National Pollutant Discharge Elimination System (NPDES) Permit Program

FACT SHEET

Regarding an NPDES Permit To Discharge to Waters of the State of Ohio
for Eramet Marietta, Incorporated

Public Notice No.: 19-05-003
Public Notice Date: May 2, 2019
Comment Period Ends: June 2, 2019

Ohio EPA Permit No.: 0ID00001*GD
Application No.: OH0004006

Name and Address of Applicant:
Eramet Marietta, Inc.
16705 State Route 7
Marietta, OH 45750

Name and Address of Facility Where Discharge Occurs:
Eramet Marietta, Inc.
16705 State Route 7
Marietta, OH 45750
Washington County

Receiving Water: Ohio River and unnamed tributary of Ohio River

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

Proposed changes to the renewed permit are listed below. For justification of these changes, please see the section titled "Reasonable Potential/Effluent Limits/Management Decisions" on page 12.

Limit Changes

- **New Limits**
  - *Outfall 008*
    - Barium
    - Chromium, both total recoverable and hexavalent
    - Lead
    - Zinc
- **Limit Change**
  - *Station 602*
    - Fecal coliform was made less stringent. The limit period was increased from summer-only to year-round.
  - *Station 603*
    - All limits were changed from production-normalized loading limits to concentration-based limits.
    - pH limits were changed from a footnote to a limit in the table.
  - *Station 605*
    - Loading limits were adjusted based on:
      - revised production information; and
      - accounting for loading from stormwater runoff
    - pH limits were changed from a footnote to a limit in the table.
- **Removed Limits**
  - *Outfall 003* – Whole effluent toxicity and lead
  - *Outfall 006* – All limits were removed because they are directly applied at stations 603 and 605. Formerly, Outfall 006 was calculated based on discharges from 603 and 605.

Monitoring Changes

- **Outfall 003**
  - *Removed:* Whole effluent toxicity
  - *Less Frequent:* Cadmium and lead
- **Outfall 006** – **Removed**
  - Limits are directly assessed on monitoring stations 603 and 605. Formerly, Outfall 006 was calculated based on the discharge from 603 and 605.
- **Outfall 008**

    - *New:* Barium
    - *More Frequent:* Chromium, zinc, hexavalent chromium, and lead.
    - *Less Frequent:* Total suspended solids
    - *Removed:* Arsenic, beryllium, copper, free cyanide, mercury, nickel, selenium, and silver.
- **Outfall 589**
    - *Removed:* All parameters except for sludge weight.
- **Outfall 603**
    - Monitoring was changed from 24-hour composite to grab because the outfall has not had a reported discharge since 1994 and obtaining a composite sample may be impractical.

Schedule of Compliance

- Flow monitoring at 603
- Treatment SOP Development
- Limits at Outfall 008

Special or Changed Part II Language

- **Removed** – Whole effluent toxicity language
- **Added** – Operator certification
- **Added** – Optional mixing zone study for diffuser
- **Added** – Cooling water intake structure requirements
- **Added** – Outfall Signage requirements

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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 (cole.miller@epa.ohio.gov) or Aaron Pennington at (740) 380-5272 (aaron.pennington@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, a written request 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

Eramet Marietta, Incorporated discharges to the Ohio River at Mile Points [MPs] 176.3 (Outfall 007) and MP 177.0 (Outfall 003). The company also discharges to an unnamed tributary of the Ohio River at River Mile (RM) 0.15. The unnamed tributary enters the Ohio River at MP 176.5. Figure 4 shows the approximate location of the facility.

This segment of the Ohio River is described by Ohio EPA River Code: 25-500, U.S. EPA River Reach Code: 05030202-039, County: Washington, Ecoregion: Western Allegheny Plateau. The Ohio River is designated for the following uses under Ohio's WQS (OAC 3745-1-32): Warmwater Habitat, General High Quality Water, Agricultural Water Supply, Industrial Water Supply, Bathing Waters, Public Water Supply. The Ohio River must also meet any more stringent WQS listed in OAC 3745-1-32.

The unnamed tributary of the Ohio River is currently undesignated in the Ohio WQS. The WQS require that undesignated waters meet aquatic life criteria associated with the WWH use, and human health criteria to protect fish consumption.

FACILITY DESCRIPTION

Eramet Marietta manufactures manganese ferroalloys and manganese dioxide. The former Simplex facility has been idled and the electrolytic manganese and chromium plants are being demolished under the Ohio Voluntary Action Program (VAP). The ferromanganese and silicomanganese processes remain, as does the manganese dioxide process used by the Energizer plant on the site.

The process operations at Eramet Marietta are classified in the Standard Industrial Classification (SIC) category 3313 Electrometallurgical Products. The process wastewaters generated from these operations are regulated under 40 CFR 424, Ferroalloys, Subpart B, Covered Electrical Furnaces with Wet Air Pollution Control Devices, and Subpart F, Electrolytic Manganese Products – Electrolytic Manganese Dioxide

DESCRIPTION OF EXISTING DISCHARGE

Monitoring Locations

Eramet Marietta has 3 final outfalls. Figures 2-4 provide flow schematics and Table 1 highlights the primary outfalls which are summarized below:

- **Outfall 003** – Primary discharge to the Ohio River. The discharge consists of non-contact cooling water, storm water, and the following internal monitoring stations:
  - ***Station 602*** – Plant sanitary wastewater
  - ***Station 603*** – Ferromanganese wet scrubber process recycle system overflows.
  - ***Station 605*** – Treated manganese dioxide production and furnace wet scrubber wastewater, stormwater, and leachate from the closed Richard H Gorsuch North Fly Ash landfill.
- **Outfall 007** – Storm water from the capped and vegetated closed east fly ash landfill.
- **Outfall 008** – Leachate from capped east fly ash landfill and storm water from north slope of landfill.
- **Sludge Monitoring Station 589** – Sludge removed from the sanitary waste treatment plant for final disposal.

Eramet's current permit contains a calculated Outfall 006. Outfall 006 was previously permitted to add stations 603 and 605 loadings together to monitor for TBEL compliance. Wastewater that has potential to discharge at station 603 has routinely been routed upstream of station 605 since the August 1994 reroute system was installed. With no documented history of discharge at station 603, Ohio EPA intends to only include TBELs at station 605. In the event 603 has a discharge under the proposed permit, it will be subject

to TBEL concentrations and reporting associated with a bypass. Therefore, Outfall 006 is proposed to be removed.

Compliance and Permitting

Eramet reported 29 effluent violations which can be found on Table 2. 23 of the effluent violations are from the sanitary wastewater treatment plant.

Eramet Marietta is covered under the following orders and permit(s): DFFOs, Ohio EPA Title V Air Permit 84-02-0006 and Hazardous Waste (RCRA) Permit OHD004325411.

Wastewater Characteristics

The facility discharges an average of approximately 17 MGD from outfall 003, the primary discharge location.

Eramet Marietta obtains water from 3 source(s) – Process water is withdrawn from the Ohio River; cooling water is purchased from Good River, LLC. Water for sanitary systems is purchased from the Marietta water supply.

See the following tables for additional information on discharges for the period of November 2013 through November 2018:

- Table 3 and Table 4- presents data compiled from the NPDES permit renewal application Form 2C.
- Table 5 – Unaltered Discharge Monitoring Report (DMR) with effluent limits.
- Table 6 – Summary of whole effluent toxicity (WET) tests of the final effluent.

ASSESSMENT OF IMPACT ON RECEIVING WATERS

Unnamed Tributary

The unnamed tributary receiving the Outfall 008 discharge has not been identified as a priority impaired water on Ohio's 303(d) list.

Ohio River

Eramet Marietta discharges directly to the Ohio River in the Belleville dam pool. Water quality monitoring on the Ohio River is performed by the Ohio River Valley Water Sanitation Commission (ORSANCO). This information can be found in the *2016 Biennial Assessment of Ohio River Water Quality Conditions (305b) Report* and/or biological survey results/pool reports.

The Biennial Report can be found at this website:

http://www.orsanco.org/wp-content/uploads/2016/07/2016-305b-Report-Final-Draft.pdf

The most recent pool report can be found here:

http://www.orsanco.org/wp-content/uploads/2016/11/2014_Combined_Pool_Report1.pdf

ORSANCO evaluates the river for four uses: aquatic life, contact recreation impairment, public water supply (or PWS), and fish consumption. The segment of the Ohio River that Eramet Marietta discharges to is attaining the aquatic life and public water use criteria. This segment does not fully attain the recreation use (bacteria), and all segments of the Ohio River are considered impaired for fish consumption due to

polychlorinated biphenyl compounds (PCBs) and chlorinated dibenzodioxins (dioxin). New, year-round fecal coliform limits are proposed at the Outfall 602 treatment system and PCB/dioxin compounds do not appear to be discharged by Eramet Marietta.

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 Eramet Marietta 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)	November 2013 to November 2018
NPDES application Form 2C data	2016

Projected Effluent Quality (PEQ)

Ohio EPA evaluates the available data to statistically estimate the concentration of each pollutant. This estimation of effluent quality is called the Projected Effluent Quality (PEQ). Average PEQ (PEQ_{ave}) values reprecent the 95th percentile of monthly average data, and maximum PEQ (PEQ_{max}) values represent the 95th percentile of all data points. Table 13 summarizes the chemical specific data for Outfalls 003 and 008 by presenting the PEQ_{ave} and PEQ_{max}.

The following parameter deviated from the default methodology of developing PEQs:

Lead – Outfall 008

This parameter used PEQ Method A, versus PEQ Method B, as the linear regression of the log transformed data did not accurately model the dataset.

For more information on PEQ calculations, see Modeling Guidance #1 at the following webpage:

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

Statistical Outliers and Other Non-representative Data

The data were examined and the following values were removed from the evaluation to produce a more accurate PEQ:

Lead and Cadmium – Outfall 003

These parameters had multiple method detection limits (MDL). Because the statistical methodology used to derive the PEQs estimates a log-normal distribution, the mixture of MDLs produces PEQs that do not reflect actual results. To more accurately model the data, results less than the highest MDL were treated as being non-detects.

For lead, the PEQ_{ave} changed from 3.88 µg/L to 3.80 µg/L, the PEQ_{max} changed from 5.72 µg/L to 5.62 µg/L, and the R^2 changed from 0.98 to 0.99. There was no effect on the risk groupings.

For cadmium, the PEQ_{ave} changed from 2.51 µg/L to 2.22 µg/L, the PEQ_{max} changed from 2.69 µg/L to 2.58 µg/L, and the R^2 increased from 0.85 to 0.90. There was no effect on the risk groupings.

Zinc – Outfall 008

Five values less than 0.7 µg/L were excluded. A result of 0.7 µg/L is an improbable and is also 20 times less than the next highest value of 17 µg/L. The PEQ_{ave} decreased from 5580 µg/L to 165 µg/L, the PEQ_{max} decreased from 5010 to 292, and the R^2 increased from 0.78 to 0.96. There was no effect on the risk groupings.

Chromium – Outfall 008

Two values less than 0.2 µg/L were excluded. A result of 0.2 µg/L is improbable and is also 10 times less than the next highest value of 3 µg/L. The PEQ_{ave} decreased from 1250 µg/L to 230 µg/L, the PEQ_{max} decreased from 1300 µg/L to 370 µg/L, and the R^2 increased from 0.83 to 0.97. There was no effect on the risk groupings.

Preliminary determinations to development of water quality-based effluent limitations

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 7).

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, such as metals, are allocated by a mass-balance method because they do not break down in the receiving water. For free flowing streams, WLAs using this method are done using the following general equation (see OAC rule 3745-2-05 for more details):

$$Discharger\ WLA\ Concentration = \frac{WQC * (Q_{eff} + Q_{up}) - WQ_{up} * Q_{up}}{Q_{eff}}$$

Where:

$WQC = Water\ quality\ criterion$
$Q_{eff} = Average\ Design\ Flow$
$Q_{up} = Per\ cent\ of\ the\ stream\ design\ flow$
$WQ_{up} = Background\ water\ quality$

The applicable waterbody uses for this facility's discharge of Outfall 003 to the Ohio River and the associated stream design flows are as follows:

Aquatic life (Warmwater Habitat)		
Toxics (metals, organics, etc.)	Average	10% of annual 7Q10
	Maximum	1% of annual 1Q10
Agricultural Water Supply		10% of harmonic mean flow

Human Health (carcinogens)	10% of harmonic mean flow
Human Health (non-carcinogens)	100% of 7Q10

For Outfall 008, which discharges to a zero-flow stream, the WWH chemical criteria is applied directly to the discharge. Therefore, the WLA equals the WQC.

The data used in the WLA are listed in Table 7 and Table 9. Allocations cannot exceed the Inside Mixing Zone Maximum (IMZM). The WLA results to maintain all applicable criteria are presented in Table 11.

Thermal Wasteload

The Outfall 003 discharge was assessed for the reasonable potential to exceed temperature standards; the discharge temperatures will not exceed WLA values. Ohio EPA allocated temperature using a similar method to that used for toxic substances. The effluent flow of 30.032 cubic feet per second was given a temperature allocation using 10% of the annual 7Q10 river flow value to meet summer chronic standards, and 1% of 7Q10 to meet summer acute temperature standards. The acute WLA was more limiting.

The PEQ_{max} value for Outfall 003 was 31.3C (88.3°F), that, when compared to the acute WLA of 102.9F, does not result in the reasonable potential to contribute to exceedances of Ohio's temperature WQS. The acute WLA was calculated as follows:

$$Thermal\ WLA[°\mathrm{F}] = \frac{89\ °\mathrm{F} * (30.032\ cfs + 65.6\ cfs) - 82.6\ °\mathrm{F} * 65.6\ cfs}{30.032\ cfs}$$

$$Thermal\ WLA[°\mathrm{F}] = 102.9°\mathrm{F}$$

In this allocation, temperature data for the Hannibal Lock & Dam was used (2012 and 2014 data) because it was the closest upstream data collected.

REASONABLE POTENTIAL/EFFLUENT LIMITS/MANAGEMENT DECISIONS

After calculating the appropriate WLA, the reasonable potential of a discharger to exceed the WLA, and thereby exceeding the WQS, must also be determined. For the allocated parameters, the preliminary effluent limits (PEL) based on the most restrictive average and maximum WLAs are selected from Table 11. Reasonable potential is determined through a comparison of each pollutant's PEQs and their respective PELs. The average PEL (PEL_{avg}) is compared to the average PEQ (PEQ_{avg}) and the PEL_{max} is compared to the PEQ_{max}.

The parameters are assigned into groups 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 PEQs and the reasonable potential outcome is presented in Table 13 and the groupings mean the following:

- Group 1 – No numeric criteria is available for the pollutant
- Group 2 – **Monitoring is optional.** The PEQ is less than 25% of the WQC.
- Group 3 – **Monitoring evaluation is recommended.** The PEQ is less than 50% of the PEL.
- Group 4 – **Monitoring is required.** The PEQ is greater than or equal to 50% of the PEL.
- Group 5 – **Monitoring and limits are required.** The PEQ is greater than or equal to 100% of the PEL or greater than or equal to 75% of the PEL and the discharger takes a certain percent of the allowable load of the receiving stream.

The final effluent limits are determined by evaluating the groupings in conjunction with other applicable rules and regulations. Table 15 presents the final effluent limits and monitoring requirements proposed for Eramet Marietta outfall(s) 003 and 008 and internal monitoring stations 602, 603 and 605 and the basis for their

recommendation. Treatment technology-based limits have also been developed for Outfall 008 and internal monitoring stations 602, 603 and 605.

Unless otherwise indicated, the monitoring frequencies proposed in the permit are continued from the existing permit.

Outfall 003

This is the primary outfall consisting of flows from internal monitoring stations 602, 603, and 605, non-contact cooling water, and storm water.

Limits Based on WQBEL

pH, Chlorine, and Chlorine/Bromination Duration

Limits proposed for pH are based on WQS (OAC 3745-1-07).

The Ohio EPA risk assessment (Table 13) places residual chlorine in group 4. However, based on the fact that the permittee utilizes high doses for limited times because of current permit conditions, permit limits are proposed to continue.

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.

Monitoring – Group 3 Parameters

Cadmium and Lead

The Ohio EPA risk assessment (Table 13) places these parameters in group 3 which means the PEQ for these parameters are less than 50% of their corresponding WLA. This indicates that these pollutants are present and do not have potential to cause or contribute an exceedance of WQS. Monitoring is proposed to continue at a reduced frequency of monthly to document that these pollutants continue to remain at low levels. The limit for lead is also proposed to be removed.

Removal – Whole Effluent Toxicity

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.

The WLA calculations for WET are similar to those for aquatic life criterion. For Eramet Marietta, the WLA values for outfall 003 are 0.8 TU_a and 22.8 TU_c.

Based on evaluating the WET data presented in Table 6 and other pertinent data under the provisions of OAC 3745-33-07(B), the Eramet Marietta Outfall 003 is placed in Category 4 with respect to WET. The outfall has shown a single measurable acute toxicity during the last five years below the WLA. Based on the dilution available in the Ohio River, acute toxicity is the limiting factor for this discharge.

Therefore, monitoring for acute toxicity is proposed to be removed.

***Removal* – Outfall 006**

This outfall is calculated based on the discharges from stations 603 and 605. This calculation allowed Ohio EPA to determine compliance with applicable federal effluent guidelines from different processes. Since the

installation of the scrubber recycle system in August 1994, there have been no reported discharges at outfall 603. Therefore, the calculated outfall 006 is no longer necessary and is proposed to be removed.

Outfall 007

This outfall is for stormwater runoff from a capped and vegetated fly ash landfill. Only stormwater requirements of Parts IV, V, and VI, are proposed with no additional chemical sampling.

Outfall 008

This outfall monitors the fly ash landfill leachate as well as some storm water runoff.

Limits Based on Best Professional Judgment

Total Suspended Solids

The effluent limit for total suspended solids is a Best Professional Judgment (BPJ) treatment technology-based limit (TBEL), from TBELs for similar treatment systems developed in the Steam Electric Power Generating effluent limit guideline regulations (40 CFR 423). These limits are proposed to continue from the current permit at a reduced frequency of weekly.

Limits Based on WQBEL

Barium, Chromium^{6+}, Total Recoverable Chromium, Zinc, and Lead

The Ohio EPA risk assessment (Table 13) places these parameters in group 5. For these parameters, the PEQ is greater than 100 percent of the WLA. This indicates that these pollutants are present in the discharge in concentrations that have reasonable potential to exceed WQS and that limits are necessary to protect water quality as required by OAC 3745-33-07(A)(1). The permit contains a compliance schedule to meet these limitations.

Barium is a new parameter proposed to be monitored monthly. The remaining parameters are proposed to increase in frequency from quarterly to monthly.

Limits Based on WQBEL

pH

Limits proposed for pH are based on WQS (OAC 3745-1-07).

Monitoring – Group 3 Parameters

Cadmium

The Ohio EPA risk assessment (Table 13) places this parameter in group 3. Monitoring is proposed to continue at quarterly.

Monitoring – Plant Performance

Flow Rate

Monitoring for flow rate is proposed to continue to evaluate the quality of the discharge.

No Monitoring

Free cyanide, arsenic, selenium, beryllium, nickel, silver, copper, and mercury

The Ohio EPA risk assessment (Table 13) places these parameters in group 2. They are all proposed to be removed from sampling requirements.

Ammonia and strontium.

The Ohio EPA risk assessment (Table 13) places these parameters in group 2 or 3. No new monitoring is proposed

Whole Effluent Toxicity

As discussed on page 13 for Outfall 003, acute WET measures short term effects of the effluent while chronic WET measures longer term and potentially more subtle effects of the effluent. For this outfall, the WLA values for outfall 008 are 0.3 TUa and 1.0 TUc. No toxicity monitoring or limits are proposed for Outfall 008. The new chemical-specific limits should ensure that discharges from this outfall are not toxic.

Internal Outfall 602

Carbonaceous biochemical oxygen demand ($CBOD_5$) and total suspended solids

The limits at this outfall for carbonaceous biochemical oxygen demand (CBOD5) and total suspended solids are based on the design of the sanitary wastewater plant. The CBOD5 and TSS limits represent treatment at the secondary treatment level as required by Best Practicable Waste Treatment Technology in 40 CFR Part 133.

Fecal Coliform

The fecal coliform bacteria limits are proposed to change from 200 and 400 # / 100 mL to 1,000 and 2,000 # / 100 mL, respectively, and implemented from summer-only to year-round. The previous limits were mis-applied water quality-based effluent limits. The average discharge from the internal outfall is 0.07 MGD which is approximately 250 times less than the final outfall 003 with 19.41 MGD. Therefore, with the dilution of process water and non-contact cooling water, the water quality criterion will be met end-of pipe. The proposed limit is based on best professional judgment on the technology available. Antibacksliding does not apply because this is a technology-based limit and technical misinterpretations of the law were made in issuing previous permits [see OAC 3745-33-05(F)(1)(c)]. Antidegradation does not apply because no loading limits are being modified as this is a concentration-based technology limit.

Internal Outfall 603

The scrubber discharge is regulated by federal effluent guidelines for the Ferroalloy Industry, 40 CFR Part 424, Subpart B. These limitations are expressed in terms of kilograms of pollutant discharged per megawatt-hour of power consumed. To develop these regulations, U.S. EPA made assumptions about the amount of water discharged per MWH of power consumed.

Eramet Marietta has altered the discharge flows such that this relationship between effluent flow and power consumption no longer holds. The company has increased recycle rates to the point where discharges from the scrubber recycle system have never yet occurred. Because of this, the effluent guideline load limits would not reflect BAT treatment for this facility. To correct this, Ohio EPA has used the concentrations used to develop the production-based ELGs and that reflect the BAT treatment quality intended by U.S. EPA. Attachment 1 shows these values.

Bypass prohibition language is also included for this outfall to ensure the loadings of Internal Outfall 605 are not circumvented by utilizing Internal Outfall 603. Additionally, the sampling type has been changed from 24-hour composite to grab samples.

Internal Outfall 605

This outfall is regulated by federal effluent guidelines for the Ferroalloy Industry, Subpart F. The treatment system for this outfall also receives sludges from the scrubber system recycle pond related to FEGs covered under 40 CFR Part 424, Subpart B described in outfall 603 above. These sludges leach process pollutants from the scrubber system to this outfall.

In 1987, U.S. EPA provided a tentative decision to grant a fundamentally different factors (FDF) variance for manganese at the facility. While this permit does not propose to implement a variance, the proposed limits for manganese are based on adding the BAT numbers with additional loading allocated to storm water that contacts the treatment process based on best professional judgment (BPJ).

Determining Concentration-basis

U.S. EPA developed the guidelines in the 1970s and their methodology is detailed in technical development documents[1]. To determine the ELGs for Subpart B, U.S. EPA utilized sampling point E as basis for concentration at Plant D as shown in Figure 1 below. EPA determined that 5 mg/L was achievable as a 30-day average while 10 mg/L was achievable as a 24-hour maximum. Note sampling point E is located after clarifier and filters.

Subpart F used Eramet Marietta as one of the model plants. In the 1975 Development Document, U.S. EPA notes:

> *"Because the electrolytic wastes at Plant A* [Eramet] *and C are extensively commingled with other plant wastes, no absolute value for the treated wastes at these plants can be given. Analytical data for the lagoon discharge at Plant A* [Eramet] *are as follows, in mg/L:*
>
> *...*
> *Manganese 91*
> *...*
>
> *The treated discharge at Plant B is simply the discharge of the weak wastewater, as shown below.*
>
> *...*
> *Manganese 21.7*
> *..."*

Eramet Marietta continues to use a lagoon for settling out pollutants such as manganese. As shown in Figure 2, the permittee is currently meeting the manganese concentrations developed by U.S. EPA for Subpart B and vastly outperforming the values provided in Part F.

[1] Subpart B is supported by the *1974 Development Document for Interim Final Effluent Limitations Guidelines and Proposed New Source Performance Standards for the Smelting and Slag Processing Segments of the Ferroalloy Manufacturing Point Source Category*.

Subpart F is supported in a similarly titled document from 1975 for the *Electrolytic Ferroalloys* segment.

Figure 11.
PLANT D WATER AND WASTEWATER SYSTEMS

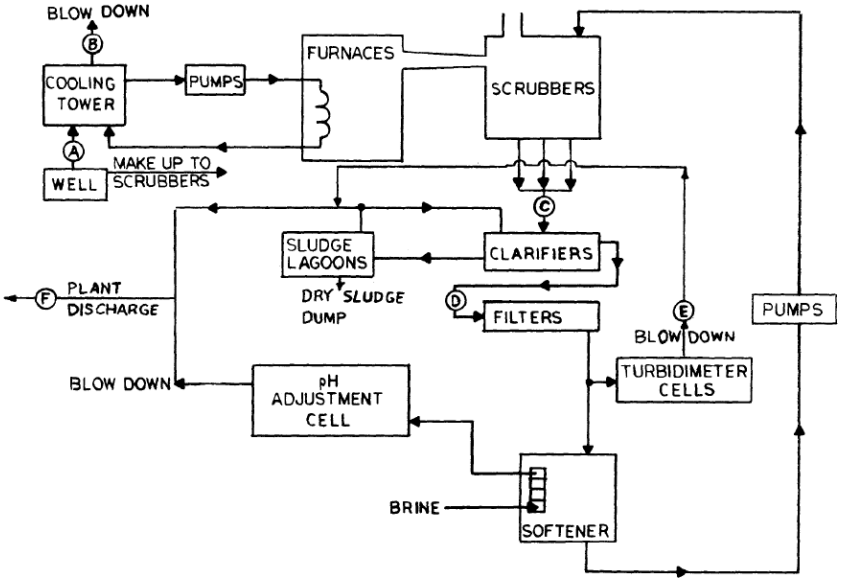


Figure 1. EPA Development Document Model Plant D

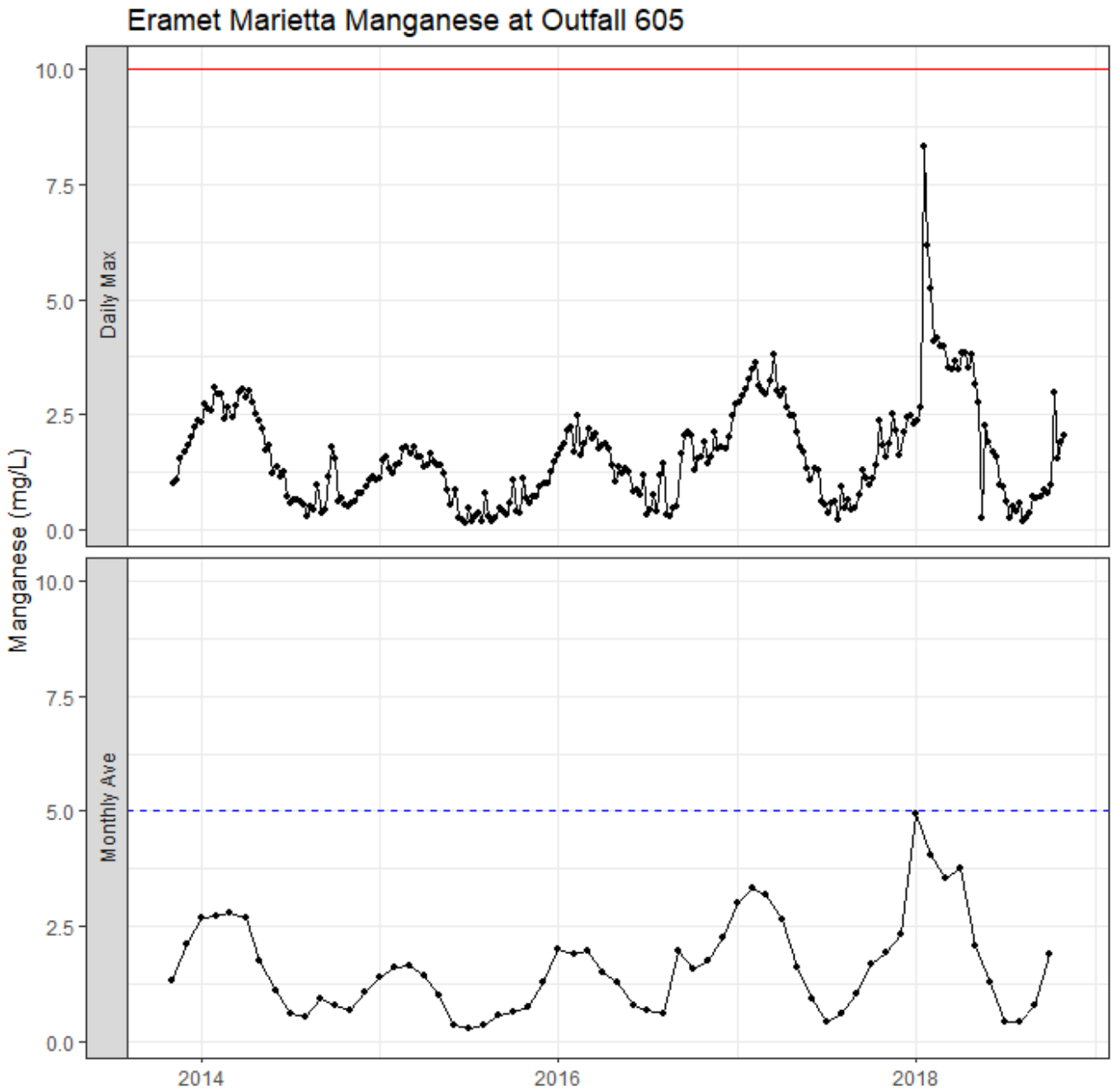


Figure 2. Eramet Manganese Concentration Performance at Outfall 605

Determining Loading and Flow

The 1974 Development Document indicates that blow down from the recirculation system was used to determine water usage for the ELGs. In other words, storm water which is introduced to the treatment process was not allocated load.

The configuration of flow diagram with respect to ELG regulated waste-streams is as follows:

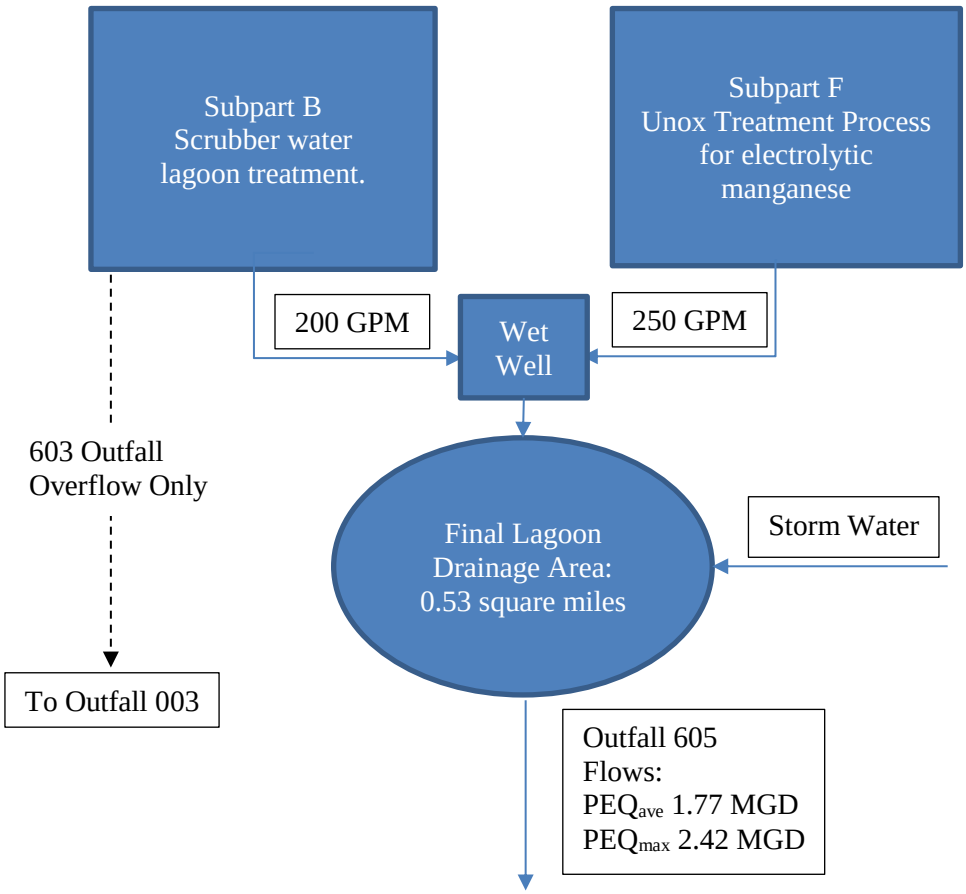


Figure 3. Simplified Flow Diagram

The drainage area for the treatment lagoon is 0.53 square miles. A half-inch of storm water runoff would produce approximately 4.6 million gallons of storm water. However, Ohio EPA used the PEQs to determine the storm flow contribution by:

$$Storm.Water.Flow.Ave[MGD] = PEQ_{ave} - (Subpart.B.Flow + Subpart.F.Flow)$$

$$Storm.Water.Flow.Ave[MGD] = 1.77MGD - (200\ GPM + 250\ GPM) * \frac{60 * 24\ min}{1\ day} * \frac{1\ MG}{10^6\ gal}$$

$$Storm.Water.Flow.Ave[MGD] = 1.12\ MGD$$

A similar calculation was performed to determine the projected daily maximum flow as well.

Final Manganese Limit Proposal

The BAT load from production was added to the storm water BPJ loading as follows with the concentration for BPJ_{storm} from the Subpart B 1974 development document discussed above:

$$Mn_{ave}[\frac{kg}{day}] = BAT_{Subpart\ B} + BAT_{Subpart\ F} + BPJ_{storm}$$

$$Mn_{ave}\left[\frac{kg}{day}\right] = 450\frac{MHW}{day} * 0.005\frac{kg}{MWH} + 34.5\frac{kkg}{day} * 0.088\frac{kg}{kkg} + 1.12\ MGD * 5\frac{mg}{L} * 3.785$$

$$Mn_{ave}\left[\frac{kg}{day}\right] = 26.5$$

The daily maximum allowable loading was done similar to above and resulted in 78.1 kg/day. For flow, the PEQ_{mzx} (2.42 MGD) was used minus the process flow. For concentration, 10 mg/L was used.

Hexavalent chromium

The limits were derived using the same procedures which allow for BPJ loadings from storm water. However, the calculated amount would increase the authorized loading. Therefore, the existing loading limits are proposed based on BAT, BPJ, and anti-degradation.

Additional Limits

ELG based-limits are also proposed for total suspended solids, pH, ammonia-nitrogen, total chromium, and phenolics. The limits are strictly based on BAT provisions as the permittee will be able to comply with the proposed limits.

The table below shows the current limits in comparison to the proposed limits.

Parameter	*Existing 30-day Limit (kg / day)*	*Proposed 30-day Limit (kg / day)*
Manganese	193	26.5
Hexavalent chromium	0.066	0.066
Total suspended solids	821	124
Ammonia	--	30.4
Total Chromium	1.72	0.225
Phenolics	1.44	0.090

<u>Outfall 589 - Sludge</u>

Limits and monitoring requirements proposed for the disposal of sewage sludge by the following management practices are based on OAC 3745-40: removal to sanitary landfill.

OTHER REQUIREMENTS

Compliance Schedule

New Limits

A 36-month compliance schedule is proposed for Eramet Marietta to meet the new water quality based effluent limits at outfall 008 for barium, total chromium, hexavalent chromium, lead, and zinc. Details are in Part I.C of the permit.

Flow meter

A 12-month compliance schedule is proposed for Eramet Marietta to make improvements to the flow meter which monitors flow from the north impoundment, monitoring station 605. The permittee has had equipment issues which have prevented accurate flow measurements.

North Impoundment Treatment Best Management Practices

A 12-month compliance schedule is proposed to optimize the north impoundment including evaluating the following methods:

- Maintaining the pH of the impoundment above the critical pH for the precipitation reaction.
- Addressing short-circuiting of flow as it may be an issue with thermal stratification of the process flow.
- Identifying proper waste placement to ensure the waste does not get disposed above permitted elevations while evenly filling the impoundment.

Part II

Operator Certification and Operator of Record

Operator certification requirements have been included in Part II of the permit in accordance with rules adopted in December 2006 (OAC 3745-7-02). These rules require Eramet Marietta to have a Class I wastewater treatment plant operator in charge of the sewage treatment plant operations discharging through outfall 602. These rules also require the permittee to designate one or more operator of record to oversee the technical operation of the "treatment works".

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.

Ohio EPA has evaluated this information and at this time has determined that the CWIS represents BTA in accordance with Section 316(b) of the CWA. This BTJ conclusion has been reached based on the use of fine-mesh screens and a design intake velocity of less than 0.5 ft/s. A more complete analysis is included in Attachment 3.

In order to ensure that the facility remains compliant with Section 316(b), special conditions are included in Part II of the permit.

Outfall Signage

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

Diffuser Mixing Zone Study Update

The permittee utilizes a diffuser to promote rapid mixing. In 1995, the permittee documented that the average aquatic life, human health, and agricultural water supply criteria could have a dilution factor of 19 based on the mixing zone. For acute criteria, the maximum aquatic life dilution factor was 6.5 while the area of initial mixing was a dilution factor of 3.

These alternative dilution factors were not applied during this permit development as they were not necessary. However, if the permittee believes alternative dilution factors are necessary in the future, a mixing zone study should be performed to determine what the current dilution factors are with the next permit renewal application.

Part III

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

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 Eramet Marietta may seek permit coverage under the general permit for industrial storm water (permit # OHR000006) or submit a "No Exposure Certification." Parts IV, V, and VI will be removed from the final permit if: 1) Eramet Marietta 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.

Figure 4. Location of Eramet Marietta

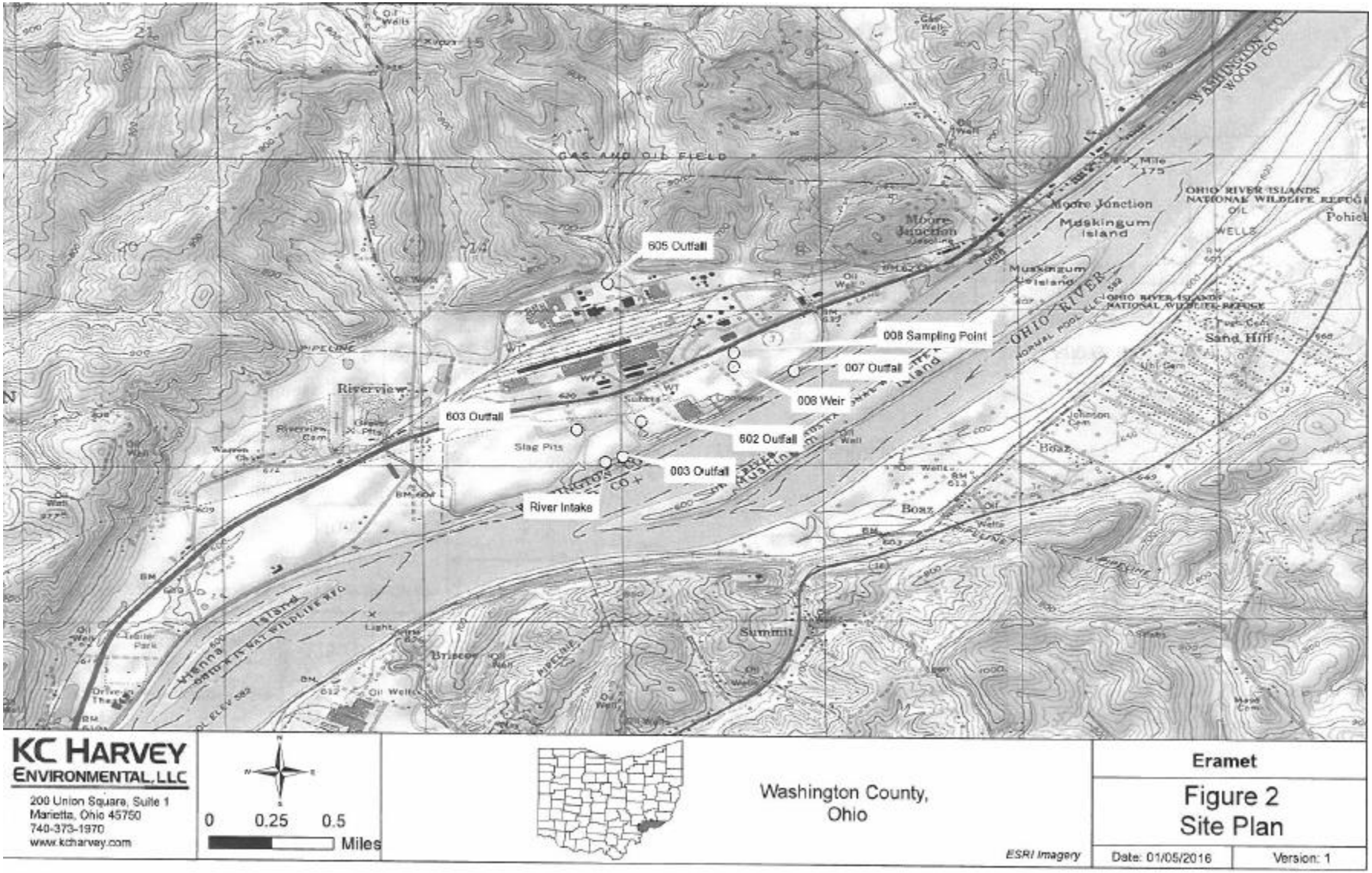


Figure 5. Diagram of Wastewater Treatment System

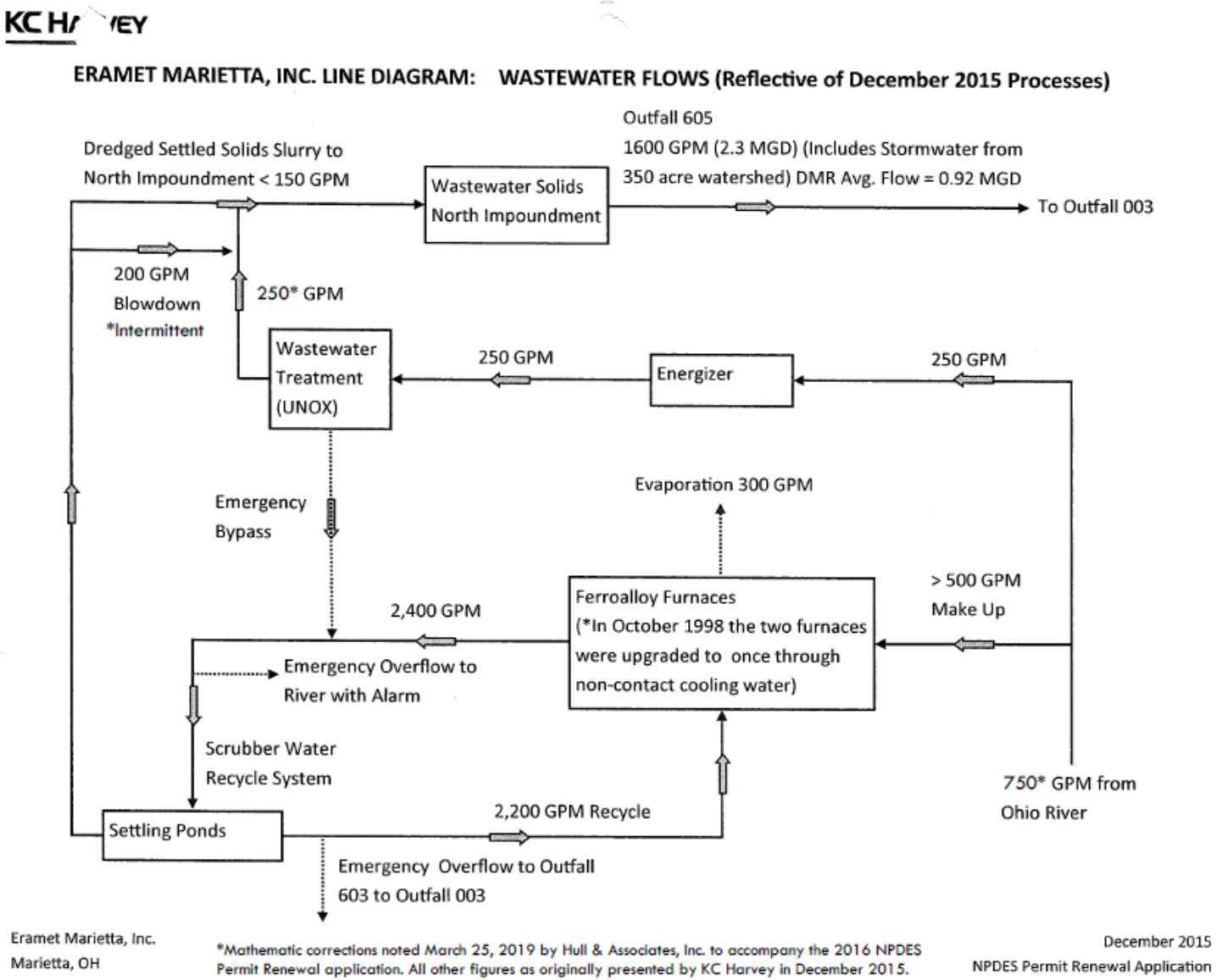
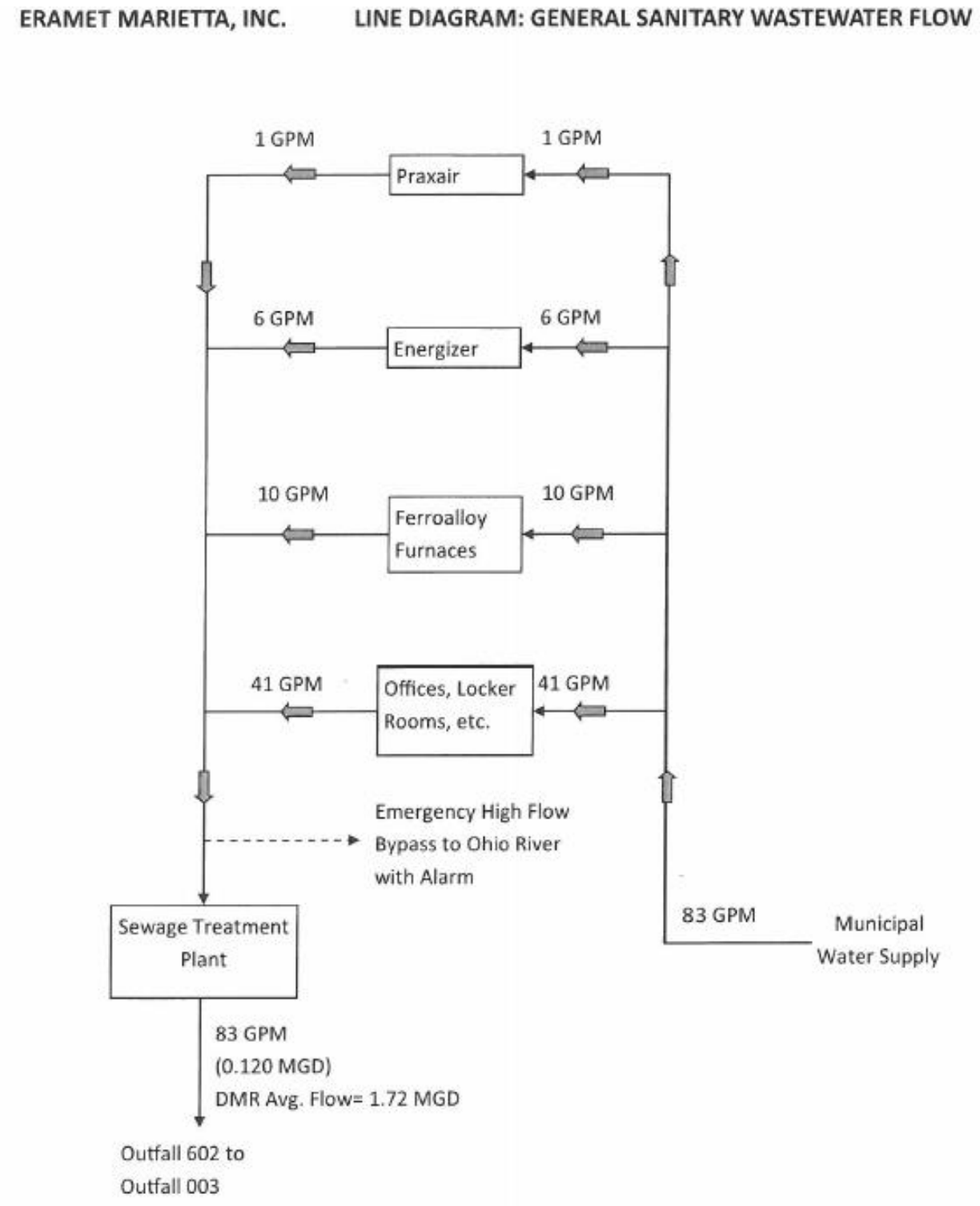


Figure 6. Eramet Sanitary Wastewater Flow Diagram



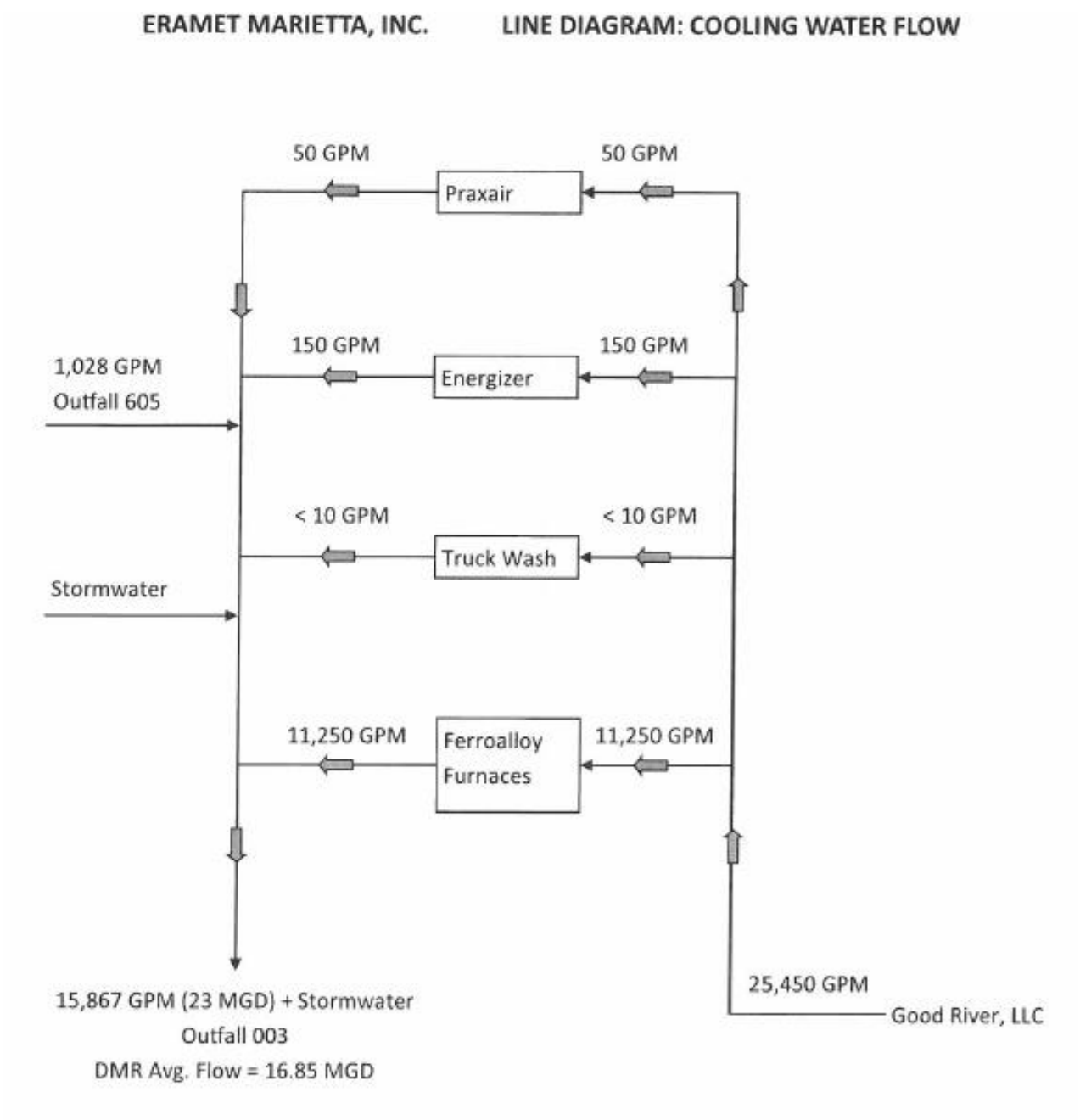


Figure 7. Eramet Cooling Water Flow Diagram

Table 1. Monitoring Stations, Wastewater Sources, Treatment Processes, Discharge Points, and Flow Rates

Station #	Wastewater Source	Treatment Utilized	Discharge/ Receiving Stream	Average Flow Rate (MGD)
003	Manganese Dioxide Process Wastewater (Station 605), Scrubber Process Recycle System (Station 603), Sanitary Wastewater (Station 602), Non-contact Cooling Water, and Plant Area Storm Water	See descriptions for Stations 602, 603, 605. Cooling water and storm water are not treated.	Ohio River	16.85
007	Storm Water from Closed Fly Ash Landfill (Capped and Vegetated)	None	Ohio River	Rainfall Dependent
008	Leachate from Capped Landfill, Storm Water from North Slope of Landfill	Sedimentation Pond	Unnamed Tributary to Ohio River	0.04
602	Sanitary Wastewater Treatment Plant	Comminution, Primary Settling, Trickling Filter, Chlorination. Solids – Drying Bed and Land Application	Outfall 003	0.029
603	Ferromanganese and Silicomanganese Furnace and Scrubber Water Recycle System Overflow	Settling (clarification and pond)	Outfall 003	0*
605	Energizer Manganese Dioxide Process Wastewater Treatment Plant , Ferromanganese and Silicomanganese Furnace Scrubber Wastewater, Storm water, and closed Fly Ash Landfill leachate	Settling with Lime Addition	Outfall 003	0.92

* No overflows from this outfall have occurred since the recycle system was installed.

Table 2. Effluent Violations
Period Nov. 2013 – Oct. 2018

Outfall - Parameter	2013	2014	2015	2016	2017	2018
003 - Chlorine, Total Residual	0	1	0	0	0	0
006 - Chromium, Hexavalent	0	1	0	0	0	0
602 - Fecal Coliform	0	5	6	4	1	5
602 - Total Suspended Solids	0	0	0	0	0	2
008 - Total Suspended Solids	0	1	0	0	0	2
008 - pH	0	0	0	1	0	0
Total	**0**	**8**	**6**	**5**	**1**	**9**

Table 3. Effluent Characterization Based on Ohio EPA and Form 2C Data – Outfall 003

Parameter	Units	Ohio EPA[1] 5/24/11	Ohio EPA 5/8/12	Ohio EPA 5/21/13	Eramet 2016 Application N	mean	maximum
Organic Carbon, T.	mg/l	NA	NA	NA	1	--	4.12
Temperature (win.)	°C	NA	NA	NA	251	9.11	23.00
Temperature (sum.)	°C	NA	NA	NA	251	25.52	32.00
Total Suspended Solids	mg/l	43	18	24	126	37.68	749
Total Dissolved Solids	mg/l	296	NA	NA	NA	NA	NA
Ammonia-N	mg/l	0.349	NA	NA	1	--	0.17
Nitrate/Nitrite-N	mg/l	1.49	NA	NA	NA	NA	NA
Total Kjeldahl N	mg/l	0.89	NA	NA	NA	NA	NA
Phosphorus	mg/l	0.063	NA	NA	NA	NA	NA
Chlorine, Total Residual	mg/l	NA	NA	NA	NA	NA	NA
Chloride	mg/l	27.2	NA	NA	NA	NA	NA
Hardness	mg/l	188	NA	206	NA	NA	NA
Aluminum	ug/l	550	NA	352	NA	NA	NA
Arsenic	ug/l	<2.0	<2.0	<2.0	1	--	<100
Barium	ug/l	49	NA	56	NA	NA	NA
Cadmium	ug/l	<0.2	0.37	<0.2	1	--	<10
Chromium	ug/l	5.4	26.4	2.2	1	--	<20
Chromium, hexavalent	ug/l	<10	NA	NA	NA	NA	NA
Copper	ug/l	4.0	5.0	4.1	1	--	<20
Iron	ug/l	1530	NA	686	NA	NA	NA
Lead	ug/l	<2.0	2.6	<2.0	1	--	<100
Magnesium	mg/l	13	NA	16	NA	NA	NA
Manganese	ug/l	1050	NA	720	1	--	360
Nickel	ug/l	5.3	6.1	4.1	1	--	<40
Potassium	mg/l	6	NA	6	NA	NA	NA
Strontium	ug/l	226	NA	279	NA	NA	NA
Zinc	ug/l	13	NA	<10	1	--	<20
Cyanide, free	ug/l	NA	NA	NA	1	--	<10*
Bis(2-ethylhexyl)phthalate	ug/l	0.5	NA	NA	1	--	19.3

NA = not analyzed
[1] Ohio EPA data not used for projected effluent quality determination because the data is older than 5 years.
*= total cyanide result

Table 4. Effluent Characterization Using Ohio EPA and Form 2C Data – Outfall 008

Parameter	Units	Ohio EPA[1] 5/24/11	Ohio EPA 5/8/12	Ohio EPA 5/21/13	Eramet 2016 Application N	mean	maximum
Total Suspended Solids	mg/l	18	21	14	139	10.73	51
Ammonia-N	mg/l	NA	NA	NA	1	--	0.121
Hardness	mg/l	536	329	1430	NA	NA	NA
Aluminum	ug/l	<200	485	211	NA	NA	NA
Arsenic	ug/l	2.4	2.2	2.7	NA	NA	NA
Barium	ug/l	136	68	59	NA	NA	NA
Cadmium	ug/l	<0.2	<0.2	<0.2	NA	NA	NA
Chromium	ug/l	2.8	45.4	<2.0	NA	NA	NA
Chromium, hexavalent	ug/l	<10	28	NA	NA	NA	NA
Copper	ug/l	2.4	2.2	2.0	NA	NA	NA
Iron	ug/l	1100	1430	1090	NA	NA	NA
Lead	ug/l	<2.0	<2.0	<2.0	NA	NA	NA
Magnesium	mg/l	49	29	133	NA	NA	NA
Manganese	ug/l	3400	2700	2230	NA	NA	NA
Nickel	ug/l	5.2	4.0	9	NA	NA	NA
Potassium	mg/l	18	11	52	NA	NA	NA
Strontium	ug/l	1310	835	3760	NA	NA	NA

[1] Ohio EPA data not used for projected effluent quality determination because the data is older than 5 years.

Table 5. Effluent Characterization Using Self-Monitoring Data

			Current Limits			Percentiles		
Outfall	Parameter	Unit	30 Day	Daily	# Obs	50th	95th	Data Range
003	Water Temperature	°C	Monitoring Only		1155	19	29	1 - 33
	pH	S.U.	--	6.5 - 9.0	256	7.98	8.59	7.51 - 8.98
	Total Suspended Solids	mg/L	Monitoring Only		255	17	129	1 - 410
	Cadmium, TR	µg/L	Monitoring Only		255	< .5	1.63	0 - 21
	Lead, TR	µg/L	--	780	255	.7	5.4	0 - 13.5
	Flow Rate	MGD	Monitoring Only		1795	17.5	19.4	14.5 - 20.1
	Chlorine, Total Residual	mg/L	--	0.2	1218	< .03	.03	0 - .23
	Acute Toxicity, Ceriodaphnia dubia	TUa	--	3.0	19	< 1	.04	0 - .4
	Acute Toxicity, Pimephales promelas	TUa	--	3.0	19	< 1	.02	0 - .2
	Chlorination/Bromination Duration	Minutes	--	120	1796	0	0	0 - 5
006	Total Suspended Solids	kg/day	821	1641	175	5.45	39	.0189 - 162
	Nitrogen, Ammonia	kg/day	147	295	175	3.91	11.6	0 - 27.7
	Nitrogen, Ammonia	mg/L	Monitoring Only		234	1.63	8.18	0 - 34.6
	Chromium, Hexavalent (Cr +6)	kg/day	0.066	0.132	175	0	.0481	0 - .182
	Chromium, Total (Cr)	kg/day	1.72	3.431	175	.0276	.232	.0000946 - 2.59
	Manganese, Total (Mn)	kg/day	29.5	59.52	175	2.74	16.2	.00557 - 35.5
	Phenolic 4AAP, Total	kg/day	1.44	2.16	175	0	0	0 - .0351
	Flow Rate	MGD	Monitoring Only		1220	.56	1.78	0 - 4.04
	Cyanide, Total	kg/day	0.35	0.661	175	0	0	0 - .0546
008	pH	S.U.	--	6.5 - 9.0	345	7.78	8.39	6.79 - 9.04
	Total Suspended Solids	mg/L	30.0	100.0	724	9	31	0 - 115
	Cyanide, Free	mg/L	Monitoring Only		17	--	--	< .005
	Arsenic, TR	µg/L	Monitoring Only		17	--	--	< .05
	Selenium, TR	µg/L	Monitoring Only		17	--	--	< .04
	Beryllium, TR	µg/L	Monitoring Only		17	--	--	< .005
	Chromium, Dissolved (Cr)	µg/L	Monitoring Only		1	--	--	< 9
	Chromium, Hexavalent (Cr +6)	µg/L	Monitoring Only		19	< 10	19.6	0 - 34
	Nickel, TR	µg/L	Monitoring Only		17	--	--	< .02

			Current Limits			Percentiles		
Outfall	Parameter	Unit	30 Day	Daily	# Obs	50th	95th	Data Range
	Silver, TR	µg/L	Monitoring Only		17	--	--	< .005
	Zinc, TR	µg/L	Monitoring Only		19	28	148	.057 - 175
	Cadmium, TR	µg/L	Monitoring Only		19	< .5	.59	0 - 1.4
	Lead, TR	µg/L	Monitoring Only		19	< .05	8.82	0 - 27
	Chromium, TR	µg/L	Monitoring Only		19	14	132	.036 - 153
	Copper, TR	µg/L	Monitoring Only		17	--	--	< .01
	Flow Rate	MGD	Monitoring Only		1134	.009	.2	0 - 75
	Mercury, TR	µg/L	Monitoring Only		17	--	--	< .0001
589	Cadmium	mg/kg	Monitoring Only		10	3.51	5.58	1.93 - 5.6
	Chromium	mg/kg	Monitoring Only		10	856	1720	207 - 1840
	Copper	mg/kg	Monitoring Only		10	812	1290	250 - 1380
	Lead	mg/kg	Monitoring Only		10	88.3	148	29.4 - 149
	Nickel	mg/kg	Monitoring Only		10	45.7	2530	28.4 - 4530
	Zinc	mg/kg	Monitoring Only		10	1340	2950	390 - 3830
	Sludge Solids, Percent Total	%	Monitoring Only		10	60.7	83.2	52.1 - 88.1
	Mercury	mg/kg	Monitoring Only		10	14.1	19	.793 - 20.2
	Nitrogen, Ammonia In Sludge	mg/kg	Monitoring Only		10	26.4	131	0 - 164
602	Total Suspended Solids	kg/day	11.4	17	485	.344	3.29	0 - 7.81
	Total Suspended Solids	mg/L	30	45	518	6	19	0 - 48
	Fecal Coliform	#/100 mL	200	400	129	< 1	16600	0 - 66000
	Flow Rate	MGD	Monitoring Only		488	.013	.067	0 - .143
	CBOD 5 day	kg/day	9.5	15	252	< .0492	1.29	0 - 3.11
	CBOD 5 day	mg/L	25	40	260	1.52	10.1	0 - 19.5
605	pH	S.U.	Monitoring Only		261	7.64	8.52	6.24 - 9.15
	Total Suspended Solids	mg/L	Monitoring Only		262	3	13	1 - 52
	Nitrogen, Ammonia	mg/L	Monitoring Only		261	1.52	7.78	0 - 34.6
	Chromium, Hexavalent (Cr +6)	µg/L	Monitoring Only		261	< 10	12	0 - 29
	Chromium, Total (Cr)	µg/L	Monitoring Only		261	12	52	0 - 275
	Manganese, Total (Mn)	µg/L	Monitoring Only		261	1390	3520	.2 - 8310
	Phenolic 4AAP, Total	µg/L	Monitoring Only		262	< .003	< .003	0 - 16
	Flow Rate	MGD	Monitoring Only		1397	.55	1.93	0 - 306
	Cyanide, Total	mg/L	Monitoring Only		262	< .005	< .005	0 - .103

* = For pH minimum and dissolved oxygen, 5th percentile shown in place of 95th percentile.

TR = Total Recoverable

[w] = weekly average

[m] = Minimum limit

Table 6. Summary of Acute and Chronic Toxicity Results at Outfall 003

Date	*Ceriodaphnia Dubia (Tu_a)*	*Pimephales Promelas (Tu_a)*
12/19/2013	AA (0)	AA (0)
3/19/2014	AA (0)	AA (0)
6/11/2014	AA (0)	AA (0)
8/20/2014	AA (0)	AA (0)
12/10/2014	AA (0)	AA (0)
3/18/2015	AA (0)	AA (0)
6/24/2015	AA (1)	AA (1)
8/5/2015	AH ()	AH ()
9/23/2015	AA (1)	AA (1)
12/9/2015	AA (1)	AA (1)
3/16/2016	AA (1)	AA (1)
6/22/2016	AA (1)	AA (1)
8/10/2016	AA (1)	AA (1)
12/21/2016	AA (1)	AA (1)
3/8/2017	AA (1)	AA (1)
6/14/2017	AA (1)	AA (1)
8/16/2017	AA (1)	AA (1)
12/27/2017	AA (1)	AA (1)
3/28/2018	AA (1)	AA (1)
6/20/2018	AA (0.2)	AA (0.2)
8/1/2018	.4	.2

AA = non-detection
TU_a = acute toxicity unit

Table 7. Water Quality Criteria for the Ohio River

Parameter	Units	Outside Mixing Zone Criteria				Inside Mixing Zone Maximum
		Average			Maximum	
		Human Health	Agri-culture	Aquatic Life	Aquatic Life	
Aluminum	µg/L	--	--	--	--	--
Ammonia-S	mg/L	--	--	1.1	--	--
Ammonia-W	mg/L	--	--	2.8	--	--
Arsenic - TR	µg/L	50	100	150	340	680
Barium	µg/L	--	--	220	2000	4000
Bis(2-ethylhexyl)phthalate	µg/L	18c	--	8.4	1100	2100
Cadmium - TR	µg/L	--	50	2.8	5.5	11
Chlorides	mg/L	250	--	--	--	--
Chlorine (wwh) - TRes	mg/L	--	--	0.011	0.019	0.038
Chromium - TR	µg/L	--	100	100	2100	4200
Chromium VI - Diss	µg/L	--	--	11	16	31
Copper - TR	µg/L	1300	500	11	17	33
Cyanide - free	mg/L	0.7	--	0.0052	0.022	0.044
Dissolved solids (ave)	mg/L	--	--	1500	--	--
Iron - TR	µg/L	--	5000	--	--	--
Lead - TR	µg/L	--	100	8.1	150	310
Magnesium	mg/L	--	--	--	--	--
Manganese - TR	µg/L	--	--	--	--	--
Nickel - TR	µg/L	610	200	61	550	1100
Nitrate-N + Nitrite-N	mg/L	10	100	--	--	--
Phenolics	µg/L	5	--	--	--	--
Phosphorus	mg/L	--	--	--	--	--
Strontium	µg/L	--	--	21000	40000	81000
TKN	mg/L	--	--	--	--	--
Vanadium	µg/L	--	--	44	150	300
Zinc - TR	µg/L	9100	25000	140	140	280
Zirconium	µg/L	--	--	--	--	--

Table 8. Water Quality Criteria for the Unnamed Tributary

Parameter	Units	Outside Mixing Zone Criteria				Inside Mixing Zone Maximum
		Average			Maximum	
		Human Health	Agri-culture	Aquatic Life	Aquatic Life	
Aluminum	µg/L	--	--	--	--	--
Ammonia-S	mg/L	--	--	1.8	--	--
Ammonia-W	mg/L	--	--	2.8	--	--
Arsenic - TR	µg/L	--	--	150	340	680
Barium	µg/L	--	--	220	2000	4000
Beryllium	µg/L	280	--	17	140	280
Cadmium - TR	µg/L	--	--	3	6.1	12
Chromium - TR	µg/L	--	--	110	2200	4500
Chromium VI - Diss	µg/L	--	--	11	16	31
Copper - TR	µg/L	1300	--	12	18	36
Cyanide - free (wwh,ewh,mwh)	mg/L	220	--	0.012	0.046	0.092
Iron - TR	µg/L	--	--	--	--	--
Lead - TR	µg/L	--	--	9	170	340
Magnesium	mg/L	--	--	--	--	--
Manganese - TR	µg/L	--	--	--	--	--
Mercury - TR (BCC)	ng/L	12	--	910	1700	3400
Nickel - TR	µg/L	4600	--	65	590	1200
Selenium - TR	µg/L	11000	--	5	--	--
Silver (wwh,ewh,mwh)	µg/L	--	--	1.3	2.5	5
Strontium	µg/L	--	--	21000	40000	81000
Zinc - TR	µg/L	69000	--	150	150	300

Table 9. Instream Conditions and Discharger Flow for the Outfall 003 WLA

Parameter	***Units***	***Season***	***Value***	***Basis***
Stream Flows				
1Q10	cfs	annual	5170	ORSANCO
7Q10	cfs	annual	6560	ORSANCO
30Q10	cfs	summer	6560	Used 7Q10 ORSANCO
		winter	6560	Used 7Q10 ORSANCO
Harmonic Mean	cfs	annual	24500	ORSANCO
Mixing Assumption	%	average	10	(***WLAs for non-carcinogens are developed using 100 percent of the 7Q10.)
	%	maximum	1	
Hardness, OMZ	mg/l	annual	120	ORSANCO
Hardness, IMZ	mg/l	annual	120	ORSANCO
pH	S.U.	summer	8	BWQR statewide 75th %ile, 1978-88
		winter	8.1	BWQR statewide 75th %ile, 1978-88
Temperature	C	summer	22.85	ORSANCO Racine 2015, 75th %ile, N=88
		winter	4	BWQR statewide 75th %ile, 1978-88
Eramet flow	cfs	annual	30.032	Application Max. 30-day Average
Background Water Quality				
Aluminum	µg/L		159	ORSANCO; 2006-11; n=30; 0<MDL; median value - Willow Island
Ammonia-S	mg/L		0.06	ORSANCO; 2000-07; n=49; 0<MDL; median value - Willow Island
Ammonia-W	mg/L		0.06	ORSANCO; 2000-07; n=49; 0<MDL; median value - Willow Island
Arsenic - TR	µg/L		0.65	ORSANCO; 2006-11; n=30; 0<MDL; median value - Willow Island
Barium	µg/L		48.5	ORSANCO; 2006-11; n=30; 0<MDL; median value - Willow Island
Bis(2-ethylhexyl)phthalate	µg/L		0	No representative data available.
Cadmium - TR	µg/L		0.05	ORSANCO; 2006-11; n=30; 25<MDL; 1/2 MDL - Willow Island

Parameter	Units	Season	Value	Basis
Chlorides	mg/L		30.5	ORSANCO; 2000-07; n=48; 0<MDL; median value - Willow Island
Chlorine (wwh) - TRes	mg/L		0	No representative data available.
Chromium - TR	µg/L		1.5	ORSANCO; 2006-11; n=30; 0<MDL; median value - Willow Island
Chromium VI - Diss	µg/L		0	No representative data available.
Copper - TR	µg/L		2.6	ORSANCO; 2006-11; n=30; 0<MDL; median value - Willow Island
Cyanide - free	mg/L		0.0025	ORSANCO; 2000-07; n=24; >12<MDL; 1/2 MDL - Willow Island
Dissolved solids (ave)	mg/L		382	BWQR; 1978-88; n=3755; 0<MDL; statewide median value
Iron - TR	µg/L		406	ORSANCO; 2006-11; n=30; 0<MDL; median value - Willow Island
Lead - TR	µg/L		0.5	ORSANCO; 2006-11; n=30; 1<MDL; median value - Willow Island
Magnesium	mg/L		8.2	ORSANCO; 2006-11; n=30; 0<MDL; median value - Willow Island
Manganese - TR	µg/L		90.9	ORSANCO; 2006-11; n=30; 0<MDL; median value - Willow Island
Nickel - TR	µg/L		3.3	ORSANCO; 2006-11; n=30; 0<MDL; median value - Willow Island
Nitrate-N + Nitrite-N	mg/L		0.894	ORSANCO; 2000-07; n=48; 0<MDL; median value - Willow Island
Phenolics	µg/L		2.5	ORSANCO; 2000-07; n=44; >22<MDL; 1/2 MDL - Willow Island
Phosphorus	mg/L		0.046	ORSANCO; 2000-07; n=49; <24<MDL; median value - Willow Island
Strontium	µg/L		685	Ecoregion; 1999-2004; n=1728; 0<MDL; statewide median value
TKN	mg/L		0.452	ORSANCO; 2000-07; n=34; 0<MDL; median value - Willow Island
Vanadium	µg/L		0	No representative data available.
Zinc - TR	µg/L		6.2	ORSANCO; 2006-11; n=30; 0<MDL; median value - Willow Island
Zirconium	µg/L		0	No representative data available.

Table 10. Instream Conditions and Discharger Flow for the Outfall 008 WLA

Parameter	***Units***	***Season***	***Value***	***Basis***
Stream Flows		**All assumed zero**		
Hardness, OMZ	mg/l	annual	130	BWQR SE Ohio R. tribs median, N=93
Hardness, IMZ	mg/l	annual	130	BWQR SE Ohio R. tribs median, N=93
pH	S.U.	summer	7.7	BWQR SE Ohio R. tribs 75th %ile, N=46
		winter	8.1	BWQR Statewide 75th %ile, N=463
Temperature	C	summer	23	BWQR SE Ohio R. tribs 75th %ile, N=52
		winter	4	BWQR Statewide 75th %ile, N=866
Eramet flow	cfs	annual	0.31	95th %ile of monthly averages
Background Water Quality		**No data available**		

Table 11. Summary of Effluent Limits to Maintain Applicable Water Quality Criteria – Outfall 003

		Outside Mixing Zone Criteria				Inside Mixing Zone Maximum
		Average			Maximum	
Parameter	Units	Human Health	Agri-culture	Aquatic Life	Aquatic Life	
Aluminum	µg/L	--	--	--	--	--
Ammonia-S	mg/L	--	--	23.82	--	--
Ammonia-W	mg/L	--	--	62.65	--	--
Arsenic - TR	µg/L	10830	8205	3412	924	680
Barium	µg/L	--	--	3966	5360	4000
Bis(2-ethylhexyl)phthalate	µg/L	1486	--	192	2994	2100
Cadmium - TR	µg/L	--	4125	63	15	11
Chlorides	mg/L	48196	--	--	--	--
Chlorine (wwh) - TRes	mg/L	--	--	0.25	0.052	0.038
Chromium - TR	µg/L	--	8136	2252	5713	4200
Chromium VI - Diss	µg/L	--	--	251	44	31
Copper - TR	µg/L	284696	41078	194	42	33
Cyanide - free	mg/L	153	--	0.064	0.056	0.044
Dissolved solids (ave)	mg/L	--	--	25921	--	--
Iron - TR	µg/L	--	379777	--	--	--
Lead - TR	µg/L	--	8217	174	407	310
Magnesium	mg/L	--	--	--	--	--
Manganese - TR	µg/L	--	--	--	--	--
Nickel - TR	µg/L	133134	16247	1321	1491	1100
Nitrate-N + Nitrite-N	mg/L	1999	8185	--	--	--
Phenolics	µg/L	551	--	--	--	--
Phosphorus	mg/L	--	--	--	--	--
Strontium	µg/L	--	--	464748	107681	81000
TKN	mg/L	--	--	--	--	--
Vanadium	µg/L	--	--	1005	408	300
Zinc - TR	µg/L	1995492	2063985	3063	370	280
Zirconium	µg/L	--	--	--	--	--

Table 12. Summary of Effluent Limits to Maintain Applicable Water Quality Criteria – Outfall 008

		Outside Mixing Zone Criteria				Inside Mixing Zone Maximum
			Average		Maximum	
Parameter	Units	Human Health	Agri-culture	Aquatic Life	Aquatic Life	
Aluminum	µg/L	--	--	--	--	--
Ammonia-S	mg/L	--	--	1.8	--	--
Ammonia-W	mg/L	--	--	2.8	--	--
Arsenic - TR	µg/L	--	--	150	340	680
Barium	µg/L	--	--	220	2000	4000
Beryllium	µg/L	280	--	17	140	280
Cadmium - TR	µg/L	--	--	3	6.1	12
Chromium - TR	µg/L	--	--	110	2200	4500
Chromium VI - Diss	µg/L	--	--	11	16	31
Copper - TR	µg/L	1300	--	12	18	36
Cyanide - free (wwh,ewh,mwh)	mg/L	220	--	0.012	0.046	0.092
Iron - TR	µg/L	--	--	--	--	--
Lead - TR	µg/L	--	--	9	170	340
Magnesium	mg/L	--	--	--	--	--
Manganese - TR	µg/L	--	--	--	--	--
Mercury - TR (BCC)	ng/L	12	--	910	1700	3400
Nickel - TR	µg/L	4600	--	65	590	1200
Selenium - TR	µg/L	11000	--	5	--	--
Silver (wwh,ewh,mwh)	µg/L	--	--	1.3	2.5	5
Strontium	µg/L	--	--	21000	40000	81000
Zinc - TR	µg/L	69000	--	150	150	300

Table 13. Parameter Assessment – Outfall 003

Group 2 - Parameters with PEQ < 25% of WQS

Parameter	Units	# obs	# > MDL	Average PEQ	Average WQS	Average %	Maximum PEQ	Maximum WQS^{OMZM}	Maximum %
Ammonia-S	mg/L	2	2	0.97	1.1^{AL}	88	1.33	--	--
Ammonia-W	mg/L	2	2	0.97	2.8^{AL}	35	1.33	--	--
Arsenic - TR	µg/L	3	0	0	150^{AL}	0	0	340	0
Chromium VI - Diss	µg/L	2	0	0	11^{AL}	0	0	16	0
Cyanide - free	mg/L	1	0	0	0.0052^{AL}	0	0	0.022	0
Nickel - TR	µg/L	3	3	13.4	61^{AL}	22	18.3	550	3
Phenolics	µg/L	1	0	0	5^{HH}	0	0	--	--
Strontium	µg/L	2	2	774	21000^{AL}	4	1060	40000	3
Vanadium	µg/L	1	0	0	44^{AL}	0	0	150	0

Group 3 - Parameters with PEQ < 50% of PEL

Parameter	Units	# obs	# > MDL	Average PEQ	Average PEL	Average %	Maximum PEQ	Maximum PEL^{IMZM}	Maximum %
Barium	µg/L	2	2	155	3966^{AL}	4	213	4000	5
Bis(2-ethylhexyl)phthalate	µg/L	2	2	53.5	192^{AL}	28	73.3	2100	3
Cadmium - TR	µg/L	255	55	2.22	63^{AL}	4	2.58	11	23
Chlorides	mg/L	1	1	123	48196^{HH}	0	169	--	--
Chromium - TR	µg/L	4	3	50.1	2252^{AL}	2	68.6	4200	2
Copper - TR	µg/L	3	2	11	194^{AL}	6	15	33	45
Dissolved solids (ave)	mg/L	1	1	1340	25921^{AL}	5	1840	--	--
Iron - TR	µg/L	2	2	4240	379777^{Ag}	1	5810	--	--
Lead - TR	µg/L	255	117	3.8	174^{AL}	2	5.63	310	2
Nitrate-N + Nitrite-N	mg/L	1	1	6.74	1999^{HH}	0	9.24	--	--
Zinc - TR	µg/L	2	1	36.1	3063^{AL}	1	49.4	280	18

Group 4 - Monitoring Required - Parameters with PEQ ≥ 50%, but < 100% of PEL

Parameter	Units	# obs	# > MDL	Average PEQ	Average PEL	Average %	Maximum PEQ	Maximum PEL^{IMZM}	Maximum %
Chlorine (wwh) - TRes	mg/L	1218	64	0.01	**0.25^{AL}**	6	0.028	**0.038**	75

1 = The average criteria are protective of long-term conditions. The letters next to the

WQS/PEL indicate the most restrictive standard. Water uses to protect include:

Ag = Agricultural or Industrial Water Supply	HH = Human Health
AL = Aquatic Life	WL = Wildlife

2 = The maximum criteria are protective of short-term toxicity to aquatic life.

OMZM = Outside Mixing Zone Maximum

IMZM = Inside Mixing Zone Maximum - More restrictive than OMZM in situations where dilution is available

Other Abbreviations / Acronyms:

BCC = Bioaccumulative Chemical of Concern	PEL = Preliminary Effluent Limit
MDL = Method Detection Limit	PEQ = Projected Effluent Quality
obs = Observations (i.e., sampling events)	WQS = Water Quality Standard

Table 14. Parameter Assessment – Outfall 008

Group 2 - Parameters with PEQ < 25% of WQS

Parameter	Units	# obs	# > MDL	Average PEQ	Average WQS	Average %	Maximum PEQ	Maximum WQS^{OMZM}	Maximum %
Ammonia-W	mg/L	1	1	0.55	2.8^{AL}	20	0.75	--	--
Arsenic - TR	µg/L	20	0	0	150^{AL}	0	0	340	0
Beryllium	µg/L	19	0	0	17^{AL}	0	0	140	0
Copper - TR	µg/L	20	0	0	12^{AL}	0	0	18	0
Cyanide - free	mg/L	20	0	0	0.012^{AL}	0	0	0.046	0
Mercury - TR (BCC)	ng/L	3	0	0	12^{HH}	0	0	1700	0
Nickel - TR	µg/L	20	0	0	65^{AL}	0	0	590	0
Selenium - TR	µg/L	20	0	0	5^{AL}	0	0	--	--
Silver	µg/L	20	0	0	1.3^{AL}	0	0	2.5	0

Group 3 - Parameters with PEQ < 50% of PEL

Parameter	Units	# obs	# > MDL	Average PEQ	Average PEL	Average %	Maximum PEQ	Maximum PEL^{OMZM}	Maximum %
Ammonia-S	mg/L	1	1	0.55	1.8^{AL}	30	0.75	--	--
Cadmium - TR	µg/L	21	6	0.95	3^{AL}	32	1.6	6.1	26
Strontium	µg/L	3	3	8230	21000^{AL}	39	11300	40000	28

Group 5 - Limits and monitoring required

Parameters with PEQ ≥ 100% of PEL or PEQ ≥ 75% of PEL and certain conditions are met

Parameter	Units	# obs	# > MDL	Average PEQ	Average PEL	Average %	Maximum PEQ	Maximum PEL^{OMZM}	Maximum %
Barium	µg/L	3	3	298	**220^{AL}**	135	408	**2000**	20
Chromium - TR	µg/L	19	18	230	**110^{AL}**	209	370	**2200**	17
Chromium VI - Diss	µg/L	20	3	34.7	**11^{AL}**	316	47.6	**16**	297
Lead - TR	µg/L	21	5	25.6	**9^{AL}**	285	35.1	**170**	21
Zinc - TR	µg/L	16	16	165	**150^{AL}**	110	292	**150**	195

1 = The average criteria are protective of long-term conditions. The letters next to the WQS/PEL indicate the most restrictive standard. Water uses to protect include:

Ag = Agricultural or Industrial Water Supply
HH = Human Health
AL = Aquatic Life
WL = Wildlife

2 = The maximum criteria are protective of short-term toxicity to aquatic life.

OMZM = Outside Mixing Zone Maximum

Table 15. Final Effluent Limits

Outfall	Parameter	Units	Concentration		Loading[A]		Basis
			30 Day Average	Daily Maximum	30 Day Average	Daily Maximum	
003	Water Temperature	°C	Monitoring Only				BTJ
	pH	S.U.	--	6.5 - 9.0	--	--	WQS
	Total Suspended Solids	mg/L	Monitoring Only				BTJ
	Cadmium, TR	µg/L	Monitoring Only				BTJ
	Lead, TR	µg/L	Monitoring Only				BTJ
	Flow Rate	MGD	Monitoring Only				BTJ
	Chlorine, Total Residual	mg/L	--	0.2	--	--	WLA/IMZM/BTJ
	Chlorination/Bromination Duration	Minutes	--	120	--	--	WLA/IMZM/BTJ
008	pH	S.U.	--	6.5 - 9.0	--	--	WQS
	Total Suspended Solids	mg/L	30	100	--	--	BPJ
	Barium, TR	µg/L	220	2000	0.167	1.52	WLA
	Chromium, Hexavalent (Cr +6)	µg/L	11	16	0.00833	0.0122	WLA
	Zinc, TR	µg/L	150	150	0.114	0.114	WLA
	Cadmium, TR	µg/L	--	--	-	--	BTJ, WLA
	Lead, TR	µg/L	9	170	0.00682	0.0129	WLA
	Chromium, TR	µg/L	110	2200	0.0833	1.67	WLA
	Flow Rate	MGD	Monitoring Only				M
602	Total Suspended Solids	mg/L	30	45	11.4	17	PD
	Fecal Coliform	#/100 mL	1000	2000	--	--	BPJ
	Flow Rate	MGD	Monitoring Only				Monitor only
	CBOD 5 day	mg/L	25	40	9.5	15	PD
603	pH	S.U.	--	6.0 – 9.0	--	--	BAT
	Total Suspended Solids	mg/L	25	50	--	--	BPJ, BCT
	Chromium, Hexavalent (Cr +6)	µg/L	50	100	--	--	BPJ, BAT
	Chromium, Total (Cr)	µg/L	500	1000	--	--	BPJ, BAT

	Manganese, Total (Mn)	µg/L	5000	10000	--	--	BPJ, BAT
	Phenolic 4AAP, Total	µg/L	200	400	--	--	BPJ, BAT
	Flow Rate	MGD	Monitoring Only				M
	Cyanide, Total	mg/L	0.25	0.50	--	--	BPJ, BAT
605	pH	S.U.	--	6.0 – 9.0	--	--	BAT
	Total Suspended Solids	mg/L	--	--	124	249	BCT
	Nitrogen, Ammonia	mg/L	--	--	30.4	60.9	BAT
	Chromium, Hexavalent (Cr +6)	µg/L	--	--	0.066	0.132	BAT / BPJ / AD
	Chromium, Total (Cr)	µg/L	--	--	0.23	0.45	BAT
	Manganese, Total (Mn)	µg/L	--	--	26.5	78.1	BAT / BPJ
	Phenolic 4AAP, Total	µg/L	--	--	0.090	0.180	BAT
	Flow Rate	MGD	Monitoring Only				M
	Cyanide, Total	mg/L	--	--	0.135	0.225	BAT

[a] Effluent loadings based on:
Outfall 008 – 0.2 MGD
Outfall 602 – 0.1 MGD

[b] Definitions:
AD = Antidegradation (OAC 3745-1)
BAT = Best Available Technology Economically Achievable, 40 CFR Part 424, "Subpart - Subtcategory"
BPJ = Best Professional Judgment
BTJ = Best Technical Judgment
CFR = Code of Federal Regulations
M = BEJ of Permit Guidance 2: Determination of Sampling Frequency Formula for Industrial Waste Discharges
NPDES = National Pollutant Discharge Elimination System
OAC = Ohio Administrative Code
PD = Plant Design (OAC 3745-33-05(E))
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 1. Applicable Federal Effluent Limitation Guidelines

Eramet Effluent Guideline Calculations for Outfall 605 (to 003)

Ferroalloy Scrubber	424.23-424.27 kg/mwh		MWH/day 450	Loading kg/day	
	30-day	Daily		30-day	Daily
TSS	0.209	0.419		94.050	188.550
Chromium, T.	0.0005	0.001		0.225	0.450
Chromium, hexavalent	0.00005	0.0001		0.023	0.045
Manganese, T.	0.005	0.011		2.250	4.950
Cyanide, T.	0.0003	0.0005		0.135	0.225
Phenolics, T.	0.0002	0.0004		0.090	0.180

Electrolytic MnO2	424.63-424.67 kg/kkg		kkg/day: 34.5	Loading kg/day	
	30-day	Daily		30-day	Daily
TSS	0.881	1.762		30.435	60.869
Manganese, T.	0.088	0.176		3.040	6.080
Ammonia-N	0.881	1.762		30.435	60.869

Outfall 605 Limits	**kg/day**	
	30-day	**Daily**
TSS	**124**	**249**
Chromium, T.	**0.23**	**0.450**
Chromium, hexavalent	**0.066[1]**	**0.132[2]**
Manganese, T.	**26.5[3]**	**78.1[4]**
Ammonia-N	**30.4**	**60.9**
Cyanide, T	**0.135**	**0.225**
Phenolics, T	**0.090**	**0.180**
pH (6.0-9.0)[3]		

[1] Includes BPJ of 0.21 kg/day but limited by antidegradation
[2] Includes BPJ of 0.67 kg/day but limited by antidegradation
[3] Includes BPJ of 21.2 kg/day
[4] Includes BPJ of 67.1 kg/day
[5] 424.62, 424.22

Covered Electric Furnaces and Other Melting Operations Concentration Based Treatability

Adapted from *1974 Development Document for Interim Final Effluent Limitations Guidelines and Proposed New Source Performance Standards for the Smelting and Slag Processing Segments of the Ferroalloy Manufacturing Point Source Category* – Table 92.

Parameter	*Level Effluent*	*30-Day Average (mg/L)*	*24-hr. Maximum (mg/L)*
Suspended Solids	I	25	50
Total Chromium	II	0.5	1.0
Hexavalent Chromium	II	0.05	0.10
Total Cyanide	II	0.25	0.5
Manganese	II	5	10
Phenol	II	0.2	0.4

Stormwater BPJ for Manganese

	30-day	**Daily**
ELG - Manganese, T. [kg/day]	5.29	11.03
Using Flow PEQs (Nov. '13 - Oct. '18) [MGD]	1.77	2.42
minus 450 gpm process wastewater [MGD]	0.648	0.648
Ancillary Flow [MGD] =	1.122	1.772
Development Document [mg/L]	5	10
BPJ [kg/day]	21.2	67.1
ELG + BPJ= Total [kg/day]	26.5	78.1

Stormwater BPJ for Hex Chrom

	30-day	**Daily**
ELG - Manganese, T. [kg/day]	0.0225	0.045
Ancillary Flow [MGD] =	1.122	1.772
Development Document [mg/L]	0.05	0.10
BPJ [kg/day]	0.21	0.67
ELG + BPJ= Total [kg/day]	0.23	0.72

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

Cooling Additive	System Treated	Use	Approved Concentration
Kroff KR-148-NL	Furnace Scrubber Process Recycle	Biocide	0.038 mg/l as Residual Chlorine
Kroff KR-50SP	Boiler	(1)	20.8 µg/l
Kroff KR-81L	Boiler	(1)	34.6 µg/l
Kroff KR-60P	Boiler	(1)	13.8 µg/l

(1) These additives are used to control scaling and corrosion in the plant boiler water systems.

Attachment 3. Cooling Water Intake Structure Best Technology Available Analysis

Eramet Marietta, Incorporated

Eramet Marietta, Incorporated (Eramet) manufactures manganese ferroalloys and manganese dioxide. The operation requires cooling water which is withdrawn from the Ohio River.

Eramet's current measures meet the best technology available (BTA) to minimize environmental impacts. This determination is primarily based on the use of cylindrical wedgewire screens and design intake flow velocities of less than 0.5 ft/s. The factors described below do not require additional control measures.

Regulatory Requirement for Section 316(b)

The applicant is an *existing facility* according to the definitions in 40 CFR Subpart J. Additionally, the facility has an NPDES permit, withdraws greater than 2.0 MGD, and utilizes 25 percent or more of the water withdrawn for cooling purposes. As such, the Section 316(b) regulations apply. The facility must meet impingement mortality and entrainment standards as required by 40 CFR 125.94(c) and (d), respectively.

These requirements minimize adverse environmental impacts by reducing the amount of shellfish, fish eggs and larvae which go through the cooling system (entrainment) and the amount of fish or other larger aquatic life which become stuck on the intake screens (impingement).

This permit proceeding began prior to October 14, 2014, and the Director has determined that previous information is sufficient to determine BTA as provided by 40 CFR 125.98(g).

Fish and wildlife in the vicinity of the intake structure

The information presented below is compiled from the *Kraton Polymers, LLC Clean Water Act Section 316(b) 40 CFR 122.21(r)(2-8) Application Submittals.* Kraton Polymers is located in the same dam pool (Belleville) and is approximately 10 river miles downstream of Eramet. The biological characterization data is based on Ohio River biological surveys performed and published by ORSANCO. The facility indicated that no site-specific impingement or entrainment studies have been done.

Federally Listed Endangered Species

The U.S. Fish and Wildlife Services (USFWS) lists the fanshell (*Cyprogenia stegaria*), pink mucket (*Lampsilis abrupta*), sheepnose (*Plethobasus cyphyus*), and snuffbox (*Epioblasma triquetra*) as endangered mussels possibly present near the intake. However, ORSANCO studies have never identified any of these species within the Belleville Pool of the Ohio River.

Federal Critical Habitat

None were identified.

State-Listed Endangered or Threatened Species

None were identified

Fragile Species

Fragile species are defined in 40 CFR 125.92 (m) as *"... a species of fish or shellfish that has an impingement survival rate of less than 30 percent even when the BTA technology of modified travelling screens are in operation.*" The only fragile species know to occur near the facility is the gizzard shad.

U.S. Fish and Wildlife Services

The rules require Ohio EPA to provide application materials to the United States Fish and Wildlife Serves (FWS) and to allow consultation on any threatened or endangered species. Ohio EPA provided the application and permit on April 26, 2019. FWS had no recommendations regarding the DBNPS intake structure.

Cooling Water Intake Structure and System Information

Location

The CWIS is approximately 100' offshore and 12' under the normal river level. Water is transported through four cylindrical wedgewire screens with a slot-size of 0.125" (3.2 mm) via a 43" intake pipe and four pumps.

Withdrawal Rates

Eramet and other industrial facilities purchase water from Good River, LLC. The four pumps are rated at 6,000 GPM each although the average flow is 4,200 GPM per pump for a design intake flow of 34.6 MGD and an actual intake flow of 24.2 MGD. Eramet complex which includes Energizer and Praxair utilizes 16.5 MGD of the flow.

The design flow is less than 1% of the 1Q10 of the Ohio River.

Intake Velocity

The velocity at the screens is 0.31 ft/s at the Design Intake Flow (DIF) of 34.6 MGD and 0.22 ft/s at the Average Intake Flow (AIF) of 24.2 MGD.

Cooling System

The cooling water system consists of once-through cooling water.

Description of intake structure

The submerged intake structure is comprised of four Johnson® 30" x 36" passive wedgewire intake screens. Each screen is composed of #69 wire and is designed with a slot width of 0.125 inches. Screens are cleared of debris using a Johnson Screens Hydroburst backwash system in order to maintain a through-screen velocity below 0.5 fps.

Impingement and Entrainment

Impingement

Due to lack of facility-specific impingement data, an ORERP study was used to evaluate impingement. The study includes data from fifteen power plants, including the Richard H. Gorsuch Generating Station, located approximately at the same location of the current intake structure in the Belleville Pool. At the time of the study (2005-2006), the Gorsuch Plant withdrew approximately 366 MGD, meaning the risk for impingement was significantly higher than at Eramet. In addition, it is believed that higher temperature discharges at the power plant resulted in significantly higher impingement rates.

The six most abundantly impinged fish species at the Gorsuch Plant were gizzard shad, channel catfish, temperate basses, bluegill, sauger, and freshwater drum. The total mean impingement rate was 0.0042 individuals per 1,000 m^3 of water withdrawn. Of the total organisms collected during the study, over 95 percent were gizzard shad and approximately 2.4 percent were freshwater drum. Although the study includes old data, it is still considered to be representative of the species present near Eramet.

Entrainment

An EPA 316(b) case study report published in 2002 presented data for nine Ohio River power facilities, four of which are considered relevant to Eramet. The four facilities are located within 115 miles, had once-through cooling systems, and have higher intake rates and velocities.

During these year-long entrainment surveys, fifty-two taxa were identified at one or more of the facilities. The most abundant taxa collected were bluntnose minnow, river carpsucker, emerald shiner, freshwater drum, and common carp. Specific information regarding abundance of egg, larvae or early juveniles collected was not available, and was not reported in the study whether collection periods coincided with peak abundance periods for certain species. Annual entrainment losses for these species at the selected four facilities are summarized in the table below.

	Study Facility			
	Cardinal	**Kammer**	**Kyger Creek**	**Philip Sporn**
Species				
Bluntnose minnow	38,234,900	111,249,300	59,223,900	15,082,500
River carpsucker	0	0	211,297,200	0
Emerald shiner	725,100	0	9,595,600	783,000
Common carp	858,700	4,770,600	130,089,600	27,648,300
Freshwater drum	38,200	0	45,288,800	7,597,100
Unidentified	36,352,000	62,605,700	107,662,900	40,400,000

*Table manually tabulated from the *Kraton Polymers, LLC Clean Water Act Section 316(b) 40 CFR 122.21(r)(2-8) Application Submittals*

Compliance with 40 CFR 125.94(c) and (d)

This facility utilizes the following to minimize adverse environmental impacts:

1. **Impingement**

    a. ***Impingement Mortality BTA - 40 CFR 125.94(c)(2):*** Eramet uses a through-screen design intake velocity of 0.31 ft/s. This is below the 0.5 fps BTA requirement which ensures that fish have the swimming ability to overcome the intake velocity at the CWIS opening.

2. **Entrainment**

    a. ***Site-Specific Entrainment Standards – 40 CFR 125.94(d):*** Eramet uses fine-mesh screens (3.2 mm) and an intake structure located 100’ off-shore which will reduce entrainment.

Director Requirements

The Director is required to include monitoring requirements, record keeping requirements, and reporting requirements within the permit. Additionally, the Director is required to make site-specific entrainment requirements weighing various factors.

Monitoring

40 CFR 125.96(a) – Monitoring requirements for impingement mortality for existing facilities:

The Director may establish monitoring requirements such as intake velocity, biological monitoring, and flow measurements. No additional monitoring is proposed due to low velocities and also low intake rates relative to the water body.

40 CFR 125.96(b) – Monitoring requirements for entrainment for existing facilities:

The Director may establish monitoring requirements for entrainment. No additional monitoring is proposed.

40 CFR 125.96(e) – Visual or remote inspections:

To comply with the regulation, the permit proposes weekly visual or remote monitoring devices to ensure that all technologies installed are maintained and operated as designed. However, this weekly requirement is not extended to the offshore intake per the discretion allowed by the rule.

Should the facility be performing work or an inspection on the offshore intake crib scheduled as a result of maintenance or conditions required by other regulatory agencies, the permittee shall also perform an inspection (remotely or visually) of the offshore intake crib for 316(b) purposes. The inspection, for 316(b) purposes, will ensure that the offshore intake crib is being operated with good engineering and maintenance practices. This condition does not require the permittee to conduct any inspections beyond what is scheduled for other purposes. The results of the inspection shall be documented and retained by the facility for Agency review until the subsequent permit is issued.

Reporting and Recordkeeping Requirements

40 CFR 125.97(a) – Monitoring Reports

The permittee is required to submit eDMRs which will approximate withdrawal rates.

40 CFR 125.97(c) – Annual certification

The permittee is required to submit an annual certification indicating any substantial changes at any unit which may impact cooling water intake. This is consistent with the rule.

40 CFR 125.97(d) – Permit reporting records retention

The permittee shall retain all records of all submissions related to 316(b) until the subsequent permit is issued.

Site Specific Entrainment BTA Determination

The permittee proposes closed-cycle recirculating system to minimize entrainment. For both *new units at existing facilities* and *new facilities*, closed-cycle recirculating systems are indicated as the best technology available according to the 40 CFR 125.94(e) and 40 CFR 125.85, respectively, although additional measures may be required depending on site conditions and *new facilities* also require additional flow requirements based on water source body. For *existing units* for permit proceedings prior to October 14, 2014, the Director's determination may be based on some or all of the factors of 40 CFR 125.95(f)(2) and (3) [*see 40 CFR 125.98(g)*].

Based on 40 CFR 125.95(f)(3)(i), the entrainment impacts on the waterbody are thought to be negligible based on the small size of the intake versus the size of the water body and the use of fine-mesh screens. Therefore, the cooling water intake structure meets BTA for site-specific entrainment.

Summary

The Director considers Eramet's cooling water intake structure to be BTA to minimize adverse environmental impacts based on the use of fine-mesh screens, offshore intake, and a through-screen intake velocity of less than 0.5 ft/s.

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