pennsylvania
DEPARTMENT OF ENVIRONMENTAL PROTECTION

Southcentral Regional Office
CLEAN WATER PROGRAM

Application Type	**Renewal**	Application No.	**PA0086878**
Facility Type	**Industrial**	APS ID	**105**
Major / Minor	**Minor**	Authorization ID	**1373930**

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

Applicant and Facility Information

Applicant Name	**Hamburg Municipal Authority - Berks County**	Facility Name	**Hamburg Municipal Authority Water Filtration Plant**
Applicant Address	61 North 3rd Street Hamburg, PA 19526-1501	Facility Address	Reservoir Road Hamburg, PA 19526
Applicant Contact	Kevin Dunn, Superintendent (Kdunn.hma@hamburgboro.com) David Fink, authority vice-chair (lindafink@msn.com)	Facility Contact	Alfred (Ty) Leinneweber, Authority Engr, SDEI (610) 916-8500 leinneweber@sdei.net
Applicant Phone	(610) 406-7355	Facility Phone	
Client ID	64648	Site ID	237982
SIC Code	4941 (NAICS 221310)	Municipality	Windsor Township
SIC Description	Trans. & Utilities - Water Supply	County	Berks
Date Application Received	October 22, 2021, with additional info received Dec 6 & 9, 2022	EPA Waived?	Yes
Date Application Accepted	November 4, 2021	If No, Reason	
Purpose of Application	NPDES Renewal with Discharge to Furnace Creek in Watershed 3-B.		

Summary of Review

The previous NPDES permit was issued April 27, 2017 and was administratively extended past its expiration date of April 30, 2022. The NPDES renewal application was received timely, via DEP's OnBase upload system (Reference ID #35029) . Additional sampling results, using DEP's Target Quantitation Levels (TQLs) were submitted December 6 and December 9, 2022.

The facility treats water for drinking water distribution. Clarifier supernatant, wastewater from backwash cycles, and any wastewater from a chemical feed area drain are conveyed to a clarifier for settling and then discharged through outfall 001 into Furnace Creek. Sludge from the clarifier is disposed off-site. There is an onlot disposal system for sewage and a 5000-gallon holding tank for floor drain and sink wastewater: no domestic wastewater is discharged from outfall 001.

Design Flow

A review of the application and the flow reported in their Discharge Monitoring Reports from January 1, 2019 through October 31, 2022 indicates no reason to change the design flow: the previous permit and the renewal permit used a design flow of 0.13 MGD. The Maximum Monthly Average flow from the reviewed DMRs was 0.13 MGD. The average of their Daily Maximums was also 0.13 MGD. (See the attached.)

Obsolete Outfall

Approve	Deny	Signatures	Date
x		*Bonnie Boylan* Bonnie Boylan / Permit Writer	December 15, 2022
X		*Maria D. Bebenek for* Daniel W. Martin, P.E. / Environmental Engineer Manager	January 25, 2023
X		*Maria D. Bebenek* Maria D. Bebenek, P.E. / Environmental Program Manager	January 25, 2023

The permit application's topo map showed an emergency overflow discharge location as well as outfall 001. When the permittee was questioned, they said that emergency overflow, outfall 002, no longer exists: it existed when the old finished water storage reservoir was used but that reservoir was abandoned and filled when the new finished water storage tank was constructed and put into service in 2012. They sent a corrected topo map. Only outfall 001 is therefore included in the renewal permit. The permittee's consultant also supplied a corrected latitude and longitude for outfall 001 (slightly different from the previous permit).

Anti-Degradation

This discharge is to a High Quality (HQ) waterway. An antidegradation analysis was conducted for the previous NPDES permit when the design flow was increased. The previous flow of 0.03 MGD is "grandfathered" as existing before the stream designation was changed to HQ. Increases in flow after the HQ designation are subject to the requirements for discharges to an HQ water, such as to not cause degradation of the existing water quality. The 2022 renewal application did not include an Anti-Degradation Module because they are not proposing a new or increased discharge or increased loading of pollutants. The concentrations determined in 2017 for the grandfathered flow plus the non-grandfathered flow were compared to the discharge concentrations reported in their renewal application and in their Discharge Monitoring Reports (DMRs) to ensure continued protection of the HQ waterway.

For documentation purposes, the 2017 Fact Sheet stated:

> An "Expanded Discharge Evaluation" was conducted to satisfy the DEP's antidegradation policy for discharges to waters designated as "High Quality" and in accordance with State regulations pertaining to antidegradation. The more stringent of ABACT technology-based limits [Antidegradation Best Available Combination of Technologies], site-specific limits that prevent degradation of HQ/EV waters from new or increased flows, and WQBELs should be imposed in NPDES permits in order to satisfy the antidegradation requirements. The resulting spreadsheets are attached.

The 2017 antidegradation spreadsheets are also attached to this Fact Sheet.

Outstanding Violations

None according to DEP's WMS database: Open Violations by Client report.

PA Fish and Boat Commission

Because the receiving water is designated as Class A Wild Trout, a copy of the draft permit will be forwarded to the PA Fish and Boat Commission.

Delaware River Basin Commission

As per an Interagency Agreement and State regulations, a copy of the draft permit will also be forwarded to the Delaware River Basin Commission (DRBC). Furnace Creek is within the DE River watershed. The following standard Part C Condition will be added in the permit: this discharge may be subject to other DRBC requirements.

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.

Discharge, Receiving Waters and Water Supply Information			
Outfall No.	001	Design Flow (MGD)	0.13
Latitude	40° 34' 58"	Longitude	-75° 56' 27"
Quad Name		Quad Code	
Wastewater Description:	IW Process Effluent without ELG (Water Treatment Plant Filter Backwash)		
Receiving Waters	Furnace Creek (HQ-CWF)	Stream Code	02080
NHD Com ID	25975370	RMI	3.4
Drainage Area	1.7 sq. miles	Yield (cfs/mi^2)	0.1 cfs/sq.mi. *
Q_{7-10} Flow (cfs)	0.16 cfs * estimated	Q_{7-10} Basis	Estimation using USGS data*
Elevation (ft)	Approximately 725 (topo layer)	Slope (ft/ft)	
Watershed No.	3-B	Chapter 93 Class.	HQ-CWF, MF (designated uses ID # 4086)
Existing Use	-	Existing Use Qualifier	-
Exceptions to Use	-	Exceptions to Criteria	-
Assessment Status	Furnace Run is Attaining Use(s) – but downstream Maiden Creek is impaired for recreational use by pathogens and downstream Lake Ontelaunee is impaired and subject to a Total Maximum Daily Load for (TMDL) for Nutrients (specifically Total Phosphorus) and Total Suspended Solids		
Cause(s) of Impairment	-		
Source(s) of Impairment	-		
TMDL Status	Final 8/9/2004	Name	Lake Ontelaunee

Secondary Receiving Waters: Furnace Creek empties into Maiden Creek (Stream Code 01985) at RMI 15.3 which empties into Lake Ontelaunee at RMI 8.6 and empties into the Schuylkill River (Stream Code 00833) at RMI 86.7.

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

Nearest Downstream Public Water Supply Intake		Reading Area Water Authority	
PWS Waters	Maiden Creek	Flow at Intake (cfs)	
PWS RMI	1, approximately	Distance from Outfall (mi)	18

Class A Wild Trout Classification and Trout Natural Reproduction designation on this segment of Furnace Creek: from headwaters at 5.9 RMI to lower limit at 3.1 RMI

According to eMapPA….

-No dischargers to Furnace Run upstream of facility
-Only discharger to Furnace Run downstream of facility is Lenhartsville Boro STP PA0246921

*PA Stream Stats online tool yielded a Q7-10 of 0.1 cfs whereas the last permit's Fact Sheet used a Q7-10 of 0.16 cfs. The online tool may be using regression equations and not taking into account the reservoir and dam that would affect stream flow. The closest downstream gage was on Maidencreek at Virginville , 01470756, which would have accounted for releases from the reservoir: it had a low flow yield of 0.11 cfs/mi^2 using USGS historical data [the 2011 USGS Stuckey and Roland Report titled Selected Streamflow Statistics for Streamgage Locations in and near Pennsylvania] but the period of record stopped in 1995 and it is almost 9 miles downstream and there are tributaries contributing before the

gage location. This information would result in 0.19 cfs : LFY gage x Drainage Area of site = 0.11 cfs/mi^2 x 1.7 mi^2= 0.19 cfs. The estimated Q7-10 at the stream location of 001 is therefore between 0.1 cfs (PA Stream Stats online estimate without considering dam releases) and 0.19 cfs including dam releases but an overestimate since the data was derived from a location 8.8 miles downstream after other tributaries fed into Maiden Creek (notably Sacony Creek) and including the drainage into Maiden Creek above its confluence with Furnace Creek. The Q7-10 used in the last Fact Sheet for the discharge location is considered reasonable and was carried forward: 0.16 cfs.

Treatment Facility Summary

Treatment Facility Name: Hamburg Municipal Authority Water Filtration Plant

WQM Permit No.	Issuance Date
none	-

The water treatment plant consists of two upflow clarifiers, two mixed media filters, an air stripper, and a finished water tank. Backwash water from the clarifiers and filters is conveyed to a separate clarifier/thickening tank, which also collects any wastewater from the chemical addition area drains.

DEP previously approved, by letter, the addition of de-chlorination equipment to achieve TRC limits in the NPDES permit.

Sludge is trucked to Hamburg Borough Sewage Treatment Plant's Belt Filter Press

2017 DEP Clean Water Inspection Report:

-1 air stripper, used when drawing raw water from wells (but air stripper not shown in renewal permit application diagram)
-outfall 002 to Furnace Creek was abandoned with demolition of old clear well at filter plant.

EXISTING PERMIT LIMITS, OUTFALL 001:

Parameter	Effluent Limitations						Monitoring Requirements	
	Mass Units (lbs/day)		Concentrations (mg/L)				Minimum Measurement Frequency	Required Sample Type
	Average Monthly	Daily Maximum	Minimum	Average Monthly	Daily Maximum	Instant. Maximum		
Flow (MGD)	Report	Report	XXX	XXX	XXX	XXX	Continuous	Measured
pH (S.U.)	XXX	XXX	6.0	XXX	XXX	9.0	1/day	Grab
Total Residual Chlorine (TRC)	XXX	XXX	XXX	0.12	XXX	0.41	1/day	Grab
Total Suspended Solids (lbs)	Report Total Monthly	2739 Total Annual	XXX	14.0	28.0	35	1/week	24-Hr Composite
Total Phosphorus (lbs)	Report Total Monthly	91 Total Annual	XXX	Report	XXX	XXX	1/week	24-Hr Composite
Aluminum, Total	Report	Report	XXX	1.0	1.6	2.5	1/week	24-Hr Composite
Iron, Total	Report	Report	XXX	1.4	2.8	3.5	1/week	24-Hr Composite
Manganese, Total	Report	Report	XXX	1.0	2.0	2.5	1/week	24-Hr Composite
Total Dissolved Solids	XXX	XXX	XXX	Report Avg Quarterly	XXX	XXX	1/quarter	24-Hr Composite

Compliance History

DMR Data for Outfall 001 (from September 1, 2021 to August 31, 2022)

Parameter	AUG-22	JUL-22	JUN-22	MAY-22	APR-22	MAR-22	FEB-22	JAN-22	DEC-21	NOV-21	OCT-21	SEP-21
Flow (MGD) Average Monthly	0.027	0.116	0.114	0.033	0.059	0.094	0.072	0.033	0.132	0.125	0.102	0.031
Flow (MGD) Daily Maximum	0.213	0.156	0.180	0.148	0.161	0.169	0.174	0.165	0.176	0.170	0.238	0.128
pH (S.U.) Minimum	6.69	6.36	6.65	6.17	6.51	6.53	6.43	6.39	6.41	6.47	6.4	6.43
pH (S.U.) Instantaneous Maximum	7.58	7.15	7.46	8.97	7.47	7.60	7.57	7.45	7.54	7.66	7.4	8.63
TRC (mg/L) Average Monthly	< 0.03	< 0.04	< 0.03	< 0.03	< 0.04	< 0.07	< 0.04	< 0.07	0.04	0.03	0.04	< 0.03
TRC (mg/L) Instantaneous Maximum	0.04	0.38	0.16	0.08	0.18	0.21	0.14	0.32	0.16	0.19	0.19	0.15
TSS (mg/L) Average Monthly	< 4.0	5.0	< 5.0	< 4.0	< 4.0	< 5.0	< 4.0	< 4.0	6.0	6.0	6.0	< 1.0
TSS (mg/L) Daily Maximum	4.0	6.0	6.5	4.0	4.8	6.5	4.0	5.2	11.0	7.5	9.5	1.0
Total Suspended Solids (lbs) Total Monthly	< 41	158	< 154	< 30	< 78	< 125	< 85	< 65	< 186	172	< 197	< 14
Total Suspended Solids (lbs) Total Annual									909			
Total Dissolved Solids (mg/L) Average Quarterly			26			37			< 25			29
Total Phosphorus (mg/L) Average Monthly	< 0.1	< 0.12	< 0.11	< 0.11	< 0.11	< 0.1	< 0.1	< 0.11	< 0.11	< 0.09	< 0.1	< 0.036
Total Phosphorus (lbs) Total Monthly	< 0.03	< 3	< 3	< 0.8	< 2	< 3	< 2	< 1	< 3	< 3	< 3	< 0.2
Total Phosphorus (lbs) Total Annual									14.65			
Total Aluminum (lbs/day) Average Monthly	0.1	0.5	0.6	< 0.09	< 0.4	< 0.4	< 0.2	< 0.2	0.5	0.7	16	0.08

Total Aluminum (lbs/day) Daily Maximum	0.4	0.6	1	0.4	0.9	1	0.5	0.8	0.5	1	0.7	0.2
Total Aluminum (mg/L) Average Monthly	0.3	0.5	0.6	< 0.2	< 0.4	< 0.4	< 0.2	< 0.2	0.5	0.8	0.5	0.1
Total Aluminum (mg/L) Daily Maximum	0.172	0.555	0.831	0.457	0.715	0.729	0.399	0.13	0.569	0.85	0.702	0.19
Total Iron (lbs/day) Average Monthly	0.09	0.2	0.2	< 0.03	< 0.08	< 0.09	< 0.08	< 0.04	0.2	0.3	< 0.3	0.03
Total Iron (lbs/day) Daily Maximum	0.2	0.2	0.2	0.1	0.2	0.2	< 0.1	0.1	0.2	0.5	0.4	0.07
Total Iron (mg/L) Average Monthly	0.3	0.2	0.2	< 0.1	< 0.1	< 0.1	< 0.1	< 0.3	0.2	0.3	< 0.3	0.1
Total Iron (mg/L) Daily Maximum	0.255	0.231	0.202	0.138	0.172	0.127	< 0.1	0.548	0.219	0.48	0.404	0.16
Total Manganese (lbs/day) Average Monthly	0.03	0.05	0.03	< 0.007	0.01	0.01	0.01	0.01	0.02	0.06	0.1	0.02
Total Manganese (lbs/day) Daily Maximum	0.07	0.06	0.05	0.02	0.02	0.02	0.02	0.04	0.02	0.1	0.1	0.05
Total Manganese (mg/L) Average Monthly	0.1	0.1	0.03	< 0.04	0.03	0.02	0.02	0.03	0.02	0.1	0.1	0.04
Total Manganese (mg/L) Daily Maximum	0.047	0.067	0.039	< 0.1	0.034	0.031	0.025	0.05	0.024	0.11	0.15	0.049

Compliance History

NC ID	Event Start Date	Event End Date	Parameter	Limit Type	Reported Value		Permit Limit	Unit	Sampling Point	Sampling Frequency	Sampling Type	Cause of NC	Corrective Action
120864	08/01/2020	08/31/2020	pH	Instantaneous Maximum	9.1	>	9	S.U.	Final Effluent (001)	1/day	Grab	See attached comments	Other
102416	11/01/2019	11/30/2019	pH	Minimum	5.6	<	6	S.U.	Final Effluent (001)	1/day	Grab		
91345	06/01/2019	06/30/2019	pH	Instantaneous Maximum	9.4	>	9	S.U.	Final Effluent (001)	1/day	Grab	See attached comments	Added supplemental alkalinity

INSPECTIONS

The most recent inspection according to DEP's WMS database was April 26, 2017:

> All treatment units are online and records are up to date. Clarifier supernatant and effluent are clear. Inspector measured pH as 7.54 s.u., DO as 9.97 mg/l, Temperature as 16°C

Development of Effluent Limits

Technology-Based Effluent Limitations (TBELs)

DEP's guidance document "Technology-Based Control Requirements for Water Treatment Plant Wastes" [362-2183-003] identifies pollutants of concern in this type of wastewater and prescribes the following minimum* limits which are considered Best Practicable Control Technology Currently Available (BPT):

Table 1. BPT Limits for discharges from WTPs

Parameter	Monthly Average (mg/L)	Daily Maximum (mg/L)
TSS	30	60
Total Iron	2	4
Total Aluminum	4	8
Total Manganese	1	2
pH	6.0 – 9.0	
Total Residual Chlorine (TRC)	0.5	1.0

*The guidance document also notes: "These technology-based effluent control requirements are only applicable where the WTP's wastewater discharge will not result in water quality standards violations in the receiving stream."

While the above limits are still applicable, they are not the most stringent limits in the case of TSS, Total Iron, Total Aluminum, and Total Residual Chlorine.

For TSS and Total Iron, the previous permit's limits were based on the 2017 anti-degradation evaluation and have been carried forward. (No more stringent WQBELs are applicable.)

For Total Aluminum, and Total Residual Chlorine, the TBELs shown above are less stringent than the WQBELs discussed later in this fact sheet.

The previous permit's limits for pH and Total Manganese were the same as the TBELs shown above and have been imposed in the draft renewal permit.

Regulatory limits:

Parameter	**Limit (mg/l)**	**SBC**	**State Regulation**	***DRBC Regulation***
pH	6.0 – 9.0 S.U.	Instant. Min – Instant. Max	25 Pa Code Ch. 95.2(1)	
Total Residual Chlorine	0.5	Average Monthly	25 Pa Code Chapter 95.2	
	15	Average Monthly	25 Pa Code Ch. 95.2(2)(ii)	
Oil and Grease	30	Instant. Maximum	25 Pa Code Ch. 95.2(2)(ii)	
Dissolved Iron	7	Daily Maximum	25 Pa Code Ch. 95.2(4)	
Total Suspended Solids	100	Average Monthly		18 CFR Part 410, 3.10.4.D.
Ammonia	20	Average Monthly		18 CFR Part 410, 4.30.5.D.
Total Dissolved Solids	2000, if existing discharges increase loading by >5000 lbs/day from August 2010 baseline unless variance granted	Average Monthly	25 Pa Code Ch. 95.10	

Total Dissolved Solids	1000 mg/l (unless not causing in-stream exceedance of the lesser of 133% over background or 500 mg/l)	Average Monthly		18 CFR Part 410

While there are State regulatory limits for **pH** and **TRC**, they are the same as the TBELs shown in Table 1.

While there are State regulatory limits for **Oil and Grease** and **for Dissolved Iron**, there was no reasonable potential to exceed those limits according to the concentrations reported in the permit application (a maximum concentration of <5 mg/l for Oil and Grease and a maximum concentration of 0.16 mg/l for Dissolved Iron based on 3 data points each). No permit limits have been added.

While there are DRBC regulatory limits for **TSS**, they are less stringent than the TBELs shown in Table 1.

While there are DRBC regulatory limits for **Ammonia**, there was no reasonable potential to exceed those limits according to the concentrations reported in the permit application (a maximum of <0.1 mg/l based on 3 data points). No permit limits have been added.

The State regulatory limits for **TDS** are not applicable because the facility has not increased their TDS loading by more than 5000 lbs/day since August 2010.

While there is a DRBC regulatory limit of 1000 mg/l for **TDS**, there was no reasonable potential to exceed 1000 mg/l as a monthly average according to the concentrations reported in the permit application and the reviewed DMRs (a maximum of 170 mg/l and an average of 28.9). TDS is also discussed in the WQBEL section of the Fact Sheet.

Water Quality-Based Effluent Limitations (WQBELs)

TMDL:

The Lake Ontelaunee TMDL established Waste Load Allocations for existing dischargers for **TSS** and **Total Phosphorus** (TP). Because their discharge flow at the time was 0.03 MGD, they were assigned permit mass load limits of 2739 lbs/year for TSS and 91 lbs/year for TP.

TSS: 2,739 lbs/year = 0.03 MGD x 30.0 mg/L x 8.34 x 365
TP: 91 lbs/year = 0.03 MGD x 1.0 mg/L x 8.34 x 365

These mass limits were included in the previous permit and are included in this renewal permit. The mass limits would normally only change if the TMDL is revised. They would not be altered due to a change in design flow. The permittee has been reporting annual loads well under their mass load limits:

	1/1/2019-12/31/2019	1/1/2020-12/31/2020	1/1/2021-12/31/2021
TSS	<1056 lbs	<423 lbs	909 lbs
TP	5.6 lbs	<18.3 lbs	14.65 lbs

The 2017 antidegradation evaluation included 14.0 mg/l as the concentration WQBEL for TSS and 0.46 mg/l as the concentration WQBEL for TP (allowing average discharge flow rather than design flow). The TP concentration of 0.46 mg/l included in the antidegradation evaluation is more stringent than the 2 mg/l monthly average concentration required as a minimum in the State Water Quality Standards [Pa Code § 96.5(c)] for waters impaired with phosphorous and will be imposed in the draft renewal permit. The limit 0.46 mg/l will be rounded to 0.5 mg/l as a monthly average and 1.0 mg/l as a Daily Maximum in conformance with DEP's guidance document 362-0400-001, Chapter 5 [Technical Guidance for the Development and specification of Effluent Limitations].

The most recent two years of DMRs (11/1/2020-10/31/2022) reported an average TSS concentration of 3.7 mg/l and a maximum TSS concentration of 6 mg/l for TSS. The existing permit limits of 14.0 mg/l as a monthly average and 28.0 mg/l as a daily maximum will be carried forward.

The most recent two years of DMRs (11/1/2020-10/31/2022) reported an average TP concentration of 0.085 mg/l and a maximum average concentration of 0.2 mg/l for TP, consistently below the proposed new limit of 0.46 mg/l. Reviewing DMRs from 1/1/2019 through 10/31/2022 gives nearly the same results: an average concentration of 0.082 mg/l and a maximum average concentration of 0.2 mg/l. The permittee was not required to report daily maximum concentrations for TP. Based on the DMR data, the permittee is expected to be able to meet the newly imposed permit limits of 0.46 mg/l as a monthly average and 0.92 mg/l as a daily maximum without the need for a compliance schedule.

Total Dissolved Solids:

DRBC regulations include a slightly different water quality criteria for TDS than the State regulations. Their regulations [18 CFR Part 410] specify that discharges must not cause an instream TDS exceedance of the lesser of a) 133% over background TDS concentration or b) 500 mg/l. Based on mean stream concentrations that were previously provided by DEP's Water Quality Program staff for the antidegradation analysis, background TDS is estimated to be 101 mg/l. 133% of background = 134 mg/l, which is more stringent than 500 mg/l.

CsQs + CdQd = CtQt
(101 mg/l)(0.16 cfs) + (Cd)(0.13 MGD)(1.547 conversion of MGD to cfs)=(134 mg/l)[0.16+(0.13 x 1.547) cfs]

Cd represents the TDS concentration that would be allowable in the discharge without causing an in-stream exceedance of 133% over background. Solving for Cd:

Cd = (48.4 – 16.16) / 0.2011 = 160.3 mg/l

The average TDS in the discharge according to DMRs from January 1, 2019 through October 31, 2022 was 28.9 mg/l, well below 160.3 mg/l. No permit limit for TDS has been added. The quarterly monitoring requirement has not been changed (28.9 mg/l / 160.3 mg/l = 18%).

Total Residual Chlorine (TRC):

Based on the attached TRC Excel spreadsheet calculator, which uses the equations and calculations from the Department's May 1, 2003 Implementation Guidance for Total Residual Chlorine (ID No. 391-2000-015), the facility's discharge must meet a monthly average limit of 0.12 mg/L and an instantaneous maximum limit of 0.41 mg/L, the same limits as in the previous permit. The WQBELs are more stringent than the TBELs for TRC.

Other WQBELS:

WQBELs are developed based on the designated and existing use of the particular receiving water, Water Quality Standards including water quality criteria [25 Pa Code Chapter 93 and 96], and an analysis of the reasonable potential to cause an in-stream exceedance of water quality criteria.

DEP uses 1) the WQM 7.0 model, when applicable, and 2) the Toxics Management Spreadsheet/model (TMS), when applicable.

The downstream point used in the models was as follows:

RMI 0 (in Lenhartsville) = elev 370' approx.
Lat/long = 40.574941 / -75.887015
D.A. = 3.6 sq. miles
Q7-10 = 0.22 cfs
LFY = 0.06 cfs/sq.mi.

The stream low-flow, the Drainage areas, and the Low Flow Yield values used in both models are from USGS PA Stream Stats data. (See page 3 of the Fact Sheet.)

Because this discharge has very low **Ammonia** concentrations and **$CBOD_5$** concentrations per their application and as would be expected from such operations, the WQM 7.0 model would not normally be run, consistent with DEP Standard Operating Procedures for Individual Industrial NPDES Permits. Because the receiving stream is an HQ water and

because the water quality criteria for Ammonia changed with the last Water Quality Standards regulatory amendments, however, the WQM 7.0 model was run. Background concentrations that were provided by DEP Water Quality Program staff at the time of the antidegradation evaluation were used as model inputs. See the attached. The result was a WQBEL of 3.5 mg/l for Ammonia, almost the same as the WQBEL calculated at the time of the 2017 antidegradation analysis (3.4 mg/l). The effluent concentration for Ammonia reported in the application was <0.1 mg/l, well below 3.5 mg/l. No permit limit or monitoring requirement is proposed for Ammonia. The effluent concentration for BOD_5 in the application was 2.6 mg/l as a maximum with 2 out of 3 samples resulting in "non-detect". A BOD5 concentration of 2.6 mg/l is well below the calculated concentration for CBOD5 in the 2017 antidegradation evaluation. No permit limit or monitoring requirement is proposed for $CBOD_5$ or BOD_5.

For other parameters, the TMS was used. [The TMS is an Excel version of the former PENTOX model with the same logic and calculations incorporated but which analyzes each parameter for which there is available data instead of select parameters as done in the former PENTOX model.] The TMS model also performs the reasonable potential (RP) analysis and recommends limits or monitoring requirements accordingly. In general, the TMS will recommend limits in the draft permit where the discharge concentration equals or exceeds 50% of the WQBEL (i.e., RP is demonstrated). The TMS will recommend a monitoring requirement for the draft permit where the discharge concentration is between 25% and 50% of the WQBEL in the case of non-conservative pollutants. The TMS will recommend a monitoring requirement for the draft permit where the discharge concentration is between 10% and 50% of the WQBEL in the case of conservative pollutants. These determinations are consistent with DEP's Standard Operating Procedure (SOP) Establishing Water Quality-Based Effluent Limitations (WQBELs) and Permit Conditions for Toxic Pollutants in NPDES Permits for Existing Dischargers.

For those parameters reported on the permittee's DMRs, the average concentration reported on the DMRs from January 1, 2019 through October 31, 2022 were used as the discharge concentrations in the first column of the TMS. DEP's Toxics Management Strategy Technical Guidance Document [361-0100-003] recommends using average concentrations when there is sufficient data, for example more than ten data points. For the other parameters, the *maximum* effluent concentrations per the application were used because there were only three sample results. The TMS model pages are attached, with input values and results.

Exception: the Dissolved Iron concentration in the application was 160 ug/l whereas the Total Iron average concentration from the past 47 DMRs was 109 ug/l. Because Dissolved Iron concentrations cannot be greater than Total Iron concentrations, 109 ug/l was entered as the discharge concentration in the model for both Dissolved Iron and Total Iron.

The model input values for Hardness came from the application: 13.3 mg/l as the upstream Hardness and 51.3 mg/l as the maximum discharge Hardness. In the absence of site-specific data, DEP default values are used for other inputs: stream pH (7.0 s.u.), discharge pH (7.0 s.u.), background concentrations in the stream (0 mg/l), coefficient of variation (0.5), chemical translators for converting between 'total' metal and 'dissolved' metal (varies per metal).

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

Parameter	Calculated WQBEL (units)	SBC	Model	Recommendation
Total Aluminum	0.86 mg/l	Monthly Average	TMS	Monitor and Report (no RP)
Total Aluminum	1.35 mg/l	Daily Maximum	TMS	Monitor and Report (no RP)
Total Aluminum	2.16 mg/l	Instant. Maximum	TMS	Monitor and Report (no RP)
Total Copper	0.01 mg/l	Monthly Average	TMS	Monitor and Report (no RP)
Dissolved Iron	0.54 mg/l	Monthly Average	TMS	Monitor and Report (no RP)
Total Zinc	0.06	Monthly Average	TMS	Monitor and Report (no RP)

DEP's Technical Guidance document 361-0400-001, Chapter 5, instructs that limits should be rounded to the nearest 0.01 for toxic pollutants.

Total Aluminum is a pollutant of concern at water treatment plants and was included in the list of pollutants needing a TBEL, at a minimum. The above WQBELs for Total Aluminum are more stringent than the TBELs or the existing permit limits (1.0 mg/l as a monthly average and 2.0 as a daily maximum) and will be imposed in the draft renewal permit. The DMR data reviewed from January 1, 2019 through October 31, 2022 indicate an average concentration of 0.36 mg/l and a Daily maximum of 1.37 mg/l for Total Aluminum. The permittee is expected to be able to meet the new limits.

The model-calculated WQBEL for **Total Iron,** another pollutant of concern with a TBEL required at a minimum**,** was 2.69 mg/l as a monthly average (see attached TMS), less stringent than the TBEL or the previous permit limit. The previous permit's limits for Total Iron will be carried forward: 1.4 mg/l as a monthly average and 2.8 mg/l as a daily maximum.

The model-calculated WQBEL for **Total Manganese,** another pollutant of concern with a TBEL required at a minimum, was 1.80 mg/l as a monthly average (see attached TMS), less stringent than the TBEL or the previous permit limit. The previous permit's limits for Total Manganese will be carried forward: 1.0 mg/l as a monthly average and 2.0 mg/l as a daily maximum.

Consistent with how DEP is writing NPDES permits and gathering information to be sure reasonable potential to exceed an in-stream criteria does not exist, monitoring will be required in the draft renewal permit for **Total Copper, Dissolved Iron, and Total Zinc,** as recommended by the TMS model. Because the Copper and Zinc criteria are hardness-dependent, and therefore the WQBELs are hardness-dependent, monitoring for discharge hardness will also be required.

All units are in mg/l

Parameter	Prev. Permit Limit: Mo. Avg/ Max	TBEL: Mo. Avg/ Max	WQBEL:TMDL Mo. Avg/ Max	WQBEL: Mo. Avg/ Max	Draft Renewal Permit Limit	Discharge Conc. per appl.
pH	6.0 - 9.0	6.0-9.0		6.0-9.0	6.0-9.0	6.2-9.1
TRC	0.12 / 0.41	0.5 / 1.0		0.12 / 0.41	0.12 / 0.41	0.07 (max.mo.avg., 16 analyses)
TSS	14.0 / 28.0	30 / 60	14.0 / 28.0		14.0 / 28.0	4 (max.mo.avg., 16 analyses)
TP	-	2.0 / -	0.46 / 0.92		0.5 / 1.0	0.12 (max.mo.avg., 16 analyses)
TDS	Monitor	1000 / -		160	Monitor	170 (max.mo.avg., 12 analyses)*
Aluminum, Total	1.0 / 1.6	4.0 / 8.0		0.86 / 1.35*	0.86 / 1.35	1.12 (max., 16 analyses) **
Copper, Total	-			0.01 / not calc.'d	Monitor	0.002 (max., 3 analyses)
Iron, Dissolved	-	- / 7.0		0.54 / not calc.'d	Monitor	0.160 (max., 3 analyses)
Iron, Total	1.4 / 2.8	2.0 / 4.0		2.69 / not calc.'d	1.4 / 2.8	0.150 (max.mo.avg., 16 analyses)
Manganese, Total	1.0 / 2.0	1.0 / 2.0		1.80 / not calc.'d	1.0 / 2.0	0.041 (max.mo.avg., 16 analyses)
Zinc, Total	-			0.06 / not calc'd	Monitor	0.012 (max., 3 analyses)

All units are in lbs/year

TSS	2739		2739		2739	
TP	91		91		91	

*but DMRs from January 1, 2019 through October 31, 2022 yield an average TDS concentration of 28.9 mg/l

**but DMRs from January 1, 2019 through October 31, 2022 yield an average Total Aluminum concentration of 0.36 mg/l

Stormwater:

No stormwater discharges were shown in the application, the previous permit, the previous Fact Sheet, or Inspection reports. No limits have been imposed for stormwater.

Mass Load Limits:

Mass Load Limits are included for TSS and TP in conformance with the TMDL. Mass load limits were not included for the other parameters in the previous permit and have not been added in the draft renewal permit given that the discharge is intermittent rather than continuous [Reference Technical Guidance for the Development and Specification of Effluent Limitations, 362-0400-001].

Anti-Backsliding:

No limits are less stringent in the draft renewal permit than in their previous permit.

Other

TDS BASELINE:

In order to implement the regulations at Chapter 95.10 relevant to imposing TDS limits if increased loads trigger this requirement in the future, a TDS Baseline is being documented. The increase of TDS loads is measured against existing mass loads, described in Chapter 95.10(a)(1) as “maximum daily discharge loads of TDS…that were authorized by the Department prior to August 21, 2010”.

TDS was not routinely monitored in the facility’s discharge as of August 2010 but the previous permit’s fact sheet cited the TDS concentration in their March 2013 application as 21 mg/l, as an average. The design flow as of August 2010 was 0.03 MGD. Their estimated TDS baseline load therefore is 7.3 lbs/day:

21 mg/l x 0.03 MGD x 8.34 conversion factor = 5.3 lbs/day

CLASS A and WILD TROUT FISHERIES:

This discharge is to a stream segment designated as a Class A Wild Trout Fishery. The permit limits have been developed to protect HQ waters which would also protect Class A Wild Trout.

IMPAIRED WATERS:

The receiving water is not impaired but the downstream Lake Ontelaunee is impaired with a TMDL in place restricting loading of TSS and TP, as previously discussed. The permit limits are consistent with the TMDL. No increase in flow or loading for TSS or TP have been allowed in this renewal permit.

ANTIDEGRADATION (93.4):

The effluent limits for this discharge have been developed to ensure that existing instream water uses(HQ and TSF and Class A Trout) and the level of water quality necessary to protect the existing uses are maintained and protected. The permit limits are the more stringent of: TBELs, WQBELs, concentrations calculated to be non-degrading in the 2017 antidegradation evaluation, and concentrations calculated to attain the TMDL waste load allocations. No Exceptional Value Waters are impacted by this discharge.

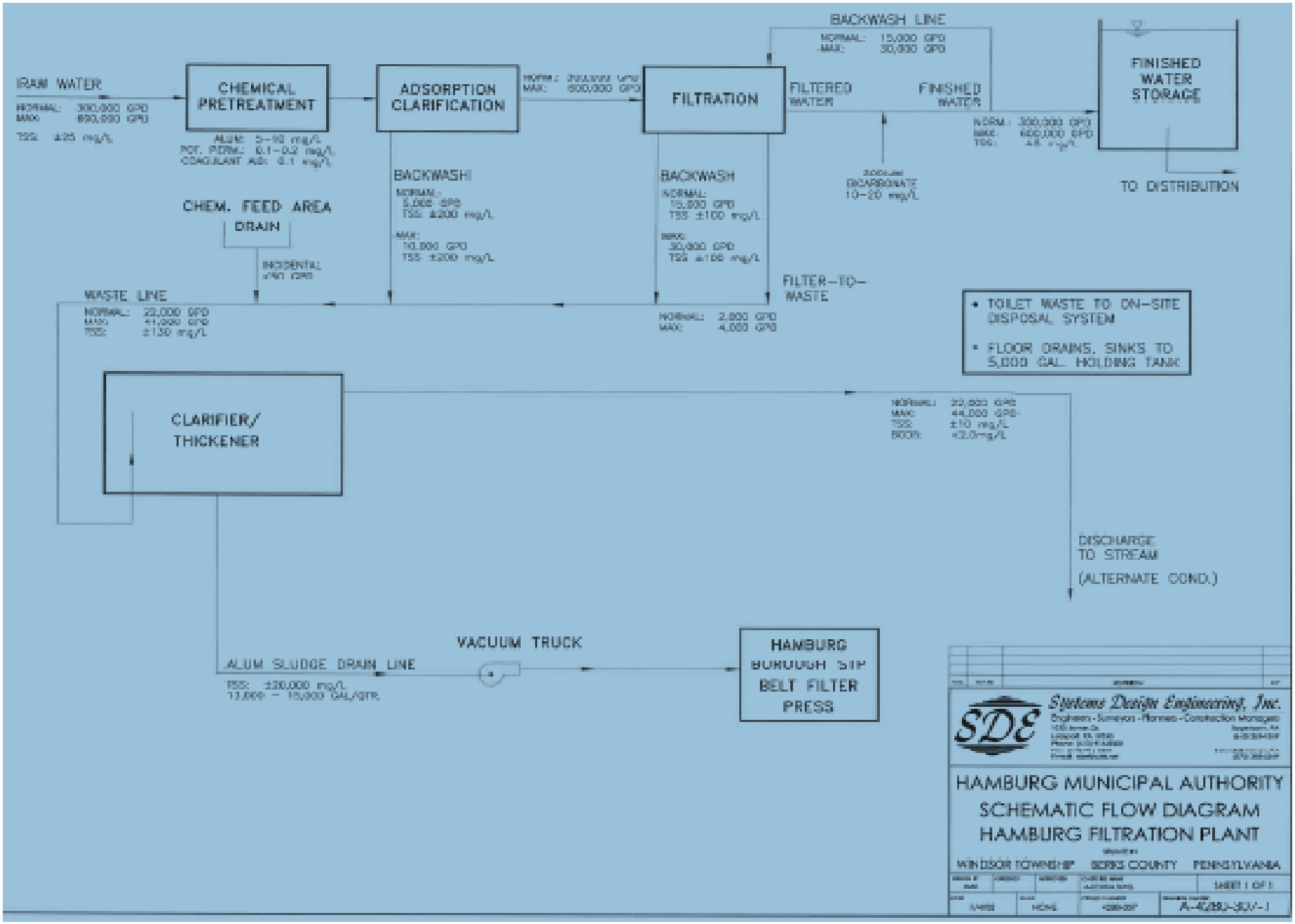
Proposed Effluent Limitations and Monitoring Requirements

The limitations and monitoring requirements specified below are proposed for the draft permit, and reflect the most stringent limitations amongst technology, water quality as needed and BPJ. Instantaneous Maximum (IMAX) limits are generally 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:

Parameter	Effluent Limitations						Monitoring Requirements	
	Mass Units (lbs/day)		Concentrations (mg/L)				Minimum Measurement Frequency	Required Sample Type
	Average Monthly	Daily Maximum	Minimum	Average Monthly	Daily Maximum	Instant. Maximum		
Flow (MGD)	Report	Report	XXX	XXX	XXX	XXX	Continuous	Measured
pH (S.U.)	XXX	XXX	6.0	XXX	XXX	9.0	1/day	Grab
Total Residual Chlorine (TRC)	XXX	XXX	XXX	0.12	XXX	0.41	1/day	Grab
Total Suspended Solids	Report	Report	XXX	14.0	28.0	35	1/week	24-Hr Composite
Total Suspended Solids (lbs)	Report Total Monthly	XXX	XXX	XXX	XXX	XXX	1/month	Calculation
Total Suspended Solids (lbs)	XXX	2739 Total Annual	XXX	XXX	XXX	XXX	1/year	Calculation
Total Dissolved Solids	XXX	XXX	XXX	Report Avg Qrtrly	XXX	XXX	1/quarter	24-Hr Composite
Total Phosphorus	Report	Report	XXX	0.5	1.0	1.5	1/week	24-Hr Composite
Total Phosphorus (lbs)	Report Total Monthly	XXX	XXX	XXX	XXX	XXX	1/month	Calculation
Total Phosphorus (lbs)	XXX	91 Total Annual	XXX	XXX	XXX	XXX	1/year	Calculation
Aluminum, Total	Report	Report	XXX	0.86	1.35	2.2	1/week	24-Hr Composite
Copper, Total	XXX	Report	XXX	XXX	Report	XXX	1/month	24-Hr Composite
Iron, Dissolved	XXX	Report	XXX	XXX	Report	XXX	1/month	24-Hr Composite
Iron, Total	Report	Report	XXX	1.4	2.8	3.5	1/week	24-Hr Composite
Manganese, Total	Report	Report	XXX	1.0	2.0	2.5	1/week	24-Hr Composite
Zinc, Total	XXX	Report	XXX	XXX	Report	XXX	1/month	24-Hr Composite
Hardness as CaCO3	XXX	XXX	XXX	XXX	Report	XXX	1/month	24-Hr Composite

Tools and References Used to Develop Permit	
☒	WQM for Windows Model (see Attachment)
☒	Toxics Management Spreadsheet (see Attachment)
☒	TRC Model Spreadsheet (see Attachment)
☐	Temperature Model Spreadsheet (see Attachment)
☒	Water Quality Toxics Management Strategy, 361-0100-003, 4/06.
☒	Technical Guidance for the Development and Specification of Effluent Limitations, 362-0400-001, 10/97.
☐	Policy for Permitting Surface Water Diversions, 362-2000-003, 3/98.
☐	Policy for Conducting Technical Reviews of Minor NPDES Renewal Applications, 362-2000-008, 11/96.
☒	Technology-Based Control Requirements for Water Treatment Plant Wastes, 362-2183-003, 10/97.
☐	Technical Guidance for Development of NPDES Permit Requirements Steam Electric Industry, 362-2183-004, 12/97.
☐	Pennsylvania CSO Policy, 385-2000-011, 9/08.
☒	Water Quality Antidegradation Implementation Guidance, 391-0300-002, 11/03.
☐	Implementation Guidance Evaluation & Process Thermal Discharge (316(a)) Federal Water Pollution Act, 391-2000-002, 4/97.
☒	Determining Water Quality-Based Effluent Limits, 391-2000-003, 12/97.
☒	Implementation Guidance Design Conditions, 391-2000-006, 9/97.
☒	Technical Reference Guide (TRG) WQM 7.0 for Windows, Wasteload Allocation Program for Dissolved Oxygen and Ammonia Nitrogen, Version 1.0, 391-2000-007, 6/2004.
☐	Interim Method for the Sampling and Analysis of Osmotic Pressure on Streams, Brines, and Industrial Discharges, 391-2000-008, 10/1997.
☐	Implementation Guidance for Section 95.6 Management of Point Source Phosphorus Discharges to Lakes, Ponds, and Impoundments, 391-2000-010, 3/99.
☒	Technical Reference Guide (TRG) PENTOXSD for Windows, PA Single Discharge Wasteload Allocation Program for Toxics, Version 2.0, 391-2000-011, 5/2004.
☒	Implementation Guidance for Section 93.7 Ammonia Criteria, 391-2000-013, 11/97.
☐	Policy and Procedure for Evaluating Wastewater Discharges to Intermittent and Ephemeral Streams, Drainage Channels and Swales, and Storm Sewers, 391-2000-014, 4/2008.
☒	Implementation Guidance Total Residual Chlorine (TRC) Regulation, 391-2000-015, 11/1994.
☐	Implementation Guidance for Temperature Criteria, 391-2000-017, 4/09.
☐	Implementation Guidance for Section 95.9 Phosphorus Discharges to Free Flowing Streams, 391-2000-018, 10/97.
☐	Implementation Guidance for Application of Section 93.5(e) for Potable Water Supply Protection Total Dissolved Solids, Nitrite-Nitrate, Non-Priority Pollutant Phenolics and Fluorides, 391-2000-019, 10/97.
☐	Field Data Collection and Evaluation Protocol for Determining Stream and Point Source Discharge Design Hardness, 391-2000-021, 3/99.
☐	Implementation Guidance for the Determination and Use of Background/Ambient Water Quality in the Determination of Wasteload Allocations and NPDES Effluent Limitations for Toxic Substances, 391-2000-022, 3/1999.
☒	Design Stream Flows, 391-2000-023, 9/98.
☐	Field Data Collection and Evaluation Protocol for Deriving Daily and Hourly Discharge Coefficients of Variation (CV) and Other Discharge Characteristics, 391-2000-024, 10/98.
☐	Evaluations of Phosphorus Discharges to Lakes, Ponds and Impoundments, 391-3200-013, 6/97.
☐	Pennsylvania's Chesapeake Bay Tributary Strategy Implementation Plan for NPDES Permitting, 4/07.
☒	SOP: Establishing Water Quality-Based Effluent Limitations (WQBELs) and Permit Conditions for Toxic Pollutants in NPDES Permits for Existing Dischargers, SOP No. BCW-PMT-037, 5/20/2021, Vsn 1.5
☒	SOP: Establishing Effluent Limitations for Individual Industrial Permits, SOP No. BCW-PMT-032, 10/1/2020, Version 1.6


BACKWASH LINE
NORMAL: 15,000 GPD
MAX: 30,000 GPD
RAW WATER
NORMAL: 300,000 GPD
MAX: 890,000 GPD
TSS: ±25 mg/L
CHEMICAL PRETREATMENT
ALUM: 5–10 mg/L
POT. PERM.: 0.1–0.2 mg/L
COAGULANT AID: 0.1 mg/L
ADSORPTION CLARIFICATION
NORM.: 300,000 GPD
MAX: 600,000 GPD
FILTRATION
FILTERED WATER
FINISHED WATER
NORM.: 300,000 GPD
MAX: 600,000 GPD
TSS: ±5 mg/L
FINISHED WATER STORAGE
TO DISTRIBUTION
BICARBONATE 10–20 mg/L
BACKWASH
NORMAL: 5,000 GPD
TSS: ±200 mg/L
MAX: 10,000 GPD
TSS: ±200 mg/L
BACKWASH
NORMAL: 10,000 GPD
TSS: ±100 mg/L
MAX: 30,000 GPD
TSS: ±100 mg/L
CHEM. FEED AREA
DRAIN
INCIDENTAL
FILTER–TO–WASTE
NORMAL: 2,800 GPD
MAX: 4,000 GPD
WASTE LINE
NORMAL: 22,000 GPD
MAX: 41,000 GPD
TSS: ±130 mg/L
• TOILET WASTE TO ON–SITE DISPOSAL SYSTEM
• FLOOR DRAINS, SINKS TO 5,000 GAL. HOLDING TANK
CLARIFIER/ THICKENER
NORMAL: 22,000 GPD
MAX: 44,000 GPD
TSS: ±10 mg/L
BOD5: <2.0 mg/L
DISCHARGE TO STREAM
(ALTERNATE COND.)
VACUUM TRUCK
ALUM SLUDGE DRAIN LINE
TSS: ±20,000 mg/L
12,000 – 15,000 GAL/DAY
HAMBURG BOROUGH SIP
BELT FILTER PRESS
Systems Design Engineering, Inc.
HAMBURG MUNICIPAL AUTHORITY
SCHEMATIC FLOW DIAGRAM
HAMBURG FILTRATION PLANT
WINDSOR TOWNSHIP BERKS COUNTY PENNSYLVANIA
SHEET 1 OF 1
A-42180-30/-1

PA0086878	1/1/2019	1/31/2019	Monthly	1	Flow	MGD	0.085	Monitor	Average Mo	0.187	Monitor	Daily Maximum
PA0086878	2/1/2019	2/28/2019	Monthly	1	Flow	MGD	0.005	Monitor	Average Mo	0.021	Monitor	Daily Maximum
PA0086878	3/1/2019	3/31/2019	Monthly	1	Flow	MGD	0.007	Monitor	Average Mo	0.014	Monitor	Daily Maximum
PA0086878	4/1/2019	4/30/2019	Monthly	1	Flow	MGD	0.007	Monitor	Average Mo	0.015	Monitor	Daily Maximum
PA0086878	5/1/2019	5/31/2019	Monthly	1	Flow	MGD	0.008	Monitor	Average Mo	0.01	Monitor	Daily Maximum
PA0086878	6/1/2019	6/30/2019	Monthly	1	Flow	MGD	0.008	Monitor	Average Mo	0.009	Monitor	Daily Maximum
PA0086878	7/1/2019	7/31/2019	Monthly	1	Flow	MGD	0.009	Monitor	Average Mo	0.016	Monitor	Daily Maximum
PA0086878	8/1/2019	8/31/2019	Monthly	1	Flow	MGD	0.008	Monitor	Average Mo	0.023	Monitor	Daily Maximum
PA0086878	9/1/2019	9/30/2019	Monthly	1	Flow	MGD	0.055	Monitor	Average Mo	0.139	Monitor	Daily Maximum
PA0086878	10/1/2019	10/31/2019	Monthly	1	Flow	MGD	0.107	Monitor	Average Mo	0.162	Monitor	Daily Maximum
PA0086878	11/1/2019	11/30/2019	Monthly	1	Flow	MGD	0.098	Monitor	Average Mo	0.192	Monitor	Daily Maximum
PA0086878	12/1/2019	12/31/2019	Monthly	1	Flow	MGD	0.103	Monitor	Average Mo	0.113	Monitor	Daily Maximum
PA0086878	1/1/2020	1/31/2020	Monthly	1	Flow	MGD	0.098	Monitor	Average Mo	0.167	Monitor	Daily Maximum
PA0086878	2/1/2020	2/29/2020	Monthly	1	Flow	MGD	0.008	Monitor	Average Mo	0.05	Monitor	Daily Maximum
PA0086878	3/1/2020	3/31/2020	Monthly	1	Flow	MGD	0.024	Monitor	Average Mo	0.143	Monitor	Daily Maximum
PA0086878	4/1/2020	4/30/2020	Monthly	1	Flow	MGD	0.05	Monitor	Average Mo	0.189	Monitor	Daily Maximum
PA0086878	5/1/2020	5/31/2020	Monthly	1	Flow	MGD	0.035	Monitor	Average Mo	0.151	Monitor	Daily Maximum
PA0086878	6/1/2020	6/30/2020	Monthly	1	Flow	MGD	0.018	Monitor	Average Mo	0.155	Monitor	Daily Maximum
PA0086878	7/1/2020	7/31/2020	Monthly	1	Flow	MGD	0.014	Monitor	Average Mo	0.098	Monitor	Daily Maximum
PA0086878	8/1/2020	8/31/2020	Monthly	1	Flow	MGD	0.02	Monitor	Average Mo	0.082	Monitor	Daily Maximum
PA0086878	9/1/2020	9/30/2020	Monthly	1	Flow	MGD	0.05	Monitor	Average Mo	0.15	Monitor	Daily Maximum
PA0086878	10/1/2020	10/31/2020	Monthly	1	Flow	MGD	0.099	Monitor	Average Mo	0.147	Monitor	Daily Maximum
PA0086878	11/1/2020	11/30/2020	Monthly	1	Flow	MGD	0.102	Monitor	Average Mo	0.152	Monitor	Daily Maximum

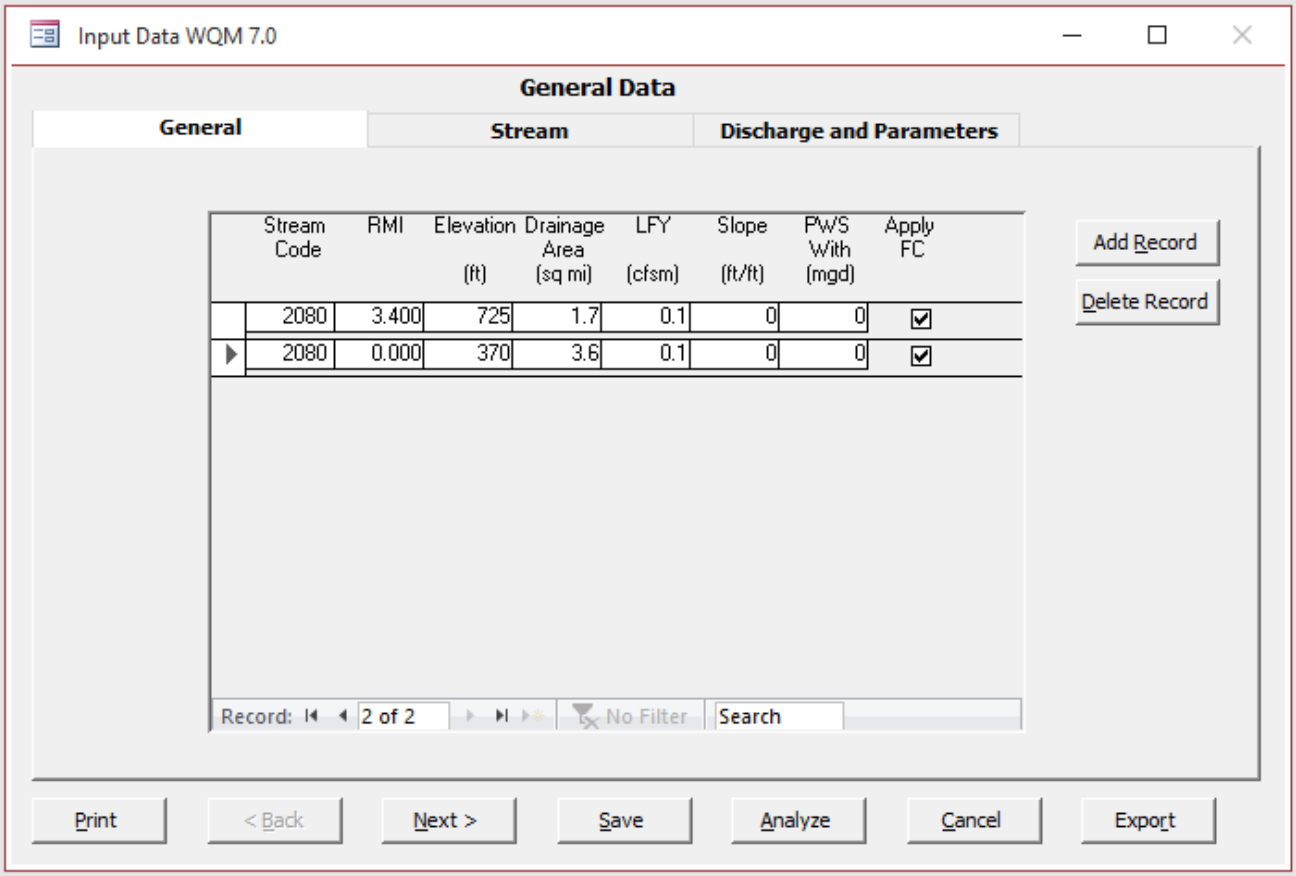
PA0086878	12/1/2020	12/31/2020	Monthly	1	Flow	MGD	0.081	Monitor	Average Mo	0.138	Monitor	Daily Maximum
PA0086878	1/1/2021	1/31/2021	Monthly	1	Flow	MGD	0.1	Monitor	Average Mo	0.18	Monitor	Daily Maximum
PA0086878	2/1/2021	2/28/2021	Monthly	1	Flow	MGD	0.109	Monitor	Average Mo	0.222	Monitor	Daily Maximum
PA0086878	3/1/2021	3/31/2021	Monthly	1	Flow	MGD	0.105	Monitor	Average Mo	0.143	Monitor	Daily Maximum
PA0086878	4/1/2021	4/30/2021	Monthly	1	Flow	MGD	0.092	Monitor	Average Mo	0.149	Monitor	Daily Maximum
PA0086878	5/1/2021	5/31/2021	Monthly	1	Flow	MGD	0.09	Monitor	Average Mo	0.177	Monitor	Daily Maximum
PA0086878	6/1/2021	6/30/2021	Monthly	1	Flow	MGD	0.015	Monitor	Average Mo	0.06	Monitor	Daily Maximum
PA0086878	7/1/2021	7/31/2021	Monthly	1	Flow	MGD	0.029	Monitor	Average Mo	0.087	Monitor	Daily Maximum
PA0086878	8/1/2021	8/31/2021	Monthly	1	Flow	MGD	0.006	Monitor	Average Mo	0.045	Monitor	Daily Maximum
PA0086878	9/1/2021	9/30/2021	Monthly	1	Flow	MGD	0.031	Monitor	Average Mo	0.128	Monitor	Daily Maximum
PA0086878	10/1/2021	10/31/2021	Monthly	1	Flow	MGD	0.102	Monitor	Average Mo	0.238	Monitor	Daily Maximum
PA0086878	11/1/2021	11/30/2021	Monthly	1	Flow	MGD	0.125	Monitor	Average Mo	0.17	Monitor	Daily Maximum
PA0086878	12/1/2021	12/31/2021	Monthly	1	Flow	MGD	0.132	Monitor	Average Mo	0.176	Monitor	Daily Maximum
PA0086878	1/1/2022	1/31/2022	Monthly	1	Flow	MGD	0.033	Monitor	Average Mo	0.165	Monitor	Daily Maximum
PA0086878	2/1/2022	2/28/2022	Monthly	1	Flow	MGD	0.072	Monitor	Average Mo	0.174	Monitor	Daily Maximum
PA0086878	3/1/2022	3/31/2022	Monthly	1	Flow	MGD	0.094	Monitor	Average Mo	0.169	Monitor	Daily Maximum
PA0086878	4/1/2022	4/30/2022	Monthly	1	Flow	MGD	0.059	Monitor	Average Mo	0.161	Monitor	Daily Maximum
PA0086878	5/1/2022	5/31/2022	Monthly	1	Flow	MGD	0.033	Monitor	Average Mo	0.148	Monitor	Daily Maximum
PA0086878	5/1/2022	5/31/2022	Monthly	1	Flow	MGD	0.033	Monitor	Average Mo	0.148	Monitor	Daily Maximum
PA0086878	6/1/2022	6/30/2022	Monthly	1	Flow	MGD	0.114	Monitor	Average Mo	0.18	Monitor	Daily Maximum
PA0086878	7/1/2022	7/31/2022	Monthly	1	Flow	MGD	0.116	Monitor	Average Mo	0.156	Monitor	Daily Maximum
PA0086878	8/1/2022	8/31/2022	Monthly	1	Flow	MGD	0.027	Monitor	Average Mo	0.213	Monitor	Daily Maximum
PA0086878	9/1/2022	9/30/2022	Monthly	1	Flow	MGD	0.001	Monitor	Average Mo	0.004	Monitor	Daily Maximum
PA0086878	10/1/2022	10/31/2022	Monthly	1	Flow	MGD	0.005	Monitor	Average Mo	0.011	Monitor	Daily Maximum
							0.05579	Avg		0.12398	Avg	
							0.1320	Max Mo	Avg	0.238	Max	

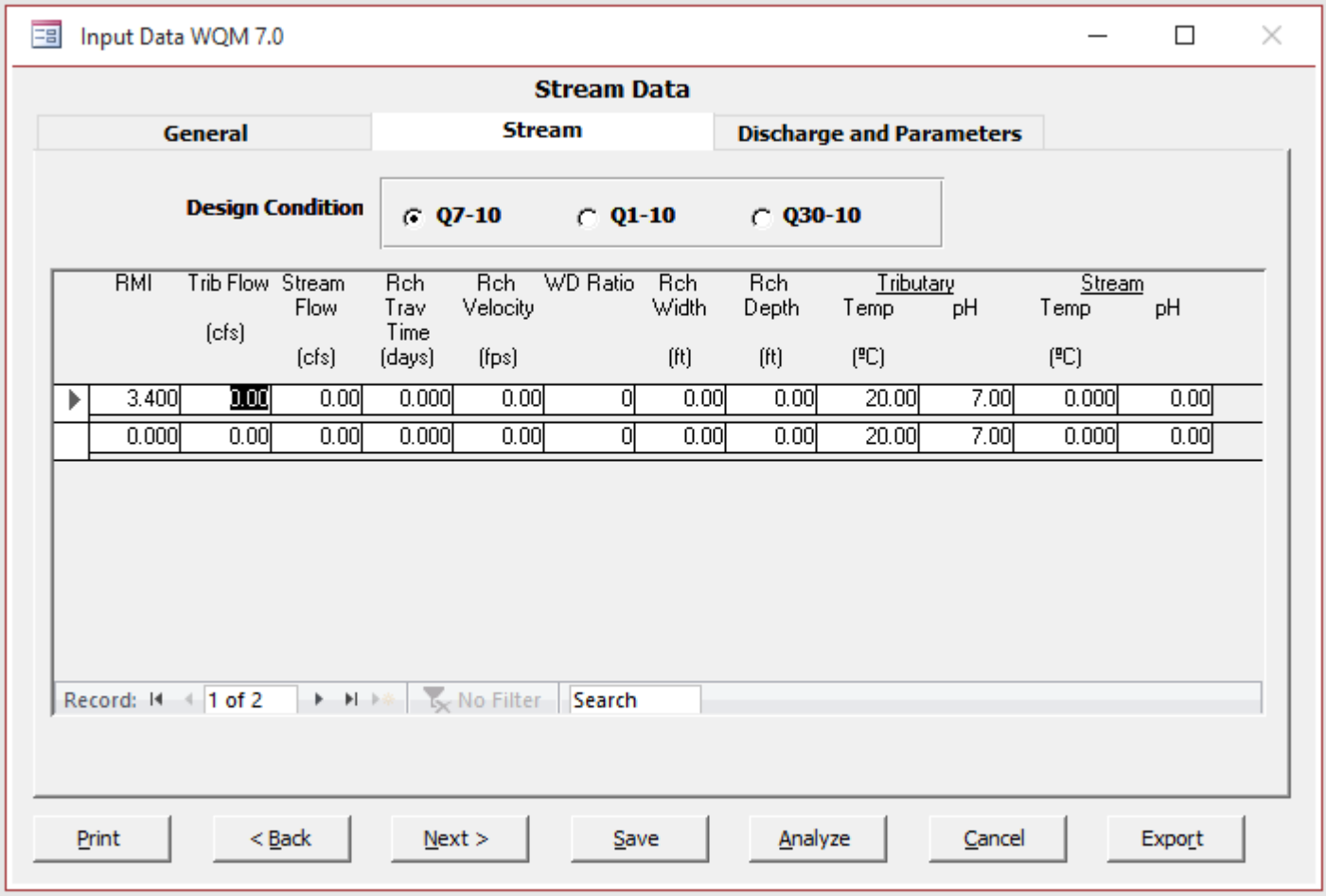
USGS Pennsylvania Stream Stats online tool:

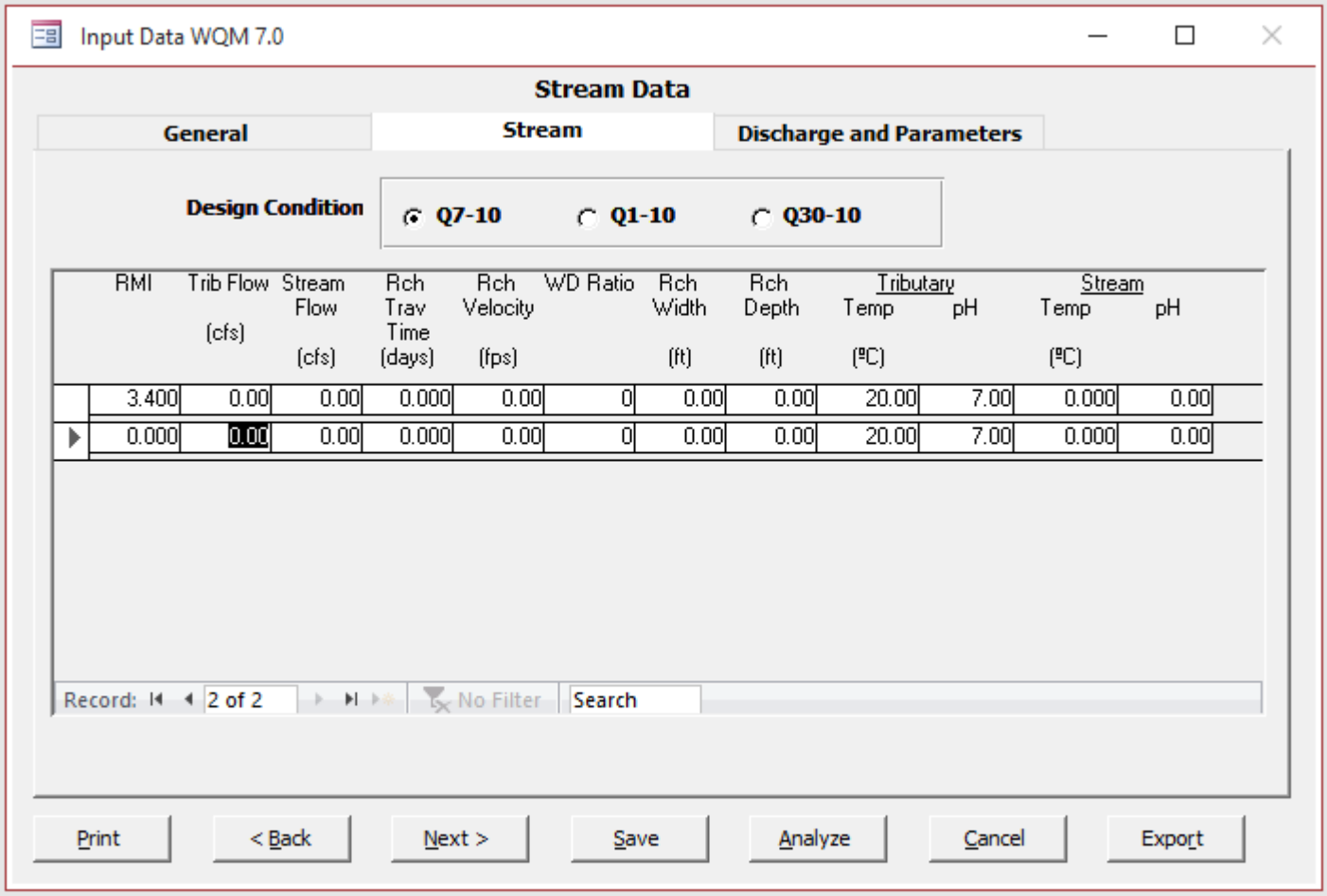
StreamStats Output Report - Furnace Run					
State/Region ID	PA				
Workspace ID	PA20221004191716357000				
Latitude	40.58349				
Longitude	-75.94104				
Time	10/4/2022	3:17:38 PM			
Low-Flow Statistics Parameters	100.0 Percent Low Flow Region 2				
Parameter Code	Parameter Name	Value	Units	Min Limit	Max Limit
DRNAREA	Drainage Area	1.66	square mi	4.93	1280
PRECIP	Mean Annual Precipitation	49	inches	35	50.4
Low-Flow Statistics Flow Repor	100.0 Percent Low Flow Region 2				
Statistic	Value	Unit			
7 Day 2 Year Low Flow	0.252	ft^3/s			
30 Day 2 Year Low Flow	0.358	ft^3/s			
7 Day 10 Year Low Flow	0.0926	ft^3/s			
30 Day 10 Year Low Flow	0.134	ft^3/s			
plication Version: 4.10.1					
StreamStats Services Version: 1.2.22					
NSS Services Version: 2.2.1					

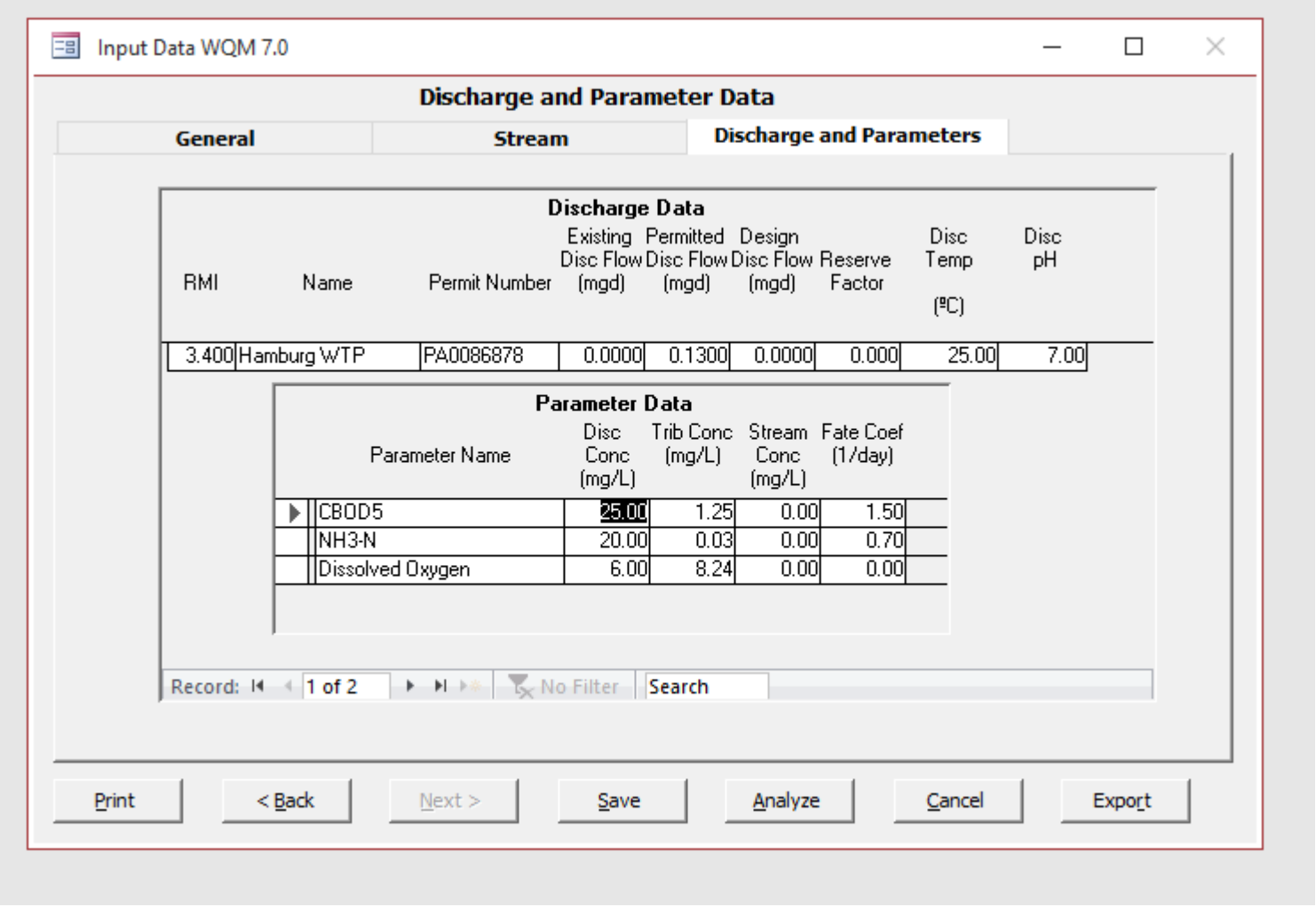
USGS Pennsylvania Stream Stats online tool:

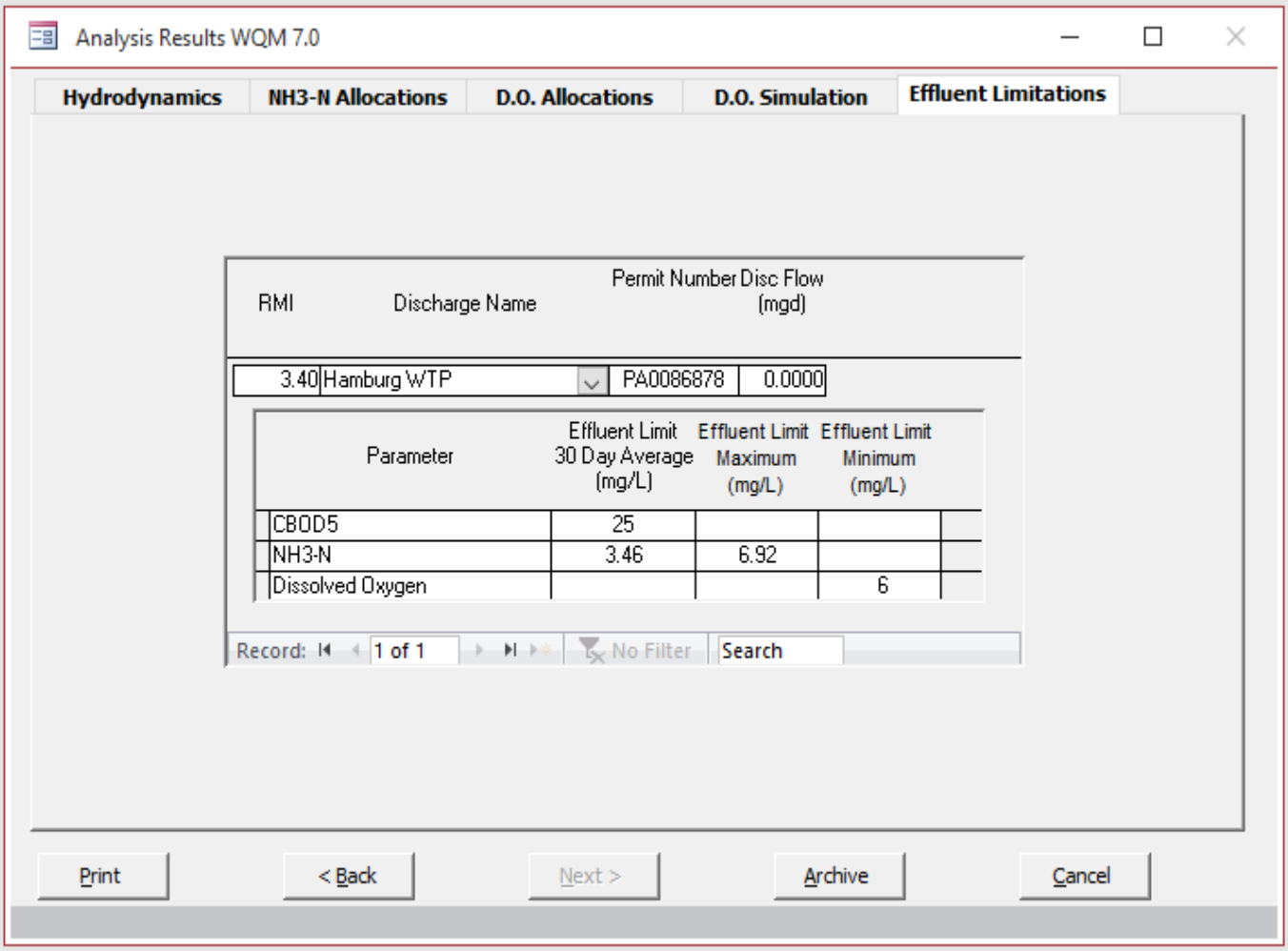
StreamStats Output Report-confl Furnace Run & Maiden Crk			
State/Region ID	PA		
Workspace ID	PA20221004192730731000		
Latitude	40.57477		
Longitude	-75.88677		
Time	10/4/2022	3:27:51 PM	
Basin Characteristics			
Parameter Code	Parameter Description	Value	Unit
CARBON	Percentage of area of carbonate rock	0	percent
PRECIP	Mean Annual Precipitation	48	inches
ROCKDEP	Depth to rock	4.1	feet
DRNAREA	Drainage Area	3.63	square miles
Low-Flow Statistics Flow	100.0 Percent Low Flow Region 2		
Statistic	Value	Unit	
7 Day 2 Year Low Flow	0.546	ft^3/s	
30 Day 2 Year Low Flow	0.763	ft^3/s	
7 Day 10 Year Low Flow	0.215	ft^3/s	
30 Day 10 Year Low Flow	0.304	ft^3/s	
Application Version: 4.10.1			
StreamStats Services Version: 1.2.22			
NSS Services Version: 2.2.1			


Input Data WQM 7.0
General Data
General
Stream
Discharge and Parameters
Stream Code
RMI
Elevation (ft)
Drainage Area (sq mi)
LFY (cfsm)
Slope (ft/ft)
PWS With (mgd)
Apply FC
2080 3.400 725 1.7 0.1 0 0
2080 0.000 370 3.6 0.1 0 0
Add Record
Delete Record
Record: 2 of 2
No Filter
Search
Print
< Back
Next >
Save
Analyze
Cancel
Export


Input Data WQM 7.0
Stream Data
General
Stream
Discharge and Parameters
Design Condition
Q7-10
Q1-10
Q30-10
RMI
Trib Flow (cfs)
Stream Flow (cfs)
Rch Trav Time (days)
Rch Velocity (fps)
WD Ratio
Rch Width (ft)
Rch Depth (ft)
Tributary Temp (ºC)
Tributary pH
Stream Temp (ºC)
Stream pH
3.400 0.00 0.00 0.000 0.00 0 0.00 0.00 20.00 7.00 0.000 0.00
0.000 0.00 0.00 0.000 0.00 0 0.00 0.00 20.00 7.00 0.000 0.00
Record: 1 of 2
No Filter
Search
Print
< Back
Next >
Save
Analyze
Cancel
Export


Input Data WQM 7.0
Stream Data
General
Stream
Discharge and Parameters
Design Condition
Q7-10
Q1-10
Q30-10
RMI
Trib Flow (cfs)
Stream Flow (cfs)
Rch Trav Time (days)
Rch Velocity (fps)
WD Ratio
Rch Width (ft)
Rch Depth (ft)
Tributary Temp (ºC)
Tributary pH
Stream Temp (ºC)
Stream pH
3.400 0.00 0.00 0.000 0.00 0 0.00 0.00 20.00 7.00 0.000 0.00
0.000 0.00 0.00 0.000 0.00 0 0.00 0.00 20.00 7.00 0.000 0.00
Record: 2 of 2
No Filter
Search
Print
< Back
Next >
Save
Analyze
Cancel
Export


Input Data WQM 7.0
Discharge and Parameter Data
General
Stream
Discharge and Parameters
Discharge Data
RMI
Name
Permit Number
Existing Disc Flow (mgd)
Permitted Disc Flow (mgd)
Design Disc Flow (mgd)
Reserve Factor
Disc Temp (ºC)
Disc pH
3.400
Hamburg WTP
PA0086878
0.0000
0.1300
0.0000
0.000
25.00
7.00
Parameter Data
Parameter Name
Disc Conc (mg/L)
Trib Conc (mg/L)
Stream Conc (mg/L)
Fate Coef (1/day)
CBOD5
25.00
1.25
0.00
1.50
NH3-N
20.00
0.03
0.00
0.70
Dissolved Oxygen
6.00
8.24
0.00
0.00
Record: 1 of 2
No Filter
Search
Print
< Back
Next >
Save
Analyze
Cancel
Export


Analysis Results WQM 7.0
Hydrodynamics
NH3-N Allocations
D.O. Allocations
D.O. Simulation
Effluent Limitations
RMI
Discharge Name
Permit Number
Disc Flow (mgd)
3.40
Hamburg WTP
PA0086878
0.0000
Parameter
Effluent Limit 30 Day Average (mg/L)
Effluent Limit Maximum (mg/L)
Effluent Limit Minimum (mg/L)
CBOD5
25
NH3-N
3.46
6.92
Dissolved Oxygen
6
Record: 1 of 1
No Filter
Search
Print
< Back
Next >
Archive
Cancel

TRC EVALUATION

Input appropriate values in A3:A9 and D3:D9

0.16	= Q stream (cfs)	0.5	= CV Daily
0.13	= Q discharge (MGD)	0.5	= CV Hourly
30	= no. samples	1	= 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 =	0.273	1.3.2.iii	WLA cfc =	0.258
PENTOXSD TRG	5.1a	LTAMULT afc =	0.373	5.1c	LTAMULT cfc =	0.581
PENTOXSD TRG	5.1b	LTA_afc=	0.102	5.1d	LTA_cfc =	0.150

Source		Effluent Limit Calculations		
PENTOXSD TRG	5.1f	AML MULT =	1.231	
PENTOXSD TRG	5.1g	AVG MON LIMIT (mg/l) =	0.125	AFC
		INST MAX LIMIT (mg/l) =	0.409	

WLA afc	(.019/e(-k*AFC_tc)) + [(AFC_Yc*Qs*.019/Qd*e(-k*AFC_tc))...
	...+ Xd + (AFC_Yc*Qs*Xs/Qd)]*(1-FOS/100)
LTAMULT afc	EXP((0.5*LN(cvh^2+1))-2.326*LN(cvh^2+1)^0.5)
LTA_afc	wla_afc*LTAMULT_afc
WLA_cfc	(.011/e(-k*CFC_tc) + [(CFC_Yc*Qs*.011/Qd*e(-k*CFC_tc))...
	...+ Xd + (CFC_Yc*Qs*Xs/Qd)]*(1-FOS/100)
LTAMULT_cfc	EXP((0.5*LN(cvd^2/no_samples+1))-2.326*LN(cvd^2/no_samples+1)^0.5)
LTA_cfc	wla_cfc*LTAMULT_cfc
AML MULT	EXP(2.326*LN((cvd^2/no_samples+1)^0.5)-0.5*LN(cvd^2/no_samples+1))
AVG MON LIMIT	MIN(BAT_BPJ,MIN(LTA_afc,LTA_cfc)*AML_MULT)
INST MAX LIMIT	1.5*((av_mon_limit/AML_MULT)/LTAMULT_afc)

(0.011/EXP(-K*CFC_tc/1440))+(((CFC_Yc*Qs*0.011)/(1.547*Qd)....
....*EXP(-K*CFC_tc/1440)))+Xd+(CFC_Yc*Qs*Xs/1.547*Qd))*(1-FOS/100)

pennsylvania
DEPARTMENT OF ENVIRONMENTAL PROTECTION

Toxics Management Spreadsheet
Version 1.3, March 2021

Discharge Information

Instructions | Discharge | Stream

Facility: **Hamburg WTP** NPDES Permit No.: **PA0086878** Outfall No.: **001**

Evaluation Type: **Major Sewage / Industrial Waste** Wastewater Description: **backwash**

Discharge Characteristics								
Design Flow (MGD)*	Hardness (mg/l)*	pH (SU)*	Partial Mix Factors (PMFs)				Complete Mix Times (min)	
			AFC	CFC	THH	CRL	Q_{7-10}	Q_h
0.13	51.3	7						

					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		28.9									
	Chloride (PWS)	mg/L		3.66									
	Bromide	mg/L	<	1									
	Sulfate (PWS)	mg/L		16									
	Fluoride (PWS)	mg/L	<	0.5									
Group 2	Total Aluminum	µg/L		364									
	Total Antimony	µg/L	<	0.4									
	Total Arsenic	µg/L	<	1									
	Total Barium	µg/L		41									
	Total Beryllium	µg/L	<	1									
	Total Boron	µg/L	<	200									
	Total Cadmium	µg/L	<	0.1									
	Total Chromium (III)	µg/L	<	1									
	Hexavalent Chromium	µg/L	<	0.1									
	Total Cobalt	µg/L	<	1									
	Total Copper	µg/L		2									
	Free Cyanide	µg/L											
	Total Cyanide	µg/L		6									
	Dissolved Iron	µg/L		109									
	Total Iron	µg/L		109									
	Total Lead	µg/L	<	1									
	Total Manganese	µg/L	<	32.2									
	Total Mercury	µg/L	<	0.2									
	Total Nickel	µg/L		2.4									
	Total Phenols (Phenolics) (PWS)	µg/L	<	2									
	Total Selenium	µg/L	<	1									
	Total Silver	µg/L	<	0.2									
	Total Thallium	µg/L	<	0.4									
	Total Zinc	µg/L		13									
	Total Molybdenum	µg/L	<	3									
	Acrolein	µg/L	<										
	Acrylamide	µg/L	<										
	Acrylonitrile	µg/L	<										
	Benzene	µg/L	<										
	Bromoform	µg/L	<										

pennsylvania
DEPARTMENT OF ENVIRONMENTAL PROTECTION

Toxics Management Spreadsheet
Version 1.3, March 2021

Discharge Information

Instructions | Discharge | Stream

Facility: **Hamburg WTP** NPDES Permit No.: **PA0086878** Outfall No.: **001**

Evaluation Type: **Major Sewage / Industrial Waste** Wastewater Description: **backwash**

Discharge Characteristics								
Design Flow (MGD)*	Hardness (mg/l)*	pH (SU)*	Partial Mix Factors (PMFs)				Complete Mix Times (min)	
			AFC	CFC	THH	CRL	Q_{7-10}	Q_h
0.13	51.3	7						

					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		28.9									
	Chloride (PWS)	mg/L		3.66									
	Bromide	mg/L	<	1									
	Sulfate (PWS)	mg/L		16									
	Fluoride (PWS)	mg/L	<	0.5									

Group 2	Total Aluminum	µg/L		364									
	Total Antimony	µg/L	<	0.4									
	Total Arsenic	µg/L	<	1									
	Total Barium	µg/L		41									
	Total Beryllium	µg/L	<	1									
	Total Boron	µg/L	<	200									
	Total Cadmium	µg/L	<	0.1									
	Total Chromium (III)	µg/L	<	1									
	Hexavalent Chromium	µg/L	<	0.1									
	Total Cobalt	µg/L	<	1									
	Total Copper	µg/L		2									
	Free Cyanide	µg/L											
	Total Cyanide	µg/L		6									
	Dissolved Iron	µg/L		109									
	Total Iron	µg/L		109									
	Total Lead	µg/L	<	1									
	Total Manganese	µg/L	<	32.2									
	Total Mercury	µg/L	<	0.2									
	Total Nickel	µg/L		2.4									
	Total Phenols (Phenolics) (PWS)	µg/L	<	2									
	Total Selenium	µg/L	<	1									
	Total Silver	µg/L	<	0.2									
	Total Thallium	µg/L	<	0.4									
	Total Zinc	µg/L		13									
	Total Molybdenum	µg/L	<	3									
	Acrolein	µg/L	<										
	Acrylamide	µg/L	<										
	Acrylonitrile	µg/L	<										
	Benzene	µg/L	<										
	Bromoform	µg/L	<										

Discharge Information 12/12/2022 Page 1

Above discharge concentrations for Total Aluminum, Total Iron, and Total Manganese are averages based on DMRs from January 1, 2019 through October 31, 2022. For each of these parameters, most of the sample results reported were detected concentrations but some were reported as < values. (The model results are not different if < signs are input or not for these parameters.)

Stream / Surface Water Information

Hamburg WTP, NPDES Permit No. PA0086878, Outfall 001

Instructions | Discharge | *Stream*

Receiving Surface Water Name: **Furnace Creek**

No. Reaches to Model: **1**

- (●) Statewide Criteria
- ( ) Great Lakes Criteria
- ( ) ORSANCO Criteria

Location	Stream Code*	RMI*	Elevation (ft)*	DA (mi^2)*	Slope (ft/ft)	PWS Withdrawal (MGD)	Apply Fish Criteria*
Point of Discharge	002080	3.4	725	1.7			Yes
End of Reach 1	002080	0	370	3.6			Yes

$Q_{7\text{-}10}$

Location	RMI	LFY (cfs/mi^2)*	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	3.4	0.1	0.16									13.2	7		
End of Reach 1	0	0.1													

Q_h

Location	RMI	LFY (cfs/mi^2)	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	3.4														
End of Reach 1	0														

☑ ***Wasteload Allocations***

☑ ***AFC*** CCT (min): 0.335 PMF: 1 Analysis Hardness (mg/l): 34.419 Analysis pH: 7.00

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	1,347	
Total Antimony	0	0		0	1,100	1,100	1,975	
Total Arsenic	0	0		0	340	340	610	Chem Translator of 1 applied
Total Barium	0	0		0	21,000	21,000	37,707	
Total Boron	0	0		0	8,100	8,100	14,544	
Total Cadmium	0	0		0	0.713	0.72	1.3	Chem Translator of 0.989 applied
Total Chromium (III)	0	0		0	237.864	753	1,352	Chem Translator of 0.316 applied
Hexavalent Chromium	0	0		0	16	16.3	29.3	Chem Translator of 0.982 applied
Total Cobalt	0	0		0	95	95.0	171	
Total Copper	0	0		0	4.920	5.12	9.2	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	19.877	21.0	37.7	Chem Translator of 0.946 applied
Total Manganese	0	0		0	N/A	N/A	N/A	
Total Mercury	0	0		0	1.400	1.65	2.96	Chem Translator of 0.85 applied
Total Nickel	0	0		0	189.930	190	342	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	0.514	0.6	1.09	Chem Translator of 0.85 applied
Total Thallium	0	0		0	65	65.0	117	
Total Zinc	0	0		0	47.466	48.5	87.1	Chem Translator of 0.978 applied

☑ ***CFC*** CCT (min): 0.335 PMF: 1 Analysis Hardness (mg/l): 34.419 Analysis pH: 7.00

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	395	
Total Arsenic	0	0		0	150	150	269	Chem Translator of 1 applied
Total Barium	0	0		0	4,100	4,100	7,362	
Total Boron	0	0		0	1,600	1,600	2,873	
Total Cadmium	0	0		0	0.117	0.12	0.22	Chem Translator of 0.954 applied
Total Chromium (III)	0	0		0	30.941	36.0	64.6	Chem Translator of 0.86 applied
Hexavalent Chromium	0	0		0	10	10.4	18.7	Chem Translator of 0.962 applied
Total Cobalt	0	0		0	19	19.0	34.1	
Total Copper	0	0		0	3.600	3.75	6.73	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	2,693	WQC = 30 day average; PMF = 1
Total Lead	0	0		0	0.775	0.82	1.47	Chem Translator of 0.946 applied
Total Manganese	0	0		0	N/A	N/A	N/A	
Total Mercury	0	0		0	0.770	0.91	1.63	Chem Translator of 0.85 applied
Total Nickel	0	0		0	21.095	21.2	38.0	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	8.96	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	23.3	
Total Zinc	0	0		0	47.854	48.5	87.1	Chem Translator of 0.986 applied

THH: CCT = 0.335 minutes PMFa = 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	N/A	
Chloride (PWS)	0	0		0	250,000	250,000	N/A	
Sulfate (PWS)	0	0		0	250,000	250,000	N/A	
Fluoride (PWS)	0	0		0	2,000	2,000	N/A	
Total Aluminum	0	0		0	N/A	N/A	N/A	
Total Antimony	0	0		0	5.6	5.6	10.1	
Total Arsenic	0	0		0	10	10.0	18.0	
Total Barium	0	0		0	2,400	2,400	4,309	
Total Boron	0	0		0	3,100	3,100	5,566	
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	539	
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	1,796	
Total Mercury	0	0		0	0.050	0.05	0.09	
Total Nickel	0	0		0	610	610	1,095	
Total Phenols (Phenolics) (PWS)	0	0		0	5	5.0	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	0.24	0.24	0.43	
Total Zinc	0	0		0	N/A	N/A	N/A	

☑ ***CRL*** CCT (min): 0.477 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

	Mass Limits		*Concentration Limits*						
Pollutants	AML (lbs/day)	MDL (lbs/day)	AML	MDL	IMAX	Units	Governing WQBEL	WQBEL Basis	Comments
Total Aluminum	Report	Report	Report	Report	Report	µg/L	863	AFC	Discharge Conc > 10% WQBEL (no RP)
Total Copper	Report	Report	Report	Report	Report	µg/L	5.9	AFC	Discharge Conc > 10% WQBEL (no RP)
Dissolved Iron	Report	Report	Report	Report	Report	µg/L	539	THH	Discharge Conc > 10% WQBEL (no RP)
Total Zinc	Report	Report	Report	Report	Report	µg/L	55.9	AFC	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)	N/A	N/A	PWS Not Applicable
Chloride (PWS)	N/A	N/A	PWS Not Applicable
Bromide	N/A	N/A	No WQS
Sulfate (PWS)	N/A	N/A	PWS Not Applicable
Fluoride (PWS)	N/A	N/A	PWS Not Applicable
Total Antimony	N/A	N/A	Discharge Conc < TQL
Total Arsenic	N/A	N/A	Discharge Conc < TQL
Total Barium	4,309	µg/L	Discharge Conc ≤ 10% WQBEL
Total Beryllium	N/A	N/A	No WQS
Total Boron	2,873	µg/L	Discharge Conc < TQL
Total Cadmium	0.22	µg/L	Discharge Conc < TQL
Total Chromium (III)	64.6	µg/L	Discharge Conc < TQL
Hexavalent Chromium	18.7	µg/L	Discharge Conc < TQL
Total Cobalt	34.1	µg/L	Discharge Conc < TQL
Total Cyanide	N/A	N/A	No WQS
Total Iron	2,693	µg/L	Discharge Conc ≤ 10% WQBEL
Total Lead	1.47	µg/L	Discharge Conc < TQL
Total Manganese	1,796	µg/L	Discharge Conc ≤ 10% WQBEL
Total Mercury	0.09	µg/L	Discharge Conc < TQL
Total Nickel	38.0	µg/L	Discharge Conc ≤ 10% WQBEL
Total Phenols (Phenolics) (PWS)		µg/L	Discharge Conc < TQL
Total Selenium	8.96	µg/L	Discharge Conc < TQL
Total Silver	0.7	µg/L	Discharge Conc < TQL
Total Thallium	0.43	µg/L	Discharge Conc < TQL
Total Molybdenum	N/A	N/A	No WQS

To obtain the Daily Max and IMAX WQBELs for Total Aluminum…..

Discharge Information

Instructions | Discharge | Stream

Facility: **Hamburg WTP** NPDES Permit No.: **PA0086878** Outfall No.: **001**

Evaluation Type: **Major Sewage / Industrial Waste** Wastewater Description: **backwash**

Discharge Characteristics								
Design Flow (MGD)*	Hardness (mg/l)*	pH (SU)*	Partial Mix Factors (PMFs)				Complete Mix Times (min)	
			AFC	CFC	THH	CRL	Q_{7-10}	Q_h
0.13	51.3	7						

					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	Strea m CV	Fate Coeff	FOS	Criteri a Mod	Chem Transl
Group 1	Total Dissolved Solids (PWS)	mg/L											
	Chloride (PWS)	mg/L											
	Bromide	mg/L	<										
	Sulfate (PWS)	mg/L											
	Fluoride (PWS)	mg/L	<										
	Total Aluminum	µg/L		9999999									
	Total Antimony	µg/L	<										

☑ ***Recommended WQBELs & Monitoring Requirements***

No. Samples/Month: 4

	Mass Limits		Concentration Limits						
Pollutants	AML (lbs/day)	MDL (lbs/day)	AML	MDL	IMAX	Units	Governing WQBEL	WQBEL Basis	
Total Aluminum	0.94	1.46	863	1,347	2,158	µg/L	863	AFC	D

Excerpt from 2017 Fact Sheet…….

See next pages

PA0086878

Table 4. Comparison of TBEL, WQBEL, ABACT, and Antidegradation Limits:

	All units in mg/l (except pH)														
Parameter	Existing Permit	TBEL	WQBEL (Hardness of 100, pH of 7, and Qd of 0.13 MGD)(b)	R.P. (compares actual max conc, to WQBEL)	Non-Deg, Blended (Uses Avg Qd of 0.065 MGD & Qstrm= Qharmonic) (c)	ABACT, Blended (Uses Qd of 0.13 MGD)	Recom-mended Limit before rounding (a)	Existing Conc. (Avg.)	RP?	Existing Conc (Avg) New DMRs	RP?	Existing Conc. (Max (Mo.Avg) New DMRs	RP?	Updated Proposed Limit	Basis
Aluminum, Total	2.1	4.0	0.87	Yes	1.2	2.1	0.9	0.41 [1]	N	0.66 [3]	Y	1.08 [3]	Y	1.0	WQBEL
Ammonia Nitrogen	-	-	3.4		9.9	-	3.4	<0.1 [2]	N					-	Not a poc
$CBOD_5$	-	-	-		24.6	-	24.6	<2 [2]	N					-	Not a poc
Copper, Total	-	-	0.016	No	0.12	-	0.02	<0.01 [2]	N					-	Not a poc
Iron, Total	2.0	2.0	2.7	No	1.35	2.0	1.35	0.09 [1]	N	0.11 [3]	N	0.23 [3]	N	1.4	Non-degrad.
Lead, Total	-	-	0.006	Unknown	0.088	-	0.006	<0.01 [2]	Un-known					-	Not a poc
Manganese, Total	1.0	1.0	1.8	No	0.51	1.0	0.51	0.03 [1]	N	0.03 [3]	N	0.072 [3]	N	1.0 (d)	Non-degrad/ TBEL.
Nitrate-Nitrite Nitrogen	-	-	-		7.6	-	7.6	<1 [2]	N					-	Not a poc
Phosphorus	Report conc. / & mass load limit		0.46 (to achieve lb/year limit) (c)		0.61	0.62	-	0.08	N	<0.05	N	<0.06	N	Report conc. / & same mass load limit	TMDL
Sulfate	-	-	-	No	26.3	-	26.3	4 [2]	N					-	Not a poc
TDS	-	-	-	No	379	-	379	21 [2]	N					-	Not a poc
TSS	30 / & mass load limit	30	13.8 (to achieve lb/year limit) (c)		2571	30	13.8	3 [1]	N	3.4 [3]	N	6 [3]	N	14.0 / and same mass load limit	TMDL
TRC	0.5	0.5	0.125	Yes	0.23	0.12	0.12	0.1 [1]	Y	0.2 [3]	Y	0.4 [3]	Y	0.12	WQBEL / ABACT
Zinc, Total	-	-	0.14	No	0.22	-	0.14	<0.005 [2]	N					-	Not a poc
pH (S.U.)	6.0-9.0	6.0-9.0	-		-	-	6.0-9.0	-						6.0-9.0	TBEL

1. Existing concentration taken from DMR data, October 2011-Sept 2015, 46-48 data points.
2. Existing concentration taken from 2012 application data- 3 effluent samples, all in Nov. 2012.
3. Existing concentrations taken from eDMR data for October 2015 through November 2016

poc = parameter of concern
TMDL = Total maximum daily load

Footnotes:

(a) Where there is a permit limit, it should be the most stringent of TBEL, WQBEL, ABACT, or Non-degrading per DEP's Antidegradation.Technical Guidance
Where there is no TBEL or Reasonable Potential (RP) to exceed WQBEL/ABACT/Non-degrading limits, no permit limit is needed (i.e. not a pollutant of concern)

Continued from above (2017 Fact Sheet)…….

PA0086878

(b) model defaults are 100 for stream and discharge Hardness; model defaults are 7 for stream and discharge pH. There were not enough effluent sampling results to justify a deviation of the default value for discharge Hardness. In the models, the typical defaults for pH and Hardness were used. [Using lower Hardness values and higher pH values can cause more stringent WQBELs for some parameters.]

(c) Because the non-degradation evaluation was a long-term average approach, a median/ average discharge flow was allowed similar to using the harmonic (long-term average) stream flow.
A median/average discharge flow was similarly used for back-calculating the average concentration to achieve established TMDL loads.

(d) The current DEP software (WMS) rounds up to 1.0 mg/l from 0.5 mg/l. (permit writer overwrite not available)

Hamburg WTF - PA0086878
Expanded Discharge Evaluation

Spreadsheet to evaluate Non-Degradation of Water Quality

Parameter	Existing Permit Limits	ABACT Limits C ABACT	Blended ABACT	Discharge Flow Q expansion	WQ Objective C total	Stream Flow Q upstream	Mean Concentration C upstream	Combined Flow Q total	LTA Discharge Concentration Expansion	Multiplier	Expansion AML	Units		Blended Non Degrading	Ajustmt if no existing permit limit	Pollutant of Concern?
CBOD5	0	0	0	0.0541	1.7	1.4976	1.25	1.5517	14.15	1.72	24.33	mg/L	CBOD5	13.10	24.64	No
TSS	30	30	30	0.0541	106	1.4976	10	1.5517	2761.23	1.72	4749.32	mg/L	TSS	2571.17		
NH3-N	0	0	0	0.0541	0.05	1.4976	0.025	1.5517	0.74	1.72	1.28	mg/L	NH3-N	0.69	9.92	No
NO2/NO3-N	0	0	0	0.0541	0.76	1.4976	0.67	1.5517	3.25	1.72	5.59	mg/L	NO2/NO3-N	3.01	7.62	No
Phosphorus	1	0.5	0.7307692	0.0541	0.024	1.4976	0.019	1.5517	0.16	1.72	0.28	mg/L	Phosphorus	0.61		
TRC	0.5	0	0.2307692	0.0541	0	1.4976	0	1.5517	0.00	1.72	0.00	mg/L	TRC	0.23		
Lead, Total	0	0	0	0.0541	4.56	1.4976	1.9	1.5517	78.13	1.72	134.39	ug/L	Lead Total	72.36	88.05	No
Copper, Total	0	0	0	0.0541	8.5	1.4976	4.75	1.5517	112.22	1.72	193.02	ug/L	Copper Total	103.93	122.39	No
Iron, Total	2000	2000	2000	0.0541	100	1.4976	87	1.5517	459.56	1.72	790.45	ug/L	Iron Total	1348.70		
Sulfate	0	0	0	0.0541	11.41	1.4976	11.2075	1.5517	17.01	1.72	29.26	mg/L	Sulfate	15.75	26.29	No
Aluminum, Total	2100	2100	2100	0.0541	40.45	1.4976	34.5	1.5517	205.02	1.72	352.63	ug/L	Aluminum Total	1159.11		
TDS	0	0	0	0.0541	108	1.4976	101	1.5517	301.61	1.72	518.77	mg/L	TDS	279.34	379.03	No
Zinc, Total	0	0	0.00	0.0541	9.07	1.4976	8.1	1.5517	35.90	1.72	61.75	ug/L	Zinc Total	33.25	217.86	No
Manganese,Total	1000	1000	1000.00	0.0541	6.94	1.4976	5.25	1.5517	53.68	1.72	92.34	ug/L	Manganese, Total	511.26		
				CFS		Qhm-CFS		CFS								

ABACT Tech Limits-Sewage cases

Parameter		<2000 gpd Limit	2000 to 50,000 gpd Limit	>50,000gpd Limit
CBOD5	5/1 to 10/31	10	10	10
CBOD5	11/1 to 4/30	20	20	10
TSS		20	10	10
NH3-N	5/1 to 10/31	5	3	1.5
NH3-N	11/1 to 4/30	15	9	4.5
Disinfection		UV/ND	UV/ND	UV/ND

Q Discharge Existing	0.03	mgd	=	0.0464 cfs
Q Discharge Expansion	0.035	mgd	=	0.0541 cfs
Q Upstream Q_{7-10}	0.16	cfs	=	1.4976 Q_{hm} cfs

Qd represent avg and not max mo avg
for antideg calcs

Source of information:
WQ Objective: TABLE 3
Upstream Concentration: TABLE 3
Multiplier from LTA to AMV @CV of 0.5 TABLE on page 64

$$Q_{hm} = 7.43 \times (Q_{7-10})^{.874}$$

Preliminary Limitations are the more stringent of ABACT, Non-degradation or WQBEL for each parameter of concern.