | | | | | 1 | µg/l | -- | | | |
| 21B. 1,3-Di-chloro-benzene (541-73-1) | X | | | <5.0 | -- | | | | | 1 | µg/l | -- | | | |



CONTINUE ON PAGE V-7

CONTINUED FROM PAGE V-6

| 1. POLLUTANT AND CAS NUMBER (*if available*) | 2. MARK "X" | | | 3. EFFLUENT | | | | | | | 4. UNITS | | 5. INTAKE (*optional*) | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | a. TESTING REQUIRED | b. BELIEVED PRESENT | c. BELIEVED ABSENT | a. MAXIMUM DAILY VALUE | | b. MAXIMUM 30 DAY VALUE (*if available*) | | c. LONG TERM AVRG. VALUE (*if available*) | | d. NO. OF ANALYSES | a. CONCENTRATION | b. MASS | a. LONG TERM AVERAGE VALUE | | b. NO. OF ANALYSES |
| | | | | (1) CONCENTRATION | (2) MASS | (1) CONCENTRATION | (2) MASS | (1) CONCENTRATION | (2) MASS | | | | (1) CONCENTRATION | (2) MASS | |
| GC/MS FRACTION – BASE/NEUTRAL COMPOUNDS (*continued*) | | | | | | | | | | | | | | | |
| 22B. 1,4-Dichlorobenzene (106-46-7) | X | | | <5.0 | -- | | | | | 1 | µg/l | -- | | | |
| 23B. 3,3-Dichlorobenzidine (91-94-1) | X | | | <20.0 | -- | | | | | 1 | µg/l | -- | | | |
| 24B. Diethyl Phthalate (84-66-2) | X | | | <10.0 | -- | | | | | 1 | µg/l | -- | | | |
| 25B. Dimethyl Phthalate (131 -11-3) | X | | | <10.0 | -- | | | | | 1 | µg/l | -- | | | |
| 26B. Di-N-Butyl Phthalate (84-74-2) | X | | | <10.0 | -- | | | | | 1 | µg/l | -- | | | |
| 27B. 2,4-Dinitrotoluene (121-14-2) | X | | | <20.0 | -- | | | | | 1 | µg/l | -- | | | |
| 28B. 2,6-Dinitrotoluene (606-20-2) | X | | | <10.0 | -- | | | | | 1 | µg/l | -- | | | |
| 29B. Di-N-Octyl Phthalate (117-84-0) | X | | | <10.0 | -- | | | | | 1 | µg/l | -- | | | |
| 30B. 1,2-Diphenylhydrazine (*as Azobenzene*) (122-66-7) | X | | | <10.0 | -- | | | | | 1 | µg/l | -- | | | |
| 31B. Fluoranthene (206-44-0) | X | | | <10.0 | -- | | | | | 1 | µg/l | -- | | | |
| 32B. Fluorene (86-73-7) | X | | | <10.0 | -- | | | | | 1 | µg/l | -- | | | |
| 33B. Hexachlorobenzene (118-74-1) | X | | | <10.0 | -- | | | | | 1 | µg/l | -- | | | |
| 34B. Hexachlorobutadiene (87-68-3) | X | | | <10.0 | -- | | | | | 1 | µg/l | -- | | | |
| 35B. Hexachlorocyclopentadiene (77-47-4) | X | | | <10.0 | -- | | | | | 1 | µg/l | -- | | | |
| 36B Hexachloroethane (67-72-1) | X | | | <10.0 | -- | | | | | 1 | µg/l | -- | | | |
| 37B. Indeno (*1,2,3-cd*) Pyrene (193-39-5) | X | | | <20.0 | -- | | | | | 1 | µg/l | -- | | | |
| 38B. Isophorone (78-59-1) | X | | | <10.0 | -- | | | | | 1 | µg/l | -- | | | |
| 39B. Naphthalene (91-20-3) | X | | | <10.0 | -- | | | | | 1 | µg/l | -- | | | |
| 40B. Nitrobenzene (98-95-3) | X | | | <10.0 | -- | | | | | 1 | µg/l | -- | | | |
| 41B. N-Nitrosodimethylamine (62-75-9) | X | | | <10.0 | -- | | | | | 1 | µg/l | -- | | | |
| 42B. N-Nitrosodi-N-Propylamine (621-64-7) | X | | | <10.0 | -- | | | | | 1 | µg/l | -- | | | |

CONTINUED FROM THE FRONT

| 1. POLLUTANT AND CAS NUMBER (*if available*) | 2. MARK "X" | | | 3. EFFLUENT | | | | | | | 4. UNITS | | 5. INTAKE (*optional*) | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | a. TESTING REQUIRED | b. BELIEVED PRESENT | c. BELIEVED ABSENT | a. MAXIMUM DAILY VALUE | | b. MAXIMUM 30 DAY VALUE (*if available*) | | c. LONG TERM AVRG. VALUE (*if available*) | | d. NO. OF ANALYSES | a. CONCENTRATION | b. MASS | a. LONG TERM AVERAGE VALUE | | b. NO. OF ANALYSES |
| | | | | (1) CONCENTRATION | (2) MASS | (1) CONCENTRATION | (2) MASS | (1) CONCENTRATION | (2) MASS | | | | (1) CONCENTRATION | (2) MASS | |
| GC/MS FRACTION – BASE/NEUTRAL COMPOUNDS (*continued*) | | | | | | | | | | | | | | | |
| 43B. N-Nitro-sodiphenylamine (86-30-6) | X | | | <10.0 | -- | | | | | 1 | µg/l | -- | | | |
| 44B. Phenanthrene (85-01-8) | X | | | <10.0 | -- | | | | | 1 | µg/l | -- | | | |
| 45B. Pyrene (129-00-0) | X | | | <10.0 | -- | | | | | 1 | µg/l | -- | | | |
| 46B. 1,2,4-Tri-chlorobenzene (120-82-1) | X | | | <10.0 | -- | | | | | 1 | µg/l | -- | | | |
| GC/MS FRACTION – PESTICIDES | | | | | | | | | | | | | | | |
| 1P. Aldrin (309-00-2) | | | X | | | | | | | -- | -- | -- | | | |
| 2P. α-BHC (319-84-6) | | | X | | | | | | | -- | -- | -- | | | |
| 3P. β-BHC (319-85-7) | | | X | | | | | | | -- | -- | -- | | | |
| 4P. γ-BHC (58-89-9) | | | X | | | | | | | -- | -- | -- | | | |
| 5P. δ-BHC (319-86-8) | | | X | | | | | | | -- | -- | -- | | | |
| 6P. Chlordane (57-74-9) | | | X | | | | | | | -- | -- | -- | | | |
| 7P. 4,4'-DDT (50-29-3) | | | X | | | | | | | -- | -- | -- | | | |
| 8P. 4,4'-DDE (72-55-9) | | | X | | | | | | | -- | -- | -- | | | |
| 9P. 4,4'-DDD (72-54-8) | | | X | | | | | | | -- | -- | -- | | | |
| 10P. Dieldrin (60-57-1) | | | X | | | | | | | -- | -- | -- | | | |
| 11P. α-Enosulfan (115-29-7) | | | X | | | | | | | -- | -- | -- | | | |
| 12P. β-Endosulfan (115-29-7) | | | X | | | | | | | -- | -- | -- | | | |
| 13P. Endosulfan Sulfate (1031-07-8) | | | X | | | | | | | -- | -- | -- | | | |
| 14P. Endrin (72-20-8) | | | X | | | | | | | -- | -- | -- | | | |
| 15P. Endrin Aldehyde (7421-93-4) | | | X | | | | | | | -- | -- | -- | | | |
| 16P. Heptachlor (76-44-8) | | | X | | | | | | | -- | -- | -- | | | |



CONTINUE ON PAGE V-9

| EPA I.D. NUMBER (*copy from Item 1 of Form 1*) | OUTFALL NUMBER |
|---|---|
| 3IB00002*KD | 612 |

CONTINUED FROM PAGE V-8

| 1. POLLUTANT AND CAS NUMBER (*if available*) | 2. MARK "X" | | | 3. EFFLUENT | | | | | | | 4. UNITS | | 5. INTAKE (*optional*) | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | a. TESTING REQUIRED | b. BELIEVED PRESENT | c. BELIEVED ABSENT | a. MAXIMUM DAILY VALUE | | b. MAXIMUM 30 DAY VALUE (*if available*) | | c. LONG TERM AVRG. VALUE (*if available*) | | d. NO. OF ANALYSES | a. CONCENTRATION | b. MASS | a. LONG TERM AVERAGE VALUE | | b. NO. OF ANALYSES |
| | | | | (1) CONCENTRATION | (2) MASS | (1) CONCENTRATION | (2) MASS | (1) CONCENTRATION | (2) MASS | | | | (1) CONCENTRATION | (2) MASS | |
| GC/MS FRACTION – PESTICIDES (*continued*) | | | | | | | | | | | | | | | |
| 17P. Heptachlor Epoxide (1024-57-3) | | | X | | | | | | | -- | -- | | | | |
| 18P. PCB-1242 (53469-21-9) | | | X | | | | | | | -- | -- | | | | |
| 19P. PCB-1254 (11097-69-1) | | | X | | | | | | | -- | -- | | | | |
| 20P. PCB-1221 (11104-28-2) | | | X | | | | | | | -- | -- | | | | |
| 21P. PCB-1232 (11141-16-5) | | | X | | | | | | | -- | -- | | | | |
| 22P. PCB-1248 (12672-29-6) | | | X | | | | | | | -- | -- | | | | |
| 23P. PCB-1260 (11096-82-5) | | | X | | | | | | | -- | -- | | | | |
| 24P. PCB-1016 (12674-11-2) | | | X | | | | | | | -- | -- | | | | |
| 25P. Toxaphene (8001-35-2) | | | X | | | | | | | -- | -- | | | | |

PLEASE PRINT OR TYPE IN THE UNSHADED AREAS ONLY. You may report some or all of this information on separate sheets (*use the same format*) instead of completing these pages.
SEE INSTRUCTIONS.

EPA I.D. NUMBER (*copy from Item 1 of Form 1*)
3IB00002*KD

V. INTAKE AND EFFLUENT CHARACTERISTICS *(continued from page 3 of Form 2-C)*

OUTFALL NO. 601

PART A –You must provide the results of at least one analysis for every pollutant in this table. Complete one table for each outfall. See instructions for additional details.

| 1. POLLUTANT | 2. EFFLUENT a. MAXIMUM DAILY VALUE (1) CONCENTRATION | a. MAXIMUM DAILY VALUE (2) MASS | b. MAXIMUM 30 DAY VALUE (*if available*) (1) CONCENTRATION | b. MAXIMUM 30 DAY VALUE (*if available*) (2) MASS | c. LONG TERM AVRG. VALUE (*if available*) (1) CONCENTRATION | c. LONG TERM AVRG. VALUE (*if available*) (2) MASS | d. NO. OF ANALYSES | 3. UNITS (*specify if blank*) a. CONCEN-TRATION | 3. UNITS b. MASS | 4. INTAKE (*optional*) a. LONG TERM AVERAGE VALUE (1) CONCENTRATION | 4. INTAKE a. LONG TERM AVERAGE VALUE (2) MASS | 4. INTAKE b. NO. OF ANALYSES |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| a. Biochemical Oxygen Demand (*BOD*) | <4.0 | -- | | | | | 1 | mg/l | -- | | | |
| b. Chemical Oxygen Demand (*COD*) | 13 | -- | | | | | 1 | mg/l | -- | | | |
| c. Total Organic Carbon (*TOC*) | 1.9 | -- | | | | | 1 | mg/l | -- | | | |
| d. Total Suspended Solids (*TSS*) | 24 | -- | | | | | 1 | mg/l | -- | | | |
| e. Ammonia (*as N*) | <0.05 | -- | | | | | 1 | mg/l | -- | | | |
| f. Flow | VALUE Recycled* | | VALUE -- | | VALUE -- | | 1 | MGD | -- | VALUE | | |
| g. Temperature (*winter*) | VALUE -- | | VALUE -- | | VALUE -- | | -- | °C | | VALUE | | |
| h. Temperature (*summer*) | VALUE 25.7 | | VALUE -- | | VALUE -- | | 1 | °C | | VALUE | | |
| i. pH | MINIMUM 8.06 | MAXIMUM 8.06 | MINIMUM -- | MAXIMUM -- | | | 1 | STANDARD UNITS | | | | |

PART B – Mark "X" in column 2-a for each pollutant you know or have reason to believe is present. Mark "X" in column 2-b for each pollutant you believe to be absent. If you mark column 2a for any pollutant which is limited either directly, or indirectly but expressly, in an effluent limitations guideline, you must provide the results of at least one analysis for that pollutant. For other pollutants for which you mark column 2a, you must provide quantitative data or an explanation of their presence in your discharge. Complete one table for each outfall. See the instructions for additional details and requirements.

| 1. POLLUTANT AND CAS NO. (*if available*) | 2. MARK "X" a. BELIEVED PRESENT | 2. MARK "X" b. BELIEVED ABSENT | 3. EFFLUENT a. MAXIMUM DAILY VALUE (1) CONCENTRATION | a. MAXIMUM DAILY VALUE (2) MASS | b. MAXIMUM 30 DAY VALUE (*if available*) (1) CONCENTRATION | b. MAXIMUM 30 DAY VALUE (*if available*) (2) MASS | c. LONG TERM AVRG. VALUE (*if available*) (1) CONCENTRATION | c. LONG TERM AVRG. VALUE (*if available*) (2) MASS | d. NO. OF ANALYSES | 4. UNITS a. CONCEN-TRATION | 4. UNITS b. MASS | 5. INTAKE (*optional*) a. LONG TERM AVERAGE VALUE (1) CONCENTRATION | 5. INTAKE a. LONG TERM AVERAGE VALUE (2) MASS | 5. INTAKE b. NO. OF ANALYSES |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| a. Bromide (24959-67-9) | X | | 0.037 | -- | | | | | 1 | mg/l | -- | | | |
| b. Chlorine, Total Residual | X | | 0.03 | -- | | | | | 1 | mg/l | -- | | | |
| c. Color | X | | 10 | -- | | | | | 1 | Pt-Co | -- | | | |
| d. Fecal Coliform | | X | -- | -- | | | | | -- | -- | -- | | | |
| e. Fluoride (16984-48-8) | X | | 0.201 | -- | | | | | 1 | mg/l | -- | | | |
| f. Nitrate-Nitrite (*as N*) | X | | 0.10 | -- | | | | | 1 | mg/l | -- | | | |



* Wastewater stream is recycled before discharge to ash ponds and ultimate discharge via Outfall 002.

ITEM V-B CONTINUED FROM FRONT

| 1. POLLUTANT AND CAS NO. (*if available*) | 2. MARK "X" | | 3. EFFLUENT | | | | | | | 4. UNITS | | 5. INTAKE (*optional*) | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | a. BELIEVED PRESENT | b. BELIEVED ABSENT | a. MAXIMUM DAILY VALUE | | b. MAXIMUM 30 DAY VALUE (*if available*) | | c. LONG TERM AVRG. VALUE (*if available*) | | d. NO. OF ANALYSES | a. CONCENTRATION | b. MASS | a. LONG TERM AVERAGE VALUE | | b. NO. OF ANALYSES |
| | | | (1) CONCENTRATION | (2) MASS | (1) CONCENTRATION | (2) MASS | (1) CONCENTRATION | (2) MASS | | | | (1) CONCENTRATION | (2) MASS | |
| g. Nitrogen, Total Organic (*as N*) | X | | 0.29* | -- | | | | | 1 | mg/l | -- | | | |
| h. Oil and Grease | X | | <5.2 | -- | | | | | 1 | mg/l | -- | | | |
| i. Phosphorus (as P), Total (7723-14-0) | X | | 5.56 | -- | | | | | 1 | mg/l | -- | | | |
| j. Radioactivity | | | | | | | | | | | | | | |
| (1) Alpha, Total | | X | -- | -- | | | | | -- | -- | -- | | | |
| (2) Beta, Total | | X | -- | -- | | | | | -- | -- | -- | | | |
| (3) Radium, Total | | X | -- | -- | | | | | -- | -- | -- | | | |
| (4) Radium 226, Total | | X | -- | -- | | | | | -- | -- | -- | | | |
| k. Sulfate (*as $SO_4$*) (14808-79-8) | X | | 30 | -- | | | | | 1 | mg/l | -- | | | |
| l. Sulfide (*as S*) | X | | 0.11 | -- | | | | | 1 | mg/l | -- | | | |
| m. Sulfite (*as $SO_3$*) (14265-45-3) | X | | <0.64 | -- | | | | | 1 | mg/l | -- | | | |
| n. Surfactants | X | | 0.046* | -- | | | | | 1 | mg/l | -- | | | |
| o. Aluminum, Total (7429-90-5) | X | | 920 | -- | | | | | 1 | µg/l | -- | | | |
| p. Barium, Total (7440-39-3) | X | | 43 | -- | | | | | 1 | µg/l | -- | | | |
| q. Boron, Total (7440-42-8) | X | | 140 | -- | | | | | 1 | µg/l | -- | | | |
| r. Cobalt, Total (7440-48-4) | X | | 0.5* | -- | | | | | 1 | µg/l | -- | | | |
| s. Iron, Total (7439-89-6) | X | | 890 | -- | | | | | 1 | µg/l | -- | | | |
| t. Magnesium, Total (7439-95-4) | X | | 8,900 | -- | | | | | 1 | µg/l | -- | | | |
| u. Molybdenum, Total (7439-98-7) | X | | 6.54* | -- | | | | | 1 | µg/l | -- | | | |
| v. Manganese, Total (7439-96-5) | X | | 19 | -- | | | | | 1 | µg/l | -- | | | |
| w. Tin, Total (7440-31-5) | X | | <10 | -- | | | | | 1 | µg/l | -- | | | |
| x. Titanium, Total (7440-32-6) | X | | 49 | -- | | | | | 1 | µg/l | -- | | | |



CONTINUE ON PAGE V-3

* Estimated value below practical quantitation limit.

| EPA I.D. NUMBER (*copy from Item 1 of Form 1*) | OUTFALL NUMBER |
|---|---|
| 3IB00002*KD | 601 |

CONTINUED FROM PAGE 3 OF FORM 2-C

PART C - If you are a primary industry and this outfall contains process wastewater, refer to Table 2c-2 in the instructions to determine which of the GC/MS fractions you must test for. Mark "X" in column 2-a for all such GC/MS fractions that apply to your industry and for ALL toxic metals, cyanides, and total phenols. If you are not required to mark column 2-a (*secondary industries, nonprocess wastewater outfalls, and nonrequired GC/MS fractions*), mark "X" in column 2-b for each pollutant you know or have reason to believe is present. Mark "X" in column 2-c for each pollutant you believe is absent. If you mark column 2a for any pollutant, you must provide the results of at least one analysis for that pollutant. If you mark column 2b for any pollutant, you must provide the results of at least one analysis for that pollutant if you know or have reason to believe it will be discharged in concentrations of 10 ppb or greater. If you mark column 2b for acrolein, acrylonitrile, 2,4 dinitrophenol, or 2-methyl-4, 6 dinitrophenol, you must provide the results of at least one analysis for each of these pollutants which you know or have reason to believe that you discharge in concentrations of 100 ppb or greater. Otherwise, for pollutants for which you mark column 2b, you must either submit at least one analysis or briefly describe the reasons the pollutant is expected to be discharged. Note that there are 7 pages to this part; please review each carefully. Complete one table (*all 7 pages*) for each outfall. See instructions for additional details and requirements.

| 1. POLLUTANT AND CAS NUMBER (*if available*) | 2. MARK "X" | | | 3. EFFLUENT | | | | | | | 4. UNITS | | 5. INTAKE (*optional*) | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | a. TESTING REQUIRED | b. BELIEVED PRESENT | c. BELIEVED ABSENT | a. MAXIMUM DAILY VALUE | | b. MAXIMUM 30 DAY VALUE (*if available*) | | c. LONG TERM AVRG. VALUE (*if available*) | | d. NO. OF ANALYSES | a. CONCENTRATION | b. MASS | a. LONG TERM AVERAGE VALUE | | b. NO. OF ANALYSES |
| | | | | (1) CONCENTRATION | (2) MASS | (1) CONCENTRATION | (2) MASS | (1) CONCENTRATION | (2) MASS | | | | (1) CONCENTRATION | (2) MASS | |
| METALS, CYANIDE, AND TOTAL PHENOLS | | | | | | | | | | | | | | | |
| 1M. Antimony, Total (7440-36-0) | X | | | 0.367* | -- | | | | | 1 | µg/l | -- | | | |
| 2M. Arsenic, Total (7440-38-2) | X | | | 7.8 | -- | | | | | 1 | µg/l | -- | | | |
| 3M. Beryllium, Total (7440-41-7) | X | | | 0.147* | -- | | | | | 1 | µg/l | -- | | | |
| 4M. Cadmium, Total (7440-43-9) | X | | | 0.054* | -- | | | | | 1 | µg/l | -- | | | |
| 5M. Chromium, Total (7440-47-3) | X | | | 2.762* | -- | | | | | 1 | µg/l | -- | | | |
| 6M. Copper, Total (7440-50-8) | X | | | 4.622* | -- | | | | | 1 | µg/l | -- | | | |
| 7M. Lead, Total (7439-92-1) | X | | | 7.0 | -- | | | | | 1 | µg/l | -- | | | |
| 8M. Mercury, Total (7439-97-6) | X | | | <0.500 | -- | | | | | 1 | ng/l | -- | | | |
| 9M. Nickel, Total (7440-02-0) | X | | | 5.613* | -- | | | | | 1 | µg/l | -- | | | |
| 10M. Selenium, Total (7782-49-2) | X | | | 0.878* | -- | | | | | 1 | µg/l | -- | | | |
| 11M. Silver, Total (7440-22-4) | X | | | <5.0 | -- | | | | | 1 | µg/l | -- | | | |
| 12M. Thallium, Total (7440-28-0) | X | | | 0.164* | -- | | | | | 1 | µg/l | -- | | | |
| 13M. Zinc, Total (7440-66-6) | X | | | 3.8* | -- | | | | | 1 | µg/l | -- | | | |
| 14M. Cyanide, Total (57-12-5) | X | | | <0.005 | -- | | | | | 1 | mg/l | -- | | | |
| 15M. Phenols, Total | X | | | <50 | -- | | | | | 1 | µg/l | -- | | | |
| DIOXIN | | | | | | | | | | | | | | | |
| 2,3,7,8-Tetra-chlorodibenzo-P-Dioxin (1764-01-6) | | | X | DESCRIBE RESULTS<br>Not detected. | | | | | | | | | | | |



* Estimated value below practical quantitation limit.

CONTINUED FROM THE FRONT

| 1. POLLUTANT AND CAS NUMBER (*if available*) | 2. MARK "X" | | | 3. EFFLUENT | | | | | | | 4. UNITS | | 5. INTAKE (*optional*) | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | a. TESTING REQUIRED | b. BELIEVED PRESENT | c. BELIEVED ABSENT | a. MAXIMUM DAILY VALUE | | b. MAXIMUM 30 DAY VALUE (*if available*) | | c. LONG TERM AVRG. VALUE (*if available*) | | d. NO. OF ANALYSES | a. CONCENTRATION | b. MASS | a. LONG TERM AVERAGE VALUE | | b. NO. OF ANALYSES |
| | | | | (1) CONCENTRATION | (2) MASS | (1) CONCENTRATION | (2) MASS | (1) CONCENTRATION | (2) MASS | | | | (1) CONCENTRATION | (2) MASS | |
| GC/MS FRACTION – VOLATILE COMPOUNDS | | | | | | | | | | | | | | | |
| 1V. Accrolein (107-02-8) | X | | | <50.0 | -- | | | | | 1 | µg/l | -- | | | |
| 2V. Acrylonitrile (107-13-1) | X | | | <50.0 | -- | | | | | 1 | µg/l | -- | | | |
| 3V. Benzene (71-43-2) | X | | | <5.0 | -- | | | | | 1 | µg/l | -- | | | |
| 4V. Bis (*Chloromethyl*) Ether (542-88-1) | X | | | ND* | -- | | | | | 1 | µg/l | -- | | | |
| 5V. Bromoform (75-25-2) | X | | | <5.0 | -- | | | | | 1 | µg/l | -- | | | |
| 6V. Carbon Tetrachloride (56-23-5) | X | | | <5.0 | -- | | | | | 1 | µg/l | -- | | | |
| 7V. Chlorobenzene (108-90-7) | X | | | <5.0 | -- | | | | | 1 | µg/l | -- | | | |
| 8V. Chlorodibromomethane (124-48-1) | X | | | <5.0 | -- | | | | | 1 | µg/l | -- | | | |
| 9V. Chloroethane (75-00-3) | X | | | <10.0 | -- | | | | | 1 | µg/l | -- | | | |
| 10V. 2-Chloroethylvinyl Ether (110-75-8) | X | | | <10 | -- | | | | | 1 | µg/l | -- | | | |
| 11V. Chloroform (67-66-3) | X | | | <5.0 | -- | | | | | 1 | µg/l | -- | | | |
| 12V. Dichlorobromomethane (75-27-4) | X | | | <5.0 | -- | | | | | 1 | µg/l | -- | | | |
| 13V. Dichlorodifluoromethane (75-71-8) | X | | | <10 | -- | | | | | 1 | µg/l | -- | | | |
| 14V. 1,1-Dichloroethane (75-34-3) | X | | | <5.0 | -- | | | | | 1 | µg/l | -- | | | |
| 15V. 1,2-Dichloroethane (107-06-2) | X | | | <5.0 | -- | | | | | 1 | µg/l | -- | | | |
| 16V. 1,1-Dichloroethylene (75-35-4) | X | | | <5.0 | -- | | | | | 1 | µg/l | -- | | | |
| 17V. 1,2-Dichloropropane (78-87-5) | X | | | <5.0 | -- | | | | | 1 | µg/l | -- | | | |
| 18V. 1,3-Dichloropropylene (542-75-6) | X | | | <5.0 | -- | | | | | 1 | µg/l | -- | | | |
| 19V. Ethylbenzene (100-41-4) | X | | | <5.0 | -- | | | | | 1 | µg/l | -- | | | |
| 20V. Methyl Bromide (74-83-9) | X | | | <10.0 | -- | | | | | 1 | µg/l | -- | | | |
| 21V. Methyl Chloride (74-87-3) | X | | | <10 | -- | | | | | 1 | µg/l | -- | | | |



CONTINUE ON PAGE V-5

*ND - Not detected in library search.

CONTINUED FROM PAGE V-4

| 1. POLLUTANT AND CAS NUMBER (*if available*) | 2. MARK "X" | | | 3. EFFLUENT | | | | | | | 4. UNITS | | 5. INTAKE (*optional*) | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | a. TESTING REQUIRED | b. BELIEVED PRESENT | c. BELIEVED ABSENT | a. MAXIMUM DAILY VALUE | | b. MAXIMUM 30 DAY VALUE (*if available*) | | c. LONG TERM AVRG. VALUE (*if available*) | | d. NO. OF ANALYSES | a. CONCENTRATION | b. MASS | a. LONG TERM AVERAGE VALUE | | b. NO. OF ANALYSES |
| | | | | (1) CONCENTRATION | (2) MASS | (1) CONCENTRATION | (2) MASS | (1) CONCENTRATION | (2) MASS | | | | (1) CONCENTRATION | (2) MASS | |
| GC/MS FRACTION – VOLATILE COMPOUNDS (*continued*) | | | | | | | | | | | | | | | |
| 22V. Methylene Chloride (75-09-2) | X | | | <10 | -- | | | | | 1 | µg/l | -- | | | |
| 23V. 1,1,2,2-Tetrachloroethane (79-34-5) | X | | | <5.0 | -- | | | | | 1 | µg/l | -- | | | |
| 24V. Tetrachloroethylene (127-18-4) | X | | | <5.0 | -- | | | | | 1 | µg/l | -- | | | |
| 25V. Toluene (108-88-3) | X | | | <5.0 | -- | | | | | 1 | µg/l | -- | | | |
| 26V. 1,2-Trans-Dichloroethylene (156-60-5) | X | | | <5.0 | -- | | | | | 1 | µg/l | -- | | | |
| 27V. 1,1,1-Trichloroethane (71-55-6) | X | | | <5.0 | -- | | | | | 1 | µg/l | -- | | | |
| 28V. 1,1,2-Trichloroethane (79-00-5) | X | | | <5.0 | -- | | | | | 1 | µg/l | -- | | | |
| 29V Trichloroethylene (79-01-6) | X | | | <5.0 | -- | | | | | 1 | µg/l | -- | | | |
| 30V. Trichlorofluoromethane (75-69-4) | X | | | <10 | -- | | | | | 1 | µg/l | -- | | | |
| 31V. Vinyl Chloride (75-01-4) | X | | | <10 | -- | | | | | 1 | µg/l | -- | | | |
| GC/MS FRACTION – ACID COMPOUNDS | | | | | | | | | | | | | | | |
| 1A. 2-Chlorophenol (95-57-8) | X | | | <10.0 | -- | | | | | 1 | µg/l | -- | | | |
| 2A. 2,4-Dichlorophenol (120-83-2) | X | | | <10.0 | -- | | | | | 1 | µg/l | -- | | | |
| 3A. 2,4-Dimethylphenol (105-67-9) | X | | | <10.0 | -- | | | | | 1 | µg/l | -- | | | |
| 4A. 4,6-Dinitro-O-Cresol (534-52-1) | X | | | <50.0 | -- | | | | | 1 | µg/l | -- | | | |
| 5A. 2,4-Dinitrophenol (51-28-5) | X | | | <50.0 | -- | | | | | 1 | µg/l | -- | | | |
| 6A. 2-Nitrophenol (88-75-5) | X | | | <10.0 | -- | | | | | 1 | µg/l | -- | | | |
| 7A. 4-Nitrophenol (100-02-7) | X | | | <50.0 | -- | | | | | 1 | µg/l | -- | | | |
| 8A. P-Chloro-M-Cresol (59-50-7) | X | | | <50.0 | -- | | | | | 1 | µg/l | -- | | | |
| 9A. Pentachlorophenol (87-86-5) | X | | | <50.0 | -- | | | | | 1 | µg/l | -- | | | |
| 10A. Phenol (108-95-2) | X | | | <10.0 | -- | | | | | 1 | µg/l | -- | | | |
| 11A. 2,4,6-Trichlorophenol (88-05-2) | X | | | <20.0 | -- | | | | | 1 | µg/l | -- | | | |

CONTINUED FROM THE FRONT

| 1. POLLUTANT AND CAS NUMBER (*if available*) | 2. MARK "X" | | | 3. EFFLUENT | | | | | | | 4. UNITS | | 5. INTAKE (*optional*) | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | a. TESTING REQUIRED | b. BELIEVED PRESENT | c. BELIEVED ABSENT | a. MAXIMUM DAILY VALUE | | b. MAXIMUM 30 DAY VALUE (*if available*) | | c. LONG TERM AVRG. VALUE (*if available*) | | d. NO. OF ANALYSES | a. CONCENTRATION | b. MASS | a. LONG TERM AVERAGE VALUE | | b. NO. OF ANALYSES |
| | | | | (1) CONCENTRATION | (2) MASS | (1) CONCENTRATION | (2) MASS | (1) CONCENTRATION | (2) MASS | | | | (1) CONCENTRATION | (2) MASS | |
| GC/MS FRACTION – BASE/NEUTRAL COMPOUNDS | | | | | | | | | | | | | | | |
| 1B. Acenaphthene (83-32-9) | X | | | <10.0 | -- | | | | | 1 | µg/l | -- | | | |
| 2B. Acenaphtylene (208-96-8) | X | | | <10.0 | -- | | | | | 1 | µg/l | -- | | | |
| 3B. Anthracene (120-12-7) | X | | | <10.0 | -- | | | | | 1 | µg/l | -- | | | |
| 4B. Benzidine (92-87-5) | X | | | <50.0 | -- | | | | | 1 | µg/l | -- | | | |
| 5B. Benzo (*a*) Anthracene (56-55-3) | X | | | <10.0 | -- | | | | | 1 | µg/l | -- | | | |
| 6B. Benzo (*a*) Pyrene (50-32-8) | X | | | <10.0 | -- | | | | | 1 | µg/l | -- | | | |
| 7B. 3,4-Benzo-fluoranthene (205-99-2) | X | | | <10.0 | -- | | | | | 1 | µg/l | -- | | | |
| 8B. Benzo (*ghi*) Perylene (191-24-2) | X | | | <10.0 | -- | | | | | 1 | µg/l | -- | | | |
| 9B. Benzo (*k*) Fluoranthene (207-08-9) | X | | | <10.0 | -- | | | | | 1 | µg/l | -- | | | |
| 10B. Bis (*2-Chloro-ethoxy*) Methane (111-91-1) | X | | | <10.0 | -- | | | | | 1 | µg/l | -- | | | |
| 11B. Bis (*2-Chloro-ethyl*) Ether (111-44-4) | X | | | <10.0 | -- | | | | | 1 | µg/l | -- | | | |
| 12B. Bis (*2-Chloroisopropyl*) Ether (102-80-1) | X | | | <10.0 | -- | | | | | 1 | µg/l | -- | | | |
| 13B. Bis (*2-Ethyl-hexyl*) Phthalate (117-81-7) | X | | | 20 | -- | | | | | 1 | µg/l | -- | | | |
| 14B. 4-Bromophenyl Phenyl Ether (101-55-3) | X | | | <10.0 | -- | | | | | 1 | µg/l | -- | | | |
| 15B. Butyl Benzyl Phthalate (85-68-7) | X | | | <10.0 | -- | | | | | 1 | µg/l | -- | | | |
| 16B. 2-Chloro-naphthalene (91-58-7) | X | | | <10.0 | -- | | | | | 1 | µg/l | -- | | | |
| 17B. 4-Chloro-phenyl Phenyl Ether (7005-72-3) | X | | | <10.0 | -- | | | | | 1 | µg/l | -- | | | |
| 18B. Chrysene (218-01-9) | X | | | <10.0 | -- | | | | | 1 | µg/l | -- | | | |
| 19B. Dibenzo (*a,h*) Anthracene (53-70-3) | X | | | <10.0 | -- | | | | | 1 | µg/l | -- | | | |
| 20B. 1,2-Dichloro-benzene (95-50-1) | X | | | <5.0 | -- | | | | | 1 | µg/l | -- | | | |
| 21B. 1,3-Di-chloro-benzene (541-73-1) | X | | | <5.0 | -- | | | | | 1 | µg/l | -- | | | |



CONTINUE ON PAGE V-7

CONTINUED FROM PAGE V-6

| 1. POLLUTANT AND CAS NUMBER (*if available*) | 2. MARK "X" | | | 3. EFFLUENT | | | | | | | 4. UNITS | | 5. INTAKE (*optional*) | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | a. TESTING REQUIRED | b. BELIEVED PRESENT | c. BELIEVED ABSENT | a. MAXIMUM DAILY VALUE | | b. MAXIMUM 30 DAY VALUE (*if available*) | | c. LONG TERM AVRG. VALUE (*if available*) | | d. NO. OF ANALYSES | a. CONCENTRATION | b. MASS | a. LONG TERM AVERAGE VALUE | | b. NO. OF ANALYSES |
| | | | | (1) CONCENTRATION | (2) MASS | (1) CONCENTRATION | (2) MASS | (1) CONCENTRATION | (2) MASS | | | | (1) CONCENTRATION | (2) MASS | |
| GC/MS FRACTION – BASE/NEUTRAL COMPOUNDS (*continued*) | | | | | | | | | | | | | | | |
| 22B. 1,4-Dichlorobenzene (106-46-7) | X | | | <5.0 | -- | | | | | 1 | µg/l | -- | | | |
| 23B. 3,3-Dichlorobenzidine (91-94-1) | X | | | <20.0 | -- | | | | | 1 | µg/l | -- | | | |
| 24B. Diethyl Phthalate (84-66-2) | X | | | <10.0 | -- | | | | | 1 | µg/l | -- | | | |
| 25B. Dimethyl Phthalate (131 -11-3) | X | | | <10.0 | -- | | | | | 1 | µg/l | -- | | | |
| 26B. Di-N-Butyl Phthalate (84-74-2) | X | | | <10.0 | -- | | | | | 1 | µg/l | -- | | | |
| 27B. 2,4-Dinitrotoluene (121-14-2) | X | | | <20.0 | -- | | | | | 1 | µg/l | -- | | | |
| 28B. 2,6-Dinitrotoluene (606-20-2) | X | | | <10.0 | -- | | | | | 1 | ug/l | -- | | | |
| 29B. Di-N-Octyl Phthalate (117-84-0) | X | | | <10.0 | -- | | | | | 1 | µg/l | -- | | | |
| 30B. 1,2-Diphenylhydrazine (*as Azobenzene*) (122-66-7) | X | | | <10.0 | -- | | | | | 1 | µg/l | -- | | | |
| 31B. Fluoranthene (206-44-0) | X | | | <10.0 | -- | | | | | 1 | µg/l | -- | | | |
| 32B. Fluorene (86-73-7) | X | | | <10.0 | -- | | | | | 1 | µg/l | -- | | | |
| 33B. Hexachlorobenzene (118-74-1) | X | | | <10.0 | -- | | | | | 1 | µg/l | -- | | | |
| 34B. Hexachlorobutadiene (87-68-3) | X | | | <10.0 | -- | | | | | 1 | µg/l | -- | | | |
| 35B. Hexachlorocyclopentadiene (77-47-4) | X | | | <10.0 | -- | | | | | 1 | µg/l | -- | | | |
| 36B Hexachloroethane (67-72-1) | X | | | <10.0 | -- | | | | | 1 | µg/l | -- | | | |
| 37B. Indeno (*1,2,3-cd*) Pyrene (193-39-5) | X | | | <20.0 | -- | | | | | 1 | µg/l | -- | | | |
| 38B. Isophorone (78-59-1) | X | | | <10.0 | -- | | | | | 1 | µg/l | -- | | | |
| 39B. Naphthalene (91-20-3) | X | | | <10.0 | -- | | | | | 1 | µg/l | -- | | | |
| 40B. Nitrobenzene (98-95-3) | X | | | <10.0 | -- | | | | | 1 | µg/l | -- | | | |
| 41B. N-Nitrosodimethylamine (62-75-9) | X | | | <10.0 | -- | | | | | 1 | µg/l | -- | | | |
| 42B. N-Nitrosodi-N-Propylamine (621-64-7) | X | | | <10.0 | -- | | | | | 1 | µg/l | -- | | | |

CONTINUED FROM THE FRONT

| 1. POLLUTANT AND CAS NUMBER (*if available*) | 2. MARK "X" | | | 3. EFFLUENT | | | | | | | 4. UNITS | | 5. INTAKE (*optional*) | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | a. TESTING REQUIRED | b. BELIEVED PRESENT | c. BELIEVED ABSENT | a. MAXIMUM DAILY VALUE | | b. MAXIMUM 30 DAY VALUE (*if available*) | | c. LONG TERM AVRG. VALUE (*if available*) | | d. NO. OF ANALYSES | a. CONCENTRATION | b. MASS | a. LONG TERM AVERAGE VALUE | | b. NO. OF ANALYSES |
| | | | | (1) CONCENTRATION | (2) MASS | (1) CONCENTRATION | (2) MASS | (1) CONCENTRATION | (2) MASS | | | | (1) CONCENTRATION | (2) MASS | |
| GC/MS FRACTION – BASE/NEUTRAL COMPOUNDS (*continued*) | | | | | | | | | | | | | | | |
| 43B. N-Nitrosodiphenylamine (86-30-6) | X | | | <10.0 | -- | | | | | 1 | µg/l | -- | | | |
| 44B. Phenanthrene (85-01-8) | X | | | <10.0 | -- | | | | | 1 | µg/l | -- | | | |
| 45B. Pyrene (129-00-0) | X | | | <10.0 | -- | | | | | 1 | µg/l | -- | | | |
| 46B. 1,2,4-Trichlorobenzene (120-82-1) | X | | | <10.0 | -- | | | | | 1 | µg/l | -- | | | |
| GC/MS FRACTION – PESTICIDES | | | | | | | | | | | | | | | |
| 1P. Aldrin (309-00-2) | | | X | | | | | | | -- | -- | -- | | | |
| 2P. α-BHC (319-84-6) | | | X | | | | | | | -- | -- | -- | | | |
| 3P. β-BHC (319-85-7) | | | X | | | | | | | -- | -- | -- | | | |
| 4P. γ-BHC (58-89-9) | | | X | | | | | | | -- | -- | -- | | | |
| 5P. δ-BHC (319-86-8) | | | X | | | | | | | -- | -- | -- | | | |
| 6P. Chlordane (57-74-9) | | | X | | | | | | | -- | -- | -- | | | |
| 7P. 4,4'-DDT (50-29-3) | | | X | | | | | | | -- | -- | -- | | | |
| 8P. 4,4'-DDE (72-55-9) | | | X | | | | | | | -- | -- | -- | | | |
| 9P. 4,4'-DDD (72-54-8) | | | X | | | | | | | -- | -- | -- | | | |
| 10P. Dieldrin (60-57-1) | | | X | | | | | | | -- | -- | -- | | | |
| 11P. α-Enosulfan (115-29-7) | | | X | | | | | | | -- | -- | -- | | | |
| 12P. β-Endosulfan (115-29-7) | | | X | | | | | | | -- | -- | -- | | | |
| 13P. Endosulfan Sulfate (1031-07-8) | | | X | | | | | | | -- | -- | -- | | | |
| 14P. Endrin (72-20-8) | | | X | | | | | | | -- | -- | -- | | | |
| 15P. Endrin Aldehyde (7421-93-4) | | | X | | | | | | | -- | -- | -- | | | |
| 16P. Heptachlor (76-44-8) | | | X | | | | | | | -- | -- | -- | | | |



CONTINUE ON PAGE V-9

| EPA I.D. NUMBER (*copy from Item 1 of Form 1*) | OUTFALL NUMBER |
|---|---|
| 3IB00002*KD | 601 |

CONTINUED FROM PAGE V-8

| 1. POLLUTANT AND CAS NUMBER (*if available*) | 2. MARK "X" | | | 3. EFFLUENT | | | | | | | 4. UNITS | | 5. INTAKE (*optional*) | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | a. TESTING REQUIRED | b. BELIEVED PRESENT | c. BELIEVED ABSENT | a. MAXIMUM DAILY VALUE | | b. MAXIMUM 30 DAY VALUE (*if available*) | | c. LONG TERM AVRG. VALUE (*if available*) | | d. NO. OF ANALYSES | a. CONCENTRATION | b. MASS | a. LONG TERM AVERAGE VALUE | | b. NO. OF ANALYSES |
| | | | | (1) CONCENTRATION | (2) MASS | (1) CONCENTRATION | (2) MASS | (1) CONCENTRATION | (2) MASS | | | | (1) CONCENTRATION | (2) MASS | |
| GC/MS FRACTION – PESTICIDES (*continued*) | | | | | | | | | | | | | | | |
| 17P. Heptachlor Epoxide (1024-57-3) | | | X | | | | | | | -- | -- | -- | | | |
| 18P. PCB-1242 (53469-21-9) | | | X | | | | | | | -- | -- | -- | | | |
| 19P. PCB-1254 (11097-69-1) | | | X | | | | | | | -- | -- | -- | | | |
| 20P. PCB-1221 (11104-28-2) | | | X | | | | | | | -- | -- | -- | | | |
| 21P. PCB-1232 (11141-16-5) | | | X | | | | | | | -- | -- | -- | | | |
| 22P. PCB-1248 (12672-29-6) | | | X | | | | | | | -- | -- | -- | | | |
| 23P. PCB-1260 (11096-82-5) | | | X | | | | | | | -- | -- | -- | | | |
| 24P. PCB-1016 (12674-11-2) | | | X | | | | | | | -- | -- | -- | | | |
| 25P. Toxaphene (8001-35-2) | | | X | | | | | | | -- | -- | -- | | | |

PLEASE PRINT OR TYPE IN THE UNSHADED AREAS ONLY. You may report some or all of this information on separate sheets (*use the same format*) instead of completing these pages.
SEE INSTRUCTIONS.

EPA I.D. NUMBER (*copy from Item 1 of Form 1*): 3IB00002*KD

V. INTAKE AND EFFLUENT CHARACTERISTICS *(continued from page 3 of Form 2-C)*

OUTFALL NO. 610

PART A –You must provide the results of at least one analysis for every pollutant in this table. Complete one table for each outfall. See instructions for additional details.

| 1. POLLUTANT | 2. EFFLUENT a. MAXIMUM DAILY VALUE (1) CONCENTRATION | a. MAXIMUM DAILY VALUE (2) MASS | b. MAXIMUM 30 DAY VALUE (*if available*) (1) CONCENTRATION | b. MAXIMUM 30 DAY VALUE (*if available*) (2) MASS | c. LONG TERM AVRG. VALUE (*if available*) (1) CONCENTRATION | c. LONG TERM AVRG. VALUE (*if available*) (2) MASS | d. NO. OF ANALYSES | 3. UNITS (*specify if blank*) a. CONCENTRATION | 3. UNITS b. MASS | 4. INTAKE (*optional*) a. LONG TERM AVERAGE VALUE (1) CONCENTRATION | 4. INTAKE a. LONG TERM AVERAGE VALUE (2) MASS | 4. INTAKE b. NO. OF ANALYSES |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| a. Biochemical Oxygen Demand (*BOD*) | <4.0 | -- | | | | | 1 | mg/l | -- | | | |
| b. Chemical Oxygen Demand (*COD*) | 7.19* | 5.39 | | | | | 1 | mg/l | lb/day | | | |
| c. Total Organic Carbon (*TOC*) | 3.2 | 2.40 | | | | | 1 | mg/l | lb/day | | | |
| d. Total Suspended Solids (*TSS*) | 3.4 | 2.55 | | | | | 1 | mg/l | lb/day | | | |
| e. Ammonia (*as N*) | 0.58 | 0.44 | | | | | 1 | mg/l | lb/day | | | |
| f. Flow | VALUE 0.09 | | VALUE -- | | VALUE -- | | 1 | MGD | -- | VALUE | | |
| g. Temperature (*winter*) | VALUE -- | | VALUE -- | | VALUE -- | | -- | °C | | VALUE | | |
| h. Temperature (*summer*) | VALUE 25.0 | | VALUE -- | | VALUE -- | | 1 | °C | | VALUE | | |
| i. pH | MINIMUM 8.5 | MAXIMUM 8.5 | MINIMUM -- | MAXIMUM -- | | | 1 | STANDARD UNITS | | | | |

PART B – Mark "X" in column 2-a for each pollutant you know or have reason to believe is present. Mark "X" in column 2-b for each pollutant you believe to be absent. If you mark column 2a for any pollutant which is limited either directly, or indirectly but expressly, in an effluent limitations guideline, you must provide the results of at least one analysis for that pollutant. For other pollutants for which you mark column 2a, you must provide quantitative data or an explanation of their presence in your discharge. Complete one table for each outfall. See the instructions for additional details and requirements.

| 1. POLLUTANT AND CAS NO. (*if available*) | 2. MARK "X" a. BELIEVED PRESENT | 2. MARK "X" b. BELIEVED ABSENT | 3. EFFLUENT a. MAXIMUM DAILY VALUE (1) CONCENTRATION | a. MAXIMUM DAILY VALUE (2) MASS | b. MAXIMUM 30 DAY VALUE (*if available*) (1) CONCENTRATION | b. MAXIMUM 30 DAY VALUE (*if available*) (2) MASS | c. LONG TERM AVRG. VALUE (*if available*) (1) CONCENTRATION | c. LONG TERM AVRG. VALUE (*if available*) (2) MASS | d. NO. OF ANALYSES | 4. UNITS a. CONCENTRATION | 4. UNITS b. MASS | 5. INTAKE (*optional*) a. LONG TERM AVERAGE VALUE (1) CONCENTRATION | 5. INTAKE a. LONG TERM AVERAGE VALUE (2) MASS | 5. INTAKE b. NO. OF ANALYSES |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| a. Bromide (24959-67-9) | X | | <0.010 | -- | | | | | 1 | mg/l | -- | | | |
| b. Chlorine, Total Residual | X | | 0.02 | 0.015 | | | | | 1 | mg/l | lb/day | | | |
| c. Color | X | | <5.0 | -- | | | | | 1 | Pt-Co | -- | | | |
| d. Fecal Coliform | | X | -- | -- | | | | | -- | -- | -- | | | |
| e. Fluoride (16984-48-8) | X | | 0.692 | 0.52 | | | | | 1 | mg/l | lb/day | | | |
| f. Nitrate-Nitrite (*as N*) | X | | 0.413* | 0.31 | | | | | 1 | mg/l | lb/day | | | |



* Estimated value below practical quantitation limit.

ITEM V-B CONTINUED FROM FRONT

| 1. POLLUTANT AND CAS NO. (*if available*) | 2. MARK "X" | | 3. EFFLUENT | | | | | | | 4. UNITS | | 5. INTAKE (*optional*) | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | a. BELIEVED PRESENT | b. BELIEVED ABSENT | a. MAXIMUM DAILY VALUE | | b. MAXIMUM 30 DAY VALUE (*if available*) | | c. LONG TERM AVRG. VALUE (*if available*) | | d. NO. OF ANALYSES | a. CONCENTRATION | b. MASS | a. LONG TERM AVERAGE VALUE | | b. NO. OF ANALYSES |
| | | | (1) CONCENTRATION | (2) MASS | (1) CONCENTRATION | (2) MASS | (1) CONCENTRATION | (2) MASS | | | | (1) CONCENTRATION | (2) MASS | |
| g. Nitrogen, Total Organic (*as N*) | X | | 1.19 | 0.89 | | | | | 1 | mg/l | lb/day | | | |
| h. Oil and Grease | X | | 5.8 | 4.35 | | | | | 1 | mg/l | lb/day | | | |
| i. Phosphorus (as P), Total (7723-14-0) | X | | 0.007* | 0.005 | | | | | 1 | mg/l | lb/day | | | |
| j. Radioactivity | | | | | | | | | | | | | | |
| (1) Alpha, Total | | X | -- | -- | | | | | -- | -- | -- | | | |
| (2) Beta, Total | | X | -- | -- | | | | | -- | -- | -- | | | |
| (3) Radium, Total | | X | -- | -- | | | | | -- | -- | -- | | | |
| (4) Radium 226, Total | | X | -- | -- | | | | | -- | -- | -- | | | |
| k. Sulfate (*as $SO_4$*) (14808-79-8) | X | | 1400 | 1,051 | | | | | 1 | mg/l | lb/day | | | |
| l. Sulfide (*as S*) | X | | 0.016* | 0.012 | | | | | 1 | mg/l | lb/day | | | |
| m. Sulfite (*as $SO_3$*) (14265-45-3) | X | | <0.64 | -- | | | | | 1 | mg/l | -- | | | |
| n. Surfactants | X | | 0.06 | 0.045 | | | | | 1 | mg/l | lb/day | | | |
| o. Aluminum, Total (7429-90-5) | X | | 210 | 0.16 | | | | | 1 | ug/l | lb/day | | | |
| p. Barium, Total (7440-39-3) | X | | 17 | 0.013 | | | | | 1 | µg/l | lb/day | | | |
| q. Boron, Total (7440-42-8) | X | | 240 | 0.18 | | | | | 1 | µg/l | lb/day | | | |
| r. Cobalt, Total (7440-48-4) | X | | <20 | -- | | | | | 1 | µg/l | -- | | | |
| s. Iron, Total (7439-89-6) | X | | 76 | 0.057 | | | | | 1 | µg/l | lb/day | | | |
| t. Magnesium, Total (7439-95-4) | X | | 28,900 | 21.7 | | | | | 1 | µg/l | lb/day | | | |
| u. Molybdenum, Total (7439-98-7) | X | | <10 | -- | | | | | 1 | µg/l | -- | | | |
| v. Manganese, Total (7439-96-5) | X | | 24 | 0.018 | | | | | 1 | µg/l | lb/day | | | |
| w. Tin, Total (7440-31-5) | X | | <10 | -- | | | | | 1 | µg/l | -- | | | |
| x. Titanium, Total (7440-32-6) | X | | <10 | -- | | | | | 1 | µg/l | -- | | | |



CONTINUE ON PAGE V-3

* Estimated value below practical quantitation limit.

| EPA I.D. NUMBER (*copy from Item 1 of Form 1*) | OUTFALL NUMBER |
|---|---|
| 3IB00002*KD | 610 |

CONTINUED FROM PAGE 3 OF FORM 2-C

PART C - If you are a primary industry and this outfall contains process wastewater, refer to Table 2c-2 in the instructions to determine which of the GC/MS fractions you must test for. Mark "X" in column 2-a for all such GC/MS fractions that apply to your industry and for ALL toxic metals, cyanides, and total phenols. If you are not required to mark column 2-a (*secondary industries, nonprocess wastewater outfalls, and nonrequired GC/MS fractions*), mark "X" in column 2-b for each pollutant you know or have reason to believe is present. Mark "X" in column 2-c for each pollutant you believe is absent. If you mark column 2a for any pollutant, you must provide the results of at least one analysis for that pollutant. If you mark column 2b for any pollutant, you must provide the results of at least one analysis for that pollutant if you know or have reason to believe it will be discharged in concentrations of 10 ppb or greater. If you mark column 2b for acrolein, acrylonitrile, 2,4 dinitrophenol, or 2-methyl-4, 6 dinitrophenol, you must provide the results of at least one analysis for each of these pollutants which you know or have reason to believe that you discharge in concentrations of 100 ppb or greater. Otherwise, for pollutants for which you mark column 2b, you must either submit at least one analysis or briefly describe the reasons the pollutant is expected to be discharged. Note that there are 7 pages to this part; please review each carefully. Complete one table (*all 7 pages*) for each outfall. See instructions for additional details and requirements.

| 1. POLLUTANT AND CAS NUMBER (*if available*) | 2. MARK "X" | | | 3. EFFLUENT | | | | | | | 4. UNITS | | 5. INTAKE (*optional*) | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | a. TESTING REQUIRED | b. BELIEVED PRESENT | c. BELIEVED ABSENT | a. MAXIMUM DAILY VALUE | | b. MAXIMUM 30 DAY VALUE (*if available*) | | c. LONG TERM AVRG. VALUE (*if available*) | | d. NO. OF ANALYSES | a. CONCENTRATION | b. MASS | a. LONG TERM AVERAGE VALUE | | b. NO. OF ANALYSES |
| | | | | (1) CONCENTRATION | (2) MASS | (1) CONCENTRATION | (2) MASS | (1) CONCENTRATION | (2) MASS | | | | (1) CONCENTRATION | (2) MASS | |
| METALS, CYANIDE, AND TOTAL PHENOLS | | | | | | | | | | | | | | | |
| 1M. Antimony, Total (7440-36-0) | X | | | <3.0 | -- | | | | | 1 | µg/l | -- | | | |
| 2M. Arsenic, Total (7440-38-2) | X | | | 0.519* | 0.0004 | | | | | 1 | µg/l | lb/day | | | |
| 3M. Beryllium, Total (7440-41-7) | X | | | <0.50 | -- | | | | | 1 | µg/l | -- | | | |
| 4M. Cadmium, Total (7440-43-9) | X | | | 0.079* | 0.0001 | | | | | 1 | µg/l | lb/day | | | |
| 5M. Chromium, Total (7440-47-3) | X | | | <10 | -- | | | | | 1 | µg/l | -- | | | |
| 6M. Copper, Total (7440-50-8) | X | | | 2.758* | 0.0026 | | | | | 1 | µg/l | lb/day | | | |
| 7M. Lead, Total (7439-92-1) | X | | | <2.0 | -- | | | | | 1 | µg/l | -- | | | |
| 8M. Mercury, Total (7439-97-6) | X | | | <0.2 | -- | | | | | 1 | µg/l | -- | | | |
| 9M. Nickel, Total (7440-02-0) | X | | | 10 | 0.0075 | | | | | 1 | µg/l | lb/day | | | |
| 10M. Selenium, Total (7782-49-2) | X | | | 4.9 | 0.0037 | | | | | 1 | µg/l | lb/day | | | |
| 11M. Silver, Total (7440-22-4) | X | | | <5.0 | -- | | | | | 1 | µg/l | -- | | | |
| 12M. Thallium, Total (7440-28-0) | X | | | 0.785* | 0.0006 | | | | | 1 | µg/l | lb/day | | | |
| 13M. Zinc, Total (7440-66-6) | X | | | 2.8* | 0.0021 | | | | | 1 | µg/l | lb/day | | | |
| 14M. Cyanide, Total (57-12-5) | X | | | <0.005 | -- | | | | | 1 | mg/l | -- | | | |
| 15M. Phenols, Total | X | | | <50 | -- | | | | | 1 | µg/l | -- | | | |
| DIOXIN | | | | | | | | | | | | | | | |
| 2,3,7,8-Tetra-chlorodibenzo-P-Dioxin (1764-01-6) | | | X | DESCRIBE RESULTS Not detected. | | | | | | | | | | | |



* Estimated value below practical quantitation limit.

CONTINUED FROM THE FRONT

| 1. POLLUTANT AND CAS NUMBER (*if available*) | 2. MARK "X" | | | 3. EFFLUENT | | | | | | | 4. UNITS | | 5. INTAKE (*optional*) | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | a. TESTING REQUIRED | b. BELIEVED PRESENT | c. BELIEVED ABSENT | a. MAXIMUM DAILY VALUE | | b. MAXIMUM 30 DAY VALUE (*if available*) | | c. LONG TERM AVRG. VALUE (*if available*) | | d. NO. OF ANALYSES | a. CONCENTRATION | b. MASS | a. LONG TERM AVERAGE VALUE | | b. NO. OF ANALYSES |
| | | | | (1) CONCENTRATION | (2) MASS | (1) CONCENTRATION | (2) MASS | (1) CONCENTRATION | (2) MASS | | | | (1) CONCENTRATION | (2) MASS | |
| GC/MS FRACTION – VOLATILE COMPOUNDS | | | | | | | | | | | | | | | |
| 1V. Accrolein (107-02-8) | X | | | <50.0 | -- | | | | | 1 | µg/l | -- | | | |
| 2V. Acrylonitrile (107-13-1) | X | | | <50.0 | -- | | | | | 1 | µg/l | -- | | | |
| 3V. Benzene (71-43-2) | X | | | <5.0 | -- | | | | | 1 | µg/l | -- | | | |
| 4V. Bis (*Chloromethyl*) Ether (542-88-1) | X | | | ND* | -- | | | | | 1 | µg/l | -- | | | |
| 5V. Bromoform (75-25-2) | X | | | <5.0 | -- | | | | | 1 | µg/l | -- | | | |
| 6V. Carbon Tetrachloride (56-23-5) | X | | | <5.0 | -- | | | | | 1 | µg/l | -- | | | |
| 7V. Chlorobenzene (108-90-7) | X | | | <5.0 | -- | | | | | 1 | µg/l | -- | | | |
| 8V. Chlorodibromomethane (124-48-1) | X | | | <5.0 | -- | | | | | 1 | µg/l | -- | | | |
| 9V. Chloroethane (75-00-3) | X | | | <10.0 | -- | | | | | 1 | µg/l | -- | | | |
| 10V. 2-Chloroethylvinyl Ether (110-75-8) | X | | | <10 | -- | | | | | 1 | µg/l | -- | | | |
| 11V. Chloroform (67-66-3) | X | | | <5.0 | -- | | | | | 1 | µg/l | -- | | | |
| 12V. Dichlorobromomethane (75-27-4) | X | | | <5.0 | -- | | | | | 1 | µg/l | -- | | | |
| 13V. Dichlorodifluoromethane (75-71-8) | X | | | <10 | -- | | | | | 1 | µg/l | -- | | | |
| 14V. 1,1-Dichloroethane (75-34-3) | X | | | <5.0 | -- | | | | | 1 | µg/l | -- | | | |
| 15V. 1,2-Dichloroethane (107-06-2) | X | | | <5.0 | -- | | | | | 1 | µg/l | -- | | | |
| 16V. 1,1-Dichloroethylene (75-35-4) | X | | | <5.0 | -- | | | | | 1 | µg/l | -- | | | |
| 17V. 1,2-Dichloropropane (78-87-5) | X | | | <5.0 | -- | | | | | 1 | ug/l | -- | | | |
| 18V. 1,3-Dichloropropylene (542-75-6) | X | | | <5.0 | -- | | | | | 1 | µg/l | -- | | | |
| 19V. Ethylbenzene (100-41-4) | X | | | <5.0 | -- | | | | | 1 | µg/l | -- | | | |
| 20V. Methyl Bromide (74-83-9) | X | | | <10.0 | -- | | | | | 1 | µg/l | -- | | | |
| 21V. Methyl Chloride (74-87-3) | X | | | <10 | -- | | | | | 1 | µg/l | -- | | | |



CONTINUE ON PAGE V-5

*ND - Not detected in library search.

CONTINUED FROM PAGE V-4

| 1. POLLUTANT AND CAS NUMBER (*if available*) | 2. MARK "X" | | | 3. EFFLUENT | | | | | | | 4. UNITS | | 5. INTAKE (*optional*) | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | a. TESTING REQUIRED | b. BELIEVED PRESENT | c. BELIEVED ABSENT | a. MAXIMUM DAILY VALUE | | b. MAXIMUM 30 DAY VALUE (*if available*) | | c. LONG TERM AVRG. VALUE (*if available*) | | d. NO. OF ANALYSES | a. CONCENTRATION | b. MASS | a. LONG TERM AVERAGE VALUE | | b. NO. OF ANALYSES |
| | | | | (1) CONCENTRATION | (2) MASS | (1) CONCENTRATION | (2) MASS | (1) CONCENTRATION | (2) MASS | | | | (1) CONCENTRATION | (2) MASS | |
| GC/MS FRACTION – VOLATILE COMPOUNDS (*continued*) | | | | | | | | | | | | | | | |
| 22V. Methylene Chloride (75-09-2) | X | | | <10 | -- | | | | | 1 | µg/l | -- | | | |
| 23V. 1,1,2,2-Tetrachloroethane (79-34-5) | X | | | <5.0 | -- | | | | | 1 | µg/l | -- | | | |
| 24V. Tetrachloroethylene (127-18-4) | X | | | <5.0 | -- | | | | | 1 | µg/l | -- | | | |
| 25V. Toluene (108-88-3) | X | | | <5.0 | -- | | | | | 1 | µg/l | -- | | | |
| 26V. 1,2-Trans-Dichloroethylene (156-60-5) | X | | | <5.0 | -- | | | | | 1 | µg/l | -- | | | |
| 27V. 1,1,1-Trichloroethane (71-55-6) | X | | | <5.0 | -- | | | | | 1 | µg/l | -- | | | |
| 28V. 1,1,2-Trichloroethane (79-00-5) | X | | | <5.0 | -- | | | | | 1 | µg/l | -- | | | |
| 29V Trichloroethylene (79-01-6) | X | | | <5.0 | -- | | | | | 1 | µg/l | -- | | | |
| 30V. Trichlorofluoromethane (75-69-4) | X | | | <10 | -- | | | | | 1 | µg/l | -- | | | |
| 31V. Vinyl Chloride (75-01-4) | X | | | <10 | -- | | | | | 1 | µg/l | -- | | | |
| GC/MS FRACTION – ACID COMPOUNDS | | | | | | | | | | | | | | | |
| 1A. 2-Chlorophenol (95-57-8) | X | | | <10.0 | -- | | | | | 1 | µg/l | -- | | | |
| 2A. 2,4-Dichlorophenol (120-83-2) | X | | | <10.0 | -- | | | | | 1 | µg/l | -- | | | |
| 3A. 2,4-Dimethylphenol (105-67-9) | X | | | <10.0 | -- | | | | | 1 | µg/l | -- | | | |
| 4A. 4,6-Dinitro-O-Cresol (534-52-1) | X | | | <50.0 | -- | | | | | 1 | µg/l | -- | | | |
| 5A. 2,4-Dinitrophenol (51-28-5) | X | | | <50.0 | -- | | | | | 1 | µg/l | -- | | | |
| 6A. 2-Nitrophenol (88-75-5) | X | | | <10.0 | -- | | | | | 1 | µg/l | -- | | | |
| 7A. 4-Nitrophenol (100-02-7) | X | | | <50.0 | -- | | | | | 1 | µg/l | -- | | | |
| 8A. P-Chloro-M-Cresol (59-50-7) | X | | | <50.0 | -- | | | | | 1 | µg/l | -- | | | |
| 9A. Pentachlorophenol (87-86-5) | X | | | <50.0 | -- | | | | | 1 | µg/l | -- | | | |
| 10A. Phenol (108-95-2) | X | | | <10.0 | -- | | | | | 1 | µg/l | -- | | | |
| 11A. 2,4,6-Trichlorophenol (88-05-2) | X | | | <20.0 | -- | | | | | 1 | µg/l | -- | | | |



CONTINUE ON REVERSE

CONTINUED FROM THE FRONT

| 1. POLLUTANT AND CAS NUMBER (*if available*) | 2. MARK "X" | | | 3. EFFLUENT | | | | | | | 4. UNITS | | 5. INTAKE (*optional*) | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | a. TESTING REQUIRED | b. BELIEVED PRESENT | c. BELIEVED ABSENT | a. MAXIMUM DAILY VALUE | | b. MAXIMUM 30 DAY VALUE (*if available*) | | c. LONG TERM AVRG. VALUE (*if available*) | | d. NO. OF ANALYSES | a. CONCENTRATION | b. MASS | a. LONG TERM AVERAGE VALUE | | b. NO. OF ANALYSES |
| | | | | (1) CONCENTRATION | (2) MASS | (1) CONCENTRATION | (2) MASS | (1) CONCENTRATION | (2) MASS | | | | (1) CONCENTRATION | (2) MASS | |
| GC/MS FRACTION – BASE/NEUTRAL COMPOUNDS | | | | | | | | | | | | | | | |
| 1B. Acenaphthene (83-32-9) | X | | | <10.0 | -- | | | | | 1 | µg/l | -- | | | |
| 2B. Acenaphtylene (208-96-8) | X | | | <10.0 | -- | | | | | 1 | µg/l | -- | | | |
| 3B. Anthracene (120-12-7) | X | | | <10.0 | -- | | | | | 1 | µg/l | -- | | | |
| 4B. Benzidine (92-87-5) | X | | | <50.0 | -- | | | | | 1 | µg/l | -- | | | |
| 5B. Benzo (*a*) Anthracene (56-55-3) | X | | | <10.0 | -- | | | | | 1 | µg/l | -- | | | |
| 6B. Benzo (*a*) Pyrene (50-32-8) | X | | | <10.0 | -- | | | | | 1 | µg/l | -- | | | |
| 7B. 3,4-Benzo-fluoranthene (205-99-2) | X | | | <10.0 | -- | | | | | 1 | µg/l | -- | | | |
| 8B. Benzo (*ghi*) Perylene (191-24-2) | X | | | <10.0 | -- | | | | | 1 | µg/l | -- | | | |
| 9B. Benzo (*k*) Fluoranthene (207-08-9) | X | | | <10.0 | -- | | | | | 1 | µg/l | -- | | | |
| 10B. Bis (*2-Chloro-ethoxy*) Methane (111-91-1) | X | | | <10.0 | -- | | | | | 1 | µg/l | -- | | | |
| 11B. Bis (*2-Chloro-ethyl*) Ether (111-44-4) | X | | | <10.0 | -- | | | | | 1 | µg/l | -- | | | |
| 12B. Bis (*2-Chloroisopropyl*) Ether (102-80-1) | X | | | <10.0 | -- | | | | | 1 | µg/l | -- | | | |
| 13B. Bis (*2-Ethyl-hexyl*) Phthalate (117-81-7) | X | | | <5.0 | -- | | | | | 1 | µg/l | -- | | | |
| 14B. 4-Bromophenyl Phenyl Ether (101-55-3) | X | | | <10.0 | -- | | | | | 1 | µg/l | -- | | | |
| 15B. Butyl Benzyl Phthalate (85-68-7) | X | | | <10.0 | -- | | | | | 1 | µg/l | -- | | | |
| 16B. 2-Chloro-naphthalene (91-58-7) | X | | | <10.0 | -- | | | | | 1 | µg/l | -- | | | |
| 17B. 4-Chloro-phenyl Phenyl Ether (7005-72-3) | X | | | <10.0 | -- | | | | | 1 | µg/l | -- | | | |
| 18B. Chrysene (218-01-9) | X | | | <10.0 | -- | | | | | 1 | µg/l | -- | | | |
| 19B. Dibenzo (*a,h*) Anthracene (53-70-3) | X | | | <10.0 | -- | | | | | 1 | µg/l | -- | | | |
| 20B. 1,2-Dichloro-benzene (95-50-1) | X | | | <5.0 | -- | | | | | 1 | µg/l | -- | | | |
| 21B. 1,3-Di-chloro-benzene (541-73-1) | X | | | <5.0 | -- | | | | | 1 | µg/l | -- | | | |



CONTINUE ON PAGE V-7

CONTINUED FROM PAGE V-6

| 1. POLLUTANT AND CAS NUMBER (*if available*) | 2. MARK "X" | | | 3. EFFLUENT | | | | | | | 4. UNITS | | 5. INTAKE (*optional*) | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | a. TESTING REQUIRED | b. BELIEVED PRESENT | c. BELIEVED ABSENT | a. MAXIMUM DAILY VALUE | | b. MAXIMUM 30 DAY VALUE (*if available*) | | c. LONG TERM AVRG. VALUE (*if available*) | | d. NO. OF ANALYSES | a. CONCENTRATION | b. MASS | a. LONG TERM AVERAGE VALUE | | b. NO. OF ANALYSES |
| | | | | (1) CONCENTRATION | (2) MASS | (1) CONCENTRATION | (2) MASS | (1) CONCENTRATION | (2) MASS | | | | (1) CONCENTRATION | (2) MASS | |
| GC/MS FRACTION – BASE/NEUTRAL COMPOUNDS (*continued*) | | | | | | | | | | | | | | | |
| 22B. 1,4-Dichlorobenzene (106-46-7) | X | | | <5.0 | -- | | | | | 1 | µg/l | -- | | | |
| 23B. 3,3-Dichlorobenzidine (91-94-1) | X | | | <20.0 | -- | | | | | 1 | µg/l | -- | | | |
| 24B. Diethyl Phthalate (84-66-2) | X | | | <10.0 | -- | | | | | 1 | µg/l | -- | | | |
| 25B. Dimethyl Phthalate (131 -11-3) | X | | | <10.0 | -- | | | | | 1 | µg/l | -- | | | |
| 26B. Di-N-Butyl Phthalate (84-74-2) | X | | | <10.0 | -- | | | | | 1 | µg/l | -- | | | |
| 27B. 2,4-Dinitrotoluene (121-14-2) | X | | | <20.0 | -- | | | | | 1 | µg/l | -- | | | |
| 28B. 2,6-Dinitrotoluene (606-20-2) | X | | | <10.0 | -- | | | | | 1 | µg/l | -- | | | |
| 29B. Di-N-Octyl Phthalate (117-84-0) | X | | | <10.0 | -- | | | | | 1 | µg/l | -- | | | |
| 30B. 1,2-Diphenylhydrazine (*as Azobenzene*) (122-66-7) | X | | | <10.0 | -- | | | | | 1 | µg/l | -- | | | |
| 31B. Fluoranthene (206-44-0) | X | | | <10.0 | -- | | | | | 1 | µg/l | -- | | | |
| 32B. Fluorene (86-73-7) | X | | | <10.0 | -- | | | | | 1 | µg/l | -- | | | |
| 33B. Hexachlorobenzene (118-74-1) | X | | | <10.0 | -- | | | | | 1 | µg/l | -- | | | |
| 34B. Hexachlorobutadiene (87-68-3) | X | | | <10.0 | -- | | | | | 1 | µg/l | -- | | | |
| 35B. Hexachlorocyclopentadiene (77-47-4) | X | | | <10.0 | -- | | | | | 1 | µg/l | -- | | | |
| 36B Hexachloroethane (67-72-1) | X | | | <10.0 | -- | | | | | 1 | µg/l | -- | | | |
| 37B. Indeno (*1,2,3-cd*) Pyrene (193-39-5) | X | | | <20.0 | -- | | | | | 1 | µg/l | -- | | | |
| 38B. Isophorone (78-59-1) | X | | | <10.0 | -- | | | | | 1 | µg/l | -- | | | |
| 39B. Naphthalene (91-20-3) | X | | | <10.0 | -- | | | | | 1 | µg/l | -- | | | |
| 40B. Nitrobenzene (98-95-3) | X | | | <10.0 | -- | | | | | 1 | µg/l | -- | | | |
| 41B. N-Nitrosodimethylamine (62-75-9) | X | | | <10.0 | -- | | | | | 1 | µg/l | -- | | | |
| 42B. N-Nitrosodi-N-Propylamine (621-64-7) | X | | | <10.0 | -- | | | | | 1 | µg/l | -- | | | |



CONTINUE ON REVERSE

CONTINUED FROM THE FRONT

| 1. POLLUTANT AND CAS NUMBER (*if available*) | 2. MARK "X" | | | 3. EFFLUENT | | | | | | | 4. UNITS | | 5. INTAKE (*optional*) | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | a. TESTING REQUIRED | b. BELIEVED PRESENT | c. BELIEVED ABSENT | a. MAXIMUM DAILY VALUE | | b. MAXIMUM 30 DAY VALUE (*if available*) | | c. LONG TERM AVRG. VALUE (*if available*) | | d. NO. OF ANALYSES | a. CONCENTRATION | b. MASS | a. LONG TERM AVERAGE VALUE | | b. NO. OF ANALYSES |
| | | | | (1) CONCENTRATION | (2) MASS | (1) CONCENTRATION | (2) MASS | (1) CONCENTRATION | (2) MASS | | | | (1) CONCENTRATION | (2) MASS | |
| GC/MS FRACTION – BASE/NEUTRAL COMPOUNDS (*continued*) | | | | | | | | | | | | | | | |
| 43B. N-Nitrosodiphenylamine (86-30-6) | X | | | <10.0 | -- | | | | | 1 | µg/l | -- | | | |
| 44B. Phenanthrene (85-01-8) | X | | | <10.0 | -- | | | | | 1 | µg/l | -- | | | |
| 45B. Pyrene (129-00-0) | X | | | <10.0 | -- | | | | | 1 | µg/l | -- | | | |
| 46B. 1,2,4-Trichlorobenzene (120-82-1) | X | | | <10.0 | -- | | | | | 1 | µg/l | -- | | | |
| GC/MS FRACTION – PESTICIDES | | | | | | | | | | | | | | | |
| 1P. Aldrin (309-00-2) | | | X | | | | | | | -- | -- | -- | | | |
| 2P. α-BHC (319-84-6) | | | X | | | | | | | -- | -- | -- | | | |
| 3P. β-BHC (319-85-7) | | | X | | | | | | | -- | -- | -- | | | |
| 4P. γ-BHC (58-89-9) | | | X | | | | | | | -- | -- | -- | | | |
| 5P. δ-BHC (319-86-8) | | | X | | | | | | | -- | -- | -- | | | |
| 6P. Chlordane (57-74-9) | | | X | | | | | | | -- | -- | -- | | | |
| 7P. 4,4'-DDT (50-29-3) | | | X | | | | | | | -- | -- | -- | | | |
| 8P. 4,4'-DDE (72-55-9) | | | X | | | | | | | -- | -- | -- | | | |
| 9P. 4,4'-DDD (72-54-8) | | | X | | | | | | | -- | -- | -- | | | |
| 10P. Dieldrin (60-57-1) | | | X | | | | | | | -- | -- | -- | | | |
| 11P. α-Enosulfan (115-29-7) | | | X | | | | | | | -- | -- | -- | | | |
| 12P. β-Endosulfan (115-29-7) | | | X | | | | | | | -- | -- | -- | | | |
| 13P. Endosulfan Sulfate (1031-07-8) | | | X | | | | | | | -- | -- | -- | | | |
| 14P. Endrin (72-20-8) | | | X | | | | | | | -- | -- | -- | | | |
| 15P. Endrin Aldehyde (7421-93-4) | | | X | | | | | | | -- | -- | -- | | | |
| 16P. Heptachlor (76-44-8) | | | X | | | | | | | -- | -- | -- | | | |



CONTINUE ON PAGE V-9

| EPA I.D. NUMBER (*copy from Item 1 of Form 1*) | OUTFALL NUMBER |
|---|---|
| 3IB00002*KD | 610 |

CONTINUED FROM PAGE V-8

| 1. POLLUTANT AND CAS NUMBER (*if available*) | 2. MARK "X" | | | 3. EFFLUENT | | | | | | | 4. UNITS | | 5. INTAKE (*optional*) | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | a. TESTING REQUIRED | b. BELIEVED PRESENT | c. BELIEVED ABSENT | a. MAXIMUM DAILY VALUE | | b. MAXIMUM 30 DAY VALUE (*if available*) | | c. LONG TERM AVRG. VALUE (*if available*) | | d. NO. OF ANALYSES | a. CONCENTRATION | b. MASS | a. LONG TERM AVERAGE VALUE | | b. NO. OF ANALYSES |
| | | | | (1) CONCENTRATION | (2) MASS | (1) CONCENTRATION | (2) MASS | (1) CONCENTRATION | (2) MASS | | | | (1) CONCENTRATION | (2) MASS | |
| GC/MS FRACTION – PESTICIDES (*continued*) | | | | | | | | | | | | | | | |
| 17P. Heptachlor Epoxide (1024-57-3) | | | X | | | | | | | -- | -- | | | | |
| 18P. PCB-1242 (53469-21-9) | | | X | | | | | | | -- | -- | | | | |
| 19P. PCB-1254 (11097-69-1) | | | X | | | | | | | -- | -- | | | | |
| 20P. PCB-1221 (11104-28-2) | | | X | | | | | | | -- | -- | | | | |
| 21P. PCB-1232 (11141-16-5) | | | X | | | | | | | -- | -- | | | | |
| 22P. PCB-1248 (12672-29-6) | | | X | | | | | | | -- | -- | | | | |
| 23P. PCB-1260 (11096-82-5) | | | X | | | | | | | -- | -- | | | | |
| 24P. PCB-1016 (12674-11-2) | | | X | | | | | | | -- | -- | | | | |
| 25P. Toxaphene (8001-35-2) | | | X | | | | | | | -- | -- | | | | |

PLEASE PRINT OR TYPE IN THE UNSHADED AREAS ONLY. You may report some or all of this information on separate sheets (*use the same format*) instead of completing these pages.
SEE INSTRUCTIONS.

EPA I.D. NUMBER (*copy from Item 1 of Form 1*)
3IB00002*KD

V. INTAKE AND EFFLUENT CHARACTERISTICS *(continued from page 3 of Form 2-C)*

OUTFALL NO. 004

PART A –You must provide the results of at least one analysis for every pollutant in this table. Complete one table for each outfall. See instructions for additional details.

| 1. POLLUTANT | 2. EFFLUENT | | | | | | d. NO. OF ANALYSES | 3. UNITS (*specify if blank*) | | 4. INTAKE (*optional*) | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | a. MAXIMUM DAILY VALUE | | b. MAXIMUM 30 DAY VALUE (*if available*) | | c. LONG TERM AVRG. VALUE (*if available*) | | | a. CONCEN-TRATION | b. MASS | a. LONG TERM AVERAGE VALUE | | b. NO. OF ANALYSES |
| | (1) CONCENTRATION | (2) MASS | (1) CONCENTRATION | (2) MASS | (1) CONCENTRATION | (2) MASS | | | | (1) CONCENTRATION | (2) MASS | |
| a. Biochemical Oxygen Demand (*BOD*) | 3.6* | 16.51 | | | | | 1 | mg/l | lb/day | | | |
| b. Chemical Oxygen Demand (*COD*) | 18 | 82.56 | | | | | 1 | mg/l | lb/day | | | |
| c. Total Organic Carbon (*TOC*) | 2.3 | 10.55 | | | | | 1 | mg/l | lb/day | | | |
| d. Total Suspended Solids (*TSS*) | <2.0 | -- | | | | | 1 | mg/l | -- | | | |
| e. Ammonia (*as N*) | <0.05 | -- | | | | | 1 | mg/l | -- | | | |
| f. Flow | VALUE 0.55 | | VALUE -- | | VALUE -- | | 1 | MGD | -- | VALUE | | |
| g. Temperature (*winter*) | VALUE -- | | VALUE -- | | VALUE -- | | -- | °C | | VALUE | | |
| h. Temperature (*summer*) | VALUE 19.3 | | VALUE -- | | VALUE -- | | 1 | °C | | VALUE | | |
| i. pH | MINIMUM 7.16 | MAXIMUM 7.16 | MINIMUM -- | MAXIMUM -- | | | 1 | STANDARD UNITS | | | | |

PART B – Mark "X" in column 2-a for each pollutant you know or have reason to believe is present. Mark "X" in column 2-b for each pollutant you believe to be absent. If you mark column 2a for any pollutant which is limited either directly, or indirectly but expressly, in an effluent limitations guideline, you must provide the results of at least one analysis for that pollutant. For other pollutants for which you mark column 2a, you must provide quantitative data or an explanation of their presence in your discharge. Complete one table for each outfall. See the instructions for additional details and requirements.

| 1. POLLUTANT AND CAS NO. (*if available*) | 2. MARK "X" | | 3. EFFLUENT | | | | | | | 4. UNITS | | 5. INTAKE (*optional*) | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | a. BELIEVED PRESENT | b. BELIEVED ABSENT | a. MAXIMUM DAILY VALUE | | b. MAXIMUM 30 DAY VALUE (*if available*) | | c. LONG TERM AVRG. VALUE (*if available*) | | d. NO. OF ANALYSES | a. CONCEN-TRATION | b. MASS | a. LONG TERM AVERAGE VALUE | | b. NO. OF ANALYSES |
| | | | (1) CONCENTRATION | (2) MASS | (1) CONCENTRATION | (2) MASS | (1) CONCENTRATION | (2) MASS | | | | (1) CONCENTRATION | (2) MASS | |
| a. Bromide (24959-67-9) | X | | 0.047 | 0.22 | | | | | 1 | mg/l | lb/day | | | |
| b. Chlorine, Total Residual | X | | 0.01 | 0.05 | | | | | 1 | mg/l | lb/day | | | |
| c. Color | X | | 6.0 | -- | | | | | 1 | Pt-Co | -- | | | |
| d. Fecal Coliform | | X | -- | -- | | | | | -- | -- | -- | | | |
| e. Fluoride (16984-48-8) | X | | 0.448 | 2.06 | | | | | 1 | mg/l | lb/day | | | |
| f. Nitrate-Nitrite (*as N*) | X | | 0.21 | 0.96 | | | | | 1 | mg/l | lb/day | | | |



* Estimated value below practical quantitation limit.

ITEM V-B CONTINUED FROM FRONT

| 1. POLLUTANT AND CAS NO. (*if available*) | 2. MARK "X" | | 3. EFFLUENT | | | | | | | 4. UNITS | | 5. INTAKE (*optional*) | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | a. BELIEVED PRESENT | b. BELIEVED ABSENT | a. MAXIMUM DAILY VALUE | | b. MAXIMUM 30 DAY VALUE (*if available*) | | c. LONG TERM AVRG. VALUE (*if available*) | | d. NO. OF ANALYSES | a. CONCENTRATION | b. MASS | a. LONG TERM AVERAGE VALUE | | b. NO. OF ANALYSES |
| | | | (1) CONCENTRATION | (2) MASS | (1) CONCENTRATION | (2) MASS | (1) CONCENTRATION | (2) MASS | | | | (1) CONCENTRATION | (2) MASS | |
| g. Nitrogen, Total Organic (*as N*) | X | | <0.50 | -- | | | | | 1 | mg/l | -- | | | |
| h. Oil and Grease | X | | <5.1 | -- | | | | | 1 | mg/l | -- | | | |
| i. Phosphorus (as P), Total (7723-14-0) | X | | 0.05 | 0.23 | | | | | 1 | mg/l | lb/day | | | |
| j. Radioactivity | | | | | | | | | | | | | | |
| (1) Alpha, Total | | X | -- | -- | | | | | -- | -- | -- | | | |
| (2) Beta, Total | | X | -- | -- | | | | | -- | -- | -- | | | |
| (3) Radium, Total | | X | -- | -- | | | | | -- | -- | -- | | | |
| (4) Radium 226, Total | | X | -- | -- | | | | | -- | -- | -- | | | |
| k. Sulfate (*as $SO_4$*) (14808-79-8) | X | | 39 | 178.9 | | | | | 1 | mg/l | lb/day | | | |
| l. Sulfide (*as S*) | X | | 0.016* | 0.07 | | | | | 1 | mg/l | lb/day | | | |
| m. Sulfite (*as $SO_3$*) (14265-45-3) | X | | <0.64 | -- | | | | | 1 | mg/l | -- | | | |
| n. Surfactants | X | | 0.06 | 0.28 | | | | | 1 | mg/l | lb/day | | | |
| o. Aluminum, Total (7429-90-5) | X | | <200 | -- | | | | | 1 | ug/l | -- | | | |
| p. Barium, Total (7440-39-3) | X | | 26 | 0.12 | | | | | 1 | µg/l | lb/day | | | |
| q. Boron, Total (7440-42-8) | X | | 34 | 0.16 | | | | | 1 | µg/l | lb/day | | | |
| r. Cobalt, Total (7440-48-4) | X | | <20 | -- | | | | | 1 | µg/l | -- | | | |
| s. Iron, Total (7439-89-6) | X | | 120 | 0.55 | | | | | 1 | µg/l | lb/day | | | |
| t. Magnesium, Total (7439-95-4) | X | | 9,520 | 43.67 | | | | | 1 | µg/l | lb/day | | | |
| u. Molybdenum, Total (7439-98-7) | X | | 2.959* | 0.01 | | | | | 1 | µg/l | lb/day | | | |
| v. Manganese, Total (7439-96-5) | X | | 6.9* | 0.03 | | | | | 1 | µg/l | lb/day | | | |
| w. Tin, Total (7440-31-5) | X | | <10 | -- | | | | | 1 | µg/l | -- | | | |
| x. Titanium, Total (7440-32-6) | X | | 4.0* | 0.02 | | | | | 1 | µg/l | lb/day | | | |



CONTINUE ON PAGE V-3

* Estimated value below practical quantitation limit.

| EPA I.D. NUMBER (*copy from Item 1 of Form 1*) | OUTFALL NUMBER |
|---|---|
| 3IB00002*KD | 004 |

CONTINUED FROM PAGE 3 OF FORM 2-C

PART C - If you are a primary industry and this outfall contains process wastewater, refer to Table 2c-2 in the instructions to determine which of the GC/MS fractions you must test for. Mark "X" in column 2-a for all such GC/MS fractions that apply to your industry and for ALL toxic metals, cyanides, and total phenols. If you are not required to mark column 2-a (*secondary industries, nonprocess wastewater outfalls, and nonrequired GC/MS fractions*), mark "X" in column 2-b for each pollutant you know or have reason to believe is present. Mark "X" in column 2-c for each pollutant you believe is absent. If you mark column 2a for any pollutant, you must provide the results of at least one analysis for that pollutant. If you mark column 2b for any pollutant, you must provide the results of at least one analysis for that pollutant if you know or have reason to believe it will be discharged in concentrations of 10 ppb or greater. If you mark column 2b for acrolein, acrylonitrile, 2,4 dinitrophenol, or 2-methyl-4, 6 dinitrophenol, you must provide the results of at least one analysis for each of these pollutants which you know or have reason to believe that you discharge in concentrations of 100 ppb or greater. Otherwise, for pollutants for which you mark column 2b, you must either submit at least one analysis or briefly describe the reasons the pollutant is expected to be discharged. Note that there are 7 pages to this part; please review each carefully. Complete one table (*all 7 pages*) for each outfall. See instructions for additional details and requirements.

| 1. POLLUTANT AND CAS NUMBER (*if available*) | 2. MARK "X" | | | 3. EFFLUENT | | | | | | | 4. UNITS | | 5. INTAKE (*optional*) | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | a. TESTING REQUIRED | b. BELIEVED PRESENT | c. BELIEVED ABSENT | a. MAXIMUM DAILY VALUE | | b. MAXIMUM 30 DAY VALUE (*if available*) | | c. LONG TERM AVRG. VALUE (*if available*) | | d. NO. OF ANALYSES | a. CONCENTRATION | b. MASS | a. LONG TERM AVERAGE VALUE | | b. NO. OF ANALYSES |
| | | | | (1) CONCENTRATION | (2) MASS | (1) CONCENTRATION | (2) MASS | (1) CONCENTRATION | (2) MASS | | | | (1) CONCENTRATION | (2) MASS | |
| METALS, CYANIDE, AND TOTAL PHENOLS | | | | | | | | | | | | | | | |
| 1M. Antimony, Total (7440-36-0) | X | | | 0.151* | 0.0007 | | | | | 1 | µg/l | lb/day | | | |
| 2M. Arsenic, Total (7440-38-2) | X | | | 0.930* | 0.004 | | | | | 1 | µg/l | lb/day | | | |
| 3M. Beryllium, Total (7440-41-7) | X | | | <0.50 | -- | | | | | 1 | µg/l | -- | | | |
| 4M. Cadmium, Total (7440-43-9) | X | | | <0.50 | -- | | | | | 1 | µg/l | -- | | | |
| 5M. Chromium, Total (7440-47-3) | X | | | <10 | -- | | | | | 1 | µg/l | -- | | | |
| 6M. Copper, Total (7440-50-8) | X | | | 7.819* | 0.036 | | | | | 1 | µg/l | lb/day | | | |
| 7M. Lead, Total (7439-92-1) | X | | | <2.0 | -- | | | | | 1 | µg/l | -- | | | |
| 8M. Mercury, Total (7439-97-6) | X | | | <0.2 | -- | | | | | 1 | µg/l | -- | | | |
| 9M. Nickel, Total (7440-02-0) | X | | | 1.968* | 0.009 | | | | | 1 | µg/l | lb/day | | | |
| 10M. Selenium, Total (7782-49-2) | X | | | <3.0** | -- | | | | | 1 | µg/l | -- | | | |
| 11M. Silver, Total (7440-22-4) | X | | | <5.0 | -- | | | | | 1 | µg/l | -- | | | |
| 12M. Thallium, Total (7440-28-0) | X | | | <1.0 | -- | | | | | 1 | µg/l | -- | | | |
| 13M. Zinc, Total (7440-66-6) | X | | | 3.7* | 0.017 | | | | | 1 | µg/l | lb/day | | | |
| 14M. Cyanide, Total (57-12-5) | X | | | <0.005 | -- | | | | | 1 | mg/l | -- | | | |
| 15M. Phenols, Total | X | | | <50 | -- | | | | | 1 | µg/l | -- | | | |
| DIOXIN | | | | | | | | | | | | | | | |
| 2,3,7,8-Tetra-chlorodibenzo-P-Dioxin (1764-01-6) | | | X | DESCRIBE RESULTS<br>Not detected. | | | | | | | | | | | |



* Estimated value below practical quantitation limit.

** Lab control standard recovery biased above method limits.

CONTINUED FROM THE FRONT

| 1. POLLUTANT AND CAS NUMBER (*if available*) | 2. MARK "X" | | | 3. EFFLUENT | | | | | | | 4. UNITS | | 5. INTAKE (*optional*) | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | a. TESTING REQUIRED | b. BELIEVED PRESENT | c. BELIEVED ABSENT | a. MAXIMUM DAILY VALUE | | b. MAXIMUM 30 DAY VALUE (*if available*) | | c. LONG TERM AVRG. VALUE (*if available*) | | d. NO. OF ANALYSES | a. CONCENTRATION | b. MASS | a. LONG TERM AVERAGE VALUE | | b. NO. OF ANALYSES |
| | | | | (1) CONCENTRATION | (2) MASS | (1) CONCENTRATION | (2) MASS | (1) CONCENTRATION | (2) MASS | | | | (1) CONCENTRATION | (2) MASS | |
| GC/MS FRACTION – VOLATILE COMPOUNDS | | | | | | | | | | | | | | | |
| 1V. Accrolein (107-02-8) | X | | | <50.0 | -- | | | | | 1 | µg/l | -- | | | |
| 2V. Acrylonitrile (107-13-1) | X | | | <50.0 | -- | | | | | 1 | µg/l | -- | | | |
| 3V. Benzene (71-43-2) | X | | | <5.0 | -- | | | | | 1 | µg/l | -- | | | |
| 4V. Bis (*Chloromethyl*) Ether (542-88-1) | X | | | ND* | -- | | | | | 1 | µg/l | -- | | | |
| 5V. Bromoform (75-25-2) | X | | | <5.0 | -- | | | | | 1 | µg/l | -- | | | |
| 6V. Carbon Tetrachloride (56-23-5) | X | | | <5.0 | -- | | | | | 1 | µg/l | -- | | | |
| 7V. Chlorobenzene (108-90-7) | X | | | <5.0 | -- | | | | | 1 | µg/l | -- | | | |
| 8V. Chlorodibromomethane (124-48-1) | X | | | <5.0 | -- | | | | | 1 | µg/l | -- | | | |
| 9V. Chloroethane (75-00-3) | X | | | <10.0 | -- | | | | | 1 | µg/l | -- | | | |
| 10V. 2-Chloroethylvinyl Ether (110-75-8) | X | | | <10 | -- | | | | | 1 | µg/l | -- | | | |
| 11V. Chloroform (67-66-3) | X | | | <5.0 | -- | | | | | 1 | µg/l | -- | | | |
| 12V. Dichlorobromomethane (75-27-4) | X | | | <5.0 | -- | | | | | 1 | µg/l | -- | | | |
| 13V. Dichlorodifluoromethane (75-71-8) | X | | | <10 | -- | | | | | 1 | µg/l | -- | | | |
| 14V. 1,1-Dichloroethane (75-34-3) | X | | | <5.0 | -- | | | | | 1 | µg/l | -- | | | |
| 15V. 1,2-Dichloroethane (107-06-2) | X | | | <5.0 | -- | | | | | 1 | µg/l | -- | | | |
| 16V. 1,1-Dichloroethylene (75-35-4) | X | | | <5.0 | -- | | | | | 1 | µg/l | -- | | | |
| 17V. 1,2-Dichloropropane (78-87-5) | X | | | <5.0 | -- | | | | | 1 | ug/l | -- | | | |
| 18V. 1,3-Dichloropropylene (542-75-6) | X | | | <5.0 | -- | | | | | 1 | µg/l | -- | | | |
| 19V. Ethylbenzene (100-41-4) | X | | | <5.0 | -- | | | | | 1 | µg/l | -- | | | |
| 20V. Methyl Bromide (74-83-9) | X | | | <10.0 | -- | | | | | 1 | µg/l | -- | | | |
| 21V. Methyl Chloride (74-87-3) | X | | | <10 | -- | | | | | 1 | µg/l | -- | | | |



CONTINUE ON PAGE V-5

*ND - Not detected in library search.

CONTINUED FROM PAGE V-4

| 1. POLLUTANT AND CAS NUMBER (*if available*) | 2. MARK "X" | | | 3. EFFLUENT | | | | | | | 4. UNITS | | 5. INTAKE (*optional*) | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | a. TESTING REQUIRED | b. BELIEVED PRESENT | c. BELIEVED ABSENT | a. MAXIMUM DAILY VALUE | | b. MAXIMUM 30 DAY VALUE (*if available*) | | c. LONG TERM AVRG. VALUE (*if available*) | | d. NO. OF ANALYSES | a. CONCENTRATION | b. MASS | a. LONG TERM AVERAGE VALUE | | b. NO. OF ANALYSES |
| | | | | (1) CONCENTRATION | (2) MASS | (1) CONCENTRATION | (2) MASS | (1) CONCENTRATION | (2) MASS | | | | (1) CONCENTRATION | (2) MASS | |
| GC/MS FRACTION – VOLATILE COMPOUNDS (*continued*) | | | | | | | | | | | | | | | |
| 22V. Methylene Chloride (75-09-2) | X | | | <10 | -- | | | | | 1 | µg/l | -- | | | |
| 23V. 1,1,2,2-Tetrachloroethane (79-34-5) | X | | | <5.0 | -- | | | | | 1 | µg/l | -- | | | |
| 24V. Tetrachloroethylene (127-18-4) | X | | | <5.0 | -- | | | | | 1 | µg/l | -- | | | |
| 25V. Toluene (108-88-3) | X | | | <5.0 | -- | | | | | 1 | µg/l | -- | | | |
| 26V. 1,2-Trans-Dichloroethylene (156-60-5) | X | | | <5.0 | -- | | | | | 1 | µg/l | -- | | | |
| 27V. 1,1,1-Trichloroethane (71-55-6) | X | | | <5.0 | -- | | | | | 1 | µg/l | -- | | | |
| 28V. 1,1,2-Trichloroethane (79-00-5) | X | | | <5.0 | -- | | | | | 1 | µg/l | -- | | | |
| 29V Trichloroethylene (79-01-6) | X | | | <5.0 | -- | | | | | 1 | µg/l | -- | | | |
| 30V. Trichlorofluoromethane (75-69-4) | X | | | <10 | -- | | | | | 1 | µg/l | -- | | | |
| 31V. Vinyl Chloride (75-01-4) | X | | | <10 | -- | | | | | 1 | µg/l | -- | | | |
| GC/MS FRACTION – ACID COMPOUNDS | | | | | | | | | | | | | | | |
| 1A. 2-Chlorophenol (95-57-8) | X | | | <10.0 | -- | | | | | 1 | µg/l | -- | | | |
| 2A. 2,4-Dichlorophenol (120-83-2) | X | | | <10.0 | -- | | | | | 1 | µg/l | -- | | | |
| 3A. 2,4-Dimethylphenol (105-67-9) | X | | | <10.0 | -- | | | | | 1 | µg/l | -- | | | |
| 4A. 4,6-Dinitro-O-Cresol (534-52-1) | X | | | <50.0 | -- | | | | | 1 | µg/l | -- | | | |
| 5A. 2,4-Dinitrophenol (51-28-5) | X | | | <50.0 | -- | | | | | 1 | µg/l | -- | | | |
| 6A. 2-Nitrophenol (88-75-5) | X | | | <10.0 | -- | | | | | 1 | µg/l | -- | | | |
| 7A. 4-Nitrophenol (100-02-7) | X | | | <50.0 | -- | | | | | 1 | µg/l | -- | | | |
| 8A. P-Chloro-M-Cresol (59-50-7) | X | | | <50.0 | -- | | | | | 1 | µg/l | -- | | | |
| 9A. Pentachlorophenol (87-86-5) | X | | | <50.0 | -- | | | | | 1 | µg/l | -- | | | |
| 10A. Phenol (108-95-2) | X | | | <10.0 | -- | | | | | 1 | µg/l | -- | | | |
| 11A. 2,4,6-Trichlorophenol (88-05-2) | X | | | <20.0 | -- | | | | | 1 | µg/l | -- | | | |



CONTINUE ON REVERSE

CONTINUED FROM THE FRONT

| 1. POLLUTANT AND CAS NUMBER (*if available*) | 2. MARK "X" | | | 3. EFFLUENT | | | | | | | 4. UNITS | | 5. INTAKE (*optional*) | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | a. TESTING REQUIRED | b. BELIEVED PRESENT | c. BELIEVED ABSENT | a. MAXIMUM DAILY VALUE | | b. MAXIMUM 30 DAY VALUE (*if available*) | | c. LONG TERM AVRG. VALUE (*if available*) | | d. NO. OF ANALYSES | a. CONCENTRATION | b. MASS | a. LONG TERM AVERAGE VALUE | | b. NO. OF ANALYSES |
| | | | | (1) CONCENTRATION | (2) MASS | (1) CONCENTRATION | (2) MASS | (1) CONCENTRATION | (2) MASS | | | | (1) CONCENTRATION | (2) MASS | |
| GC/MS FRACTION – BASE/NEUTRAL COMPOUNDS | | | | | | | | | | | | | | | |
| 1B. Acenaphthene (83-32-9) | X | | | <10.0 | -- | | | | | 1 | µg/l | -- | | | |
| 2B. Acenaphtylene (208-96-8) | X | | | <10.0 | -- | | | | | 1 | µg/l | -- | | | |
| 3B. Anthracene (120-12-7) | X | | | <10.0 | -- | | | | | 1 | µg/l | -- | | | |
| 4B. Benzidine (92-87-5) | X | | | <50.0 | -- | | | | | 1 | µg/l | -- | | | |
| 5B. Benzo (*a*) Anthracene (56-55-3) | X | | | <10.0 | -- | | | | | 1 | µg/l | -- | | | |
| 6B. Benzo (*a*) Pyrene (50-32-8) | X | | | <10.0 | -- | | | | | 1 | µg/l | -- | | | |
| 7B. 3,4-Benzo-fluoranthene (205-99-2) | X | | | <10.0 | -- | | | | | 1 | µg/l | -- | | | |
| 8B. Benzo (*ghi*) Perylene (191-24-2) | X | | | <10.0 | -- | | | | | 1 | µg/l | -- | | | |
| 9B. Benzo (*k*) Fluoranthene (207-08-9) | X | | | <10.0 | -- | | | | | 1 | µg/l | -- | | | |
| 10B. Bis (*2-Chloro-ethoxy*) Methane (111-91-1) | X | | | <10.0 | -- | | | | | 1 | µg/l | -- | | | |
| 11B. Bis (*2-Chloro-ethyl*) Ether (111-44-4) | X | | | <10.0 | -- | | | | | 1 | µg/l | -- | | | |
| 12B. Bis (*2-Chloroisopropyl*) Ether (102-80-1) | X | | | <10.0 | -- | | | | | 1 | µg/l | -- | | | |
| 13B. Bis (*2-Ethyl-hexyl*) Phthalate (117-81-7) | X | | | <5.0 | -- | | | | | 1 | µg/l | -- | | | |
| 14B. 4-Bromophenyl Phenyl Ether (101-55-3) | X | | | <10.0 | -- | | | | | 1 | µg/l | -- | | | |
| 15B. Butyl Benzyl Phthalate (85-68-7) | X | | | <10.0 | -- | | | | | 1 | µg/l | -- | | | |
| 16B. 2-Chloro-naphthalene (91-58-7) | X | | | <10.0 | -- | | | | | 1 | µg/l | -- | | | |
| 17B. 4-Chloro-phenyl Phenyl Ether (7005-72-3) | X | | | <10.0 | -- | | | | | 1 | µg/l | -- | | | |
| 18B. Chrysene (218-01-9) | X | | | <10.0 | -- | | | | | 1 | µg/l | -- | | | |
| 19B. Dibenzo (*a,h*) Anthracene (53-70-3) | X | | | <10.0 | -- | | | | | 1 | µg/l | -- | | | |
| 20B. 1,2-Dichloro-benzene (95-50-1) | X | | | <5.0 | -- | | | | | 1 | µg/l | -- | | | |
| 21B. 1,3-Di-chloro-benzene (541-73-1) | X | | | <5.0 | -- | | | | | 1 | µg/l | -- | | | |



CONTINUE ON PAGE V-7

CONTINUED FROM PAGE V-6

| 1. POLLUTANT AND CAS NUMBER (*if available*) | 2. MARK "X" | | | 3. EFFLUENT | | | | | | | 4. UNITS | | 5. INTAKE (*optional*) | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | a. TESTING REQUIRED | b. BELIEVED PRESENT | c. BELIEVED ABSENT | a. MAXIMUM DAILY VALUE | | b. MAXIMUM 30 DAY VALUE (*if available*) | | c. LONG TERM AVRG. VALUE (*if available*) | | d. NO. OF ANALYSES | a. CONCENTRATION | b. MASS | a. LONG TERM AVERAGE VALUE | | b. NO. OF ANALYSES |
| | | | | (1) CONCENTRATION | (2) MASS | (1) CONCENTRATION | (2) MASS | (1) CONCENTRATION | (2) MASS | | | | (1) CONCENTRATION | (2) MASS | |
| GC/MS FRACTION – BASE/NEUTRAL COMPOUNDS (*continued*) | | | | | | | | | | | | | | | |
| 22B. 1,4-Dichlorobenzene (106-46-7) | X | | | <5.0 | -- | | | | | 1 | µg/l | -- | | | |
| 23B. 3,3-Dichlorobenzidine (91-94-1) | X | | | <20.0 | -- | | | | | 1 | µg/l | -- | | | |
| 24B. Diethyl Phthalate (84-66-2) | X | | | <10.0 | -- | | | | | 1 | µg/l | -- | | | |
| 25B. Dimethyl Phthalate (131 -11-3) | X | | | <10.0 | -- | | | | | 1 | µg/l | -- | | | |
| 26B. Di-N-Butyl Phthalate (84-74-2) | X | | | <10.0 | -- | | | | | 1 | µg/l | -- | | | |
| 27B. 2,4-Dinitrotoluene (121-14-2) | X | | | <20.0 | -- | | | | | 1 | µg/l | -- | | | |
| 28B. 2,6-Dinitrotoluene (606-20-2) | X | | | <10.0 | -- | | | | | 1 | µg/l | -- | | | |
| 29B. Di-N-Octyl Phthalate (117-84-0) | X | | | <10.0 | -- | | | | | 1 | µg/l | -- | | | |
| 30B. 1,2-Diphenylhydrazine (*as Azobenzene*) (122-66-7) | X | | | <10.0 | -- | | | | | 1 | µg/l | -- | | | |
| 31B. Fluoranthene (206-44-0) | X | | | <10.0 | -- | | | | | 1 | µg/l | -- | | | |
| 32B. Fluorene (86-73-7) | X | | | <10.0 | -- | | | | | 1 | µg/l | -- | | | |
| 33B. Hexachlorobenzene (118-74-1) | X | | | <10.0 | -- | | | | | 1 | µg/l | -- | | | |
| 34B. Hexachlorobutadiene (87-68-3) | X | | | <10.0 | -- | | | | | 1 | µg/l | -- | | | |
| 35B. Hexachlorocyclopentadiene (77-47-4) | X | | | <10.0 | -- | | | | | 1 | µg/l | -- | | | |
| 36B Hexachloroethane (67-72-1) | X | | | <10.0 | -- | | | | | 1 | µg/l | -- | | | |
| 37B. Indeno (*1,2,3-cd*) Pyrene (193-39-5) | X | | | <20.0 | -- | | | | | 1 | µg/l | -- | | | |
| 38B. Isophorone (78-59-1) | X | | | <10.0 | -- | | | | | 1 | µg/l | -- | | | |
| 39B. Naphthalene (91-20-3) | X | | | <10.0 | -- | | | | | 1 | µg/l | -- | | | |
| 40B. Nitrobenzene (98-95-3) | X | | | <10.0 | -- | | | | | 1 | µg/l | -- | | | |
| 41B. N-Nitrosodimethylamine (62-75-9) | X | | | <10.0 | -- | | | | | 1 | µg/l | -- | | | |
| 42B. N-Nitrosodi-N-Propylamine (621-64-7) | X | | | <10.0 | -- | | | | | 1 | µg/l | -- | | | |

CONTINUED FROM THE FRONT

| 1. POLLUTANT AND CAS NUMBER (*if available*) | 2. MARK "X" | | | 3. EFFLUENT | | | | | | | 4. UNITS | | 5. INTAKE (*optional*) | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | a. TESTING REQUIRED | b. BELIEVED PRESENT | c. BELIEVED ABSENT | a. MAXIMUM DAILY VALUE | | b. MAXIMUM 30 DAY VALUE (*if available*) | | c. LONG TERM AVRG. VALUE (*if available*) | | d. NO. OF ANALYSES | a. CONCENTRATION | b. MASS | a. LONG TERM AVERAGE VALUE | | b. NO. OF ANALYSES |
| | | | | (1) CONCENTRATION | (2) MASS | (1) CONCENTRATION | (2) MASS | (1) CONCENTRATION | (2) MASS | | | | (1) CONCENTRATION | (2) MASS | |
| GC/MS FRACTION – BASE/NEUTRAL COMPOUNDS (*continued*) | | | | | | | | | | | | | | | |
| 43B. N-Nitrosodiphenylamine (86-30-6) | X | | | <10.0 | -- | | | | | 1 | µg/l | -- | | | |
| 44B. Phenanthrene (85-01-8) | X | | | <10.0 | -- | | | | | 1 | µg/l | -- | | | |
| 45B. Pyrene (129-00-0) | X | | | <10.0 | -- | | | | | 1 | µg/l | -- | | | |
| 46B. 1,2,4-Trichlorobenzene (120-82-1) | X | | | <10.0 | -- | | | | | 1 | µg/l | -- | | | |
| GC/MS FRACTION – PESTICIDES | | | | | | | | | | | | | | | |
| 1P. Aldrin (309-00-2) | | | X | | | | | | | -- | -- | -- | | | |
| 2P. α-BHC (319-84-6) | | | X | | | | | | | -- | -- | -- | | | |
| 3P. β-BHC (319-85-7) | | | X | | | | | | | -- | -- | -- | | | |
| 4P. γ-BHC (58-89-9) | | | X | | | | | | | -- | -- | -- | | | |
| 5P. δ-BHC (319-86-8) | | | X | | | | | | | -- | -- | -- | | | |
| 6P. Chlordane (57-74-9) | | | X | | | | | | | -- | -- | -- | | | |
| 7P. 4,4'-DDT (50-29-3) | | | X | | | | | | | -- | -- | -- | | | |
| 8P. 4,4'-DDE (72-55-9) | | | X | | | | | | | -- | -- | -- | | | |
| 9P. 4,4'-DDD (72-54-8) | | | X | | | | | | | -- | -- | -- | | | |
| 10P. Dieldrin (60-57-1) | | | X | | | | | | | -- | -- | -- | | | |
| 11P. α-Enosulfan (115-29-7) | | | X | | | | | | | -- | -- | -- | | | |
| 12P. β-Endosulfan (115-29-7) | | | X | | | | | | | -- | -- | -- | | | |
| 13P. Endosulfan Sulfate (1031-07-8) | | | X | | | | | | | -- | -- | -- | | | |
| 14P. Endrin (72-20-8) | | | X | | | | | | | -- | -- | -- | | | |
| 15P. Endrin Aldehyde (7421-93-4) | | | X | | | | | | | -- | -- | -- | | | |
| 16P. Heptachlor (76-44-8) | | | X | | | | | | | -- | -- | -- | | | |



CONTINUE ON PAGE V-9

| EPA I.D. NUMBER (*copy from Item 1 of Form 1*) | OUTFALL NUMBER |
|---|---|
| 3IB00002*KD | 004 |

CONTINUED FROM PAGE V-8

| 1. POLLUTANT AND CAS NUMBER (*if available*) | 2. MARK "X" | | | 3. EFFLUENT | | | | | | | 4. UNITS | | 5. INTAKE (*optional*) | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | a. TESTING REQUIRED | b. BELIEVED PRESENT | c. BELIEVED ABSENT | a. MAXIMUM DAILY VALUE | | b. MAXIMUM 30 DAY VALUE (*if available*) | | c. LONG TERM AVRG. VALUE (*if available*) | | d. NO. OF ANALYSES | a. CONCENTRATION | b. MASS | a. LONG TERM AVERAGE VALUE | | b. NO. OF ANALYSES |
| | | | | (1) CONCENTRATION | (2) MASS | (1) CONCENTRATION | (2) MASS | (1) CONCENTRATION | (2) MASS | | | | (1) CONCENTRATION | (2) MASS | |
| GC/MS FRACTION – PESTICIDES (*continued*) | | | | | | | | | | | | | | | |
| 17P. Heptachlor Epoxide (1024-57-3) | | | X | | | | | | | -- | -- | -- | | | |
| 18P. PCB-1242 (53469-21-9) | | | X | | | | | | | -- | -- | -- | | | |
| 19P. PCB-1254 (11097-69-1) | | | X | | | | | | | -- | -- | -- | | | |
| 20P. PCB-1221 (11104-28-2) | | | X | | | | | | | -- | -- | -- | | | |
| 21P. PCB-1232 (11141-16-5) | | | X | | | | | | | -- | -- | -- | | | |
| 22P. PCB-1248 (12672-29-6) | | | X | | | | | | | -- | -- | -- | | | |
| 23P. PCB-1260 (11096-82-5) | | | X | | | | | | | -- | -- | -- | | | |
| 24P. PCB-1016 (12674-11-2) | | | X | | | | | | | -- | -- | -- | | | |
| 25P. Toxaphene (8001-35-2) | | | X | | | | | | | -- | -- | -- | | | |

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Please print or type in the unshaded areas only

EPA ID Number *(copy from Item 1 of Form 1)* 3IB00002*KD

Form Approved. OMB No. 2040-0086
Approval expires 5-31-92

Form 2F NPDES

United States Environmental Protection Agency
Washington, DC 20460

# Application for Permit to Discharge Storm Water Discharges Associated with Industrial Activity

**Paperwork Reduction Act Notice**

Public reporting burden for this application is estimated to average 28.6 hours per application, including time for reviewing instructions, searching existing data sources, gathering and maintaining the data needed, and completing and reviewing the collection of information. Send comments regarding the burden estimate, any other aspect of this collection of information, or suggestions for improving this form, including suggestions which may increase or reduce this burden to: Chief, Information Policy Branch, PM-223, U.S. Environmental Protection Agency, 401 M St., SW, Washington, DC 20460, or Director, Office of Information and Regulatory Affairs, Office of Management and Budget, Washington, DC 20503.

## I. Outfall Location

For each outfall, list the latitude and longitude of its location to the nearest 15 seconds and the name of the receiving water.

| A. Outfall Number *(list)* | B. Latitude | | | C. Longitude | | | D. Receiving Water *(name)* |
|---|---|---|---|---|---|---|---|
| #1 | 41 | 30 | 15 | 82 | 03 | 30 | Lake Erie |
| #2 | 41 | 30 | 15 | 82 | 03 | 50 | Lake Erie |
| #4 | 41 | 30 | 30 | 82 | 03 | 15 | Powder Maker Creek Outlet (Lake Erie) |
| #5 | 41 | 30 | 15 | 82 | 03 | 15 | Powder Maker Creek |
| #6 | 41 | 30 | 15 | 82 | 03 | 15 | Lake Erie |
| #8 | 41 | 30 | 15 | 82 | 03 | 15 | Powder Maker Creek |
| #10 | 41 | 30 | 13 | 82 | 03 | 35 | Lake Erie |
| 002 | 41 | 30 | 30 | 82 | 03 | 00 | Lake Erie |
| 004 | 41 | 30 | 30 | 82 | 03 | 00 | Lake Erie |
| | | | | | | | NOTE: #3, #7, #9 not exposed to industrial activity. |

## II. Improvements

A. Are you now required by any Federal, State, or local authority to meet any implementation schedule for the construction, upgrading or operation of wastewater treatment equipment or practices or any other environmental programs which may affect the discharges described in this application? This includes, but is not limited to, permit conditions, administrative or enforcement orders, enforcement compliance schedule letters, stipulations, court orders, and grant or loan conditions.

| 1. Identification of Conditions, Agreements, Etc. | 2. Affected Outfalls | | 3. Brief Description of Project | 4. Final Compliance Date | |
|---|---|---|---|---|---|
| | number | source of discharge | | a. req. | b. proj. |
| NA | | | | | |
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B. You may attach additional sheets describing any additional water pollution (or other environmental projects which may affect your discharges) you now have under way or which you plan. Indicate whether each program is now under way or planned, and indicate your actual or planned schedules for construction.

## III. Site Drainage Map

Attach a site map showing topography (or indicating the outline of drainage areas served by the outfall(s) covered in the application if a topographic map is unavailable) depicting the facility including: each of its intake and discharge structures; the drainage area of each storm water outfall; paved areas and buildings within the drainage area of each storm water outfall, each known past or present areas used for outdoor storage or disposal of significant materials, each existing structural control measure to reduce pollutants in storm water runoff, materials loading and access areas, areas where pesticides, herbicides, soil conditioners and fertilizers are applied; each of its hazardous waste treatment, storage or disposal units (including each area not required to have a RCRA permit which is used for accumulating hazardous waste under 40 CFR 262.34); each well where fluids from the facility are injected underground; springs, and other surface water bodies which receive storm water discharges from the facility.

Continued from the Front

## IV. Narrative Description of Pollutant Sources

A. For each outfall, provide an estimate of the area (include units) of impervious surfaces (including paved areas and building roofs) drained to the outfall, and an estimate of the total surface area drained by the outfall.

| Outfall Number | Area of Impervious Surface (provide units) | Total Area Drained (provide units) | Outfall Number | Area of Impervious Surface (provide units) | Total Area Drained (provide units) |
|---|---|---|---|---|---|
| | See Attachment A | | | | |

B. Provide a narrative description of significant materials that are currently or in the past three years have been treated, stored or disposed in a manner to allow exposure to storm water; method of treatment, storage, or disposal; past and present materials management practices employed to minimize contact by these materials with storm water runoff; materials loading and access areas; and the location, manner, and frequency in which pesticides, herbicides, soil conditioners, and fertilizers are applied.

See Attachment B

C. For each outfall, provide the location and a description of existing structural and nonstructural control measures to reduce pollutants in storm water runoff; and a description of the treatment the storm water receives, including the schedule and type of maintenance for control and treatment measures and the ultimate disposal of any solid or fluid wastes other than by discharge.

| Outfall Number | Treatment | List Codes from Table 2F-1 |
|---|---|---|
| 002 | Sedimentation, chemical precipitation, anthracite filtration, discharge to surface water, landfill solids disposal | 1U, 2C, 2K, 1Q, 4A, 5Q |
| 004 | Sedimentation, disinfection (chlorine), neutralization, gravity filtration, discharge to surface water, solids disposal at landfill ( #1, #2, #5, #8 - Equipped with oil/water separators) | 1U, 2F, 2K, 1Q, 4A, 5Q |

## V. Nonstormwater Discharges

A. I certify under penalty of law that the outfall(s) covered by this application have been tested or evaluated for the presence of nonstormwater discharges, and that all nonstormwater discharges from these outfall(s) are identified in either an accompanying Form 2C or Form 2E application for the outfall.

| Name and Official Title *(type or print)* | Signature | Date Signed |
|---|---|---|
| Daniel A. Rogatto, Plant Manager | | |

B. Provide a description of the method used, the date of any testing, and the onsite drainage points that were directly observed during a test.

Outfalls 002 and 004 have continuous process and stormwater. No unidentified non-stormwater sources were identified from these outfalls. Outfalls #1 through #10 have been evaluated for the presence of non-stormwater discharges based on observation of the outfalls during dry weather conditions and examination of piping and site diagrams. No non-stormwater sources were identified from these outfalls.

## VI. Significant Leaks or Spills

Provide existing information regarding the history of significant leaks or spills of toxic or hazardous pollutants at the facility in the last three years, including the approximate date and location of the spill or leak, and the type and amount of material released.

There have been no significant leaks or spills of any toxic or hazardous pollutants at the Avon Lake Plant in the last three years.

# Attachment A

**3IB00002*KD**

**Form 2F**
**ITEM IV-A**
**Estimate Areas**

| Outfall Number | Area of Impervious Surface Estimate | Total Area Drained Estimate |
|---|---|---|
| # 1 | 21,500 $ft^2$ | 55,500 $ft^2$ |
| # 2 | 38,000 $ft^2$ | 109,000 $ft^2$ |
| # 3 | 0 | 173,600 $ft^2$ |
| # 4 | > 3 acres | > 3.5 square miles |
| # 5 | 57,000 $ft^2$ | 96,000 $ft^2$ |
| # 6 | 1,500 $ft^2$ | 1,500 $ft^2$ |
| # 7 | 38,000 $ft^2$ | 53,000 $ft^2$ |
| # 8 | 31,000 $ft^2$ | 88,000 $ft^2$ |
| # 9 | 0 | 22,900 $ft^2$ |
| # 10 | 118,600 $ft^2$ | 136,400 $ft^2$ |
| 002 | 8 acres | 15 acres |
| 004 | 48,000 $ft^2$ | 6 acres |

Continued from Page 2

EPA ID Number *(copy from Item I of Form 1)*
3IB00002*KD

## VII. Discharge Information

A,B,C, & D: **See instructions before proceeding. Complete one set of tables for each outfall. Annotate the outfall number in the space provided. Tables VII-A, VII-B, and VII-C are included on separate sheets numbered VII-1 and VII-2.**

E: Potential discharges not covered by analysis - is any toxic pollutant listed in table 2F-2, 2F-3 or 2F-4, a substance or a componant of a substance which you currently use or manufacture as an intermediate or final product or byproduct?

☐ **Yes** *(list all such pollutants below)* ☑ **No** *(go to Section IX)*

## VIII. Biological Toxicity Testing Data

**Do you have any knowledge or reason to believe that any biological test for acute or chronic toxicity has been made on any of your discharges or on a receiving water in relation to your discharge within the last 3 years?**

☐ **Yes** *(list all such pollutants below)* ☑ **No** *(go to Section IX)*

(Toxicity testing is no longer required at the facility based on monitoring results from previous permit cycles.)

## IX. Contract Analysis Information

Were any of the analysis reported in item VII performed by a contract laboratory or consulting firm?

☑ **Yes** *(list the name, address, and telephone number of, and pollutants analyzed by, each such laboratory or firm below)* ☐ **No** *(go to Section X)*

| A. Name | B. Address | C. Area Code & Phone No. | D. Pollutants Analyzed |
|---|---|---|---|
| Alloway | 1776 Marion-Waldo Road<br>Marion, OH 43302 | 740-389-5991 | All parameters listed. |

## X. 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.***

| A. Name & Official Title *(type or print)* | B. Area Code and Phone No. |
|---|---|
| Daniel A. Rogatto, Plant Manager | (440) 930-6426 |
| **C. Signature** Daniel A Rogatto | **D. Date Signed** 1-20-15 |

# Attachment B

3IB00002*KD

**Form 2F**
**ITEM IV-B**
**Narrative Description of Pollutant Sources**

The Avon Lake Generating Station is an electrical generating station that burns bituminous and Powder River Basin coal, natural gas in two package boilers, and No. 2 Fuel Oil in a combustion turbine. Treated industrial wastewater and uncontaminated stormwater from plant operations are discharged to Lake Erie. The location of the facility is shown in Figure 1. Key features and stormwater outfalls are shown in Figure 2. Potential pollutant sources at the facility are:

- **Coal handling and storage**. A coal-pile storage area is located southwest of the main plant across Lake Road. Coal is unloaded from rail cars and/or trucks and piled in a designated area surrounded by a runoff trench. Stormwater from the runoff trench is treated prior to discharge.

- **Ash handling and storage**. Fly ash and bottom ash are generated from coal combustion in Boiler Units 7 and 9. Fly ash is collected in a dry system and shipped off site via trucks for either re-use or landfill disposal. Depending on the end-use of the ash, it may be shipped in dry or wetted form. Bottom ash is conveyed to hydrobins, where the ash settles and the transport water is recycled. Overflow from the ash recycle system is routed to settling ponds. Solid bottom ash collected in the hydrobins is shipped from the facility via trucks. Solids from the settling ponds are routinely dredged, decanted along the pond berm, and then shipped via truck.

- **Liquid fuel handling and storage.** Fuel oil is stored in bulk in various field-constructed and shop-fabricated storage tanks throughout the facility. Fuel is delivered to the facility via tanker trucks and smaller vehicles. An unloading rack with secondary containment is constructed in the main fuel oil tank unloading area. All on-site tanks are equipped with leak detection and secondary containment features and are inspected in accordance with federal and state storage tank and oil pollution prevention regulations.

- **Chemical handling and storage.** Outdoor acid storage and aqueous ammonia tanks are located along the southern wall of the main plant building. Secondary containment, filling safeguards, and inspection of these tanks are performed in accordance with the facility's SPCC plan. Smaller bulk containers of dry and liquid chemicals, such as drums, are transferred to the facility in a designated receiving area.

- **Non-ash waste handling and storage.** Plant trash is stored in designated dumpsters stored near the receiving area. Used oil is stored in a bulk storage tank

within a secondary containment berm and waste absorbents are stored in a roll-off container within the same bermed area.

A detailed inventory of petroleum substances, chemical products and other material stored at the facility that have the potential to be exposed to stormwater is provided in the facility Stormwater Pollution Prevention Plan.

EPA ID Number (*copy from Item 1 of Form 1*)
3IB00002*KD Outfall #1

Form Approved. OMB No. 2040-0086
Approval expires 5-31-92

## VII. Discharge information *(Continued from page 3 of Form 2F)*

*Outfall #1 is representative of Outfall #2.

Part A – You must provide the results of at least one analysis for every pollutant in this table. Complete one table for each outfall. See instructions for additional details.

| Pollutant and CAS Number *(if available)* | Maximum Values *(include units)* | | Average Values *(include units)* | | Number of Storm Events Sampled | Sources of Pollutants |
|---|---|---|---|---|---|---|
| | Grab Sample Taken During First 20 Minutes * | Flow-Weighted Composite * | Grab Sample Taken During First 20 Minutes | Flow-Weighted Composite | | |
| Oil and Grease | <5.1 mg/l | N/A | | | 1 | |
| Biological Oxygen Demand (BOD5) | -- | 4.1 mg/l** | | | 1 | |
| Chemical Oxygen Demand (COD) | -- | 13 mg/l | | | 1 | |
| Total Suspended Solids (TSS) | -- | 6.6 mg/l | | | 1 | |
| Total Nitrogen | -- | 5.32 mg/l | | | 1 | |
| Total Phosphorus | -- | 0.09 mg/l | | | 1 | |
| pH | Minimum 7.64 | Maximum 7.64 | Minimum | Maximum | 1 | |

Part B – List each pollutant that is limited in an effluent guideline which the facility is subject to or any pollutant listed in the facility's NPDES permit for its process wastewater (if the facility is operating under an existing NPDES permit). Complete one table for each outfall. See the instructions for additional details and requirements.

| Pollutant and CAS Number *(if available)* | Maximum Values *(include units)* | | Average Values *(include units)* | | Number of Storm Events Sampled | Sources of Pollutants |
|---|---|---|---|---|---|---|
| | Grab Sample Taken During First 20 Minutes * | Flow-Weighted Composite * | Grab Sample Taken During First 20 Minutes | Flow-Weighted Composite | | |
| Copper | -- | 12 µg/l | | | 1 | |



*Grab sample set was inadvertently omitted during event. Composite sample is considered representative of discharge.
** Estimate. Received and analyzed outside of standard hold time requirements.

Part C - List each pollutant shown in Table 2F-2, 2F-3, and 2F-4 that you know or have reason to believe is present. See the instructions for additional details and requirements. Complete one table for each outfall.

| Pollutant and CAS Number *(if available)* | Maximum Values *(include units)* | | Average Values *(include units)* | | Number of Storm Events Sampled | Sources of Pollutants |
|---|---|---|---|---|---|---|
| | Grab Sample Taken During First 20 Minutes | Flow-Weighted Composite | Grab Sample Taken During First 20 Minutes | Flow-Weighted Composite | | |
| N/A | | | | | | |
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Part D – Provide data for the storm event(s) which resulted in the maximum values for the flow weighted composite sample.

| 1. Date of Storm Event | 2. Duration of Storm Event *(in minutes)* | 3. Total rainfall during storm event *(in inches)* | 4. Number of hours between beginning of storm measured and end of previous measurable rain event | 5. Maximum flow rate during rain event *(gallons/minute or specify units)* | 6. Total flow from rain event *(gallons or specify units)* |
|---|---|---|---|---|---|
| 6-8-14 | 175 | 0.25 | 420 | 13* | 2,358** |

7. Provide a description of the method of flow measurement or estimate.

* Average flow estimate based on storm event duration and total flow.

** Total flow estimate based on estimated drainage areas.

## VII. Discharge information *(Continued from page 3 of Form 2F)*

Part A – You must provide the results of at least one analysis for every pollutant in this table. Complete one table for each outfall. See instructions for additional details.

| Pollutant and CAS Number *(if available)* | Maximum Values *(include units)* | | Average Values *(include units)* | | Number of Storm Events Sampled | Sources of Pollutants |
|---|---|---|---|---|---|---|
| | Grab Sample Taken During First 20 Minutes * | Flow-Weighted Composite * | Grab Sample Taken During First 20 Minutes | Flow-Weighted Composite | | |
| Oil and Grease | <5.1 mg/l | N/A | | | 1 | |
| Biological Oxygen Demand (BOD5) | -- | <4.0 mg/l** | | | 1 | |
| Chemical Oxygen Demand (COD) | -- | 30 mg/l | | | 1 | |
| Total Suspended Solids (TSS) | -- | 6.8 mg/l | | | 1 | |
| Total Nitrogen | -- | 0.940 mg/l | | | 1 | |
| Total Phosphorus | -- | 0.07 mg/l | | | 1 | |
| pH | Minimum 7.64 | Maximum 7.64 | Minimum | Maximum | 1 | |

Part B – List each pollutant that is limited in an effluent guideline which the facility is subject to or any pollutant listed in the facility's NPDES permit for its process wastewater (if the facility is operating under an existing NPDES permit). Complete one table for each outfall. See the instructions for additional details and requirements.

| Pollutant and CAS Number *(if available)* | Maximum Values *(include units)* | | Average Values *(include units)* | | Number of Storm Events Sampled | Sources of Pollutants |
|---|---|---|---|---|---|---|
| | Grab Sample Taken During First 20 Minutes * | Flow-Weighted Composite * | Grab Sample Taken During First 20 Minutes | Flow-Weighted Composite | | |
| Copper | -- | <10 µg/l | | | 1 | |



*Grab sample set was inadvertently omitted during event. Composite sample is considered representative of discharge.
** Estimate. Received and analyzed outside of standard hold time requirements.

Part C - List each pollutant shown in Table 2F-2, 2F-3, and 2F-4 that you know or have reason to believe is present. See the instructions for additional details and requirements. Complete one table for each outfall.

| Pollutant and CAS Number *(if available)* | Maximum Values *(include units)* | | Average Values *(include units)* | | Number of Storm Events Sampled | Sources of Pollutants |
|---|---|---|---|---|---|---|
| | Grab Sample Taken During First 20 Minutes | Flow-Weighted Composite | Grab Sample Taken During First 20 Minutes | Flow-Weighted Composite | | |
| N/A | | | | | | |
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Part D – Provide data for the storm event(s) which resulted in the maximum values for the flow weighted composite sample.

| 1. Date of Storm Event | 2. Duration of Storm Event *(in minutes)* | 3. Total rainfall during storm event *(in inches)* | 4. Number of hours between beginning of storm measured and end of previous measurable rain event | 5. Maximum flow rate during rain event *(gallons/minute or specify units)* | 6. Total flow from rain event *(gallons or specify units)* |
|---|---|---|---|---|---|
| 6-8-14 | 175 | 0.25 | 420 | 3,562* | 623,998** |

7. Provide a description of the method of flow measurement or estimate.

* Average flow estimate based on storm event duration and total flow.

** Total flow estimate based on estimated drainage areas.

## VII. Discharge information *(Continued from page 3 of Form 2F)*

Part A – You must provide the results of at least one analysis for every pollutant in this table. Complete one table for each outfall. See instructions for additional details.

| Pollutant and CAS Number *(if available)* | Maximum Values *(include units)* | | Average Values *(include units)* | | Number of Storm Events Sampled | Sources of Pollutants |
|---|---|---|---|---|---|---|
| | Grab Sample Taken During First 20 Minutes * | Flow-Weighted Composite * | Grab Sample Taken During First 20 Minutes | Flow-Weighted Composite | | |
| Oil and Grease | <5.2 mg/l | N/A | | | 1 | |
| Biological Oxygen Demand (BOD5) | -- | <4.0 mg/l | | | 1 | |
| Chemical Oxygen Demand (COD) | -- | 45 mg/l | | | 1 | |
| Total Suspended Solids (TSS) | -- | 19 mg/l | | | 1 | |
| Total Nitrogen | -- | 1.71 mg/l | | | 1 | |
| Total Phosphorus | -- | 0.11 mg/l | | | 1 | |
| pH | Minimum 7.14 | Maximum 7.14 | Minimum | Maximum | 1 | |

Part B – List each pollutant that is limited in an effluent guideline which the facility is subject to or any pollutant listed in the facility's NPDES permit for its process wastewater (if the facility is operating under an existing NPDES permit). Complete one table for each outfall. See the instructions for additional details and requirements.

| Pollutant and CAS Number *(if available)* | Maximum Values *(include units)* | | Average Values *(include units)* | | Number of Storm Events Sampled | Sources of Pollutants |
|---|---|---|---|---|---|---|
| | Grab Sample Taken During First 20 Minutes * | Flow-Weighted Composite * | Grab Sample Taken During First 20 Minutes | Flow-Weighted Composite | | |
| Copper | -- | <10 µg/l | | | 1 | |



*Grab sample set was inadvertently omitted during event. Composite sample is considered representative of discharge.

Part C - List each pollutant shown in Table 2F-2, 2F-3, and 2F-4 that you know or have reason to believe is present. See the instructions for additional details and requirements. Complete one table for each outfall.

| Pollutant and CAS Number *(if available)* | Maximum Values *(include units)* | | Average Values *(include units)* | | Number of Storm Events Sampled | Sources of Pollutants |
|---|---|---|---|---|---|---|
| | Grab Sample Taken During First 20 Minutes | Flow-Weighted Composite | Grab Sample Taken During First 20 Minutes | Flow-Weighted Composite | | |
| N/A | | | | | | |
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Part D – Provide data for the storm event(s) which resulted in the maximum values for the flow weighted composite sample.

| 1. Date of Storm Event | 2. Duration of Storm Event *(in minutes)* | 3. Total rainfall during storm event *(in inches)* | 4. Number of hours between beginning of storm measured and end of previous measurable rain event | 5. Maximum flow rate during rain event *(gallons/minute or specify units)* | 6. Total flow from rain event *(gallons or specify units)* |
|---|---|---|---|---|---|
| 6-18-14 | 110 | 0.56 | 245 | 123* | 13,545** |

7. Provide a description of the method of flow measurement or estimate.

* Average flow estimate based on storm event duration and total flow.

** Total flow estimate based on estimated drainage areas.

## VII. Discharge information *(Continued from page 3 of Form 2F)*

Part A – You must provide the results of at least one analysis for every pollutant in this table. Complete one table for each outfall. See instructions for additional details.

| Pollutant and CAS Number *(if available)* | Maximum Values *(include units)* | | Average Values *(include units)* | | Number of Storm Events Sampled | Sources of Pollutants |
|---|---|---|---|---|---|---|
| | Grab Sample Taken During First 20 Minutes * | Flow-Weighted Composite * | Grab Sample Taken During First 20 Minutes | Flow-Weighted Composite | | |
| Oil and Grease | <5.1 mg/l | N/A | | | 1 | |
| Biological Oxygen Demand (BOD5) | -- | 13 mg/l | | | 1 | |
| Chemical Oxygen Demand (COD) | -- | 13 mg/l | | | 1 | |
| Total Suspended Solids (TSS) | -- | 10 mg/l | | | 1 | |
| Total Nitrogen | -- | <0.50 mg/l | | | 1 | |
| Total Phosphorus | -- | 0.06 mg/l | | | 1 | |
| pH | Minimum 8.19 | Maximum 8.19 | Minimum | Maximum | 1 | |

Part B – List each pollutant that is limited in an effluent guideline which the facility is subject to or any pollutant listed in the facility's NPDES permit for its process wastewater (if the facility is operating under an existing NPDES permit). Complete one table for each outfall. See the instructions for additional details and requirements.

| Pollutant and CAS Number *(if available)* | Maximum Values *(include units)* | | Average Values *(include units)* | | Number of Storm Events Sampled | Sources of Pollutants |
|---|---|---|---|---|---|---|
| | Grab Sample Taken During First 20 Minutes * | Flow-Weighted Composite * | Grab Sample Taken During First 20 Minutes | Flow-Weighted Composite | | |
| Copper | -- | <10 µg/l | | | 1 | |



*Grab sample set was inadvertently omitted during event. Composite sample is considered representative of discharge.

Continued from the Front

Part C - List each pollutant shown in Table 2F-2, 2F-3, and 2F-4 that you know or have reason to believe is present. See the instructions for additional details and requirements. Complete one table for each outfall.

| Pollutant and CAS Number *(if available)* | Maximum Values *(include units)* | | Average Values *(include units)* | | Number of Storm Events Sampled | Sources of Pollutants |
|---|---|---|---|---|---|---|
| | Grab Sample Taken During First 20 Minutes | Flow-Weighted Composite | Grab Sample Taken During First 20 Minutes | Flow-Weighted Composite | | |
| N/A | | | | | | |
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Part D – Provide data for the storm event(s) which resulted in the maximum values for the flow weighted composite sample.

| 1. Date of Storm Event | 2. Duration of Storm Event *(in minutes)* | 3. Total rainfall during storm event *(in inches)* | 4. Number of hours between beginning of storm measured and end of previous measurable rain event | 5. Maximum flow rate during rain event *(gallons/minute or specify units)* | 6. Total flow from rain event *(gallons or specify units)* |
|---|---|---|---|---|---|
| 6-18-14 | 110 | 0.56 | 245 | 4* | 467** |

7. Provide a description of the method of flow measurement or estimate.

* Average flow estimate based on storm event duration and total flow.

** Total flow estimate based on estimated drainage areas.

EPA ID Number (*copy from Item 1 of Form 1*)
3IB00002*KD Outfall #8

Form Approved. OMB No. 2040-0086
Approval expires 5-31-92

## VII. Discharge information *(Continued from page 3 of Form 2F)*

Part A – You must provide the results of at least one analysis for every pollutant in this table. Complete one table for each outfall. See instructions for additional details.

| Pollutant and CAS Number *(if available)* | Maximum Values *(include units)* | | Average Values *(include units)* | | Number of Storm Events Sampled | Sources of Pollutants |
|---|---|---|---|---|---|---|
| | Grab Sample Taken During First 20 Minutes * | Flow-Weighted Composite * | Grab Sample Taken During First 20 Minutes | Flow-Weighted Composite | | |
| Oil and Grease | <5.0 mg/l | N/A | | | 1 | |
| Biological Oxygen Demand (BOD5) | -- | 14 mg/l | | | 1 | |
| Chemical Oxygen Demand (COD) | -- | 120 mg/l | | | 1 | |
| Total Suspended Solids (TSS) | -- | 220 mg/l | | | 1 | |
| Total Nitrogen | -- | 3.31 mg/l | | | 1 | |
| Total Phosphorus | -- | 0.28 mg/l | | | 1 | |
| pH | Minimum 7.55 | Maximum 7.55 | Minimum | Maximum | 1 | |

Part B – List each pollutant that is limited in an effluent guideline which the facility is subject to or any pollutant listed in the facility's NPDES permit for its process wastewater (if the facility is operating under an existing NPDES permit). Complete one table for each outfall. See the instructions for additional details and requirements.

| Pollutant and CAS Number *(if available)* | Maximum Values *(include units)* | | Average Values *(include units)* | | Number of Storm Events Sampled | Sources of Pollutants |
|---|---|---|---|---|---|---|
| | Grab Sample Taken During First 20 Minutes * | Flow-Weighted Composite * | Grab Sample Taken During First 20 Minutes | Flow-Weighted Composite | | |
| Copper | -- | 22 µg/l | | | 1 | |



*Grab sample set was inadvertently omitted during event. Composite sample is considered representative of discharge.

Part C - List each pollutant shown in Table 2F-2, 2F-3, and 2F-4 that you know or have reason to believe is present. See the instructions for additional details and requirements. Complete one table for each outfall.

| Pollutant and CAS Number *(if available)* | Maximum Values *(include units)* | | Average Values *(include units)* | | Number of Storm Events Sampled | Sources of Pollutants |
|---|---|---|---|---|---|---|
| | Grab Sample Taken During First 20 Minutes | Flow-Weighted Composite | Grab Sample Taken During First 20 Minutes | Flow-Weighted Composite | | |
| N/A | | | | | | |
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Part D – Provide data for the storm event(s) which resulted in the maximum values for the flow weighted composite sample.

| 1. Date of Storm Event | 2. Duration of Storm Event *(in minutes)* | 3. Total rainfall during storm event *(in inches)* | 4. Number of hours between beginning of storm measured and end of previous measurable rain event | 5. Maximum flow rate during rain event *(gallons/minute or specify units)* | 6. Total flow from rain event *(gallons or specify units)* |
|---|---|---|---|---|---|
| 6-18-14 | 110 | 0.56 | 245 | 71* | 7,784** |

7. Provide a description of the method of flow measurement or estimate.

* Average flow estimate based on storm event duration and total flow.

** Total flow estimate based on estimated drainage areas.

EPA ID Number (*copy from Item 1 of Form 1*)
3IB00002*KD Outfall #10

Form Approved. OMB No. 2040-0086
Approval expires 5-31-92

## VII. Discharge information *(Continued from page 3 of Form 2F)*

Part A – You must provide the results of at least one analysis for every pollutant in this table. Complete one table for each outfall. See instructions for additional details.

| Pollutant and CAS Number *(if available)* | Maximum Values *(include units)* | | Average Values *(include units)* | | Number of Storm Events Sampled | Sources of Pollutants |
|---|---|---|---|---|---|---|
| | Grab Sample Taken During First 20 Minutes * | Flow-Weighted Composite * | Grab Sample Taken During First 20 Minutes | Flow-Weighted Composite | | |
| Oil and Grease | <5.2 mg/l | N/A | | | 1 | |
| Biological Oxygen Demand (BOD5) | -- | 13 mg/l | | | 1 | |
| Chemical Oxygen Demand (COD) | -- | 180 mg/l | | | 1 | |
| Total Suspended Solids (TSS) | -- | 180 mg/l | | | 1 | |
| Total Nitrogen | -- | 3.15 mg/l | | | 1 | |
| Total Phosphorus | -- | 0.37 mg/l | | | 1 | |
| pH | Minimum 7.01 | Maximum 7.01 | Minimum | Maximum | 1 | |

Part B – List each pollutant that is limited in an effluent guideline which the facility is subject to or any pollutant listed in the facility's NPDES permit for its process wastewater (if the facility is operating under an existing NPDES permit). Complete one table for each outfall. See the instructions for additional details and requirements.

| Pollutant and CAS Number *(if available)* | Maximum Values *(include units)* | | Average Values *(include units)* | | Number of Storm Events Sampled | Sources of Pollutants |
|---|---|---|---|---|---|---|
| | Grab Sample Taken During First 20 Minutes * | Flow-Weighted Composite * | Grab Sample Taken During First 20 Minutes | Flow-Weighted Composite | | |
| Copper | -- | 14 µg/l | | | 1 | |



*Grab sample set was inadvertently omitted during event. Composite sample is considered representative of discharge.

Continued from the Front

Part C - List each pollutant shown in Table 2F-2, 2F-3, and 2F-4 that you know or have reason to believe is present. See the instructions for additional details and requirements. Complete one table for each outfall.

| Pollutant and CAS Number *(if available)* | Maximum Values *(include units)* | | Average Values *(include units)* | | Number of Storm Events Sampled | Sources of Pollutants |
|---|---|---|---|---|---|---|
| | Grab Sample Taken During First 20 Minutes | Flow-Weighted Composite | Grab Sample Taken During First 20 Minutes | Flow-Weighted Composite | | |
| N/A | | | | | | |
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Part D – Provide data for the storm event(s) which resulted in the maximum values for the flow weighted composite sample.

| 1. Date of Storm Event | 2. Duration of Storm Event *(in minutes)* | 3. Total rainfall during storm event *(in inches)* | 4. Number of hours between beginning of storm measured and end of previous measurable rain event | 5. Maximum flow rate during rain event *(gallons/minute or specify units)* | 6. Total flow from rain event *(gallons or specify units)* |
|---|---|---|---|---|---|
| 6-18-14 | 110 | 0.56 | 245 | 298* | 32,727** |

7. Provide a description of the method of flow measurement or estimate.

* Average flow estimate based on storm event duration and total flow.

** Total flow estimate based on estimated drainage areas.

EPA ID Number (*copy from Item 1 of Form 1*)
3IB00002*KD Outfall 002

Form Approved. OMB No. 2040-0086
Approval expires 5-31-92

## VII. Discharge information *(Continued from page 3 of Form 2F)*

Part A – You must provide the results of at least one analysis for every pollutant in this table. Complete one table for each outfall. See instructions for additional details.

| Pollutant and CAS Number *(if available)* | Maximum Values *(include units)* | | Average Values *(include units)* | | Number of Storm Events Sampled | Sources of Pollutants |
|---|---|---|---|---|---|---|
| | Grab Sample Taken During First 20 Minutes * | Flow-Weighted Composite * | Grab Sample Taken During First 20 Minutes | Flow-Weighted Composite | | |
| Oil and Grease | <5.1 mg/l | N/A | | | 1 | |
| Biological Oxygen Demand (BOD5) | -- | <4.0 mg/l** | | | 1 | |
| Chemical Oxygen Demand (COD) | -- | <10 mg/l | | | 1 | |
| Total Suspended Solids (TSS) | -- | 4.4 mg/l | | | 1 | |
| Total Nitrogen | -- | 0.38 mg/l | | | 1 | |
| Total Phosphorus | -- | 0.04 mg/l | | | 1 | |
| pH | Minimum 8.10 | Maximum 8.10 | Minimum | Maximum | 1 | |

Part B – List each pollutant that is limited in an effluent guideline which the facility is subject to or any pollutant listed in the facility's NPDES permit for its process wastewater (if the facility is operating under an existing NPDES permit). Complete one table for each outfall. See the instructions for additional details and requirements.

| Pollutant and CAS Number *(if available)* | Maximum Values *(include units)* | | Average Values *(include units)* | | Number of Storm Events Sampled | Sources of Pollutants |
|---|---|---|---|---|---|---|
| | Grab Sample Taken During First 20 Minutes * | Flow-Weighted Composite * | Grab Sample Taken During First 20 Minutes | Flow-Weighted Composite | | |
| Copper | -- | <10 µg/l | | | 1 | |
| Iron | -- | 87 µg/l | | | 1 | |



*Grab sample set was inadvertently omitted during event. Composite sample is considered representative of discharge.
** Estimate. Received and analyzed outside of standard hold time requirements.

Continued from the Front

Part C - List each pollutant shown in Table 2F-2, 2F-3, and 2F-4 that you know or have reason to believe is present. See the instructions for additional details and requirements. Complete one table for each outfall.

| Pollutant and CAS Number *(if available)* | Maximum Values *(include units)* | | Average Values *(include units)* | | Number of Storm Events Sampled | Sources of Pollutants |
|---|---|---|---|---|---|---|
| | Grab Sample Taken During First 20 Minutes | Flow-Weighted Composite | Grab Sample Taken During First 20 Minutes | Flow-Weighted Composite | | |
| N/A | | | | | | |
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Part D – Provide data for the storm event(s) which resulted in the maximum values for the flow weighted composite sample.

| 1. Date of Storm Event | 2. Duration of Storm Event *(in minutes)* | 3. Total rainfall during storm event *(in inches)* | 4. Number of hours between beginning of storm measured and end of previous measurable rain event | 5. Maximum flow rate during rain event *(gallons/minute or specify units)* | 6. Total flow from rain event *(gallons or specify units)* |
|---|---|---|---|---|---|
| 6-8-14 | 175 | 0.25 | 420 | 210* | 36,770** |

7. Provide a description of the method of flow measurement or estimate.

* Average flow estimate based on storm event duration and total flow.

** Total flow estimate based on estimated drainage areas.

EPA ID Number (*copy from Item 1 of Form 1*)
3IB00002*KD Outfall 004

Form Approved. OMB No. 2040-0086
Approval expires 5-31-92

## VII. Discharge information *(Continued from page 3 of Form 2F)*

Part A – You must provide the results of at least one analysis for every pollutant in this table. Complete one table for each outfall. See instructions for additional details.

| Pollutant and CAS Number *(if available)* | Maximum Values *(include units)* | | Average Values *(include units)* | | Number of Storm Events Sampled | Sources of Pollutants |
|---|---|---|---|---|---|---|
| | Grab Sample Taken During First 20 Minutes * | Flow-Weighted Composite * | Grab Sample Taken During First 20 Minutes | Flow-Weighted Composite | | |
| Oil and Grease | <5.1 mg/l | N/A | | | 1 | |
| Biological Oxygen Demand (BOD5) | -- | <4.0 mg/l** | | | 1 | |
| Chemical Oxygen Demand (COD) | -- | <10 mg/l | | | 1 | |
| Total Suspended Solids (TSS) | -- | 2.4 mg/l | | | 1 | |
| Total Nitrogen | -- | 0.66 mg/l | | | 1 | |
| Total Phosphorus | -- | <0.04 mg/l | | | 1 | |
| pH | Minimum 7.71 | Maximum 7.71 | Minimum | Maximum | 1 | |

Part B – List each pollutant that is limited in an effluent guideline which the facility is subject to or any pollutant listed in the facility's NPDES permit for its process wastewater (if the facility is operating under an existing NPDES permit). Complete one table for each outfall. See the instructions for additional details and requirements.

| Pollutant and CAS Number *(if available)* | Maximum Values *(include units)* | | Average Values *(include units)* | | Number of Storm Events Sampled | Sources of Pollutants |
|---|---|---|---|---|---|---|
| | Grab Sample Taken During First 20 Minutes * | Flow-Weighted Composite * | Grab Sample Taken During First 20 Minutes | Flow-Weighted Composite | | |
| Copper | -- | <10 µg/l | | | 1 | |



*Grab sample set was inadvertently omitted during event. Composite sample is considered representative of discharge.
** Estimate. Received and analyzed outside of standard hold time requirements.

Part C - List each pollutant shown in Table 2F-2, 2F-3, and 2F-4 that you know or have reason to believe is present. See the instructions for additional details and requirements. Complete one table for each outfall.

| Pollutant and CAS Number *(if available)* | Maximum Values *(include units)* | | Average Values *(include units)* | | Number of Storm Events Sampled | Sources of Pollutants |
|---|---|---|---|---|---|---|
| | Grab Sample Taken During First 20 Minutes | Flow-Weighted Composite | Grab Sample Taken During First 20 Minutes | Flow-Weighted Composite | | |
| N/A | | | | | | |
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Part D – Provide data for the storm event(s) which resulted in the maximum values for the flow weighted composite sample.

| 1. Date of Storm Event | 2. Duration of Storm Event *(in minutes)* | 3. Total rainfall during storm event *(in inches)* | 4. Number of hours between beginning of storm measured and end of previous measurable rain event | 5. Maximum flow rate during rain event *(gallons/minute or specify units)* | 6. Total flow from rain event *(gallons or specify units)* |
|---|---|---|---|---|---|
| 6-8-14 | 175 | 0.25 | 420 | 37* | 6,564** |

7. Provide a description of the method of flow measurement or estimate.

* Average flow estimate based on storm event duration and total flow.

** Total flow estimate based on estimated drainage areas.

# MSDS FOR CHEMICAL ADDITIVES

| AVON LAKE GENERATING STATION<br>CHEMICAL ADDITIVES LIST | | | |
|---|---|---|---|
| **NO.** | **CHEMICAL** | **USE** | **STORAGE LOCATION** |
| | | | |
| 1 | AMMONIA 19% | BOILER PH CONTROL | 5676 GAL BULK OUTSIDE STORAGE TANK LOCATED IN TRANSFORMER YARD |
| | | | |
| 2A | SODIUM HYDROXIDE (CAUSTIC) | REGENERATION OF CONDENSATE POLISHER RESINS & PH ADJUST MENT ON NEUTRALIZATION TANK | 4,000 GAL AUX. BULK STORAGE TANK<br>5,000 GAL MAIN BULK STORAGE TANK<br>UNIT 9 SOUTHSIDE |
| 2B | SODIUM HYDROXIDE (CAUSTIC) | NON-CHEMICAL METAL CLEANING WASTEWATER PH ADJUSTMENT | 250-GAL TOTES IN PACKAGE BOILER ROOM |
| | | | |
| 3 | SULFURIC ACID | REGENERATION OF CONDENSATE POLISHER RESINS & PH ADJUST MENT ON NEUTRALIZATION TANK | 5,000 GAL BULK OUTSIDE STORAGE TANK LOCATED IN TRANSFORMER YARD |
| | | | |
| 4 | COARSE SOLAR SALT | R/O SOFTENER REGENERATION | 30 TON BULK OUTSIDE STORAGE TANK LOCATED IN TRANSFORMER YARD |
| | | | |
| 5 | AS-2821 POLYMER | ASH POND TSS TREATMENT | 200 GALLON TOTES, UNIT 7 ID FAN HOUSE |
| | | | |
| 6 | AS-1012 POLYMER | COAL PILE RUNOFF POND TREATMENT | 50 LB. BAGS, CPRO TREATMENT BUILDING |
| | | | |
| 7A | LIME | COAL PILE RUNOFF POND TREATMENT | BULK LIME SILO, CPRO TREATMENT BUILDING |
| 7B | LIME | OILY POND PH CONTROL | 50 LB BAGS IN STORAGE SHED |
| 7C | LIME | ASH BASIN PH CONTROL | 50 LB BAGS IN STORAGE SHED |
| | | | |
| 8 | MEKOR 6701 CORROSION INHIBITOR | FEEDWATER TREATMENT, UNIT 7 BOILER | 120 GALLON TOTES, UNIT 7 TURBINE BASEMENT SOUTHSIDE |
| | | | |
| 9 | SLCC-D | PH CONTROL, UNIT 7 BOILER | 120 GALLON TOTES, UNIT 7 TURBINE BASEMENT SOUTHSIDE |
| | | | |
| 10A | SODIUM BISULFATE | OILY POND PH CONTROL | 50 LB BAGS IN STORAGE SHED |
| 10B | SODIUM BISULFATE | ASH POND PH CONTROL | 50 LB BAGS IN STORAGE SHED |
| | | | |

| AVON LAKE GENERATING STATION<br>CHEMICAL ADDITIVES LIST | | | |
|---|---|---|---|
| **NO.** | **CHEMICAL** | **USE** | **STORAGE LOCATION** |
| 11 | SODIUM BISULFITE | DECHLORINATION OF R/O FEED | 50 LB BAGS |
| | | | |
| 12 | TRISODIUM PHOSPHATE | UNIT 7 BOILER TREATMENT | 50 LB BAGS |
| | | | |
| 13A | CHLORINE | CHLORINATION OF FEEDWATER FOR NON-CONTACT COOLING | (NOT CURRENTLY STORED ON SITE) |
| 13B | CHLORINE | UNIT 9 MAIN TURBINE OIL COOLER | (NOT CURRENTLY STORED ON SITE) |
| | | | |
| 14 | SOIL-SEMENT | CRUSTING AGENT FOR COAL PILE | (NOT CURRENTLY STORED ON SITE – APPLIED BY CONTRACTOR) |
| | | | |
| 15 | HAUL ROAD DUST CONTROL | DUST SUPRESSANT FOR COAL PILE AREA AND HAUL ROAD | 55-GAL DRUMS NEAR BEARING SEAL WATER TANK |
| | | | |
| 16 | HALOKLEAR™ LBP-2101 | NON-CHEMICAL METAL CLEANING WASTEWATER FLOCCULATION AND CLARIFICATION | (NOT CURRENTLY STORED ON SITE – CONTRACTOR SUPPLIES IN 250-GAL TOTE) |
| | | | |
| 17 | HALOKLEAR™ LIQUIFLOC 2% | NON-CHEMICAL METAL CLEANING WASTEWATER FLOCCULATION | 250-GAL TOTE IN PACKAGE BOILER ROOM |
| | | | |
| 18 | ANODAMINE™ HPFG | CORROSION PROTECTION DURING LAYUP OF BOILER | 250-GAL TOTES IN UNIT 7 TURBINE BASIN |

# MATERIAL SAFETY DATA SHEET

Manufactured exclusively in the USA using
locally manufactured and supplied raw materials

Date Issued: 5/24/2013
Revised: 24 May 2013
MSDS Ref.
No: MSDS-USA-05-24-HPFG+
Revision No: 20 New MSDS original.

## 1. PRODUCT AND COMPANY IDENTIFICATION

**GENERAL USE**: High Pressure Boiler Metal Passivation Scale and Corrosion Inhibition.
**PRODUCT DESCRIPTION**: Proprietary non-toxic mixture of surface-active polyamines.
**PRODUCT CODE**: anodamine™ **HPFG+** proprietary blend.
**PRODUCT FORMULATION NAME**: anodamine™ **HPFG+**
**CHEMICAL FAMILY**: Surface active amines.
**MOLECULAR FORMULA**: Proprietary

## 2. COMPOSITION / INFORMATION OF INGREDIENTS

| Chemical Name | Wt. % | CAS # | EINECS # |
|---|---|---|---|
| Typical CAS components (unknown) | Proprietary Non Toxic Components | | |

## 3. HAZARDS IDENTIFICATION

**EMERGENCY OVERVIEW**
**PHYSICAL APPEARANCE**: Clear to colorless organic liquid with limited odor.
**IMMEDIATE CONCERNS:** None.

**POTENTIAL HEALTH EFFECTS**
**EYES:** Expected to cause mild irritation to the eyes with exposed contact.
**SKIN**: May cause mild irritation to the skin of some.
**SKIN ABSORPTION**: None expected.
**INGESTION:** May cause mild irritation to the digestive tract if ingested in small quantities.
**INHALATION:** No irritation to the lungs, upper respiratory tract and nose with extended exposure.
**ACUTE TOXICITY**: No test data is available for acute dermal toxicity.
No test data is available for acute ingestion toxicity.

## 4. FIRST AID MEASURES

**EYES**: Immediately flush eyes with plenty of water for two to three minutes. Remove any contact lenses and continue flushing for 15 minutes. Get medical attention.

**SKIN**: Remove contaminated clothing including shoes and immediately wash affected area with plenty of soap and water. Wash contaminated clothing and shoes before reuse.

**INGESTION**: Wash out mouth with water. Seek medical attention.

**INHALATION:** No affects or symptoms are expected when handling the product. No respiratory PPE is required.

ORIGINAL

**ADDITIONAL INFORMATION**: None.

**COMMENTS:** None.

## 5. FIRE FIGHTING MEASURES

**FLASHPOINT AND METHOD**: None Expected.

**FLAMMABLE LIMITS**: None flammable.

**AUTOIGNITION TEMPERATURE**: None

## 6. ACCIDENTAL RELEASE MEASURES

**SMALL SPILL**: The HPFG has an LD50 of 89,500 mg/kg, accordingly small leaks of less than 100 lt can be diluted with water and washed with no known risk to the waterways or alternatively, spilt material can be absorbed on to absorbent materials and discarded without regulations at appropriate waste disposal facilities according to current applicable local laws and regulations.

**LARGE SPILL**: Good practice would dictate that large spills should be absorbed on to absorbent materials and discarded without regulations at appropriate waste disposal facilities according to current applicable local laws and regulations.

**ENVIRONMENTAL PRECAUTIONS**

**WATER SPILL**:
This material will not cause adverse environmental impact if it reaches waterways. The material is considered as NON-HAZARDOUS to the aquatic environment.

**LAND SPILL**: None

**AIR SPILL**: None known.

**GENERAL PROCEDURES**: Absorb material, shovel up and dispose of at an appropriate waste disposal facility according to current applicable laws and regulations, and product characteristics at time of disposal.

**RELEASE NOTES**:
This material will not cause adverse environmental impact if it reaches waterways. The material is considered as NON-HAZARDOUS to the aquatic environment.
In case of accident or road spill notify: CHEMTREC in USA at 800-424-9300 CANUTEC in Canada at 613-996-6666 CHEMTREC, other countries, at (International code) +1 703 527 3887
**SPECIAL PROTECTIVE EQUIPMENT:** CHEMTREC in USA at 800-424-9300 CANUTEC in Canada at 613-996-6666 CHEMTREC, other countries, at (International code) +1 703 527 3887
**COMMENTS:** See Section 13 for disposal information and Section 15 for regulatory requirements. Large and small spills may have a broad definition depending on the user's handling system. Therefore technically qualified personnel must define the spill category at the point of release.

ORIGINAL

## 7. HANDLING AND STORAGE

**GENERAL PROCEDURES:** Store the product out of direct sun and ideally under roof. Storage of the product at temperatures > 33 °F (freeze protection) or < 180 °F typically ensure a useable shelf life of 3 – 5 years. Even after freezing, thawing allows re-use of the product without limitations.

**HANDLING**: Use appropriate personal protective equipment as specified in Section 8. Handle and use in a manner consistent with good industrial/manufacturing techniques and responsible chemical handling practices.

**STORAGE:** Store in unopened containers under cool and dry conditions.

**STORAGE TEMPERATURE**: Ambient conditions. Avoid extended exposure to direct sun with open containers. There is no known product degradation during exposure to these storage conditions.

**LOADING TEMPERATURE**: NA = Not Applicable

## 8. EXPOSURE CONTROLS / PERSONAL PROTECTION

**EXPOSURE GUIDELINES**:

**OSHA HAZARDOUS COMPONENTS (29 CFR 1910.1200)**

**Toxicological results for bioassays on corrosion inhibitor amodamine HPFG.**

| *Investigative Species* | *Observations* |
|---|---|
| | **LC50** |
| Daphnia Pulex<br>48 hour | **89,531.36 ppm**<br>95 % Lower Confidence Limit: 86,079.85 ppm<br>95 % Upper Confidence Limit: 93,121.27 ppm |
| Pimephales Promelas<br>96 hour | **49,210.46 ppm**<br>95 % Lower Confidence Limit: 55,755.86 ppm<br>95 % Upper Confidence Limit: 43,433.46 ppm |

Environmental Protection Agency's Trimmed Spearman-Karber statistical program was used to analyze all data.
The 48-Hour LC-50 (concentration at which 50% mortality is expected to occur) for amodamine™ HPFG, Daphnia pulex survival data, was calculated by the Spearman- Karber program, as 89,531.36 ppm.
The 96-Hour LC-50 (concentration at which 50% mortality is expected to occur) for amodamine™ HPFG, Pimephales promelas survival data, was calculated by the Spearman-Karber program, as 49,210.46 ppm.
Both the lethal and sub-lethal endpoints were statistically calculated according to their respective EPA guidelines. The Chronic Freshwater organisms were calculated according to EPA-821-R-02-013, October 2002 Fourth Edition. The Chronic Marine and Estuarine organisms were calculated according to EPA-821-R-02-014, October 2002 Third Edition. The Acute Freshwater and Marine organisms were calculated according to EPA-821-R-02-012, October 2002 Fifth Edition.

**ENGINEERING CONTROLS**: Normal ventilation is required when handling or using this material.

**PERSONAL PROTECTIVE EQUIPMENT**

**EYES AND FACE**: Wear safety glasses with side shields or goggles when handling this material.

**SKIN**: Wear basic nitrile or latex disposable protective gloves.

**RESPITORY**: No special precautions are necessary under normal operating conditions and with adequate ventilation.

**PROTECTIVE CLOTHING**: None

**WORK HYGIENIC PRACTICES**: Good Personal hygiene practices should always be followed.

**OTHER USE PRECAUTIONS:** None known.

## 9. PHYSICAL AND CHEMICAL PROPERTIES

| | |
|---|---|
| **PHYSICAL STATE:** | Liquid |
| **ODOR:** | Trace smell of amine |
| **APPEARANCE:** | Clear liquid, depending on age/concentration slight straw color. |
| **COLOR:** | Colorless |
| **pH:** | ~ 6.0 |
| **PERCENT VOLATILE:** | ~ 1 % of non hazardous active in water steam phase at > 250°C |
| **BOILING POINT:** | similar to water |
| **SPECIFIC GRAVITY:** | 0.98 |

## 10. STABILITY AND REACTIVITY

**STABLE:** YES
**HAZARDOUS POLYMERIZATION:** NO
**CONDITIONS TO AVOID:** None
**STABILITY:** The product is stable under normal ambient conditions of temperature and pressure.
**POLYMERIZATION:** None
**HAZARDOUS DECOMPOSITION PORDUCTS:** At temperatures above 600°C decomposition products in the presence of oxygen may include trace quantities of carbon dioxide.

**INCOMPATIBLE MATERIALS:** Strong Acids.

**COMMENTS:** None Expected

## 11. TOXICOLOGICAL INFORMATION

**ACUTE**

DERMAL $LD_{50}$: ~ 90,000 Dermal LD50 (rabbit) = 90,000 mg/kg

**EYE EFFECTS:** This material is not expected to cause significant irritation to the eyes.

**SKIN EFFECTS:** This material is not expected to cause significant irritation to the skin.

## 12. ECOLOGICAL INFORMATION

**ENVIRONMENTAL DATA:** This material will not cause adverse environmental impact if it reaches waterways. The material is considered as NON-HAZARDOUS to the aquatic environment.

**ECOTOXICOLOGICAL INFORMATION:**

**Acute toxicity test in *Daphnia sp.* (OECD 202, 2004)**
It was established, Environmental Protection Agency's Trimmed Spearman-Karber statistical program was used to analyze all data. The 48-Hour LC-50 (concentration at which 50% mortality is expected to occur) for ɑnodɑmine™ HPFG, Daphnia pulex survival data, was calculated by the Spearman- Karber program, as 89,531.36 ppm. The 96-Hour LC-50 (concentration at which 50% mortality is expected to occur) for ɑnodɑmine™ HPFG, Pimephales promelas survival data, was calculated by the Spearman-Karber program,

ORIGINAL

as 49,210.46 ppm, for the corrosion inhibitor sample [redacted] HPFG food grade was **well above 100 mg/L, therefore the sample is classified as NON-HAZARDOUS to the aquatic environment**.
Other information:
Biological Degradability: >554% ($BSB_{12}$/CSB*100), product may be slightly retained by silicate containing soil.
Class of Water Endangerment: 1 (self classification): slight danger to water

**DISTRIBUTION:** The material is readily biodegradable based on a 28-day study with oxygen depletion of at least 90% of the theoretical maxima.

**CHEMICAL FATE INFORMATION**: Class of Water Endangerment: 1 (self classification): slight danger to water.

**COMMENTS:** Information based upon data for an equivalent product and analog.

## 13. DISPOSAL CONSIDERATIONS

**DISPOSAL METHOD**: Dispose of waste at an appropriate waste disposal facility according to current applicable laws and regulations.

**FOR LARGE SPILLS**: This material will not cause adverse environmental impact if it reaches waterways.

**PRODUCT DISPOSAL**: Collect in appropriate containers. Dispose of at an appropriate waste disposal facility in accordance with current applicable laws and regulation, and product characteristics at time of disposal.

**EMPTY CONTAINER**: Triple rinse (or equivalent) all containers and offer for recycling or reconditioning, or punctures and disposes of in a sanitary landfill or other procedures approved by state and local authorities.

**RCRA/EPA WASTE INFORMATION**: NA

**RCRA HAZARD CLASS**: None Expected

## 14. TRANSPORTATION INFORMATION

| | |
|---|---|
| **DOT (DEPARTMENT OF TRANSPORTATION)** | |
| **TECHNICAL NAME**: | Proprietary Formulation. |
| **PRIMARY HAZARD CLASS/DIVISION**: | Non-Hazardous Material. |
| **LABEL**: | N/A |
| **MARINE POLLUTANT #1**: | None Expected |
| **MARINE POLLUTANT #2:** | No Data Available Contact Env. Dept. |
| **OTHER SHIPPING INFORMATION**: | Not a regulated material. |
| Road Transport ADR/RID and GGVS/GGVE: | Non-dangerous goods |
| Sea Transport IMDG/GGVSee: | Non-dangerous goods |
| Air Transport ICAO-TI and IATA-DGR: | Non-dangerous goods |

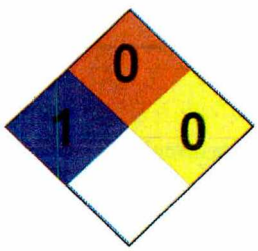
## 15. REGULATORY INFORMATION

**UNITED STATES SARA TITLE III**
**(SUPERFUND AMENDMENTS AND REAUTHORIZATION ACT)**
**311/312 HAZARD CATEGORIES**: NA
**FIRE:** NO **PRESSURE GENERATING**: NO **REACTIVITY**: NO
**ACUTE**: NO **CHRONIC**: NO

ORIGINAL

| | |
|---|---|
| **313 REPORTABLE INGREDIENTS:** | NA |
| **TITLE III NOTES:** | NOT YET DETERMINED |
| **CERCLA (COMPREHENSIVE RESPONSE, COMPENSATION, AND LIABILITY ACT)** | |
| **CERCLA REGULATORY:** | NOT YET DETERMINED |
| **EPA** | |
| **EPA RQ INGREDIENT:** | NONE EXPECTED |
| **EPA RQ PRODUCT:** | NONE KNOWN |
| **TSCA (TOXIC SUBSTANCE CONTROL ACT)** | |
| **TSCA REGULATORY:** | NA |
| **TSCA STATUS:** | NA |

**16.** OTHER INFORMATION:




PREPARED BY: Paul R. Hattingh
INFORMATION CONTACT: Product Stewardship Analyst.
MANUFACTURER DISCLAIMER: Information given herein is offered in good faith as accurate, but without guarantee. Conditions of use and suitability of the product for particular uses are beyond our control; all risks of use of the product are therefore assumed by the user. Nothing is intended as a recommendation for uses which infringe valid patents or as extending license under valid patents. Appropriate warnings and safe handling procedures should be provided to handlers and users.

ADDITIONAL MSDS INFORMATION: The information given is based on the present state of knowledge and experience according to the law on declaration and preparation of dangerous chemicals as well as on toxicological investigations for self-classification in the class of water endangerment according the concept of self-classification of preparations.

GENERAL STATEMENTS: This product and its handling should attract sensible and good housekeeping practice, the use of PPE typical for handling of any chemicals.

**Made in America**

All anodamine™ proprietary metal surface-active protection products are exclusively manufactured in the USA using locally sourced raw materials.

Sole manufacture and distribution by anodamine™ Inc
2590 Oakmont Drive
Building 300
Round Rock Texas, 78665
Tel: + 1 (512) 244 2318
www.anodamine.com

ORIGINAL

## 1. Product And Company Identification

**Product Name: AS-1012**

**Synonyms: Anionic Water Soluble Polymer**

**Manufacturer/Supplier:**
Applied Specialties, Inc.
33555 Pin Oak Parkway
Avon Lake, OH 44012

**Customer Information Number:** 440-933-9442
Emergency 24-Hour Health/Environmental Phone: 216-973-6118

## 3. Hazards Identification

### EMERGENCY OVERVIEW

White granular solid with little to no odor

**Caution!** May cause eye and skin irritation. Aqueous solutions or powders that become wet pose an extreme slip hazard.

**HMIS –ratings (0 – 4)**

| | |
|---|---|
| HEALTH | 1 |
| FIRE | 1 |
| REACTIVITY | 0 |

0 **Minimal**
1 **Slight Hazard**
2 **Moderate Hazard**
3 **Serious Hazard**
4 **Severe Hazard**

**TARGET ORGANS** - Eyes, Skin,
**ROUTES OF ENTRY INTO BODY** - Skin or Eye Contact, Inhalation, Ingestion
**SIGNS AND SYMPTOMS OF EXPOSURE** – Direct contact may cause slight eye and skin irritation.

## 2. Chemical Composition

| Component | CAS Number | Wt% | Exposure TWA/Ceiling |
|---|---|---|---|
| Anionic water-soluble polymer | NA | | |
| No regulated components noted | NA | | |

Chemical identity of some ingredients may be withheld as confidential as permitted by 29 CFR 1910.1200 and various State right to know laws.

## 4. First Aid Measures

Eye Contact: Rinse thoroughly with plenty of water, also under the eyelids. In case of persistent skin irritation, consult a physician.

Skin Contact: Wash with soap and water to remove any chemical from skin as a precaution. In case of skin irritation, consult a physician.

Inhalation: No hazards which require special first aid measures.

Ingestion: No hazards which require special first aid measures. The product is not considered toxic based on studies on laboratory animals

## 5. Fire Fighting Measures

Flash Point and Method: Not applicable
Auto Ignition Temperature: Not applicable

EXTINGUISHING MEDIA
Use carbon dioxide ($CO_2$), dry chemical, foam, water, water spray or agents suitable for surrounding fire. Aqueous solutions or powders that become wet pose an extreme slip hazard.

General Hazard
Spills are a slip hazard! Keep upwind. Avoid breathing dust, vapors, and fumes. Keep material out of water sources and sewers.

Fire Fighting Equipment
No special protective equipment required.

## 6. Accidental Release Measures

Prevent access to the spill area. No special precautions required. Spilled material is a slip hazard when wet. If spilled, take the following steps:

1. Ventilate the spill area. Do Not Flush with water.
2. Clean up promptly by sweeping or vacuuming.
3. Keep in suitable and closed containers for disposal.
4. After cleaning, flush away traces with water. Discard any vacuumed material and the absorbent material in accordance to all FEDERAL, STATE AND LOCAL REGULATIONS.

NOTE: DO NOT wash or pour into any surface waters or streams or directly into sewers.

## 7. Handling And Storage

Handling
Avoid direct contact with skin and eyes. Avoid dust formation. Do not breathe dust. Use with adequate ventilation. Practice good industrial hygiene. Wash after handling and before eating, drinking, or smoking.

Storage
Keep container tightly closed when not in use. Containers should be stored in a cool, dry place (0°-35°C) with labels visible.

## 8. Exposure Controls/Personal Protection

Engineering Controls
No exposure limits noted for ingredients(s).
Use engineering. Local exhaust ventilation may be necessary for some operations if dusting occurs. Natural ventilation is adequate in absence of dusts.

Personal Protection

| | |
|---|---|
| **Respirator** | Dust safety masks are recommended where concentration of total dust is more than 10 $mg/m^3$. |
| **Eye Protection** | Wear chemical safety glasses with side shields. Do not wear contact lenses where this product is used. |
| **Gloves** | Wear chemically impervious gloves. Rubber is recommended. Consider all various work functions to be done when selecting the appropriate gloves. |
| **Clothing** | Use protective clothing chemically resistant to this material. Selection of specific items such as face shield, boots, apron, or full body suit will depend on the task. Chemical resistant apron or protective suit if splashing or repeated contact with solution is likely. |
| **Other** | Eye wash and safety showers should be in immediate work area, practice good industrial hygiene |

Recommendations: Handle in accordance with good industrial hygiene and safety practice. Wash hands before breaks and at the end of the workday.

## 9. Physical And Chemical Properties

| | |
|---|---|
| **Appearance** | White granular solid |
| **Odor** | None |
| **Boiling Point** | Not available |
| **Melting Point** | Not available |
| **Flash Point** | Not applicable |
| **Vapor Pressure** | Not available |
| **Bulk Density** | 0.80 |
| **Viscosity** | Not available |
| **Percent Volatile (% by Wt.)** | Not available |
| **Evaporation Rate** | Not available |
| **Volatile Organic Content** | Not available |
| **Specific Gravity** | Not available |
| **Product pH** | 4 – 9 @ 5 g/l |
| **Saturation in Air (% by Vol.)** | Not available |
| **Solubility in Water** | Completely miscible |
| **Flammable Limits (% by Vol.)** | Not available |
| **Autoignition Temperature** | Not applicable |
| **Decomposition Temperature** | Not available |
| **Partition coefficient (n-octanol/water)** | Not available |
| **LogPow** | ~0 |

## 10. Stability And Reactivity

| | |
|---|---|
| Stability | The product is stable |
| Hazardous Polymerization | Will not occur |
| Materials to Avoid | Oxidizing agents may cause exothermic reactions. |
| Hazardous Decomposition Products | May produce carbon oxides ($CO_x$)), nitrogen oxides ($NO_x$) |



Applied Specialties, Inc.

33555 Pin Oak Parkway, Avon Lake, OH
44012

## 11. Toxicological Information

**Acute Toxicity**

| | | |
|---|---|---|
| Oral LD50 | Rat | >5,000 mg/kg |
| Dermal LD50 | | The results of testing on rabbits showed the material to be non-toxic even at high dose levels. |

**Irritation**

| | | |
|---|---|---|
| Skin | Rabbit | The results of testing on rabbits showed this material to be non-irritating to the skin |
| Eyes | | Testing conducted according to the Draize technique showed the material produces no corneal or iridial effects and only slight transitory conjunctiva effects similar to those which all granular materials have on conjunctivae. |
| **Sensitization** | | The results of testing on guinea pigs showed this material to be non-sensitizing |
| **Chronic Toxicity** | | A two year feeding study on rats did not reveal adverse health effects. A one-year study on dogs did not reveal adverse health effects. |

## 12. Ecological Information

All Ecological information as conducted on a structurally similar product. This material is not classified as dangerous to the environment.

| | | | |
|---|---|---|---|
| Toxicity To Fish | | | |
| 96 hr $LC_{50}$ | | >100 mg/l | OECD 203 |
| Toxicity To Aquatic Invertebrates | | | |
| 48 hr $LC_{50}$ | Daphnia | >100 mg/l | OECD 202 |
| Toxicity To Algae | | | |
| 72 hr $IC_{50}$ | Selenatrum capricornutum | >100 mg/l | OECD 201 |

Environmental Fate
Persistence and degradability: Not readily biodegradable.
Hydrolysis: Does not hydrolyse.
LogPow: ~0
Bioaccumulation: Does not bioaccumulate.

## 13. Disposal Considerations

Product Residues
Prohibition – Do not discharge to sewer
Disposal – Dispose in accordance with federal, state, and local regulations.

Used Packaging
Rinse empty containers with water and use the rinsate to prepare the working solution. Can be landfilled or incinerated, when in compliance with federal, state, and local regulations.



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## 14. Transport Information

| | |
|---|---|
| Proper Shipping Name | Resin Compound, Dry polymer |
| Hazard Class | Not regulated |
| Identification Number | NMFC 46030 Class 55 |
| Packaging Group | NA |
| Label Required | None |

## 15. Regulatory Information

### Federal Regulations

**OSHA HAZARD COMMUNICATION STANDARD (26 CFR 1910.1200)**

**CERCLA/SUPERFUND (40 CFR 117, Section 302)**

| Component | CAS Number | Concentration | CERCLA RQ | Product RQ |
|---|---|---|---|---|
| None | | | | |

**SARA EXTREMELY HAZARDOUS SUBSTANCES (40 CFR 355)**
This product does not contain any chemicals subject to the reporting requirements of 40 CFR 355.

**SARA HAZARD CATEGORIES (40 CFR 370, Sections 311, 312)**
[] Acute [ ] Chronic [ ] Fire [ ] Pressure [ ] Reactive [ ] None

**SARA TOXIC SUBSTANCES (40 CFR 372, Section 313)**

| Component | CAS Number | Concentration | CERCLA RQ | Product RQ |
|---|---|---|---|---|

**US TOXIC SUBSTANCES CONTROL ACT/INVENTORY STATUS (TSCA)**
All components are listed or exempt

**RCRA STATUS**
Not regulated as supplied

**NTP, IARC, OSHA, & ACGIH STATUS**
None of the components in this product at concentrations greater than 0.1% are listed

**DOT REPORTABLE QUANTITY (RQ) (49 CFR, Subchapter C, Section 172.101, Appendix A)**

| Component | CAS Number | Concentration | CERCLA RQ | Product RQ |
|---|---|---|---|---|
| None | | | | |

### State Regulations

**PENNSYLVANIA, NEW JERSEY, and MASSACHUSETTS RIGHT-TO-KNOW INFORMATION:**

| Component | CAS Number |
|---|---|
| None | |

**CALIFORNIA PROPOSITION 65:**
This product does contain toxic chemical(s) currently on the California list of known carcinogens and reproductive toxins: Acrylamide

Pursuant to the California Safe Drinking Water and Toxic Enforcement Act of 1986 (proposition 65), this information is provided. This law requires that " clear and reasonable warning " be provided to any individual, knowingly or intentionally exposed to any substances identified by the state as being cancer or reproductive hazards unless, it can be shown that the exposure poses "no significant risk".

## 16. Other Information

This information is given without any warranty or representation. We do not assume any legal responsibility for same, nor do we give permission, inducement, or recommendation to practice any patented invention without a license. It is offered solely for your consideration, investigation and verification. Before using any product, read its label carefully and completely.

**Revision 7 / Supersedes 07/03/12 / ABS**

Revisions: ANSI format, all sections



Applied Specialties, Inc.

33555 Pin Oak Parkway, Avon Lake, OH
44012

# Material Safety Data Sheet

*MSDS Date: 9/17/12*
122602821-6

## 1. PRODUCT AND COMPANY IDENTIFICATION

**Product Name: AS-2821**

**Synonyms:** Coagulant aid

Certified to a Maximum Use for Potable Water of 200 mg/L

**Manufacturer/Supplier:**
Applied Specialties, Inc.
33555 Pin Oak Parkway
Avon Lake, OH 44012

**Customer Information Number:** 440-933-9442
Emergency 24-Hour Health/Environmental Phone: 216-973-6118

## 2. HAZARDS IDENTIFICAITON

**EMERGENCY OVERVIEW**

Dark Red-Brown Liquid, Sharp Odor

**DANGER**! Corrosive. May burn skin, eyes and other tissue. Harmful if inhaled.

**HMIS –ratings (0 – 4)**

| | |
|---|---|
| HEALTH | 2 |
| FIRE | 0 |
| REACTIVITY | 1 |

0 Minimal
1 Slight Hazard
2 Moderate Hazard
3 Serious Hazard
4 Severe Hazard

**OSHA Hazard Communication**
This material is hazardous according to 29 CFR 1910.1200

**TARGET ORGANS** – Eyes, Skin, Respiratory and Gastrointestinal systems, Liver, Kidney
**ROUTES OF ENTRY INTO BODY** - Inhalation, Ingestion, Skin or Eye Contact
**SIGNS AND SYMPTOMS OF EXPOSURE** – Irritation or burns of the eyes may result in permanent vision loss unless removed quickly by thorough irrigation with water. Irritation or burns to the skin, mucous membranes, gastrointestinal tract or respiratory system are possible. Ingestion may cause severe liver and/or kidney damage which may be fatal

## 3. CHEMICAL COMPOSITION

| Component | CAS Number | Wt% | Exposure Guidelines |
|---|---|---|---|
| Iron Chloride $FeCl_3$ | 7705-08-0 | <41 | 1 $mg/m^3$ (as iron salts) ACGIH |
| Hydrochloric acid | 7647-01-0 | <5 | 5 ppm (PEL Ceiling) OSHA |
| 1,2-Ethandiamine, polymer with (chloromethyl) oxirane and N-methylmethanamine | 42751-79-1 | | Not Established |

Chemical identity of some ingredients may be withheld as confidential as permitted by 29 CFR 1910.1200 and various State right to know laws.

## 4. FIRST AID MEASURES

**NOTE: The speed with which the product is removed from eyes and skin determines the level of damage caused by contact.**

EYE CONTACT: If material gets into the eyes, flush the eyes with large amounts of water for at least 30 minutes, lifting the lower and upper lids occasionally. **Seek medical attention immediately**, preferably from an ophthalmologist. Contact lenses should not be worn when working with this substance or any other chemical. If contact lenses were worn, remove from the eye after the first 5 minutes of flushing.

SKIN CONTACT: Skin that becomes contaminated should be washed or showered for 30 minutes with soap and water to remove any chemical from skin. **Get medical attention immediately**. Contaminated clothing should be removed and laundered.

INHALATION: If a person breathes in large amounts of product mist, move the person to fresh air. If breathing has stopped, perform artificial respiration. Keep the affected person warm and at rest. **Get medical attention as soon as is possible**.

INGESTION: If a person swallows this product, give two glasses of water. **Get medical attention immediately** and follow physician instructions. **Do not induce vomiting**. Vomiting may occur spontaneously. To prevent aspiration of swallowed product, lay the victim on one side with the head lower than the waist. Never give anything by mouth to an unconscious person.

## 5. FIRE FIGHTING MEASURES

Flash Point and Method: Not Applicable

EXTINGUISHING MEDIA
Use water spray, fog, carbon dioxide ($CO_2$), dry chemical extinguishers, foam, or other agents suitable for surrounding fire. Use water spray to cool fire exposed containers. Closed containers may heat above the boiling point and rupture violently.

GENERAL HAZARD
Keep upwind. Dike the area to prevent runoff. Prevent unauthorized entry to the area. Avoid breathing dust, vapors, and fumes from this material. Avoid bodily contact with the material. The material will not support combustion. Containers can build pressure if exposed to heat.

FIRE FIGHTING EQUIPMENT
As in any fire, wear NIOSH/MSHA approved, pressure-demand self-contained breathing apparatus and full protective gear including boots, protective gloves, and gas-tight goggles. Regular Fire Fighter's gear is inadequate.

HAZARDOUS DECOMPOSITION PRODUCTS
Hydrogen chloride may be generated with thermal decomposition; it is an irritating and toxic gas.

## 6. ACCIDENTAL RELEASE MEASURES

Persons not wearing protective equipment and clothing should be restricted from spill areas until clean-up has been completed. If AS-2821 is spilled, take the following steps:

1. Ventilate the spill area and confine spill if possible.



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2. If ventilation is adequate, Neutralize with lime, limestone or soda ash and collect in a suitable container for disposal. Carbon dioxide may evolve during the neutralization process.
3. Spills on dirt, sand, earth, etc. may be handled by removing the affected solids and placing in approved containers
4. Handle, Store, Transport and Discard any material and containers in accordance to all FEDERAL, STATE AND LOCAL REGULATIONS.
5. AS-2821 is RCRA regulated as a D002, corrosive material.
6. Ferric Chloride has an RQ under CERCLA of 1,000 pounds, so any spills must be reported to the appropriate authorities.

NOTE: DO NOT wash or pour AS-2821 into any surface waters or streams or directly into sewers.

## 7. HANDLING AND STORAGE

HANDLING
Avoid contact with eyes, skin and clothing. Wash thoroughly after handling. Use with adequate ventilation. Wear appropriate protective equipment (See Section 8). This material will corrode steel or aluminum at a rate greater than 0.25 inches/year @ 130°F. Emptied containers retain vapor and product residue. Observe all labeled safeguards until the container is cleaned, reconditioned or destroyed. Practice good industrial hygiene. Wash after handling and before eating, drinking, or smoking.

STORAGE
Bulk storage containers and ancillary fill and feed systems should be constructed out of appropriate materials such as polyethylene, polypropylene, rubber-lined steel and FRP designated as appropriate for use with this product. Storage tanks should be vented to scrubber or exterior atmosphere. Storage facilities should have secondary containment as required by law or regulation. This product should be used within one year.

## 8. EXPOSURE CONTROLS/PERSONAL PROTECTION

ENGINEERING CONTROLS
Use process enclosures, local exhaust ventilation, or other engineering controls to keep airborne levels below the recommended exposure limits. Use local exhaust ventilation in areas where these levels may be exceeded.

PERSONAL PROTECTION

| | |
|---|---|
| Respirator: | Use a properly fitted NIOSH/MSHA approved or equivalent respirator if a risk assessment indicates this is necessary. |
| Eye Protection: | Safety eyewear complying with an approved standard should be worn. Tightly fitting safety goggles are recommended where there is potential for eye contact. |
| Gloves: | Wear gloves to minimize exposure. Check with the glove manufacturers for recommendations. Consider all functions for the appropriate glove material. |
| Clothing: | Chemically resistant clothing should be worn, when splashing may occur, where chemically impervious clothing |
| Other: | Eye wash and safety showers should be in immediate work area, practice good industrial hygiene |

Recommendations: ESCAPE & FIRE FIGHTING-Self-contained breathing apparatus with a face-piece operated in pressure demand or other positive-pressure mode.

## 9. PHYSICAL AND CHEMICAL PROPERTIES

| | |
|---|---|
| APPEARANCE | Dark red-brown liquid |
| ODOR | Sharp |
| BOILING POINT RANGE | 105-110°C (220-230°F) *Approximately* |
| FREEZING POINT | Not determined |
| FLASH POINT | Not applicable |
| VAPOR PRESSURE | Not determined |
| SPECIFIC GRAVITY | 1.43 ± 0.05 |
| PRODUCT pH | <1.0 |
| SOLUBILITY IN WATER | 100% |

## 10. STABILITY AND REACTIVITY

| | |
|---|---|
| Stability | Stable under normal conditions of handling and storing. |
| Hazardous Polymerization | Will not occur |
| Incompatibilities | Most metals such as iron and steel, alkaline materials, strong reducing agents |
| Conditions to Avoid | Dangerous gases may accumulate in confined spaces |
| Hazardous Decomposition Products | Hydrochloric acid |

## 11. TOXICOLOGICAL INFORMATION

**Based on Ferric Chloride Solid (anhydrous)**

ACUTE TOXICITY

| | | |
|---|---|---|
| Oral rat | LD50 | 450 mg/kg |
| Dermal Rabbit | LD50 | No Data |

## 12. ECOLOGICAL INFORAMTION

TOXICITY TO AQUATIC INVERTEBRATES

| | | | |
|---|---|---|---|
| 48 hr. EC50 | Daphnia magna | No Data | OECD 202 |

## 13. DISPOSAL CONSIDERATIONS

PRODUCT RESIDUES
Prohibition – Do not discharge to sewer
Disposal –Dispose in accordance with federal, state, and local regulations.

USED PACKAGING
Dispose of containers in a safe manner in accordance with local, state, and federal regulations.



Applied Specialties, Inc.

33555 Pin Oak Parkway, Avon Lake, OH
44012

## 14. TRANSPORT INFORMATION

| | |
|---|---|
| PROPER SHIPPING NAME | Corrosive liquid, acidic, inorganic, n.o.s. (Ferric Chloride) |
| HAZARD CLASS | 8 |
| IDENTIFICATION NUMBER | UN 3264 |
| PACKAGING GROUP | II |
| LABEL REQUIRED | CORROSIVE |

## 15. REGULATORY INFORMATION

### Federal Regulations

**OSHA HAZARD COMMUNICATION STANDARD (29 CFR 1910.1200)**
[X] Hazardous [ ] Non-Hazardous

**OSHA HIGHLY HAZARDOUS MATERIALS (29 CFR 1910.119 APP A)**
Not Listed

**CERCLA/SUPERFUND (40 CFR 117, Section 302)**

| Component | CAS Number | Concentration | RQ | Product RQ |
|---|---|---|---|---|
| Ferric chloride | 7705-08-0 | <41 | 1,000 lbs | 2,439 lbs |

**SARA EXTREMELY HAZARDOUS SUBSTANCES (40 CFR 355, Section 302)**
This product does not contain any chemicals subject to the reporting requirements of 40 CFR 355.

**SARA HAZARD CATEGORIES (40 CFR 370, Sections 311, 312)**
[X] Acute [X] Chronic [ ] Fire [ ] Pressure [X] Reactive [ ] None

**SARA TOXIC SUBSTANCES (40 CFR 372, Section 313)**
None of the components are listed

**US TOXIC SUBSTANCES CONTROL ACT/INVENTORY STATUS (TSCA)**
All components are listed

**RCRA STATUS**
Regulated as D002, Corrosive, as supplied

**NTP, IARC, OSHA, & ACGIH STATUS**
None of the components are listed

**DOT REPORTABLE QUANTITY (RQ) (49 CFR Subchapter C, Section 172.101, Appendix A)**

| Component | CAS Number | Concentration | RQ | Product RQ |
|---|---|---|---|---|
| Ferric chloride | 7705-08-0 | <41 | 1,000 lbs | 2,439 lbs |

Spills of over 213 gallons are reportable to the National Response Center 1-800-424-8802, State and Local Authorities immediately due to the reportable quantity of Ferric chloride.



Applied Specialties, Inc.

33555 Pin Oak Parkway, Avon Lake, OH
44012

## State Regulations

**PENNSYLVANIA, NEW JERSEY, and MASSACHUSETTS RIGHT-TO-KNOW INFORMATION:**

| Component | CAS Number |
|---|---|
| Ferric Chloride | 7705-08-0 |
| Hydrochloric acid | 7647-01-0 |
| 1,2-Ethandiamine, polymer with (chloromethyl) oxirane and N-methylmethanamine | 42751-79-1 |
| Water | 7732-18-5 |

**CALIFORNIA PROPOSITION 65:**

This product does not contain toxic chemical(s) currently on the California list of known carcinogens and reproductive toxins

Pursuant to the California Safe Drinking Water and Toxic Enforcement Act of 1986 (proposition 65), this information is provided. This law requires that " clear and reasonable warning " be provided to any individual, knowingly or intentionally exposed to any substances identified by the state as being cancer or reproductive hazards unless, it can be shown that the exposure poses "no significant risk". Based on available data, the following chemicals listed by Proposition 65 may be present in this product:
NO SUBSTANCES ARE PRESENT AT DETECTABLE LEVELS GREATER THAN 0.1%

## 16. OTHER INFORMATION

This information is given without any warranty or representation. We do not assume any legal responsibility for same, nor do we give permission, inducement, or recommendation to practice any patented invention without a license. It is offered solely for your consideration, investigation and verification. Before using any product, read its label carefully and completely.

**Revision 6 / Supersedes 7/26/07/ JMJ**

Revisions: ANSI format, all sections



Applied Specialties, Inc.

33555 Pin Oak Parkway, Avon Lake, OH
44012

HALOSOURCE

Date: 9/27/2011
Revision: 00

# Material Safety Data Sheet
*HaloKlear: LBP-2101*

## SECTION 1: PRODUCT AND COMPANY IDENTIFICATION

| | |
|---|---|
| **Manufacturer's Name:** | HaloSource, Inc. |
| **Corporate Address:** | 1631 220th St. SE, Suite 100, Bothell, WA 98021 |
| **Manufacturer's Telephone:** | (425) 881-6464 (Monday-Friday, 8AM-5PM PDT) |
| **Emergency Telephone (24 Hours):** | 800-424-9300 CHEMTREC (Domestic, North America)<br>703-527-3887 CHEMTREC (International, collect calls accepted) |
| **Material/Trade/Product Name:** | **HaloKlear: LBP-2101** |
| **Synonyms:** | LBP-X1, Polymer X Liquid |
| **Chemical Name:** | Proprietary |
| **Chemical Formula:** | Proprietary |
| **CAS No.:** | Not applicable. |
| **EPA Registration #:** | Not applicable |
| **Product Use:** | Environmental water treatment, flocculation and clarification |

## SECTION 2: COMPOSITION/INFORMATION ON INGREDIENTS

| CAS NO. | COMPONENT | % | OSHA HAZARDOUS? |
|---|---|---|---|
| *Trade Secret* | *Trade Secret* | *Trade Secret* | NO |
| | *Other hazardous components below de minimus quantities* | | YES |
| | *All other components are non-hazardous* | | YES |

*NOTE: See Section 8 for permissible exposure limits.*

## SECTION 3: HAZARDS IDENTIFICATION

**EMERGENCY OVERVIEW**

Milky white to clear liquid.

May be mildly irritating to eyes. Not likely to be hazardous to skin, respiratory tract, or by ingestion.

**POTENTIAL HEALTH EFFECTS**

**EYE:** May be mildly irritating to eyes.

**SKIN**: Not likely to be hazardous to skin.

**INHALATION:** Not likely to be hazardous by inhalation.

**INGESTION:** Not likely to be hazardous by ingestion.

**CHRONIC EXPOSURE/CARCINOGENICITY:** None of the components present in this material at concentrations of equal to or greater than 0.1% are listed by IARC, NTP, OSHA or ACGIH as a carcinogen.

**AGGRAVATION OF PRE-EXISTING CONDITIONS:** None known.

**POTENTIAL ENVIRONMENTAL EFFECTS:** None known.

## SECTION 4: FIRST AID MEASURES

**FIRST AID PROCEDURES**

**EYE CONTACT:** Remove contact lenses (if applicable), flush with water for 15 minutes. Call a physician.

**SKIN CONTACT:** Cleansing the skin after exposure is advisable.

**INHALATION:** If large amounts of fumes are inhaled, remove to fresh air and consult a physician.

**INGESTION:** Consult a physician if necessary.

**NOTE TO PHYSICIANS:** None.

## SECTION 5: FIRE FIGHTING MEASURES

**FLASH POINT:** Not available
**UPPER FLAMMABLE LIMIT:** Not available
**FLAMMABLITY CLASS (OSHA):** Not applicable

**AUTOIGNITION TEMPERATURE:** Not available
**LOWER FLAMMABLE LIMIT:** Not available
**FLAME PROPAGATION/BURNING RATE:** Not available

**UNIQUE FIRE PROPERTIES:** None known.

**HAZARDOUS COMBUSTION PRODUCTS:** None.

**EXTINGUISHING MEDIA:** Does not burn. Use water, dry chemicals, carbon dioxide, sand or foam. Use extinguishing media appropriate for surrounding fire.

**PROTECTION OF FIREFIGHTERS:** Do not enter confined fire space without full bunker gear (helmet with face shield, bunker coat, gloves and rubber boots), including a positive pressure NIOSH approved self-contained breathing apparatus. Water may be used to keep fire-exposed containers cool until fire is out.

## SECTION 6: ACCIDENTAL RELEASE MEASURES

**PERSONAL PROTECTIVE EQUIPMENT:** See Section 8 (Personal Protective Equipment).

**ENVIRONMENTAL PRECAUTIONS:** None known.

**METHODS FOR CLEANING UP:** Contain large spills and pump to recover. Small spills can be mopped up and recovered.

## SECTION 7: HANDLING AND STORAGE

**SAFE *HANDLING* RECOMMENDATIONS**

**VENTILATION:** General ventilation should be sufficient under normal conditions.

**FIRE PREVENTION:** Non-flammable, no special fire protection required.

**SPECIAL HANDLING REQUIREMENTS:** Avoid eye contact.

**SAFE *STORAGE* RECOMMENDATIONS**

**CONTAINMENT:** The container should be kept covered to prevent contamination.

**STORAGE ROOM RECOMMENDATIONS:** Store in a cool, dry, well-ventilated area away from direct heat.

**INCOMPATIBLE MATERIALS:** None known.

**STORAGE CONDITIONS:** Store in cool, dry place. Keep container closed when not in use; keep out of the reach of children.

## SECTION 8: EXPOSURE CONTROLS/PERSONAL PROTECTION

**ENGINEERING CONTROLS:** General ventilation

**PERSONAL PROTECTIVE EQUIPMENT (PPE)**

**EYE/FACE PROTECTION:** Safety glasses are recommended under normal conditions.

**SKIN PROTECTION:** Avoid contact with skin.

**HAND PROTECTION**: Chemical resistant gloves are recommended to minimize potential irritation from handling.

**RESPIRATORY PROTECTION:** A respiratory protection program that meets OSHA's 29 CFR 1910.134 and ANSI Z88.2 requirements must be followed whenever workplace conditions warrant a respirator's use. Respirator use is not required for this product.

**GOOD HYGEIENE/WORK PRACTICES:** Always follow good hygiene/work practices by avoiding vapors or mists and contact with eyes and skin. Thoroughly wash hands after handling and before eating or drinking. Always wear the appropriate PPE when repairing or performing maintenance on contaminated equipment.

**EXPOSURE GUIDELINES**

| PERMISSIBLE EXPOSURE LIMITS | | | | | | |
|---|---|---|---|---|---|---|
| INGREDIENT CAS NO. | OSHA | | WISHA | | ACGIH (TLV) | |
| | TWA | STEL | TWA | STEL | TWA | STEL |
| Not Applicable | Not Applicable | Not Applicable | Not Applicable | Not Applicable | Not Applicable | Not Applicable |

## SECTION 9: PHYSICAL AND CHEMICAL PROPERTIES

**COLOR:** Milky white to clear
**PHYSICAL FORM:** Liquid
**pH:** 3.4 – 3.8
**VAPOR DENSITY:** Not known
**MELTING POINT:** Not known
**SOLUBILITY IN WATER:** Fully soluble
**SHAPE:** Liquid
**ODOR:** Faint vinegar odor
**VAPOR PRESSURE:** Not known
**BOILING POINT:** Not known
**FREEZING POINT:** Not known
**SPECIFIC GRAVITY OR DENSITY:** 0.95-0.99 g/cc

*NOTE: These physical data are typical values based on material tested but may vary from sample to sample. Values should not be construed as a guaranteed analysis of any specific lot or as specifications.*

## SECTION 10: STABILITY AND REACTIVITY

**CHEMICAL STABILITY:** Stable

**CONDITIONS TO AVOID:** None known

**MATERIALS TO AVOID (INCOMPATIBILITY):** None known

**HAZARDOUS DECOMPOSITION PRODUCTS:** None known

**HAZARDOUS POLYMERIZATION:** Will not occur

## SECTION 11: TOXICOLOGICAL INFORMATION

**ORAL $LD_{50}$ (rat):** Not available

**DERMAL $LD_{50}$ (rabbit):** Not available

**DERMAL $LD_{50}$ (rat):** Not available

**SKIN IRRITATION:** Not available

**EYE IRRITATION:** Not available

**SKIN SENSITIZATION:** Not available

**ADDITIONAL INFORMATION:** Not available

## SECTION 12: ECOLOGICAL INFORMATION

**ECOTOXICITY:**

- Acute $LC_{50}/LC_{25}$ Rainbow Trout = >4000 mg/L/96 hr
- NOEC Acute Rainbow Trout = 4000 mg/L/96 hr
- Acute $LC_{50}/LC_{25}$ Fathead Minnow = >4000 mg/L/96 hr
- NOEC Acute Fathead Minnow = 4000 mg/L/96 hr
- Chronic Survival $LC_{50}/LC_{25}$ C. Dubia = >4000 mg/L/7 day
- NOEC Chronic Survival C. Dubia = 4000 mg/L/7 day

- Chronic Reproduction $LC_{25}$ C. Dubia = 694 mg/L/7 day
- NOEC Chronic Reproduction C. Dubia = 500 mg/L/7 day

**MOBILITY:** Not available

**PERSISTENCE AND DEGRADABILITY:** Not available

**BIOACCUMULATIVE POTENTIAL:** Not available

**ADDITIONAL INFORMATION:** Not available

## SECTION 13: DISPOSAL CONSIDERATIONS

If this product as supplied becomes a waste, it does not meet the criteria of a hazardous waste as defined under the Resource Conservation and Recovery Act (RCRA) 40 CFR 261. Please be advised that state and local requirements for waste disposal may be more restrictive or otherwise different from federal regulations. Consult state and local regulations regarding the proper disposal of this material.

*NOTE: Chemical additions, processing or otherwise altering this material may make the waste management information presented in this MSDS incomplete, inaccurate or otherwise inappropriate.*

## SECTION 14: TRANSPORT INFORMATION

**U.S. DEPARTMENT OF TRANSPORTATION (DOT):**

| | |
|---|---|
| **Proper Shipping Name:** | Not Regulated |
| **Hazard Class:** | Not Regulated |
| **Identification Number (UN Number):** | Not Regulated |
| **Packing Group (PG):** | Not Regulated |

## SECTION 15: REGULATORY INFORMATION

**TSCA STATUS:** Components are listed

**CERCLA REPORTABLE QUANTITY (RQ):**

| CHEMICAL NAME | RQ |
|---|---|
| Not applicable | Not applicable |

**SARA TITLE III SECTION 302 EXTREMELY HAZARDOUS SUBSTANCES (EHS):**

| CHEMICAL NAME | TPQ | RQ |
|---|---|---|
| Not applicable | Not applicable | Not applicable |

**SARA TITLE III SECTION 311/312 HAZARD CATEGORIES:** Does this product/material meet the definition of the following hazard classes according to the EPA 'Hazard Categories' promulgated under Sections 311 and 312 of SARA Title III?

| ACUTE HEALTH HAZARD | CHRONIC HEALTH HAZARD | FIRE HAZARD | REACTIVE HAZARD | SUDDEN RELEASE OF PRESSURE |
|---|---|---|---|---|
| NO | NO | NO | NO | NO |

**SARA TITLE III SECTION 313 TOXIC CHEMICALS INFORMATION:**

| CHEMICAL NAME | CAS NO. | CONCENTRATION (%) |
|---|---|---|
| Not applicable | Not applicable | Not applicable |

**CALIFORNIA PROPOSITION 65:** The following chemical(s) is/are known to the state of California to cause cancer or reproductive toxicity:

| CHEMICAL NAME | CAS NO. | CONCENTRATION (%) |
|---|---|---|
| Not applicable | Not applicable | Not applicable |

## SECTION 16: OTHER INFORMATION

**REVISION INFORMATION:**
MSDS sections(s) changed since last revision of document:

- None, this is a new MSDS.

**DISCLAIMER:**
**********
The above information is based upon information HaloSource, Inc. believes to be reliable and is supplied for informational purposes only. HaloSource, Inc. disclaims any liability for damage which results from the use of the above information and nothing contained therein shall constitute a guarantee, warranty (including fitness for a particular purpose) or representation with respect to the accuracy or completeness of the data, the product described or their use for any specific purpose even if that purpose is known to HaloSource, Inc. The final determination of the suitability of the information, the manner of use of the information or product and potential infringement is the sole responsibility of the user.
**********

**MSDS PREPARED BY: Jeremy Heath, EH&S Manager**

HALOSOURCE

Date: 9/27/2011
Revision: 00

# Material Safety Data Sheet
## *HaloKlear® LiquiFloc™ 2%*

## SECTION 1: PRODUCT AND COMPANY IDENTIFICATION

| | |
|---|---|
| **Manufacturer's Name:** | HaloSource, Inc. |
| **Corporate Address:** | 1631 220th St. SE, Suite 100, Bothell, WA 98021 |
| **Manufacturer's Telephone:** | (425) 881-6464 (Monday-Friday, 8AM-5PM PDT) |
| **Emergency Telephone (24 Hours):** | **800-424-9300 CHEMTREC (Domestic, North America)**<br>**703-527-3887 CHEMTREC (International, collect calls accepted)** |
| **Material/Trade/Product Name:** | **HaloKlear® LiquiFloc™ 2%** |
| **Synonyms:** | None |
| **Chemical Name:** | Chitosan Acetate Solution |
| **Chemical Formula:** | Not available |
| **CAS No.:** | Not applicable |
| **EPA Registration #:** | Not applicable |
| **Product Use:** | Flocculates soil contamination in stormwater. |

## SECTION 2: COMPOSITION/INFORMATION ON INGREDIENTS

| CAS NO. | COMPONENT | % | OSHA HAZARDOUS? |
|---|---|---|---|
| Trade Secret | Trade Secret | 4 | NO |
| | *All other components are non-hazardous.* | 96 | NO |

*NOTE: See Section 8 for permissible exposure limits.*

## SECTION 3: HAZARDS IDENTIFICATION

### EMERGENCY OVERVIEW

Clear to pale yellow viscous liquid with a pungent vinegar odor.

May be mildly irritating to eyes. Not likely to be hazardous to skin, respiratory tract, or by ingestion.

### POTENTIAL HEALTH EFFECTS

**EYE:** May be mildly irritating to eyes.

**SKIN**: Not hazardous to skin.

**INHALATION:** Not likely to be hazardous by inhalation.

**INGESTION:** Not likely to be hazardous by ingestion.

**CHRONIC EXPOSURE/CARCINOGENICITY:** None of the components present in this material at concentrations of equal to or greater than 0.1% are listed by IARC, NTP, OSHA or ACGIH as a carcinogen.

**SIGNS AND SYMPTOMS OF OVEREXPOSURE:** Eye irritation.

**AGGRAVATION OF PRE-EXISTING CONDITIONS:** None known.

**POTENTIAL ENVIRONMENTAL EFFECTS:** Material is 100% biodegradable and nontoxic.

## SECTION 4: FIRST AID MEASURES

**FIRST AID PROCEDURES**

**EYE CONTACT:** Remove contact lenses (if applicable), flush with water for 15 minutes. Call a physician.

**SKIN CONTACT:** Cleansing the skin after exposure is advisable.

**INHALATION:** If large amounts of fumes are inhaled, remove to fresh air and consult a physician.

**INGESTION:** Consult a physician if necessary.

**NOTE TO PHYSICIANS:** None.

## SECTION 5: FIRE FIGHTING MEASURES

**FLASH POINT:** Not available
**UPPER FLAMMABLE LIMIT:** Not available
**FLAMMABLITY CLASS (OSHA):** Not applicable

**AUTOIGNITION TEMPERATURE:** Not available
**LOWER FLAMMABLE LIMIT:** Not available
**FLAME PROPAGATION/BURNING RATE:** Not available

**UNIQUE FIRE PROPERTIES:** None known.

**HAZARDOUS COMBUSTION PRODUCTS:** None.

**EXTINGUISHING MEDIA:** Does not burn. Use water, dry chemicals, carbon dioxide, sand or foam. Use extinguishing media appropriate for surrounding fire.

**PROTECTION OF FIREFIGHTERS:** Do not enter confined fire space without full bunker gear (helmet with face shield, bunker coat, gloves and rubber boots), including a positive pressure NIOSH approved self-contained breathing apparatus. Water may be used to keep fire-exposed containers cool until fire is out.

## SECTION 6: ACCIDENTAL RELEASE MEASURES

**PERSONAL PROTECTIVE EQUIPMENT:** See Section 8 (Personal Protective Equipment).

**ENVIRONMENTAL PRECAUTIONS:** Material is 100% biodegradable and nontoxic.

**METHODS FOR CLEANING UP:** Dilute with water and hose down.

## SECTION 7: HANDLING AND STORAGE

**SAFE *HANDLING* RECOMMENDATIONS**

**VENTILATION:** General ventilation should be sufficient under normal conditions.

**FIRE PREVENTION:** Non-flammable, no special fire protection required.

**SPECIAL HANDLING REQUIREMENTS:** Avoid eye contact.

**SAFE *STORAGE* RECOMMENDATIONS**

**CONTAINMENT:** The container should be kept covered to prevent contamination.

**STORAGE ROOM RECOMMENDATIONS:** Store in a cool, dry, well-ventilated area away from direct heat.

**INCOMPATIBLE MATERIALS:** Strong oxidizing material and strong bases.

**STORAGE CONDITIONS:** 10-50°C recommended (will freeze @ ~3°C). Shelf life is indefinite but viscosity will decrease over time.

## SECTION 8: EXPOSURE CONTROLS/PERSONAL PROTECTION

**ENGINEERING CONTROLS:** General ventilation should be sufficient under normal conditions.

**PERSONAL PROTECTIVE EQUIPMENT (PPE)**

**EYE/FACE PROTECTION:** Safety glasses recommended.

**SKIN PROTECTION:** For operations where skin contact can occur, wear impervious clothing such as apron, boots, or whole bodysuit.

**HAND PROTECTION**: For operations where hand contact can occur, rubber gloves recommended.

**RESPIRATORY PROTECTION:** A respiratory protection program that meets OSHA's 29 CFR 1910.134 and ANSI Z88.2 requirements must be followed whenever workplace conditions warrant a respirator's use. Respirator use is not required for this product.

**GOOD HYGEIENE/WORK PRACTICES:** Always follow good hygiene/work practices by avoiding vapors or mists and contact with eyes and skin. Thoroughly wash hands after handling and before eating or drinking. Always wear the appropriate PPE when repairing or performing maintenance on contaminated equipment.

**EXPOSURE GUIDELINES**

| PERMISSIBLE EXPOSURE LIMITS | | | | | | |
|---|---|---|---|---|---|---|
| INGREDIENT CAS NO. | OSHA | | WISHA | | ACGIH (TLV) | |
| | TWA | STEL | TWA | STEL | TWA | STEL |
| Not Applicable | Not Applicable | Not Applicable | Not Applicable | Not Applicable | Not Applicable | Not Applicable |

## SECTION 9: PHYSICAL AND CHEMICAL PROPERTIES

**COLOR:** Clear to pale yellow
**PHYSICAL FORM:** Viscous liquid
**pH:** 3.0-4.5
**VAPOR DENSITY:** Not available
**MELTING POINT:** Not available
**SOLUBILITY IN WATER:** Soluble
**SHAPE:** Viscous liquid
**ODOR:** Pungent vinegar odor
**VAPOR PRESSURE:** Not available
**BOILING POINT:** 211°F
**FREEZING POINT:** Not available
**SPECIFIC GRAVITY OR DENSITY:** 1.0-1.1 g/mL

*NOTE: These physical data are typical values based on material tested but may vary from sample to sample. Values should not be construed as a guaranteed analysis of any specific lot or as specifications.*

## SECTION 10: STABILITY AND REACTIVITY

**CHEMICAL STABILITY:** Stable.

**CONDITIONS TO AVOID:** Freezing temperatures or excess heat (for quality purposes).

**MATERIALS TO AVOID (INCOMPATIBILITY):** Strong oxidizing material and strong bases.

**HAZARDOUS DECOMPOSITION PRODUCTS:** Decomposition will not occur.

**HAZARDOUS POLYMERIZATION:** Will not occur.

## SECTION 11: TOXICOLOGICAL INFORMATION

**ORAL $LD_{50}$ (rat):** Not available.

**DERMAL $LD_{50}$ (rabbit):** Not available.

**SKIN IRRITATION:** Not available.

**EYE IRRITATION:** Not available.

**SKIN SENSITIZATION:** Not available.

**ADDITIONAL INFORMATION:**

## SECTION 12: ECOLOGICAL INFORMATION

**ECOTOXICITY (in water):**

- Acute:
  - Daphnia LC 50 – 1369 mg/ L
  - Daphnia NOEC – 1000 mg/L
  - Fathead minnows LC 50 – 642 mg/L
  - Fathead minnows NOEC – 500 mg/L
  - Rainbow Trout LC 50 – 173mg/L
  - Rainbow Trout NOEC – 125 mg/L
- Chronic:
  - Rainbow Trout LC 50 – 154 mg /L

- Rainbow Trout LC 25 – 121 mg/L
- Fathead Minnow LC 50 - > 1000 mg/L
- Fathead Minnow LC25 – 932 mg/L

**MOBILITY:** Not available.

**PERSISTENCE AND DEGRADABILITY:** Not available.

**BIOACCUMULATIVE POTENTIAL:** Not available.

**ADDITIONAL INFORMATION:** Not available.

## SECTION 13: DISPOSAL CONSIDERATIONS

If this product as supplied becomes a waste, it does not meet the criteria of a hazardous waste as defined under the Resource Conservation and Recovery Act (RCRA) 40 CFR 261. Please be advised that state and local requirements for waste disposal may be more restrictive or otherwise different from federal regulations. Consult state and local regulations regarding the proper disposal of this material.

*NOTE: Chemical additions, processing or otherwise altering this material may make the waste management information presented in this MSDS incomplete, inaccurate or otherwise inappropriate.*

## SECTION 14: TRANSPORT INFORMATION

**U.S. DEPARTMENT OF TRANSPORTATION (DOT):**

| | |
|---|---|
| **Proper Shipping Name:** | Not Regulated |
| **Hazard Class:** | Not Regulated |
| **Identification Number (UN Number):** | Not Regulated |
| **Packing Group (PG):** | Not Regulated |

## SECTION 15: REGULATORY INFORMATION

**TSCA STATUS:** The substances in this preparation are included on or exempted from the TSCA 8(b) inventory (40 CFR 710).

**CERCLA REPORTABLE QUANTITY (RQ):**

| CHEMICAL NAME | RQ |
|---|---|
| Not applicable | Not applicable |

**SARA TITLE III SECTION 302 EXTREMELY HAZARDOUS SUBSTANCES (EHS):**

| CHEMICAL NAME | TPQ | RQ |
|---|---|---|
| Not applicable | Not applicable | Not applicable |

**SARA TITLE III SECTION 311/312 HAZARD CATEGORIES:** Does this product/material meet the definition of the following hazard classes according to the EPA 'Hazard Categories' promulgated under Sections 311 and 312 of SARA Title III?

| ACUTE HEALTH HAZARD | CHRONIC HEALTH HAZARD | FIRE HAZARD | REACTIVE HAZARD | SUDDEN RELEASE OF PRESSURE |
|---|---|---|---|---|
| NO | NO | NO | NO | NO |

**SARA TITLE III SECTION 313 TOXIC CHEMICALS INFORMATION:**

| CHEMICAL NAME | CAS NO. | CONCENTRATION (%) |
|---|---|---|
| Not applicable | Not applicable | Not applicable |

**CALIFORNIA PROPOSITION 65:** The following chemical(s) is/are known to the state of California to cause cancer or reproductive toxicity:

| CHEMICAL NAME | CAS NO. | CONCENTRATION (%) |
|---|---|---|
| Not applicable | Not applicable | Not applicable |

## SECTION 16: OTHER INFORMATION

**REVISION INFORMATION:**
MSDS sections(s) changed since last revision of document:

- None, this is a new MSDS.

**DISCLAIMER:**
**********
The above information is based upon information HaloSource, Inc. believes to be reliable and is supplied for informational purposes only. HaloSource, Inc. disclaims any liability for damage which results from the use of the above information and nothing contained therein shall constitute a guarantee, warranty (including fitness for a particular purpose) or representation with respect to the accuracy or completeness of the data, the product described or their use for any specific purpose even if that purpose is known to HaloSource, Inc. The final determination of the suitability of the information, the manner of use of the information or product and potential infringement is the sole responsibility of the user.
**********

**MSDS PREPARED BY: Jeremy Heath, EH&S Manager**

MIDWEST INDUSTRIAL SUPPLY, INC.
P. O. BOX 8431
CANTON, OHIO 44711 U.S.A.
Emergency Phone Numbers: 330-456-3121

# Haul Road Dust Control®

**Dust Wetting Additive**

## MATERIAL SAFETY DATA SHEET

## SECTION I -- IDENTIFICATION OF SUBSTANCE/PREPARATION AND COMPANY/UNDERTAKING

| | |
|---|---|
| **TRADE NAME:** | HAUL ROAD DUST CONTROL |
| **CHEMICAL NAME:** | ANIONIC AND NONIONIC SURFACTANT AGENT |
| **SYNONYMS:** | DUST WETTING ADDITIVE |
| **CHEMICAL FAMILY:** | SURFACTANTS |
| **MOLECULAR WEIGHT:** | N/A |
| **FORMULA:** | N/A |
| **CAS REGISTRY NO.:** | MIXTURE - NO NUMBER ASSIGNED |

## SECTION II -- COMPOSITION/INFORMATION ON INGREDIENTS

| NAME | CAS REG NO. | WT. % |
|---|---|---|
| Ethyl Alcohol | 64-17-5 | <6% |
| Surfactant blend | Blend | >20% |

## SECTION III -- HAZARDS IDENTIFICATION

| | |
|---|---|
| Ethyl alcohol | Irritant to mouth, upper digestive system, skin and eyes |

## SECTION IV -- FIRST AID MEASURES

| | |
|---|---|
| **EYES:** | Flush eyes with flowing water at least 15 minutes, get medical attention. |
| **INHALATION:** | If irritation occurs move to fresh air and seek medical attention |
| **SKIN:** | Flush with large amount of water or wash with soap and water. Seek medical attention if irritation occurs. |
| **INGESTION:** | Give water to drink. Do not induce vomiting. Call a physician. **NEVER GIVE FLUIDS OR INDUCE VOMITING IF PATIENT IS UNCONSCIOUS OR HAVING CONVULSIONS.** |

## SECTION V -- FIRE FIGHTING MEASURES

| | |
|---|---|
| **FLASH POINT (TEST METHOD):** | > 135$^0$F (greater than 50% aqueous solutions and does not sustain combustion) |
| **AUTOIGNITION TEMPERATURE:** | N/D |
| **EXTINGUISHING MEDIUM:** | Water fog, alcohol foams, Co2, dry chemical |
| **SPECIAL FIREFIGHTING PROCEDURES:** | Water or foam may cause frothing, use water to cool containers. Use self contained breathing apparatus. |
| **UNUSUAL FIRE AND EXPLOSION HAZARDS:** | None |

## SECTION VI - ACCIDENTAL RELEASE MEASURES

**SPILL AND LEAK PROCEDURES:** Dike and control spill. Absorb with sand. Failure to contain release may require reporting to local authority. Floor may be slippery. Wear impervious gloves, overalls and eye protection while cleaning spill. Do not wash into drains. Place in containers for proper disposal in accordance with state, federal, and local regulations.

## SECTION VII -- HANDLING AND STORAGE

| | |
|---|---|
| **STORAGE:** | Keep in a cool, dry, ventilated storage area and in closed containers. |
| **HANDLING:** | Handle in a well ventilated work space. |

## SECTION VIII -- EXPOSURE CONTROL/PERSONAL PROTECTION

| | |
|---|---|
| **RESPIRATORY PROTECTION:** | None required. |
| **VENTILATION:** | Local exhaust. |
| **EYE PROTECTION:** | Chemical splash goggles recommended. |
| **PROTECTIVE CLOTHING:** | Impervious gloves recommended. |
| **OTHER:** | None. |

Avoid contact with eyes and skin or clothes. All personal protective equipment must comply with appropriate standards and be maintained as indicated.

## SECTION IX -- PHYSICAL AND CHEMICAL PROPERTIES

| | |
|---|---|
| **BOILING/MELTING POINT @ 760 mm Hg:** | N/D |
| **VAPOR PRESSURE mm Hg @ 20°C:** | N/D |
| **SPECIFIC GRAVITY OR BULK DENSITY:** | 1.00 |
| **SOLUBILITY IN WATER:** | complete |
| **APPEARANCE:** | green to yellow tinted liquid |
| **ODOR:** | Slight Odor |
| **pH:** | 7.0 – 9.0 |

## SECTION X -- STABILITY AND REACTIVITY

| | |
|---|---|
| **STABILITY:** | Stable |
| **CHEMICAL INCOMPATIBILITY:** | Strong oxidizers |
| **HAZARDOUS DECOMPOSITION PRODUCTS:** | None known |
| **HAZARDOUS POLYMERIZATION:** | Does not occur |

## SECTION XI -- TOXICOLOGICAL INFORMATION

**EFFECTS OF OVEREXPOSURE**

| | |
|---|---|
| **INHALATION:** | Vapors and mists may be irritating to nose, throat and mucous membranes |
| **SKIN:** | Prolonged contact may cause irritation, local redness and mild discomfort. |
| **EYES:** | May cause significant eye irritation. |
| **INGESTION:** | Not classified as harmful if swallowed, may cause irritation of the mouth and upper digestive tract. |
| **$LD_{50}$ (oral rat)** | >12 ml/kg |

## SECTION XII -- ECOLOGICAL INFORMATION

Do not release into bodies of water.

## SECTION XIII -- DISPOSAL CONSIDERATIONS

| | |
|---|---|
| **WASTE DISPOSAL METHOD:** | Do not wash into drains. Do not mix with other waste materials. Comply with all federal, state and local laws, regulations and procedures. |
| **CONTAINER DISPOSAL:** | Do not re-use containers. |

## SECTION XIV -- TRANSPORTATION INFORMATION

| | |
|---|---|
| **D.O.T. PROPER SHIPPING NAME (49CFR172.101):** | None |
| **HAZARDOUS SUBSTANCE (40CFR116):** | N/A |
| **REPORTABLE QUANTITY (RQ):** | N/A |
| **D.O.T. HAZARD CLASSIFICATION (49CFR172.101):** | Non-regulated |
| **D.O.T. PLACARDS REQUIRED:** | None |
| **POISON CONSTITUENT (49CFR173.343):** | N/A |
| **BILL OF LADING DESCRIPTION:** | Liquid dust suppressant, wetting additive |
| **UN No.:** | N/A |
| **PACKING GROUP:** | N/A |

## SECTION XV-- REGULATORY INFORMATION

**Haul Road Dust Control is not a restricted article according to the Department of Transportation and International Air Transport Association regulations.**

| | |
|---|---|
| **EPA SARA Title III hazard class:** | None |
| **OSHA HCS hazard class:** | Irritant (29CFR1910.1200) |
| **TSCA:** | All components are listed on US TSCA inventory. |

**EPA SARA Title III Section 313(40CFR372)**
**Toxic Chemicals present in quantities greater than the "de minimus" level are:** None

**WHMIS Classification:** The Canadian Workplace Hazardous Material Information System (WHMIS) Classification: D2B - eye or skin irritant.

## SECTION XVI -- OTHER INFORMATION

**ABBREVIATIONS AND SYMBOLS:**

N/D -Not Determined
N/A -Not Applicable
N/T -Not Tested
< - Less Than
> - Greater Than

MEKOR® 6701 CORROSION INHIBITOR
51628

## 1. IDENTIFICATION OF THE SUBSTANCE/PREPARATION AND OF THE COMPANY/UNDERTAKING

| | | |
|---|---|---|
| Ashland<br>P.O. Box 2219<br>Columbus, OH 43216 | Regulatory Information Number<br>Telephone<br>Emergency telephone | 1-800-325-3751<br>614-790-3333<br>1-800-ASHLAND<br>(1-800-274-5263) |

| | |
|---|---|
| Product name | MEKOR® 6701 CORROSION INHIBITOR |
| Product code | 51628 |
| Product Use Description | No data |

## 2. HAZARDS IDENTIFICATION

**Emergency Overview**

Appearance: liquid, Colorless

DANGER! COMBUSTIBLE LIQUID AND VAPOR. MAY AFFECT THE CENTRAL NERVOUS SYSTEM CAUSING DIZZINESS, HEADACHE OR NAUSEA. MAY BE HARMFUL IF SWALLOWED OR ABSORBED THROUGH SKIN. MAY CAUSE ALLERGIC SKIN REACTION. HARMFUL IF INHALED. CAUSES SEVERE EYE BURNS.

**Potential Health Effects**

**Routes of exposure**

Inhalation, Skin absorption, Skin contact, Eye Contact, Ingestion

**Eye contact**

Can cause permanent eye injury. Symptoms include stinging, tearing, redness, and swelling of eyes. Can injure the cornea and cause blindness.

**Skin contact**

May cause mild skin irritation. Symptoms may include redness and burning of skin. Additional symptoms of skin contact may include: allergic skin reaction (delayed skin rash which may be followed by blistering, scaling and other skin effects) Passage of this material into the body through the skin is possible, and may add to toxic effects from breathing or swallowing.

**Ingestion**

Swallowing small amounts of this material during normal handling is not likely to cause harmful effects. Swallowing large amounts may be harmful.

**Inhalation**

Breathing of vapor or mist is possible. Breathing this material may be harmful.

**Aggravated Medical Condition**

Preexisting disorders of the following organs (or organ systems) may be aggravated by exposure to this material:, upper respiratory tract, lung (for example, asthma-like conditions), Liver, Exposure to this material may aggravate any preexisting condition sensitive to a decrease in available oxygen, such as chronic lung disease, coronary artery disease or anemias.

**Symptoms**

Signs and symptoms of exposure to this material through breathing, swallowing, and/or passage of the material through the skin may include:, stomach or intestinal upset (nausea, vomiting, diarrhea), irritation (nose, throat, airways), central nervous system depression (dizziness, drowsiness, weakness, fatigue, nausea, headache, unconsciousness), blood abnormalities (breakage of red blood cells), narcosis (dazed or sluggish feeling), respiratory failure, coma, May cause methemoglobinemia, a blood abnormality that may cause headache, difficulty breathing, lightheadedness, weakness, confusion, rapid heart rate and cyanosis (lack of oxygen in the tissues causing blue-colored skin and nails).

**Target Organs**

Overexposure to this material (or its components) has been suggested as a cause of the following effects in laboratory animals:, mild, reversible spleen effects, mild, reversible kidney effects, anemia, nasal damage, liver damage

**Carcinogenicity**

Methyl ethyl ketoxime has been shown to cause liver cancer in male rats and mice. The relevance of this finding to humans is uncertain.

**Reproductive hazard**

Methyl ethyl ketoxime was not harmful to the fetus in laboratory animal studies even at levels that were harmful to the pregnant animals.

**Other information**

Ingestion of alcoholic beverages after exposure to methyl ethyl ketoxime may result in headache, redness of the face, vomiting, sweating, and rapid heartbeat.

## 3. COMPOSITION/INFORMATION ON INGREDIENTS

| Components | CAS-No. | Concentration |
|---|---|---|
| METHYL ETHYL KETONE OXIME | 96-29-7 | >=10-<15% |

## 4. FIRST AID MEASURES

**Eyes**

If material gets into the eyes, immediately flush eyes gently with water for at least 15 minutes while holding eyelids apart. If symptoms develop as a result of vapor exposure, immediately move individual away from exposure and into fresh air before flushing as recommended above. Seek immediate medical attention.

**Skin**

Remove contaminated clothing. Wash exposed area with soap and water. If symptoms persist, seek medical attention. Launder clothing before reuse.

**Ingestion**

Seek medical attention. If individual is drowsy or unconscious, do not give anything by mouth; place individual on the left side with the head down. Contact a physician, medical facility, or poison control center for advice about whether to induce vomiting. If possible, do not leave individual unattended.

**Inhalation**

If symptoms develop, immediately move individual away from exposure and into fresh air. Seek immediate medical attention; keep person warm and quiet. If person is not breathing, begin artificial respiration. If breathing is difficult, administer oxygen.

**Notes to physician**

**Hazards**: Overexposure to this product (or a component) may cause methemoglobinemia, which in sufficient concentration causes cyanosis. Severe cyanosis may require intravenous injection of methylene blue. Methylene blue is contraindicated if the patient has confirmed or suspected glucose-6-phosphate dehydrogenase deficiency.

**Treatment**: No information available.

## 5. FIRE-FIGHTING MEASURES

**Suitable extinguishing media**

Alcohol-resistant foam, Carbon dioxide (CO2), Dry chemical

**Hazardous combustion products**

May form:, carbon dioxide and carbon monoxide, methyl ethyl ketone, nitrogen oxides, substituted amides

**Precautions for fire-fighting**

If product is heated above its flash point it will produce vapors sufficient to support combustion. Vapors are heavier than air and may travel along the ground and be ignited by heat, pilot lights, other flames and ignition sources at locations near the point of release. Never use welding or cutting torch on or near drum (even empty) because product (even just residue) can ignite explosively.Wear full firefighting turn-out gear (full Bunker gear), and respiratory protection (SCBA). Use water spray to cool fire exposed containers and structures until fire is out if it can be done with minimal risk. Avoid spreading burning liquid with water used for cooling purposes.

## 6. ACCIDENTAL RELEASE MEASURES

**Personal precautions**

For personal protection see section 8. Eliminate all ignition sources (flares, flames including pilot lights, electrical sparks). Persons not wearing protective equipment should be excluded from area of spill until clean-up has been completed. Stop spill at source. Prevent from entering drains, sewers, streams or other bodies of water. Prevent from spreading. If runoff occurs, notify authorities as required. Pump or vacuum transfer spilled product to clean containers for recovery. Absorb unrecoverable product. Transfer contaminated absorbent, soil and other materials to containers for disposal.

**Environmental precautions**

Prevent run-off to sewers, streams or other bodies of water. If run-off occurs, notify proper authorities as required, that a spill has occurred.

**Methods for cleaning up**

Scoop and sweep up all spilled product and other contaminated materials and place in marked disposal containers. If possible, clean up spill area on a dry basis and then flush with plenty of water.

## 7. HANDLING AND STORAGE

**Handling**

Containers of this material may be hazardous when emptied. Since emptied containers retain product residues (vapor, liquid, and/or solid), all hazard precautions given in the data sheet must be observed. When opening, remove closures carefully to relieve possible internal pressure. Never use pressure to empty. Do not store near high heat or open flames.

**Storage**

Store in closed containers in a dry, well-ventilated area. Keep from freezing.

## 8. EXPOSURE CONTROLS / PERSONAL PROTECTION

**Exposure Guidelines**

**General advice**

These recommendations provide general guidance for handling this product. Personal protective equipment should be selected for individual applications and should consider factors which affect exposure potential, such as handling practices, chemical concentrations and ventilation. It is ultimately the responsibility of the employer to follow regulatory guidelines established by local authorities.

**Exposure controls**

Provide sufficient mechanical (general and/or local exhaust) ventilation to maintain exposure below level of overexposure (from known, suspected or apparent adverse effects).

**Eye protection**

Chemical splash goggles in compliance with OSHA regulations are advised; however, OSHA regulations also permit other type safety glasses. Consult your safety representative.

**Skin and body protection**

To prevent repeated or prolonged skin contact, wear impervious clothing and boots.
Wear resistant gloves such as:
Nitrile rubber
butyl-rubber
neoprene -- unsupported
neoprene - supported
Wear resistant gloves such as:
Natural Rubber
Nitrile rubber
butyl-rubber
neoprene -- unsupported
neoprene - supported

**Respiratory protection**

If overexposure has been determined or documented, a NIOSH-approved air supplied respirator is advised in absence of proper environmental control. OSHA regulations also permit other NIOSH respirators under specified conditions. (See your safety equipment supplier.) Engineering or administrative controls should be implemented to reduce exposure.

## 9. PHYSICAL AND CHEMICAL PROPERTIES

| | |
|---|---|
| **Physical state** | liquid |
| **Form** | No data |
| **Colour** | Colorless |
| **Odour** | No data |
| **Boiling point/boilingrange** | 97.78 °C / 208.00 °F@ 1,013.33 hPa |
| **Melting point/range** | 28 °F / -2 °C |
| **pH** | 10.4 |
| **Flash point** | 157.98 °F / 69.99 °C, Pensky Martens closed cup |
| **Evaporation rate** | > 1 (Ethyl Ether) |
| **Explosion limits** | No data |
| **Vapour pressure** | 23.33 hPa @ 68 °F / 20 °C |
| **Vapour density** | (>) 1 (AIR=1) |
| **Density** | 1.000 g/cm3 @ 77.00 °F / 25.00 °C |
| | No data |
| **Solubility** | completely soluble in water |
| **Partition coefficient: n-** | No data |

**octanol/water**
**Autoignition temperature** No data

## 10. STABILITY AND REACTIVITY

**Stability**
Stable.

**Conditions to avoid**
Avoid contact with:, excessive heat

**Incompatible products**
Avoid contact with:, strong alkalis, strong organic acids, strong oxidizing agents

**Hazardous decomposition products**
May form:, carbon dioxide and carbon monoxide, methyl ethyl ketone, nitrogen oxides (NOx), substituted amides

**Hazardous reactions**
Product will not undergo hazardous polymerization.

**Thermal decomposition**
No data

## 11. TOXICOLOGICAL INFORMATION

**Acute oral toxicity**

| | |
|---|---|
| METHYL ETHYL KETONE OXIME | LD 50 Rat: 930 mg/kg |

**Acute inhalation toxicity**

| | |
|---|---|
| METHYL ETHYL KETONE OXIME | LC 50 Rat: > 4,830 mg/l , 4 h |

**Acute dermal toxicity**

| | |
|---|---|
| METHYL ETHYL KETONE OXIME | LD 50 Rabbit: > 1,000 mg/kg |

## 12. ECOLOGICAL INFORMATION

### Aquatic toxicity

#### Acute and Prolonged Toxicity to Fish

96 h LC 50 Oncorhynchus mykiss (rainbow trout), static test: 3,078.0 mg/l

#### Acute Toxicity to Aquatic Invertebrates

48 h LC 50 Daphnia magna (Water flea), static test: 2,679.4 mg/l

### Environmental fate and pathways

| | |
|---|---|
| BOD5: | 124,500 mg/l |
| COD: | 228,000 mg/l |

## 13. DISPOSAL CONSIDERATIONS

### Waste disposal methods

Dispose of in accordance with all applicable local, state and federal regulations. For assistance with your waste management needs - including disposal, recycling and waste stream reduction, contact Ashland Distribution's Environmental Services Group at 800-637-7922.

## 14. TRANSPORT INFORMATION

Dangerous goods descriptions (if indicated above) may not reflect package size, quantity, end-use or region-specific exceptions that can be applied. Consult shipping documents for descriptions that are specific to the shipment.

## 15. REGULATORY INFORMATION

**California Prop. 65**
This product does not contain any chemicals known to State of California to cause cancer, birth, or any other reproductive defects.

**SARA Hazard Classification** Fire Hazard
Acute Health Hazard

**SARA 313 Component(s)**

| | Health | Flammability | Reactivity | Other |
|---|---|---|---|---|
| **HMIS** | 3* | 2 | 0 | |
| **NFPA** | 3 | 2 | 0 | |

## 16. OTHER INFORMATION

The information accumulated herein is believed to be accurate but is not warranted to be whether originating with the company or not. Recipients are advised to confirm in advance of need that the information is current, applicable, and suitable to their circumstances. This MSDS has been prepared by Ashland's Environmental Health and Safety Department (1-800-325-3751).

SLCC-D
67725

## 1. IDENTIFICATION OF THE SUBSTANCE/PREPARATION AND OF THE COMPANY/UNDERTAKING

| | | |
|---|---|---|
| Ashland<br>P.O. Box 2219<br>Columbus, OH 43216 | Regulatory Information Number<br>Telephone<br>Emergency telephone | 1-800-325-3751<br>614-790-3333<br>1-800-ASHLAND<br>(1-800-274-5263) |

| | |
|---|---|
| Product name | SLCC-D |
| Product code | 67725 |
| Product Use Description | No data |

## 2. HAZARDS IDENTIFICATION

**Emergency Overview**

Appearance: liquid,, colourless

DANGER! CAUSES SEVERE BURNS OF THE EYES AND SKIN. MAY BE HARMFUL. MAY CAUSE SEVERE BURNS OF RESPIRATORY AND DIGESTIVE TRACTS.

**Potential Health Effects**

**Routes of exposure**

Inhalation, Skin contact, Eye Contact, Ingestion

**Eye contact**

Can cause permanent eye injury. Symptoms include stinging, tearing, redness, and swelling of eyes. Can injure the cornea and cause blindness. Additional symptoms of eye exposure may include: blurred vision

**Skin contact**

Can cause permanent skin damage. Symptoms may include redness, burning, and swelling of skin, burns, and other skin damage.

**Ingestion**

Swallowing this material may be harmful or fatal. Symptoms may include severe stomach and intestinal irritation (nausea, vomiting, diarrhea), abdominal pain, and vomiting of blood. Swallowing this material may cause burns and destroy tissue in the

mouth, throat, and digestive tract. Low blood pressure and shock may occur as a result of severe tissue injury.

**Inhalation**

Breathing of vapor or mist is possible. Breathing this material may be harmful or fatal. Symptoms may include severe irritation and burns to the nose, throat, and respiratory tract. Symptoms are not expected at air concentrations below the recommended exposure limits, if applicable (see Section 8.).

**Aggravated Medical Condition**

Preexisting disorders of the following organs (or organ systems) may be aggravated by exposure to this material:, Skin, lung (for example, asthma-like conditions)

**Symptoms**

Signs and symptoms of exposure to this material through breathing, swallowing, and/or passage of the material through the skin may include:, stomach or intestinal upset (nausea, vomiting, diarrhea), irritation (nose, throat, airways), Cough, bronchitis, Headache, Shortness of breath, Difficulty in breathing, lung edema (fluid buildup in the lung tissue)

**Target Organs**

No data

**Carcinogenicity**

This material is not listed as a carcinogen by the International Agency for Research on Cancer (IARC), the National Toxicology Program (NTP), or the Occupational Safety and Health Administration (OSHA).

**Reproductive hazard**

There are no data available for assessing risk to the fetus from maternal exposure to this material.

**Other information**

When combined, sodium hypochlorite (bleach) and ammonia produce chloramine gas. Breathing this gas causes choking, difficult breathing, and other symptoms of airway and lung irritation. Fluid may collect in the lung tissue after a severe exposure.

## 3. COMPOSITION/INFORMATION ON INGREDIENTS

| Components | CAS-No. | Concentration |
|---|---|---|
| AMMONIA | 7664-41-7 | >=10-<15% |

## 4. FIRST AID MEASURES

**Eyes**

If material gets into the eyes, immediately flush eyes gently with water for at least 15 minutes while holding eyelids apart. If symptoms develop as a result of vapor exposure, immediately move individual away from exposure and into fresh air before flushing as recommended above. Seek immediate medical attention.

**Skin**

Immediately flush skin with water for at least 15 minutes while removing contaminated clothing and shoes. Seek immediate medical attention. Wash clothing before reuse and discard contaminated shoes.

**Ingestion**

Seek immediate medical attention. Do not induce vomiting. Vomiting will cause further damage to the mouth and throat. If individual is conscious and alert, immediately rinse mouth with water and give milk or water to drink. If possible, do not leave individual unattended.

**Inhalation**

If symptoms develop, immediately move individual away from exposure and into fresh air. Seek immediate medical attention; keep person warm and quiet. If person is not breathing, begin artificial respiration. If breathing is difficult, administer oxygen.

**Notes to physician**

**Hazards**: Pulmonary edema may be delayed.
**Treatment**: No information available.

## 5. FIRE-FIGHTING MEASURES

**Suitable extinguishing media**

Water spray

**Hazardous combustion products**

Ammonia, Hydrogen, nitrogen oxides (NOx)

**Precautions for fire-fighting**

Wear full firefighting turn-out gear (full Bunker gear), and respiratory protection (SCBA). Use water spray to cool fire exposed containers and structures until fire is out if it can be done with minimal risk. Avoid spreading burning liquid with water used for cooling purposes.

## 6. ACCIDENTAL RELEASE MEASURES

**Personal precautions**

For personal protection see section 8. Persons not wearing protective equipment should be excluded from area of spill until clean-up has been completed. Ensure adequate ventilation.

**Environmental precautions**

Prevent run-off to sewers, streams or other bodies of water. If run-off occurs, notify proper authorities as required, that a spill has occurred.

**Methods for cleaning up**

Neutralize and mop up solution. Absorb liquid on vermiculite, floor absorbent or other absorbent material.

## 7. HANDLING AND STORAGE

**Handling**

Containers of this material may be hazardous when emptied. Since emptied containers retain product residues (vapor, liquid, and/or solid), all hazard precautions given in the data sheet must be observed. Emergency eyewash fountains and safety showers should be available in the immediate vicinity of potential exposure. Contents may be under pressure. Use extreme caution when opening drums of this material. If contents of container are more than 80 degrees F (22 degrees C) or if container is bulging, cool drum before opening by packing in ice or spraying with chilled water. Opening a container that is under pressure may result in a violent discharge of the contents. Static ignition hazard can result from handling and use. Electrically bond and ground all containers, personnel and equipment before transfer or use of material. Special precautions may be necessary to dissipate static electricity for non-conductive containers. Use proper bonding and grounding during product transfer as described in National Fire Protection Association document NFPA 77. Warning. Sudden release of hot organic chemical vapors or mists from process equipment operating at elevated temperature and pressure, or sudden ingress of air into vacuum equipment, may result in ignitions without the presence of obvious ignition sources. Published "autoignition" or

"ignition" temperature values cannot be treated as safe operating temperatures in chemical processes without analysis of the actual process conditions. Any use of this product in elevated temperature processes should be thoroughly evaluated to establish and maintain safe operating conditions.

**Storage**

Store in a cool, dry, ventilated area, away from incompatible substances.

## 8. EXPOSURE CONTROLS/PERSONAL PROTECTION

**Exposure Guidelines**

| **AMMONIA** | | **7664-41-7** |
|---|---|---|
| ACGIH | time weighted average | 25 ppm |
| ACGIH | Short term exposure limit | 35 ppm |
| NIOSH | Recommended exposure limit (REL): | 25 ppm |
| NIOSH | Recommended exposure limit (REL): | 18 mg/m3 |
| NIOSH | Short term exposure limit | 35 ppm |
| NIOSH | Short term exposure limit | 27 mg/m3 |
| OSHA Z1 | Permissible exposure limit | 50 ppm |
| OSHA Z1 | Permissible exposure limit | 35 mg/m3 |

**General advice**

These recommendations provide general guidance for handling this product. Personal protective equipment should be selected for individual applications and should consider factors which affect exposure potential, such as handling practices, chemical concentrations and ventilation. It is ultimately the responsibility of the employer to follow regulatory guidelines established by local authorities.

**Exposure controls**

Provide sufficient mechanical (general and/or local exhaust) ventilation to maintain exposure below exposure guidelines (if applicable) or below levels that cause known, suspected or apparent adverse effects. Mechanical ventilation systems used to ventilate corrosive storage or process areas must be designed with components that are corrosion resistant.

**Eye protection**

Wear chemical splash goggles and face shield when there is potential for exposure of the eyes or face to liquid, vapor or mist. Maintain eye wash station in immediate work area.

**Skin and body protection**

Wear appropriate chemical impervious clothing and boots whenever there is potential for skin contact with product. Launder clothing before reuse. Maintain safety shower at all locations where skin contact could occur. Contact your local safety equipment supplier to assist the facility in determining proper selection of personal protective equipment for the applications/operations present at your facility.
Wear impervious gloves (consult your safety equipment supplier).

**Respiratory protection**

A NIOSH-approved air-purifying respirator with an appropriate cartridge and/or filter may be persmissible under certain circumstancs where airborne concentrations are expected to exceed exposure limits (if applicable) or if overexposure has otherwise been determined. Protection provided by air-purifying respirators is limited. Use a positive pressure, air-supplied respirator if there is any potential for uncontrolled release, exposure levels are not known or any other circumstances where an air-purifying respirator may not provide adequate protection.

## 9. PHYSICAL AND CHEMICAL PROPERTIES

| | |
|---|---|
| **Physical state** | liquid |
| **Form** | No data |
| **Colour** | colourless |
| **Odour** | pungent |
| **Boiling point/boiling range** | 58.89 °C / 138.00 °F |
| **Melting point/range** | -15.00 °F / -26.11 °C |
| **pH** | 13 |
| **Flash point** | No data |
| **Evaporation rate** | < 1 (Ethyl Ether) |
| **Explosion limits** | 16 %(V) 25 %(V) |
| **Vapour pressure** | 262.00 hPa @ 77 °F / 25 °C |
| **Vapour density** | (<) 1 (AIR=1) |
| **Density** | 0.946 g/cm3 @ 77.0 °F / 25.0 °C<br>7.87 lb/gal @ 77.00 °F / 25.00 °C |
| **Solubility** | completely soluble in water |
| **Partition coefficient: n-octanol/water** | No data |
| **log Pow** | no data available |
| **Autoignition temperature** | No data |

## 10. STABILITY AND REACTIVITY

**Stability**
Stable.

**Conditions to avoid**
Heat, flames and sparks.

**Incompatible products**
Alkali metals, brass, Copper, Iron, metallic mercury, silver, Strong acids, strong alkalis, strong mineral acids, sodium hypochlorite

**Hazardous decomposition products**
Ammonia, nitrogen oxides (NOx)

**Hazardous reactions**
Product will not undergo hazardous polymerization., Reacts with hypochlorite or other halogen sources (chlorine, bromine, iodine, etc) to form explosive compounds that are sensitive to pressure or increases in temperature.

**Thermal decomposition**
No data

## 11. TOXICOLOGICAL INFORMATION

**Acute oral toxicity**

| | |
|---|---|
| AMMONIA | LD 50 Rat: 350 mg/kg |

**Acute inhalation toxicity**

| | |
|---|---|
| AMMONIA | LC 50 Rat: 2000 ppm, 4 h |

**Acute dermal toxicity**

| | |
|---|---|
| AMMONIA | no data available |

## 12. ECOLOGICAL INFORMATION

**Aquatic toxicity**

### Acute and Prolonged Toxicity to Fish

96 h LC 50 Oncorhynchus mykiss (rainbow trout), static test: 171 mg/l

96 h LC 50 Pimephales promelas (fathead minnow), static test: 95 mg/l

### Acute Toxicity to Aquatic Invertebrates

48 h EC 50 Water flea (Ceriodaphnia dubia), static test: 165 mg/l

### Environmental fate and pathways

| | |
|---|---|
| BOD5: | <50 mg/l |
| COD: | <50 mg/l |

## 13. DISPOSAL CONSIDERATIONS

### Waste disposal methods

Dispose of in accordance with all applicable local, state and federal regulations. For assistance with your waste management needs - including disposal, recycling and waste stream reduction, contact Ashland Distribution's Environmental Services Group at 800-637-7922.

## 14. TRANSPORT INFORMATION

**IMDG**:
UN2672, AMMONIA SOLUTION 8, III
**IATA_P**:
UN2672, Ammonia solution 8, III
**IATA_C**:
UN2672, Ammonia solution 8, III
**CFR_ROAD**:
UN2672, Ammonia solutions 8, III
**CFR_RAIL**:
UN2672, Ammonia solutions 8, III

**CFR_INWTR**:
UN2672, Ammonia solutions 8, III
**IMDG_ROAD**:
UN2672, AMMONIA SOLUTION 8, III
**IMDG_RAIL**:
UN2672, AMMONIA SOLUTION 8, III

Dangerous goods descriptions (if indicated above) may not reflect quantity, end-use or region-specific exceptions that can be applied. Consult shipping documents for descriptions that are specific to the shipment.

## 15. REGULATORY INFORMATION

**California Prop. 65**
This product does not contain any chemicals known to State of California to cause cancer, birth, or any other reproductive defects.
**SARA Hazard Classification** Acute Health Hazard

**SARA 313 Component(s)**

| | | |
|---|---|---|
| AMMONIA | 7664-41-7 | 14.9% |

**Reportable quantity - Product**
US. EPA CERCLA Hazardous Substances (40 CFR 302) 671 lbs

**Reportable quantity - Components**

| | | |
|---|---|---|
| AMMONIA | 7664-41-7 | 100 lbs |

| | Health | Flammability | Reactivity | Other |
|---|---|---|---|---|
| **HMIS** | 3 | 1 | 0 | |
| **NFPA** | 3 | 1 | 0 | |

## 16. OTHER INFORMATION

The information accumulated herein is believed to be accurate but is not warranted to be whether originating with the company or not. Recipients are advised to confirm in advance of need that the information is current, applicable, and suitable to their circumstances. This MSDS has been prepared by Ashland's Environmental Health and Safety Department (1-800-325-3751).

**MIDWEST INDUSTRIAL SUPPLY, INC.**
1101 3rd Street Southeast • Canton, Ohio 44707 • USA
Emergency Phone Number: 330-456-3121

# SOIL-SEMENT®

## *MATERIAL SAFETY DATA SHEET*

## SECTION I -- IDENTIFICATION OF SUBSTANCE/PREPARATION AND COMPANY/UNDERTAKING

| | |
|---|---|
| **TRADE NAME:** | SOIL-SEMENT® |
| **CHEMICAL NAME:** | POLYMER EMULSION |
| **SYNONYMS:** | DUST RETARDANT |
| **CHEMICAL FAMILY:** | N/A |
| **MOLECULAR WEIGHT:** | N/A |
| **FORMULA:** | AQUEOUS ACRYLIC VINYL ACETATE POLYMER EMULSION |
| **CAS REGISTRY NO.:** | PRODUCT A BLEND - NO NUMBER ASSIGNED |

## SECTION II -- COMPOSITION/INFORMATION ON INGREDIENTS

| NAME | CAS REG NO. | WT. % |
|---|---|---|
| Acrylic & Vinyl Acetate Polymer | Non-hazardous | 5-50 |
| Water | 7732-18-5 | 95-50 |

## SECTION III -- HAZARDS IDENTIFICATION

| | |
|---|---|
| Acrylic & Polyvinyl Acetate Polymer | Non-hazardous |
| Water | Non-hazardous |

## SECTION IV -- FIRST AID MEASURES

| | |
|---|---|
| **EYES:** | Flush eyes with flowing water at least 15 minutes, get medical attention. |
| **INHALATION:** | Move subject to fresh air. |
| **SKIN:** | Flush with large amount of water or wash with soap and water. |
| **INGESTION:** | Give water to drink. Call a physician. |
| | **NEVER GIVE FLUIDS OR INDUCE VOMITING.** |
| | **IF PATIENT IS UNCONSCIOUS OR HAVING CONVULSIONS.** |

## SECTION V -- FIRE FIGHTING MEASURES

| | |
|---|---|
| **FLASH POINT (TEST METHOD):** | Emulsion, >210$^0$F |
| **AUTOIGNITION TEMPERATURE:** | N/A |
| **EXTINGUISHING MEDIUM:** | N/A |
| **SPECIAL FIREFIGHTING PROCEDURES:** | N/A |
| **UNUSUAL FIRE AND EXPLOSION HAZARDS:** | Material can splatter above 212°F. Dried polymer film can burn but will not support combustion. |

## SECTION VI - ACCIDENTAL RELEASE MEASURES

| | |
|---|---|
| **SPILL AND LEAK PROCEDURES:** | Dike and control spill. Transfer liquid to containers for recovery or disposal. Keep spills out of sewers and open bodies of water. |

## SECTION VII -- HANDLING AND STORAGE

| | |
|---|---|
| **STORAGE:** | Keep in a cool, dry, ventilated storage area and in closed containers. Avoid freezing temperatures. Minimize contact with the air to prevent microorganism contamination and reduce the formation of skins on the surface. |
| **HANDLING:** | Handle in a well-ventilated workspace. |

## SECTION VIII -- EXPOSURE CONTROL/PERSONAL PROTECTION

| | |
|---|---|
| **RESPIRATORY PROTECTION:** | None required if good ventilation is maintained. |
| **VENTILATION:** | Mechanical exhaust at point of contaminant. |
| **EYE PROTECTION:** | Chemical splash goggles recommended. |
| **PROTECTIVE CLOTHING:** | Impervious gloves recommended. |
| **OTHER:** | Under normal handling conditions, the risk of exposure to residual monomer is negligible. |

## SECTION IX -- PHYSICAL AND CHEMICAL PROPERTIES

| | |
|---|---|
| **BOILING/MELTING POINT @ 760 mm Hg:** | 212°F |
| **VAPOR PRESSURE mm Hg @ 20°C:** | 17 |
| **SPECIFIC GRAVITY OR BULK DENSITY:** | 1.01 to 1.15 |
| **SOLUBILITY IN WATER:** | Dilutable |
| **APPEARANCE:** | Milky White Liquid |
| **ODOR:** | Characteristic Acrylic odor |
| **pH:** | 4.0 to 9.5 |

## SECTION X -- STABILITY AND REACTIVITY

| | |
|---|---|
| **STABILITY:** | Stable |
| **CHEMICAL INCOMPATIBILITY:** | No hazardous reactions are expected to occur under normal industrial conditions. |
| **HAZARDOUS DECOMPOSITION PRODUCTS:** | Thermal decomposition in the presence of air may yield carbon monoxide and/or carbon dioxide and water. |
| **HAZARDOUS POLYMERIZATION:** | Does not occur |
| **CONDITIONS TO AVOID:** | N/A |
| **CORROSIVE TO METAL:** | No |
| **OXIDIZER:** | No |

## SECTION XI -- TOX ICOLOGICAL INFORMATION

**EFFECTS OF OVEREXPOSURE**

| | |
|---|---|
| **INHALATION:** | Vapor from stored, undiluted product can cause headache and nausea. |
| **SKIN:** | Stored, undiluted product is slightly irritating to skin. |
| **EYES:** | Slightly irritating to eyes. |
| **INGESTION:** | May be irritating to digestive tract. |

| NAME | OSHA TWA | OSHA STEL | ACGIH TWA | ACGIH STEL |
|---|---|---|---|---|
| Acrylic & polyvinyl Acetate Polymer | None | None | None | None |
| Water | None | None | None | None |

## SECTION XII -- ECOLOGICAL INFORMATION

Animal toxicity studies on blended SOIL-SEMENT® have not been carried out because we believe the fish toxicity studies done on the blend demonstrate it is as non-toxic as the individual emulsions which go into the blend. TABLE #1 gives the results of our fish toxicity tests.
In summary, these data show that the $LC_{50}$ of SOIL-SEMENT® on goldfish is somewhere above 12,500 ppm. This is extremely low toxicity, especially in view of the legal requirement that chemicals must be labeled "toxic to fish" only if their $LC_{50}$ is less than 1.0 ppm.

**TABLE I**

| FISH TOXICITY STUDIES | | | |
|---|---|---|---|
| **EMULSION NUMBER** | **TYPE OF FISH** | **HOURS** | **$LC_{50}$ PPM** |
| C | Rainbow Trout | 24 | 10,000 |
| C | Rainbow Trout | 96 | 8,950 |
| C | Bluegill Sunfish | 24 | 10,000 |
| C | Bluegill Sunfish | 96 | 5,640 |
| C | Goldfish | 24 | 4,200 |
| H | Goldfish | 24 | 7,500 |
| G | Goldfish | 24 | 10,000 |
| D | Goldfish | 24 | 13,400 |
| F | Goldfish | 24 | 13,400 |
| SOIL-SEMENT® | Goldfish | 24 | 12.500 - 25,000 |
| SOIL-SEMENT® | Goldfish | 48 | 12,500 - 25,000 |
| SOIL-SEMENT® | Goldfish | 72 | 12,500 - 20,000 |
| B | Goldfish | 24 | 24,000 |
| E | Goldfish | 24 | 24,000 |

The 48 hour $LC_{50}$ for Daphnia Magna based on nominal test concentrations and mortality at the end of testing was calculated to be 3,482.8 parts per million (ppm).

## SECTION XIII -- DISPOSAL CONSIDERATIONS

**WASTE DISPOSAL METHOD:**

Coagulate the emulsion by the stepwise addition of ferric chloride and lime or the addition of sand or other absorbent material. Remove the clear supernatant liquid and flush to a chemical sewer or landfill. Incinerate solids and the contaminated diking material according to local, state and federal regulations.

**CONTAINER DISPOSAL:**

Do not re-use containers. Do not weld on metal containers.

## SECTION XIV -- TRANSPORTATION INFORMATION

| | |
|---|---|
| **D.O.T. PROPER SHIPPING NAME (49CFR172.101):** | None |
| **HAZARDOUS SUBSTANCE (40CFR116):** | N/A |
| **REPORTABLE QUANTITY (RQ):** | N/A |
| **D.O.T. HAZARD CLASSIFICATION (49CFR172.101):** | Non-regulated |
| **D.O.T. PLACARDS REQUIRED:** | None |
| **POISON CONSTITUENT (49CFR173.343):** | N/A |
| **BILL OF LADING DESCRIPTION:** | Liquid plastic, NOS |
| **C NO.:** | N/A |
| **UN/NA CODE:** | N/A |

## SECTION XV-- REGULATORY INFORMATION

**SOIL-SEMENT® is not a restricted article according to the Department of Transportation and International Air Transport Association regulations.**

| | |
|---|---|
| **EPA SARA Title III hazard class:** | None |
| **OSHA HCS hazard class:** | Non-OSHA hazardous (29CFR1910.1200) |
| **EPA SARA Title III Section 313 (40CFR372)** | |
| **Toxic Chemicals present in quantities greater than the "de minimus" level are:** | None |

This product is not a "controlled product" under the Canadian Workplace Hazardous Material Information System (WHMIS)

## SECTION XVI -- OTHER INFORMATION

**ABBREVIATIONS AND SYMBOLS:**

N.D. - Not Determined
N.A. - Not Applicable
N.T. - Not Tested
< - LESS THAN
> - MORE THAN

Material Safety Data Sheet

## 1. CHEMICAL PRODUCT AND COMPANY INFORMATION

| | |
|---|---|
| **Chemical Product Name** | Sodium Chloride (Salt) |
| **Chemical Family** | Alkali Metal/Halide |
| **Chemical Name** | Sodium Chloride |
| **INCI Name** | SODIUM CHLORIDE |
| **INN Name** | sodium chloride |
| **Formula** | NaCl |
| **Molecular Weight** | 58.44 |
| **Commercial Name** | Kiln Dried Solar Salt - Coarse, Kiln Dried Solar Salt - Medium, Cod Fish Salt, North Pacific Boat & Shore® Salt - Coarse, North Pacific Boat & Shore® Salt - Medium, North Pacific Boat & Shore® Salt - Extra Fine, Kiln Dried Solar Salt - Extra Fine |

**Manufacturer**
Cargill Salt
P.O. Box 5621
Minneapolis, MN 55440

**Emergency Telephone Numbers**
CHEMTREC (800) 424-9300

## 2. COMPOSITION/INFORMATION ON INGREDIENTS

**Description**
White crystalline solid

| **Ingredient Name** / **CAS Number** | **Exposure Limits** | **Concentration (%)** |
|---|---|---|
| Sodium Chloride 7647-14-5 | | 100 |

## 3. HAZARDS IDENTIFICATION

**EMERGENCY OVERVIEW**

None – GRAS Substance (Generally Recognized As Safe)

**Potential Health Effects**

**Route(s) Of Entry:** Ingestion, skin/eye contact, inhalation.

**Human Effects and Symptoms of Overexposure:**

**Acute Inhalation:** Irritation of the respiratory tract.

**Chronic Inhalation:** No applicable information found for chronic system effects.

**Acute Skin Contact:** Large amounts can cause irritation, and, if applied to damaged skin, absorption can occur with effects similar to those via ingestion.

**Chronic Skin Contact:** No applicable information found for chronic system effects.

**Acute Eye Contact:** Irritation with burning and tearing (salt concentrations greater than the normal saline present).

**Chronic Eye Contact:** No applicable information found for chronic systemic effects.

**Acute Ingestion:** Intake of large amounts has generally occurred for deliberate reasons: suicide, absorption, and to induce vomiting. The following effects were observed; nausea and vomiting, diarrhea, cramps, restlessness, irritability, dehydration, water retention, nose bleed, gastrointestinal tract damage, fever, sweating, sunken eyes, high blood pressure, muscle weakness, dry mouth and nose, shock, cerebral edema (fluid on brain), pulmonary edema (fluid in lungs), blood cell shrinkage, and brain damage (due to dehydration of brain cells). Death is generally due to cardiovascular collapse or CNS damage. Less than a few grams would not be harmful. For larger quantities, drink large amounts of water or milk.

**Chronic Ingestion:** No applicable information found for chronic systemic effects.

**Carcinogenicity**
**NTP:** Not listed as carcinogen or mutagen.
**IARC:** Not listed as carcinogen or mutagen.
**OSHA:** Not listed as carcinogen or mutagen.

**Medical Conditions Aggravated by Exposure:** In some cases of confirmed hypertension, ingestion may result in elevated blood pressure.

**HMIS** Health: 1, Flammability: 0, Reactivity: 0, Protective Equipment: A

## 4. FIRST AID MEASURES

**First Aid for Eyes:** For eye contact, flush with water immediately, lifting eyelids occasionally.

**First Aid for Skin:** Remove clothing from affected area. Wash skin thoroughly. Rinse carefully.

**First Aid for Inhalation:** If person breathes large quantities, remove to fresh air at once. If breathing stops, apply artificial respiration immediately.

**First Aid for Ingestion:** Less than a few grams would not be harmful. For larger quantities, drink large amounts of water or milk.

## 5. FIRE AND MEASURES

**Flash Point:** N/A

**Extinguishing Media:** N/A. This product is nonflammable.

**Special Fire Fighting Procedures:** N/A

## 6. ACCIDENTAL RELEASE MEASURES

**Spill or Leak Procedures:** Contain spills to prevent contamination of water supply or sanitary sewer system. Vacuum or sweep into containers for proper disposal.

## 7. HANDLING AND STORAGE

**Storage Temperature (min./max.):** Avoid humid or wet conditions as product will cake and become hard.

**Special Sensitivity:** Avoid contact with strong acids.

**Handling and Storage Precautions:** Becomes hygroscopic at 75% relative humidity.

## 8. EXPOSURE CONTROLS/PERSONAL PROTECTION

**Eye Protection Requirements:** Eyeglasses or goggles should be worn in dusty areas.

**Skin Protection Requirements:** Protective clothing may be worn in dusty areas, but is generally not required.

**Respiratory/Ventilation Requirements:** NIOSH/MSHA approved respirator for particulates.

**Exposure Limits:** Not listed.

## 9. PHYSICAL AND CHEMICAL PROPERTIES

**Physical Form:** White crystalline solid with slight halogen odor.

**Color:** White to opaque.

**Odor:** Halogen odor when heated.

**Boiling Point (760mm Hg)(°C):** 1465

**Melting Point/Freezing Point (°C):** 801

**pH:** 6.7 – 10.0

**Solubility in Water (g/cc)(%):** 26.4

**Specific Gravity ($H_2O$ = 1):** 2.16

**Bulk Density (lbs./$ft^3$):** 35-83

**% Volatile by Weight:** N/A

**Vapor Pressure (mm Hg/747°C):** 2.4

**Vapor Density (Air=1):** N/A

## 10. REACTIVITY

**Stability:** Stable

**Incompatibilities:** Avoid contact with strong acids. Becomes corrosive to metals when wet.

**Decomposition Products:** May evolve chlorine gas when in contact with strong acids.

## 11. TOXICOLOGICAL INFORMATION

**Description:** Not listed.

## 12. ECOLOGICAL INFORMATION

**Ecotoxicity:** Not listed.

**Environmental Degradation:** Not listed.

## 13. DISPOSAL CONSIDERATIONS

**Waste Disposal Method:** Follow applicable Federal, state, and local regulations.

## 14. TRANSPORTATION INFORMATION

**D.O.T. Shipping Name:** Not listed.

**Technical Shipping Name:** Not listed.

**D.O.T. Hazard Class:** Not listed.

**U.N./N.A. Number:** Not listed.

**Product Rq (lbs.):** N/A

**D.O.T. Label:** Not listed.

**D.O.T. Placard:** N/A

**Freight Class Bulk:** N/A

**Freight Class Package:** N/A

**Product Label:** N/A

## 15. REGULATORY INFORMATION

**OSHA Status:** Not listed.

**TSCA Status:** Listed as non-hazardous.

**CERCLA Reportable Quantity SARA Title III**

**Section 302 Extremely Hazardous Substances**: Not listed.

**Section 311/312 Hazard Categories:** Not listed.

**Section 313 Toxic Chemicals:** Not listed.

**RCRA Status:** Not listed.

**EINECS Number:** 231-598-3

**ENCS Number:** 1-236

**ECL Serial Number:** KE-31387

**SWISS Number:** G-2580

**HMIS Rating:** 1 0 0 A

**State Regulatory Information**

| Company Name/Cas Number | Concentration | State Code |
|---|---|---|
| N/A | | |

## 16. OTHER INFORMATION

**Reason for Issue:** Regulatory compliance.
**Prepared By:** Steve Karl
**Approved By:** Dave Merriweather
**Title:** Technical Director
**Approval Date:** May 2007
**Supersedes Date:** February 2005
**MSDS Number:** NK3

Disclaimer: All statements, technical information and recommendations contained herein are, to the best of our knowledge, reliable and accurate; however, no warranty, either expressed or implied is made with respect thereto, nor will any liability be assumed for damages resultant from the use of the material described.

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CHEMTRADE LOGISTICS

# MATERIAL SAFETY DATA SHEET

## Sulfuric Acid

## 1. PRODUCT AND COMPANY IDENTIFICATION

**Product Name:** Sulfuric Acid
**Synonyms:** Sulphuric Acid, Hydrogen Sulphate, Oil of Vitriol, Battery Acid
**Product Use:** Used in manufacture of fertilizers, explosives, other acids, metal pickling and petroleum processing.

**Chemtrade Logistics Inc.**
155 Gordon Baker Road
Suite 300
North York, ON
M2H 3N5
(866) 887-8805
www.chemtradelogistics.com

**Emergency Telephone Number**
Chemtrec 1-800-424-9300
Canutec (613) 996-6666

## 2. COMPOSITION/INFORMATION ON INGREDIENTS

| **Hazardous Ingredients** | **% by Wt.** | **CAS Number** |
|---|---|---|
| Sulfuric Acid | 70-100% | 7664-93-9 |
| **Non-Hazardous Ingredients** | | |
| Water | 0-30% | 7732-18-5 |

## 3. HAZARD INFORMATION

**EMERGENCY OVERVIEW**:

**Danger! Extremely corrosive. Causes severe burns and eye damage. Mist: Causes respiratory irritation. Harmful if inhaled. Harmful or fatal if swallowed. Reacts violently with water. Concentrated Sulfuric Acid will react with many organic materials and may cause fire due to the heat of the reaction. Not flammable, but reacts with most metals to form explosive/flammable hydrogen gas.** Read the entire MSDS for a more thorough evaluation of the hazards.

**National Fire Protection Association (NFPA) Rating**
**Hazardous Materials Identification System (HMIS) Rating**

| | NFPA | HMIS | |
|---|---|---|---|
| Health | 3 | 3 | 4 = Extreme/Severe |
| Fire | 0 | 0 | 3 = High/Serious |
| Reactivity | 2 | 2 | 2 = Moderate |
| Special | ~~W~~ | | 1 = Slight |
| Personal Protection | | C | 0 = Minimum |
| | | | ~~W~~ = Water Reactive |

## 3. HAZARD INFORMATION (continued)

**Exposure Limits:**

| | ACGIH (TLV) | OSHA (PEL) | NIOSH (REL) |
|---|---|---|---|
| Sulfuric Acid | 1 mg/m$^3$ (TWA)<br>3 mg/m$^3$ (STEL)<br>A2 (Notations) refers to sulfuric acid contained in strong inorganic acid mists; suspected human carcinogen | 1 mg/m$^3$ (TWA) | 1 mg/m$^3$ (TWA) |

**POTENTIAL HEALTH EFFECTS:**

**Eye Contact:** Immediate pain, severe burns and corneal damage, which may result in permanent blindness.

**Skin Contact**: Causes burns, and brownish or yellow stains. Concentrated solutions may cause second or third degree burns with severe necrosis. Prolonged and repeated exposure to dilute solutions may cause irritation, redness, pain and drying and cracking of the skin.

**Inhalation**: Causes respiratory irritation and at high concentrations may cause severe injury, burns, or death. Effects of exposure may be delayed.

**Ingestion**: Causes severe irritation or burns of the mouth, throat, and esophagus.

**Existing Medical Conditions Possibly Aggravated By Exposure:** Skin irritation may be aggravated in individuals with existing skin lesions. Breathing of vapors or sprays (mists) may aggravate acute or chronic asthma and chronic pulmonary disease such as emphysema and bronchitis.

**Carcinogenicity**: Strong inorganic acid mists containing sulfuric acid (Occupational exposures) : Proven (Human, Group 1, IARC) ; Suspected (Human Group A2, ACGIH) ; Group 3 (NTP) ; Classification not applicable to sulfuric acid and sulfuric acid solutions.

## 4. FIRST AID MEASURES

**General:** Corrosive effects on the skin and eyes may be delayed, and damage may occur without the sensation or onset of pain. Strict adherence to first aid measures following any exposure is essential. SPEED IS ESSENTIAL. OBTAIN IMMEDIATE MEDICAL ATTENTION.

**Skin Contact:** Immediately flush skin with running water for a **minimum** of 20 minutes. Start flushing while removing contaminated clothing. If irritation persists, repeat flushing. Obtain medical attention IMMEDIATELY. Do not transport victim unless the recommended flushing period is completed or flushing can be continued during transport.

While the patient is being transported to a medical facility, apply compresses of iced water. If medical treatment must be delayed, immerse the affected area in iced water. If immersion is not practical, compresses of iced water can be applied. Avoid freezing tissues.

Discard heavily contaminated clothing and shoes in a manner that limits further exposure. Otherwise, wash clothing separately before reuse.

**Eye Contact:** Immediately flush eyes with running water for a **minimum** of 20 minutes. Hold eyelids open during flushing. If irritation persists, repeat flushing. Obtain medical attention IMMEDIATELY. Do not transport victim until the recommended flushing period is completed unless flushing can be continued during transport.

**Inhalation:** Move victim to fresh air. Give artificial respiration ONLY if breathing has stopped. Do not use mouth-to-mouth method if victim ingested or inhaled the substance: induce artificial respiration with the aid of a pocket mask equipped with a one-way valve or other proper respiratory medical device. Give Cardiopulmonary Resuscitation (CPR) if there is no pulse AND no breathing. Obtain medical attention IMMEDIATELY.

**Ingestion:** DO NOT INDUCE VOMITING. If victim is alert and not convulsing, rinse mouth and give ½ to 1 glass of water to dilute material. If spontaneous vomiting occurs, have victim lean forward with head down to avoid breathing in of vomitus, rinse mouth and administer more water. IMMEDIATELY contact local poison control center. Vomiting may need to be induced but should be directed by a physician or a poison control centre. IMMEDIATELY transport victim to an emergency facility.

**Note to Physicians**: This product contains materials that may cause severe pneumonitis if aspirated. If ingestion has occurred less than 2 hours earlier, carry out careful gastric lavage; use endotracheal cuff if available, to prevent aspiration. Observe patient for respiratory difficulty from aspiration pneumonitis. Give artificial resuscitation and appropriate chemotherapy if respiration is depressed. Following exposure the patient should be kept under medical review for at least 48 hours as delayed pneumonitis may occur. DO NOT attempt to neutralize the acid with weak bases since the reaction will produce heat that may extend the corrosive injury

## 5. FIRE AND EXPLOSION DATA

**Flash Point (method)**: Not applicable. Not combustible
**Flammable Limits (Lower):** Not applicable.
**Flammable Limits (Upper):** Not applicable.
**Auto Ignition Temperature:** Not applicable.
**Combustion and Thermal Decomposition Products:** Oxides of Sulfur

**Fire and Explosion Hazards:** Not flammable but highly reactive. Strong dehydrating agent, which may cause ignition of finely divided combustible materials on contact. Reacts violently with water with evolution of heat can react with organic materials explosively (See Section 10). Reacts with many metals to liberate hydrogen gas which can form explosive mixtures with air. Hydrogen, a highly flammable gas, can accumulate to explosive concentrations inside drums, or any types of steel containers or tanks upon storage. Oxides of sulfur may be produced in fire.

**Fire Fighting Instructions:** Wear a NIOSH/MSHA approved self-contained breathing apparatus if vapors or mists are present and full protective clothing. For fighting fires in close proximity to spill or vapors, use acid-resistant personal protective equipment. Evacuate personnel to a safe area. Prevent unauthorized entry to fire area. Dike area to contain runoff and prevent contamination of water sources. Neutralize runoff with lime, soda ash or other suitable neutralizing agents (see Deactivating Chemicals, Section 6). Cool containers that are exposed to flame with streams of water until fire is out.

**NOTE:** Also see "Section 10 - Stability and Reactivity"

## 6. ACCIDENTAL RELEASE MEASURES

**Steps to be taken in the event of a spill or leak:** Remove all ignition sources (no smoking, flares, sparks or flames). All equipment should be grounded. Ventilate area. Use appropriate Personal Protection Equipment. Prevent liquid from entering sewers or waterways. Stop or reduce leak if safe to do so.
**Small Spills:** Cover with DRY earth, sand or other non-combustible material. Use clean non-sparking tools to collect material and place it into loosely covered plastic containers for later disposal.
**Large Spills:** Prevent liquid from entering sewers or waterways. Dike with inert material (sand, earth, etc.). Collect into plastic containers for disposal. Consider insitu neutralization and disposal. Ensure adequate decontamination of tools and equipment following clean up. Comply with Federal, Provincial/State and local regulations on reporting releases.

**Waste Disposal Methods:** Dispose of waste material at an approved waste treatment/disposal facility, in accordance with applicable regulations. Do not dispose of waste with normal garbage or to sewer systems.

Note - Clean-up material may be a RCRA Hazardous Waste on disposal.
- Spills are subject to CERCLA reporting requirements: RQ = 1000 lbs.

## 7. HANDLING AND STORAGE

**Handling:** Wear appropriate Personal Protection Equipment. Do not breathe sprays or mists. Do not ingest. Do not get in eyes, on skin or on clothing. Keep ignition sources away from sulfuric acid storage, handling and transportation equipment. Locate safety shower and eyewash station close to chemical handling area. Use EXTREME care when diluting with water. **Always add acid to water**. CAUTION: Hydrogen, a highly flammable gas, can accumulate to explosive concentrations inside drums, or any types of steel containers or tanks upon storage. **Carbon steel storage tanks must be vented.** People working with this chemical should be properly trained regarding its hazards and its safe use.

**Storage:** If stored in non-reactive container, keep container tightly closed. Metal and, specifically carbon steel, storage tanks must be vented due to hydrogen release as noted above.

## 8. EXPOSURE CONTROLS/PERSONAL PROTECTION

**Engineering Controls:** Local exhaust ventilation should be applied wherever there is an incidence of point source emissions or dispersion of regulated contaminants in the work area. Ventilation control of the contaminant as close to its point of generation is both the most economical and safest method to minimize personnel exposure to airborne contaminants. The most effective measures are the total enclosure of processes and the mechanization of handling procedures to prevent all personal contact with sulfuric acid. Electrical installations should be protected against the corrosive action of acid vapors. Smoking should be prohibited in areas in which sulfuric acid is stored or handled.

**Respiratory Protection:** A NIOSH/MSHA approved air-purifying respirator equipped with acid gas/fume, dust, mist cartridges for concentrations up to 10 mg/m$^3$. An air-supplied respirator if concentrations are higher or unknown.

**Skin Protection:** RECOMMENDED: Impervious (i.e., neoprene, PVC) gloves, coveralls, boots and/or other acid resistant protective clothing.

**Eye Protection:** Tight-fitting chemical goggles and face shield.

**Other Personal Protective Equipment:** Where there is a danger of spilling or splashing, acid resistant aprons or suits should be worn. Trouser legs should be worn outside (not tucked in) rubber boots. Safety showers and eyewash fountains should be installed in storage and handling areas.

**Pictograms**



**EXPOSURE GUIDELINES:**

**HAZARDOUS INGREDIENT(S):**

**Sulfuric Acid:**

| | |
|---|---|
| ACGIH TLV | 1 mg/m$^3$ (TWA) 8 hours |
| ACGIH STEL | 3 mg/m$^3$ 15 minutes |
| OSHA PEL | 1 mg/m$^3$ (TWA) 8 hours |
| NIOSH REL | 1 mg/m$^3$ (TWA) 10 hours |

## 9. PHYSICAL AND CHEMICAL PROPERTIES

**Molecular Weight:** 98.08
**Physical State:** Liquid
**Appearance and Odor:** Odourless, clear to amber, heavy, oily liquid. A pungent odor may exist If certain impurities are present in the acid.
**Odor Threshold:** Not applicable
**Boiling Point:** 77.67%: 193°C (380°F); 93.19%: 276°C (529°F); 98%: 330°C (626°F)
**Melting/Freezing Point:** 77.67%: -11.2°C (+11.6°F); 93.19%: -29.5°C (-21.1°F) ; 98%: -1.1°C (30°F)
**Vapor Pressure at 40°C (102°F):** 77.67%: 1.2 mmHg; 93.19%: 0.0016 mmHg; 98%: 0.002 mmHg
**Specific Gravity at 15°C (60°F):** 77.67%: 1.7059; 93.19%: 1.8354; 98%: 1.8437
**Vapor Density: (Air=1):** 3.4 sulfuric acid component
**Bulk Density:** Not applicable (see specific gravity)
**Evaporation Rate:** Not applicable
**Solubility:** Miscible in all proportions in water.
**pH:** 0.3 (1N solution at 25°C/78°F)

## 10. STABILITY AND REACTIVITY

**Stability**: The product is stable under normal conditions.

**Conditions to Avoid:** Keep away from heat and sources of ignition. Avoid temperatures, which may have a negative effect on the materials of construction used in equipment.

**Materials to Avoid:** Contact with organic materials (such as alcohol, acrylonitrile, chlorates, carbides, epichlorohydrin, fulminates, isoprene, nitrates and picrates) may cause fire and explosions. Contact with metals may produce flammable hydrogen gas. When diluting, add acid to water. Do NOT add water to the acid.

**Hazardous Decomposition or Combustion Products:** Toxic gases and vapors (e.g. sulfur dioxide, sulfuric acid vapors/mists and sulfur trioxide) may be released when sulfuric acid decomposes.

**Hazardous Polymerization:** Will not occur

**Corrosivity:** The product is corrosive.

## 11. TOXICOLOGICAL INFORMATION

**Toxicological Data:** $LD_{50}$ (oral, rat) = 2140 mg/kg
$LC_{50}$ (inhalation, rat) = 510 mg/m$^3$ for 2 hrs
Skin effects (rabbit): Severe irritation
Eye effects (rabbit): Severe irritation

**Carcinogenicity Data:** The International Agency for Research on Cancer (IARC) has concluded that occupational exposure to strong inorganic acid mists containing sulfuric acid is carcinogenic to man, causing cancer of the larynx (the voice box). Although no direct link has been established between exposure to sulfuric acid, itself, and cancer in man, exposure to any mist or aerosol during the use of this product should be avoided See Section 3. Hazard Information, regarding Potential Health Effects (Long Term Exposure) for further discussion.

The National Toxicology Program (NTP) does not classify sulfuric acid or strong inorganic acid mists as known (or reasonably anticipated to be) human carcinogens.

**Reproductive Effects:** Slightly embryotoxic in rabbits (a minor, rare skeletal variation). The animals were exposed to 5 and 20 mg/m$^3$ for 7 hrs/day throughout pregnancy. Slight maternal toxicity was present at the highest dose in both species.

**Mutagenicity Data:** Cytogenic analysis (hamster) ovaries 4 mmol/L

**Teratogenicity Data:** Not teratogenic in mice and rabbits.

**Synergistic Materials:** None known

## 12. ECOLOGICAL INFORMATION

**Ecotoxic Effects:** Harmful to aquatic life in very low concentrations. May be dangerous if it enters water intake; Fish toxicity; 2.8 µg/L 96 hrs LC50 Rainbow trout.

**Products of Degradation:** These products are sulphur oxides (SO2, SO3)

**Toxicity of the Products of Degradation:** The products of degradation are more toxic than the original product.

## 13. DISPOSAL CONSIDERATIONS

**Waste Disposal:** Cleaned up material may be a hazardous waste as defined by Resource Conservation and Recovery Act (RCRA) on disposal due to the corrosivity characteristic. DO NOT flush to surface water or sanitary sewer system. Waste must be disposed of in accordance with federal, state, provincial and local environmental control regulations.

## 14. TRANSPORT INFORMATION

**U.S. (Under DOT)**

**Shipping Name:** Sulfuric acid
**Hazard Class or Division:** 8
**Identification No.:** UN1830
**Packing Group:** II
**Reportable Quantity** = 1000 pounds (454 kg)
**IMO:** 8
**IATA/ICAO Class:** 8

**ER Guide**: 137

**Canada (Under TDG)**

**Shipping Name:** Sulfuric acid
**Classification(s):** Class 8
**Product Identification No.** (PIN): UN1830
**Packing Group:** II
Regulated Limit: 50 kg

## 15. REGULATORY INFORMATION

**U.S.A.**

**SARA Title III HAZARD CATEGORIES AND LISTS**

| Product Hazard Categories | | Lists | |
|---|---|---|---|
| Acute (Immediate) Health: | Yes | Extremely Hazardous Substance (40 CFR 355, SARA Title III Section 302) | Yes |
| Chronic (Delayed) Health: | Yes | | |
| Fire: | No | CERCLA Hazardous Substance (40 CFR 302.4) | Yes |
| Reactivity: | Yes | | |
| Sudden Release of Pressure: | No | Toxic Chemical (40 CFR 372.65, SARA Title III Section 313) | Yes |

**Reportable Quantity (RQ) under U.S. EPA CERCLA:** RQ=1000 lb / 454 kg

**TSCA Inventory Status:** Reported/Included

**Right-To-Know:** Illinois, Massachusetts, New Jersey, Pennsylvania

**Other Regulations/Legislation which apply to this product**: New Jersey Special Health Hazard Substance List and Environmental Hazardous Substance; Minnesota, Florida, Rhode Island Hazardous Substance ; California Director's List of Hazardous Substances; Massachusetts Extraordinarily Hazardous Substance List

## 15. REGULATORY INFORMATION (continued)

**CANADA**

**Workplace Hazardous Materials Information System (WHMIS)**

**WHMIS Classification(s):** Class D1A - Very Toxic
**Class D2B** – Suspected Human Carcinogen
Class E - Corrosive

**WHMIS Health Effects Index:** Acute Lethality - very toxic – immediate
Materials Causing Other Toxic Effects- Chronic
Corrosive to animal skin

**WHMIS Ingredient Disclosure List:** Confirmed A; Meets criteria for disclosure at 1% or greater.

National Pollutant Release Inventory (NPRI): Included

European:

**EEC CLASSIFICATION**: C, R 35
**EINECS**: 231-639-5

## 16. OTHER INFORMATION

**REFERENCES:**

1. **RTECS-Registry of Toxic Effects of Chemical Substances,** On-line search, Canadian Centre for OccupationalHealth and Safety RTECS database, Doris V. Sweet, Ed., National Institute for Occupational Safety and Health, U.S. Dept. of Health and Human Services, Cincinnati, Entry Update/Dec1997.

2. ChemAdvisor, Canadian Centre for Occupational Health and Safety, October 1998.

3. **CHEMINFO**, through **"CCINFOdisc"**, Canadian Centre for Occupational Health and Safety, Hamilton, Ontario, Canada, (August, 1998).

4. **Hazardous Substances Data Bank** , through "CCINFO disc", Canadian Centre for Occupational Health and Safety, Hamilton, Ontario, Canada, (2007).

5. NIOSH POCKET GUIDE TO CHEMICAL HAZARDS, U.S. Department of Health and Human Services, National Institute for Occupational Safety and Health, 2006.

6. "8th Report on Carcinogens – 1998 Summary", National Toxicology Program.

7. Sax, N.I., "Dangerous Properties of Industrial Materials", 7th Edition, 1989.

8. "2006 Threshold Limit Values and Biological Exposure Indices", American Conference of Government Industrial Hygienists, 2006.

9. Merck, 12th Edition, 1999.

10. Supplier's Material Safety Data Sheets.

## 16. OTHER INFORMATION (continued)

**Legend:**

| | |
|---|---|
| AFFF | - Aqueous Film Forming Foam |
| CAS # | - Chemical Abstracts Service Registry Number |
| CERCLA | - Comprehensive Environmental Response, Compensation, and Liability Act |
| CFR | - Code of Federal Regulations |
| DOT | - Department of Transportation |
| EPA | - Environmental Protection Agency |
| $LC_{50}$ | - The concentration of material in air expected to kill 50% of a group of test animals |
| $LD_{50}$ | - Lethal Dose expected to kill 50% of a group of test animals |
| LEL | - Lower Explosive Limit |
| MSHA | - Mine Safety and Health Administration |
| NIOSH | - National Institute for Occupational Safety and Health |
| PEL | - Permissible Exposure Limit |
| PVC | - Polyvinyl chloride |
| RCRA | - Resource Conservation and Recovery Act |
| SARA | - Superfund Amendments and Reauthorization Act of the U.S. EPA |
| STEL | - Short Term Exposure Limit |
| TC | - Transport Canada |
| TDG | - Transportation of Dangerous Goods Act/Regulations |
| TLV | - Threshold Limit Value |
| TSCA | - Toxic Substances Control Act |
| TWA | - Time-Weighted Average |
| UEL | - Upper Explosive Limit |

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Gestion responsable™ Au-delà des exigences. Responsible Care® Beyond what's required.

Prepared by Chemtrade Logistics Inc.

# Univar USA Inc Material Safety Data Sheet

| | |
|---|---|
| MSDS No: | AS010064 |
| Version No: | 006 2009-02-11 |
| Order No: | |

Univar USA Inc., 17425 NE Union Hill Rd., Redmond WA 98052
(425) 889 3400

Emergency Assistance

For emergency assistance involving chemicals call
Chemtrec - (800) 424-9300

The Version Date and Number for this MSDS is : 02/11/2009 - #006

| | |
|---|---|
| PRODUCT NAME: | TRISODIUM PHOSPHATE ANHYDROUS |
| MSDS NUMBER: | AS010064 |
| DATE ISSUED: | 05/15/2008 |
| SUPERSEDES: | 04/17/2006 |
| ISSUED BY: | 007115 |

**********
**********

Material Safety Data Sheet

## 1. CHEMICAL PRODUCT AND COMPANY IDENTIFICATION

### Identification

Product Name: TRISODIUM PHOSPHATE ANHYDROUS
Reference Number: ASTI 0064

### Use of the substance or preparation

Industrial and household cleaners, water conditioner, photograph developer bath ingredient, paint remover, denture cleaners, emulsifier and pH control agent for foods. May be used to treat drinking water.

Distributed by:
Univar USA Inc.
17425 NE Union Hill Rd.
Redmond, WA 98052
425-889-3400

Emergency telephone
In USA call CHEMTREC: 1 800 424 9300
In Canada call CANUTEC: 1 613 996 6666

## 2. COMPOSITION/INFORMATION ON INGREDIENTS

### Composition

| Substance | CAS No. | %w/w | EINECS No. | Risk Phrase |
|---|---|---|---|---|
| Trisodium Phosphate Anhydrous | 7601-549 | 100 | 231-509-8 | R34R37/38 R41 |

## 3. HAZARDS IDENTIFICATION

Classification of the substance/preparation

EC Classification Xi - Irritant
Safety Phrase S26 S36/37/39

Human Health Effects

This product causes eye burns and may cause skin irritation. Inhalation of dust may cause coughing and sneezing. Inhalation may cause respiratory irritation. Ingestion of this product may cause severe nausea, vomiting, abdominal discomfort and burning sensation.

Environmental Effects

This material is not expected to product any significant adverse environmental effects when recommended use instructions are followed.

## 4. FIRST AID MEASURES

WARNING STATEMENTS

DANGER!
CAUSES EYE IRRITATION
MAY CAUSE RESPIRATORY TRACT IRRITATION

General
Treatment is symptomatic and supportive. The product causes eye and skin irritation. May be harmful if swallowed. This product is destructive to mucous membranes.

Eye contact
In case of contact with eyes, immediately flush the eyes with plenty of water for at least 15 minutes. Seek medical attention if irritation, pain, swelling, lacrimation, or photophobia persists.

Skin contact
Immediately remove this material from skin and wash with plenty of water. Remove contaminated clothing. Wash clothing and thoroughly clean shoes before reuse.

Inhalation
Inhalation of the dust may cause coughing and sneezing. Remove to fresh air immediately. If not breathing, give artificial respiration. If breathing is difficult, give oxygen.

Ingestion
If victim is conscious and alert, give 2-4 cupfuls of milk or water. Never give anything by mouth to an unconscious person. Do NOT induce vomiting. Get medical attention immediately. Contact a Poison Control Center. Swallowing this product may cause severe nausea, vomiting, abdominal discomfort, and burning sensation.

## 5. FIRE FIGHTING MEASURES

Extinguishing media

Non-combustible
No special requirement.
To extinguish fire use water spray, dry chemical, carbon dioxide, or appropriate foam

Unsuitable extinguishable media
Non-combustible
No special requirement.

Exposure hazards
No special considerations

Protective equipment
As a general precaution, firefighters and others exposed, wear self-contained breathing apparatus.

## 6. ACCIDENTAL RELEASE MEASURES

Personal precautions
Avoid unnecessary exposure and remove all material from eyes, skin and clothing. Environmental precautions

Small quantities: Avoid discharge into the environment
Large quantities: Avoid discharge into the environmental See section 15

Method for cleaning up
Sweep, scoop or vacuum spill material, contaminated soil and other contaminated material and place in dean, dry containers for removal. If possible, complete cleanup on a dry basis.

## 7. HANDLING AND STORAGE

Handling:
Do not get in eyes, on skin, or on clothing.
Avoid breathing dust.
Do not taste or swallow.
Use only in adequate ventilation.
Wash thoroughly after handling
Remove material from clothing.

Engineering measures
Ensure adequate ventilation. The use of local mechanical exhaust ventilation is preferred at sources of air contamination such as open process equipment.

Storage
Store in cool, dry place to maintain product performance. Product should be

stored in sealed containers and be kept free of water due to product corrosivity.

## 8. EXPOSURE CONTROLS/PERSONAL PROTECTION

Occupational Exposure limit
OSHA and ACGIH have not established specific exposure limits for this material. However, OSHA and ACGIH have established limits for particulates not otherwise regulated (PNOR) and particulates not otherwise classified (PNOC) which are the least stringent exposure limits applicable to dusts.

| | |
|---|---|
| ACGIH TLV | 10 mg/m3 (inhalable) 8-hr TWA, 3 mg/m3 (respirable) 8-hr TWA |
| OSHA PEL | 15 mg/m3 (total dust) 8-hr TWA, 5 mg/m3 (respirable) 8-hr TWA |

Respiratory protection
Avoid breathing dust. In case of insufficient ventilation, use approved respiratory protective equipment as described in OSHA 29 CFR 1910.134 or European Standard EN149. A vapor respirator is recommended.

Hand/Skin protection
Wear protective gloves is recommended; wash hands and contaminated skin thoroughly after handling.

Eye protection
Wear appropriate protective eyeglasses or chemical safety goggles as described in OSHA eye and face regulation in 29 CFR 1910.133 or European Standard EN166.

## 9. PHYSICAL AND CHEMICAL PROPERTIES

General Information

| | |
|---|---|
| Chemical Formula: | Na3PO4 |
| Form: | Free-flowing granular product |
| Color: | White |
| Odor. | Odorless |

Important health. safety and environmental information

| | |
|---|---|
| pH: | 11.5 12.0 (as a 1% solution) |
| Specific Gravity | 2.54 |
| Melting Point | 1340 deg C |
| Solubility in Water: | (g./100 g. H20): 5.4 @ 0 deg C |
| | 14.5 @ 25 deg C |
| | 23.3 @ deg C |
| | 54.3 @ 60 deg C |
| | 94.6 @ 100 deg C |

NOTE: These physical data are typical values based on material tested but may vary from sample to sample. Typical values should not be construed as a guaranteed analysis of any specific lot or as specifications for the product.

## 10. STABILITY AND REACTIVITY

Product is stable under normal conditions of storage and handling.

Conditions to avoid
Store product in dry areas away from moisture. This product could be corrosive to aluminum surfaces due to high pH. When wet, mild steel and brass may be corroded.

Materials to avoid
Incompatible with strong mineral acids, aluminum and moisture.

Hazardous decomposition
Oxides of sodium and phosphorus may form when heated to decomposition

## 11. TOXICOLOGICAL INFORMATION

Laboratory data

Data from ICL Performance Products LP single-dose (acute) animal studies with this material are given below:

| | |
|---|---|
| Oral - rat LD5o: | 4,150 mg/kg; slightly toxic |
| Dermal - rabbit LD50: | >7,940 mg/kg; practically nontoxic |
| Eye Irritation - rabbit | corrosive |
| Skin Irritation - rabbit: | 2.2/8.0 (24-hr. exp.); slightly irritating |

This product produced no mutagenic effects is standard assays using fruit flies.

This material has been defined as a hazardous chemical under the criteria of the OSHA Hazard Communication Standard (29 CFR 1910.1200).

## 12. ECOLOGICAL INFORMATION

Environmental toxicity
The following data have been classified using the criteria adopted by the European Economic Community (EEC) for aquatic organism toxicity.

| | |
|---|---|
| Invertebrate: 50-hr EC50 Daphnia magna: | 177 mg/L; Practically Nontoxic |
| Warmwater fish: 96-hr LC50 Bluegill sunfish: | 220 mg/L; Practically Nontoxic |
| Coldwater fish: 96-hr LC50 Rainbow trout: | 120 mg/L; Practically Nontoxic |

No definitive algal data was available for this material.

Environmental fate
Inorganic compounds in contact with the soil, sub-surface or surface waters may be taken up by plants and utilized as essential nutrients. Phosphates may also form precipitates, usually with calcium or magnesium. The resultant compounds are insoluble in water and become a part of the soil or sediment. The term biodegradability, as such, is not applicable to inorganic compounds.

13. DISPOSAL CONSIDERATIONS

European waste catalog number
Unknown

Disposal Considerations
This material when discarded is not a hazardous waste as that term is defined by the Resource, Conservation and Recovery Act (RCRA), 40 CFR 261. Dry material may be landfilled or recycled in accordance with local, state and federal regulations. Consult your attorney or appropriate regulatory officials for information on such disposal.

14. TRANSPORT INFORMATION

The data provided in this section is for information only. Please apply the appropriate regulations to properly classify your shipment for transportation.

Road/Rail. Sea and Air

| | |
|---|---|
| IMDG/UN | ENVIRONMENTALLY HAZARDOUS SUBSTANCE, SOLID, N.O.S. (contains sodium phosphate, tribasic), UN 3077, 9, PG III* |
| ICAO/IATA passenger aircraft | UN 3077, Environmentally hazardous substance, solid, n.o.s. (contains sodium phosphate, tribasic), 9, PG III* |
| RID/ADR | Unknown |
| Canadian TDG | Sodium Phosphate Tribasic, NA9148, Class 9.2, PG III* |
| US DOT | Environmentally hazardous substance, solid, n.o.s. (contains sodium phosphate, tribasic),UN 3077, 9, PG III* |

+ Applies only to packages containing a Reportable Limit of 230 kg or more
* Applies only to a package containing a Reportable Quantity (RQ) of 5000 lbs or more.

15. REGULATORY INFORMATION

EC Label

| | |
|---|---|
| Hazard symbol: | Xi - Irritant |
| R34 | Causes burns |
| R37/38 | Irritating to respiratory system and skin |
| R41 | Risk of serious damage to eyes |
| S26 | In cased of contact with eyes, rinse immediately with plenty of water and seek medical attention |
| S36/37/39 | Wear suitable protective clothing, gloves and eye/face Protection |

Chemical Inventory

| | | | |
|---|---|---|---|
| USA TSCA: | Listed | Australia | Listed |
| Canada DSL: | Listed | Korea | Listed |
| EC: | Listed | Philippines | Listed |
| Japan | Listed | China | Listed |

Other Information

Germany: WGK = 1

WHMIS Classification: D2(B) Materials Causing Other Toxic Effects

SARA Hazard Notification
Hazard Categories Under Title III Rules (40 CFR 370): Immediate
Section 302 Extremely Hazardous Substances: Not Applicable
Section 313 Toxic Chemical(s): Not Applicable

CERCLA Reportable Quantity: 5,000 lb. RQ of sodium phosphate, tribasic

This product has been classified in accordance with the hazard criteria of the Canadian Controlled Products Regulation and the MSDS contain all the information required by the Canadian Controlled Products Regulation.

16. OTHER INFORMATION

| | Health | Fire | Reactivity | Additional Information |
|---|---|---|---|---|
| Suggested NFPA Rating | 3 | 0 | 0 | |
| Suggested HMIS Rating | 3 | 0 | 0 | G<br>G = safety glasses, gloves, vapor respirator |

# Univar USA Inc Material Safety Data Sheet

For Additional Information contact MSDS Coordinator during business hours, Pacific time: (425) 889-3400

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All information appearing herein is based upon data obtained from the manufacturer and/or recognized technical sources. While the information is believed to be accurate, Univar makes no representations as to its accuracy or sufficiency. Conditions of use are beyond Univar's control and therefore users are responsible to verify this data under their own operating conditions to determine whether the product is suitable for their particular purposes and they assume all risks of their use, handling, and disposal of the product, or from the publication or use of, or reliance upon, information contained herein.

This information relates only to the product designated herein, and does not relate to its use in combination with any other material or in any other process

# *Documentation for Renewal of General Mercury Variance Avon Lake Generating Station NPDES Permit No. 3IB00002*KD*

Prepared for:



NRG Power Midwest LP
121 Champion Way, Suite 300
Canonsburg, PA 15317

Prepared by:



CB&I Environmental & Infrastructure, Inc.
2790 Mosside Blvd
Monroeville, PA 15146

January 2015

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Attachment 1 – Projected Effluent Quality (PEQ) Calculation
Attachment 2 – Annual PMP Progress Report

# 1.0 Introduction

Effective August 1, 2011, NRG Power Midwest LP (NRG Power), a subsidiary of NRG Energy, Inc., (NRG) was granted a General Mercury Variance by the Ohio Environmental Protection Agency (OEPA) for operations at the Avon Lake Generating Station, specific to the effluent discharge from Outfall 002 into Lake Erie. This Variance was issued as an integral component of the Station's National Pollutant Discharge Elimination System (NPDES) Permit No. 3IB00002*KD, with requirements and compliance obligations outlined in Part II, Items K through M of the NPDES Permit. The current NPDES Permit and General Mercury Variance are both set to expire on July 31, 2015, and thus appropriate renewal applications and documentation must be submitted for each no later than January 31, 2015. With regard to the General Mercury Variance, Items M.1 through M.4 of the NPDES Permit outline the necessary pieces of information that must be included with the request for renewal, as follows:

- *Item M.1 – the certification described under Part II, Item K.1.h., and all information required under Part II, Item K.1.h.i. through Part II, Item K.1.h.iii.;*
- *Item M.2 – a status report on the progress being made implementing the pollutant minimization program (PMP). This information may be included in the annual PMP report required under Part II, Item K.1.g.;*
- *Item M.3 – a listing of the strategies and/or programs in the PMP which will be continued under the next renewal of this permit; and*
- *Item M.4 – a statement requesting the renewal of the mercury variance.*

The above aspects are addressed in the sections which follow and comprise the overall documentation being provided by NRG Power for the requested renewal of the General Mercury Variance at the Avon Lake Generating Station.

## 2.0 Certification and Accompanying Information (Item M.1)

Item M.1 of the NPDES Permit requires NRG Power to provide a certification as described in Part II, Item K.1.h. and all information listed under Part II, Items K.1.h.i. through K.1.h.iii. These components are further detailed below:

- *Item K.1.h. – Upon completion of the actions identified in the Plan of Study as required in Part II, Item K.1.d. of this permit or upon submittal of the permittee's NPDES permit renewal application, whichever comes first, the permittee shall submit to OEPA's Northeast District Office a certification stating that all permit conditions imposed to implement the Plan of Study and the PMP have been satisfied and whether compliance with the monthly average water quality based effluent limit for mercury has been achieved and can be maintained. This certification shall be accompanied by the following:*
    - *Item K.1.h.i. – All available mercury influent and effluent data for the most recent 12-month period;*
    - *Item K.1.h.ii. – Data documenting all known significant sources of mercury and the steps that have been taken to reduce or eliminate those sources; and*
    - *Item K.1.h.iii. – A determination of the lowest mercury concentration that currently available data indicate can be reliably achieved through implementation of the PMP.*

### 2.1 Certification (Item K.1.h.)

Over the term of the current General Mercury Variance (beginning August 1, 2011), NRG Power has conducted the required activities to satisfy the conditions as stipulated in Items K.1.a. through K.1.g. of the NPDES Permit. These aspects have included consistent compliance with the Outfall 002 effluent limitation (monthly average limit presently at 8.0 ng/L); continued progress towards attainment of the monthly average water quality based effluent limit of 1.3 ng/L; implementation of the Plan of Study, including submittal of a Source Characterization Report (dated July 30, 2012) and Wastewater Sampling and Engineering Study Report (dated July 29, 2013); submittal of annual PMP progress reports; and achievement of an annual average mercury effluent concentration (AAMEC) of 12 ng/L at Outfall 002. NRG Power's efforts have also included the recent performance of a pilot-scale testing program to evaluate the possible benefits of polymer addition to selected wastewater streams, the results from which are discussed in the current PMP progress report (included as Attachment 2 to this renewal documentation package).

In relation to the monthly average water quality based effluent limit of 1.3 ng/L, the mercury concentrations reported at Outfall 002 have witnessed a steady decline throughout the term of the General Mercury Variance thus far. Monthly samples over the past year have frequently shown mercury values less than 1.3 ng/L (see below), although intermittent concentrations measured above this level preclude the ability to demonstrate consistent compliance with the water quality criterion. Occasionally elevated concentrations of mercury in the Lake Erie Intake further exacerbate the ability to maintain consistent compliance with the targeted effluent limit.

## 2.2 *Influent/Effluent Mercury Data for Most Recent 12-Month Period (Item K.1.h.i.)*

The table below summarizes the influent (Outfall 008-Intake) and effluent (Outfall 002) mercury data for the most recent 12-month period.

| | Mercury Concentrations (ng/L) | |
|---|---|---|
| Date | Lake Erie Intake (Outfall 800) | Station Discharge (Outfall 002) |
| 1/23/2014 | 1.27 | 0.63 |
| 2/12/2014 | <0.50 | 1.00 |
| 3/11/2014 | <0.50 | 1.19 |
| 4/16/2014 | 1.39 | 1.58 |
| 5/22/2014 | 0.64 | <0.50 |
| 6/18/2014 | 1.42 | 0.72 |
| 7/9/2014 | 1.35 | 1.32 |
| 8/12/2014 | 0.52 | 0.73 |
| 9/9/2014 | 0.59 | <0.50 |
| 10/1/2014 | 0.57 | <0.50 |
| 11/5/2014 | 2.15 | 0.54 |
| 12/10/2014 | 5.08 | <0.50 |
| **Average** | **1.25** | **0.64** |

<0.50 = Non-detect.

## 2.3 *Mercury Sources and Steps to Reduce/Eliminate (Item K.1.h.ii.)*

As documented in the previously submitted Source Characterization and Engineering Study Reports, the predominant sources of contributing mercury have been identified as wastewaters emanating from Yard Sump No. 1 and the Ash Filter Backwash. Aside from increased awareness and general housekeeping improvements, procedural changes were instituted for better control of the Ash Filter backwashing cycles. Bench- and pilot-scale testing of polymers was also performed to evaluate possible benefits for enhancing solids/mercury removal from the wastewater streams. Pilot-scale testing results showed initial promise, but operational issues arose within the Anthracite Filters and which are believed tied to the introduction of the polymer; this is further discussed in the annual PMP progress report (see Attachment 2).

## 2.4 Achievable Mercury Concentration (Item K.1.h.iii.)

NRG Power has evaluated the Projected Effluent Quality (PEQ) for Outfall 002 utilizing all monthly data collected thus far since the August 1, 2011 effective date of the General Mercury Variance. Determination of the PEQ was done in accordance with the OEPA protocols as contained in "Modeling Guidance 1, Calculating PEQ: Determining a Discharger's Effluent Quality, Revision 1, August 23, 2006," Method B. The calculations and data used are presented in Attachment 1, and which provide for an observed average PEQ for mercury of 5.8 ng/L. It is expected that this average PEQ would be an appropriate and consistently achievable effluent limitation at Outfall 002 during the renewed term of the General Mercury Variance. This value would also be recognized as an improvement over the monthly average effluent limitation of 8.0 ng/L currently imposed at Outfall 002. Continued compliance with the AAMEC value of 12 ng/L would additionally be maintained during the renewed term of the General Mercury Variance.

## 3.0 Annual PMP Progress Report (Item M.2)

As an acceptable alternative to satisfy the requirements of Item M.2, the annual PMP progress report has been prepared to document the status of NRG Power's continuing implementation of the Plan of Study, and is included as Attachment 2 to this renewal package. This current progress report dovetails to the prior report (dated February 2014) and covers the period from March 2014 through December 2014, with forward-looking statements also provided.

## 4.0 Continuing Activities/Strategies (Item M.3)

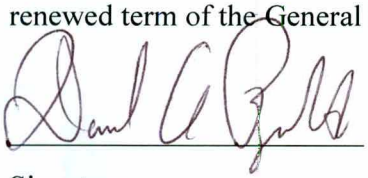
At present, the majority of the activities originally identified in the December 2010 Plan of Study have since been completed, including the source identification/characterization work, evaluation of the hydraulic performance of the Ash Basins, and subsequent wastewater/engineering studies. These latter studies culminated in a pilot-scale polymer addition program, but have ultimately led to the conclusion that implementation of such measures will not provide an overwhelming benefit and may in fact be the cause of operational performance issues in the existing Anthracite Filters.

One other original component of the Plan of Study, which was spearheaded by the corporate Fuels Group, included examination of the mercury content of the Station's existing coal supply along with evaluation of alternative sources potentially containing lesser amounts of mercury. This work did not result in any substantive findings to suggest that a possible change in coal was warranted. Nonetheless, fuel options continue to be evaluated, and thus the strategies for dealing with mercury will continue to evolve into the next renewed term of the General Mercury Variance.

NRG Power remains committed to its current obligations under the General Mercury Variance, and those which will be mandated under the anticipated renewal leading to continuing targeted reductions in the mercury concentrations in the Outfall 002 effluent.

## 5.0 Request for Renewal of General Mercury Variance (Item M.4)

As an authorized representative for NRG Power's Avon Lake Generating Station, I am applying to the Director of Ohio EPA for renewed coverage under the General Mercury Variance from the monthly average water quality based effluent limit of 1.3 ng/L for mercury in NPDES Permit 3IB00002*KD. I understand and accept that I will be subject to the General Mercury Variance terms and conditions of paragraph (D)(10) of rule 3745-33-07 of the Ohio Administrative Code. To the best of my knowledge, I project that an average PEQ of 5.8 ng/L for Outfall 002 (as calculated in Attachment 1) can be consistently achieved, and further project that compliance with an annual average mercury effluent concentration of 12 ng/L will be maintained during the renewed term of the General Mercury Variance.



Signature

1-20-15

Date

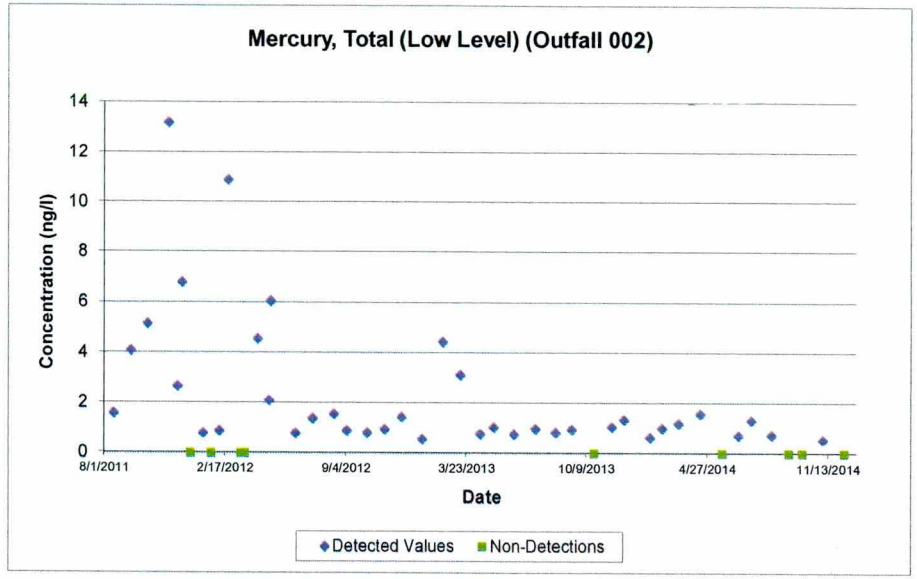
Daniel A. Rogatto
Plant Manager

**Par ɛr name:** Mercury, Total (Low Level)
**Reporting code:** 50092
**Units of measure:** ng/l

| # of Obs. | # of Obs. > MDL | # of Obs. excluded | Min. Value | Max. Value | MaxChk Value | PEQ Method | $R^2$ Value | PEQ average | PEQ max. |
|---|---|---|---|---|---|---|---|---|---|
| 47 | 38 | 0 | 0.535 | 13.2 | 16.133 | B | 0.94548 | 5.7579 | 9.1252 |

**Permit number:** AVL_1
**Outfall number:** 002

| Date | Reported Value | A Code | MDL | Enter "x" to exclude as outlier |
|---|---|---|---|---|
| 8/17/2011 | 1.59 | | | |
| 9/14/2011 | 4.09 | | | |
| 10/12/2011 | 5.15 | | | |
| 11/15/2011 | 13.2 | | | |
| 11/30/2011 | 2.67 | | | |
| 12/7/2011 | 6.81 | | | |
| 12/21/2011 | | AA | 0.5 ng/L | |
| 1/12/2012 | 0.791 | | | |
| 1/25/2012 | | AA | 0.5 ng/L | |
| 2/8/2012 | 0.885 | | | |
| 2/22/2012 | 10.9 | | | |
| 3/14/2012 | | AA | 0.5 ng/L | |
| 3/21/2012 | | AA | 0.5 ng/L | |
| 4/11/2012 | 4.56 | | | |
| 4/30/2012 | 2.11 | | | |
| 5/3/2012 | 6.06 | | | |
| 6/13/2012 | 0.795 | | | |
| 7/11/2012 | 1.38 | | | |
| 8/15/2012 | 1.57 | | | |
| 9/6/2012 | 0.898 | | | |
| 10/10/2012 | 0.809 | | | |
| 11/8/2012 | 0.951 | | | |
| 12/6/2012 | 1.45 | | | |
| 1/10/2013 | 0.568 | | | |
| 2/13/2013 | 4.44 | | | |
| 3/14/2013 | 3.14 | | | |
| 4/16/2013 | 0.763 | | | |
| 5/8/2013 | 1.03 | | | |
| 6/12/2013 | 0.75 | | | |
| 7/18/2013 | 0.971 | | | |
| 8/20/2013 | 0.825 | | | |
| 9/16/2013 | 0.95 | | | |
| 10/22/2013 | | AA | 0.5 ng/L | |
| 11/21/2013 | 1.06 | | | |
| 12/11/2013 | 1.35 | | | |
| 1/23/2014 | 0.634 | | | |
| 2/12/2014 | 0.996 | | | |
| 3/11/2014 | 1.19 | | | |
| 4/16/2014 | 1.58 | | | |
| 5/22/2014 | | AA | 0.5 ng/L | |
| 6/18/2014 | 0.722 | | | |
| 7/9/2014 | 1.32 | | | |
| 8/12/2014 | 0.727 | | | |
| 9/9/2014 | | AA | 0.5 ng/L | |
| 10/1/2014 | | AA | 0.5 ng/L | |
| 11/5/2014 | 0.535 | | | |
| 12/10/2014 | | AA | 0.5 ng/L | |



**NRG Power Midwest LP**
**Avon Lake Generating Station**
33570 Lake Road
Avon Lake, OH 44012

**VIA TRACKED DELIVERY**

January 19, 2015

Mr. Eric Nygaard
Ohio Environmental Protection Agency
Division of Surface Water
50 West Town Street, Suite 700
Columbus, OH 43216

**NRG Power Midwest LP**
**Avon Lake Generating Station**
**NPDES Permit No. 3IB00002*KD**
**General Mercury Variance**
**Fourth Annual PMP Progress Report**

Dear Mr. Nygaard:

As per the requirements of Items K.1.g.i. through K.1.g.iv. of Part II of the Avon Lake Generating Station's NPDES Permit No. 3IB00002*KD, NRG Power Midwest LP (NRG Power), as a subsidiary of NRG Energy, Inc. (NRG), is providing this report to comply with the obligations for submittal of an annual Pollutant Minimization Program (PMP) progress report by March 1 of each Calendar Year. This correspondence represents the fourth annual report submitted to the Ohio Environmental Protection Agency (OEPA), following the effective date of the General Mercury Variance on August 1, 2011 (as part of the renewed NPDES Permit). It is further noted that the current report has been prepared slightly in advance of the "normal" timeframe for submittal (typically by March 1 of each subsequent Calendar Year). This has been done in order to satisfy Item M.2. of the NPDES Permit, specific to one component of the documentation necessary to apply for renewal of the General Mercury Variance.

The initial annual progress report (dated February 24, 2012) summarized the status of activities through the first seven months of Year 1 of the variance. The second annual progress report (dated February 14, 2013) summarized the activities performed during the final five months of Year 1 (March 2012 thru July 2012), and the first seven months of Year 2 (August 2012 thru February 2013). The third annual progress report (dated February 19, 2014) summarized the activities performed during the final five months of Year 2 (March 2013 thru July 2013), and the first seven months of Year 3 (August 2013 thru February 2014). The current report summarizes the activities performed during the final five months of Year 3 (March 2014 thru July 2014), and the first five months of Year 4 (August 2014 thru December 2014).

**Overview of Completed/Ongoing Activities:**

At the time of last year's PMP progress report submittal (February 2014), planning and preparations were underway in support of agreed upon pilot-scale testing to examine the possible benefits of polymer injection into two different wastewater streams which were deemed to be the major contributing sources

of mercury. Based on the findings as documented in the "Wastewater Sampling and Engineering Study Summary Report," (submitted to OEPA in July 2013), the two streams selected for polymer injection included Yard Sump No. 1 and the Ash Filter Backwash, utilizing KlarAid PC2700 (a product of GE Power & Water [GE]). In support of the pilot-scale testing program, baseline sampling (prior to active polymer injection) was intended to begin during early-March 2014, focusing on the collection/analysis of paired-samples (using total suspended solids [TSS] as a surrogate indicator for particulate mercury) from the inlet of the Primary Ash Settling Basin and the outlet of the Secondary Ash Settling Basin. Following weather impacts, completion of a scheduled maintenance outage, and unanticipated repairs to the Unit #9 boiler, baseline sampling actually commenced during the week of June 9, 2014. After an approximate one-month period without significant operational interruptions, the final round of baseline samples was collected during the week of July 7, 2014. Overall, a total of 51 discrete pairs of samples were collected as part of the baseline sampling effort.

In preparation for the polymer injection phase of the pilot-testing program, Station personnel and GE representatives installed the required chemical feed equipment on the Yard Sump No. 1 and Ash Filter Backwash wastewater streams during the week of July 22, 2014. Following confirmation that the equipment was functioning as intended, polymer injection and associated sample collection were initiated during the week of August 4, 2014, with a similar one-month data collection period targeted. Shortly thereafter, the Station was taken offline for economic considerations and operated intermittently during the latter half of August and remained down for the majority of September and into mid-October. Consequently, the required sampling for the polymer injection phase was not able to be completed until the week of November 3, 2014. Overall, a total of 80 discrete pairs of samples were collected during the polymer injection phase of the pilot-testing program.

**Monitoring Results [Item K.1.g.i. of NPDES Permit]:**

Since submittal of the February 2014 PMP progress report, the only data generated specific to the General Mercury Variance implementation has been associated with performance of the pilot-scale polymer injection program as described above. Summaries of the data are attached hereto and are further discussed under the "Current/Planned Actions" section of this report. Notwithstanding, the Station's monthly NPDES Permit monitoring results as related to compliance with the General Mercury Variance requirement to achieve and maintain an annual average mercury effluent concentration (AAMEC) $\leq$ 12 ng/L at Outfall 002, have been summarized below commensurate with prior PMP progress report submittals.

The table (based on monthly DMR data) shows the progression of the 12-month running average for mercury in the Outfall 002 effluent. The initial column reflects the AAMEC (with a value of 1.33 ng/L) which was the final tabulated entry included in the February 2014 PMP progress report. The remaining columns account for subsequently calculated AAMEC values since that PMP submittal, arriving at the most recent AAMEC value of 0.64 ng/L. As shown, the mercury concentrations at Outfall 002 have maintained consistent compliance with this AAMEC objective ($\leq$ 12 ng/L), with the present value being approximately 52% lower than a year ago and nearly 75% lower than the initially cited value of 2.50 ng/L from the February 2012 PMP progress report.

**Outfall 002—AAMEC Tabulation**

| Date | Total Hg (ng/L) | | | | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| February 2013 | 4.44 | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- |
| March 2013 | 3.14 | 3.14 | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- |
| April 2013 | 0.76 | 0.76 | 0.76 | --- | --- | --- | --- | --- | --- | --- | --- | --- |
| May 2013 | 1.03 | 1.03 | 1.03 | 1.03 | --- | --- | --- | --- | --- | --- | --- | --- |
| June 2013 | 0.75 | 0.75 | 0.75 | 0.75 | 0.75 | --- | --- | --- | --- | --- | --- | --- |
| July 2013 | 0.97 | 0.97 | 0.97 | 0.97 | 0.97 | 0.97 | --- | --- | --- | --- | --- | --- |
| August 2013 | 0.83 | 0.83 | 0.83 | 0.83 | 0.83 | 0.83 | 0.83 | --- | --- | --- | --- | --- |
| September 2013 | 0.95 | 0.95 | 0.95 | 0.95 | 0.95 | 0.95 | 0.95 | 0.95 | --- | --- | --- | --- |
| October 2013 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | --- | --- | --- |
| November 2013 | 1.06 | 1.06 | 1.06 | 1.06 | 1.06 | 1.06 | 1.06 | 1.06 | 1.06 | 1.06 | --- | --- |
| December 2013 | 1.35 | 1.35 | 1.35 | 1.35 | 1.35 | 1.35 | 1.35 | 1.35 | 1.35 | 1.35 | 1.35 | --- |
| January 2014 | 0.63 | 0.63 | 0.63 | 0.63 | 0.63 | 0.63 | 0.63 | 0.63 | 0.63 | 0.63 | 0.63 | 0.63 |
| February 2014 | --- | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 |
| March 2014 | --- | --- | 1.19 | 1.19 | 1.19 | 1.19 | 1.19 | 1.19 | 1.19 | 1.19 | 1.19 | 1.19 |
| April 2014 | --- | --- | --- | 1.58 | 1.58 | 1.58 | 1.58 | 1.58 | 1.58 | 1.58 | 1.58 | 1.58 |
| May 2014 | --- | --- | --- | --- | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 |
| June 2014 | --- | --- | --- | --- | --- | 0.72 | 0.72 | 0.72 | 0.72 | 0.72 | 0.72 | 0.72 |
| July 2014 | --- | --- | --- | --- | --- | --- | 1.32 | 1.32 | 1.32 | 1.32 | 1.32 | 1.32 |
| August 2014 | --- | --- | --- | --- | --- | --- | --- | 0.73 | 0.73 | 0.73 | 0.73 | 0.73 |
| September 2014 | --- | --- | --- | --- | --- | --- | --- | --- | 0.00 | 0.00 | 0.00 | 0.00 |
| October 2014 | --- | --- | --- | --- | --- | --- | --- | --- | --- | 0.00 | 0.00 | 0.00 |
| November 2014 | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | 0.54 | 0.54 |
| December 2014 | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | 0.00 |
| **AAMEC** | **1.33** | **1.04** | **0.88** | **0.95** | **0.86** | **0.86** | **0.89** | **0.88** | **0.80** | **0.80** | **0.76** | **0.64** |

Note: Zero values used to represent non-detects.

**Preliminary Identification of Mercury Sources [Item K.1.g.ii. of NPDES Permit]:**

The efforts conducted in support of the 2013 Engineering Study allowed for confirmation that the Yard Sump No.1 and the Ash Filter Backwash streams are the major contributing sources for mercury in the ash handling wastewaters. In turn, this source determination supported the implementation of the pilot-scale polymer testing program on both of these streams between the period of June thru November 2014.

**Current/Planned Actions to Meet Mercury Effluent Limits [Items K.1.g.iii. & K.1.g.iv. of NPDES Permit]:**

As documented in the February 2014 PMP progress report, a fixed-interval backwashing frequency of the Anthracite Filters remains in effect (based on differential pressure set-points), and analysis of monthly NPDES Permit compliance samples continues under contract with the laboratory (Alloway) that was transitioned to in mid-2012. This backwashing procedure has resulted in an increased level of operational control, and minimized the potential for introduction of widely variable slugs of solids into the Primary Ash Basin. Consistent use of the Alloway laboratory and their familiarity with Station operations has further served to reduce the potential for reporting of anomalous mercury data. Correspondingly, it is recognized that the 12-month running average mercury discharge concentrations at Outfall 002 (as evidenced by the AAMEC values tabulated above) are currently at the lowest levels that have been tracked since the August 2011 effective date of the General Mercury Variance, and affirm the Station's ongoing commitment to mercury reduction.

With respect to the recently completed pilot-scale program, the attached spreadsheets provide a summary of the TSS data collected prior to the addition of polymer (Table 1) as well as that collected during the polymer addition (Table 2). The TSS parameter was selected for evaluation since the ability to remove suspended/particulate matter would be expected to translate into co-removal of the particulate-phase mercury, although no direct mathematical removal equivalent/correlation was derived for the study. For each phase of the testing, collection of a minimum number of samples was targeted in an attempt to account for variability in the analytical results and to offer a sufficient data population upon which conclusions could be drawn with reasonable statistical confidence.

From review of Table 1 (results prior to polymer addition), the observed TSS removal across the Primary and Secondary Ash Basins was found to be on the order of approximately 65% based on the arithmetic average values for the inlet and outlet samples. Similar review of Table 2 (results with polymer addition) shows TSS removal of approximately 71%, again utilizing the arithmetic average values for the inlet and outlet samples. Comparison of the data via the corresponding geometric means (since the data better conform to a lognormal distribution) provides a more pronounced difference of approximately 55% TSS removal (Table 1 without polymer) vs. approximately 83% TSS removal (Table 2 with polymer).

Despite a rather high degree of persistent variability, these standalone results (from the geometric mean comparison) tentatively suggested a generally favorable outcome with use of the polymer, with predictions that increased TSS removal would lead to enhanced mercury removal from the wastewaters. However, during the latter stages of the polymer addition program (around the October 2014 timeframe), a notable change in the operational performance of the existing Anthracite Filters began to emerge. This change was highlighted by an inability of the filters to return to their baseline differential pressure following a backwashing cycle. Current speculation (to be further evaluated through planned visual inspection of the anthracite media) has focused on possible accumulation of the polymer within the filter vessels, thus leading to decreased pore space and residually elevated pressures across the filters. This potential drawback, combined with other fuel considerations (discussed below) and the Station's already demonstrated reductions in effluent mercury concentrations, have caused NRG Power to lean away from any further examination of the polymer at this point in time.

**Upcoming Year 4 Activities:**

Throughout the remainder of Year 4 (concluding on July 31, 2015), NRG Power will first focus on assembling the appropriate documentation and certifications necessary to request renewal of the General Mercury Variance, of which this PMP progress report will be a part. This information will be integrated into the overall NPDES Permit Renewal Application package and submitted to OEPA on or before January 31, 2015. Beyond that, the Station will continue to evaluate potential alternative fuel options as part of future operations, leading to a possible transition by early to mid-2016. Irrespective of which alternative fuel source proves most viable, it remains the Station's focus to continue the progress made thus far under the initial term of the General Mercury Variance. As noted above, other near-term activities will include visual inspection of the Anthracite Filters to gain a further understanding of the potential "clotting" effects that may have been induced by the polymer. Even if the polymer is not determined as the cause of the filters' differential pressure issues, NRG Power maintains that any benefits from its future use are overshadowed by the Station's mercury reductions to date (achieved without polymer) and the ongoing evaluation of alternative fuel options.

We trust that this submittal is in accordance with OEPA's expectations regarding annual PMP reporting, and will further serve as one of the required pieces of documentation to support NRG Power's request for renewal of the General Mercury Variance at the Avon Lake Generating Station. Should you have any questions or concerns regarding this matter, please contact Nate Rozic directly at (724) 597-8630 or via email at Nathan.Rozic@nrg.com.

Respectfully submitted,

Daniel A. Rogatto
Plant Manager

cc: Scott Cameron, – Avon Lake Generating Station
Nate Rozic, NRG-Southpointe
David Shott, CB&I

**Table 2**
**Avon Lake Polymer Pilot Test**
**TSS Summary--With Polymer Addition**

| **Raw Data** | | | | | | | | | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Date | 8/6/2014 | 8/6/2014 | 8/6/2014 | 8/6/2014 | 8/8/2014 | 8/8/2014 | 8/8/2014 | 8/8/2014 | 8/11/2014 | 8/11/2014 | 8/11/2014 | 8/11/2014 | 8/12/2014 | 8/12/2014 | 8/12/2014 | 8/12/2014 |
| Time | 9:00:00 AM | 11:00:00 AM | 1:00:00 PM | 3:00:00 PM | 9:00:00 AM | 11:00:00 AM | 1:00:00 PM | 3:00:00 PM | 9:00:00 AM | 11:00:00 AM | 1:00:00 PM | 3:00:00 PM | 9:00:00 AM | 11:00:00 AM | 1:00:00 PM | 3:00:00 PM |
| TSS Primary Ash Basin Inlet (mg/L) | 9.6 | 14 | 97 | 96 | 13 | 16 | 39 | 63 | 19 | 41 | 27 | 160 | 55 | 45 | 11 | 48 |
| TSS Secondary Ash Basin Outlet (mg/L) | 90 | 57 | 3.8 | 17 | 6.8 | 5.2 | 5.2 | 6.2 | 5.6 | 4 | 4.4 | 3 | 12 | 13 | 7.6 | 17 |
| TSS Inlet - TSS Outlet (mg/L) | 0 | 0 | 93.2 | 79 | 6.2 | 10.8 | 33.8 | 56.8 | 13.4 | 37 | 22.6 | 157 | 43 | 32 | 3.4 | 31 |
| Removal (%) | 0 | 0 | 96 | 82 | 48 | 68 | 87 | 90 | 71 | 90 | 84 | 98 | 78 | 71 | 31 | 65 |
| **Raw Data** | | | | | | | | | | | | | | | | |
| Date | 8/13/2014 | 8/13/2014 | 8/13/2014 | 8/13/2014 | 8/25/2014 | 8/25/2014 | 8/25/2014 | 8/25/2014 | 9/3/2014 | 9/3/2014 | 9/3/2014 | 9/3/2014 | 9/4/2014 | 9/4/2014 | 9/4/2014 | 9/4/2014 |
| Time | 9:00:00 AM | 11:00:00 AM | 1:00:00 PM | 3:00:00 PM | 9:00:00 AM | 11:00:00 AM | 1:00:00 PM | 3:00:00 PM | 9:00:00 AM | 11:00:00 AM | 1:00:00 PM | 3:00:00 PM | 9:00:00 AM | 11:00:00 AM | 1:00:00 PM | 3:00:00 PM |
| TSS Primary Ash Basin Inlet (mg/L) | 84 | 21 | 16 | 23 | 56 | 26 | 49 | 39 | 94 | 10 | 16 | 15 | 8.6 | 6.6 | 11 | 15 |
| TSS Secondary Ash Basin Outlet (mg/L) | 6 | 4.6 | 4.8 | 5 | 4.2 | 2.2 | 2 | 3 | 16 | 3.2 | 0.001 | 3.2 | 2.2 | 16 | 5.6 | 8 |
| TSS Inlet - TSS Outlet (mg/L) | 78 | 16.4 | 11.2 | 18 | 51.8 | 23.8 | 47 | 36 | 78 | 6.8 | 16 | 11.8 | 6.4 | 0 | 5.4 | 7 |
| Removal (%) | 93 | 78 | 70 | 78 | 93 | 92 | 96 | 92 | 83 | 68 | 100 | 79 | 74 | 0 | 49 | 47 |
| **Raw Data** | | | | | | | | | | | | | | | | |
| Date | 9/5/2014 | 9/5/2014 | 9/5/2014 | 9/5/2014 | 10/20/2014 | 10/20/2014 | 10/20/2014 | 10/20/2014 | 10/21/2014 | 10/21/2014 | 10/21/2014 | 10/21/2014 | 10/22/2014 | 10/22/2014 | 10/22/2014 | 10/22/2014 |
| Time | 9:00:00 AM | 11:00:00 AM | 1:00:00 PM | 3:00:00 PM | 9:00:00 AM | 11:05:00 AM | 1:05:00 PM | 15:00:00 PM | 9:00:00 AM | 11:00:00 AM | 1:00:00 PM | 3:00:00 PM | 9:00:00 AM | 11:00:00 AM | 1:00:00 PM | 3:00:00 PM |
| TSS Primary Ash Basin Inlet (mg/L) | 26 | 28 | 36 | 52 | 20 | 19 | 95 | 25 | 17 | 25 | 94 | 21 | 28 | 6.2 | 30 | 54 |
| TSS Secondary Ash Basin Outlet (mg/L) | 4.2 | 19 | 6.4 | 5.4 | 8.4 | 14 | 13 | 5.6 | 5.6 | 6 | 0.001 | 13 | 8.2 | 150 | 6 | 6.2 |
| TSS Inlet - TSS Outlet (mg/L) | 21.8 | 9 | 29.6 | 46.6 | 11.6 | 5 | 82 | 19.4 | 11.4 | 19 | 94 | 8 | 19.8 | 0 | 24 | 47.8 |
| Removal (%) | 84 | 32 | 82 | 90 | 58 | 26 | 86 | 78 | 67 | 76 | 100 | 38 | 71 | 0 | 80 | 89 |
| **Raw Data** | | | | | | | | | | | | | | | | |
| Date | 10/23/2014 | 10/23/2014 | 10/23/2014 | 10/23/2014 | 10/24/2014 | 10/24/2014 | 10/24/2014 | 10/24/2014 | 10/27/2014 | 10/27/2014 | 10/27/2014 | 10/27/2014 | 10/28/2014 | 10/28/2014 | 10/28/2014 | 10/28/2014 |
| Time | 9:00:00 AM | 11:05:00 AM | 1:05:00 PM | 15:00:00 PM | 9:05:00 AM | 11:05:00 AM | 1:05:00 PM | 15:00:00 PM | 9:00:00 AM | 11:05:00 AM | 15:00:00 PM | 15:05:00 PM | 9:00:00 AM | 11:00:00 AM | 1:05:00 PM | 15:00:00 PM |
| TSS Primary Ash Basin Inlet (mg/L) | 67 | 100 | 24 | 100 | 4.4 | 45 | 19 | 12 | 10 | 13 | 18 | 88 | 19 | 34 | 18 | 44 |
| TSS Secondary Ash Basin Outlet (mg/L) | 4.6 | 5 | 0.001 | 18 | 6.6 | 0.001 | 4 | 4 | 7 | 44 | 6.6 | 6.8 | 7.2 | 19 | 12 | 25 |
| TSS Inlet - TSS Outlet (mg/L) | 62.4 | 95 | 24 | 82 | 0 | 45 | 15 | 8 | 3 | 0 | 11.4 | 81.2 | 11.8 | 15 | 6 | 19 |
| Removal (%) | 93 | 95 | 100 | 82 | 0 | 100 | 79 | 67 | 30 | 0 | 63 | 92 | 62 | 44 | 33 | 43 |
| **Raw Data** | | | | | | | | | | | | | | | | |
| Date | 10/29/2014 | 10/29/2014 | 10/29/2014 | 10/29/2014 | 10/30/2014 | 10/30/2014 | 10/30/2014 | 10/30/2014 | 10/31/2014 | 10/31/2014 | 10/31/2014 | 10/31/2014 | 11/3/2014 | 11/3/2014 | 11/3/2014 | 11/3/2014 |
| Time | 9:00:00 AM | 11:00:00 AM | 1:05:00 PM | 15:00:00 PM | 9:05:00 AM | 11:00:00 AM | 13:00:00 PM | 15:00:00 PM | 9:00:00 AM | 11:00:00 AM | 13:00:00 PM | 15:00:00 PM | 9:05:00 AM | 11:00:00 AM | 13:00:00 PM | 15:00:00 PM |
| TSS Primary Ash Basin Inlet (mg/L) | 56 | 91 | 90 | 270 | 31 | 22 | 20 | 13 | 42 | 18 | 35 | 16 | 37 | 120 | 49 | 64 |
| TSS Secondary Ash Basin Outlet (mg/L) | 15 | 13 | 11 | 14 | 11 | 12 | 7.2 | 8.2 | 6.2 | 13 | 9 | 8.2 | 20 | 12 | 17 | 11 |
| TSS Inlet - TSS Outlet (mg/L) | 41 | 78 | 79 | 256 | 20 | 10 | 12.8 | 4.8 | 35.8 | 5 | 26 | 7.8 | 17 | 108 | 32 | 53 |
| Removal (%) | 73 | 86 | 88 | 95 | 65 | 45 | 64 | 37 | 85 | 28 | 74 | 49 | 46 | 90 | 65 | 83 |
| **Statistical Metrics** | | | | | | | | | | | | | | | | |
| | Arithmetic Average | Arithmetic Standard Deviation | Geometric Mean | Geometric Standard Deviation | | | | | | | | | | | | |
| TSS Primary Ash Basin Inlet (mg/L) | 42.6 | 40.8 | 30.3 | 2.3 | | | | | | | | | | | | |
| TSS Secondary Ash Basin Outlet (mg/L) | 12.2 | 19.9 | 5.3 | 8.4 | | | | | | | | | | | | |
| TSS Inlet - TSS Outlet (mg/L) | 30.4 | | 25.0 | | | | | | | | | | | | | |
| Removal (%) | 71.4 | | 82.5 | | | | | | | | | | | | | |

**Table 1**
**Avon Lake Polymer Pilot Test**
**TSS Summary--Prior to Polymer Addition**

| **Raw Data** | | | | | | | | | | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Date | 6/9/2014 | 6/9/2014 | 6/9/2014 | 6/10/2014 | 6/10/2014 | 6/10/2014 | 6/10/2014 | 6/11/2014 | 6/11/2014 | 6/11/2014 | 6/11/2014 | 6/12/2014 | 6/12/2014 | 6/12/2014 | 6/12/2014 | 6/13/2014 | 6/13/2014 |
| Time | 11:05:00 AM | 1:05:00 PM | 3:05:00 PM | 9:05:00 AM | 11:05:00 AM | 1:05:00 PM | 3:05:00 PM | 9:05:00 AM | 11:05:00 AM | 1:05:00 PM | 3:05:00 PM | 9:05:00 AM | 11:05:00 AM | 1:05:00 PM | 3:05:00 PM | 9:05:00 AM | 11:05:00 AM |
| TSS Primary Ash Basin Inlet (mg/L) | 41 | 63 | 33 | 190 | 69 | 22 | 9.4 | 31 | 19 | 17 | 17 | 14 | 26 | 32 | 20 | 12 | 11 |
| TSS Secondary Ash Basin Outlet (mg/L) | 23 | 50 | 14 | 35 | 8.4 | 7.6 | 8 | 20 | 15 | 16 | 12 | 11 | 7 | 8 | 8.2 | 7.4 | 6.6 |
| TSS Inlet - TSS Outlet (mg/L) | 18 | 13 | 19 | 155 | 60.6 | 14.4 | 1.4 | 11 | 4 | 1 | 5 | 3 | 19 | 24 | 11.8 | 4.6 | 4.4 |
| Removal (%) | 44 | 21 | 58 | 82 | 88 | 65 | 15 | 35 | 21 | 6 | 29 | 21 | 73 | 75 | 59 | 38 | 40 |
| **Raw Data** | | | | | | | | | | | | | | | | | |
| Date | 6/13/2014 | 6/13/2014 | 6/16/2014 | 6/16/2014 | 6/16/2014 | 6/16/2014 | 6/17/2014 | 6/17/2014 | 6/17/2014 | 6/17/2014 | 6/18/2014 | 6/18/2014 | 6/18/2014 | 6/18/2014 | 6/19/2014 | 6/19/2014 | 6/19/2014 |
| Time | 1:05:00 PM | 3:05:00 PM | 9:05:00 AM | 11:05:00 AM | 1:05:00 PM | 3:05:00 PM | 9:05:00 AM | 11:05:00 AM | 1:05:00 PM | 3:05:00 PM | 9:05:00 AM | 11:05:00 AM | 1:05:00 PM | 3:05:00 PM | 9:05:00 AM | 11:05:00 AM | 1:05:00 PM |
| TSS Primary Ash Basin Inlet (mg/L) | 50 | 14 | 34 | 21 | 55 | 39 | 46 | 41 | 22 | 25 | 14 | 170 | 43 | 240 | 23 | 22 | 18 |
| TSS Secondary Ash Basin Outlet (mg/L) | 10 | 8.4 | 16 | 33 | 18 | 30 | 13 | 11 | 12 | 11 | 7.4 | 10 | 12 | 12 | 13 | 15 | 14 |
| TSS Inlet - TSS Outlet (mg/L) | 40 | 5.6 | 18 | 0 | 37 | 9 | 33 | 30 | 10 | 14 | 6.6 | 160 | 31 | 228 | 10 | 7 | 4 |
| Removal (%) | 80 | 40 | 53 | 0 | 67 | 23 | 72 | 73 | 45 | 56 | 47 | 94 | 72 | 95 | 43 | 32 | 22 |
| **Raw Data** | | | | | | | | | | | | | | | | | |
| Date | 6/19/2014 | 6/20/2014 | 6/20/2014 | 6/20/2014 | 6/20/2014 | 7/3/2014 | 7/3/2014 | 7/3/2014 | 7/3/2014 | 7/4/2014 | 7/4/2014 | 7/4/2014 | 7/4/2014 | 7/7/2014 | 7/7/2014 | 7/7/2014 | 7/7/2014 |
| Time | 3:05:00 PM | 9:05:00 AM | 11:05:00 AM | 1:05:00 PM | 3:05:00 PM | 9:05:00 AM | 11:05:00 AM | 1:05:00 PM | 3:05:00 PM | 9:05:00 AM | 11:05:00 AM | 1:05:00 PM | 3:05:00 PM | 9:05:00 AM | 11:05:00 AM | 1:05:00 PM | 3:05:00 PM |
| TSS Primary Ash Basin Inlet (mg/L) | 17 | 25 | 21 | 14 | 22 | 31 | 33 | 35 | 40 | 23 | 22 | 11 | 14 | 9.2 | 4.6 | 4.8 | 210 |
| TSS Secondary Ash Basin Outlet (mg/L) | 12 | 9.6 | 17 | 35 | 12 | 12 | 8.6 | 9.4 | 8.2 | 12 | 12 | 17 | 10 | 5.6 | 8 | 5.6 | 6 |
| TSS Inlet - TSS Outlet (mg/L) | 5 | 15.4 | 4 | 0 | 10 | 19 | 24.4 | 25.6 | 31.8 | 11 | 10 | 0 | 4 | 3.6 | 0 | 0 | 204 |
| Removal (%) | 29 | 62 | 19 | 0 | 45 | 61 | 74 | 73 | 80 | 48 | 45 | 0 | 29 | 39 | 0 | 0 | 97 |
| **Statistical Metrics** | | | | | | | | | | | | | | | | | |
| | Arithmetic Average | Arithmetic Standard Deviation | Geometric Mean | Geometric Standard Deviation | | | | | | | | | | | | | |
| TSS Primary Ash Basin Inlet (mg/L) | 40.0 | 50.4 | 26.5 | 2.3 | | | | | | | | | | | | | |
| TSS Secondary Ash Basin Outlet (mg/L) | 13.8 | 8.7 | 12.0 | 1.6 | | | | | | | | | | | | | |
| TSS Inlet - TSS Outlet (mg/L) | 26.2 | | 14.5 | | | | | | | | | | | | | | |
| Removal (%) | 65.5 | | 54.7 | | | | | | | | | | | | | | |

| Avon Lake Generating Station<br>NPDES Renewal Sampling Plan<br>April 2014 | | |
|---|---|---|
| **Outfall** | **Pollutant Groups** | **No. Sample Events** |
| **001**<br>(Condenser cooling water and boiler blowdown) | All except pesticides. Exclude radioactive cmpds and fecal coliform as "Believed Absent." | 1 - Grab/Composite |
| **002**<br>(Combined wastewater treatment system) | All except pesticides. Exclude radioactive cmpds and fecal coliform as "Believed Absent." | 1 - Grab/Composite |
| **004**<br>(Low volume wastewater treatment system) | All except pesticides. Exclude radioactive cmpds and fecal coliform as "Believed Absent." | 1 - Grab/Composite |
| **604**<br>(Boiler blowdown water) | All except pesticides. Exclude radioactive cmpds and fecal coliform as "Believed Absent." | 1 - Grab/Composite |
| **601**<br>(Influent to ash pond) | All except pesticides. Exclude radioactive cmpds and fecal coliform as "Believed Absent." | 1 - Grab/Composite |
| **610**<br>(Coal pile runoff WWT prior to combined basin) | All except pesticides. Exclude radioactive cmpds and fecal coliform as "Believed Absent." | 1 - Grab/Composite |
| **611**<br>(Treated metal cleaning wastes) | N/A - No discharge. | 0 |
| **612**<br>(Noncontact cooling water Unit #9 heat exchanger) | All except pesticides. Exclude radioactive cmpds and fecal coliform as "Believed Absent." | 1 - Grab/Composite |
| **800**<br>(Intake water at plant inlet) | All except pesticides. Exclude radioactive cmpds and fecal coliform as "Believed Absent." | 1 - Grab/Composite |
| **#1 OR #2** Stormwater*<br>** Outfalls are substantially identical.* | O&G, BOD5, COD, TSS, Total N, Total P, pH, Cu | 1 - Grab<br>1 - Composite |
| **#4** Stormwater | O&G, BOD5, COD, TSS, Total N, Total P, pH, Cu | 1 - Grab<br>1 - Composite |
| **#5** Stormwater | O&G, BOD5, COD, TSS, Total N, Total P, pH, Cu | 1 - Grab<br>1 - Composite |
| **#6** Stormwater | O&G, BOD5, COD, TSS, Total N, Total P, pH, Cu | 1 - Grab<br>1 - Composite |
| **#8** Stormwater | O&G, BOD5, COD, TSS, Total N, Total P, pH, Cu | 1 - Grab<br>1 - Composite |
| **#10** Stormwater | O&G, BOD5, COD, TSS, Total N, Total P, pH, Cu | 1 - Grab<br>1 - Composite |
| **002** Stormwater | O&G, BOD5, COD, TSS, Total N, Total P, pH, Cu, Fe | 1 - Grab<br>1 - Composite |
| **004** Stormwater | O&G, BOD5, COD, TSS, Total N, Total P, pH, Cu | 1 - Grab<br>1 - Composite |

Note: Stormwater Outfalls #3, #7 and #9 are not exposed to industrial activities and thus will not be sampled.

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# Antidegradation Addendum
## Division of Surface Water

In accordance with Ohio Administrative Code (OAC) 3745-1-05 Antidegradation, additional information may be required to complete your application for a permit to install (PTI) or National Pollutant Discharge Elimination System (NPDES) permit. For any application that may result in an increase in the level of pollutant being discharged (NPDES and/or PTI) or for which there might be an activity taking place within a stream bed, the processing of the permit(s) may be required to go through procedures as outlined in the antidegradation rule. The rule outlines procedures for public notification and participation as well as the procedures pertaining to the levels of review necessary. The levels of review necessary depend on the degradation being considered/requested. The rule also outlines exclusion from portions of the application and review requirements and waivers that the Director may grant as specified in Section OAC 3745-1-05(D) of the rule. Please complete the following questions. The answers provided will allow the Ohio EPA to determine if additional information is needed. **All projects that require both an NPDES and PTI should submit both applications simultaneously to avoid going through the antidegradation process separately for each permit.**

### A. General Information

| | |
|---|---|
| **Applicant:** | Avon Lake Generating Station |
| **Facility Owner:** | NRG Power Midwest LP |
| **Facility Location *(city & county)*:** | Avon Lake, Lorain County |
| **Application or Plans Prepared by:** | CB&I |
| **Project Name:** | Renewal of NPDES Permit No. 3IB00002*KD |
| **NPDES Permit No. *(if applicable)*:** | 3IB00002*KD |

### B. Antidegradation Applicability

**Is the application for? *(check as many as apply)***

| | |
|---|---|
| ☐ | Application with no direct surface water discharge *(Projects that do not meet the applicability section of OAC 3745-1-05(B)(1))*. Examples include on-site disposal, extensions of sanitary sewers, spray irrigation, indirect discharge to POTW, etc. **Complete Section E.** |
| ☒ | Renewal NPDES application or PTI application with no requested increase in loading of currently permitted pollutants. **Complete Section E.** |
| ☐ | PTI and NPDES application for a new wastewater treatment works that will discharge to a surface water. **Complete Sections C & E.** |
| ☐ | PTI and/or NPDES application for an expansion/modification of an existing wastewater treatment works discharging to a surface water that will result in any of the following:<br>• Addition of any pollutant no currently in the discharge; or<br>• An increase in mass or concentration of any pollutant currently in the discharge; or<br>• An increase in any current pollutant limitation in terms of mass or concentration.<br>**Complete Sections C & E.** |
| ☐ | PTI application that involves placement of fill or installation of any portion of a sewerage system (i.e., sanitary sewers, pump stations, WWTP, etc.) within 150 feet of a stream bed. **Please provide information requested on the stream evaluation addendum and complete Section E.** |
| ☐ | Initial NPDES application for an existing treatment works with a wastewater discharge prior to October 1, 1996. **Complete Sections D & E.** |
| ☐ | Renewal NPDES application or modification to an effective NPDES permit that will result in any of the following:<br>• A new permit limitation for a pollutant that previously had no limitation; or<br>• An increase in any mass or concentration limitation of any pollutant that currently has a limitation.<br>**Complete Sections C and E.** |

## C. Antidegradation Information

**1.** Does the PTI and/or NPDES permit application meet an exclusion as outlined by OAC 3745-1-05(D)(1) of the Antidegradation rule?

| ☐ Yes. **Complete Question C.2.** | ☐ No. **Complete Questions C.3 and C.4.** |
|---|---|

**2.** For projects that would be eligible for exclusions provide the following information:

a. Provide justification for the exclusion.
b. Identify the substances to be discharged, including the amount of regulated pollutants to be discharged in terms of mass and concentration.
c. A description of any construction work, fill or other substances to occur or be placed in or near a stream bed.

**3.** Are you requesting a waiver as outlined by OAC 3745-1-05(D)(2-7) of the Antidegradation rule? ☐ No ☐ Yes
If you wish to pursue one of the waivers, please identify the waiver and submit the necessary information to support the request. Depending on the waiver requested, the information required under question C.4. may be required to complete the application.

**4.** For all projects that do not qualify for an exclusion, a report must accompany this application evaluating the preferred design alternative, non-degradation alternatives, minimal degradation alternatives, and mitigative techniques/measures for the design and operation of the activity. The information outlined below should be addressed in this report. If a waiver is requested, this section is still required.

a. Describe the availability, cost effectiveness and technical feasibility of connecting to existing central or regional sewage collection and treatment facilities, including long range plans for sewer service outlined in state or local water quality management planning documents and applicable facility planning documents.

b. List and describe all government and/or privately sponsored conservation projects that may have been or will be specifically targeted to improve water quality or enhance recreational opportunities on the affected water resource.

c. Provide a brief description of all treatment/disposal alternatives (preferred, non-degradation, minimal degradation and mitigative technique/measure) evaluated for this application and their respective operational and maintenance needs.

**At a minimum, the following information must be included in the report for each alternative evaluated.**

d. Outline of the treatment/disposal system evaluated, including the costs associated with the equipment, installation, and continued operation and maintenance.

e. Identify the substances to be discharged, including the amount of regulated pollutants to be discharged in terms of mass and concentration.

f. Describe the reliability of the treatment/disposal system, including but not limited to the possibility of recurring operation and maintenance difficulties that would lead to increased degradation.

g. Describe any impacts to human health and the overall quality and value of the water resource.

h. Describe and provide an estimate of the important social and economic benefits to be realized through this proposed project. Include the number and types of jobs created and tax revenues generated.

i. Describe environmental benefits to be realized through this proposed project.

j. Describe and provide an estimate of the social and economic benefits that may be lost as a result of this project. Include the impacts on commercial and recreational use of the water resource.

k. Describe the environmental benefits lost as a result of this project. Include the impact on the aquatic life, wildlife, threatened or endangered species.

l. Describe any construction work, fill or other structures to occur or be placed in or near a stream bed.

m. Provide any other information that may be useful in evaluating this application.

**D. Discharge Information**

. For treatment/disposal systems constructed pursuant to a previously issued Ohio EPA PTI, provide the following information:

| | |
|---|---|
| **PTI Number:** | |
| **PTI Issuance Date:** | |
| **Initial Date of Discharge:** | |

**2.** Has the appropriate NPDES permit application form been submitted including representative effluent data?

☐ Yes **Go to Section E.** ☐ No **See below.**

**If no, submit the information as applicable under a or b as follows:**

a. For entities discharging process wastewater, attach a completed NPDES 2C form.

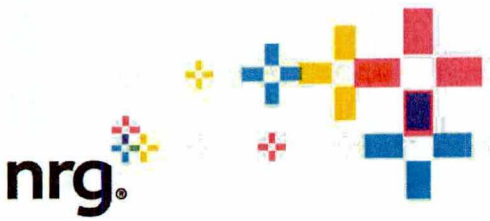
b. For entities discharging wastewater of domestic origin, attach the results of a least one chemical analysis of the wastestream for all pollutants for which authorization to discharge is being requested and a measurement of the daily volume (gallons per day) of wastewaters being discharged.

**E.** Based on my inquiry of the person or persons who manage the system or those persons directly responsible for gathering the information, the information is, to be best of my knowledge and belief, true, accurate and complete.

**This section must be signed by the same responsible person who signed the accompanying permit application or certification as per 40 C.F.R. 122.22.**

| | |
|---|---|
| **Signature:** | |
| **Date:** | 1-20-15 |

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**NRG Energy, Inc.**
**Southpointe Operations Center**
121 Champion Way
Suite 300
Canonsburg, PA 15317

**VIA TRACKED DELIVERY**

January 27, 2015

Mr. Tomás Parry
Ohio EPA Northeast District Office
2110 East Aurora Road
Twinsburg, OH 44087

**NPDES Permit Renewal Application**
**NRG Power Midwest LP**
**Avon Lake Generating Station**
**NPDES Permit 3IB00002*KD**

Dear Mr. Parry:

Enclosed are the original and one copy of the NPDES permit renewal application for the NRG Power Midwest LP Avon Lake Generating Station.

Included as part of the application are the facility's General Mercury Variance Renewal/Certification documentation, antidegradation addendum, and approved sampling plan. The package is accompanied by an application fee of $200 made payable to the "Treasurer of the State of Ohio."

Thank you for your consideration. We look forward to hearing from you regarding a draft permit. If you have any questions or comments regarding the application or require additional information, please contact me directly at (724) 597-8630 or via email at Nathan.Rozic@nrg.com.

Respectfully submitted,

Nathan J. Rozic
Environmental Manager
NRG Energy, Inc.

cc: Scott Cameron, NRG, Avon Lake
David Shott, CB&I

Enclosures

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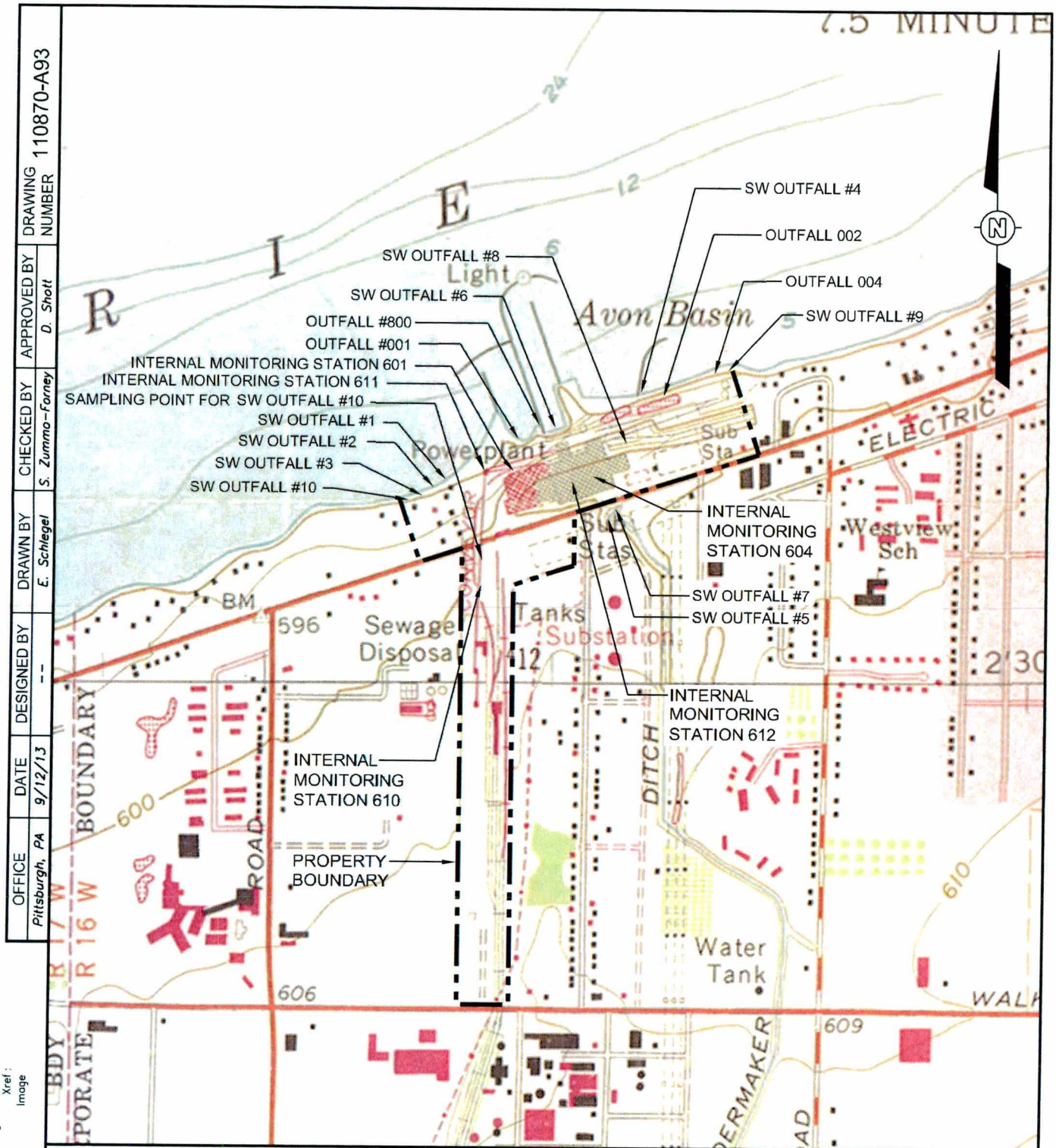


# APPLICATION FOR PERMIT RENEWAL
# NPDES INDUSTRIAL DISCHARGE PERMIT NO. 3IB00002*KD
# Avon Lake Generating Station
# Lorain County, Ohio
# January 2015

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## CONTENTS


- Form 1
- Application Fee
- Form 2C
- Form 2F
- Material Safety Data Sheets for Chemical Additives
- Documentation for Renewal of General Mercury Variance
- Antidegradation Addendum
- Figures
  - Figure 1 – Site Location Map and Outfall Locations
  - Wastewater Flow Diagram
  - Figure 2 – Storm Water Drainage Areas
- Attachment
  - Sampling Plan




| OFFICE | DATE | DESIGNED BY | DRAWN BY | CHECKED BY | APPROVED BY | DRAWING NUMBER |
|---|---|---|---|---|---|---|
| Pittsburgh, PA | 9/12/13 | -- | E. Schlegel | S. Zummo-Forney | D. Shott | 110870-A93 |

SCALE

0 1000 2000 FEET

REFERENCE:

USGS TOPOGRAPHIC MAP, 7.5 MINUTE SERIES
AVON QUADRANGLE, DATED 1993, SCALE: 1"=2000'.

CB&I Environmental & Infrastructure, Inc.
2790 Mosside Boulevard
Monroeville, PA 15146

NRG POWER MIDWEST LP
AVON LAKE GENERATING STATION

# FIGURE 1
## SITE LOCATION MAP AND OUTFALL LOCATIONS

AVON LAKE GENERATING STATION
AVON LAKE, OHIO

File: O:\Project\110870\Avon\110870-A93.dwg
Plot Date/Time: Nov 12, 2014 - 12:30pm
Plotted By: evon.schlegel
Xref : Image

| DRAWING NUMBER | APPROVED BY | CHECKED BY | DRAWN BY | DESIGNED BY |
|---|---|---|---|---|
| 110870-B8 | -- | -- | E. Schlegel | -- |

| OFFICE | DATE |
|---|---|
| Pittsburgh, PA | 12/23/08 |

LAKE ERIE INTAKE

OUTFALL 800 - INTAKE WATER
373.78 MGD

CHLORINE (SEE NOTE 2)

NON-CONTACT COOLING WATER CONDENSER

SCREEN WASH

DISCHARGE TUNNEL

OUTFALL 001 (LAKE ERIE)
342.20 MGD

OUTFALL 612
2.34 MGD

OUTFALL 604
0.08 MGD

#9 OIL COOLERS HEAT EXCHANGER

SLCC-D
MEKOR 6701
AMMONIA 19%
TRISODIUM PHOSPHATE
ANODAMINE™ HPFG

CITY WATER

BOILERS MAKEUP WATER

AVON LAKE BOILERS 7 & 9

BOILER BLOWDOWN

HOUSE SERVICE WATER

HYDROBINS

RECYCLE

MAKEUP WATER

ASH RECYCLE TANK

BOTTOM ASH PITS

FLOOR AND EQUIPMENT DRAINS

SULFURIC ACID
SODIUM HYDROXIDE

NEUTRALIZATION TANK

LAB DRAINS

SOLAR SALTS
SODIUM BISULFITE
CHLORINE (SEE NOTE 2)

LIME
SODIUM BISULFATE

OIL STORAGE TANK

OUTFALL 601

OVERFLOW

CHEMICAL FILTRATE SUMP

OIL COOLERS PLANT SUMPS

LOW VOLUME (OILY) WASTE BASIN

OIL-WATER SEPARATOR

OILY WASTE BASIN FILTERS

0.52 MGD

OUTFALL 004 (LAKE ERIE)

SODIUM BISULFATE
AS-2821 POLYMER
LIME

BOTTOM ASH PIT SUMPS

TRUCK WASH

ASH SLUICE WATER

FLOW ONLY DURING RECYCLE OUTAGE

ASH SLUICEWAY

ASH SETTLING BASINS

ASH SETTLING BASIN FILTERS

0.75 MGD

OUTFALL 002 (LAKE ERIE)

AS-1012 POLYMER
LIME

HAUL ROAD DUST CONTROL
SOIL-SEMENT

COAL PILE RUNOFF AND COAL HANDLING AREA

COAL PILE RETENTION BASIN

CPR WASTEWATER TREATMENT BUILDING

OUTFALL 610
0.10 MGD

OUTFALL 610
(SEE NOTE 4)

EMERGENCY OVERFLOW TO POWDERMAKER CREEK

SODIUM HYDROXIDE
HALOKLEAR™ LBP-2101
HALOKLEAR™ LIQUIFLOC 2%

NON-CHEMICAL METAL CLEANING WASTE WATER (SEE NOTE 3)

(SEE NOTE 4)

TREATMENT AND STORAGE TANKS

OUTFALL 611
0.05 MGD

NOTES:

1. FLOWS ARE ESTIMATED AVERAGES BASED ON LAST 5 YEARS OF REPORTED DATA.
2. USED ON AN AS-NEEDED BASIS IN ACCORDANCE WITH PERMIT CONDITIONS.
3. NON-CHEMICAL METAL CLEANING WASTE WATER IS TREATED IN ONE OF TWO FORMER CLARIFIER TANKS BEFORE DISCHARGE VIA OUTFALL 611 TO THE ASH SETTLING BASINS OR TAKEN OFF-SITE FOR TREATMENT AND DISPOSAL.
4. IN POTENTIAL OVERFLOW CONDITIONS, THE CPR BASIN WASTEWATER MAY BE STORED AND/OR TREATED TEMPORARILY BEFORE RETURN TO THE CPR BASIN OR TREATED AND DISCHARGED TO THE ASH SETTLING BASINS.

| REV | DESCRIPTION / ISSUE | DATE | APPROVED |
|---|---|---|---|
| A | CHEMICAL ADDITIVES | 12/23/08 | DJS |
| B | FOR PERMIT RENEWAL | 2/24/10 | SZF |
| C | NPDES QA MANUAL | 11/5/11 | SZF |
| D | COAL PILE CHEMICAL ADDITIVES | 5/2/12 | DJS |
| E | FOR PERMIT RENEWAL | 12/22/14 | DJS |

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Monroeville, PA 15146

NRG POWER MIDWEST LP
AVON LAKE GENERATING STATION

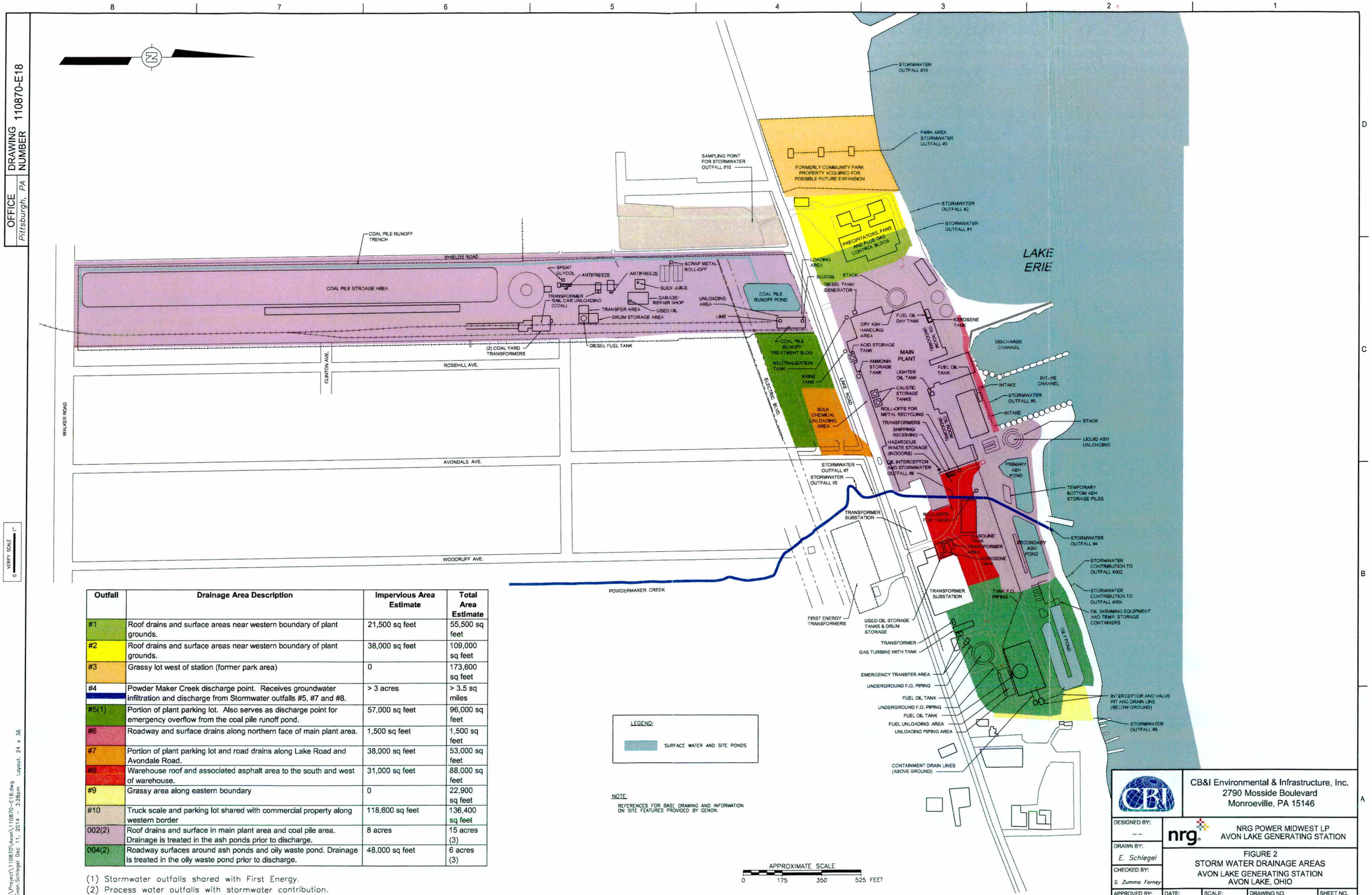
# WASTE WATER FLOW DIAGRAM
## NPDES PERMIT # 3IB00002

AVON LAKE GENERATING STATION
AVON LAKE, OH

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File: O:\Project\110870\110870B8 REV E.dwg
Plot Date/Time: Dec 22, 2014 - 3:49pm
Plotted By: Evan.Schlegel

OFFICE Pittsburgh, PA | DRAWING NUMBER 110870-E18




| Outfall | Drainage Area Description | Impervious Area Estimate | Total Area Estimate |
|---|---|---|---|
| #1 | Roof drains and surface areas near western boundary of plant grounds. | 21,500 sq feet | 55,500 sq feet |
| #2 | Roof drains and surface areas near western boundary of plant grounds. | 38,000 sq feet | 109,000 sq feet |
| #3 | Grassy lot west of station (former park area) | 0 | 173,600 sq feet |
| #4 | Powder Maker Creek discharge point. Receives groundwater infiltration and discharge from Stormwater outfalls #5, #7 and #8. | > 3 acres | > 3.5 sq miles |
| #5(1) | Portion of plant parking lot. Also serves as discharge point for emergency overflow from the coal pile runoff pond. | 57,000 sq feet | 96,000 sq feet |
| #6 | Roadway and surface drains along northern face of main plant area. | 1,500 sq feet | 1,500 sq feet |
| #7 | Portion of plant parking lot and road drains along Lake Road and Avondale Road. | 38,000 sq feet | 53,000 sq feet |
| #8 | Warehouse roof and associated asphalt area to the south and west of warehouse. | 31,000 sq feet | 88,000 sq feet |
| #9 | Grassy area along eastern boundary | 0 | 22,900 sq feet |
| #10 | Truck scale and parking lot shared with commercial property along western border | 118,600 sq feet | 136,400 sq feet |
| 002(2) | Roof drains and surface in main plant area and coal pile area. Drainage is treated in the ash ponds prior to discharge. | 8 acres | 15 acres (3) |
| 004(2) | Roadway surfaces around ash ponds and oily waste pond. Drainage is treated in the oily waste pond prior to discharge. | 48,000 sq feet | 6 acres (3) |

(1) Stormwater outfalls shared with First Energy.
(2) Process water outfalls with stormwater contribution.
(3) Includes Treatment Ponds


CB&I Environmental & Infrastructure, Inc.
2790 Mosside Boulevard
Monroeville, PA 15146


| | |
|---|---|
| DESIGNED BY: -- | NRG POWER MIDWEST LP<br>AVON LAKE GENERATING STATION |
| DRAWN BY: E. Schlegel | FIGURE 2<br>STORM WATER DRAINAGE AREAS<br>AVON LAKE GENERATING STATION<br>AVON LAKE, OHIO |
| CHECKED BY: S. Zummo Forney | |
| APPROVED BY: -- | DATE: 12/10/14 \| SCALE: AS NOTED \| DRAWING NO. 110870-E18 \| SHEET NO. -- |

VERIFY SCALE 0 1"

File: O:\Project\110870\Avon\110870-E18.dwg
User: Evon.Schlegel Dec 11, 2014 - 3:26pm Layout: 24 x 36