pennsylvania
DEPARTMENT OF ENVIRONMENTAL PROTECTION

Southwest Regional Office
CLEAN WATER PROGRAM

Application Type	**Renewal**	Application No.	**PA0098779**
Facility Type	**Industrial**	APS ID	**826973**
Major / Minor	**Minor**	Authorization ID	**1280642**

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

Applicant and Facility Information

Applicant Name	**Portage Borough Municipal Water Authority**	Facility Name	**Portage Area Municipal Authority– Martindale WTP**
Applicant Address	606 Cambria Street Portage, PA 15946-1516	Facility Address	775 Puritan Road Portage, PA 15946
Applicant Contact	Ronald Cadwallader	Facility Contact	Same as Applicant
Applicant Phone	(814) 736-9642	Facility Phone	Same as Applicant
Client ID	118359	Site ID	256155
SIC Code	4941,4952	Municipality	Portage Township
SIC Description	Trans. & Utilities - Sewerage Systems,Trans. & Utilities - Water Supply	County	Cambria
Date Application Received	July 16, 2019	EPA Waived?	Yes
Date Application Accepted	July 17, 2019	If No, Reason	
Purpose of Application	Renewal NPDES permit		

Summary of Review

The Department received a renewal NPDES permit application from Portage Borough Municipal Authority for coverage of the Martindale Water Treatment Plant on July 16, 2019. The site is a municipal potable water treatment facility.

Raw water enters the plant from the reservoir or from wells. Chemicals are added (perchloride, polyaluminum chloride, and potassium permanganate). Coagulation, flocculation, sedimentation takes place. The sludge drops out and the water is filtered. After filtering, zinc orthophosphate, post chlorine and soda ash are added before the finished water goes to the municipal system. The sludge and filter backwash go to a settling pit before being pumped to a sedimentation lagoon. The lagoon discharges via Outfall 001 to Trout Run. Sludge from the sedimentation lagoon is hauled out and landfilled.

The site has one outfall, Outfall 001, that discharges to Trout Run, designated in 25 PA Code Chapter 93 as a cold-water fishery. Trout Run is within the Kiskiminetas-Conemaugh River Watershed, for which the Department has developed Total Maximum Daily Loads for the discharge.

The site was last inspected on March 12, 2015; no violations were noted. The permittee has no open violations.

It is recommended that a Draft NPDES Permit be published for public comment in response to this application.

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

Approve	Deny	Signatures	Date
X		Adam Olesnanik / Environmental Engineering Specialist	9-10-19
✓		Michael E. Fifth, P.E. / Environmental Engineer Manager	9/10/19

Summary of Review

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)	0.022
Latitude	40º 21' 17"	Longitude	-78º 37' 31"
Quad Name	Beaverdale	Quad Code	1616
Wastewater Description:	IW Process Effluent without ELG		
Receiving Waters	Trout Run (CWF)	Stream Code	46052
NHD Com ID	123713381	RMI	4.83
Drainage Area	1.41	Yield (cfs/mi^2)	0.091
Q_{7-10} Flow (cfs)	0.128	Q_{7-10} Basis	USGS StreamStats
Elevation (ft)	2305	Slope (ft/ft)	0.0001
Watershed No.	18-E	Chapter 93 Class.	CWF
Existing Use		Existing Use Qualifier	
Exceptions to Use		Exceptions to Criteria	
Assessment Status	Attaining Use(s)		
Cause(s) of Impairment			
Source(s) of Impairment			
TMDL Status	Final	Name	Kiskiminetas-Conemaugh River Watersheds TMDL
Nearest Downstream Public Water Supply Intake	Saltsburg Municipal Waterworks		
PWS Waters	Conemaugh River	Flow at Intake (cfs)	124
PWS RMI	0.5	Distance from Outfall (mi)	~76

Development of Effluent Limitations

Outfall No. 001 **Design Flow (MGD)** 0.022
Latitude 40º 21' 17" **Longitude** -78º 37' 31"
Wastewater Description: IW Process Effluent without ELG

Technology-Based Limitations

The Martindale 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 (MGD)	Monitor	Monitor	----
pH (S.U.)	6-9 at all times		----
TRC (mg/L)	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 relies on Best Professional Judgement in accordance with 40 CFR § 125.3. The limits proposed 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 (MGD)	Monitor	----
pH (S.U.)	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 Outfall 001

Table 3: PENTOXSD Inputs

Parameter	**Value**
River Mile Index	4.83
Discharge Flow (MGD)	0.022
Basin/Stream Characteristics	
Parameter	**Value**
Area in Square Miles	1.41
Q_{7-10} (cfs)	0.128
Low-flow yield (cfs/mi^2)	0.091
Elevation (ft)	2305
Slope	0.0001

Discharges from Outfall 001 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 Toxics Screening Analysis recommended that Total Phenols be run in the PENTOXSD model; however, because Total Phenols is a Potable Water Parameter and the nearest Potable Water Supply is over 76 miles downstream, Total Phenols were not evaluated using the PENTOXSD model.

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. Based on the recommendations of the Toxics Screening Analysis, monitoring for Total Aluminum and Total Selenium is required for Outfall 001. Output from the PENTOXSD model runs are included in Attachment C.

Note, Selenium received Monitoring Requirements because of the reporting limit that was used during the analytical testing was less stringent that the quantitation limitations that the Department requires. Therefore, it is uncertain if Selenium is discharging at concentrations above the Department QLs.

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.

Total Maximum Daily Loads

Wastewater discharges from the Martindale Water Treatment Plant are located within the Kiskiminetas-Conemaugh River Watersheds for which the Department has developed a TMDL. The TMDL was finalized on January 29, 2010 and establishes waste load allocations for the discharge of aluminum, iron and manganese within the Kiskiminetas-Conemaugh River Watersheds. The Martindale Water Treatment Plant permit, (PA0098779), is listed in the Appendix G of the Kiskiminetas-Conemaugh River Watersheds TMDL, requiring load allocations. Section 303(d) of the Clean Water Act and the U.S. Environmental Protection Agency's Water Quality Planning and Management Regulations (codified at Title 40 of the *Code of Federal Regulations* Part 130) require states to develop a TMDL for impaired water bodies. A TMDL establishes the amount of a pollutant that a water body can assimilate without exceeding the water quality criteria for that pollutant. TMDLs provide the scientific basis for a state to establish water quality-based controls to reduce pollution from both point and non-point sources in order to restore and maintain the quality of the state's water resources (USEPA 1991a). Stream reaches within the Kiskiminetas-Conemaugh River Watersheds are included in the state's 2008 Section 303(d) list because of various impairments, including metals, pH and sediment. The TMDL includes consideration for each river and tributary within the target watershed and its impairment sources. Stream data is then used to calculate minimum pollutant reductions that are necessary to attain water quality criteria levels. Target concentrations published in the TMDL were based on established water quality criteria of 0.750 $^{mg}/_{L}$ total recoverable aluminum, 1.5 $^{mg}/_{L}$ total recoverable iron based on a 30-day average and 1.0 $^{mg}/_{L}$ total recoverable manganese. The reduction needed to meet the minimum water quality standards is then divided between each known point and non-point pollutant source in the form of a watershed allocation. TMDLs prescribe allocations that minimally achieve water quality criteria (i.e., 100 percent use of a stream's assimilative capacity). For non-mining facilities with aluminum, iron, or manganese permit limits, the WLA was calculated using corresponding metals permit limits and flows. The WLAs for Aluminum and Manganese at the Martindale Water Treatment Plant were derived from the existing effluent limitations in the permit at the time the TMDL was developed. The WLA for Iron was derived based on the water quality criteria for total recoverable iron. The WLAs are displayed below in Table 4.

Table 4: Kiskiminetas River Watershed Major Non-Mining Wasteload Allocations

Permit	Pipe	Metal	Baseline Load (lbs/yr)	Baseline Concentration (mg/L)	Allocated Load (lbs/yr)	Allocated Concentration (mg/L)	% Reduction
PA0098779	1	Aluminum	221	2.50	221	2.50	0
PA0098779	1	Iron	177	2.00	133	1.50	25
PA0098779	1	Manganese	88	1.00	88	1.00	0

Anti-Backsliding

The limits below in Table 5 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 5: 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	2.5	XXX	5.0
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 Outfall 001

The proposed effluent limitations and monitoring requirements for Outfall 001 are shown below in Table 6. 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. As discussed above, the site received new monitoring requirements for Total Selenium due to the Quantitation Limit (QL) that was used during the sample analysis. The QL that was used is less stringent than the QL that the Department requires (5.0 µg/L), therefore it is uncertain if Total Selenium is present at Outfall 001 above the Department's QL. During the 30-day public comment period, Portage Area Municipal Authority may resample Total Selenium at the Department's QL to verify that it is not present in the discharge. If it is determined that Total Selenium is not present in the discharge at the Department's QLs, the Total Selenium monitoring requirement will be removed from the Final Permit.

Table 6: Proposed Effluent Limitation for Outfall 001

Parameters	Mass (lb/day)		Concentration				Monitoring Requirements	
	Average Monthly	Daily Maximum	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	2.5	5.0	XXX	2/Month	Grab
Total Iron (mg/L)	XXX	XXX	XXX	1.5	3.0	XXX	2/Month	Grab
Total Manganese (mg/L)	XXX	XXX	XXX	1.0	2.0	XXX	2/Month	Grab
Total Selenium	XXX	XXX	XXX	Monitor	Monitor	XXX	2/Month	Grab
pH (S.U.)	XXX	XXX	6.0	XXX	9.0	XXX	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 Report
Attachment B: Toxics Screening Analysis for Outfall 001
Attachment C: PENTOXSD model run for Outfall 001
Attachment D: TRC Evaluation Model for Outfall 001

Attachment A: StreamStats Report

StreamStats Report

Region ID:	PA
Workspace ID:	PA20190807183634518000
Clicked Point (Latitude, Longitude):	40.35510, -78.62550
Time:	2019-08-07 14:36:50 -0400

Basin Characteristics

Parameter Code	Parameter Description	Value	Unit
DRNAREA	Area that drains to a point on a stream	1.41	square miles
ELEV	Mean Basin Elevation	2565.7	feet
PRECIP	Mean Annual Precipitation	48	inches

Low-Flow Statistics Parameters[100 Percent (1.4 square miles) Low Flow Region 3]

Parameter Code	Parameter Name	Value	Units	Min Limit	Max Limit
DRNAREA	Drainage Area	1.41	square miles	2.33	1720
ELEV	Mean Basin Elevation	2565.7	feet	898	2700
PRECIP	Mean Annual Precipitation	48	inches	38.7	47.9

Low-Flow Statistics Disclaimers[100 Percent (1.4 square miles) Low Flow Region 3]

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

Low-Flow Statistics Flow Report[100 Percent (1.4 square miles) Low Flow Region 3]

Statistic	Value	Unit
7 Day 2 Year Low Flow	0.27	ft^3/s
30 Day 2 Year Low Flow	0.395	ft^3/s
7 Day 10 Year Low Flow	0.128	ft^3/s
30 Day 10 Year Low Flow	0.166	ft^3/s
90 Day 10 Year Low Flow	0.242	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 for Outfall 001

TOXICS SCREENING ANALYSIS
WATER QUALITY POLLUTANTS OF CONCERN
VERSION 2.7

CLEAR FORM

Facility: **Portage Borough Martindal WTP** NPDES Permit No.: **PA0098779** Outfall: **001**

Analysis Hardness (mg/L): **100** Discharge Flow (MGD): **0.022** Analysis pH (SU): **7**

Stream Flow, Q_{7-10} (cfs): **0.128**

	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		132000	500000	No		
	Chloride		10300	250000	No		
	Bromide		516	N/A	No		
	Sulfate		18700	250000	No		
	Fluoride	<	1000	2000	No		
Group 2	Total Aluminum		826	750	Yes	2265.017	Monitor
	Total Antimony		1.5	5.6	No		
	Total Arsenic		0.889	10	No		
	Total Barium		284	2400	No		
	Total Beryllium	<	0.05	N/A	No		
	Total Boron		32.8	1600	No		
	Total Cadmium	<	0.1	0.271	No (Value < QL)		
	Total Chromium		1.53	N/A	No		
	Hexavalent Chromium		3.3	10.4	No		
	Total Cobalt	<	1	19	No (Value < QL)		
	Total Copper	<	2.5	9.3	No (Value < QL)		
	Total Cyanide	<	2.9	N/A	No		
	Total Iron		107	1500	No		
	Dissolved Iron	<	8	300	No (Value < QL)		
	Total Lead	<	1	3.2	No (Value < QL)		
	Total Manganese		223	1000	No		
	Total Mercury	<	0.05	0.05	No (Value < QL)		
	Total Molybdenum	<	5	N/A	No		
	Total Nickel	<	5	52.2	No		
	Total Phenols (Phenolics)	<	18.9	5	Yes		
	Total Selenium	<	7	5.0	Yes	23.753	Monitor
	Total Silver	<	1	3.8	No		
	Total Thallium	<	0.911	0.24	No (Value < QL)		
	Total Zinc		7.8	119.8	No		

Attachment C:
PENTOXSD model run for Outfall 001

PENTOXSD

Modeling Input Data

Stream Code	RMI	Elevation (ft)	Drainage Area (sq mi)	Slope	PWS With (mgd)	Apply FC
46052	4.83	2305.00	1.41	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	0.128	0	0	0	0	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	Permitted Disc Flow	Design Disc Flow	Reserve Factor	AFC PMF	CFC PMF	THH PMF	CRL PMF	Disc Hard	Disc pH
		(mgd)	(mgd)	(mgd)						(mg/L)	
Martindale WTP	PA0098779	0.022	0	0	0	0	0	0	0	100	7

Parameter Data

Parameter Name	Disc Conc	Trib Conc	Disc Daily CV	Disc Hourly CV	Steam Conc	Stream CV	Fate Coef	FOS	Crit Mod	Max Disc Conc
	(µg/L)	(µg/L)			(µg/L)					(µg/L)
ALUMINUM	1E+09	0	0.5	0.5	0	0	0	0	1	0
SELENIUM	1E+09	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
46052	4.00	2300.00	1.42	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	0	0	0	0	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	Permitted Disc Flow	Design Disc Flow	Reserve Factor	AFC PMF	CFC PMF	THH PMF	CRL PMF	Disc Hard	Disc pH
		(mgd)	(mgd)	(mgd)						(mg/L)	
		0	0	0	0	0	0	0	0	100	7

Parameter Data

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

PENTOXSD Analysis Results

Hydrodynamics

SWP Basin	Stream Code:	Stream Name:
18E	46052	TROUT RUN

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											
4.830	0.128	0	0.128	0.03403	0.0001	0.4399	7.2486	16.476	0.0508	0.9983	15.4
4.000	0.129	0	0.129	NA	0	0	0	0	0	0	NA
Qh Hydrodynamics											
4.830	1.2322	0	1.2322	0.03403	0.0001	1.0871	7.2486	6.6675	0.1607	0.3157	6.016
4.000	1.2406	0	1.2406	NA	0	0	0	0	0	0	NA

PENTOXSD Analysis Results

Wasteload Allocations

RMI	Name	Permit Number
4.83	**Martindale WTP**	**PA0098779**

AFC

Q7-10: **CCT (min)** 15 **PMF** 0.986 **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	3533.79
SELENIUM	0	0	0	0	NA	NA	NA

CFC

Q7-10: **CCT (min)** 15.4 **PMF** 1 **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
SELENIUM	0	0	0	0	4.6	4.989	23.753

Dissolved WQC. Chemical translator of 0.922 applied.

THH

Q7-10: **CCT (min)** 15.4 **PMF** NA **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
SELENIUM	0	0	0	0	NA	NA	NA

CRL

Qh: **CCT (min)** 6.016 **PMF** 1

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
SELENIUM	0	0	0	0	NA	NA	NA

PENTOXSD Analysis Results

Wasteload Allocations

RMI	Name	Permit Number
4.83	**Martindale WTP**	**PA0098779**

PENTOXSD Analysis Results

Recommended Effluent Limitations

SWP Basin	Stream Code:	Stream Name:
18E	46052	TROUT RUN

RMI	Name	Permit Number	Disc Flow (mgd)
4.83	Martindale WTP	PA0098779	0.0220

Parameter	Effluent Limit (µg/L)	Governing Criterion	Max. Daily Limit (µg/L)	Most Stringent WQBEL (µg/L)	Most Stringent WQBEL Criterion
ALUMINUM	2265.017	AFC	3533.79	2265.017	AFC
SELENIUM	23.753	CFC	37.059	23.753	CFC

Attachment D:
TRC Evaluation Model for Outfall 001

TRC EVALUATION

0.128	= Q stream (cfs)	0.5	= CV Daily
0.022	= Q discharge (MGD)	0.5	= CV Hourly
4	= no. samples	0.7	= AFC_Partial Mix Factor
0.3	= Chlorine Demand of Stream	0.7	= 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 =	0.859	**1.3.2.iii**	WLA cfc =	0.830
PENTOXSD TRG	**5.1a**	LTAMULT afc =	0.373	**5.1c**	LTAMULT cfc =	0.581
PENTOXSD TRG	**5.1b**	LTA_afc=	0.320	**5.1d**	LTA_cfc =	0.482

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)**