

Application Type Renewal  
Facility Type Industrial  
Major / Minor Minor

**NPDES PERMIT FACT SHEET  
INDIVIDUAL INDUSTRIAL WASTE (IW)  
AND IW STORMWATER**

Application No. PA0100510  
APS ID 1004485  
Authorization ID 1293342

**Applicant and Facility Information**

Applicant Name	<u>Greenville Metals, Inc.</u>	Facility Name	<u>Greenville Metals</u>
Applicant Address	<u>99 Crestview Drive Extension</u> <u>Transfer, PA 16154-2317</u>	Facility Address	<u>99 Crestview Drive Extension</u> <u>Transfer, PA 16154-1709</u>
Applicant Contact	<u>Bryan Bowen</u>	Facility Contact	<u>Bryan Bowen</u>
Applicant Phone	<u>(724) 509-1863</u>	Facility Phone	<u>(724) 509-1863</u>
Client ID	<u>3039</u>	Site ID	<u>446252</u>
SIC Code	<u>3341</u>	Municipality	<u>Pymatuning Township</u>
SIC Description	<u>Manufacturing - Secondary Nonferrous Metals</u>	County	<u>Mercer</u>
Date Application Received	<u>October 2, 2019</u>	EPA Waived?	<u>Yes</u>
Date Application Accepted	<u>October 30, 2019</u>	If No, Reason	
Purpose of Application	<u>Renewal of a NPDES Permit for existing discharges of Industrial Waste.</u>		

**Summary of Review**

This facility is engaged in the manufacturing of metallurgical products using techniques including electric arc furnace, AOD, induction furnaces, and various crushing, grinding and sizing equipment. Products include nickel, cobalt, and iron-based (particularly stainless steel) alloys produced as small ingots, pigs, shot and powder.

The permit renewal application indicates that no chemical additives are added to the water used in the manufacturing processes.

The plant discharges to a segment of the Shenango River, which is known to contain threatened and endangered mussel species. A summary of threatened and endangered mussel species concerns and considerations is included on Page 10 of this Fact Sheet. Additionally, the draft permit will be forwarded to the US Fish & Wildlife Service.

There are currently no open violations listed in EFACTS for this permittee (1/08/2021).

Public Participation

DEP will publish notice of the receipt of the NPDES permit application and a tentative decision to issue the individual NPDES permit in the *Pennsylvania Bulletin* in accordance with 25 Pa. Code § 92a.82. Upon publication in the *Pennsylvania Bulletin*, DEP will accept written comments from interested persons for a 30-day period (which may be extended for one additional 15-day period at DEP's discretion), which will be considered in making a final decision on the application. Any person may request or petition for a public hearing with respect to the application. A public hearing may be held if DEP determines that there is significant public interest in holding a hearing. If a hearing is held, notice of the hearing will be published in the *Pennsylvania Bulletin* at least 30 days prior to the hearing and in at least one newspaper of general circulation within the geographical area of the discharge.

Approve	Deny	Signatures	Date
X		Adam Pesek Adam J. Pesek, E.I.T. / Environmental Engineering Specialist	January 8, 2021
X		Justin C. Dickey Justin C. Dickey, P.E. / Environmental Engineer Manager	January 14, 2021

**Discharge, Receiving Waters and Water Supply Information**

Outfall No.	<u>002</u>	Design Flow (MGD)	<u>0</u>
Latitude	<u>41° 21' 52.2"</u>	Longitude	<u>-80° 24' 13.7"</u>
Wastewater Description:	<u>Electric Furnace Non-Contact Cooling Water Emergency Discharge</u>		

Outfall No.	<u>001</u>	Design Flow (MGD)	<u>0.029</u>
Latitude	<u>41° 21' 25.19"</u>	Longitude	<u>-80° 24' 7.7"</u>
Wastewater Description:	<u>Contact Cooling Water from the Hot Metal Shot Process</u>		

Outfall No.	<u>009</u>	Design Flow (MGD)	<u>0.012</u>
Latitude	<u>41° 21' 53.1"</u>	Longitude	<u>-80° 24' 13.6"</u>
Wastewater Description:	<u>Contact Cooling Water from the Induction II Shot Tank</u>		

Quad Name	<u>Sharpsville</u>	Quad Code	<u>0802</u>
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Receiving Waters	<u>Unnamed tributaries to the Shenango River</u>	Stream Code	<u>35482</u>
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NHD Com ID	<u>130034452</u>	RMI	<u>55.52 (002); 55.53 (001 &amp; 009)</u>
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Drainage Area	<u>331</u>	Yield (cfs/mi <sup>2</sup> )	<u>0.161</u>
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Q <sub>7-10</sub> Flow (cfs)	<u>53.3</u>	Q <sub>7-10</sub> Basis	<u>USGS #03102850 (1967-2008)</u>
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Elevation (ft)	<u>925</u>	Slope (ft/ft)	<u>0.0009</u>
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Watershed No.	<u>20-A</u>	Chapter 93 Class.	<u>WWF</u>
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Existing Use	<u></u>	Existing Use Qualifier	<u></u>
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Exceptions to Use	<u></u>	Exceptions to Criteria	<u></u>
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Assessment Status	<u>Attaining Use(s)</u>		
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Cause(s) of Impairment	<u></u>		
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Source(s) of Impairment	<u></u>		
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TMDL Status	<u></u>	Name	<u></u>
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Background/Ambient Data		Data Source	
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pH (SU)	<u>7.41</u>	WQN 913 (geo mean-'00-'15)(June-Sept.)	<u></u>
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Temperature (°C)	<u>25</u>	Default (WWF)	<u></u>
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Hardness (mg/l)	<u>139.4</u>	WQN 913 (90 <sup>th</sup> %-'00-'15)(June-Sept.)	<u></u>
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Other: NH <sub>3</sub> -N (mg/l)	<u>0.04</u>	WQN 913 (Median-'00-'15)(June-Sept.)	<u></u>
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Nearest Downstream Public Water Supply Intake	<u>Aqua PA Shenango Valley WTP</u>		
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PWS Waters	<u>Shenango River</u>	Flow at Intake (cfs)	<u>143.8</u>
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PWS RMI	<u>28.88</u>	Distance from Outfall (mi)	<u>26.65</u>
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Changes Since Last Permit Issuance: Stream gage data is updated.

Other Comments: Please note that stream data above is for when the unnamed tributaries enter the Shenango River, where perennial conditions exist.

Stormwater Outfalls 003, 004, 006, 007, and 008 also discharge to unnamed tributaries to the Shenango River in the same area as the process and non-process outfalls listed above.

Treatment Facility Summary				
<b>Treatment Facility Name:</b> Greenville Metals Inc.				
<b>WQM Permit No.</b>	<b>Issuance Date</b>			
N/A				
<b>Waste Type</b>	<b>Degree of Treatment</b>	<b>Process Type</b>	<b>Disinfection</b>	<b>Avg Annual Flow (MGD)</b>
Industrial			No Disinfection	
<b>Hydraulic Capacity (MGD)</b>	<b>Organic Capacity (lbs/day)</b>	<b>Load Status</b>	<b>Biosolids Treatment</b>	<b>Biosolids Use/Disposal</b>
		Not Overloaded		

Changes Since Last Permit Issuance:

Other Comments: No treatment of process or non-process wastewater is currently used at the facility.

Compliance History

DMR Data for Outfall 001 (from November 1, 2019 to October 31, 2020)

Parameter	OCT-20	SEP-20	AUG-20	JUL-20	JUN-20	MAY-20	APR-20	MAR-20	FEB-20	JAN-20	DEC-19	NOV-19
Flow (MGD) Average Monthly	0.074	0.039	0.098	0.021	0.037	0.098	0.023		0.107	0.046	0.056	0.017
pH (S.U.) Minimum	6.85	7.07	6.81	6.97	7.12	7.27	7.19		7.25	7.33	7.15	6.63
pH (S.U.) Instantaneous Maximum	7.35	7.36	7.69	7.60	7.70	8.02	8.12		8.10	7.95	8.27	6.63
TSS (mg/L) Average Monthly	5.3	7.0	7.0	17.5	5.0	< 5	5.3		10.2	8.3	5.8	7.5
TSS (mg/L) Instantaneous Maximum	6.0	9.0	9.0	24	5.0	< 5	5.5		20.5	15.0	6.0	7.5
Total Iron (mg/L) Average Monthly	0.639	0.334	0.650	0.939	0.069	0.591	0.584		1.46	0.702	0.731	1.32
Total Iron (mg/L) Instantaneous Maximum	0.904	0.391	0.803	1.06	0.074	0.840	0.931		2.88	1.3	0.938	1.32

DMR Data for Outfall 002 (from November 1, 2019 to October 31, 2020)

Parameter	OCT-20	SEP-20	AUG-20	JUL-20	JUN-20	MAY-20	APR-20	MAR-20	FEB-20	JAN-20	DEC-19	NOV-19
Flow (MGD) Average Monthly				0.00337 5			0.115		0.0035			
pH (S.U.) Minimum				7.26			7.63		7.00			
pH (S.U.) Maximum				7.26			7.63		7.03			

DMR Data for Outfall 009 (from November 1, 2019 to October 31, 2020)

Parameter	OCT-20	SEP-20	AUG-20	JUL-20	JUN-20	MAY-20	APR-20	MAR-20	FEB-20	JAN-20	DEC-19	NOV-19
Flow (MGD) Average Monthly	0.001	0.003	0.002						0.003			
pH (S.U.) Minimum	6.94	8.32	7.42						7.17			

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pH (S.U.) Maximum	6.94	8.32	7.42						7.59			
TSS (mg/L) Average Monthly	5	< 5	5.0						5.0			
TSS (mg/L) Instantaneous Maximum	5	< 5	5.0						5.0			
Total Iron (mg/L) Average Monthly	1.05	0.431	0.379						0.70			
Total Iron (mg/L) Instantaneous Maximum	1.05	0.431	0.379						1.2			

**Compliance History**

Summary of Inspections: An inspection was last conducted at the facility on December 21, 2020. No major violations were noted in the inspection report. The permittee was reminded of the requirement to use the supplemental reports associated with the previous permit. The report also noted the last discharge from Outfall 002 occurred in July 2020, with two occurring in April and February of 2020 as well. This Outfall had not previously discharged for a significant number of years.

Other Comments: N/A

**Development of Effluent Limitations**

Outfall No. 002 Design Flow (MGD) 0  
 Latitude 41° 21' 52.2" Longitude -80° 24' 13.7"  
 Wastewater Description: Electric Furnace Non-Contact Cooling Water Emergency Discharge

**Technology-Based Limitations**

The following technology-based limitations apply, subject to water quality analysis and BPJ where applicable:

Parameter	Limit (mg/l)	SBC	Federal Regulation	State Regulation
pH	6.0 – 9.0 S.U.	Min – Max	133.102(c)	95.2(1)

Comments: There are no federal ELGs associated with this waste stream.

**Water Quality-Based Limitations**

The following limitations were determined through water quality modeling (output files attached):

Parameter	Limit (mg/l)	SBC	Model
N/A			

Comments: Due to the infrequent nature of this discharge and the type of discharge, no water quality modeling was done.

**Best Professional Judgment (BPJ) Limitations**

Comments: Flow will be required to be monitored as authorized under Chapter 92a.61.

**Anti-Backsliding**

N/A

**Development of Effluent Limitations**

Outfall No. 001 Design Flow (MGD) 0.029  
 Latitude 41° 21' 25.19" Longitude -80° 24' 7.70"  
 Wastewater Description: Contact Cooling Water from the Hot Metal Shot Process

**Technology-Based Limitations**

The following technology-based limitations apply, subject to water quality analysis and BPJ where applicable:

Parameter	Limit (mg/l)	SBC	Federal Regulation	State Regulation
pH	6.0 – 9.0 S.U.	Min – Max	133.102(c)	95.2(1)
Total Residual Chlorine	0.5	Average Monthly	-	92a.48(b)(2)

Comments: Due to the elevated concentration of total residual chlorine in the effluent (greater than 50% of the technology-based concentration limit), a technology-based limit of 0.5 mg/l as an average monthly will be applied.

**Water Quality-Based Limitations**

The following limitations were determined through water quality modeling (output files attached):

Parameter	Limit (mg/l)	SBC	Model
Total Residual Chlorine	1.2	IMAX	TRC Evaluation Spreadsheet

Comments: The Toxic Management Spreadsheet recommended monitoring for total copper, total silver and total thallium. Quarterly monitoring for these parameters will be placed in the renewed permit to further evaluate the need for limits in the future.

**Best Professional Judgment (BPJ) Limitations**

Comments: TSS effluent limits of 30 mg/l as an average monthly / 60 mg/l as an IMAX and total iron limits of 3.5 mg/l as an average monthly / 7.0 mg/l as an IMAX are existing BPJ-based effluent limits that will be retained in this permit renewal. The TSS BPJ limits are derived from the Metal Finishing ELGs (40 CFR 433) and secondary treatment standards for sewage. The total iron BPJ effluent limits are derived from "Industrial Water Quality, Fourth Edition. Eckenfelder, Ford, and Engle, 2009. Chapter 4.

**Anti-Backsliding**

N/A

**Development of Effluent Limitations**

Outfall No.	003	Design Flow (MGD)	0
Latitude	41° 21' 40.10"	Longitude	-80° 24' 12.50"
Outfall No.	004	Design Flow (MGD)	0
Latitude	41° 21' 43.40"	Longitude	-80° 24' 9.30"
Outfall No.	006	Design Flow (MGD)	0
Latitude	41° 21' 53.10"	Longitude	-80° 24' 15.80"
Outfall No.	007	Design Flow (MGD)	0
Latitude	41° 21' 51.80"	Longitude	-80° 24' 11.50"
Outfall No.	008	Design Flow (MGD)	0
Latitude	41° 21' 53.20"	Longitude	-80° 24' 9.40"

**Wastewater Description:** Stormwater not associated with industrial activity

**Discussion**

Greenville Metals is operating an in-situ, bio-enhancement remediation system to deal with on-site PCE contamination near the Powder I building. The required, quarterly groundwater monitoring should provide enough data to characterize the amount of PCE present, where any additional stormwater sampling would be unnecessary.

The Reynolds Development site has an extensive stormwater collection system that serves as a pathway for carrying TCE contaminated groundwater from areas off the Greenville Metals property through their site. This is the reason why TCE was found in previous application's stormwater sampling for Outfalls 007 & 008. This fact has been verified by staff in our Environmental Cleanup program. Since the company is not contributing to the TCE contamination, stormwater monitoring of this parameter is not being recommended.

The permittee indicated a condition of "No Exposure" for all five of their current stormwater outfalls. A condition of "No Exposure" is met when the permittee indicates/ demonstrates that the stormwater is not exposed to any industrial activities at the facility that drains to a particular outfall or outfalls. as detailed in the application and through stormwater sampling also done as part of the application. A compliance specialist concurred that the facility qualifies for a condition of "No Exposure" as a result of a site inspection on 12/21/2020.

As a result of the information above, no sampling will be required for these stormwater outfalls as part of this permit renewal. However, annual stormwater inspections will be required as part of a Part C condition in the permit.

**Technology-Based Limitations**

Comments: N/A

**Water Quality-Based Limitations**

Comments: N/A

**Best Professional Judgment (BPJ) Limitations**

Comments: N/A

**Anti-Backsliding**

N/A



**Development of Effluent Limitations**

Outfall No. 009 Design Flow (MGD) 0.012\*  
Latitude 41° 21' 53.10" Longitude -80° 24' 13.60"  
Wastewater Description: Contact Cooling Water from the Induction II Shot Tank

**Technology-Based Limitations**

The following technology-based limitations apply, subject to water quality analysis and BPJ where applicable:

Parameter	Limit (mg/l)	SBC	Federal Regulation	State Regulation
pH	6.0 – 9.0 S.U.	Min – Max	133.102(c)	95.2(1)

Comments: A total residual chlorine technology-based limit was not deemed necessary due to the effluent concentration in the application being much lower than 50% of the technology-based limit concentration).

**Water Quality-Based Limitations**

The following limitations were determined through water quality modeling (output files attached):

Parameter	Limit (mg/l)	SBC	Model
N/A			

Comments: The flow rate used for the Toxic Management Spreadsheet (TMS) was 0.096 MGD, which corresponds to the flowrate when the batch discharge is occurring (12,000 gallons over three (3) hours).

The Toxic Management Spreadsheet recommended monitoring for total thallium. Quarterly monitoring for total thallium will be placed in the renewed permit to further evaluate the need for limits in the future.

**Best Professional Judgment (BPJ) Limitations**

Comments: TSS effluent limits of 30 mg/l as an average monthly / 60 mg/l as an IMAX and total iron limits of 3.5 mg/l as an average monthly / 7.0 mg/l as an IMAX are existing BPJ-based effluent limits that will be retained in this permit renewal. The TSS BPJ limits are derived from the Metal Finishing ELGs (40 CFR 433) and secondary treatment standards for sewage. The total iron BPJ effluent limits are derived from "Industrial Water Quality, Fourth Edition. Eckenfelder, Ford, and Engle, 2009. Chapter 4.

**Anti-Backsliding**

N/A

**Threatened and Endangered Mussel Species Concerns and Considerations**

The main segment of the Shenango River from Porter Road near Greenville, Pennsylvania, downstream to the point of inundation by Shenango River Lake near Big Bend, Mercer County, Pennsylvania was designated by the United States Fish and Wildlife Services (USFWS) as "Critical Habitat" for the rabbitsfoot mussel, a federally listed threatened species, and is known to also contain other threatened and endangered mussel species. Due to the discharge being in close proximity to the Shenango River (discharges are to intermittent tributaries of the Shenango River), potential impacts to endangered mussel species were evaluated.

The USFWS has indicated in comment letters on other NPDES permits that in order to protect threatened and endangered mussel species, wastewater discharges containing ammonia-nitrogen ( $\text{NH}_3\text{-N}$ ), chloride ( $\text{Cl}^-$ ) and nickel, where mussels or their habitat exist, can be no more than 1.9 mg/l, 78 mg/l and 7.3 ug/l, respectively. The calculated site-specific criteria based on WQN Station 913 stream background pH data and default temperature for a WWF (pH of 7.41 and temperature of 25) results in  $\text{NH}_3\text{-N}$  criteria of 1.058 mg/l.

A summary of the sampling data for ammonia-nitrogen ( $\text{NH}_3\text{-N}$ ), chloride ( $\text{Cl}^-$ ) and nickel based on three samples at Outfall 001 and one sample at Outfall 009 for the 2019 renewal application is as follows:

PARAMETER	UNITS	Maximum	Average	
Outfall 001				
$\text{NH}_3\text{-N}$	mg/l	0.52	0.46	
Chloride	mg/l	20.8	20.3	
Nickel	ug/l	561	326	
Outfall 009				
$\text{NH}_3\text{-N}$	mg/l	<0.04		
Chloride	mg/l	23.9		
Nickel	ug/l	172		

At Outfall 002, only ammonia nitrogen was sampled (once) for the application and it had a concentration of <0.04 mg/l.

Outfall 001 consists of contact cooling water from a shot tank used for cooling nickel-based stainless-steel shots and discharges continuously for less than one day a week during normal operation from an overflow on the tank. Outfall 002 discharges non-contact cooling water from the cooling furnace and only discharges in cases of emergency (less than 6 times in the last thirteen years). Outfall 009 consists of contact cooling water from a shot tank used to cool nickel and cobalt based stainless- steel shot that discharges approximately three hours during a batch discharge with less than 12 discharges occurring during a calendar year during normal operation.

Based on this sampling data, type and frequency of wastewater being discharged, and use potable water from a public water supply, the Department does not believe there has been or will be any measurable impacts at Outfalls 001, 002 and 009 due to ammonia-nitrogen and chlorides. The Department also does not believe there has been or will be any measurable impacts at Outfall 002 due to total nickel due to the type and frequency of the discharge and the use of potable water from a public water supply.

Since application sampling for total nickel at Outfalls 001 and 009 were well above concentrations indicated by USFWS to be harmful to threatened and endangered mussels, the Endangered Mussel Species Impact Area Calculations Spreadsheet (attached) was used to evaluate the area of impact due to total nickel. Since no site-specific mussel surveys were conducted for this facility or in the near proximity, only Method 2 and 3 were used in the spreadsheet. The results indicate a maximum impact area for nickel of 2.00 square meters for Outfall 001 using the maximum effluent concentration reported in the application and a maximum impact area for nickel of 1.06 square meters for Outfall 009.

Based on the information provided above, the discharge is not believed to be having any measurable adverse effects on threatened or endangered mussel species in the Shenango River. However, the Department will establish quarterly effluent monitoring for nickel at Outfall 001 and 009 in the renewed permit to develop a dataset as a means of further evaluating potential impacts in the upcoming permit term. In addition, a Part C condition was added to the permit which will require the permittee to conduct a Pollutant Reduction Evaluation for total nickel with the purpose of identifying sources of nickel in the waste stream and implementing measures to eliminate or reduce nickel quantities in the effluent.

**Proposed Effluent Limitations and Monitoring Requirements**

The limitations and monitoring requirements specified below are proposed for the draft permit, and reflect the most stringent limitations amongst technology, water quality and BPJ. Instantaneous Maximum (IMAX) limits are determined using multipliers of 2 (conventional pollutants) or 2.5 (toxic pollutants). Sample frequencies and types are derived from the "NPDES Permit Writer's Manual" (362-0400-001), SOPs and/or BPJ.

**Outfall 001**, Effective Period: **Permit Effective Date** through **Permit Expiration Date**.

Parameter	Effluent Limitations						Monitoring Requirements	
	Mass Units (lbs/day) <sup>(1)</sup>		Concentrations (mg/L)				Minimum <sup>(2)</sup> Measurement Frequency	Required Sample Type
	Average Monthly	Average Weekly	Minimum	Average Monthly	Maximum	Instant. Maximum		
Flow (MGD)	Report	XXX	XXX	XXX	XXX	XXX	Daily when Discharging	Estimate
pH (S.U.)	XXX	XXX	6.0	XXX	9.0	XXX	Daily when Discharging	Grab
Total Residual Chlorine	XXX	XXX	XXX	0.5	XXX	1.2	1/week	Grab
TSS	XXX	XXX	XXX	30	XXX	75	2/month	Grab
Total Iron	XXX	XXX	XXX	3.5	XXX	8.8	2/month	Grab
Total Copper	Report Avg Qrtly	XXX	XXX	Report Avg Qrtly	XXX	XXX	1/quarter	Grab
Total Silver	Report Avg Qrtly	XXX	XXX	Report Avg Qrtly	XXX	XXX	1/quarter	Grab
Total Thallium	Report Avg Qrtly	XXX	XXX	Report Avg Qrtly	XXX	XXX	1/quarter	Grab
Total Nickel	Report Avg Qrtly	XXX	XXX	Report Avg Qrtly	XXX	XXX	1/quarter	Grab

Compliance Sampling Location: Outfall 001 (prior to mixing with any other waters)

**Proposed Effluent Limitations and Monitoring Requirements**

The limitations and monitoring requirements specified below are proposed for the draft permit, and reflect the most stringent limitations amongst technology, water quality and BPJ. Instantaneous Maximum (IMAX) limits are determined using multipliers of 2 (conventional pollutants) or 2.5 (toxic pollutants). Sample frequencies and types are derived from the "NPDES Permit Writer's Manual" (362-0400-001), SOPs and/or BPJ.

**Outfall 002**, Effective Period: **Permit Effective Date** through **Permit Expiration Date**.

Parameter	Effluent Limitations						Monitoring Requirements	
	Mass Units (lbs/day) <sup>(1)</sup>		Concentrations (mg/L)				Minimum <sup>(2)</sup> Measurement Frequency	Required Sample Type
	Average Monthly	Average Weekly	Minimum	Average Monthly	Maximum	Instant. Maximum		
Flow (MGD)	Report	XXX	XXX	XXX	XXX	XXX	Daily when Discharging	Estimate
pH (S.U.)	XXX	XXX	6.0	XXX	9.0	XXX	Daily when Discharging	Grab

Compliance Sampling Location: Outfall 002 (prior to mixing with any other waters).

**Proposed Effluent Limitations and Monitoring Requirements**

The limitations and monitoring requirements specified below are proposed for the draft permit, and reflect the most stringent limitations amongst technology, water quality and BPJ. Instantaneous Maximum (IMAX) limits are determined using multipliers of 2 (conventional pollutants) or 2.5 (toxic pollutants). Sample frequencies and types are derived from the "NPDES Permit Writer's Manual" (362-0400-001), SOPs and/or BPJ.

**Outfall 009**, Effective Period: **Permit Effective Date** through **Permit Expiration Date**.

Parameter	Effluent Limitations						Monitoring Requirements	
	Mass Units (lbs/day) <sup>(1)</sup>		Concentrations (mg/L)				Minimum <sup>(2)</sup> Measurement Frequency	Required Sample Type
	Average Monthly	Average Weekly	Minimum	Average Monthly	Maximum	Instant. Maximum		
Flow (MGD)	Report	XXX	XXX	XXX	XXX	XXX	2/month	Estimate
pH (S.U.)	XXX	XXX	6.0	XXX	9.0	XXX	2/month	Grab
TSS	XXX	XXX	XXX	30	XXX	75	2/month	Grab
Total Iron	XXX	XXX	XXX	3.5	XXX	8.8	2/month	Grab
Total Thallium	Report Avg Qrtly	XXX	XXX	Report Avg Qrtly	XXX	XXX	1/quarter	Grab
Total Nickel	Report Avg Qrtly	XXX	XXX	Report Avg Qrtly	XXX	XXX	1/quarter	Grab

Compliance Sampling Location: Outfall 009 (prior to mixing with any other waters)

# Discharge Information

Instructions

Discharge

Stream

Facility: **Greenville Metals**

NPDES Permit No.: **PA0100510**

Outfall No.: **001**

Evaluation Type **Major Sewage / Industrial Waste**

Wastewater Description: **Contact Cooling Water**

Discharge Characteristics								
Design Flow (MGD)*	Hardness (mg/l)*	pH (SU)*	Partial Mix Factors (PMFs)				Complete Mix Times (min)	
			AFC	CFC	THH	CRL	Q <sub>7-10</sub>	Q <sub>h</sub>
0.144	137	7.3						

	Discharge Pollutant	Units	Max Discharge Conc	0 if left blank		0.5 if left blank		0 if left blank			1 if left blank	
				Trib Conc	Stream Conc	Daily CV	Hourly CV	Stream CV	Fate Coeff	FOS	Criteria Mod	Chem Transl
Group 1	Total Dissolved Solids (PWS)	mg/L	189									
	Chloride (PWS)	mg/L	20.8									
	Bromide	mg/L	< 0.05									
	Sulfate (PWS)	mg/L	52.3									
	Fluoride (PWS)	mg/L	0.19									
Group 2	Total Aluminum	µg/L	500									
	Total Antimony	µg/L	< 20.3									
	Total Arsenic	µg/L	< 13.7									
	Total Barium	µg/L	17.5									
	Total Beryllium	µg/L	< 0.73									
	Total Boron	µg/L	322									
	Total Cadmium	µg/L	< 0.73									
	Total Chromium (III)	µg/L	83									
	Hexavalent Chromium	µg/L	9.5									
	Total Cobalt	µg/L	115									
	Total Copper	µg/L	76									
	Free Cyanide	µg/L	6									
	Total Cyanide	µg/L	6									
	Dissolved Iron	µg/L	3320									
	Total Iron	µg/L	64									
	Total Lead	µg/L	16									
	Total Manganese	µg/L	493									
	Total Mercury	µg/L	0.0023									
	Total Nickel	µg/L	561									
	Total Phenols (Phenolics) (PWS)	µg/L	9									
	Total Selenium	µg/L	< 14.3									
	Total Silver	µg/L	29									
	Total Thallium	µg/L	< 13.4									
	Total Zinc	µg/L	48									
	Total Molybdenum	µg/L	107									
	Acrolein	µg/L	<									
	Acrylamide	µg/L	<									
	Acrylonitrile	µg/L	<									
	Benzene	µg/L	<									
	Bromoform	µg/L	<									

Group 3	Carbon Tetrachloride	µg/L	<																				
	Chlorobenzene	µg/L																					
	Chlorodibromomethane	µg/L	<																				
	Chloroethane	µg/L	<																				
	2-Chloroethyl Vinyl Ether	µg/L	<																				
	Chloroform	µg/L	<																				
	Dichlorobromomethane	µg/L	<																				
	1,1-Dichloroethane	µg/L	<																				
	1,2-Dichloroethane	µg/L	<																				
	1,1-Dichloroethylene	µg/L	<																				
	1,2-Dichloropropane	µg/L	<																				
	1,3-Dichloropropylene	µg/L	<																				
	1,4-Dioxane	µg/L	<																				
	Ethylbenzene	µg/L	<																				
	Methyl Bromide	µg/L	<																				
	Methyl Chloride	µg/L	<																				
	Methylene Chloride	µg/L	<																				
	1,1,2,2-Tetrachloroethane	µg/L	<																				
	Tetrachloroethylene	µg/L	<																				
	Toluene	µg/L	<																				
	1,2-trans-Dichloroethylene	µg/L	<																				
	1,1,1-Trichloroethane	µg/L	<																				
	1,1,2-Trichloroethane	µg/L	<																				
	Trichloroethylene	µg/L	<																				
	Vinyl Chloride	µg/L	<																				
Group 4	2-Chlorophenol	µg/L	<																				
	2,4-Dichlorophenol	µg/L	<																				
	2,4-Dimethylphenol	µg/L	<																				
	4,6-Dinitro-o-Cresol	µg/L	<																				
	2,4-Dinitrophenol	µg/L	<																				
	2-Nitrophenol	µg/L	<																				
	4-Nitrophenol	µg/L	<																				
	p-Chloro-m-Cresol	µg/L	<																				
	Pentachlorophenol	µg/L	<																				
	Phenol	µg/L	<																				
	2,4,6-Trichlorophenol	µg/L	<																				
Group 5	Acenaphthene	µg/L	<																				
	Acenaphthylene	µg/L	<																				
	Anthracene	µg/L	<																				
	Benzidine	µg/L	<																				
	Benzo(a)Anthracene	µg/L	<																				
	Benzo(a)Pyrene	µg/L	<																				
	3,4-Benzofluoranthene	µg/L	<																				
	Benzo(ghi)Perylene	µg/L	<																				
	Benzo(k)Fluoranthene	µg/L	<																				
	Bis(2-Chloroethoxy)Methane	µg/L	<																				
	Bis(2-Chloroethyl)Ether	µg/L	<																				
	Bis(2-Chloroisopropyl)Ether	µg/L	<																				
	Bis(2-Ethylhexyl)Phthalate	µg/L	<																				
	4-Bromophenyl Phenyl Ether	µg/L	<																				
	Butyl Benzyl Phthalate	µg/L	<																				
	2-Chloronaphthalene	µg/L	<																				
	4-Chlorophenyl Phenyl Ether	µg/L	<																				
	Chrysene	µg/L	<																				
	Dibenzo(a,h)Anthracene	µg/L	<																				
	1,2-Dichlorobenzene	µg/L	<																				
	1,3-Dichlorobenzene	µg/L	<																				
	1,4-Dichlorobenzene	µg/L	<																				
	3,3-Dichlorobenzidine	µg/L	<																				
	Diethyl Phthalate	µg/L	<																				
	Dimethyl Phthalate	µg/L	<																				
	Di-n-Butyl Phthalate	µg/L	<																				
	2,4-Dinitrotoluene	µg/L	<																				



Page 3



## Stream / Surface Water Information

Greenville Metals, NPDES Permit No. PA0100510, Outfall 001

Instructions

Discharge

Stream

Receiving Surface Water Name: **Shenango River**

No. Reaches to Model: **1**

- ☒ Statewide Criteria  
☐ Great Lakes Criteria  
☐ ORSANCO Criteria

Location	Stream Code*	RMI*	Elevation (ft)*	DA (mi <sup>2</sup> )*	Slope (ft/ft)	PWS Withdrawal (MGD)	Apply Fish Criteria*
Point of Discharge	036482	55.53	925	331			Yes
End of Reach 1	035482	28.88	842	701		0.1	Yes

**Q<sub>7-10</sub>**

Location	RMI	LFY (cfs/mi <sup>2</sup> )*	Flow (cfs)		W/D Ratio	Width (ft)	Depth (ft)	Velocity (fps)	Travel Time (days)	Tributary		Stream		Analysis	
			Stream	Tributary						Hardness	pH	Hardness*	pH*	Hardness	pH
Point of Discharge	55.53	0.161				100						139.4	7.4		
End of Reach 1	28.88	0.161	143.8									139.4	7.4		

**Q<sub>h</sub>**

Location	RMI	LFY (cfs/mi <sup>2</sup> )*	Flow (cfs)		W/D Ratio	Width (ft)	Depth (ft)	Velocity (fps)	Travel Time (days)	Tributary		Stream		Analysis	
			Stream	Tributary						Hardness	pH	Hardness	pH	Hardness	pH
Point of Discharge	55.53														
End of Reach 1	28.88														

# Model Results

Greenville Metals, NPDES Permit No. PA0100510, Outfall 001

Instructions

Results

RETURN TO INPUTS

SAVE AS PDF

PRINT

☒ All

☐ Inputs

☐ Results

☐ Limits

☒ **Hydrodynamics**

**Q<sub>7-10</sub>**

RMI	Stream Flow (cfs)	PWS Withdrawal (cfs)	Net Stream Flow (cfs)	Discharge Analysis Flow (cfs)	Slope (ft/ft)	Depth (ft)	Width (ft)	W/D Ratio	Velocity (fps)	Travel Time (days)	Complete Mix Time (min)
55.53	53.29		53.29	0.223	0.00059	1.174	100.	117.201	0.456	3.572	440.21
28.88	143.80	0.155	143.6453								

**Q<sub>h</sub>**

RMI	Stream Flow (cfs)	PWS Withdrawal (cfs)	Net Stream Flow (cfs)	Discharge Analysis Flow (cfs)	Slope (ft/ft)	Depth (ft)	Width (ft)	W/D Ratio	Velocity (fps)	Travel Time (days)	Complete Mix Time (min)
55.53	239.93		239.93	0.223	0.00059	2.272	100.	44.015	1.057	1.541	164.491
28.88	571.308	0.155	571.15								

☒ **Wasteload Allocations**

☒ **AFC**

CCT (min): 15

PMF: 0.185

Analysis Hardness (mg/l): 139.35

Analysis pH: 7.40

Pollutants	Stream Conc (µg/L)	Stream CV	Trib Conc (µg/L)	Fate Coef	WQC (µg/L)	WQ Obj (µg/L)	WLA (µg/L)	Comments
Total Dissolved Solids (PWS)	0	0		0	N/A	N/A	N/A	
Chloride (PWS)	0	0		0	N/A	N/A	N/A	
Sulfate (PWS)	0	0		0	N/A	N/A	N/A	
Fluoride (PWS)	0	0		0	N/A	N/A	N/A	
Total Aluminum	0	0		0	750	750	33,869	
Total Antimony	0	0		0	1,100	1,100	49,675	
Total Arsenic	0	0		0	340	340	15,354	Chem Translator of 1 applied
Total Barium	0	0		0	21,000	21,000	948,334	
Total Boron	0	0		0	8,100	8,100	365,786	
Total Cadmium	0	0		0	2.780	2.99	135	Chem Translator of 0.93 applied
Total Chromium (III)	0	0		0	747.670	2,366	106,848	Chem Translator of 0.316 applied
Hexavalent Chromium	0	0		0	16	16.3	736	Chem Translator of 0.982 applied
Total Cobalt	0	0		0	95	95.0	4,290	

Total Copper	0	0		0	18.371	19.1	864	Chem Translator of 0.96 applied
Free Cyanide	0	0		0	22	22.0	993	
Dissolved Iron	0	0		0	N/A	N/A	N/A	
Total Iron	0	0		0	N/A	N/A	N/A	
Total Lead	0	0		0	92.502	125	5,625	Chem Translator of 0.743 applied
Total Manganese	0	0		0	N/A	N/A	N/A	
Total Mercury	0	0		0	1.400	1.65	74.4	Chem Translator of 0.85 applied
Total Nickel	0	0		0	619.970	621	28,053	Chem Translator of 0.998 applied
Total Phenols (Phenolics) (PWS)	0	0		0	N/A	N/A	N/A	
Total Selenium	0	0		0	N/A	N/A	N/A	Chem Translator of 0.922 applied
Total Silver	0	0		0	5.692	6.7	302	Chem Translator of 0.85 applied
Total Thallium	0	0		0	65	65.0	2,935	
Total Zinc	0	0		0	155.220	159	7,167	Chem Translator of 0.978 applied

☒ **CFC**

CCT (min): #####

PMF: 1

Analysis Hardness (mg/l): 139.39

Analysis pH: 7.40

Pollutants	Stream Conc (µg/L)	Stream CV	Trib Conc (µg/L)	Fate Coef	WQC (µg/L)	WQ Obj (µg/L)	WLA (µg/L)	Comments
Total Dissolved Solids (PWS)	0	0		0	N/A	N/A	N/A	
Chloride (PWS)	0	0		0	N/A	N/A	N/A	
Sulfate (PWS)	0	0		0	N/A	N/A	N/A	
Fluoride (PWS)	0	0		0	N/A	N/A	N/A	
Total Aluminum	0	0		0	N/A	N/A	N/A	
Total Antimony	0	0		0	220	220	52,849	
Total Arsenic	0	0		0	150	150	36,033	Chem Translator of 1 applied
Total Barium	0	0		0	4,100	4,100	984,910	
Total Boron	0	0		0	1,600	1,600	384,355	
Total Cadmium	0	0		0	0.310	0.35	83.1	Chem Translator of 0.895 applied
Total Chromium (III)	0	0		0	97.281	113	27,173	Chem Translator of 0.86 applied
Hexavalent Chromium	0	0		0	10	10.4	2,497	Chem Translator of 0.962 applied
Total Cobalt	0	0		0	19	19.0	4,564	
Total Copper	0	0		0	11.895	12.4	2,976	Chem Translator of 0.96 applied
Free Cyanide	0	0		0	5.2	5.2	1,249	
Dissolved Iron	0	0		0	N/A	N/A	N/A	
Total Iron	0	0		0	1,500	1,500	360,333	WQC = 30 day average; PMF = 1
Total Lead	0	0		0	3.606	4.86	1,166	Chem Translator of 0.743 applied
Total Manganese	0	0		0	N/A	N/A	N/A	
Total Mercury	0	0		0	0.770	0.91	218	Chem Translator of 0.85 applied
Total Nickel	0	0		0	68.878	69.1	16,596	Chem Translator of 0.997 applied
Total Phenols (Phenolics) (PWS)	0	0		0	N/A	N/A	N/A	
Total Selenium	0	0		0	4.600	4.99	1,199	Chem Translator of 0.922 applied
Total Silver	0	0		0	N/A	N/A	N/A	Chem Translator of 1 applied
Total Thallium	0	0		0	13	13.0	3,123	
Total Zinc	0	0		0	156.531	159	38,136	Chem Translator of 0.986 applied

☒ **THH**

CCT (min): #####

THH PMF: 1

Analysis Hardness (mg/l): N/A

Analysis pH: N/A

PWS PMF: 1

Pollutants	Stream Conc (µg/L)	Stream CV	Trib Conc (µg/L)	Fate Coef	WQC (µg/L)	WQ Obj (µg/L)	WLA (µg/L)	Comments
Total Dissolved Solids (PWS)	0	0		0	500,000	500,000	#####	WQC applied at RMI 28.88 with a design stream flow of 143.8 cfs
Chloride (PWS)	0	0		0	250,000	250,000	#####	WQC applied at RMI 28.88 with a design stream flow of 143.8 cfs
Sulfate (PWS)	0	0		0	250,000	250,000	#####	WQC applied at RMI 28.88 with a design stream flow of 143.8 cfs
Fluoride (PWS)	0	0		0	2,000	2,000	1,293,029	WQC applied at RMI 28.88 with a design stream flow of 143.8 cfs
Total Aluminum	0	0		0	N/A	N/A	N/A	
Total Antimony	0	0		0	5.6	5.6	1,345	
Total Arsenic	0	0		0	10	10.0	2,402	
Total Barium	0	0		0	2,400	2,400	576,533	
Total Boron	0	0		0	3,100	3,100	744,688	
Total Cadmium	0	0		0	N/A	N/A	N/A	
Total Chromium (III)	0	0		0	N/A	N/A	N/A	
Hexavalent Chromium	0	0		0	N/A	N/A	N/A	
Total Cobalt	0	0		0	N/A	N/A	N/A	
Total Copper	0	0		0	N/A	N/A	N/A	
Free Cyanide	0	0		0	140	140	33,631	
Dissolved Iron	0	0		0	300	300	72,067	
Total Iron	0	0		0	N/A	N/A	N/A	
Total Lead	0	0		0	N/A	N/A	N/A	
Total Manganese	0	0		0	1,000	1,000	240,222	
Total Mercury	0	0		0	0.050	0.05	12.0	
Total Nickel	0	0		0	610	610	146,535	
Total Phenols (Phenolics) (PWS)	0	0		0	5	5.0	3,233	WQC applied at RMI 28.88 with a design stream flow of 143.8 cfs
Total Selenium	0	0		0	N/A	N/A	N/A	
Total Silver	0	0		0	N/A	N/A	N/A	
Total Thallium	0	0		0	0.24	0.24	57.7	
Total Zinc	0	0		0	N/A	N/A	N/A	

☒ **CRL**

CCT (min): #####

PMF: 1

Analysis Hardness (mg/l): N/A

Analysis pH: N/A

Pollutants	Stream Conc (µg/L)	Stream CV	Trib Conc (µg/L)	Fate Coef	WQC (µg/L)	WQ Obj (µg/L)	WLA (µg/L)	Comments
Total Dissolved Solids (PWS)	0	0		0	N/A	N/A	N/A	
Chloride (PWS)	0	0		0	N/A	N/A	N/A	
Sulfate (PWS)	0	0		0	N/A	N/A	N/A	
Fluoride (PWS)	0	0		0	N/A	N/A	N/A	
Total Aluminum	0	0		0	N/A	N/A	N/A	
Total Antimony	0	0		0	N/A	N/A	N/A	
Total Arsenic	0	0		0	N/A	N/A	N/A	
Total Barium	0	0		0	N/A	N/A	N/A	
Total Boron	0	0		0	N/A	N/A	N/A	
Total Cadmium	0	0		0	N/A	N/A	N/A	
Total Chromium (III)	0	0		0	N/A	N/A	N/A	

Hexavalent Chromium	0	0		0	N/A	N/A	N/A	
Total Cobalt	0	0		0	N/A	N/A	N/A	
Total Copper	0	0		0	N/A	N/A	N/A	
Free Cyanide	0	0		0	N/A	N/A	N/A	
Dissolved Iron	0	0		0	N/A	N/A	N/A	
Total Iron	0	0		0	N/A	N/A	N/A	
Total Lead	0	0		0	N/A	N/A	N/A	
Total Manganese	0	0		0	N/A	N/A	N/A	
Total Mercury	0	0		0	N/A	N/A	N/A	
Total Nickel	0	0		0	N/A	N/A	N/A	
Total Phenols (Phenolics) (PWS)	0	0		0	N/A	N/A	N/A	
Total Selenium	0	0		0	N/A	N/A	N/A	
Total Silver	0	0		0	N/A	N/A	N/A	
Total Thallium	0	0		0	N/A	N/A	N/A	
Total Zinc	0	0		0	N/A	N/A	N/A	

☒ **Recommended WQBELs & Monitoring Requirements**

No. Samples/Month: 4

Pollutants	Mass Limits		Concentration Limits				Governing WQBEL	WQBEL Basis	Comments
	AML (lbs/day)	MDL (lbs/day)	AML	MDL	IMAX	Units			
Total Copper	Report	Report	Report	Report	Report	µg/L	554	AFC	Discharge Conc > 10% WQBEL (no RP)
Total Silver	Report	Report	Report	Report	Report	µg/L	194	AFC	Discharge Conc > 10% WQBEL (no RP)
Total Thallium	Report	Report	Report	Report	Report	µg/L	57.7	THH	Discharge Conc > 10% WQBEL (no RP)

☒ **Other Pollutants without Limits or Monitoring**

The following pollutants do not require effluent limits or monitoring based on water quality because reasonable potential to exceed water quality criteria was not determined and the discharge concentration was less than thresholds for monitoring, or the pollutant was not detected and a sufficiently sensitive analytical method was used (e.g., <= Target QL).

Pollutants	Governing WQBEL	Units	Comments
Total Dissolved Solids (PWS)	323,257	mg/L	Discharge Conc ≤ 10% WQBEL
Chloride (PWS)	161,629	mg/L	Discharge Conc ≤ 10% WQBEL
Bromide	N/A	N/A	No WQS
Sulfate (PWS)	161,629	mg/L	Discharge Conc ≤ 10% WQBEL
Fluoride (PWS)	1,293	mg/L	Discharge Conc ≤ 10% WQBEL
Total Aluminum	21,709	µg/L	Discharge Conc ≤ 10% WQBEL
Total Antimony	1,345	µg/L	Discharge Conc ≤ 10% WQBEL
Total Arsenic	2,402	µg/L	Discharge Conc ≤ 10% WQBEL
Total Barium	576,533	µg/L	Discharge Conc ≤ 10% WQBEL
Total Beryllium	N/A	N/A	No WQS
Total Boron	234,454	µg/L	Discharge Conc ≤ 10% WQBEL

Total Cadmium	83.1	µg/L	Discharge Conc ≤ 10% WQBEL
Total Chromium (III)	27,173	µg/L	Discharge Conc ≤ 10% WQBEL
Hexavalent Chromium	472	µg/L	Discharge Conc ≤ 10% WQBEL
Total Cobalt	2,750	µg/L	Discharge Conc ≤ 10% WQBEL
Free Cyanide	637	µg/L	Discharge Conc ≤ 25% WQBEL
Total Cyanide	N/A	N/A	No WQS
Dissolved Iron	72,067	µg/L	Discharge Conc ≤ 10% WQBEL
Total Iron	360,333	µg/L	Discharge Conc ≤ 10% WQBEL
Total Lead	1,166	µg/L	Discharge Conc ≤ 10% WQBEL
Total Manganese	240,222	µg/L	Discharge Conc ≤ 10% WQBEL
Total Mercury	12.0	µg/L	Discharge Conc ≤ 10% WQBEL
Total Nickel	16,596	µg/L	Discharge Conc ≤ 10% WQBEL
Total Phenols (Phenolics) (PWS)	3,233	µg/L	Discharge Conc ≤ 10% WQBEL
Total Selenium	1,199	µg/L	Discharge Conc ≤ 10% WQBEL
Total Zinc	4,594	µg/L	Discharge Conc ≤ 10% WQBEL
Total Molybdenum	N/A	N/A	No WQS



# Discharge Information

Instructions

Discharge

Stream

Facility: **Greenville Metals**

NPDES Permit No.: **PA0100510**

Outfall No.: **009**

Evaluation Type **Major Sewage / Industrial Waste**

Wastewater Description: **Contact Cooling Water**

Discharge Characteristics								
Design Flow (MGD)*	Hardness (mg/l)*	pH (SU)*	Partial Mix Factors (PMFs)				Complete Mix Times (min)	
			AFC	CFC	THH	CRL	Q <sub>7-10</sub>	Q <sub>h</sub>
0.096	188	8						

					0 if left blank		0.5 if left blank		0 if left blank			1 if left blank	
	Discharge Pollutant	Units	Max Discharge Conc		Trib Conc	Stream Conc	Daily CV	Hourly CV	Stream CV	Fate Coeff	FOS	Criteria Mod	Chem Transl
Group 1	Total Dissolved Solids (PWS)	mg/L		220									
	Chloride (PWS)	mg/L		23.9									
	Bromide	mg/L	<	0.05									
	Sulfate (PWS)	mg/L		71.5									
	Fluoride (PWS)	mg/L		0.22									
Group 2	Total Aluminum	µg/L		19									
	Total Antimony	µg/L	<	30									
	Total Arsenic	µg/L	<	20									
	Total Barium	µg/L		6									
	Total Beryllium	µg/L	<	1									
	Total Boron	µg/L		1300									
	Total Cadmium	µg/L	<	1									
	Total Chromium (III)	µg/L		9									
	Hexavalent Chromium	µg/L		7.1									
	Total Cobalt	µg/L	<	4									
	Total Copper	µg/L	<	6									
	Free Cyanide	µg/L											
	Total Cyanide	µg/L	<	5									
	Dissolved Iron	µg/L		16									
	Total Iron	µg/L		283									
	Total Lead	µg/L	<	16									
	Total Manganese	µg/L		14									
	Total Mercury	µg/L	<	0.002									
	Total Nickel	µg/L		172									
	Total Phenols (Phenolics) (PWS)	µg/L	<	5									
	Total Selenium	µg/L	<	20									
	Total Silver	µg/L	<	3									
	Total Thallium	µg/L	<	20									
	Total Zinc	µg/L		8									
	Total Molybdenum	µg/L		37									
	Acrolein	µg/L	<										
	Acrylamide	µg/L	<										
	Acrylonitrile	µg/L	<										
	Benzene	µg/L	<										
	Bromoform	µg/L	<										

Group 3	Carbon Tetrachloride	µg/L	<																				
	Chlorobenzene	µg/L																					
	Chlorodibromomethane	µg/L	<																				
	Chloroethane	µg/L	<																				
	2-Chloroethyl Vinyl Ether	µg/L	<																				
	Chloroform	µg/L	<																				
	Dichlorobromomethane	µg/L	<																				
	1,1-Dichloroethane	µg/L	<																				
	1,2-Dichloroethane	µg/L	<																				
	1,1-Dichloroethylene	µg/L	<																				
	1,2-Dichloropropane	µg/L	<																				
	1,3-Dichloropropylene	µg/L	<																				
	1,4-Dioxane	µg/L	<																				
	Ethylbenzene	µg/L	<																				
	Methyl Bromide	µg/L	<																				
	Methyl Chloride	µg/L	<																				
	Methylene Chloride	µg/L	<																				
	1,1,2,2-Tetrachloroethane	µg/L	<																				
	Tetrachloroethylene	µg/L	<																				
	Toluene	µg/L	<																				
	1,2-trans-Dichloroethylene	µg/L	<																				
	1,1,1-Trichloroethane	µg/L	<																				
	1,1,2-Trichloroethane	µg/L	<																				
	Trichloroethylene	µg/L	<																				
	Vinyl Chloride	µg/L	<																				
Group 4	2-Chlorophenol	µg/L	<																				
	2,4-Dichlorophenol	µg/L	<																				
	2,4-Dimethylphenol	µg/L	<																				
	4,6-Dinitro-o-Cresol	µg/L	<																				
	2,4-Dinitrophenol	µg/L	<																				
	2-Nitrophenol	µg/L	<																				
	4-Nitrophenol	µg/L	<																				
	p-Chloro-m-Cresol	µg/L	<																				
	Pentachlorophenol	µg/L	<																				
	Phenol	µg/L	<																				
	2,4,6-Trichlorophenol	µg/L	<																				
Group 5	Acenaphthene	µg/L	<																				
	Acenaphthylene	µg/L	<																				
	Anthracene	µg/L	<																				
	Benzidine	µg/L	<																				
	Benzo(a)Anthracene	µg/L	<																				
	Benzo(a)Pyrene	µg/L	<																				
	3,4-Benzofluoranthene	µg/L	<																				
	Benzo(ghi)Perylene	µg/L	<																				
	Benzo(k)Fluoranthene	µg/L	<																				
	Bis(2-Chloroethoxy)Methane	µg/L	<																				
	Bis(2-Chloroethyl)Ether	µg/L	<																				
	Bis(2-Chloroisopropyl)Ether	µg/L	<																				
	Bis(2-Ethylhexyl)Phthalate	µg/L	<																				
	4-Bromophenyl Phenyl Ether	µg/L	<																				
	Butyl Benzyl Phthalate	µg/L	<																				
	2-Chloronaphthalene	µg/L	<																				
	4-Chlorophenyl Phenyl Ether	µg/L	<																				
	Chrysene	µg/L	<																				
	Dibenzo(a,h)Anthracene	µg/L	<																				
	1,2-Dichlorobenzene	µg/L	<																				
	1,3-Dichlorobenzene	µg/L	<																				
	1,4-Dichlorobenzene	µg/L	<																				
	3,3-Dichlorobenzidine	µg/L	<																				
	Diethyl Phthalate	µg/L	<																				
	Dimethyl Phthalate	µg/L	<																				
	Di-n-Butyl Phthalate	µg/L	<																				
	2,4-Dinitrotoluene	µg/L	<																				



Page 3

## Stream / Surface Water Information

Greenville Metals, NPDES Permit No. PA0100510, Outfall 009

Instructions Discharge **Stream**

Receiving Surface Water Name:

No. Reaches to Model: 1

- ☒ Statewide Criteria  
☐ Great Lakes Criteria  
☐ ORSANCO Criteria

Location	Stream Code*	RMI*	Elevation (ft)*	DA (mi²)*	Slope (ft/ft)	PWS Withdrawal (MGD)	Apply Fish Criteria*
Point of Discharge	036482	55.53	925	331			Yes
End of Reach 1	035482	28.88	842	701		0.1	Yes

**Q<sub>7-10</sub>**

Location	RMI	LFY (cfs/mi²)*	Flow (cfs)		W/D Ratio	Width (ft)	Depth (ft)	Velocity (fps)	Travel Time (days)	Tributary		Stream		Analysis	
			Stream	Tributary						Hardness	pH	Hardness*	pH*	Hardness	pH
Point of Discharge	55.53	0.161										139.4	7.4		
End of Reach 1	28.88	0.161	143.8									139.4	7.4		

**Q<sub>h</sub>**

Location	RMI	LFY (cfs/mi²)	Flow (cfs)		W/D Ratio	Width (ft)	Depth (ft)	Velocity (fps)	Travel Time (days)	Tributary		Stream		Analysis	
			Stream	Tributary						Hardness	pH	Hardness	pH	Hardness	pH
Point of Discharge	55.53														
End of Reach 1	28.88														

# Model Results

Greenville Metals, NPDES Permit No. PA0100510, Outfall 009

Instructions

Results

RETURN TO INPUTS

SAVE AS PDF

PRINT

☒ All

☐ Inputs

☐ Results

☐ Limits

☒ **Hydrodynamics**

**Q<sub>7-10</sub>**

RMI	Stream Flow (cfs)	PWS Withdrawal (cfs)	Net Stream Flow (cfs)	Discharge Analysis Flow (cfs)	Slope (ft/ft)	Depth (ft)	Width (ft)	W/D Ratio	Velocity (fps)	Travel Time (days)	Complete Mix Time (min)
55.53	53.29		53.29	0.149	0.00059	1.001	117.218	117.149	0.456	3.574	770.448
28.88	143.80	0.155	143.6453								

**Q<sub>h</sub>**

RMI	Stream Flow (cfs)	PWS Withdrawal (cfs)	Net Stream Flow (cfs)	Discharge Analysis Flow (cfs)	Slope (ft/ft)	Depth (ft)	Width (ft)	W/D Ratio	Velocity (fps)	Travel Time (days)	Complete Mix Time (min)
55.53	239.93		239.93	0.149	0.00059	1.938	117.218	60.484	1.057	1.541	287.064
28.88	571.308	0.155	571.15								

☒ **Wasteload Allocations**

☒ **AFC**

CCT (min): 15

PMF: 0.140

Analysis Hardness (mg/l): 140.35

Analysis pH: 7.41

Pollutants	Stream Conc (µg/L)	Stream CV	Trib Conc (µg/L)	Fate Coef	WQC (µg/L)	WQ Obj (µg/L)	WLA (µg/L)	Comments
Total Dissolved Solids (PWS)	0	0		0	N/A	N/A	N/A	
Chloride (PWS)	0	0		0	N/A	N/A	N/A	
Sulfate (PWS)	0	0		0	N/A	N/A	N/A	
Fluoride (PWS)	0	0		0	N/A	N/A	N/A	
Total Aluminum	0	0		0	750	750	38,302	
Total Antimony	0	0		0	1,100	1,100	56,176	
Total Arsenic	0	0		0	340	340	17,363	Chem Translator of 1 applied
Total Barium	0	0		0	21,000	21,000	1,072,443	
Total Boron	0	0		0	8,100	8,100	413,656	
Total Cadmium	0	0		0	2.800	3.01	154	Chem Translator of 0.93 applied
Total Chromium (III)	0	0		0	752.083	2,380	121,544	Chem Translator of 0.316 applied
Hexavalent Chromium	0	0		0	16	16.3	832	Chem Translator of 0.982 applied
Total Cobalt	0	0		0	95	95.0	4,852	

Total Copper	0	0		0	18.496	19.3	984	Chem Translator of 0.96 applied
Dissolved Iron	0	0		0	N/A	N/A	N/A	
Total Iron	0	0		0	N/A	N/A	N/A	
Total Lead	0	0		0	93.221	126	6,419	Chem Translator of 0.742 applied
Total Manganese	0	0		0	N/A	N/A	N/A	
Total Mercury	0	0		0	1.400	1.65	84.1	Chem Translator of 0.85 applied
Total Nickel	0	0		0	623.750	625	31,918	Chem Translator of 0.998 applied
Total Phenols (Phenolics) (PWS)	0	0		0	N/A	N/A	N/A	
Total Selenium	0	0		0	N/A	N/A	N/A	Chem Translator of 0.922 applied
Total Silver	0	0		0	5.763	6.78	346	Chem Translator of 0.85 applied
Total Thallium	0	0		0	65	65.0	3,319	
Total Zinc	0	0		0	156.168	160	8,155	Chem Translator of 0.978 applied

☒ **CFC**

CCT (min): **720**

PMF: **0.967**

Analysis Hardness (mg/l): **139.54**

Analysis pH: **7.40**

Pollutants	Stream Conc (µg/L)	Stream CV	Trib Conc (µg/L)	Fate Coef	WQC (µg/L)	WQ Obj (µg/L)	WLA (µg/L)	Comments
Total Dissolved Solids (PWS)	0	0		0	N/A	N/A	N/A	
Chloride (PWS)	0	0		0	N/A	N/A	N/A	
Sulfate (PWS)	0	0		0	N/A	N/A	N/A	
Fluoride (PWS)	0	0		0	N/A	N/A	N/A	
Total Aluminum	0	0		0	N/A	N/A	N/A	
Total Antimony	0	0		0	220	220	76,535	
Total Arsenic	0	0		0	150	150	52,183	Chem Translator of 1 applied
Total Barium	0	0		0	4,100	4,100	1,426,333	
Total Boron	0	0		0	1,600	1,600	556,618	
Total Cadmium	0	0		0	0.310	0.35	121	Chem Translator of 0.895 applied
Total Chromium (III)	0	0		0	97.367	113	39,387	Chem Translator of 0.86 applied
Hexavalent Chromium	0	0		0	10	10.4	3,616	Chem Translator of 0.962 applied
Total Cobalt	0	0		0	19	19.0	6,610	
Total Copper	0	0		0	11.905	12.4	4,314	Chem Translator of 0.96 applied
Dissolved Iron	0	0		0	N/A	N/A	N/A	
Total Iron	0	0		0	1,500	1,500	539,749	WQC = 30 day average; PMF = 1
Total Lead	0	0		0	3.610	4.86	1,692	Chem Translator of 0.742 applied
Total Manganese	0	0		0	N/A	N/A	N/A	
Total Mercury	0	0		0	0.770	0.91	315	Chem Translator of 0.85 applied
Total Nickel	0	0		0	68.940	69.1	24,055	Chem Translator of 0.997 applied
Total Phenols (Phenolics) (PWS)	0	0		0	N/A	N/A	N/A	
Total Selenium	0	0		0	4.600	4.99	1,736	Chem Translator of 0.922 applied
Total Silver	0	0		0	N/A	N/A	N/A	Chem Translator of 1 applied
Total Thallium	0	0		0	13	13.0	4,523	
Total Zinc	0	0		0	156.674	159	55,278	Chem Translator of 0.986 applied

☒ **THH**

CCT (min): **720**

THH PMF: **0.967**

Analysis Hardness (mg/l): **N/A**

Analysis pH: **N/A**

PWS PMF: **1**

Pollutants	Stream Conc	Stream CV	Trib Conc	Fate	WQC	WQ Obj	WLA (µg/L)	Comments
------------	-------------	-----------	-----------	------	-----	--------	------------	----------

	(µg/L)	CV	(µg/L)	Coef	(µg/L)	(µg/L)		
Total Dissolved Solids (PWS)	0	0		0	500,000	500,000	#####	WQC applied at RMI 28.88 with a design stream flow of 143.8 cfs
Chloride (PWS)	0	0		0	250,000	250,000	#####	WQC applied at RMI 28.88 with a design stream flow of 143.8 cfs
Sulfate (PWS)	0	0		0	250,000	250,000	#####	WQC applied at RMI 28.88 with a design stream flow of 143.8 cfs
Fluoride (PWS)	0	0		0	2,000	2,000	1,938,544	WQC applied at RMI 28.88 with a design stream flow of 143.8 cfs
Total Aluminum	0	0		0	N/A	N/A	N/A	
Total Antimony	0	0		0	5.6	5.6	1,948	
Total Arsenic	0	0		0	10	10.0	3,479	
Total Barium	0	0		0	2,400	2,400	834,927	
Total Boron	0	0		0	3,100	3,100	1,078,447	
Total Cadmium	0	0		0	N/A	N/A	N/A	
Total Chromium (III)	0	0		0	N/A	N/A	N/A	
Hexavalent Chromium	0	0		0	N/A	N/A	N/A	
Total Cobalt	0	0		0	N/A	N/A	N/A	
Total Copper	0	0		0	N/A	N/A	N/A	
Dissolved Iron	0	0		0	300	300	104,366	
Total Iron	0	0		0	N/A	N/A	N/A	
Total Lead	0	0		0	N/A	N/A	N/A	
Total Manganese	0	0		0	1,000	1,000	347,886	
Total Mercury	0	0		0	0.050	0.05	17.4	
Total Nickel	0	0		0	610	610	212,211	
Total Phenols (Phenolics) (PWS)	0	0		0	5	5.0	4,846	WQC applied at RMI 28.88 with a design stream flow of 143.8 cfs
Total Selenium	0	0		0	N/A	N/A	N/A	
Total Silver	0	0		0	N/A	N/A	N/A	
Total Thallium	0	0		0	0.24	0.24	83.5	
Total Zinc	0	0		0	N/A	N/A	N/A	

☒ **CRL**

CCT (min): #####

PMF: 1

Analysis Hardness (mg/l): N/A

Analysis pH: N/A

Pollutants	Stream Conc (µg/L)	Stream CV	Trib Conc (µg/L)	Fate Coef	WQC (µg/L)	WQ Obj (µg/L)	WLA (µg/L)	Comments
Total Dissolved Solids (PWS)	0	0		0	N/A	N/A	N/A	
Chloride (PWS)	0	0		0	N/A	N/A	N/A	
Sulfate (PWS)	0	0		0	N/A	N/A	N/A	
Fluoride (PWS)	0	0		0	N/A	N/A	N/A	
Total Aluminum	0	0		0	N/A	N/A	N/A	
Total Antimony	0	0		0	N/A	N/A	N/A	
Total Arsenic	0	0		0	N/A	N/A	N/A	
Total Barium	0	0		0	N/A	N/A	N/A	
Total Boron	0	0		0	N/A	N/A	N/A	
Total Cadmium	0	0		0	N/A	N/A	N/A	
Total Chromium (III)	0	0		0	N/A	N/A	N/A	
Hexavalent Chromium	0	0		0	N/A	N/A	N/A	
Total Cobalt	0	0		0	N/A	N/A	N/A	
Total Copper	0	0		0	N/A	N/A	N/A	

Dissolved Iron	0	0		0	N/A	N/A	N/A	
Total Iron	0	0		0	N/A	N/A	N/A	
Total Lead	0	0		0	N/A	N/A	N/A	
Total Manganese	0	0		0	N/A	N/A	N/A	
Total Mercury	0	0		0	N/A	N/A	N/A	
Total Nickel	0	0		0	N/A	N/A	N/A	
Total Phenols (Phenolics) (PWS)	0	0		0	N/A	N/A	N/A	
Total Selenium	0	0		0	N/A	N/A	N/A	
Total Silver	0	0		0	N/A	N/A	N/A	
Total Thallium	0	0		0	N/A	N/A	N/A	
Total Zinc	0	0		0	N/A	N/A	N/A	

☒ **Recommended WQBELs & Monitoring Requirements**

No. Samples/Month: 4

Pollutants	Mass Limits		Concentration Limits				Governing WQBEL	WQBEL Basis	Comments
	AML (lbs/day)	MDL (lbs/day)	AML	MDL	IMAX	Units			
Total Thallium	Report	Report	Report	Report	Report	µg/L	83.5	THH	Discharge Conc > 10% WQBEL (no RP)

☒ **Other Pollutants without Limits or Monitoring**

The following pollutants do not require effluent limits or monitoring based on water quality because reasonable potential to exceed water quality criteria was not determined and the discharge concentration was less than thresholds for monitoring, or the pollutant was not detected and a sufficiently sensitive analytical method was used (e.g., <= Target QL).

Pollutants	Governing WQBEL	Units	Comments
Total Dissolved Solids (PWS)	484,636	mg/L	Discharge Conc ≤ 10% WQBEL
Chloride (PWS)	242,318	mg/L	Discharge Conc ≤ 10% WQBEL
Bromide	N/A	N/A	No WQS
Sulfate (PWS)	242,318	mg/L	Discharge Conc ≤ 10% WQBEL
Fluoride (PWS)	1,939	mg/L	Discharge Conc ≤ 10% WQBEL
Total Aluminum	24,550	µg/L	Discharge Conc ≤ 10% WQBEL
Total Antimony	1,948	µg/L	Discharge Conc ≤ 10% WQBEL
Total Arsenic	3,479	µg/L	Discharge Conc ≤ 10% WQBEL
Total Barium	687,392	µg/L	Discharge Conc ≤ 10% WQBEL
Total Beryllium	N/A	N/A	No WQS
Total Boron	265,137	µg/L	Discharge Conc ≤ 10% WQBEL
Total Cadmium	98.6	µg/L	Discharge Conc ≤ 10% WQBEL
Total Chromium (III)	39,387	µg/L	Discharge Conc ≤ 10% WQBEL
Hexavalent Chromium	533	µg/L	Discharge Conc ≤ 10% WQBEL
Total Cobalt	3,110	µg/L	Discharge Conc ≤ 10% WQBEL
Total Copper	631	µg/L	Discharge Conc ≤ 10% WQBEL
Total Cyanide	N/A	N/A	No WQS



Dissolved Iron	104,366	µg/L	Discharge Conc ≤ 10% WQBEL
Total Iron	539,749	µg/L	Discharge Conc ≤ 10% WQBEL
Total Lead	1,692	µg/L	Discharge Conc ≤ 10% WQBEL
Total Manganese	347,886	µg/L	Discharge Conc ≤ 10% WQBEL
Total Mercury	17.4	µg/L	Discharge Conc < TQL
Total Nickel	20,458	µg/L	Discharge Conc ≤ 10% WQBEL
Total Phenols (Phenolics) (PWS)	4,846	µg/L	Discharge Conc < TQL
Total Selenium	1,736	µg/L	Discharge Conc ≤ 10% WQBEL
Total Silver	222	µg/L	Discharge Conc ≤ 10% WQBEL
Total Zinc	5,227	µg/L	Discharge Conc ≤ 10% WQBEL
Total Molybdenum	N/A	N/A	No WQS

**TRC EVALUATION**

Input appropriate values in A3:A9 and D3:D9

53.29	= Q stream (cfs)	0.5	= CV Daily
0.029	= Q discharge (MGD)	0.5	= CV Hourly
4	= no. samples	0.185	= AFC_Partial Mix Factor
0.3	= Chlorine Demand of Stream	1	= CFC_Partial Mix Factor
0	= Chlorine Demand of Discharge	15	= AFC_Criteria Compliance Time (min)
0.5	= BAT/BPJ Value	720	= CFC_Criteria Compliance Time (min)
0	= % Factor of Safety (FOS)		=Decay Coefficient (K)

Source	Reference	AFC Calculations	Reference	CFC Calculations
TRC	1.3.2.iii	WLA afc = 70.119	1.3.2.iii	WLA cfc = 369.429
PENTOXSD TRG	5.1a	LTAMULT afc = 0.373	5.1c	LTAMULT cfc = 0.581
PENTOXSD TRG	5.1b	LTA_afc= 26.128	5.1d	LTA_cfc = 214.769

Source	Effluent Limit Calculations
PENTOXSD TRG	5.1f AML MULT = 1.720
PENTOXSD TRG	5.1g AVG MON LIMIT (mg/l) = 0.500 BAT/BPJ
	INST MAX LIMIT (mg/l) = 1.170

WLA afc	$(.019/e^{-k \cdot AFC\_tc}) + [(AFC\_Yc \cdot Qs \cdot .019 / Qd \cdot e^{-k \cdot AFC\_tc}) \dots + Xd + (AFC\_Yc \cdot Qs \cdot Xs / Qd)] \cdot (1 - FOS / 100)$
LTAMULT afc	$EXP((0.5 \cdot LN(cvh^2 + 1)) - 2.326 \cdot LN(cvh^2 + 1)^{0.5})$
LTA_afc	$wla\_afc \cdot LTAMULT\_afc$
WLA_cfc	$(.011/e^{-k \cdot CFC\_tc}) + [(CFC\_Yc \cdot Qs \cdot .011 / Qd \cdot e^{-k \cdot CFC\_tc}) \dots + Xd + (CFC\_Yc \cdot Qs \cdot Xs / Qd)] \cdot (1 - FOS / 100)$
LTAMULT_cfc	$EXP((0.5 \cdot LN(cvd^2 / no\_samples + 1)) - 2.326 \cdot LN(cvd^2 / no\_samples + 1)^{0.5})$
LTA_cfc	$wla\_cfc \cdot LTAMULT\_cfc$
AML MULT	$EXP(2.326 \cdot LN((cvd^2 / no\_samples + 1)^{0.5}) - 0.5 \cdot LN(cvd^2 / no\_samples + 1))$
AVG MON LIMIT	$MIN(BAT\_BPJ, MIN(LTA\_afc, LTA\_cfc) \cdot AML\_MULT)$
INST MAX LIMIT	$1.5 \cdot ((av\_mon\_limit / AML\_MULT) / LTAMULT\_afc)$



Facility:	Greenville Metals		
Permit Number:	PA0100510	Effective: Pending Renewa	Expiration:
Outfall No:	001		
Location:	99 Crestview Drive Ext, Greenville, PA 16125		
Discharge to:	Shenango River		
Site Specific Mussel Survey Completed:	NO		
<b>Discharge and Stream Characteristics</b>			
Q <sub>s</sub>	Stream Flow	34 MGD / 53.29 cfs	
Q <sub>d</sub>	Discharge Flow	0.029 MGD / 0.04 cfs	
N <sub>s(Ni)</sub>	Instream nickel concentration	0 mg/L	WQN 913 ('00-'15) All results were less than the lower RL (50 ug/l)
N <sub>e(Ni)</sub>	Discharge nickel (existing)	561 mg/L	Max Value reported in 2019 Renewal Application
N <sub>p(Ni)</sub>	Discharge nickel (proposed)	561 mg/L	
C <sub>s(NH3-N)</sub>	Instream NH <sup>3</sup> -N	mg/L	
C <sub>e(NH3-N)</sub>	Discharge NH <sup>3</sup> -N (existing)	mg/L	
C <sub>p(NH3-N)</sub>	Discharge NH <sup>3</sup> -N (proposed)	mg/L	
pH <sub>s</sub>	Instream pH	7.41 S.U.	WQN 913 (geo mean-'00-'15)(June-Sept.)
T <sub>s</sub>	Instream Temp.	25 °C	Default (WWF)
C <sub>c(NH3-N)</sub>	Ammonia criteria	1.058 mg/L	From ammonia criteria comparison spreadsheet -using instream pH and Temp
N <sub>c(Ni)</sub>	Nickel criteria	7.3 ug/L	USFWS criteria
W <sub>s</sub>	Stream width	30.5 meters	Google Earth Measurement

<b>Ammonia Criteria Calculations:</b>			
	pH <sub>s</sub>	7.41 S.U.	(Default value is 7.0)
	T <sub>s</sub>	25 °C	(Default value is 20 °)
	<b>Acute Criteria</b>		
		METHOD and UNITS	CRITERIA
		Current CMC (mg TAN/L) =	4.605
		EPA 2013 CMC (mg TAN/L) =	6.951
			6.951
	<b>Chronic Criteria</b>		
		METHOD and UNITS	CRITERIA
	C <sub>c(NH3-N)</sub> Current CMC (mg TAN/L) =	1.058	
	EPA 2013 CMC (mg TAN/L) =	1.087	

**Endangered Mussel Species Impact Area Calculations:**

**Existing Area of Impact**

☒ N/A - No Site Specific Mussel Survey Completed for this Discharger

Approximate Area of Impact Determined from Survey =	N/A m <sup>2</sup>
Existing Mussel Density within Area of Impact =	
Rabbitsfoot ( <i>Quadrula cylindrica</i> )	per m <sup>2</sup>
Northern Riffleshell ( <i>Epioblasma torulosa rangiana</i> )	per m <sup>2</sup>
Rayed Bean ( <i>Villosa fabalis</i> )	per m <sup>2</sup>
Clubshell ( <i>Pleurobema clava</i> )	per m <sup>2</sup>
Sheepnose ( <i>Plethobasus cyphus</i> )	per m <sup>2</sup>
Snuffbox ( <i>Epioblasma triquetra</i> )	per m <sup>2</sup>
TOTAL	0 per m <sup>2</sup>

(Enter N/A if no site specific survey has been completed)

**Method 1 - Utilizing Site Specific Mussel Survey Information**

☒ N/A - No Site Specific Mussel Survey Completed for this Discharger

This method utilizes a simple comparison of the size of the existing area of impact as determined from a site specific mussel survey and the chlorides in the existing discharge compared to the chlorides in the proposed discharge after the facility upgrades treatment technologies. This method is only applicable to where the stream impairment is caused by TDS and/or chlorides as the plume has been delineated through conductivity measurements.

A. Area of Impact Determined from Survey:	N/A m <sup>2</sup>
B. Chlorides in Existing Discharge:	561 mg/L
C. Chlorides in Proposed Discharge after Treatment Facility Upgrades:	561 mg/L
D. Approximate Area of Impact after Treatment Facility Upgrades:	N/A m <sup>2</sup>

A/B = D/C                      Therefore, D = (A\*C)/B

Facility:	Greenville Metals		
Permit Number:	PA0100510	Effective: Pending Renewa	Expiration:
Outfall No:	001		
Location:	99 Crestview Drive Ext, Greenville, PA 16125		
Discharge to:	Shenango River		
Site Specific Mussel Survey Completed:	NO		

**Endangered Mussel Species Impact Area Calculations: (continued...)**

**Method 2 - Mass Balance Relationship of Loading and Assimilative Capacity of Stream**

Nickel (Ni)	$L_{S(Ni)} = \text{Available Nickel Loading in Stream} = N_{C(Ni)} - N_{S(Ni)} \times Q_S(\text{MGD}) \times 8.34 =$	2,070 lbs/Day
	$L_{D-MAX(Cl^-)} = \text{Current Maximum Discharge Chloride Loading} = C_{E(Cl^-)} \times Q_D(\text{MGD}) \times 8.34 =$	136 lbs/Day
	$\%E_{(Ni)} = \text{Percent of Stream Capacity for Current Loading} = L_{D-MAX(Ni)} / L_{S(Ni)} =$	7% of Stream Capacity
	$L_{D(Ni)} = \text{Proposed Discharge Ni Loading after Treatment Facility Upgrades} = N_{P(Ni)} \times Q_D(\text{MGD}) \times 8.34 =$	135.68346 lbs/Day
	$\%P_{(Ni)} = \text{Percent of Stream Capacity for Proposed Loading} = L_{D(Ni)} / L_{S(Ni)} =$	6.55% of Stream Capacity
	Proposed Area of Impact due to Nickel * = $(\%P_{(Ni)} \times W_S)^2 \times 0.5 =$ * assuming equal flow across transect and 90° spread at discharge	1.9984 m <sup>2</sup>
Ammonia-Nitrogen (NH3-N)	$L_{S(NH3-N)} = \text{Available NH3-N Loading in Stream} = C_{C(NH3-N)} - C_{S(NH3-N)} \times Q_S(\text{MGD}) \times 8.34 =$	300 lbs/Day
	$L_{D-MAX(NH3-N)} = \text{Current Maximum Discharge NH3-N Loading} = C_{E(NH3-N)} \times Q_D(\text{MGD}) \times 8.34 =$	0 lbs/Day
	$\%E_{(NH3-N)} = \text{Percent of Stream Capacity for Current Loading} = L_{D-MAX(NH3-N)} / L_{S(NH3-N)} =$	0% of Stream Capacity
	$L_{D(NH3-N)} = \text{Proposed Discharge NH3-N Loading after Treatment Facility Upgrades} = C_{P(NH3-N)} \times Q_D(\text{MGD}) \times 8.34 =$	0 lbs/Day
	$\%P_{(NH3-N)} = \text{Percent of Stream Capacity for Proposed Loading} = L_{D(NH3-N)} / L_{S(NH3-N)} =$	0.00% of Stream Capacity
	Proposed Area of Impact due to NH3-N * = $(\%P_{(NH3-N)} \times W_S)^2 \times 0.5 =$ * assuming equal flow across transect and 90° spread at discharge	0.0000 m <sup>2</sup>

**Method 3 - Mass Balance Relationship of Stream Flow, Proposed Effluent Quality, and Mussel Protection Criteria**

Nickel (Ni)	$Q_{A(Ni)} N_{S(Ni)} + Q_{DNP(Ni)} = Q_{TNC(Ni)}$	
	$Q_{A(Ni)} = \text{Assimilative Stream Flow Required to Achieve Criteria (cfs)}$	
	$Q_T = Q_S + Q_D \text{ (cfs)}$	
	$Q_{A(Ni)} N_{S(Ni)} + Q_{DNP(Ni)} = (Q_D + Q_S) N_{C(Ni)}$	
	SOLVING FOR $Q_{A(Ni)} = [(Q_D N_{P(Ni)} / N_{C(Ni)}) - Q_D] / (1 - N_{S(Ni)} / N_{C(Ni)}) =$	3.03 cfs
	$\%P_{(Ni)} = \text{Percent of Stream Width Required to Assimilate Nickel to Criteria Concentration} = Q_{A(Ni)} / Q_S \text{ (cfs)} =$	5.69%
	$W_{I(Ni)} = \text{Proposed Width of Stream required to Assimilate Nickel to Criteria Concentration} = W_S \times \%P_{(Ni)}$	1.73 meters
	Proposed Area of Impact due to Nickel * = $(W_{I(Ni)})^2 \times 0.5 =$ * assuming equal flow across transect and 90° spread at discharge	1.50 m <sup>2</sup>
Ammonia-Nitrogen (NH3-N)	$Q_{A(NH3-N)} C_{S(NH3-N)} + Q_D C_{P(NH3-N)} = Q_T C_{C(NH3-N)}$	
	$Q_{A(NH3-N)} = \text{Assimilative Stream Flow Required to Achieve Criteria (cfs)}$	
	$Q_T = Q_S + Q_D \text{ (cfs)}$	
	$Q_{A(NH3-N)} C_{S(NH3-N)} + Q_D C_{P(NH3-N)} = (Q_D + Q_S) C_{C(NH3-N)}$	
	SOLVING FOR $Q_{A(NH3-N)} = [(Q_D C_{P(NH3-N)} / C_{C(NH3-N)}) - Q_D] / (1 - C_{S(NH3-N)} / C_{C(NH3-N)}) =$	-0.04 cfs
	$\%P_{(NH3-N)} = \text{Percent of Stream Width Required to Assimilate NH3-N to Criteria Concentration} = Q_{A(NH3-N)} / Q_S \text{ (cfs)} =$	-0.08%
	$W_{I(NH3-N)} = \text{Proposed Width of Stream required to Assimilate NH3-N to Criteria Concentration} = W_S \times \%P_{(NH3-N)}$	-0.02 meters
	Proposed Area of Impact due to NH3-N * = $(W_{I(NH3-N)})^2 \times 0.5 =$ * assuming equal flow across transect and 90° spread at discharge	0.00 m <sup>2</sup>

Facility:	Greenville Metals		
Permit Number:	PA0100510	Effective: Pending Renewa	Expiration:
Outfall No:	001		
Location:	99 Crestview Drive Ext, Greenville, PA 16125		
Discharge to:	Shenango River		
Site Specific Mussel Survey Completed:	NO		

Summary

				Mussels Potentially Taken as result of Discharge (approximate)							Comments
				Mussel Species							
				Rabbitsfoot ( <i>Quadrula cylindrica</i> )	Northern Riffleshell ( <i>Epioblasma torulosa rangiana</i> )	Rayed Bean ( <i>Villosa fabalis</i> )	Clubshell ( <i>Pleurobema clava</i> )	Sheepnose ( <i>Plethobasus cyphus</i> )	Snuffbox ( <i>Epioblasma triquetra</i> )	Total Density	
Approximate Mussel Density (per m²)										0	
Existing Area of Impact		N/A	m²	N/A	N/A	N/A	N/A	N/A	N/A	N/A	
Area of Impact with Proposed Treatment Facility Upgrades	Method 1 Area of Impact										
	as result of nickel		N/A	m²	N/A	N/A	N/A	N/A	N/A	N/A	
	as result of NH3-N		N/A	m²	N/A	N/A	N/A	N/A	N/A	N/A	
	Method 2 Area of Impact										
	as result of nickel		2.00	m²	0	0	0	0	0	0	
	as result of NH3-N		N/A	m²	N/A	N/A	N/A	N/A	N/A	N/A	
	Method 3 Area of Impact										
	as result of nickel		1.50	m²	0	0	0	0	0	0	
	as result of NH3-N		0.00	m²	0	0	0	0	0	0	

Facility:	Greenville Metals		
Permit Number:	PA0100510	Effective: Pending Renewa	Expiration:
Outfall No:	009		
Location:	99 Crestview Drive Ext, Greenville, PA 16125		
Discharge to:	Shenango River		
Site Specific Mussel Survey Completed:	NO		
<b>Discharge and Stream Characteristics</b>			
Q <sub>s</sub>	Stream Flow	34 MGD / 53.29 cfs	
Q <sub>d</sub>	Discharge Flow	0.069 MGD / 0.11 cfs	converted flowrate of 0.012 MGD discharged over approximately 3 hours.
N <sub>s(Ni)</sub>	Instream nickel concentration	0 mg/L	WQN 913 ('00-'15) All results were less than the lower RL (50 ug/l)
N <sub>e(Ni)</sub>	Discharge nickel (existing)	172 ug/L	Max Value reported in 2019 Renewal Application
N <sub>p(Ni)</sub>	Discharge nickel (proposed)	172 ug/L	
C <sub>s(NH3-N)</sub>	Instream NH <sup>3</sup> -N	mg/L	
C <sub>e(NH3-N)</sub>	Discharge NH <sup>3</sup> -N (existing)	mg/L	
C <sub>p(NH3-N)</sub>	Discharge NH <sup>3</sup> -N (proposed)	mg/L	
pH <sub>s</sub>	Instream pH	7.41 S.U.	WQN 913 (geo mean-'00-'15)(June-Sept.)
T <sub>s</sub>	Instream Temp.	25 °C	Default (WWF)
C <sub>c(NH3-N)</sub>	Ammonia criteria	1.058 mg/L	From ammonia criteria comparison spreadsheet -using instream pH and Temp
N <sub>c(Ni)</sub>	Nickel criteria	7.3 ug/L	USFWS criteria
W <sub>s</sub>	Stream width	30.5 meters	Google Earth Measurement

<b>Ammonia Criteria Calculations:</b>			
	pH <sub>s</sub>	7.41 S.U.	(Default value is 7.0)
	T <sub>s</sub>	25 °C	(Default value is 20 °)
	<b>Acute Criteria</b>		
		METHOD and UNITS	CRITERIA
		Current CMC (mg TAN/L) =	4.605
		EPA 2013 CMC (mg TAN/L) =	6.951
			6.951
	<b>Chronic Criteria</b>		
		METHOD and UNITS	CRITERIA
	C <sub>c(NH3-N)</sub> Current CMC (mg TAN/L) =	1.058	
	EPA 2013 CMC (mg TAN/L) =	1.087	

**Endangered Mussel Species Impact Area Calculations:**

**Existing Area of Impact**

☒ N/A - No Site Specific Mussel Survey Completed for this Discharger

Approximate Area of Impact Determined from Survey =	N/A m <sup>2</sup>
Existing Mussel Density within Area of Impact =	
Rabbitsfoot ( <i>Quadrula cylindrica</i> )	per m <sup>2</sup>
Northern Riffleshell ( <i>Epioblasma torulosa rangiana</i> )	per m <sup>2</sup>
Rayed Bean ( <i>Villosa fabalis</i> )	per m <sup>2</sup>
Clubshell ( <i>Pleurobema clava</i> )	per m <sup>2</sup>
Sheepnose ( <i>Plethobasus cyphus</i> )	per m <sup>2</sup>
Snuffbox ( <i>Epioblasma triquetra</i> )	per m <sup>2</sup>
TOTAL	0 per m <sup>2</sup>

(Enter N/A if no site specific survey has been completed)

**Method 1 - Utilizing Site Specific Mussel Survey Information**

☒ N/A - No Site Specific Mussel Survey Completed for this Discharger

This method utilizes a simple comparison of the size of the existing area of impact as determined from a site specific mussel survey and the chlorides in the existing discharge compared to the chlorides in the proposed discharge after the facility upgrades treatment technologies. This method is only applicable to where the stream impairment is caused by TDS and/or chlorides as the plume has been delineated through conductivity measurements.

A. Area of Impact Determined from Survey:	N/A m <sup>2</sup>
B. Chlorides in Existing Discharge:	172 mg/L
C. Chlorides in Proposed Discharge after Treatment Facility Upgrades:	172 mg/L
D. Approximate Area of Impact after Treatment Facility Upgrades:	N/A m <sup>2</sup>

A/B = D/C                      Therefore, D = (A\*C)/B

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Discharge to:	Shenango River		
Site Specific Mussel Survey Completed:	NO		

**Endangered Mussel Species Impact Area Calculations: (continued...)**

**Method 2 - Mass Balance Relationship of Loading and Assimilative Capacity of Stream**

Nickel (Ni)	$L_{S(Ni)} = \text{Available Nickel Loading in Stream} = N_{C(Ni)} - N_{S(Ni)} \times Q_S(\text{MGD}) \times 8.34 =$	2,070 lbs/Day
	$L_{D-MAX(Cl^-)} = \text{Current Maximum Discharge Chloride Loading} = C_{E(Cl^-)} \times Q_D(\text{MGD}) \times 8.34 =$	99 lbs/Day
	$\%E_{(Ni)} = \text{Percent of Stream Capacity for Current Loading} = L_{D-MAX(Ni)} / L_{S(Ni)} =$	5% of Stream Capacity
	$L_{D(Ni)} = \text{Proposed Discharge Ni Loading after Treatment Facility Upgrades} = N_{P(Ni)} \times Q_D(\text{MGD}) \times 8.34 =$	98.97912 lbs/Day
	$\%P_{(Ni)} = \text{Percent of Stream Capacity for Proposed Loading} = L_{D(Ni)} / L_{S(Ni)} =$	4.78% of Stream Capacity
	Proposed Area of Impact due to Nickel * = $(\%P_{(Ni)} \times W_S)^2 \times 0.5 =$ * assuming equal flow across transect and 90° spread at discharge	1.0634 m <sup>2</sup>
Ammonia-Nitrogen (NH3-N)	$L_{S(NH3-N)} = \text{Available NH3-N Loading in Stream} = C_{C(NH3-N)} - C_{S(NH3-N)} \times Q_S(\text{MGD}) \times 8.34 =$	300 lbs/Day
	$L_{D-MAX(NH3-N)} = \text{Current Maximum Discharge NH3-N Loading} = C_{E(NH3-N)} \times Q_D(\text{MGD}) \times 8.34 =$	0 lbs/Day
	$\%E_{(NH3-N)} = \text{Percent of Stream Capacity for Current Loading} = L_{D-MAX(NH3-N)} / L_{S(NH3-N)} =$	0% of Stream Capacity
	$L_{D(NH3-N)} = \text{Proposed Discharge NH3-N Loading after Treatment Facility Upgrades} = C_{P(NH3-N)} \times Q_D(\text{MGD}) \times 8.34 =$	0 lbs/Day
	$\%P_{(NH3-N)} = \text{Percent of Stream Capacity for Proposed Loading} = L_{D(NH3-N)} / L_{S(NH3-N)} =$	0.00% of Stream Capacity
	Proposed Area of Impact due to NH3-N * = $(\%P_{(NH3-N)} \times W_S)^2 \times 0.5 =$ * assuming equal flow across transect and 90° spread at discharge	0.0000 m <sup>2</sup>

**Method 3 - Mass Balance Relationship of Stream Flow, Proposed Effluent Quality, and Mussel Protection Criteria**

Nickel (Ni)	$Q_{A(Ni)} N_{S(Ni)} + Q_{DNP(Ni)} = Q_{TNC(Ni)}$	
	$Q_{A(Ni)} = \text{Assimilative Stream Flow Required to Achieve Criteria (cfs)}$	
	$Q_T = Q_S + Q_D \text{ (cfs)}$	
	$Q_{A(Ni)} N_{S(Ni)} + Q_{DNP(Ni)} = (Q_D + Q_S) N_{C(Ni)}$	
	SOLVING FOR $Q_{A(Ni)} = [(Q_D N_{P(Ni)} / N_{C(Ni)}) - Q_D] / (1 - N_{S(Ni)} / N_{C(Ni)}) =$	2.48 cfs
	$\%P_{(Ni)} = \text{Percent of Stream Width Required to Assimilate Nickel to Criteria Concentration} = Q_{A(Ni)} / Q_S \text{ (cfs)} =$	4.65%
	$W_{I(Ni)} = \text{Proposed Width of Stream required to Assimilate Nickel to Criteria Concentration} = W_S \times \%P_{(Ni)}$	1.42 meters
	Proposed Area of Impact due to Nickel * = $(W_{I(Ni)})^2 \times 0.5 =$ * assuming equal flow across transect and 90° spread at discharge	1.01 m <sup>2</sup>
Ammonia-Nitrogen (NH3-N)	$Q_{A(NH3-N)} C_{S(NH3-N)} + Q_D C_{P(NH3-N)} = Q_T C_{C(NH3-N)}$	
	$Q_{A(NH3-N)} = \text{Assimilative Stream Flow Required to Achieve Criteria (cfs)}$	
	$Q_T = Q_S + Q_D \text{ (cfs)}$	
	$Q_{A(NH3-N)} C_{S(NH3-N)} + Q_D C_{P(NH3-N)} = (Q_D + Q_S) C_{C(NH3-N)}$	
	SOLVING FOR $Q_{A(NH3-N)} = [(Q_D C_{P(NH3-N)} / C_{C(NH3-N)}) - Q_D] / (1 - C_{S(NH3-N)} / C_{C(NH3-N)}) =$	-0.11 cfs
	$\%P_{(NH3-N)} = \text{Percent of Stream Width Required to Assimilate NH3-N to Criteria Concentration} = Q_{A(NH3-N)} / Q_S \text{ (cfs)} =$	-0.21%
	$W_{I(NH3-N)} = \text{Proposed Width of Stream required to Assimilate NH3-N to Criteria Concentration} = W_S \times \%P_{(NH3-N)}$	-0.06 meters
	Proposed Area of Impact due to NH3-N * = $(W_{I(NH3-N)})^2 \times 0.5 =$ * assuming equal flow across transect and 90° spread at discharge	0.00 m <sup>2</sup>

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Discharge to:	Shenango River		
Site Specific Mussel Survey Completed:	NO		

Summary

				Mussels Potentially Taken as result of Discharge (approximate)							Comments
				Mussel Species							
				Rabbitsfoot ( <i>Quadrula cylindrica</i> )	Northern Riffleshell ( <i>Epioblasma torulosa rangiana</i> )	Rayed Bean ( <i>Villosa fabalis</i> )	Clubshell ( <i>Pleurobema clava</i> )	Sheepnose ( <i>Plethobasus cyphus</i> )	Snuffbox ( <i>Epioblasma triquetra</i> )	Total Density	
Approximate Mussel Density (per m²)										0	
Existing Area of Impact			N/A	m²	N/A	N/A	N/A	N/A	N/A	N/A	
Area of Impact with Proposed Treatment Facility Upgrades	Method 1 Area of Impact										
	as result of nickel		N/A	m²	N/A	N/A	N/A	N/A	N/A	N/A	
	as result of NH3-N		N/A	m²	N/A	N/A	N/A	N/A	N/A	N/A	
	Method 2 Area of Impact										
	as result of nickel		1.06	m²	0	0	0	0	0	0	
	as result of NH3-N		N/A	m²	N/A	N/A	N/A	N/A	N/A	N/A	
	Method 3 Area of Impact										
	as result of nickel		1.01	m²	0	0	0	0	0	0	
	as result of NH3-N		0.00	m²	0	0	0	0	0	0	