pennsylvania
DEPARTMENT OF ENVIRONMENTAL PROTECTION

Southwest Regional Office
CLEAN WATER PROGRAM

Application Type	**Renewal**	Application No.	**PA0205991**
Facility Type	**Industrial**	APS ID	**1076970**
Major / Minor	**Minor**	Authorization ID	**1419803**

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

Applicant and Facility Information

Applicant Name	**Moon Township Municipal Authority Allegheny County**	Facility Name	**Moon Township Municipal Authority**
Applicant Address	1700 Beaver Grade Road Suite 200 Moon Township, PA 15108-3109	Facility Address	150 Fern Hollow Road Moon Township, PA 15108
Applicant Contact	Robert Rateau	Facility Contact	
Applicant Phone	(412) 264-4300	Facility Phone	
Client ID	28901	Site ID	258069
SIC Code	4941	Municipality	Moon Township
SIC Description	Trans. & Utilities - Water Supply	County	Allegheny
Date Application Received	December 6, 2022	EPA Waived?	Yes
Date Application Accepted		If No, Reason	

Purpose of Application: Renewal NPDES permit application

Summary of Review

- The Department received a timely NPDES permit renewal application from Moon Township Municipal Authority for the Fern Hollow Water Treatment Plant (WTP) located in Moon Township of Allegheny County on 12/6/2022
- The facility is a potable public WTP with an NAICS Code of 221310; the facility's existing permitted Industrial Waste discharge consists of supernatant from the gravity thickener which is discharged via a 16-inch diameter outfall (Outfall 001) to the Ohio River
- The Fern Hollow WTP Facility (plant capacity rated at 5.2 MGD) purifies water obtained from two sources: an alluvium deposit of sand and gravel in the flood plain of and beneath the Ohio River, and directly from the Ohio River
    - To collect and treat water, a radial well, two vertical wells, and a surface water intake are utilized with an inline static rapid mixer with cationic polymer, a potassium permanganate, hypo chlorination, and fluoride contact chamber (fluoride treatment to be discontinued), flocculation basins, sedimentation basins, dual-media rapid sand filters, a UV unit, and a clearwell
- Wastewater is generated by backwashing the filter (50000 gpd) along with flows from the control building floor drains (1000 gpd) and roof drains (19000 gpd)
    - The wastewaters are retained in a collection tank then pumped to a gravity thickener; supernatant from the gravity thickener flows to Outfall 001 to the Ohio River (65000 gpd)
    - Blowdown sludge from the sedimentation basin is recirculated to the flocculation basin and is discharged (20000 gpd) along with gravity thickener sludge (5000 gpd) via sanitary sewer to the Riverview Sanitary Authority Wastewater Treatment Plant.
- Stormwater runoff flows to Outfalls SW002, SW003, and SW004 and ultimately discharges to the Ohio River

Approve	Deny	Signatures	Date
x		Jace William Marsh / Environmental Engineer Trainee	December 29, 2022
X		Michael E. Fifth, P.E. / Environmental Engineer Manager	January 25, 2022

Summary of Review

- Outfall 002 receives stormwater from facility roof drains and the parking lot; sodium hypochlorite double containment tanks are within its drainage area
- Outfall 003 receives stormwater from portions of the north and south access road
- Outfall 004 receives stormwater from the grass areas east and south of the plant, south of the parking lot, and the remainder of the access roads and discharges directly to the Township storm sewer

- Residual waste disposal must meet solid waste regulations

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)	.065
Latitude	40º 31' 57.87"	Longitude	-80º 11' 15.68"
Quad Name	Ambridge	Quad Code	
Wastewater Description:	IW Process Effluent without ELG		
Receiving Waters	Ohio River (WWF)	Stream Code	32317
NHD Com ID	134396148	RMI	969.33
Drainage Area	19500 sq. mi.	Yield (cfs/mi^2)	0.243
Q_{7-10} Flow (cfs)	4730	Q_{7-10} Basis	USACE
Elevation (ft)	694	Slope (ft/ft)	0.0001
Watershed No.	20-G	Chapter 93 Class.	WWF
Existing Use		Existing Use Qualifier	
Exceptions to Use		Exceptions to Criteria	
Assessment Status	Impaired		
Cause(s) of Impairment	Dioxin, PCB, Pathogens		
Source(s) of Impairment	Source Unknown		
TMDL Status	Final	Name	Ohio River
Nearest Downstream Public Water Supply Intake	Center Township Water Authority; Intake Flow: 3 MGD		
PWS Waters	Ohio River	Flow at Intake (cfs)	5880
PWS RMI	951.6	Distance from Outfall (mi)	15.73

Changes Since Last Permit Issuance: none

Other Comments: Ohio River flows sourced from US Army Corps of Engineers Q_{7-10} Flows of Majors Rivers table

Discharge, Receiving Waters and Water Supply Information

Outfall No.	002	Design Flow (MGD)	0
Latitude	40º 31' 57.10"	Longitude	-80º 11' 13.32"
Quad Name		Quad Code	
Wastewater Description:	Stormwater		
Receiving Waters	Ohio River (WWF)	Stream Code	32317
NHD Com ID	134396148	RMI	969.33
Drainage Area	19500 sq. mi.	Yield (cfs/mi^2)	0.243
Q_{7-10} Flow (cfs)	4730	Q_{7-10} Basis	ACOE
Elevation (ft)	694	Slope (ft/ft)	0.0001
Watershed No.	20-G	Chapter 93 Class.	WWF
Existing Use		Existing Use Qualifier	
Exceptions to Use		Exceptions to Criteria	
Assessment Status	Impaired		
Cause(s) of Impairment	Dioxin, PCB, Pathogens		
Source(s) of Impairment	Source Unknown		
TMDL Status	Final	Name	Ohio River
Nearest Downstream Public Water Supply Intake	Center Township Water Authority; Intake Flow: 3 MGD		
PWS Waters	Ohio River	Flow at Intake (cfs)	5880
PWS RMI	951.6	Distance from Outfall (mi)	15.73

Changes Since Last Permit Issuance: Receiving waters changed to Ohio River, unnamed tributary to the Ohio River on previous permit is not in DEP records

Other Comments: Ohio River flows sourced from US Army Corps of Engineers Q_{7-10} Flows of Majors Rivers table, sodium hypochlorite double containment tanks are within Outfall 002 drainage area

Discharge, Receiving Waters and Water Supply Information

Outfall No.	003	Design Flow (MGD)	0
Latitude	40º 31' 55.83"	Longitude	-80º 11' 11.52"
Quad Name		Quad Code	
Wastewater Description:	Stormwater		
Receiving Waters	Ohio River (WWF)	Stream Code	32317
NHD Com ID	134396148	RMI	969.33
Drainage Area	19500 sq. mi.	Yield (cfs/mi^2)	0.243
Q_{7-10} Flow (cfs)	4730	Q_{7-10} Basis	ACOE
Elevation (ft)	694	Slope (ft/ft)	0.0001
Watershed No.	20-G	Chapter 93 Class.	WWF
Existing Use		Existing Use Qualifier	
Exceptions to Use		Exceptions to Criteria	
Assessment Status	Impaired		
Cause(s) of Impairment	Dioxin, PCB, Pathogens		
Source(s) of Impairment	Source Unknown		
TMDL Status	Final	Name	Ohio River
Nearest Downstream Public Water Supply Intake	Center Township Water Authority; Intake Flow: 3 MGD		
PWS Waters	Ohio River	Flow at Intake (cfs)	5880
PWS RMI	951.6	Distance from Outfall (mi)	15.73

Changes Since Last Permit Issuance: Receiving waters changed to Ohio River, unnamed tributary to the Ohio River on previous permit is not in DEP records

Other Comments: Ohio River flows sourced from US Army Corps of Engineers Q_{7-10} Flows of Majors Rivers table

Discharge, Receiving Waters and Water Supply Information

Outfall No.	004	Design Flow (MGD)	0
Latitude	40º 31' 57.10"	Longitude	-80º 11' 13.32"
Quad Name		Quad Code	
Wastewater Description:	Stormwater		
Receiving Waters	Ohio River (WWF)	Stream Code	32317
NHD Com ID	134396148	RMI	969.33
Drainage Area	19500 sq. mi.	Yield (cfs/mi^2)	0.243
Q_{7-10} Flow (cfs)	4730	Q_{7-10} Basis	ACOE
Elevation (ft)	694	Slope (ft/ft)	0.0001
Watershed No.	20-G	Chapter 93 Class.	WWF
Existing Use		Existing Use Qualifier	
Exceptions to Use		Exceptions to Criteria	
Assessment Status	Impaired		
Cause(s) of Impairment	Dioxin, PCB, Pathogens		
Source(s) of Impairment	Source Unknown		
TMDL Status	Final	Name	Ohio River
Nearest Downstream Public Water Supply Intake	Center Township Water Authority; Intake Flow: 3 MGD		
PWS Waters	Ohio River	Flow at Intake (cfs)	5880
PWS RMI	951.6	Distance from Outfall (mi)	15.73

Changes Since Last Permit Issuance: Receiving waters changed to Ohio River, unnamed tributary to the Ohio River on previous permit is not in DEP records

Other Comments: Ohio River flows sourced from US Army Corps of Engineers Q_{7-10} Flows of Majors Rivers table

Compliance History	
Summary of DMRs:	Permit effluent limits were not exceeded from 11/1/2021-10/31/2022
Summary of Inspections:	The facility was inspected on 7/18/2018 and no violations were noted

Compliance History

DMR Data for Outfall 001 (from November 1, 2021 to October 31, 2022)

Parameter	OCT-22	SEP-22	AUG-22	JUL-22	JUN-22	MAY-22	APR-22	MAR-22	FEB-22	JAN-22	DEC-21	NOV-21
Flow (MGD) Average Monthly	0.044	0.044	0.043	0.065	0.040	0.04	0.043	0.043	0.043	0.043	0.043	0.044
Flow (MGD) Daily Maximum	0.044	0.044	0.043	0.086	0.040	0.04	0.043	0.043	0.043	0.043	0.043	0.044
pH (S.U.) Daily Minimum	7.9	7.9	7.8	7.8	7.8	8.0	7.9	8.0	7.9	7.9	8.0	7.9
pH (S.U.) Daily Maximum	7.9	8.0	7.9	7.8	7.8	8.0	8.0	8.0	7.9	7.9	8.0	7.9
TRC (mg/L) Average Monthly	0.3	0.2	0.3	0.1	0.3	0.09	0.3	0.2	0.2	0.2	0.3	0.1
TRC (mg/L) Instantaneous Maximum	0.3	0.4	0.4	0.2	0.4	0.1	0.3	0.2	0.2	0.2	0.4	0.1
TSS (mg/L) Average Monthly	9	6	8	7	7	9	5	8	9	7	12	7
TSS (mg/L) Instantaneous Maximum	13	7	9	8	7	10	5	9	9	10	14	8
Total Aluminum (mg/L) Average Quarterly		0.7			0.6			0.9			0.7	
Total Aluminum (mg/L) Instantaneous Maximum		0.8			0.7			1.0			0.7	
Total Iron (mg/L) Average Quarterly		0.2			0.3			0.6			0.4	
Total Iron (mg/L) Instantaneous Maximum		0.3			0.3			0.7			0.4	
Total Manganese (mg/L) Average Monthly	0.6	0.5	0.5	0.7	0.6	0.5	0.6	0.8	0.6	0.7	0.7	0.6
Total Manganese (mg/L) Instantaneous Maximum	0.7	0.6	0.6	0.8	0.8	0.6	0.7	0.9	0.6	0.7	0.9	0.6

Development of Effluent Limitations

Outfall No. 001 **Design Flow (MGD)** 0.065
Latitude 40º 31' 50.00" **Longitude** -80º 11' 18.00"
Wastewater Description: Supernatant from the gravity thickener

Technology-Based Effluent Limitations:

The Fern Hollow WTP facility is not subject to Federal Effluent Limitation Guidelines (ELGs).

Regulatory Effluent Standards and Monitoring Requirements

The pH effluent range for all Industrial waste process and non-process discharges pursuant of 25 Pa. Code § 92a.48(a)(2) and 25 Pa. Code § 95.2 is indicated in Table 1 below.

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

Pursuant to 25 Pa. Code § 95.2(4) effluent standards for industrial wastes may not contain more than 7 mg/L of dissolved iron as indicated in Table 1 below.

Pursuant to 25 Pa. Code § 92a.48(b) the imposition of technology-based Total Residual Chlorine (TRC) limits for facilities that use chlorination and that are not already subject to TRC limits based on applicable federal ELG's or a facility specific BPJ evaluation as indicated in Table 1 below.

Table 1. Regulatory Effluent Standards

Parameter	Monthly Avg	Daily Max	Instantaneous Max
Flow (MGD)	Monitor	Monitor	----
Iron, Dissolved	----	----	7.0 mg/L
pH (S.U.)	Wastes must have a pH of not less than 6 and not greater than 9		
TRC	0.5 mg/L	----	----

Total Dissolved Solids (TDS)

Integral to the implementation of 25 Pa. Code § 95.10 is the principle that existing, authorized mass loadings of TDS are exempt from any treatment requirements under these provisions. Existing mass loadings of TDS up to and including the maximum daily discharge loading for any existing discharge, provided that the loading was authorized prior to August 21, 2010 are exempt. Discharge loadings of TDS authorized by the Department are typically exempt from the treatment requirements of Chapter 95.10 until the net TDS loading is increased, an existing discharge proposes a hydraulic expansion or a change in the waste stream. If there are existing mass or production-based TDS effluent limits, then these are used as the basis for the existing mass loading. The facility is not new or expanding waste loading of TDS, therefore, the facility is exempt from 25 Pa. Code § 95.10 treatment requirements.

Best Practicable Control Technology Currently Achievable (BPT)

The Department's reference document *Technology-Based Control Requirements for Water Treatment Plant Wastes* (DEP-ID 362-2183-003) established BPT for discharges of WTPs wastewater, which are illustrated in Table 2 below.

Table 2. BPT Limits for WTP Filter Backwash Wastewater

Parameter	Monthly Avg (mg/L)	Daily Max (mg/L)
Total Suspended solids (TSS)	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 (S.U.)	6-9 at all times	
TRC	0.5	1.0

Water Quality-Based Effluent Limitations

Total Maximum Daily Load (TMDL)

Wastewater discharges from Fern Hollow WTP facility are located within the Ohio River Watershed for which the Department has developed a TMDL. The TMDL was finalized on March 6, 2001 to address PCB and Chlordane within the Ohio River Watershed. The Industrial Waste discharge for the Fern Hollow WTP facility consist of supernatant from the gravity thickener. The facility does not use PCBs or Chlordane, therefore, the Ohio River TMDL does not apply to the Fern Hollow WTP.

Toxics Management Spread Sheet

The Department of Environmental Protection has developed the DEP Toxics Management Spreadsheet ("TMS") to facilitate calculations necessary for completing a reasonable potential (RP) analysis and determining water quality-based effluent limitations for discharges of toxic pollutants. The Toxics Management Spreadsheet is a macro-enabled Excel binary file that combines the functions of the PENTOXSD model and the Toxics Screening Analysis spreadsheet to evaluate the reasonable potential for discharges to cause excursions above water quality standards and to determine WQBELs. The Toxics Management Spread Sheet is a single discharge, mass-balance water quality calculation spread sheet 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, discharge flow rate and the discharge concentrations for parameters in the permit application or in DMRs, which are entered into the spread sheet 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. Discharge concentrations for the parameters are chosen to represent the "worst case" quality of the discharge (i.e., maximum reported discharge concentrations). The spread sheet then evaluates each parameter 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, the Toxics Management Spread sheet recommends average monthly and maximum daily WQBELs.

ORSANCO Pollution Control Standards

The Ohio River Valley Water Sanitation Commission (ORSANCO) sets water quality standards for the Ohio River, to which Fern Hollow WTP is a direct discharger. DEP will implement ORSANCO's water quality standards pursuant to Chapter 93.2(b) in the TMS.

Reasonable Potential Analysis and WQBEL Development for Outfall 001

Discharges from Outfall 001 are evaluated based on concentrations reported on the application and on DMRs; data from those sources are entered into the Toxics Management Spread Sheet. The maximum reported value of the parameters from the application form or from previous DMRs is used as the input concentration in the Toxics Management Spread Sheet. 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 considered to be 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]. The Toxics Management Spread Sheet is run with the discharge and receiving stream characteristics shown in Table 3. Pollutants for which water quality standards have not been promulgated (e.g., TSS, oil and grease) are excluded from the analysis. All the parameters are evaluated using the model to determine the water quality-based effluent limits applicable to the discharge and the receiving stream. The spreadsheet then compares the reported discharge concentrations to the calculated water quality-based effluent limitations to determine if a reasonable potential exists to exceed the calculated WQBELs. Effluent limitations are established in the draft permit where a pollutant's maximum reported discharge concentration equals or exceeds 50% of the WQBEL. For non-conservative pollutants, monitoring requirements are established where the maximum reported concentration is between 25% - 50% of the WQBEL. For conservative pollutants, monitoring requirements are established 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 displayed in the Toxics Management Spread Sheet in Attachment C of this Fact Sheet. The Toxics Management Spread Sheet did not recommend any WQBELs for Outfall 001.

Table 3. TMS Inputs for Outfall 001

Discharge Information	
Parameter	**Value**
River Mile Index	969.33
Discharge Flow (MGD)	0.065
Basin/Stream Information	
Parameter	**Value**
Drainage Area (mi^2)	19,500
Q_{7-10} (cfs)	4,730
Low-flow yield (cfs/mi^2)	0.243
Elevation (ft)	695
Slope	0.0001

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 discharge chlorine demands for the receiving stream, 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 then proposed. The results of the modeling, included in Attachment B, indicate that BAT/BPJ limits are required for TRC.

Anti-Backsliding

Section 402(o) of the Clean Water Act (CWA), enacted in the Water Quality Act of 1987, establishes anti-backsliding rules governing two situations. The first situation occurs when a permittee seeks to revise a Technology-Based effluent limitation based on BPJ to reflect a subsequently promulgated effluent guideline which is less stringent. The second situation addressed by Section 402(o) arises when a permittee seeks relaxation of an effluent limitation which is based upon a State treatment standard of water quality standard.

Previous limits can be used pursuant to EPA's anti-backsliding regulation 40 CFR 122.44 (l) Reissued permits. (1) Except as provided in paragraph (l)(2) of this section when a permit is renewed or reissued. Interim effluent limitations, standards or conditions must be at least as stringent as the final effluent limitations, standards, or conditions in the previous permit (unless the circumstances on which the previous permit was based have materially and substantially changed since the time the permit was issued and would constitute cause for permit modification or revocation and reissuance under §122.62). (2) In the case of effluent limitations established on the basis of Section 402(a)(1)(B) of the CWA, a permit may not be renewed, reissued, or modified on the basis of effluent guidelines promulgated under section 304(b) subsequent to the original issuance of such permit, to contain effluent limitations which are less stringent than the comparable effluent limitations in the previous permit.

Effluent Limitations and Monitoring Requirements for Outfall 001

Effluent limits applicable at Outfall 001 are the more stringent of TBELs, WQBELs, regulatory effluent standards, and monitoring requirements as summarized in Table 5. The applicable limits and monitoring requirements provided below are based on those in Tables 1 and 2 of this Fact Sheet.

Table 5. Effluent limits and monitoring requirements for Outfall 001

Parameter	Mass (pounds)		Concentration (mg/L)			
	Average Monthly	Daily Maximum	Average Monthly	Average Quarterly	Daily Maximum	Instant Maximum
Flow (MGD)	Report	Report	—	—	—	—
Total Residual Chlorine	—	—	0.5	—	1.0	1.6
Total Suspended Solids	—	—	30.0	—	60.0	—
Iron (total)	—	—	—	2.0	4.0	—
Aluminum (total)	—	—	4.0	—	8.0	—
Manganese (total)	—	—	1.0	—	2.0	—
pH (S.U.)		Within the range of 6.0 to 9.0				

The previous permit imposed a monitoring frequency of once per quarter for Total Iron and Total Aluminum from Outfall 001. The permit included an average monthly effluent limitation. Typically, the Department would require the collection of samples during the same calendar month in order to accurately calculate the average monthly discharge concentration. The Department is aware that the collection of one sample per quarter does not allow for the calculation of an average monthly discharge concentration. Sample analysis results submitted with the discharge monitoring reports will reflect the minimum, average and maximum discharge concentrations (where applicable) per quarterly submission.

Monitoring Frequency for Outfall 001

Fern Hollow WTP is an existing facility with no history of non-compliance with effluent limitations over the past two years according to the DMR data. This meets the requirements contained in the statistical procedures in EPA's guidance, "*Interim Guidance for Performance-Based Reductions of NPDES Permit Monitoring Frequencies*" (April 1996) to conduct a parameter-by-parameter analysis on eligibility for reduced monitoring frequency.

At a minimum, the two most current years of Monthly Average effluent data representative of the current operating conditions for the parameter at the particular outfall will be used to calculate the Long-Term Average discharge rate for use in Tables 1 and 2 of the EPA's guidance document. Table 4 below, is a summary of the referenced Tables.

Table 4. Ratio of Long-Term Effluent Average to Monthly Average Limit

Baseline Monitoring	100-76%	75-66%	65-50%	49-25%	<25%
7/wk.	6/wk.	5/wk.	4/wk.	3/wk.	1/wk.
6/wk.	5/wk.	4/wk.	3/wk.	2/wk.	1/wk.
5/wk.	4/wk.	4/wk.	3/wk.	2/wk.	1/wk.
4/wk.	4/wk.	3/wk.	2/wk.	1/wk.	1/wk.
3/wk.	3/wk.	3/wk.	2/wk.	1/wk.	1/wk.
2/wk.	2/wk.	2/wk.	1/wk.	2/month	1/month
1/wk.	1/wk.	1/wk.	1/wk.	2/month	1/2 months
2/month	2/month	2/month	2/month	2/month	1/qtr.
1/month	1/month	1/month	1/month	1/qtr.	1/6 months

The baseline monitoring of 2/month is consistent with the existing monitoring frequency of TSS, manganese, and total recoverable chlorine (TRC) for Fern Hollow WTP Outfall 001 and will be used for the comparison of the parameter-by-parameter analysis. Aluminum and Iron will be reanalyzed (using 2/month as baseline monitoring) for this renewal to determine if current performance still justifies reduced monitoring of 1/qtr. for the permit term. For the analysis, the most current two years of DMR data for Outfall 001 are used to calculate the Long-Term Average for each parameter to see if the monitoring frequency on a parameter-by-parameter basis can be relaxed. In Table 5 is a summary of the performance-based analysis for Outfall 001.

Table 5. Performance-Based Reduction of NPDES Permit Monitoring Frequency Analysis

Parameter	Monthly Average Permit Limit ($^{mg}/_{L}$)	Long-Term Average ($^{mg}/_{L}$)	Ratio Long-Term Average to Monthly Average Limit (%)	Recommended Monitoring Frequency
TSS	30.0	7.71	25.7	2/month
Aluminum (Total)	4.0	1.09	27.3	2/month
Manganese (Total)	1.0	0.604	60.4	2/month
Iron (Total)	2.0	0.34	17.0	2/qtr. (adjusted from 1/qtr.)
TRC	0.5	0.210	41.9	2/month

Monitoring requirements are based on the previous permits monitoring requirements for Fern Hollow WTP, recommendations from the Performance-Based Reduction Analysis, and the need to clarify the quarterly average effluent limit by increasing the Performance-Based Reduction monitoring from 1/qtr. to 2/qtr.

Table 6. Monitoring Requirements for Outfall 001

Parameter	Sample Type	Minimum Sample Frequency
Flow (MGD)	Meter	2/Month
TRC	Grab	2/Month
TSS	Grab	2/Month
Iron (total)	Grab	2/quarter
Aluminum (total)	Grab	2/Month
Manganese (total)	Grab	2/Month
pH (S.U.)	Grab	2/Month

Post-Comment Period Modifications Carried from Existing Permit

Two comments from the existing permit's draft period resulted in modifications to the existing final permit. These modifications will be carried to the renewed permit draft for this period. The following, verbatim, are the comments and comment responses that resulted in modifications:

Comment 2:
Part C, IV. Sedimentation Basin Cleaning, Paragraph B, requires MTMA to monitor daily all parameters during the period that the sedimentation basins are dewatered with 24-hour composite samples. We are not sure that this language should apply to the MTMA Sedimentation Basins for the following reasons: During the dewatering and cleaning process the basin being cleaned is isolated from the process and no discharge from this basin is delivered to Outfall 001. As stated previously, MTMA has two (2) separate mixing and sedimentation basins. One of these units is online at all times, while the other is offline for cleaning. So, the operation of the basins, and the discharge from the operating basin to Outfall 001 is not impacted or impaired by the cleaning process. As for the wastewater generated by the sedimentation basin cleaning process itself, this wastewater is collected and discharged to the public sanitary sewer system for processing and treatment at the Municipal POTW. No wastewater is discharged during the sedimentation basin cleaning process to Outfall 001 from the offline sedimentation basin being cleaned. For these reasons we are not sure why MTMA should monitor pollutant parameters daily during the cleaning process and what discharge they would monitor (i.e. the wastewater discharge from the offline basin being cleaned to the POTW, or the offline sedimentation basin discharging to Outfall 001). 48-hour Notification to the Clean Water Program Operations can be made by MTMA since it falls within their ability to make the cleaning and maintenance determination in this time frame. We would request that paragraph B, be removed.

Response 2:
The monitoring requirements contained in Part C, Section IV. Sedimentation Basin Cleaning, Paragraph B, do not apply to the sedimentation basin cleaning process conducted at the facility. Paragraph B will be revised to state, "*No discharge to Outfall 001 is authorized of waste waters generated by the sedimentation basin cleaning process. The sedimentation basin cleaning process includes waste waters generated from dewatering and cleaning of the sedimentation basin.*"

There was **one change** to the Draft permit in response to this comment.

Comment 3:
Part C, IV. Sedimentation Basin Cleaning, Paragraph C, requires monitoring of turbidity during the period of dewatering of sedimentation basins shall be every two hours. The dewatering of the basins shall cease immediately when the turbidity in any sample exceeds 100 NTU. A separate detailed monitoring report for the discharge shall be prepared and submitted with the monthly DMR. We would ask that additional turbidity monitoring and additional reporting requirement be removed from the NPDES permit since the MTMA has redundant sedimentation basin systems that permit full clarification operation with the online sedimentation basin while the offline sedimentation basin is being cleaned. MTMA will include in the Standard Operation Procedures for the sedimentation basin cleaning that one tank shall remain fully functional and online while the other is offline for cleaning, and that if ever a situation should occur where both units have to be offline for cleaning that the turbidity testing will be implemented and completed as outlined every two hours and not to exceed 100 NTU's. We would request Paragraph C, be removed or modified to apply only when all sedimentation tanks are offline for cleaning.

Response 3:
The monitoring requirements contained in Part C, Section IV. Sedimentation Basin Cleaning, Paragraph C, do not apply to the sedimentation basin cleaning process conducted at the facility and Paragraph C will be removed from the permit. Part C, Section IV. Sedimentation Basin Cleaning, Paragraph B was revised to state, "*No discharge to Outfall 001 is authorized of waste waters generated by the sedimentation basin cleaning process. The sedimentation basin cleaning process includes waste waters generated from dewatering and cleaning of the sedimentation basin.*"

There was **one change** to the Draft permit in response to this comment

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: BCW-PMT-032, BPNSM-PMT-001
☒	Other: Technology-Based Control Requirement for Water Treatment Plants (362-2183-003), EPA Interim Guidance for Performance-Based Reduction of NPDES Permit Monitoring Frequencies

Attachments

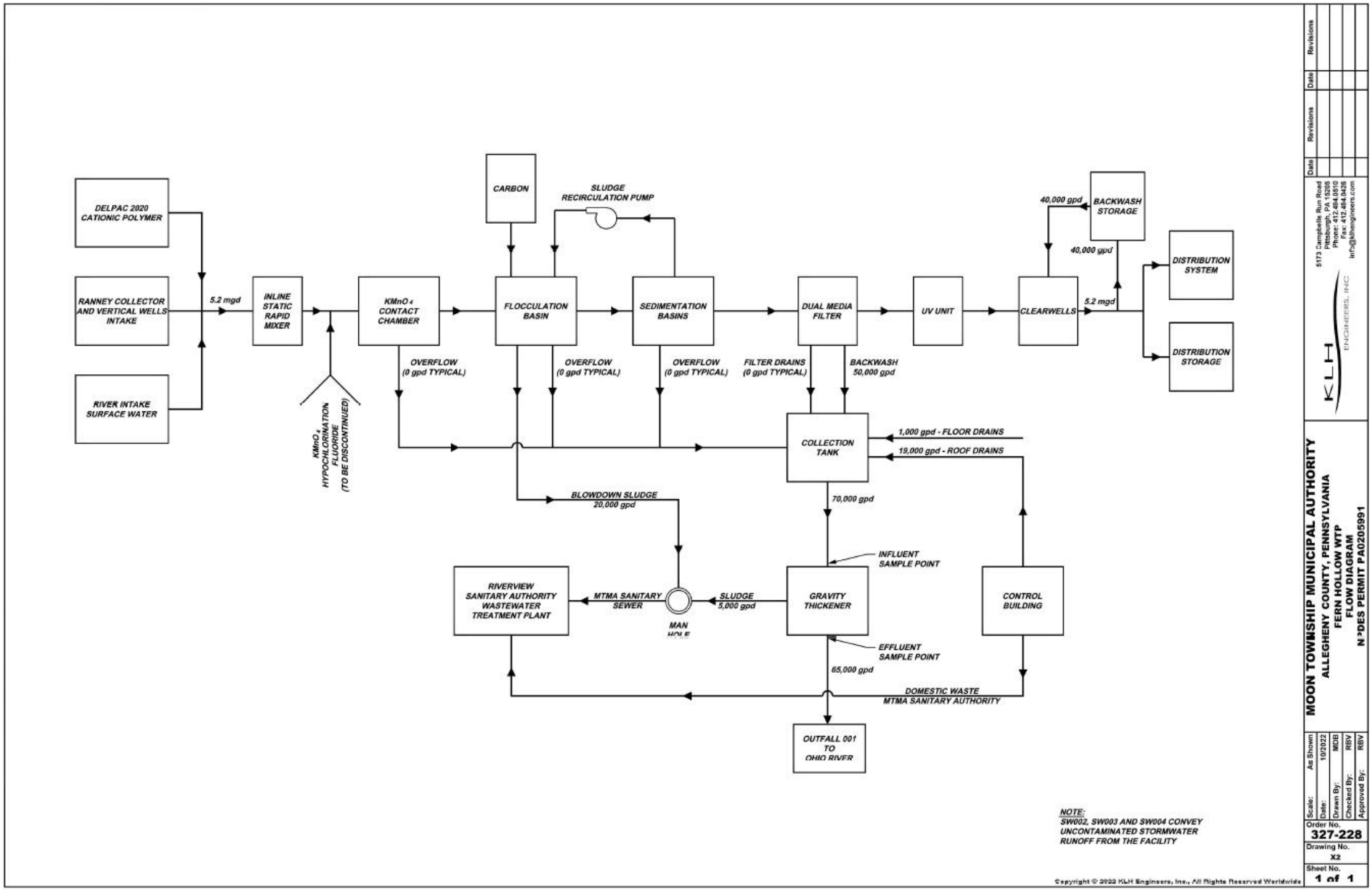
Attachment A: Process Flow Diagram

Attachment B: StreamStats Report

Attachment C: Toxics Management Spreadsheet Results for Outfall 001

Attachment D: TRC Model Spreadsheet Results for Outfall 001

Attachment A:
Process Flow Diagram


DELPAC 2020 CATIONIC POLYMER
RANNEY COLLECTOR AND VERTICAL WELLS INTAKE
RIVER INTAKE SURFACE WATER
5.2 mgd
INLINE STATIC RAPID MIXER
KMnO4, HYPOCHLORINATION, FLUORIDE (TO BE DISCONTINUED)
KMnO4 CONTACT CHAMBER
CARBON
SLUDGE RECIRCULATION PUMP
FLOCCULATION BASIN
SEDIMENTATION BASINS
DUAL MEDIA FILTER
UV UNIT
CLEARWELLS
5.2 mgd
40,000 gpd
BACKWASH STORAGE
40,000 gpd
DISTRIBUTION SYSTEM
DISTRIBUTION STORAGE
OVERFLOW (0 gpd TYPICAL)
OVERFLOW (0 gpd TYPICAL)
OVERFLOW (0 gpd TYPICAL)
FILTER DRAINS (0 gpd TYPICAL)
BACKWASH 50,000 gpd
COLLECTION TANK
1,000 gpd - FLOOR DRAINS
19,000 gpd - ROOF DRAINS
70,000 gpd
BLOWDOWN SLUDGE 20,000 gpd
INFLUENT SAMPLE POINT
RIVERVIEW SANITARY AUTHORITY WASTEWATER TREATMENT PLANT
MTMA SANITARY SEWER
SLUDGE 5,000 gpd
MAN HOLE
GRAVITY THICKENER
CONTROL BUILDING
EFFLUENT SAMPLE POINT
65,000 gpd
DOMESTIC WASTE MTMA SANITARY AUTHORITY
OUTFALL 001 TO OHIO RIVER
NOTE:
SW002, SW003 AND SW004 CONVEY UNCONTAMINATED STORMWATER RUNOFF FROM THE FACILITY
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MOON TOWNSHIP MUNICIPAL AUTHORITY
ALLEGHENY COUNTY, PENNSYLVANIA
FERN HOLLOW WTP
FLOW DIAGRAM
NPDES PERMIT PA0205991
KLH ENGINEERS, INC
5173 Campbells Run Road
Pittsburgh, PA 15205
Phone: 412.494.0510
Fax: 412.494.0626
Revisions
Date
Scale: As Shown
Date: 10/2022
Drawn By: MDB
Checked By: RBV
Approved By: RBV
Order No. 327-228
Drawing No. X2
Sheet No. 1 of 1

Attachment B:
StreamStats Report

Outfall 001 Report Moon Twp. WTP

Region ID: PA
Workspace ID: PA20221220145627925000
Clicked Point (Latitude, Longitude): 40.53226, -80.18661
Time: 2022-12-20 09:57:12 -0500

Collapse All

Basin Characteristics

Parameter Code	Parameter Description	Value	Unit
DRNAREA	Area that drains to a point on a stream	19500	square miles
ELEV	Mean Basin Elevation	1673	feet
PRECIP	Mean Annual Precipitation	45	inches

Low-Flow Statistics

Low-Flow Statistics Parameters [57.4 Percent (11200 square miles) Low Flow Region 3]

Parameter Code	Parameter Name	Value	Units	Min Limit	Max Limit
DRNAREA	Drainage Area	19500	square miles	2.33	1720
ELEV	Mean Basin Elevation	1673	feet	898	2700
PRECIP	Mean Annual Precipitation	45	inches	38.7	47.9

Low-Flow Statistics Parameters [42.3 Percent (8240 square miles) Low Flow Region 4]

Parameter Code	Parameter Name	Value	Units	Min Limit	Max Limit
DRNAREA	Drainage Area	19500	square miles	2.26	1400
ELEV	Mean Basin Elevation	1673	feet	1050	2580

Low-Flow Statistics Disclaimers [57.4 Percent (11200 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 [57.4 Percent (11200 square miles) Low Flow Region 3]

Statistic	Value	Unit
7 Day 2 Year Low Flow	2820	ft^3/s
30 Day 2 Year Low Flow	3550	ft^3/s
7 Day 10 Year Low Flow	2000	ft^3/s
30 Day 10 Year Low Flow	2320	ft^3/s
90 Day 10 Year Low Flow	3100	ft^3/s

Low-Flow Statistics Disclaimers [42.3 Percent (8240 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 [42.3 Percent (8240 square miles) Low Flow Region 4]

Statistic	Value	Unit
7 Day 2 Year Low Flow	2860	ft^3/s
30 Day 2 Year Low Flow	3550	ft^3/s
7 Day 10 Year Low Flow	1940	ft^3/s
30 Day 10 Year Low Flow	2030	ft^3/s
90 Day 10 Year Low Flow	2770	ft^3/s

Low-Flow Statistics Flow Report [Area-Averaged]

Statistic	Value	Unit
7 Day 2 Year Low Flow	2830	ft^3/s
30 Day 2 Year Low Flow	3540	ft^3/s
7 Day 10 Year Low Flow	1970	ft^3/s
30 Day 10 Year Low Flow	2190	ft^3/s
90 Day 10 Year Low Flow	2950	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/)

Application Version: 4.11.1
StreamStats Services Version: 1.2.22
NSS Services Version: 2.2.1

Attachment C:
Toxics Management Spreadsheet Results for Outfall 001

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DEPARTMENT OF ENVIRONMENTAL PROTECTION

Toxics Management Spreadsheet
Version 1.3, March 2021

Discharge Information

Instructions | Discharge | Stream

Facility: **Fern Hollow Water Treatment Plant** NPDES Permit No.: **PA0205991** Outfall No.: **001**

Evaluation Type: **Major Sewage / Industrial Waste** Wastewater Description: **IW Process Effluent without ELG**

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
0.065	131.6	7.88						

					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		286									
	Chloride (PWS)	mg/L		80.5									
	Bromide	mg/L	<	0.1									
	Sulfate (PWS)	mg/L		50.6									
	Fluoride (PWS)	mg/L		0.49									
Group 2	Total Aluminum	µg/L		3700									
	Total Antimony	µg/L	<	2									
	Total Arsenic	µg/L	<	2									
	Total Barium	µg/L		76.9									
	Total Beryllium	µg/L	<	1									
	Total Boron	µg/L	<	100									
	Total Cadmium	µg/L	<	0.2									
	Total Chromium (III)	µg/L	<	2									
	Hexavalent Chromium	µg/L	<	0.5									
	Total Cobalt	µg/L	<	1									
	Total Copper	µg/L		28									
	Free Cyanide	µg/L											
	Total Cyanide	µg/L	<	10									
	Dissolved Iron	µg/L		20									
	Total Iron	µg/L		700									
	Total Lead	µg/L	<	1									
	Total Manganese	µg/L		1000									
	Total Mercury	µg/L	<	0.2									
	Total Nickel	µg/L		0.0026									
	Total Phenols (Phenolics) (PWS)	µg/L	<	5									
	Total Selenium	µg/L	<	5									
	Total Silver	µg/L	<	0.4									
	Total Thallium	µg/L		2									
	Total Zinc	µg/L	<	5									
	Total Molybdenum	µg/L	<	2									
	Acrolein	µg/L	<										
	Acrylamide	µg/L	<										
	Acrylonitrile	µg/L	<										
	Benzene	µg/L	<										
	Bromoform	µg/L	<										

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

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

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Toxics Management Spreadsheet
Version 1.3, March 2021

Stream / Surface Water Information

Fern Hollow Water Treatment Plant, NPDES Permit No. PA0205991, Outfall 001

Instructions | Discharge | *Stream*

Receiving Surface Water Name: **Ohio River**

No. Reaches to Model: 1

- ○ Statewide Criteria
- ○ Great Lakes Criteria
- ◉ ORSANCO Criteria

Location	Stream Code*	RMI*	Elevation (ft)*	DA (mi²)*	Slope (ft/ft)	PWS Withdrawal (MGD)	Apply Fish Criteria*
Point of Discharge	032317	969.33	694	19500	0.0001		Yes
End of Reach 1	032317	968.33	693	19500.1	0.0001		Yes

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

Location	RMI	LFY (cfs/mi²)*	Flow (cfs)		W/D Ratio	Width (ft)	Depth (ft)	Velocity (fps)	Travel Time (days)	Tributary		Stream		Analysis	
			Stream	Tributary						Hardness	pH	Hardness*	pH*	Hardness	pH
Point of Discharge	969.33	0.243	4730			1144.1	20					100	7		
End of Reach 1	968.33	0.243	4730			1192.3	20								

Q_h

Location	RMI	LFY (cfs/mi²)	Flow (cfs)		W/D Ratio	Width (ft)	Depth (ft)	Velocity (fps)	Travel Time (days)	Tributary		Stream		Analysis	
			Stream	Tributary						Hardness	pH	Hardness	pH	Hardness	pH
Point of Discharge	969.33														
End of Reach 1	968.33														

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Toxics Management Spreadsheet
Version 1.3, March 2021

Model Results

Fern Hollow Water Treatment Plant, NPDES Permit No. PA0205991, Outfall 001

Instructions | Results | RETURN TO INPUTS | SAVE AS PDF | PRINT | ◉ All ○ Inputs ○ Results ○ Limits

☑ ***Hydrodynamics***

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

RMI	Stream Flow (cfs)	PWS Withdrawal (cfs)	Net Stream Flow (cfs)	Discharge Analysis Flow (cfs)	Slope (ft/ft)	Depth (ft)	Width (ft)	W/D Ratio	Velocity (fps)	Travel Time (days)	Complete Mix Time (min)
969.33	4,730		4,730	0.101	0.0001	20.	1144.1	57.205	0.207	0.296	2005.821
968.33	4,730		4,730								

Q_h

RMI	Stream Flow (cfs)	PWS Withdrawal (cfs)	Net Stream Flow (cfs)	Discharge Analysis Flow (cfs)	Slope (ft/ft)	Depth (ft)	Width (ft)	W/D Ratio	Velocity (fps)	Travel Time (days)	Complete Mix Time (min)
969.33	12100.89		12100.89	0.101	0.0001	30.236	1144.1	37.839	0.35	0.175	1079.086
968.33	12100.894		12100.89								

☑ ***Wasteload Allocations***

☑ ***AFC*** CCT (min): 15 PMF: 0.086 Analysis Hardness (mg/l): 100.01 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	3,051,582	
Total Antimony	0	0		0	1,100	1,100	4,475,654	
Total Arsenic	0	0		0	340	340	1,383,384	Chem Translator of 1 applied
Total Barium	0	0		0	21,000	21,000	85,444,299	
Total Boron	0	0		0	8,100	8,100	32,957,087	
Total Cadmium	0	0		0	2.014	2.13	8,680	Chem Translator of 0.944 applied
Total Chromium (III)	0	0		0	569.800	1,803	7,336,669	Chem Translator of 0.316 applied
Hexavalent Chromium	0	0		0	16	16.3	66,294	Chem Translator of 0.982 applied
Total Cobalt	0	0		0	95	95.0	386,534	
Total Copper	0	0		0	13.440	14.0	56,963	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	64.587	81.7	332,228	Chem Translator of 0.791 applied
Total Manganese	0	0		0	N/A	N/A	N/A	
Total Mercury	0	0		0	1.400	1.65	6,702	Chem Translator of 0.85 applied
Total Nickel	0	0		0	468.267	469	1,909,090	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	3.217	3.78	15,400	Chem Translator of 0.85 applied
Total Thallium	0	0		0	65	65.0	264,470	
Total Zinc	0	0		0	117.188	120	487,538	Chem Translator of 0.978 applied

☑ ***CFC*** CCT (min): 720 PMF: 0.599 Analysis Hardness (mg/l): 100 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	6,200,344	
Total Arsenic	0	0		0	150	150	4,227,507	Chem Translator of 1 applied
Total Barium	0	0		0	4,100	4,100	#########	
Total Boron	0	0		0	1,600	1,600	45,093,408	
Total Cadmium	0	0		0	0.246	0.27	7,627	Chem Translator of 0.909 applied
Total Chromium (III)	0	0		0	74.115	86.2	2,428,857	Chem Translator of 0.86 applied
Hexavalent Chromium	0	0		0	10	10.4	292,967	Chem Translator of 0.962 applied
Total Cobalt	0	0		0	19	19.0	535,484	
Total Copper	0	0		0	8.956	9.33	262,923	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	70,559,901	WQC = 30 day average; PMF = 1
Total Lead	0	0		0	2.517	3.18	89,669	Chem Translator of 0.791 applied
Total Manganese	0	0		0	N/A	N/A	N/A	
Total Mercury	0	0		0	0.770	0.91	25,531	Chem Translator of 0.85 applied
Total Nickel	0	0		0	52.007	52.2	1,470,144	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	140,611	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	366,384	
Total Zinc	0	0		0	118.140	120	3,376,864	Chem Translator of 0.986 applied

☑ ***THH*** CCT (min): 720 PMF: 0.599 Analysis Hardness (mg/l): N/A Analysis pH: N/A

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

Total Dissolved Solids (PWS)	0	0		0	500,000	500,000	N/A	
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	1,000	1,000	28,183,380	
Total Aluminum	0	0		0	N/A	N/A	N/A	
Total Antimony	0	0		0	5.6	5.6	157,827	
Total Arsenic	0	0		0	10	10.0	281,834	
Total Barium	0	0		0	1,000	1,000	28,183,380	
Total Boron	0	0		0	3,100	3,100	87,368,478	
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	1,300	1,300	36,638,394	
Dissolved Iron	0	0		0	300	300	8,455,014	
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	28,183,380	
Total Mercury	0	0		0	0.012	0.012	338	
Total Nickel	0	0		0	610	610	17,191,862	
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	6,764	
Total Zinc	0	0		0	7,400	7,400	#########	

☑ ***CRL*** CCT (min): 720 PMF: 0.817 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	50	50.0	4,915,034	
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

☑ ***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)	28,183	mg/L	Discharge Conc ≤ 10% WQBEL
Total Aluminum	1,955,941	µg/L	Discharge Conc ≤ 10% WQBEL
Total Antimony	N/A	N/A	Discharge Conc < TQL
Total Arsenic	N/A	N/A	Discharge Conc < TQL
Total Barium	28,183,380	µg/L	Discharge Conc ≤ 10% WQBEL
Total Beryllium	N/A	N/A	No WQS
Total Boron	21,124,162	µg/L	Discharge Conc < TQL
Total Cadmium	5,564	µg/L	Discharge Conc < TQL
Total Chromium (III)	2,428,857	µg/L	Discharge Conc < TQL
Hexavalent Chromium	42,492	µg/L	Discharge Conc < TQL
Total Cobalt	247,753	µg/L	Discharge Conc < TQL
Total Copper	36,511	µg/L	Discharge Conc ≤ 10% WQBEL
Total Cyanide	N/A	N/A	No WQS
Dissolved Iron	8,455,014	µg/L	Discharge Conc ≤ 10% WQBEL
Total Iron	70,559,901	µg/L	Discharge Conc ≤ 10% WQBEL

Total Lead	89,669	µg/L	Discharge Conc < TQL
Total Manganese	28,183,380	µg/L	Discharge Conc ≤ 10% WQBEL
Total Mercury	0.012	µg/L	Discharge Conc < TQL
Total Nickel	1,223,650	µg/L	Discharge Conc ≤ 10% WQBEL
Total Phenols (Phenolics) (PWS)		µg/L	Discharge Conc < TQL
Total Selenium	140,611	µg/L	Discharge Conc < TQL
Total Silver	9,871	µg/L	Discharge Conc < TQL
Total Thallium	6,764	µg/L	Discharge Conc ≤ 10% WQBEL
Total Zinc	312,492	µg/L	Discharge Conc < TQL
Total Molybdenum	N/A	N/A	No WQS

Attachment D:
TRC Model Spreadsheet Results for Outfall 001

TRC EVALUATION

4730	= Q stream (cfs)	0.5	= CV Daily
0.065	= Q discharge (MGD)	0.5	= CV Hourly
4	= no. samples	0.086	= AFC_Partial Mix Factor
0.3	= Chlorine Demand of Stream	0.599	= 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 =	1290.485	**1.3.2.iii**	WLA cfc =	8762.847
PENTOXSD TRG	**5.1a**	LTAMULT afc =	0.373	**5.1c**	LTAMULT cfc =	0.581
PENTOXSD TRG	**5.1b**	LTA_afc=	480.866	**5.1d**	LTA_cfc =	5094.308

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)**