

Application Type Renewal  
Facility Type Industrial  
Major / Minor Minor

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

Application No. PA0002038  
APS ID 1016759  
Authorization ID 1314996

**Applicant and Facility Information**

Applicant Name	<u>Borchers America Inc.</u>	Facility Name	<u>Borchers America</u>
Applicant Address	<u>P.O. Box 111</u> <u>Franklin, PA 16323--111</u>	Facility Address	<u>240 Two Mile Run Road</u> <u>Franklin, PA 16323-6250</u>
Applicant Contact	<u>James Daugherty</u>	Facility Contact	<u>Steve Graf</u>
Applicant Phone	<u>(814) 437-6002</u>	Facility Phone	<u>(814) 437-6055</u>
Client ID	<u>37257</u>	Site ID	<u>242125</u>
SIC Code	<u>2819</u>	Municipality	<u>Sugarcreek Borough</u>
SIC Description	<u>Manufacturing - Industrial Inorganic Chemicals, Nec</u>	County	<u>Venango</u>
Date Application Received	<u>May 12, 2020</u>	EPA Waived?	<u>Yes</u>
Date Application Accepted	<u>May 26, 2020</u>	If No, Reason	<u></u>
Purpose of Application	<u>Renewal of any NPDES Permit for an NPDES Permit for an existing discharge of Industrial Waste</u>		

**Summary of Review**

This is a specialty chemical manufacturing plant engaged primarily in batch production of metal carboxylates. Wastewater consists of cooling tower and boiler blowdown, sand filter backflushes, and stormwater.

Outfall 001 and 006 have been removed since the previous permit was issued. Outfall 001 was permanently disconnected in 2016 and Outfall 006 is now the responsibility of AM Stabilizers, who have obtained a separate NPDES Permit.

There are four chemical additives currently being used at this facility.

Outfall 002 discharges to the Allegheny 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 14 of this Fact Sheet.

There are currently no open violations listed in EFACTS for this permittee (5/03/2023). [5/5/2023 CWY](#)

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 J. Pesek Adam J. Pesek, E.I.T. / Project Manager	5/03/2023
X		Chad W. Yurisc Chad W. Yurisc, P.E. / Environmental Program Manager	5/5/2023

Discharge, Receiving Waters and Water Supply Information			
Outfall No.	002	Design Flow (MGD)	0.1332*
Latitude	41° 24' 28.94"	Longitude	-79° 47' 32.15"
Quad Name	Franklin	Quad Code	0707
Wastewater Description:	Cooling tower blowdown, boiler blowdown and filter backwash (Suboutfall 602) and non-contact cooling water (Suboutfall 702)		
Receiving Waters	Allegheny River	Stream Code	42122
NHD Com ID	100476827	RMI	125.7
Drainage Area	4745.9	Yield (cfs/mi <sup>2</sup> )	0.246
Q <sub>7-10</sub> Flow (cfs)	1169.08	Q <sub>7-10</sub> Basis	Allegheny River @ Franklin gage minus French Creek flow
Elevation (ft)	968.5	Slope (ft/ft)	
Watershed No.	16-E	Chapter 93 Class.	WWF
Existing Use		Existing Use Qualifier	
Exceptions to Use		Exceptions to Criteria	
Assessment Status	Impaired		
Cause(s) of Impairment	MERCURY		
Source(s) of Impairment	SOURCE UNKNOWN		
TMDL Status	Pending	Name	
Background/Ambient Data		Data Source	
pH (SU)	7.43		WQN #805 – Allegheny River @ West Hickory (July-Sept.)
Temperature (°C)	25		Default (WWF)
Hardness (mg/L)	41.6		WQN #805 – Allegheny River @ West Hickory (July-Sept.)
Other:			
Nearest Downstream Public Water Supply Intake	Aqua Pennsylvania, Inc. – Emlenton		
PWS Waters	Allegheny River	Flow at Intake (cfs)	1450
PWS RMI	90	Distance from Outfall (mi)	30

Changes Since Last Permit Issuance:

Other Comments: Suboutfalls 602 and 702 are internal outfalls that discharge via Outfall 002.

\*Discharge flow is derived from a 92.5 GPM discharge rate over approximately 3.5 hours occurring 4-6 times a month.

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

Outfall No.	003	Design Flow (MGD)	0
Latitude	41° 24' 45.74"	Longitude	-79° 47' 51.75"
Outfall No.	004	Design Flow (MGD)	0
Latitude	41° 24' 40.06"	Longitude	-79° 47' 44.35"
Outfall No.	007	Design Flow (MGD)	0
Latitude	41° 24' 40.29"	Longitude	-79° 47' 47.94"
Outfall No.	008	Design Flow (MGD)	0
Latitude	41° 24' 43.10"	Longitude	-79° 47' 50.38"
Outfall No.	010	Design Flow (MGD)	0
Latitude	41° 24' 34.71"	Longitude	-79° 47' 37.38"
Quad Name	Franklin	Quad Code	0707
Wastewater Description: Stormwater associated with industrial activities			

Receiving Waters	Unnamed Tributary to Twomile Run (Race Run)	Stream Code	54096
NHD Com ID	100476715	RMI	---
Drainage Area	0.5 mi <sup>2</sup>	Yield (cfs/mi <sup>2</sup> )	0.1
Q <sub>7-10</sub> Flow (cfs)	0.05	Q <sub>7-10</sub> Basis	Default
Elevation (ft)	980	Slope (ft/ft)	
Watershed No.	16-E	Chapter 93 Class.	CWF
Existing Use		Existing Use Qualifier	
Exceptions to Use		Exceptions to Criteria	

Assessment Status	Attaining Use(s)
Cause(s) of Impairment	
Source(s) of Impairment	
TMDL Status	Name

Background/Ambient Data	Data Source
pH (SU)	7
Temperature (°F)	Default
Hardness (mg/L)	100
Other:	Default

Nearest Downstream Public Water Supply Intake	Aqua Pennsylvania, Inc. – Emlenton
PWS Waters	Allegheny River
PWS RMI	90.0
	Flow at Intake (cfs)
	Distance from Outfall (mi)
	30

Changes Since Last Permit Issuance:

Other Comments: A Point of First Use Determination was conducted on Race Run on August 26, 2015 by the Department to determine if it was a perennial stream in the area passing beside the facility and if the stream path of what was once Tributary 54096 to Two Mile Creek was redirected at some point in time to flow around the west side of the facility. The Determination concluded that Race Run was indeed perennial in the area flowing beside the facility and that it is part of Tributary 54096, whose flow pattern was redirected around the facility

Discharge, Receiving Waters and Water Supply Information			
Outfall No.	009	Design Flow (MGD)	0
Latitude	41° 24' 43.79"	Longitude	-79° 47' 42.30"
Outfall No.	011	Design Flow (MGD)	0
Latitude	41° 24' 41.82"	Longitude	-79° 47' 40.72"
Quad Name	Franklin	Quad Code	0707
Wastewater Description: Stormwater Associated with Industrial Activities			
Receiving Waters	Twomile Run	Stream Code	54094
NHD Com ID	100476653	RMI	---
Drainage Area	20.1 mi <sup>2</sup>	Yield (cfs/mi <sup>2</sup> )	0.1
Q <sub>7-10</sub> Flow (cfs)	0.21	Q <sub>7-10</sub> Basis	Default
Elevation (ft)		Slope (ft/ft)	
Watershed No.	16-E	Chapter 93 Class.	CWF
Existing Use		Existing Use Qualifier	
Exceptions to Use		Exceptions to Criteria	
Assessment Status	Attaining Use(s)		
Cause(s) of Impairment			
Source(s) of Impairment			
TMDL Status		Name	
Background/Ambient Data		Data Source	
pH (SU)	7	Default	
Temperature (°F)			
Hardness (mg/L)	100	Default	
Other:			
Nearest Downstream Public Water Supply Intake	Aqua Pennsylvania, Inc. – Emlenton		
PWS Waters	Allegheny River	Flow at Intake (cfs)	
PWS RMI	90.0	Distance from Outfall (mi)	30

Changes Since Last Permit Issuance:

Other Comments:

Compliance History	
Summary of DMRs:	No effluent violations were reported in the last 5 years.
Summary of Inspections:	Last site inspection was conducted on 4/25/2019. The inspection report did not indicate any violations or major issues. It was noted that Outfall 011 has been redirected to a concrete trap area in the case of a spill near the tank farm before it discharges to a stream.

Other Comments:

Compliance History

DMR Data for Outfall 002 (from October 1, 2021 to September 30, 2022)

Parameter	SEP-22	AUG-22	JUL-22	JUN-22	MAY-22	APR-22	MAR-22	FEB-22	JAN-22	DEC-21	NOV-21	OCT-21
Flow (MGD)	0.00408	0.00369	0.00427	0.00400	0.00414	0.00402	0.00573	0.00378	0.00366	0.00344		0.00393
Average Monthly	6	7	8	4	8	4	4	3	6	0	0.00379	2

DMR Data for Outfall 003 (from October 1, 2021 to September 30, 2022)

Parameter	SEP-22	AUG-22	JUL-22	JUN-22	MAY-22	APR-22	MAR-22	FEB-22	JAN-22	DEC-21	NOV-21	OCT-21
Flow (MGD)												
Annual Average										0.0123		
pH (S.U.)												
Annual Average										7.4		
COD (mg/L)												
Annual Average										49.4		
TSS (mg/L)												
Annual Average										30		
Total Aluminum (mg/L)												
Annual Average										0.257		
Total Iron (mg/L)												
Annual Average										0.686		
Total Zinc (mg/L)												
Annual Average										0.056		

DMR Data for Outfall 004 (from October 1, 2021 to September 30, 2022)

Parameter	SEP-22	AUG-22	JUL-22	JUN-22	MAY-22	APR-22	MAR-22	FEB-22	JAN-22	DEC-21	NOV-21	OCT-21
Flow (MGD)												
Annual Average										0.02615		
pH (S.U.)												
Annual Average										8.0		
COD (mg/L)												
Annual Average										66.7		
TSS (mg/L)												
Annual Average										80		
Total Aluminum (mg/L)												
Annual Average										0.63		

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Total Iron (mg/L) Annual Average										2.39		
Total Zinc (mg/L) Annual Average										0.146		

**DMR Data for Outfall 007 (from October 1, 2021 to September 30, 2022)**

Parameter	SEP-22	AUG-22	JUL-22	JUN-22	MAY-22	APR-22	MAR-22	FEB-22	JAN-22	DEC-21	NOV-21	OCT-21
Flow (MGD) Annual Average										0.00508		
pH (S.U.) Annual Average										7.6		
COD (mg/L) Annual Average										25.6		
TSS (mg/L) Annual Average										10		
Total Aluminum (mg/L) Annual Average										0.123		
Total Iron (mg/L) Annual Average										0.877		
Total Zinc (mg/L) Annual Average										0.0746		

**DMR Data for Outfall 008 (from October 1, 2021 to September 30, 2022)**

Parameter	SEP-22	AUG-22	JUL-22	JUN-22	MAY-22	APR-22	MAR-22	FEB-22	JAN-22	DEC-21	NOV-21	OCT-21
Flow (MGD) Annual Average										0.00976 3		
pH (S.U.) Annual Average										7.9		
COD (mg/L) Annual Average										42.9		
TSS (mg/L) Annual Average										21		
Total Aluminum (mg/L) Annual Average										0.269		
Total Iron (mg/L) Annual Average										0.848		
Total Zinc (mg/L) Annual Average										0.0779		

DMR Data for Outfall 009 (from October 1, 2021 to September 30, 2022)

Parameter	SEP-22	AUG-22	JUL-22	JUN-22	MAY-22	APR-22	MAR-22	FEB-22	JAN-22	DEC-21	NOV-21	OCT-21
Flow (MGD) Annual Average										0.02138 9		
pH (S.U.) Annual Average										7.1		
COD (mg/L) Annual Average										< 25		
TSS (mg/L) Annual Average										5		
Total Aluminum (mg/L) Annual Average										0.116		
Total Iron (mg/L) Annual Average										0.194		
Total Zinc (mg/L) Annual Average										0.163		

DMR Data for Outfall 010 (from October 1, 2021 to September 30, 2022)

Parameter	SEP-22	AUG-22	JUL-22	JUN-22	MAY-22	APR-22	MAR-22	FEB-22	JAN-22	DEC-21	NOV-21	OCT-21
Flow (MGD) Annual Average										0.03527		
pH (S.U.) Annual Average										7.7		
COD (mg/L) Annual Average										55.9		
TSS (mg/L) Annual Average										23		
Total Aluminum (mg/L) Annual Average										0.271		
Total Iron (mg/L) Annual Average										4.22		
Total Zinc (mg/L) Annual Average										0.0482		

DMR Data for Outfall 011 (from October 1, 2021 to September 30, 2022)

Parameter	SEP-22	AUG-22	JUL-22	JUN-22	MAY-22	APR-22	MAR-22	FEB-22	JAN-22	DEC-21	NOV-21	OCT-21
Flow (MGD) Annual Average										0.00095 5		



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pH (S.U.) Annual Average										7.6		
COD (mg/L) Annual Average										34.3		
TSS (mg/L) Annual Average										16		
Total Aluminum (mg/L) Annual Average										0.177		
Total Iron (mg/L) Annual Average										0.472		
Total Zinc (mg/L) Annual Average										0.0548		

**DMR Data for Outfall 602 (from October 1, 2021 to September 30, 2022)**

Parameter	SEP-22	AUG-22	JUL-22	JUN-22	MAY-22	APR-22	MAR-22	FEB-22	JAN-22	DEC-21	NOV-21	OCT-21
Flow (MGD) Internal Monitoring Point   Average Monthly	0.00408 6	0.00369 7	0.00427 8	0.00400 4	0.00414 8	0.00402 4	0.00573 4	0.00378 3	0.00366 6	0.00344 0	0.00379	0.00393 2
pH (S.U.) Internal Monitoring Point   Minimum	7.3	7.6	7.2	7.0	7.3	7.9	7.8	7.9	7.6	8.0	7.9	7.9
pH (S.U.) Internal Monitoring Point   Instantaneous Maximum	7.8	7.8	7.8	7.6	8.0	8.7	8.1	8.3	8.8	8.2	8.2	8.4
TSS (mg/L) Internal Monitoring Point   Average Monthly	< 4	8	< 4	< 4	< 4	< 4	< 4	< 4	< 4	< 4	< 4	< 4
Total Aluminum (mg/L) Internal Monitoring Point   Average Monthly	0.0756	0.0665	0.184	1.11	1.25	1.23	0.887	0.95	0.524	1.21	0.85	0.699
Total Iron (mg/L) Internal Monitoring Point   Average Monthly	0.498	0.514	0.56	0.512	0.411	0.59	0.509	1.14	0.146	0.367	0.199	0.218

**Development of Effluent Limitations**

<b>Outfall No.</b>	<u>002</u>	<b>Design Flow (MGD)</b>	<u>0.1332</u>
<b>Latitude</b>	<u>41° 24' 28.94"</u>	<b>Longitude</b>	<u>-79° 47' 32.15"</u>
<b>Wastewater Description:</b>	<u>Cooling tower blowdown, boiler blowdown and filter backwash (Suboutfall 602) and non-contact cooling water (Suboutfall 702)</u>		

**Technology-Based Limitations**

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

There are no technology-based limits for the boiler blowdown and non-contact cooling water. Technology-based limits for the filter backwash are applied at Suboutfall 602.

**Water Quality-Based Limitations**

Comments: None were determined using the Department's Toxic Management Spreadsheet or Thermal Discharge Limit Calc Spreadsheet.

**Best Professional Judgment (BPJ) Limitations**

Comments: Flow will continue to be monitored at this main outfall.

**Other Considerations**

The facility has a surface water intake on Two Mile Run Creek. The intake does not meet the criteria for 40 CFR §316(b) cooling water intake applicability. The Department's SOP entitled "Establishing Best Technology Available (BTA) using BPJ for Cooling Water Intake Structures at Existing NPDES Facilities" was alternately considered but was not applied because the facility does not use any BTA equipment for impingement or entrainment avoidance.

There is also a return of excess water from the intake pumps that are returned to the Two Mile Run Creek when it is not needed for plant operations. This is considered a "water transfer" as defined in 40 CFR §122.3(i) and does not require permitting under the NPDES Program.

**Anti-Backsliding**

N/A

**Development of Effluent Limitations**

<b>Outfall No.</b>	602	<b>Design Flow (MGD)</b>	0.1332
<b>Latitude</b>	41° 24' 44.67"	<b>Longitude</b>	-79° 47' 44.58"
<b>Wastewater Description:</b>	Combined water from cooling tower blowdown, boiler blowdown (on annual basis) and filter backwash		

**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
Total Suspended Solids	30	Average Monthly		362-2183-003
Total Suspended Solids	40	Daily Maximum		362-2183-003
Aluminum	4.0	Average Monthly		362-2183-003
Aluminum	8.0	Daily Maximum		362-2183-003
Manganese	1.0	Average Monthly		362-2183-003
Manganese	2.0	Daily Maximum		362-2183-003
Total Iron	2.0	Average Monthly		362-2183-003
Total Iron	4.0	Daily Maximum		362-2183-003
Total Residual Chlorine	0.5	Average Monthly		92a.48(b)(2)
Total Residual Chlorine	1.0	Daily Maximum		362-2183-003
pH	6.0 – 9.0 S.U.	Min – Max	133.102(c)	95.2(1)

Comments: 362-2183-003 References the Department's technical guidance document entitled "Technology-based Control Requirements for Water Treatment Plant Wastes." The limits are BPT (Best Practical Control Technology) and are not based on actual regulation. The Department has identified the TSD requirements as the Best Available Treatment (BAT) that, as a minimum, the permittee will be required to meet. Since no federal effluent limitation guidelines (ELGs) have been promulgated, the Department's Best Professional Judgment of BAT, as outlined in the TSD, satisfies the Federal requirements of the 40 CFR 125.3(d) regulations.

Please note that the BPJ TRC limits above will not be applied because the source water does not contain residual chlorine, nor is it added anywhere in the facility's processes.

Manganese was previously omitted as it was only present in trace amounts. A review of application data finds that it still only found in trace amounts and therefore will continue to be omitted in the renewed permit.

**Water Quality-Based Limitations**

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

Comments: Determination for need of WQBELs was made at Outfall 002.

**Best Professional Judgment (BPJ) Limitations**

Comments: See Tech-Based Limitations section above.

**Anti-Backsliding**

N/A

**Development of Effluent Limitations**

<b>Outfall No.</b>	<u>702</u>	<b>Design Flow (MGD)</b>	<u>0.007</u>
<b>Latitude</b>	<u>41° 24' 43.01"</u>	<b>Longitude</b>	<u>-79° 47' 43.43"</u>
<b>Wastewater Description:</b> <u>Non-contact cooling water (on an annual basis)</u>			

**Technology-Based Limitations**

Comments: None

**Water Quality-Based Limitations**

Comments: Determination for need of WQBELs was made at Outfall 002.

**Best Professional Judgment (BPJ) Limitations**

Comments: Flow monitoring will remain in the permit in the event an emergency discharge occurs. The special condition in Part C.I.E. in the proposed permit states there shall be no net addition of pollutants to non-contact cooling water over intake values.

**Anti-Backsliding**

N/A

**Development of Effluent Limitations**

<b>Outfall No.</b>	003	<b>Design Flow (MGD)</b>	0
<b>Latitude</b>	41° 24' 45.74"	<b>Longitude</b>	-79° 47' 51.76"
<b>Outfall No.</b>	004	<b>Design Flow (MGD)</b>	0
<b>Latitude</b>	41° 24' 40.06"	<b>Longitude</b>	79° 47' 44.35"
<b>Outfall No.</b>	007	<b>Design Flow (MGD)</b>	0
<b>Latitude</b>	41° 24' 40.29"	<b>Longitude</b>	79° 47' 47.94"
<b>Outfall No.</b>	008	<b>Design Flow (MGD)</b>	0
<b>Latitude</b>	41° 24' 43.1"	<b>Longitude</b>	79° 47' 50.38"
<b>Outfall No.</b>	009	<b>Design Flow (MGD)</b>	0
<b>Latitude</b>	41° 24' 43.79"	<b>Longitude</b>	79° 47' 42.3"
<b>Outfall No.</b>	010	<b>Design Flow (MGD)</b>	0
<b>Latitude</b>	41° 24' 34.71"	<b>Longitude</b>	79° 47' 37.38"
<b>Outfall No.</b>	011	<b>Design Flow (MGD)</b>	0
<b>Latitude</b>	41° 24' 41.82"	<b>Longitude</b>	79° 47' 40.72"
<b>Wastewater Description:</b> Stormwater associated with industrial activities			

**Technology-Based Limitations**

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

Comments: None applied

**Water Quality-Based Limitations**

Comments: None applied

**Best Professional Judgment (BPJ) Limitations**

Comments: Monitoring Requirements and Benchmark values from the PAG-03 General Permit, Appendix F, will be placed in the permit in accordance with the Department's SOP entitled "Establishing Effluent Limitations for Individual Industrial Permits."

Pollutant	Monitoring Requirements <sup>(1),(2)</sup>		Benchmark Values
	Minimum Measurement Frequency	Sample Type	
Total Nitrogen (mg/L) <sup>(3)</sup>	1 / 6 months	Calculation	XXX
Total Phosphorus (mg/L)	1 / 6 months	Grab	XXX
pH (S.U.)	1 / 6 months	Grab	9.0
Chemical Oxygen Demand (COD) (mg/L)	1 / 6 months	Grab	120
Total Suspended Solids (TSS) (mg/L)	1 / 6 months	Grab	100
Nitrate + Nitrite-Nitrogen (mg/L)	1 / 6 months	Grab	3.0
Total Lead (mg/L)	1 / 6 months	Grab	XXX
Total Zinc (mg/L)	1 / 6 months	Grab	XXX
Total Iron (mg/L)	1 / 6 months	Grab	XXX
Total Aluminum (mg/L)	1 / 6 months	Grab	XXX

**Anti-Backsliding**

N/A

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

This segment of the Allegheny River is known to also contain federal and state listed threatened and endangered mussel species. Due to the Outfall 002 discharging directly to the Allegheny River, potential impacts to endangered mussel species were evaluated.

The USFWS has indicated in comment letters and email correspondence on other NPDES permits, that to protect threatened and endangered mussel species, wastewater discharges containing ammonia-nitrogen (NH<sub>3</sub>-N), chloride (Cl<sup>-</sup>) dissolved nickel, dissolved zinc, and total copper where mussels or their habitat exist, can be no more than 1.9 mg/l, 78 mg/l, 7.3 µg/l, 13.18 µg/l, and 10 µg/l respectively. Therefore, the Department has considered all of these parameters in this evaluation.

The calculated site- specific criteria based on WQN Station 805 stream background pH data and default temperature for a WWF (pH of 7.43 and temperature of 25) results in NH<sub>3</sub>-N criteria of 1.07 mg/l.

A summary of the sampling data for ammonia-nitrogen (NH<sub>3</sub>-N), nickel, zinc, and copper are based on three samples at Outfall 001 for the 2020 renewal application, and chloride (Cl<sup>-</sup>) and temperature based on data and information provided from the permittee is as follows:

PARAMETER	UNITS	Outfall 001			Comments
		Max	Avg. Value	No. Samples	
NH <sub>3</sub> -N	mg/l	<0.49	<0.23	3	
Chloride	mg/l	21.5	11.4	28	Cooling Tower Chloride Levels (Jan 2021 – Apr 2023)
Total Nickel	µg/l	<10	<10	3	
Total Zinc	µg/l	51.8	42.7	3	
Total Copper	µg/l	14.4	10.1	3	
Temperature	(°F)	85	35 (min)	N/A	Expected max in summer and minimum in winter (estimated – see attached correspondence).

As can be seen from the sampling above, ammonia nitrogen and chloride are well below protective levels for threatened and endangered mussels. It is not expected that there will be impacts to threatened and endangered mussels due to temperature as the wastewater typically sits for many days prior to being batch discharged and mixing with filter backwash wastewater prior to discharging.

The attached Mussel Impact Evaluation Sheet was used to determine the area of river that will be required to assimilate the maximum reported effluent concentrations of nickel, zinc, and copper to achieve pollutant concentrations that at or below the USFWS criteria in the river. The spreadsheet showed areas of impact in the Allegheny River at less than 0.00 square meters for all three of these metals.

In summary, due to the type of wastewater being discharged, the sporadic nature of the discharge, and significant amount of assimilative capacity in the stream, the Department does not find this discharge to have any potential impacts to threatened and endangered species. The Department does not propose monitoring for any of the above discussed parameters in the renewed NPDES Permit.

**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	1/day	Measured

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

Other Comments: Suboutfall 702 only discharges once per year and no samples are collected. Therefore, Sampling for 002 is conducted at Suboutfall 602.

**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 003, 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	Daily Maximum	Instant. Maximum		
pH (S.U.)	XXX	XXX	XXX	XXX	Report	XXX	1/6 months	Grab
Chemical Oxygen Demand (COD)	XXX	XXX	XXX	XXX	Report	XXX	1/6 months	Grab
Total Suspended Solids	XXX	XXX	XXX	XXX	Report	XXX	1/6 months	Grab
Nitrate-Nitrite as N	XXX	XXX	XXX	XXX	Report	XXX	1/6 months	Grab
Total Nitrogen	XXX	XXX	XXX	XXX	Report	XXX	1/6 months	Calculation
Total Phosphorus	XXX	XXX	XXX	XXX	Report	XXX	1/6 months	Grab
Aluminum, Total	XXX	XXX	XXX	XXX	Report	XXX	1/6 months	Grab
Iron, Total	XXX	XXX	XXX	XXX	Report	XXX	1/6 months	Grab
Lead, Total	XXX	XXX	XXX	XXX	Report	XXX	1/6 months	Grab
Zinc, Total	XXX	XXX	XXX	XXX	Report	XXX	1/6 months	Grab

Compliance Sampling Location: Outfall 003 (prior to mixing with any other waters)

Other Comments:



**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 004, 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	Daily Maximum	Instant. Maximum		
pH (S.U.)	XXX	XXX	XXX	XXX	Report	XXX	1/6 months	Grab
Chemical Oxygen Demand (COD)	XXX	XXX	XXX	XXX	Report	XXX	1/6 months	Grab
Total Suspended Solids	XXX	XXX	XXX	XXX	Report	XXX	1/6 months	Grab
Nitrate-Nitrite as N	XXX	XXX	XXX	XXX	Report	XXX	1/6 months	Grab
Total Nitrogen	XXX	XXX	XXX	XXX	Report	XXX	1/6 months	Calculation
Total Phosphorus	XXX	XXX	XXX	XXX	Report	XXX	1/6 months	Grab
Aluminum, Total	XXX	XXX	XXX	XXX	Report	XXX	1/6 months	Grab
Iron, Total	XXX	XXX	XXX	XXX	Report	XXX	1/6 months	Grab
Lead, Total	XXX	XXX	XXX	XXX	Report	XXX	1/6 months	Grab
Zinc, Total	XXX	XXX	XXX	XXX	Report	XXX	1/6 months	Grab

Compliance Sampling Location: Outfall 004 (prior to mixing with any other waters)

Other Comments:

**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 007, 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	Daily Maximum	Instant. Maximum		
pH (S.U.)	XXX	XXX	XXX	XXX	Report	XXX	1/6 months	Grab
Chemical Oxygen Demand (COD)	XXX	XXX	XXX	XXX	Report	XXX	1/6 months	Grab
Total Suspended Solids	XXX	XXX	XXX	XXX	Report	XXX	1/6 months	Grab
Nitrate-Nitrite as N	XXX	XXX	XXX	XXX	Report	XXX	1/6 months	Grab
Total Nitrogen	XXX	XXX	XXX	XXX	Report	XXX	1/6 months	Calculation
Total Phosphorus	XXX	XXX	XXX	XXX	Report	XXX	1/6 months	Grab
Aluminum, Total	XXX	XXX	XXX	XXX	Report	XXX	1/6 months	Grab
Iron, Total	XXX	XXX	XXX	XXX	Report	XXX	1/6 months	Grab
Lead, Total	XXX	XXX	XXX	XXX	Report	XXX	1/6 months	Grab
Zinc, Total	XXX	XXX	XXX	XXX	Report	XXX	1/6 months	Grab

Compliance Sampling Location: Outfall 007 (prior to mixing with any other waters)

Other Comments:

**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 008, 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	Daily Maximum	Instant. Maximum		
pH (S.U.)	XXX	XXX	XXX	XXX	Report	XXX	1/6 months	Grab
Chemical Oxygen Demand (COD)	XXX	XXX	XXX	XXX	Report	XXX	1/6 months	Grab
Total Suspended Solids	XXX	XXX	XXX	XXX	Report	XXX	1/6 months	Grab
Nitrate-Nitrite as N	XXX	XXX	XXX	XXX	Report	XXX	1/6 months	Grab
Total Nitrogen	XXX	XXX	XXX	XXX	Report	XXX	1/6 months	Calculation
Total Phosphorus	XXX	XXX	XXX	XXX	Report	XXX	1/6 months	Grab
Aluminum, Total	XXX	XXX	XXX	XXX	Report	XXX	1/6 months	Grab
Iron, Total	XXX	XXX	XXX	XXX	Report	XXX	1/6 months	Grab
Lead, Total	XXX	XXX	XXX	XXX	Report	XXX	1/6 months	Grab
Zinc, Total	XXX	XXX	XXX	XXX	Report	XXX	1/6 months	Grab

Compliance Sampling Location: Outfall 008 (prior to mixing with any other waters)

Other Comments:

**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	Daily Maximum	Instant. Maximum		
pH (S.U.)	XXX	XXX	XXX	XXX	Report	XXX	1/6 months	Grab
Chemical Oxygen Demand (COD)	XXX	XXX	XXX	XXX	Report	XXX	1/6 months	Grab
Total Suspended Solids	XXX	XXX	XXX	XXX	Report	XXX	1/6 months	Grab
Nitrate-Nitrite as N	XXX	XXX	XXX	XXX	Report	XXX	1/6 months	Grab
Total Nitrogen	XXX	XXX	XXX	XXX	Report	XXX	1/6 months	Calculation
Total Phosphorus	XXX	XXX	XXX	XXX	Report	XXX	1/6 months	Grab
Aluminum, Total	XXX	XXX	XXX	XXX	Report	XXX	1/6 months	Grab
Iron, Total	XXX	XXX	XXX	XXX	Report	XXX	1/6 months	Grab
Lead, Total	XXX	XXX	XXX	XXX	Report	XXX	1/6 months	Grab
Zinc, Total	XXX	XXX	XXX	XXX	Report	XXX	1/6 months	Grab

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

Other Comments:

**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 010, 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	Daily Maximum	Instant. Maximum		
pH (S.U.)	XXX	XXX	XXX	XXX	Report	XXX	1/6 months	Grab
Chemical Oxygen Demand (COD)	XXX	XXX	XXX	XXX	Report	XXX	1/6 months	Grab
Total Suspended Solids	XXX	XXX	XXX	XXX	Report	XXX	1/6 months	Grab
Nitrate-Nitrite as N	XXX	XXX	XXX	XXX	Report	XXX	1/6 months	Grab
Total Nitrogen	XXX	XXX	XXX	XXX	Report	XXX	1/6 months	Calculation
Total Phosphorus	XXX	XXX	XXX	XXX	Report	XXX	1/6 months	Grab
Aluminum, Total	XXX	XXX	XXX	XXX	Report	XXX	1/6 months	Grab
Iron, Total	XXX	XXX	XXX	XXX	Report	XXX	1/6 months	Grab
Lead, Total	XXX	XXX	XXX	XXX	Report	XXX	1/6 months	Grab
Zinc, Total	XXX	XXX	XXX	XXX	Report	XXX	1/6 months	Grab

Compliance Sampling Location: Outfall 010 (prior to mixing with any other waters)

Other Comments:

**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 011, 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	Daily Maximum	Instant. Maximum		
pH (S.U.)	XXX	XXX	XXX	XXX	Report	XXX	1/6 months	Grab
Chemical Oxygen Demand (COD)	XXX	XXX	XXX	XXX	Report	XXX	1/6 months	Grab
Total Suspended Solids	XXX	XXX	XXX	XXX	Report	XXX	1/6 months	Grab
Nitrate-Nitrite as N	XXX	XXX	XXX	XXX	Report	XXX	1/6 months	Grab
Total Nitrogen	XXX	XXX	XXX	XXX	Report	XXX	1/6 months	Calculation
Total Phosphorus	XXX	XXX	XXX	XXX	Report	XXX	1/6 months	Grab
Aluminum, Total	XXX	XXX	XXX	XXX	Report	XXX	1/6 months	Grab
Iron, Total	XXX	XXX	XXX	XXX	Report	XXX	1/6 months	Grab
Lead, Total	XXX	XXX	XXX	XXX	Report	XXX	1/6 months	Grab
Zinc, Total	XXX	XXX	XXX	XXX	Report	XXX	1/6 months	Grab

Compliance Sampling Location: Outfall 011 (prior to mixing with any other waters)

Other Comments:

**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 602, 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) Internal Monitoring Point	Report	XXX	XXX	XXX	XXX	XXX	1/day	Measured
pH (S.U.) Internal Monitoring Point	XXX	XXX	6.0	XXX	XXX	9.0	1/month	Grab
Total Suspended Solids Internal Monitoring Point	XXX	XXX	XXX	30	XXX	60	1/month	Grab
Aluminum, Total Internal Monitoring Point	XXX	XXX	XXX	4.0	XXX	8	1/month	Grab
Iron, Total Internal Monitoring Point	XXX	XXX	XXX	2.0	XXX	4	1/month	Grab

Compliance Sampling Location: Sub outfall 602 (prior to mixing with any other waters)

Other Comments:

**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 702**, 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) Internal Monitoring Point	Report	XXX	XXX	XXX	XXX	XXX	1/day	Measured

Compliance Sampling Location: Sub outfall 702 (prior to mixing with any other waters)

Other Comments:





## Discharge Information

Instructions Discharge Stream

Facility: Borchers America NPDES Permit No.: PA0002038 Outfall No.: 002

Evaluation Type: Major Sewage / Industrial Waste Wastewater Description: Cooling Tower Blowdown, boiler blowdown

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>n</sub>
0.1332	100	7.8						

				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	Strea m CV	Fate Coeff	FOS	Criteri a Mod	Chem Transl
Group 1	Discharge Pollutant	Units	Max Discharge Conc									
	Total Dissolved Solids (PWS)	mg/L	< 224									
	Chloride (PWS)	mg/L										
	Bromide	mg/L										
	Sulfate (PWS)	mg/L										
Group 2	Fluoride (PWS)	mg/L										
	Total Aluminum	µg/L	3110									
	Total Antimony	µg/L										
	Total Arsenic	µg/L										
	Total Barium	µg/L	23									
	Total Beryllium	µg/L										
	Total Boron	µg/L	< 50									
	Total Cadmium	µg/L										
	Total Chromium (III)	µg/L	< 5									
	Hexavalent Chromium	µg/L										
	Total Cobalt	µg/L	45.8									
	Total Copper	µg/L	14.4									
	Free Cyanide	µg/L										
	Total Cyanide	µg/L										
	Dissolved Iron	µg/L										
	Total Iron	µg/L	1330									
	Total Lead	µg/L	< 5									
	Total Manganese	µg/L	66.6									
	Total Mercury	µg/L										
	Total Nickel	µg/L	< 10									
	Total Phenols (Phenolics) (PWS)	µg/L										
	Total Selenium	µg/L										
	Total Silver	µg/L										
	Total Thallium	µg/L										
	Total Zinc	µg/L	51.8									
Total Molybdenum	µg/L											
	Acrolein	µg/L	<									
	Acrylamide	µg/L	<									
	Acrylonitrile	µg/L	<									
	Benzene	µg/L	<									
	Bromoform	µg/L	<									
	Carbon Tetrachloride	µg/L	<									

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Group 6	Di-n-Octyl Phthalate	µg/L	<																
	1,2-Diphenylhydrazine	µg/L	<																
	Fluoranthene	µg/L	<																
	Fluorene	µg/L	<																
	Hexachlorobenzene	µg/L	<																
	Hexachlorobutadiene	µg/L	<																
	Hexachlorocyclopentadiene	µg/L	<																
	Hexachloroethane	µg/L	<																
	Indeno(1,2,3-cd)Pyrene	µg/L	<																
	Isophorone	µg/L	<																
	Naphthalene	µg/L	<																
	Nitrobenzene	µg/L	<																
	n-Nitrosodimethylamine	µg/L	<																
	n-Nitrosodi-n-Propylamine	µg/L	<																
	n-Nitrosodiphenylamine	µg/L	<																
	Phenanthrene	µg/L	<																
	Pyrene	µg/L	<																
	1,2,4-Trichlorobenzene	µg/L	<																
	Aldrin	µg/L	<																
Group 7	alpha-BHC	µg/L	<																
	beta-BHC	µg/L	<																
	gamma-BHC	µg/L	<																
	delta BHC	µg/L	<																
	Chlordane	µg/L	<																
	4,4-DDT	µg/L	<																
	4,4-DDE	µg/L	<																
	4,4-DDD	µg/L	<																
	Dieldrin	µg/L	<																
	alpha-Endosulfan	µg/L	<																
	beta-Endosulfan	µg/L	<																
	Endosulfan Sulfate	µg/L	<																
	Endrin	µg/L	<																
	Endrin Aldehyde	µg/L	<																
	Heptachlor	µg/L	<																
	Heptachlor Epoxide	µg/L	<																
	PCB-1016	µg/L	<																
	PCB-1221	µg/L	<																
	PCB-1232	µg/L	<																
	PCB-1242	µg/L	<																
	PCB-1248	µg/L	<																
	PCB-1254	µg/L	<																
	PCB-1260	µg/L	<																
	PCBs, Total	µg/L	<																
	Toxaphene	µg/L	<																
	2,3,7,8-TCDD	ng/L	<																
Group 8	Gross Alpha	pCi/L																	
	Total Beta	pCi/L	<																
	Radium 226/228	pCi/L	<																
	Total Strontium	µg/L	<																
	Total Uranium	µg/L	<																
	Osmotic Pressure	mOs/kg																	
Group 9																			



## Stream / Surface Water Information

Borchers America, NPDES Permit No. PA0002038, Outfall 002

**Instructions** **Discharge** **Stream**

Receiving Surface Water Name: Allegheny 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	042122	125.7	968.5	4745.9			Yes
End of Reach 1	042122	90	865	6390			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	125.7	0.246	1169.08									41.6	7.43		
End of Reach 1	90	0.1	1450									100	7		

**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	125.7														
End of Reach 1	90														



Toxics Management Spreadsheet  
Version 1.3, March 2021

## Model Results

Borchers America, NPDES Permit No. PA0002038, Outfall 002

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)
125.7	1169.08		1169.08	0.206	0.00055	1.059	707.914	668.372	1.559	1.399	26882.728
90	1450.00		1,450								

#### 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)
125.7	3566.85		3566.85	0.206	0.00055	1.73	707.914	409.154	2.912	0.749	12878.922
90	4305.508		4305.51								

### ☒ Wasteload Allocations

☒ AFC CCT (min): 15 PMF: 0.024 Analysis Hardness (mg/l): 42.033 Analysis pH: 7.43

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	
Total Aluminum	0	0		0	750	750	101,262	
Total Barium	0	0		0	21,000	21,000	2,835,349	
Total Boron	0	0		0	8,100	8,100	1,093,635	
Total Chromium (III)	0	0		0	280.163	887	119,705	Chem Translator of 0.316 applied
Total Cobalt	0	0		0	95	95.0	12,827	
Total Copper	0	0		0	5.939	6.19	835	Chem Translator of 0.96 applied
Total Iron	0	0		0	N/A	N/A	N/A	
Total Lead	0	0		0	24.846	27.1	3,657	Chem Translator of 0.917 applied
Total Manganese	0	0		0	N/A	N/A	N/A	
Total Nickel	0	0		0	224.915	225	30,428	Chem Translator of 0.998 applied
Total Zinc	0	0		0	56.224	57.5	7,762	Chem Translator of 0.978 applied

☒ CFC CCT (min): 720 PMF: 0.164 Analysis Hardness (mg/l): 41.663 Analysis pH: 7.43

Model Results

4/26/2023

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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	
Total Aluminum	0	0		0	N/A	N/A	N/A	
Total Barium	0	0		0	4,100	4,100	3,810,927	
Total Boron	0	0		0	1,600	1,600	1,487,191	
Total Chromium (III)	0	0		0	36.181	42.1	39,104	Chem Translator of 0.86 applied
Total Cobalt	0	0		0	19	19.0	17,660	
Total Copper	0	0		0	4.238	4.41	4,103	Chem Translator of 0.96 applied
Total Iron	0	0		0	1,500	1,500	8,511,723	WQC = 30 day average; PMF = 1
Total Lead	0	0		0	0.959	1.04	970	Chem Translator of 0.919 applied
Total Manganese	0	0		0	N/A	N/A	N/A	
Total Nickel	0	0		0	24.795	24.9	23,116	Chem Translator of 0.997 applied
Total Zinc	0	0		0	56.261	57.1	53,037	Chem Translator of 0.986 applied

☒ **THH**

CCT (min): 720

PMF: 0.164

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	500,000	500,000	N/A	
Total Aluminum	0	0		0	N/A	N/A	N/A	
Total Barium	0	0		0	2,400	2,400	2,230,786	
Total Boron	0	0		0	3,100	3,100	2,881,433	
Total Chromium (III)	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	
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	929,494	
Total Nickel	0	0		0	610	610	566,992	
Total Zinc	0	0		0	N/A	N/A	N/A	

☒ **CRL**

CCT (min): 720

PMF: 0.236

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	
Total Aluminum	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 Chromium (III)	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	
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 Nickel	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			

☒ **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)	N/A	N/A	PWS Not Applicable
Total Aluminum	64,905	µg/L	Discharge Conc ≤ 10% WQBEL
Total Barium	1,817,344	µg/L	Discharge Conc ≤ 10% WQBEL
Total Boron	N/A	N/A	Discharge Conc < TQL
Total Chromium (III)	39,104	µg/L	Discharge Conc ≤ 10% WQBEL
Total Cobalt	8,221	µg/L	Discharge Conc ≤ 10% WQBEL
Total Copper	535	µg/L	Discharge Conc ≤ 10% WQBEL
Total Iron	8,511,723	µg/L	Discharge Conc ≤ 10% WQBEL
Total Lead	970	µg/L	Discharge Conc ≤ 10% WQBEL
Total Manganese	929,494	µg/L	Discharge Conc ≤ 10% WQBEL
Total Nickel	19,503	µg/L	Discharge Conc ≤ 10% WQBEL
Total Zinc	4,975	µg/L	Discharge Conc ≤ 10% WQBEL



Thermal Discharge Recommended Permit Limits

Warm Water Fishes (WWF) Stream

Facility: **Borchers America**  
Permit Number: PA0002038  
Stream: Allegheny River

	WWF Ambient Stream Temperature (°F) (Default)	Ambient Stream Temperature (°F) (Site-specific data)	Target Maximum Stream Temp. <sup>1</sup> (°F)	WWF Daily WLA <sup>2</sup> (Million BTUs/day)	WWF Daily WLA <sup>3</sup> (°F)	PMF at Discharge Flow (MGD)
Jan 1-31	35	0	40	N/A -- Case 2	110.0	0.1332
Feb 1-29	35	0	40	N/A -- Case 2	110.0	0.1332
Mar 1-31	40	0	46	N/A -- Case 2	110.0	0.1332
Apr 1-15	47	0	52	N/A -- Case 2	110.0	0.1332
Apr 16-30	53	0	58	N/A -- Case 2	110.0	0.1332
May 1-15	58	0	64	N/A -- Case 2	110.0	0.1332
May 16-31	62	0	72	N/A -- Case 2	110.0	0.1332
Jun 1-15	67	0	80	N/A -- Case 2	110.0	0.1332
Jun 16-30	71	0	84	N/A -- Case 2	110.0	0.1332
Jul 1-31	75	0	87	N/A -- Case 2	110.0	0.1332
Aug 1-15	74	0	87	N/A -- Case 2	110.0	0.1332
Aug 16-31	74	0	87	N/A -- Case 2	110.0	0.1332
Sep 1-15	71	0	84	N/A -- Case 2	110.0	0.1332
Sep 16-30	65	0	78	N/A -- Case 2	110.0	0.1332
Oct 1-15	60	0	72	N/A -- Case 2	110.0	0.1332
Oct 16-31	54	0	66	N/A -- Case 2	110.0	0.1332
Nov 1-15	48	0	58	N/A -- Case 2	110.0	0.1332
Nov 16-30	42	0	50	N/A -- Case 2	110.0	0.1332
Dec 1-31	37	0	42	N/A -- Case 2	110.0	0.1332

<sup>1</sup> This is the maximum of the WWF WQ criterion or the ambient temperature. The ambient temperature may be either the design (median) temperature for WWF, or the ambient stream temperature based on site-specific data entered by the user. A minimum of 1°F above ambient stream temperature is allocated.

<sup>2</sup> The WLA expressed in Million BTUs/day is valid for Case 1 scenarios, and disabled for Case 2 scenarios.

<sup>3</sup> The WLA expressed in °F is valid only if the limit is tied to a daily discharge flow limit (may be used for Case 1 or Case 2). WLAs greater than 110°F are displayed as 110°F.



5/3/2023

## Mussel Impact Evaluation Sheet - Outfall 002

Facility:	Borchers America		
Permit Number:	PA0002038	Effective: Not reissued yet	Expiration: N/A
Outfall No:	002		
Location:	Franklin PA		
Discharge to:	Allegheny River		
Site Specific Mussel Survey Completed:	No		
Discharge and Stream Characteristics		Comments	
Q <sub>S</sub>	Stream Flow	755 MGD / 1169 cfs	
Q <sub>D</sub>	Discharge Flow	0.1332 MGD / 0.20612 cfs	
C <sub>S(Cl<sup>-</sup>)</sub>	Instream chloride Concentration	16.27 mg/L	8/29/2016 upstream stream sample in Reno, PA
C <sub>E(Cl<sup>-</sup>)</sub>	Discharge chloride (existing)	21.5 mg/L	See Fact Sheet
C <sub>P(Cl<sup>-</sup>)</sub>	Discharge chloride (proposed)	21.5 mg/L	
C <sub>S(Ni)</sub>	Instream nickel Concentration	2 µg/L	Average of three instream samples taken on 8/8, 8/19, and 8/29/2022 (< 0.002, < 0.002, and 0.002 mg/L) in Plum Boro, Allegheny County.
C <sub>E(Ni)</sub>	Discharge nickel (existing)	10 µg/L	
C <sub>P(Ni)</sub>	Discharge nickel (proposed)	10 µg/L	
C <sub>S(Zn)</sub>	Instream zinc Concentration	6 µg/L	8/29/2016 upstream stream sample in Reno, PA
C <sub>E(Zn)</sub>	Discharge zinc (existing)	51.8 µg/L	
Zn <sub>P(Zn)</sub>	Discharge zinc (proposed)	51.8 µg/L	
C <sub>S(Cu)</sub>	Instream copper Concentration	0.909 µg/L	8/29/2016 upstream stream sample in Reno, PA
C <sub>E(Cu)</sub>	Discharge copper (existing)	14.4 µg/L	
Zn <sub>P(Cu)</sub>	Discharge copper (proposed)	14.4 µg/L	
C <sub>S(NH<sub>3</sub>-N)</sub>	Instream NH <sub>3</sub> -N	0.023 mg/L	8/29/2016 upstream stream sample in Reno, PA
C <sub>E(NH<sub>3</sub>-N)</sub>	Discharge NH <sub>3</sub> -N (existing)	0.49 mg/L	
C <sub>P(NH<sub>3</sub>-N)</sub>	Discharge NH <sub>3</sub> -N (proposed)	0.49 mg/L	
pH <sub>S</sub>	Instream pH	7.43 S.U.	WQN #805
T <sub>S</sub>	Instream Temp.	25 °C	Default value for a WWF
C <sub>C(NH<sub>3</sub>-N)</sub>	Ammonia criteria	1.070 mg/L	From ammonia criteria comparison spreadsheet using Instream pH and Temp
C <sub>C(Cl<sup>-</sup>)</sub>	Chloride criteria	78 mg/L	USFWS criteria
C <sub>C(Ni)</sub>	Nickel criteria	7.3 µg/L	USFWS criteria
C <sub>C(Zn)</sub>	Zinc criteria	13.18 µg/L	USFWS criteria
C <sub>C(Cu)</sub>	Copper criteria	10 µg/L	USFWS criteria
W <sub>S</sub>	Stream width	30.5 meters	Google Earth (Approximate)

## Ammonia Criteria Calculations:

pH <sub>S</sub>	7.43 S.U.	(Default value is 7.0)
T <sub>S</sub>	25 °C	(Default value is 20 ° for a CWF and 25° for a WWF)
Acute Criteria		
	METHOD and UNITS	CRITERIA
	Old CMC (mg TAN/L) =	4.494
	EPA 2013 CMC (mg TAN/L) =	6.758
		Oncorhynchus present
		6.758
		Oncorhynchus absent
		* formula on pg. 41 (plateaus at 15.7 C)
		* formula on pg. 42 (plateaus at 10.2 C)
Chronic Criteria		
	METHOD and UNITS	CRITERIA
	Old CMC (mg TAN/L) =	1.046
	EPA 2013 CMC (mg TAN/L) =	1.070
		* formula on pg. 46 (plateaus at 7 C)

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

## 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:	22 mg/L
C.	Chlorides in Proposed Discharge after Treatment Facility Upgrades:	21.5 mg/L
D.	Approximate Area of Impact after Treatment Facility Upgrades:	N/A m <sup>2</sup>

$$A/B = D/C$$

$$\text{Therefore, } D = (A \times C)/B$$

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Outfall 001

Facility:	Borchers America		
Permit Number:	PA0002038	Effective: Not reissued yet	Expiration: N/A
Outfall No:	002		
Location:	Franklin PA		
Discharge to:	Allegheny 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

Chloride (Cl <sup>-</sup> )	$L_{S(Cl)} = \text{Available Chloride Loading in Stream} = C_{S(Cl)} - C_{S(Cl)} \times Q_S(\text{MGD}) \times 8.34 =$	388,695 lbs/Day
	$L_{D-MAX(Cl)} = \text{Current Maximum Discharge Chloride Loading exceeding criteria} = (C_{E(CL)} - C_{E(CL)}) \times Q_D(\text{MGD}) \times 8.34 =$	-63 lbs/Day
	$\%_{E(Cl)} = \text{Percent of Stream Capacity for Current Loading} = L_{D-MAX(Cl)} / L_{S(Cl)} =$	0% of Stream Capacity
	$L_{D(Cl)} = \text{Proposed Discharge Cl}^- \text{ Loading exceeding criteria after Treatment Facility Upgrades} = (C_{P(Cl)} - C_{P(Cl)}) \times Q_D(\text{MGD}) \times 8.34 =$	-62.765172 lbs/Day
	$\%_{P(Cl)} = \text{Percent of Stream Capacity for Proposed Loading} = L_{D(Cl)} / L_{S(Cl)} =$	-0.02% of Stream Capacity
	Proposed Area of Impact due to Chloride * = $(\%_{P(Cl)} \times W_S)^2 \times 0.5 =$ * assuming equal flow across transect and 90° spread at discharge	0.00 m <sup>2</sup>
Nickel (Ni)	$L_{S(Ni)} = \text{Available Nickel Loading in Stream} = C_{S(Ni)} - C_{S(Ni)} \times Q_S(\text{MGD}) \times 8.34 =$	33,373 lbs/Day
	$L_{D-MAX(Ni)} = \text{Current Maximum Discharge Nickel Loading exceeding criteria} = (C_{E(Ni)} - C_{E(Ni)}) \times Q_D(\text{MGD}) \times 8.34 =$	3 lbs/Day
	$\%_{E(Ni)} = \text{Percent of Stream Capacity for Current Loading} = L_{D-MAX(Ni)} / L_{S(Ni)} =$	0% of Stream Capacity
	$L_{D(Ni)} = \text{Proposed Discharge Ni Loading exceeding criteria after Treatment Facility Upgrades} = (C_{P(Ni)} - C_{P(Ni)}) \times Q_D(\text{MGD}) \times 8.34 =$	2.9993976 lbs/Day
	$\%_{P(Ni)} = \text{Percent of Stream Capacity for Proposed Loading} = L_{D(Ni)} / L_{S(Ni)} =$	0.01% 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	0.00 m <sup>2</sup>
Zinc (Zn)	$L_{S(Zn)} = \text{Available Zinc Loading in Stream} = C_{S(Zn)} - C_{S(Zn)} \times Q_S(\text{MGD}) \times 8.34 =$	45,210 lbs/Day
	$L_{D-MAX(Zn)} = \text{Current Maximum Discharge Zinc Loading exceeding criteria} = (C_{E(Zn)} - C_{E(Zn)}) \times Q_D(\text{MGD}) \times 8.34 =$	43 lbs/Day
	$\%_{E(Zn)} = \text{Percent of Stream Capacity for Current Loading} = L_{D-MAX(Zn)} / L_{S(Zn)} =$	0% of Stream Capacity
	$L_{D(Zn)} = \text{Proposed Discharge Zn Loading exceeding criteria after Treatment Facility Upgrades} = (C_{P(Zn)} - C_{P(Zn)}) \times Q_D(\text{MGD}) \times 8.34 =$	42.9024946 lbs/Day
	$\%_{P(Zn)} = \text{Percent of Stream Capacity for Proposed Loading} = L_{D(Zn)} / L_{S(Zn)} =$	0.09% of Stream Capacity
	Proposed Area of Impact due to Zinc * = $(\%_{P(Zn)} \times W_S)^2 \times 0.5 =$ * assuming equal flow across transect and 90° spread at discharge	0.00 m <sup>2</sup>
Copper (Cu)	$L_{S(Cu)} = \text{Available Copper Loading in Stream} = C_{S(Cu)} - C_{S(Cu)} \times Q_S(\text{MGD}) \times 8.34 =$	57,243 lbs/Day
	$L_{D-MAX(Cu)} = \text{Current Maximum Discharge Copper Loading exceeding criteria} = (C_{E(Cu)} - C_{E(Cu)}) \times Q_D(\text{MGD}) \times 8.34 =$	5 lbs/Day
	$\%_{E(Cu)} = \text{Percent of Stream Capacity for Current Loading} = L_{D-MAX(Cu)} / L_{S(Cu)} =$	0% of Stream Capacity
	$L_{D(Cu)} = \text{Proposed Discharge Cu Loading exceeding criteria after Treatment Facility Upgrades} = (C_{P(Cu)} - C_{P(Cu)}) \times Q_D(\text{MGD}) \times 8.34 =$	4.8879072 lbs/Day
	$\%_{P(Cu)} = \text{Percent of Stream Capacity for Proposed Loading} = L_{D(Cu)} / L_{S(Cu)} =$	0.01% of Stream Capacity
	Proposed Area of Impact due to Copper * = $(\%_{P(Cu)} \times W_S)^2 \times 0.5 =$ * assuming equal flow across transect and 90° spread at discharge	0.00 m <sup>2</sup>
Ammonia-Nitrogen (NH3-N)	$L_{S(NH3-N)} = \text{Available NH3-N Loading in Stream} = C_{S(NH3-N)} - C_{S(NH3-N)} \times Q_S(\text{MGD}) \times 8.34 =$	6,593 lbs/Day
	$L_{D-MAX(NH3-N)} = \text{Current Maximum Discharge NH3-N Loading} = C_{E(NH3-N)} \times Q_D(\text{MGD}) \times 8.34 =$	1 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
	$L_{D(NH3-N)} = \text{Proposed Discharge NH3-N Loading after Treatment Facility Upgrades} = C_{P(NH3-N)} - C_{C(NH3-N)} \times Q_D(\text{MGD}) \times 8.34 =$	-1 lbs/Day
	$\%_{P(NH3-N)} = \text{Percent of Stream Capacity for Proposed Loading} = L_{D(NH3-N)} / L_{S(NH3-N)} =$	-0.02% 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	0.00 m <sup>2</sup>

5/3/2023

Outfall 001

Facility:	Borchers America		
Permit Number:	PA0002038	Effective: Not reissued yet	Expiration: N/A
Outfall No:	002		
Location:	Franklin PA		
Discharge to:	Allegheny River		
Site Specific Mussel Survey Completed:	No		

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

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

Chloride (Cl)	$Q_{A(Cl)}C_{S(Cl)} + Q_D C_{P(Cl)} = Q_T C_{C(Cl)}$	
	$Q_{A(Cl)} = \text{Assimilative Stream Flow Required to Achieve Criteria (cfs)}$	
	$Q_T = Q_S + Q_D \text{ (cfs)}$	
	$Q_{A(Cl)}C_{S(Cl)} + Q_D C_{P(Cl)} = (Q_D + Q_S)C_{C(Cl)}$	
	SOLVING FOR $Q_{A(Cl)} = [(Q_D C_{P(Cl)} / C_{C(Cl)}) - Q_D] / (1 - C_{S(Cl)} / C_{C(Cl)}) =$	-0.18865673 cfs
	$\%P_{(Cl)} = \text{Percent of Stream Width Required to Assimilate Chlorides to Criteria}$	
	Concentration = $Q_{A(Cl)} / Q_S \text{ (cfs)} =$	-0.0161%
	$W_{I(Cl)} = \text{Proposed Width of Stream required to Assimilate Chlorides to Criteria}$	
	Concentration = $W_S \times \%P_{(Cl)}$	-0.004922 meters
Nickel (Ni)	$Q_{A(Ni)}C_{S(Ni)} + Q_D C_{P(Ni)} = Q_T C_{C(Ni)}$	
	$Q_{A(Ni)} = \text{Assimilative Stream Flow Required to Achieve Criteria (cfs)}$	
	$Q_T = Q_S + Q_D \text{ (cfs)}$	
	$Q_{A(Ni)}C_{S(Ni)} + Q_D C_{P(Ni)} = (Q_D + Q_S)C_{C(Ni)}$	
	SOLVING FOR $Q_{A(Ni)} = [(Q_D C_{P(Ni)} / C_{C(Ni)}) - Q_D] / (1 - C_{S(Ni)} / C_{C(Ni)}) =$	0.10500453 cfs
	$\%P_{(Ni)} = \text{Percent of Stream Width Required to Assimilate Nickel to Criteria}$	
	Concentration = $Q_{A(Ni)} / Q_S \text{ (cfs)} =$	0.0090%
	$W_{I(Ni)} = \text{Proposed Width of Stream required to Assimilate Nickel to Criteria}$	
	Concentration = $W_S \times \%P_{(Ni)}$	0.002740 meters
Zinc (Zn)	$Q_{A(Zn)}C_{S(Zn)} + Q_D C_{P(Zn)} = Q_T C_{C(Zn)}$	
	$Q_{A(Zn)} = \text{Assimilative Stream Flow Required to Achieve Criteria (cfs)}$	
	$Q_T = Q_S + Q_D \text{ (cfs)}$	
	$Q_{A(Zn)}C_{S(Zn)} + Q_D C_{P(Zn)} = (Q_D + Q_S)C_{C(Zn)}$	
	SOLVING FOR $Q_{A(Zn)} = [(Q_D C_{P(Zn)} / C_{C(Zn)}) - Q_D] / (1 - C_{S(Zn)} / C_{C(Zn)}) =$	1.10868446 cfs
	$\%P_{(Zn)} = \text{Percent of Stream Width Required to Assimilate Zinc to Criteria}$	
	Concentration = $Q_{A(Zn)} / Q_S \text{ (cfs)} =$	0.0948%
	$W_{I(Zn)} = \text{Proposed Width of Stream required to Assimilate Zinc to Criteria}$	
	Concentration = $W_S \times \%P_{(Zn)}$	0.028926 meters
Copper (Cu)	$Q_{A(Cu)}C_{S(Cu)} + Q_D C_{P(Cu)} = Q_T C_{C(Cu)}$	
	$Q_{A(Cu)} = \text{Assimilative Stream Flow Required to Achieve Criteria (cfs)}$	
	$Q_T = Q_S + Q_D \text{ (cfs)}$	
	$Q_{A(Cu)}C_{S(Cu)} + Q_D C_{P(Cu)} = (Q_D + Q_S)C_{C(Cu)}$	
	SOLVING FOR $Q_{A(Cu)} = [(Q_D C_{P(Cu)} / C_{C(Cu)}) - Q_D] / (1 - C_{S(Cu)} / C_{C(Cu)}) =$	0.09976108 cfs
	$\%P_{(Cu)} = \text{Percent of Stream Width Required to Assimilate Copper to Criteria}$	
	Concentration = $Q_{A(Cu)} / Q_S \text{ (cfs)} =$	0.0085%
	$W_{I(Cu)} = \text{Proposed Width of Stream required to Assimilate Copper to Criteria}$	
	Concentration = $W_S \times \%P_{(Cu)}$	0.002603 meters
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 $Q_{A(NH3-N)} = [(Q_D C_{P(NH3-N)} / C_{C(NH3-N)}) - Q_D] / (1 - C_{S(NH3-N)} / C_{C(NH3-N)}) =$	-0.114183 cfs
	$\%P_{(NH3-N)} = \text{Percent of Stream Width Required to Assimilate NH3-N to Criteria}$	
	Concentration = $Q_{A(NH3-N)} / Q_S \text{ (cfs)} =$	-0.0098%
	$W_{I(NH3-N)} = \text{Proposed Width of Stream required to Assimilate NH3-N to Criteria}$	
	Concentration = $W_S \times \%P_{(NH3-N)}$	-0.002979 meters
	Proposed Area of Impact due to NH3-N * = $(W_{I(NH3-N)})^2 \times 0.5 =$	0.00 m <sup>2</sup>
	* assuming equal flow across transect and 90° spread at discharge	