pennsylvania
DEPARTMENT OF ENVIRONMENTAL PROTECTION

Southwest Regional Office
CLEAN WATER PROGRAM

Application Type	**Renewal**	Application No.	**PA0205800**
Facility Type	**Industrial**	APS ID	**843856**
Major / Minor	**Minor**	Authorization ID	**1310299**

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

Applicant and Facility Information

Applicant Name	**Southwestern PA Water Authority**	Facility Name	**Southwestern PA Water Authority WTP**
Applicant Address	1442 Jefferson Street PO Box 187	Facility Address	310 Tin Can Hollow Road
	Jefferson, PA 15344-4159		Rices Landing, PA 15357
Applicant Contact	Steve Lowther	Facility Contact	Same as Applicant
Applicant Phone	(724) 883-2301	Facility Phone	Same as Applicant
Client ID	38513	Site ID	461059
SIC Code	4941	Municipality	Cumberland Township
SIC Description	Trans. & Utilities - Water Supply	County	Greene
Date Application Received	March 30, 2020	EPA Waived?	Yes
Date Application Accepted	April 6, 2020	If No, Reason	

Purpose of Application: Renewal NPDES Permit Coverage

Summary of Review

The Department received an NPDES permit renewal application from the Southwestern Pennsylvania Water Authority on March 30, 2020 for the coverage of its water treatment plant on Tin Can Hollow Road. This facility is a public water supply system that provides treated water from the Monongahela River for domestic use. The standard industrial classification (SIC) code for this type of facility is 4941, water supply.

The authority has a raw water intake and pumping station which withdraws water from the Monongahela River and pumps it to the treatment plant. Pre-treatment chemicals for disinfection, coagulation, pH adjustment, and iron and manganese removal are injected into the plant influent line. Rapid mix is provided by in-line static mixers. Two plate settler clarifiers provide flocculation and clarification. These clarifiers are then followed by eight high-rate mixed media filters. Each filter has a continuous turbidity monitor on the filter effluent line. Filter effluent is discharged to the clearwell where chemicals for disinfection, corrosion control and fluoridation are injected. Finished water is pumped from the clearwell into the distribution system by high service pumps. Support facilities on site include chemical feed area, storage area, laboratory, office, locker room and control room.

Most of the waste generated at the water treatment plant is produced during sludge withdrawal from the clarifiers and the backwash of the mixed media filters. Suspended material in the raw water and the suspended material generated during pretreatment is removed during clarification. Suspended material removed by filtration is washed out during the backwash process. Process wastewater is also generated during the filter-to-waste periods. Following the backwash process, effluent is discharged to the two wastewater lagoons. The settled solids in the clarifiers are intermittently withdrawn and conveyed to a gravity thickener. The sludge is then periodically transferred to the sludge holding tank and completely mixed. Feed sludge from the sludge holding tank is then periodically dewatered with polymer addition immediately ahead of a solid-bowl decanting centrifuge. Sludge cake from the centrifuge is conveyed to a roll-off dumpster and properly disposed of offsite. The supernatant from the lagoons is discharged via Outfall 001 to the Monongahela River, designated in 25 PA Code Chapter 93

Approve	Deny	Signatures	Date
X		Adam Olesnanik Adam Olesnanik / Environmental Engineering Specialist	4/8/2020
X		Michael E. Fifth Michael E. Fifth, P.E. / Environmental Engineer Manager	4/21/2020

Summary of Review

as a Warm Water Fishery. Stormwater comingles with the wastewater from the lagoons prior to the discharge to Outfall 001; therefore, the effluent from the lagoons is monitored and the effluent limitations are applied at Internal Monitoring Point 101 prior to the comingling of the stormwater.

The site was last inspected on July 9, 2015; no violations were noted. The Permittee has no open violations.

Issuance of the Draft permit is recommended.

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)	0.418
Latitude	39º 56' 50"	Longitude	-79º 57' 00"
Quad Name	Carmichaels	Quad Code	1906
Wastewater Description:	Water treatment plant filter backwash, filter-to-waste water, effluent from sludge drying beds and stormwater		

Receiving Waters	Monongahela River (WWF)	Stream Code	37185
NHD Com ID	134839924	RMI	71.63
Drainage Area	4600	Yield (cfs/mi^2)	0.115
Q_{7-10} Flow (cfs)	530	Q_{7-10} Basis	US Army Corp of Engineers
Elevation (ft)	762	Slope (ft/ft)	0.0001
Watershed No.	19-B	Chapter 93 Class.	WWF
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	Final	Name	Monongahela River TMDL

Nearest Downstream Public Water Supply Intake	Tri County Joint Municipal Authority		
PWS Waters	Monongahela River	Flow at Intake (cfs)	530
PWS RMI	65.268	Distance from Outfall (mi)	6.36

Development of Effluent Limitations

Outfall No.	001	**Design Flow (MGD)**	0.418
Latitude	39º 56' 50"	**Longitude**	-79º 57' 00"

Wastewater Description: Effluent from IMP 101 (filter backwash water, filter-to-waste water and effluent from sludge drying beds) and plant area stormwater.

This discharge shall consist solely of sources monitored at Internal Monitoring Point 101 and uncontaminated storm water runoff from plant area. No monitoring will be imposed on Outfall 001, all limitations will be applied to the discharge from IMP 101 to isolate the process wastewater from the stormwater portion.

The Southwestern PA Water Authority sampled the stormwater discharge at Outfall 001 and the sample results indicate that the discharge is below the no exposure stormwater benchmarks, indicating that the discharge is uncontaminated stormwater. Stormwater sampling will not be imposed but semi-annual inspections will be required as part of an annual stormwater report. A part C condition is included in the permit requiring the submission of the annual stormwater report.

Development of Effluent Limitations

IMP 101 **Design Flow (MGD)** 0.418
Latitude 39º 56' 50" **Longitude** -79º 57' 0"
Wastewater Description: Filter backwash water, filter-to-waste water and effluent from sludge drying beds

Technology-Based Limitations

The Southwestern PA Water Treatment Plant is not subject to Federal Effluent Limitation Guidelines (ELGs) as the SIC code is not listed under 40 CFR parts 405 through 471.

Regulatory Effluent Standards and Monitoring Requirements

Flow monitoring is required pursuant to 25 Pa. Code § 92a.61(d)(1) which is displayed in Table 1 below.

Effluent standards for pH are also imposed on industrial wastes by 25 Pa. Code §§ 95.2(1) which is displayed in Table 1 below.

Pennsylvania regulations at 25 Pa. Code § 92a.48(b) require the imposition of technology-based TRC limits for facilities that use chlorination and that are not already subject to TRC limits based on applicable federal ELGs or a facility-specific BPJ evaluation which is displayed in Table 1 below.

Table 1. Regulatory Effluent Standards

Parameter	Monthly Avg	Daily Max	IMAX
Flow	Monitor	Monitor	----
pH	6-9 at all times		----
TRC	0.5 mg/l	----	1.6 mg/l

Best Practicable Control Technology Currently Achievable (BPT)

BPT for wastewater from treatment of WTP sludges and filter backwash is found in DEPs Technology-Based Control Requirements for Water Treatment Plant Wastes Document which falls under Best Professional Judgement under 40 CFR § 125.3 and the limits imposed are displayed in Table 2 below.

Table 2. BPT Limits for WTP sludge and filter backwash wastewater

Parameter	Monthly Avg (mg/l)	Daily Max (mg/l)
Suspended solids	30.0	60.0
Iron (total)	2.0	4.0
Aluminum (total)	4.0	8.0
Manganese (total)	1.0	2.0
Flow	Monitor	----
pH	6-9 at all times	
Total Residual Chlorine	0.5	1.0

Water Quality-Based Limitations

Toxics Screening Analysis – Procedures for Evaluating Reasonable Potential and Developing WQBELs

DEP's procedures for evaluating reasonable potential are as follows:

1. For IW discharges, the design flow to use in modeling is the average flow during production or operation and may be taken from the permit application.

2. Perform a Toxics Screening Analysis to identify toxic pollutants of concern. All toxic pollutants whose maximum concentrations, as reported in the permit application or on DMRs, are greater than the most stringent applicable water quality criterion are pollutants of concern. [This includes pollutants reported as "Not Detectable" or as "<MDL" where the method detection limit for the analytical method used by the applicant is greater than the most stringent water

quality criterion]. List all toxic pollutants of concern in a Toxics Screening Analysis section of the fact sheet (see Attachment B).

3. For any outfall with an applicable design flow, perform PENTOXSD modeling for all pollutants of concern. Use the maximum reported value from the application form or from DMRs as the input concentration for the PENTOXSD model run.

4. Compare the actual WQBEL from PENTOXSD with the maximum concentration reported on DMRs or the permit application. Use WQN data or another source to establish the existing or background concentration for naturally occurring pollutants, but generally assume zero background concentration for non-naturally occurring pollutants.

    - Establish limits in the draft permit where the maximum reported concentration equals or exceeds 50% of the WQBEL. Use the average monthly and maximum daily limits for the permit as recommended by PENTOXSD. Establish an IMAX limit at 2.5 times the average monthly limit.

    - For non-conservative pollutants, establish monitoring requirements where the maximum reported concentration is between 25% - 50% of the WQBEL.

    - For conservative pollutants, establish monitoring requirements where the maximum reported concentration is between 10% - 50% of the WQBEL.

The information described above including the maximum reported discharge concentrations, the most stringent water quality criteria, the pollutant-of-concern (reasonable potential) determinations, the calculated WQBELs, and the WQBEL/monitoring recommendations are collected on a spreadsheet titled "Toxics Screening Analysis." (Attachment B).

PENTOXSD Water Quality Modeling Program

PENTOXSD Version 2.0 for Windows is a single discharge, mass-balance water quality modeling program that includes consideration for mixing, first-order decay and other factors to determine recommended WQBELs for toxic substances and several non-toxic substances. Required input data including stream code, river mile index, elevation, drainage area, discharge name, NPDES permit number and discharge flow rate are entered into PENTOXSD to establish site-specific discharge conditions. Other data such as low flow yield, reach dimensions and partial mix factors may also be entered to further characterize the conditions of the discharge and receiving water. Pollutants are then selected for analysis based on those present or likely to be present in a discharge at levels that may cause, have the reasonable potential to cause, or contribute to excursions above state water quality standards (i.e., a reasonable potential analysis). Discharge concentrations for the selected pollutants are chosen to represent the "worst case" quality of the discharge (i.e., maximum reported discharge concentrations). PENTOXSD then evaluates each pollutant by computing a Waste Load Allocation for each applicable criterion, determining a recommended maximum WQBEL and comparing that recommended WQBEL with the input discharge concentration to determine which is more stringent. Based on this evaluation, PENTOXSD may recommend average monthly and maximum daily WQBELs.

Reasonable Potential Analysis and WQBEL Development for IMP 101

Table 3: PENTOXSD Inputs

Parameter	**Value**
River Mile Index	71.63
Discharge Flow (MGD)	0.418
Basin/Stream Characteristics	
Parameter	**Value**
Area in Square Miles	4600
Q_{7-10} (cfs)	530
Low-flow yield (cfs/mi^2)	0.115
Elevation (ft)	762
Slope	0.0001

Discharges from IMP 101 are evaluated based on concentrations reported on the application and on DMRs; data from those sources are used for toxics screening as described above. The PENTOXSD model is run with the discharge and receiving stream characteristics shown in Table 3. The pollutants selected for analysis include those identified as candidates for modeling by the Toxics Screening Analysis spreadsheet (in accordance with Step 2 of the Toxics Screening Analysis procedure discussed above). Pollutants for which water quality standards have not been promulgated (e.g., TSS, oil and grease) are excluded from the analysis.

The WQBELs calculated using PENTOXSD are compared to the maximum reported effluent concentrations as described in the Toxics Screening Analysis section above to evaluate the need to impose WQBELs or monitoring requirements in the permit. Output from the PENTOXSD model run is included in Attachment C. No WQBELs are recommended based on the Water Quality Analysis.

Total Residual Chlorine

To determine if WQBELs are required for discharges containing total residual chlorine (TRC), a discharge evaluation is performed using a DEP program called TRC_CALC created with Microsoft Excel for Windows. TRC_CALC calculates TRC Waste Load Allocations (WLAs) through the application of a mass balance model which considers TRC losses due to stream and discharge chlorine demands and first-order chlorine decay. Input values for the program include flow rates and chlorine demands for the receiving stream and the discharge, the number of samples taken per month, coefficients of TRC variability, partial mix factors, and an optional factor of safety. The mass balance model calculates WLAs for acute and chronic criteria that are then converted to long term averages using calculated multipliers. The multipliers are functions of the number of samples taken per month and the TRC variability coefficients (normally kept at default values unless site specific information is available). The most stringent limitation between the acute and chronic long-term averages is converted to an average monthly limit for comparison to the BAT average monthly limit of 0.5 mg/l from 25 Pa. Code § 92a.48(b)(2). The more stringent of these average monthly TRC limitations is imposed in the permit. The results of the modeling, included in Attachment D, indicate that no WQBELs are required for TRC.

Anti-Backsliding

Previous limits can be used pursuant to EPA's anti-backsliding regulation, 40 CFR 122.44(l). The limits below in Table 4 are from the current permit. The parameters listed are from the Departments Technical Support Document (TSD) "Development of Technology-Based Control Requirements for Water Treatment Plant Wastes in Pennsylvania".

Table 4: Current Permit Effluent Limits

Parameters	Mass (lb/day)		Concentration (mg/l)			
	Average Monthly	Daily Maximum	Minimum	Average Monthly	Daily Maximum	Instant. Maximum
Flow (MGD)	Report	Report	XXX	XXX	XXX	XXX
Total Suspended Solids	XXX	XXX	XXX	30	XXX	60
Total Residual Chlorine	XXX	XXX	XXX	0.5	XXX	1.0
Total Aluminum	XXX	XXX	XXX	4.0	XXX	8.0
Total Iron	XXX	XXX	XXX	2.0	XXX	4.0
Total Manganese	XXX	XXX	XXX	1.0	XXX	2.0
pH (S.U.)	XXX	XXX	6.0	XXX	XXX	9.0

Proposed Effluent Limitations for IMP 101

The proposed effluent limitations and monitoring requirements for IMP 101 are shown below in Table 5. Note that some values were incorrectly labeled as IMAX values in the previous permit when they should have been label as Daily Max, this has been changed to reflect existing permitting practices. The monitoring frequency will remain the same as the current permit, twice per month.

Table 5: Proposed Effluent Limitation for IMP 101

Parameters	Mass (lb/day)		Concentration				Monitoring Requirements	
	Average Monthly	Daily Maximum	Instant. Minimum	Average Monthly	Daily Maximum	Instant. Maximum	Frequency	Sample Type
Flow (MGD)	Report	Report	XXX	XXX	XXX	XXX	2/Month	Measure
Total Suspended Solids (mg/L)	XXX	XXX	XXX	30.0	60.0	XXX	2/Month	Grab
Total Residual Chlorine (mg/L)	XXX	XXX	XXX	0.5	1.0	XXX	2/Month	Grab
Total Aluminum (mg/L)	XXX	XXX	XXX	4.0	8.0	XXX	2/Month	Grab
Total Iron (mg/L)	XXX	XXX	XXX	2.0	4.0	XXX	2/Month	Grab
Total Manganese (mg/L)	XXX	XXX	XXX	1.0	2.0	XXX	2/Month	Grab
pH (S.U.)	XXX	XXX	6.0	XXX	XXX	9.0	2/Month	Grab

Tools and References Used to Develop Permit	
☐	WQM for Windows Model (see Attachment)
☒	PENTOXSD for Windows Model (see Attachment **C**)
☒	TRC Model Spreadsheet (see Attachment **D**)
☐	Temperature Model Spreadsheet (see Attachment)
☒	Toxics Screening Analysis Spreadsheet (see Attachment **B**)
☐	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:
☐	Other:

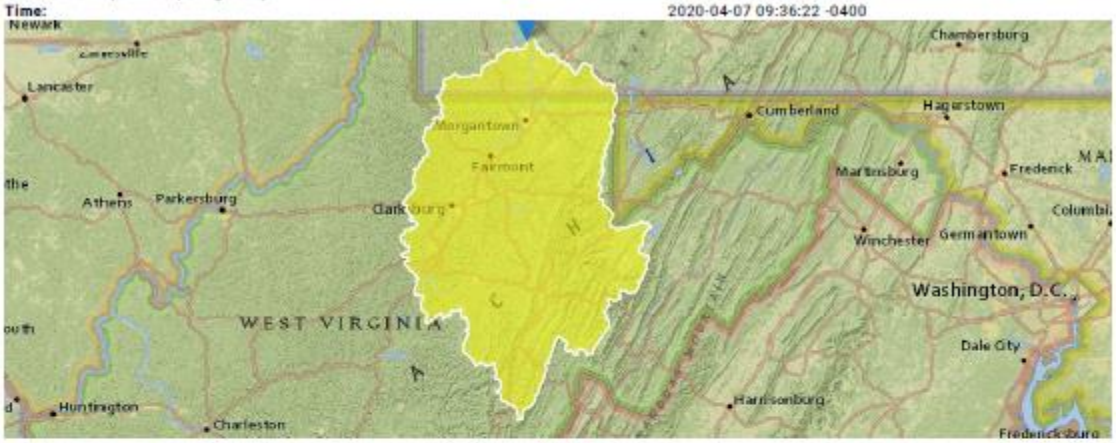
Attachments

Attachment A: StreamStats Drainage Area
Attachment B: Toxics Screening Analysis
Attachment C: PENTOXSD Model run
Attachment D: TRC Evaluation Model

Attachment A:
StreamStats Drainage Area

Outfall 001 StreamStats Report

Region ID:	PA
Workspace ID:	PA20200407133602334000
Clicked Point (Latitude, Longitude):	39.94819, -79.94947
Time:	2020-04-07 09:36:22 -0400



Basin Characteristics

Parameter Code	Parameter Description	Value	Unit
DRNAREA	Area that drains to a point on a stream	4600	square miles
ELEV	Mean Basin Elevation	1933.7	feet

Low-Flow Statistics Parameters[100 Percent (4590 square miles) Low Flow Region 4]

Parameter Code	Parameter Name	Value	Units	Min Limit	Max Limit
DRNAREA	Drainage Area	4600	square miles	2.26	1400
ELEV	Mean Basin Elevation	1933.7	feet	1050	2580

Low-Flow Statistics Disclaimers[100 Percent (4590 square miles) Low Flow Region 4]

One or more of the parameters is outside the suggested range. Estimates were extrapolated with unknown errors

Low-Flow Statistics Flow Report[100 Percent (4590 square miles) Low Flow Region 4]

Statistic	Value	Unit
7 Day 2 Year Low Flow	622	ft^3/s
30 Day 2 Year Low Flow	833	ft^3/s
7 Day 10 Year Low Flow	354	ft^3/s
30 Day 10 Year Low Flow	420	ft^3/s
90 Day 10 Year Low Flow	634	ft^3/s

Low-Flow Statistics Citations

Stuckey, M.H.,2006, Low-flow, base-flow, and mean-flow regression equations for Pennsylvania streams: U.S. Geological Survey Scientific Investigations Report 2006-5130, 84 p. (http://pubs.usgs.gov/sir/2006/5130/)

Attachment B:
Toxic Screening Analysis

TOXICS SCREENING ANALYSIS
WATER QUALITY POLLUTANTS OF CONCERN
VERSION 2.7

CLEAR FORM

Facility: **Southwestern PA WTP**
NPDES Permit No.: **PA0205800**
Outfall: **001**
Analysis Hardness (mg/L): **100**
Discharge Flow (MGD): **0.418**
Analysis pH (SU): **7**
Stream Flow, Q_{7-10} (cfs): **530**

	Parameter	Maximum Concentration in Application or DMRs (µg/L)		Most Stringent Criterion (µg/L)	Candidate for PENTOXSD Modeling?	Most Stringent WQBEL (µg/L)	Screening Recommendation
Group 1	Total Dissolved Solids		130000	500000	No		
	Chloride		15200	250000	No		
	Bromide		100	N/A	No		
	Sulfate		48400	250000	No		
	Fluoride		650	2000	No		
Group 2	Total Aluminum		860	750	Yes	295984.1	No Limits/Monitoring
	Total Antimony		2	5.6	No		
	Total Arsenic		2	10	No		
	Total Barium		280	2400	No		
	Total Beryllium		0.1	N/A	No		
	Total Boron	<	100	1600	No (Value < QL)		
	Total Cadmium		0.3	0.271	Yes	166.625	No Limits/Monitoring
	Total Chromium	<	1	N/A	No		
	Hexavalent Chromium	<	5	10.4	No		
	Total Cobalt		0.5	19	No		
	Total Copper	<	2	9.3	No (Value < QL)		
	Total Cyanide		1	N/A	No		
	Total Iron		140	1500	No		
	Dissolved Iron	<	20	300	No (Value < QL)		
	Total Lead		16	3.2	Yes	1958.939	No Limits/Monitoring
	Total Manganese		131	1000	No		
	Total Mercury	<	0.05	0.05	No (Value < QL)		
	Total Molybdenum		0.3	N/A	No		
	Total Nickel		2	52.2	No		
	Total Phenols (Phenolics)		40	5	Yes	10000000	No Limits/Monitoring
	Total Selenium	<	5	5.0	No (Value < QL)		
	Total Silver		0.1	3.8	No		
	Total Thallium	<	2	0.24	No (Value < QL)		
	Total Zinc		21	119.8	No		

Attachment C:
PENTOXSD model run

PENTOXSD

Modeling Input Data

Stream Code	RMI	Elevation (ft)	Drainage Area (sq mi)	Slope	PWS With (mgd)	Apply FC
37185	71.63	762.00	4600.00	0.00010	0.00	☑

Stream Data

	LFY	Trib Flow	Stream Flow	WD Ratio	Rch Width	Rch Depth	Rch Velocity	Rch Trav Time	Tributary Hard	Tributary pH	Stream Hard	Stream pH	Analysis Hard	Analysis pH
	(cfsm)	(cfs)	(cfs)		(ft)	(ft)	(fps)	(days)	(mg/L)		(mg/L)		(mg/L)	
Q7-10	0.1	0	530	0	700	15	0	0	100	7	0	0	0	0
Qh		0	0	0	0	0	0	0	100	7	0	0	0	0

Discharge Data

Name	Permit Number	Existing Disc Flow (mgd)	Permitted Disc Flow (mgd)	Design Disc Flow (mgd)	Reserve Factor	AFC PMF	CFC PMF	THH PMF	CRL PMF	Disc Hard (mg/L)	Disc pH
SW PA WTP	PA0205800	0.418	0	0	0	0.75	0.75	0.75	0.75	100	7

Parameter Data

Parameter Name	Disc Conc (µg/L)	Trib Conc (µg/L)	Disc Daily CV	Disc Hourly CV	Steam Conc (µg/L)	Stream CV	Fate Coef	FOS	Crit Mod	Max Disc Conc (µg/L)
ALUMINUM	1000000	0	0.5	0.5	0	0	0	0	1	0
CADMIUM	1000000	0	0.5	0.5	0	0	0	0	1	0
LEAD	1000000	0	0.5	0.5	0	0	0	0	1	0
PHENOLICS (PWS)	1E+30	0	0.5	0.5	0	0	0	0	1	0

Stream Code	RMI	Elevation (ft)	Drainage Area (sq mi)	Slope	PWS With (mgd)	Apply FC
37185	65.27	761.00	4601.00	0.00010	0.00	☑

Stream Data

	LFY	Trib Flow	Stream Flow	WD Ratio	Rch Width	Rch Depth	Rch Velocity	Rch Trav Time	Tributary Hard	Tributary pH	Stream Hard	Stream pH	Analysis Hard	Analysis pH
	(cfsm)	(cfs)	(cfs)		(ft)	(ft)	(fps)	(days)	(mg/L)		(mg/L)		(mg/L)	
Q7-10	0.1	0	530	0	700	15	0	0	100	7	0	0	0	0
Qh		0	0	0	0	0	0	0	100	7	0	0	0	0

Discharge Data

Name	Permit Number	Existing Disc Flow (mgd)	Permitted Disc Flow (mgd)	Design Disc Flow (mgd)	Reserve Factor	AFC PMF	CFC PMF	THH PMF	CRL PMF	Disc Hard (mg/L)	Disc pH
		0	0	0	0	0	0	0	0	100	7

Parameter Data

Parameter Name	Disc Conc (µg/L)	Trib Conc (µg/L)	Disc Daily CV	Disc Hourly CV	Steam Conc (µg/L)	Stream CV	Fate Coef	FOS	Crit Mod	Max Disc Conc (µg/L)
ALUMINUM	0	0	0.5	0.5	0	0	0	0	1	0
CADMIUM	0	0	0.5	0.5	0	0	0	0	1	0
LEAD	0	0	0.5	0.5	0	0	0	0	1	0
PHENOLICS (PWS)	0	0	0.5	0.5	0	0	0	0	1	0

PENTOXSD Analysis Results

Hydrodynamics

SWP Basin	Stream Code:	Stream Name:
19A	37185	MONONGAHELA RIVER

RMI	Stream Flow (cfs)	PWS With (cfs)	Net Stream Flow (cfs)	Disc Analysis Flow (cfs)	Reach Slope	Depth (ft)	Width (ft)	WD Ratio	Velocity (fps)	Reach Trav Time (days)	CMT (min)
Q7-10 Hydrodynamics											
71.630	530	0	530	0.64664	0.0001	15	700	46.667	0.0505	7.6906	1000+
65.270	530	0	530	NA	0	0	0	0	0	0	NA
Qh Hydrodynamics											
71.630	1786.5	0	1786.5	0.64664	0.0001	25.593	700	27.351	0.0998	3.8962	1000+
65.270	1786.5	0	1786.5	NA	0	0	0	0	0	0	NA

PENTOXSD Analysis Results

Wasteload Allocations

RMI	Name	Permit Number
71.63	SW PA WTP	PA0205800

AFC

Q7-10: **CCT (min)** 15 **PMF** 0.75 **Analysis pH** 7 **Analysis Hardness** 100

Parameter	Stream Conc (µg/L)	Stream CV	Trib Conc (µg/L)	Fate Coef	WQC (µg/L)	WQ Obj (µg/L)	WLA (µg/L)
ALUMINUM	0	0	0	0	750	750	461782.8
CADMIUM	0	0	0	0	2.014	2.133	1313.424
	Dissolved WQC. Chemical translator of 0.944 applied.						
LEAD	0	0	0	0	64.581	81.645	50269.72
	Dissolved WQC. Chemical translator of 0.791 applied.						
PHENOLICS (PWS)	0	0	0	0	NA	NA	NA

CFC

Q7-10: **CCT (min)** 720 **PMF** 0.75 **Analysis pH** 7 **Analysis Hardness** 100

Parameter	Stream Conc. (µg/L)	Stream CV	Trib Conc. (µg/L)	Fate Coef	WQC (µg/L)	WQ Obj (µg/L)	WLA (µg/L)
ALUMINUM	0	0	0	0	NA	NA	NA
CADMIUM	0	0	0	0	0.246	0.271	166.625
	Dissolved WQC. Chemical translator of 0.909 applied.						
LEAD	0	0	0	0	2.517	3.182	1958.939
	Dissolved WQC. Chemical translator of 0.791 applied.						
PHENOLICS (PWS)	0	0	0	0	NA	NA	NA

THH

Q7-10: **CCT (min)** 720 **PMF** 0.75 **Analysis pH** NA **Analysis Hardness** NA

Parameter	Stream Conc (µg/L)	Stream CV	Trib Conc (µg/L)	Fate Coef	WQC (µg/L)	WQ Obj (µg/L)	WLA (µg/L)
ALUMINUM	0	0	0	0	NA	NA	NA
CADMIUM	0	0	0	0	NA	NA	NA
LEAD	0	0	0	0	NA	NA	NA
PHENOLICS (PWS)	0	0	0	0	5	5	NA

CRL

Qh: **CCT (min)** 720 **PMF** 0.75

PENTOXSD Analysis Results

Wasteload Allocations

RMI	Name	Permit Number
71.63	**SW PA WTP**	**PA0205800**

Parameter	Stream Conc (µg/L)	Stream CV	Trib Conc (µg/L)	Fate Coef	WQC (µg/L)	WQ Obj (µg/L)	WLA (µg/L)
ALUMINUM	0	0	0	0	NA	NA	NA
CADMIUM	0	0	0	0	NA	NA	NA
LEAD	0	0	0	0	NA	NA	NA
PHENOLICS (PWS)	0	0	0	0	NA	NA	NA

PENTOXSD Analysis Results

Wasteload Allocations

RMI	Name	Permit Number
71.63	**SW PA WTP**	**PA0205800**

PENTOXSD Analysis Results

Recommended Effluent Limitations

SWP Basin	Stream Code:	Stream Name:
19A	37185	MONONGAHELA RIVER

RMI	Name	Permit Number	Disc Flow (mgd)
71.63	SW PA WTP	PA0205800	0.4180

Parameter	Effluent Limit (µg/L)	Governing Criterion	Max. Daily Limit (µg/L)	Most Stringent WQBEL (µg/L)	Most Stringent WQBEL Criterion
ALUMINUM	295984.1	AFC	461782.7	295984.1	AFC
CADMIUM	166.625	CFC	259.962	166.625	CFC
LEAD	1958.939	CFC	3056.26	1958.939	CFC
PHENOLICS (PWS)	1E+30	INPUT	.560161E+30	NA	NA

Attachment D:
TRC Evaluation Model

TRC EVALUATION

530	= Q stream (cfs)	0.5	= CV Daily
0.418	= Q discharge (MGD)	0.5	= CV Hourly
4	= no. samples	0.75	= AFC_Partial Mix Factor
0.3	= Chlorine Demand of Stream	0.75	= 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)
	= %Factor of Safety (FOS)		=Decay Coefficient (K)

Source	Reference	AFC Calculations		Reference	CFC Calculations	
TRC	1.3.2.iii	WLA afc =	196.112	1.3.2.iii	WLA cfc =	191.186
PENTOXSD TRG	5.1a	LTAMULT afc =	0.373	5.1c	LTAMULT cfc =	0.581
PENTOXSD TRG	5.1b	LTA_afc=	73.076	5.1d	LTA_cfc =	111.147

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

WLA afc	**(.019/e(-k*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)**