pennsylvania
DEPARTMENT OF ENVIRONMENTAL PROTECTION

Southwest Regional Office
CLEAN WATER PROGRAM

Application Type	**Renewal**	Application No.	**PA0219380**
Facility Type	**Industrial**	APS ID	**691686**
Major / Minor	**Minor**	Authorization ID	**790092**

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

Applicant and Facility Information

Applicant Name	**Pureon, Inc.**	Facility Name	**Fayette Business Park**
Applicant Address	1101 Mountain View Drive	Facility Address	1101 Mountain View Drive
	Smithfield, PA 15478		Smithville, PA 15478
Applicant Contact	Randy Breakiron	Facility Contact	Nancy Burke
Applicant Phone	724-564-2630	Facility Phone	724-737-0410
Client ID	202223	Site ID	604306
SIC Code	3972	Municipality	Georges Township
SIC Description	Other Non-Metallic Mineral Product Manufacturing	County	Fayette
Date Application Received	April 23, 2009	EPA Waived?	Yes
Date Application Accepted	May 12, 2009	If No, Reason	

Purpose of Application: Application is to renew Individual Waste NPDES Permit without ELG.

Summary of Review

On April 23, 2009, the Department received an NPDES Individual Wastewater Permit Renewal Application from Microdiamant USA, Inc. for the Fayette Business Park facility located in Georges Township, Fayette County. On March 8, 2021, the Department received an application for a name change from Microdiamant USA, Inc. to Pureon, Inc. The facility's industrial activities are classified by SIC Code 3972 – Other Non-Metallic Mineral Product Manufacturing.

The facility manufactures industrial diamond powders from synthetic diamonds. Wastewaters from the site include non-contact cooling water (NCCW), boiler blowdown, floor drains (drips from NCCW), containment trench, and uncontaminated stormwater. The containment trench is used to collect any spills that may occur during loading and unloading of materials. The wastewaters are collected in the pond, adjusted for pH, and then discharged to Georges Creek via Outfall 001. Outfall 002 only discharges uncontaminated storm water.

The facility entered into an agreement with Fairchance-Georges Joint Municipal Sewage Authority to connect to the sewer system and send all process wastewaters to the Authority for treatment on or after April 1, 2016. The facility would like to continue with the NPDES Individual Wastewater permit coverage as an emergency backup option.

Outfall 001 discharges to Georges Creek with Chapter 93 classification of Warm Water Fishes (WWF). All the facility process waters are directed to the cooling pond prior to ultimate discharge to the Sewage Authority or to Georges Creek if onsite treatment and discharge is utilized. The grading around the pond generally directs stormwater flow away from the cooling pond. The location of Outfall 001 is 39° 48' 26", -79° 46' 21".

Approve	Deny	Signatures	Date
X		Curtis Holes, P.E. / ENVIRONMENTAL ENGINEERING	June 28, 2021
X		Michael E. Fifth, P.E. / ENVIRONMENTAL ENGINEER MANAGER	June 30, 2021

Summary of Review

Internal Monitoring Point 101 discharges to Outfall 001 and ultimately to Georges Creek with Chapter 93 classification of Warm Water Fishes (WWF).

Outfall 002 discharges uncontaminated stormwater to Georges Creek with Chapter 93 classification of Warm Water Fishes (WWF). In the drainage area of Outfall 002, the activities that exist are parking area and facility roof drains. The location of Outfall 002 is 39° 48' 27", -79° 46' 22" .

The permittee has no open violations with the Clean Water Program.

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 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.

Compliance History	
Summary of DMRs:	No exceedances with permit effluent limits.
Summary of Inspections:	The last inspection conducted by the Department was on July 6, 2018 by Howard Dunn with no violations identified.

Other Comments: None

Treatment Facility Summary				
Treatment Facility Name: Fayette Business Park				
WQM Permit No.	**Issuance Date**			
2603201	April 9, 2007			
Waste Type	**Degree of Treatment**	**Process Type**	**Disinfection**	**Avg Annual Flow (MGD)**
Industrial				
Hydraulic Capacity (MGD)	**Organic Capacity (lbs/day)**	**Load Status**	**Biosolids Treatment**	**Biosolids Use/Disposal**

Changes Since Last Permit Issuance:

Other Comments:

Discharge, Receiving Waters and Water Supply Information

Outfall No.	001	Design Flow (MGD)	0.016
Latitude	39º 48' 26"	Longitude	-79º 46' 21"
Quad Name	Smithfield	Quad Code	2007
Wastewater Description:	Non-Contact Cooling Water, Boiler Blowdown, Floor Drains (drips from NCCW), Containment Trench, and Uncontaminated Stormwater.		

Receiving Waters	Georges Creek	Stream Code	41340
NHD Com ID	99417214	RMI	13.25
Drainage Area	13.6 miles^2	Yield (cfs/mi^2)	0.0168
Q_{7-10} Flow (cfs)	0.228	Q_{7-10} Basis	USGS StreamStats
Elevation (ft)	990	Slope (ft/ft)	
Watershed No.	19-G	Chapter 93 Class.	WWF
Assessed Use		Existing Use Qualifier	
Exceptions to Use		Exceptions to Criteria	

Nearest Downstream Public Water Supply Intake	Dunkard Valley Joint Municipal Authority (0.25 MGD)		
PWS Waters	Monongahela River	Flow at Intake (cfs)	530
PWS RMI	83.2	Distance from Outfall (mi)	≈15

Changes Since Last Permit Issuance: Outfall 001 is secondary/emergency discharge option.

Other Comments: None

Outfall 001 Drainage Basin

Discharge, Receiving Waters and Water Supply Information			
Outfall No.	101	Design Flow (MGD)	0.016
Latitude		Longitude	
Quad Name	Smithfield	Quad Code	2007
Wastewater Description:	Non-Contact Cooling Water, Boiler Blowdown, Floor Drains (drips from NCCW), Containment Trench.		
Receiving Waters	Georges Creek	Stream Code	41340

Changes Since Last Permit Issuance: All the facility's wastewaters are discharge to the Fairchance-Georges Joint Municipal Sewage Authority.

Other Comments: None

Outfalls not exposed to industrial activities that discharge uncontaminated stormwater

Outfall 002 Lat. 39º 48' 27" Long. -79º 46' 22" RMI 13.25 Stream Georges Creek
Source and Characteristics: Uncontaminated stormwater runoff.

Development of Effluent Limitations

Outfall No.	001	**Design Flow (MGD)**	0.016
Latitude	39º 48' 26"	**Longitude**	-79º 46' 21"

Wastewater Description: Non-Contact Cooling Water, Boiler Blowdown, Floor Drains (drips from NCCW), Containment Trench, and Uncontaminated Stormwater.

Technology-Based Limitations

Outfall 001 discharge consists of NCCW which are 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

In accordance with the recommendations given in Chapter 6, Table 6-4 of DEP's Permit Writer's Manual for NCCW discharges, self-monitoring requirements at Outfall 001 will include, at a minimum, the following parameters: flow, pH and temperature.

Flow monitoring is required pursuant to 25 Pa. Code § 92a.61(d)(1).

Effluent standards for pH (see Table 6) are also imposed on industrial wastes by 25 Pa. Code § 95.2(1).

Total Residual Chlorine (TRC)

The facility utilizes public water supply as a source from the NCCW activities, but the facility does not conduct chlorination activities. 25 Pa. Code § 92a.48 applies to facilities or activities that use chlorination. Since USAP does not use chlorine, the TRC technology-based limits 25 Pa. Code § 92a.48 do not apply to Outfall 001.

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.

Water Quality-Based Effluent Limitations

Toxics Management Analysis

The Department's Toxics Management Spreadsheet (TMS) was utilized to facilitate calculations necessary for completing a reasonable potential analysis and determine Water Quality-Based Effluent Limitations (WQBELs) for discharges containing toxic pollutant concentrations. TMS combines the functionality of two (2) of the Department's analysis tools, Toxics Screening Analysis Spreadsheet and PENTOXSD water quality model.

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 form the permit application.

2. Perform a Toxics Screening Analysis to identify toxic pollutants of concern. All toxic pollutants, as reported in the permit application or on DMRs, are modeled by the TMS to determine the parameters 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].

    - 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 TMS. 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.

Discharges from Outfall 001 are evaluated based on concentrations reported on the application and contained in the DMRs; data from those sources are used as inputs into the TMS. A summary of TMS Inputs is contained in Table 1 below.

Table 1: TMS Inputs

Parameter	Value
Discharge Inputs	
Facility	Fayette Business Park
Evaluation Type	Industrial
NPDES Permit No.	PA0219380
Wastewater Description	Industrial Wastewater and Stormwater
Outfall ID	001
Design Flow (MGD)	0.016
Hardness ($^{mg}/_{L}$)	100
pH (S.U.)	7.0
Partial Mix Factors	Unknown – Calculated by TMS
Complete Mix Times	
Q_{7-10} (min)	0.228
Q_h (min)	
Stream Inputs	
Receiving Surface Water	Georges Creek
Number of Reaches to Model	1
Stream Code	41340
RMI	13.25
Elevation (ft)	990
Drainage Area (mi^2)	13.6
Slope (ft/ft)	
PWS Withdrawal (MGD)	0.25
Apply Fish Criteria	Yes
Low Flow Yield (cfs/mi^2)	
Flows	
Stream (cfs)	0.228/0.237*****
Tributary (cfs)	N/A
Width (ft)	10/10*****
Stream Hardness ($^{mg}/_{L}$)	100
Stream pH (S.U.)	7

***** Denotes discharge location/downstream location values.

Based on the recommendations of the TMS, monitor and report are imposed for Total Copper and Total Zinc at Outfall 001. Analysis Report from the TMS run is included in Attachment A.

Thermal WQBELs for Heated Discharges (Non-Contact Cooling Water)

Thermal WQBELs are evaluated using the Department's program called "Thermal Discharge Limit Calculation Spreadsheet" created with Microsoft Excel for Windows. The program calculates temperature WLAs through the application of a heat transfer equation, which takes two forms in the program depending on the source of the facility's cooling water. In Case 1, intake water to a facility is from the receiving stream. In Case 2, intake water is from a source other than the receiving stream (e.g., municipal water supply). The determination of which case applies to a given discharge is determined by the input data which include the receiving stream flow rate (Q_{7-10} or the minimum regulated flow for large rivers), the stream intake flow rate, external source intake flow rates, consumptive flow rates and site-specific ambient stream temperatures. Case 1 limits are generally expressed as heat rejection rates while Case 2 limits are usually expressed as temperatures.

Since the temperature criteria from 25 Pa. Code Chapter 93.7(a) are expressed on monthly and semi-monthly bases for three different aquatic life-uses—cold water fishes, warm water fishes and trout stocking—the program generates monthly and semi-monthly limits for each use. The Department selects the output that corresponds to the aquatic life-use of the receiving stream and consequently which limits apply to the discharge. Temperature WLAs are bounded by an upper limit of 110°F (as discussed in Technology-Based Limitations) for the safety of sampling personnel and anyone who may come

into contact with the heated discharge where it enters the receiving water. If no WLAs below 110°F are calculated, an instantaneous maximum limit of 110°F is recommended by the program.

The Department's *Implementation Guidance for Temperature Criteria* directs permit writers to assume instantaneous complete mixing of the discharge with the receiving stream when calculating thermal effluent limits unless adverse factors exist. One such factor listed in the guidance is that the "discharge is to a receiving water that is very wide, resulting in restricted dispersion of the plume, and horizontal stratification of the plume." Since wastewaters from Outfall 001 will be discharged to the Georges Creek, the dispersion of the discharge plume is assumed to be instantaneous.

Discharges from Outfall 001 are classified under Case 2 because the facility's water is obtained from the local municipal supply. The flow rates used for modeling are 0.016 MGD, which is the monthly average flow of the facility's heated effluent sources (NCCW) and 0.228 cfs, which is the Q_{7-10} from the USGS StreamStats model. The results of the thermal analysis, included in Attachment B, indicate that 110.0°F provides adequate protection to the environment at Outfall 001 as summarized below in Table 2.

Table 2: Outfall 001 WQBELs for Temperature

Date	WWF Daily WLA (°F)
Jan 1-31	110.0
Feb 1-29	110.0
Mar 1-31	110.0
Apr 1-15	110.0
Apr 16-30	110.0
May 1-15	110.0
May 16-30	110.0
Jun 1-15	110.0
Jun 16-30	110.0
Jul 1-31	110.0
Aug 1-15	110.0
Aug 16-31	110.0
Sep 1-15	110.0
Sep 16-30	110.0
Oct 1-15	110.0
Oct 16-31	110.0
Nov 1-15	110.0
Nov 16-30	110.0
Dec 1-31	110.0

Total Residual Chlorine (TRC)

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 are included in Attachment C, which identify that BAT is the most stringent criteria for TRC at an average monthly limit of 0.5 $^{mg}/_{L}$. The maximum daily limit is 2 times the average monthly limit resulting in a 1.0 $^{mg}/_{L}$ limit for maximum daily.

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.

The facility is not seeking to revise the previously permitted effluent limits.

Effluent Limitations and Monitoring Requirements for Outfall 001

Effluent limits applicable at Outfall 001 are the more stringent of TBELs, regulatory effluent standards, WQBELs, previously permitted effluent limits and the monitoring requirements are summarized in Table 3.

Table 3: Final Effluent limits and monitoring requirements for Outfall 001

Parameter	Mass (pounds)		Concentration (mg/L)			Basis
	Average Monthly	Daily Maximum	Average Monthly	Daily Maximum	Instant Maximum	
Flow (MGD)	Report	Report	—	—	—	25 Pa. Code § 92a.61(d)(1)
Copper, Total	Report	Report	Report	Report	—	25 Pa. Code § 96.3
Zinc, Total	Report	Report	Report	Report	—	25 Pa. Code § 96.3
Temperature (°F)	—	—	—	—	110.0	25 Pa. Code § 93.7
TRC	—	—	0.5	1.0	—	25 Pa. Code § 92a.48
pH (S.U.)	Within the range of 6.0 to 9.0					25 Pa. Code § 95.2

Monitoring requirements for the interim and final effluent limits are based on the current operations of the facility. With the facility's primary treatment and discharge method being the public sewer line, on-site treatment and discharge are expected to be infrequent. The monitoring requirements are displayed in Table 4 below.

Table 4: Monitoring Requirements for Outfall 001

Parameter	Sample Type	Minimum Sample Frequency
Flow	Measured	1/discharge*****
Copper, Total	Grab	1/discharge*****
Zinc, Total	Grab	1/discharge*****
Temperature	Grab	1/discharge*****
TRC	Grab	1/discharge*****
pH	Grab	1/discharge*****

- In accordance with Part C, Condition I.E of the NPDES permit, whenever the discharge duration exceeds one week, the permittee shall collect and report at least one sample per week until the discharge ceases.

Development of Effluent Limitations

Outfall No.	101	**Design Flow (MGD)**	0.016
Latitude		**Longitude**	

Wastewater Description: Non-Contact Cooling Water, Boiler Blowdown, Floor Drains (drips from NCCW), Containment Trench.

During the previous permit cycle, the Steam Electric Effluent Limitation Guidelines (40 CFR 423.12(b)3 Low-Volume Waste) were imposed at Outfall 101 since boiler blowdown is contained in the low-volume waste. The boiler blowdown is approximately 220 gallons per day of the 16,000 gallon per day NCCW discharge. Review of the DMRs for Outfall 101 indicate that the ELG parameters for low-volume waste, total suspended solids and oil and grease, were typically reported as non-detect.

After a permit cycle of monitoring at Outfall 101, it has been determined that additional self-monitoring is not required.

Uncontaminated Stormwater Outfall 002

The Department's policy for stormwater discharges is to either (1) require that the stormwater is uncontaminated, (2) impose "Monitor and Report", to establish effluent goals and require the permittee to submit a Stormwater Pollution Prevention Plan (SWPPP), or (3) impose effluent limits. In all cases, a storm water special condition is placed in the permit in Part C.

Stormwater effluent data reported in the application are compared to stream criteria, EPA's Multi-Sector General Permit "benchmark values", ELGs and other references while considering site specific conditions such as stream flow and location to determine if actual discharge concentrations of various pollutants in stormwater warrant further controls. If there is insufficient data available, or if pollutant levels are excessive, monitoring for specific pollutants and/or a SWPPP are required in the permit. Otherwise, the storm water outfalls are simply listed as discharge points. In either case, a special condition is added to the permit to include some of the key components of the Department's General Permit (PAG-03) for Discharges of Stormwater Associated with Industrial Activities.

Due to site grading, the facility is able to collect and discharge stormwater exposed to industrial activities and stormwater outside of industrial activities separately. The uncontaminated stormwater Outfall 002, with drainage areas outside of industrial activities, is identified in the NPDES permit and have no monitoring or reporting requirements imposed.

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

Attachment A – Toxic Management Spreadsheet Outfall 001

Attachment B – Temperature Model Spreadsheet

Attachment C – TRC Calculation Spreadsheet

Attachment D – Water Flow Diagram

Attachment E – USGS StreamStats Output

Attachment A – Toxic Management Spreadsheet Outfall 001

pennsylvania
DEPARTMENT OF ENVIRONMENTAL PROTECTION

Toxics Management Spreadsheet
Version 1.3, March 2021

Discharge Information

Instructions | Discharge | Stream

Facility: **Fayette Business Park** NPDES Permit No.: **PA0219380** Outfall No.: **001**

Evaluation Type: **Major Sewage / Industrial Waste** Wastewater Description: **Industrial Wastewater and Stormwater**

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
0.016	100	7						

					0 if left blank		0.5 if left blank		0 if left blank			1 if left blank	
	Discharge Pollutant	Units	Max Discharge Conc		Trib Conc	Stream Conc	Daily CV	Hourly CV	Stream CV	Fate Coeff	FOS	Criteria Mod	Chem Transl
Group 1	Total Dissolved Solids (PWS)	mg/L											
	Chloride (PWS)	mg/L											
	Bromide	mg/L											
	Sulfate (PWS)	mg/L											
	Fluoride (PWS)	mg/L											
Group 2	Total Aluminum	µg/L											
	Total Antimony	µg/L											
	Total Arsenic	µg/L											
	Total Barium	µg/L											
	Total Beryllium	µg/L											
	Total Boron	µg/L											
	Total Cadmium	µg/L											
	Total Chromium (III)	µg/L											
	Hexavalent Chromium	µg/L											
	Total Cobalt	µg/L											
	Total Copper	µg/L		48									
	Free Cyanide	µg/L											
	Total Cyanide	µg/L											
	Dissolved Iron	µg/L											
	Total Iron	µg/L											
	Total Lead	µg/L											
	Total Manganese	µg/L											
	Total Mercury	µg/L											
	Total Nickel	µg/L											
	Total Phenols (Phenolics) (PWS)	µg/L											
	Total Selenium	µg/L											
	Total Silver	µg/L											
	Total Thallium	µg/L											
	Total Zinc	µg/L		418									
	Total Molybdenum	µg/L											
	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

Fayette Business Park, NPDES Permit No. PA0219380, Outfall 001

Instructions | Discharge | Stream

Receiving Surface Water Name: Georges Creek

No. Reaches to Model: 1

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

Location	Stream Code*	RMI*	Elevation (ft)*	DA (mi^2)*	Slope (ft/ft)	PWS Withdrawal (MGD)	Apply Fish Criteria*
Point of Discharge	041340	13.25	990	13.6			Yes
End of Reach 1	041340	12.5	985	14.1			Yes

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

Location	RMI	LFY (cfs/mi^2)*	Flow (cfs)		W/D Ratio	Width (ft)	Depth (ft)	Velocity (fps)	Travel Time (days)	Tributary		Stream		Analysis	
			Stream	Tributary						Hardness	pH	Hardness*	pH*	Hardness	pH
Point of Discharge	13.25	0.1										100	7		
End of Reach 1	12.5	0.1													

Q_h

Location	RMI	LFY (cfs/mi^2)	Flow (cfs)		W/D Ratio	Width (ft)	Depth (ft)	Velocity (fps)	Travel Time (days)	Tributary		Stream		Analysis	
			Stream	Tributary						Hardness	pH	Hardness	pH	Hardness	pH
Point of Discharge	13.25														
End of Reach 1	12.5														

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Toxics Management Spreadsheet
Version 1.3, March 2021

Model Results

Fayette Business Park, NPDES Permit No. PA0219380, Outfall 001

Instructions | *Results* | RETURN TO INPUTS | SAVE AS PDF | PRINT | (●) All ( ) Inputs ( ) Results ( ) Limits

☐ ***Hydrodynamics***

☑ ***Wasteload Allocations***

☑ ***AFC*** CCT (min): 15 PMF: 0.673 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 Copper	0	0		0	13.439	14.0	532	Chem Translator of 0.96 applied
Total Zinc	0	0		0	117.180	120	4,552	Chem Translator of 0.978 applied

☑ ***CFC*** CCT (min): 33.087 PMF: 1 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 Copper	0	0		0	8.956	9.33	522	Chem Translator of 0.96 applied
Total Zinc	0	0		0	118.139	120	6,703	Chem Translator of 0.986 applied

☑ ***THH*** CCT (min): 33.087 PMF: 1 Analysis Hardness (mg/l): N/A Analysis pH: N/A

Pollutants	Stream Conc (µg/L)	Stream CV	Trib Conc (µg/L)	Fate Coef	WQC (µg/L)	WQ Obj (µg/L)	WLA (µg/L)	Comments
Total Copper	0	0		0	N/A	N/A	N/A	
Total Zinc	0	0		0	N/A	N/A	N/A	

☑ ***CRL*** CCT (min): 9.415 PMF: 1 Analysis Hardness (mg/l): N/A Analysis pH: N/A

Pollutants	Stream Conc (µg/L)	Stream CV	Trib Conc (µg/L)	Fate Coef	WQC (µg/L)	WQ Obj (µg/L)	WLA (µg/L)	Comments
Total Copper	0	0		0	N/A	N/A	N/A	
Total Zinc	0	0		0	N/A	N/A	N/A	

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

No. Samples/Month: 4

Pollutants	*Mass Limits* AML (lbs/day)	*Mass Limits* MDL (lbs/day)	*Concentration Limits* AML	*Concentration Limits* MDL	*Concentration Limits* IMAX	*Concentration Limits* Units	Governing WQBEL	WQBEL Basis	Comments
Total Copper	Report	Report	Report	Report	Report	µg/L	341	AFC	Discharge Conc > 10% WQBEL (no RP)
Total Zinc	Report	Report	Report	Report	Report	µg/L	2,918	AFC	Discharge Conc > 10% WQBEL (no RP)

☑ ***Other Pollutants without Limits or Monitoring***

The following pollutants do not require effluent limits or monitoring based on water quality because reasonable potential to exceed water quality criteria was not determined and the discharge concentration was less than thresholds for monitoring, or the pollutant was not detected and a sufficiently sensitive analytical method was used (e.g., <= Target QL).

Pollutants	Governing WQBEL	Units	Comments

Attachment B – Temperature Model Spreadsheet

Facility: Fayette Business Park
Permit Number: PA0219380
Stream Name: Georges Creek
Analyst/Engineer: Curt Holes
Stream Q7-10 (cfs): 0.228

	Facility Flows				Stream Flows			
	Intake (Stream) (MGD)	Intake (External) (MGD)	Consumptive Loss (MGD)	Discharge Flow (MGD)	PMF	Upstream Stream Flow (cfs)	Adjusted Stream Flow (cfs)	Downstream Stream Flow (cfs)
Jan 1-31	0	0.016	0	0.016	0.50	0.70	0.35	0.38
Feb 1-29	0	0.016	0	0.016	0.50	0.80	0.40	0.42
Mar 1-31	0	0.016	0	0.016	0.50	1.48	0.74	0.77
Apr 1-15	0	0.016	0	0.016	0.50	2.04	1.02	1.05
Apr 16-30	0	0.016	0	0.016	0.50	2.04	1.02	1.05
May 1-15	0	0.016	0	0.016	0.50	1.16	0.58	0.60
May 16-31	0	0.016	0	0.016	0.50	1.16	0.58	0.60
Jun 1-15	0	0.016	0	0.016	0.50	0.67	0.34	0.36
Jun 16-30	0	0.016	0	0.016	0.50	0.67	0.34	0.36
Jul 1-31	0	0.016	0	0.016	0.50	0.31	0.16	0.18
Aug 1-15	0	0.016	0	0.016	0.50	0.32	0.16	0.18
Aug 16-31	0	0.016	0	0.016	0.50	0.32	0.16	0.18
Sep 1-15	0	0.016	0	0.016	0.50	0.25	0.12	0.15
Sep 16-30	0	0.016	0	0.016	0.50	0.25	0.12	0.15
Oct 1-15	0	0.016	0	0.016	0.50	0.29	0.15	0.17
Oct 16-31	0	0.016	0	0.016	0.50	0.29	0.15	0.17
Nov 1-15	0	0.016	0	0.016	0.50	0.41	0.21	0.23
Nov 16-30	0	0.016	0	0.016	0.50	0.41	0.21	0.23
Dec 1-31	0	0.016	0	0.016	0.50	0.68	0.34	0.37

Please forward all comments to Tom Starosta at 717-787-4317, tstarosta@state.pa.us.
Version 2.0 -- 07/01/2005 Reference: Implementation Guidance for Temperature Criteria, DEP-ID: 391-2000-017
NOTE: The user can only edit fields that are blue.
NOTE: MGD x 1.547 = cfs.

Facility: **Fayette Business Park**
Permit Number: PA0219380
Stream: Georges Creek

	WWF Ambient Stream Temperature (ºF) (Default)	Ambient Stream Temperature (ºF) (Site-specific data)	Target Maximum Stream Temp.[1] (ºF)	WWF Daily WLA[2] (Million BTUs/day)	WWF Daily WLA[3] (ºF)	at Discharge Flow (MGD)	PMF
Jan 1-31	35	0	40	N/A -- Case 2	110.0	0.016	0.50
Feb 1-29	35	0	40	N/A -- Case 2	110.0	0.016	0.50
Mar 1-31	40	0	46	N/A -- Case 2	110.0	0.016	0.50
Apr 1-15	47	0	52	N/A -- Case 2	110.0	0.016	0.50
Apr 16-30	53	0	58	N/A -- Case 2	110.0	0.016	0.50
May 1-15	58	0	64	N/A -- Case 2	110.0	0.016	0.50
May 16-31	62	0	72	N/A -- Case 2	110.0	0.016	0.50
Jun 1-15	67	0	80	N/A -- Case 2	110.0	0.016	0.50
Jun 16-30	71	0	84	N/A -- Case 2	110.0	0.016	0.50
Jul 1-31	75	0	87	N/A -- Case 2	110.0	0.016	0.50
Aug 1-15	74	0	87	N/A -- Case 2	110.0	0.016	0.50
Aug 16-31	74	0	87	N/A -- Case 2	110.0	0.016	0.50
Sep 1-15	71	0	84	N/A -- Case 2	110.0	0.016	0.50
Sep 16-30	65	0	78	N/A -- Case 2	110.0	0.016	0.50
Oct 1-15	60	0	72	N/A -- Case 2	110.0	0.016	0.50
Oct 16-31	54	0	66	N/A -- Case 2	110.0	0.016	0.50
Nov 1-15	48	0	58	N/A -- Case 2	110.0	0.016	0.50
Nov 16-30	42	0	50	N/A -- Case 2	110.0	0.016	0.50
Dec 1-31	37	0	42	N/A -- Case 2	110.0	0.016	0.50

[1] This is the maximum of the WWF WQ criterion or the ambient temperature. The ambient temperature may be either the design (median) temperature for WWF, or the ambient stream temperature based on site-specific data entered by the user. A minimum of 1ºF above ambient stream temperature is allocated.
[2] The WLA expressed in Million BTUs/day is valid for Case 1 scenarios, and disabled for Case 2 scenarios.
[3] The WLA expressed in ºF is valid only if the limit is tied to a daily discharge flow limit (may be used for Case 1 or Case 2). WLAs greater than 110ºF are displayed as 110ºF.

Attachment C – TRC Calculation Spreadsheet

TRC EVALUATION Fayette Business Park

0.288	= Q stream (cfs)	0.5	= CV Daily
0.016	= Q discharge (MGD)	0.5	= CV Hourly
4	= no. samples	0.705	= AFC_Partial Mix Factor
0.3	= Chlorine Demand of Stream	1	= CFC_Partial Mix Factor
0	= Chlorine Demand of Discharge	15	= AFC_Criteria Compliance Time (min)
0.5	= BAT/BPJ Value	720	= CFC_Criteria Compliance Time (min)
	= % Factor of Safety (FOS)		=Decay Coefficient (K)

Source	Reference	AFC Calculations	Reference	CFC Calculations
TRC	**1.3.2.iii**	WLA afc = 2.636	**1.3.2.iii**	WLA cfc = 3.630
PENTOXSD TRG	**5.1a**	LTAMULT afc = 0.373	**5.1c**	LTAMULT cfc = 0.581
PENTOXSD TRG	**5.1b**	LTA_afc= 0.982	**5.1d**	LTA_cfc = 2.110

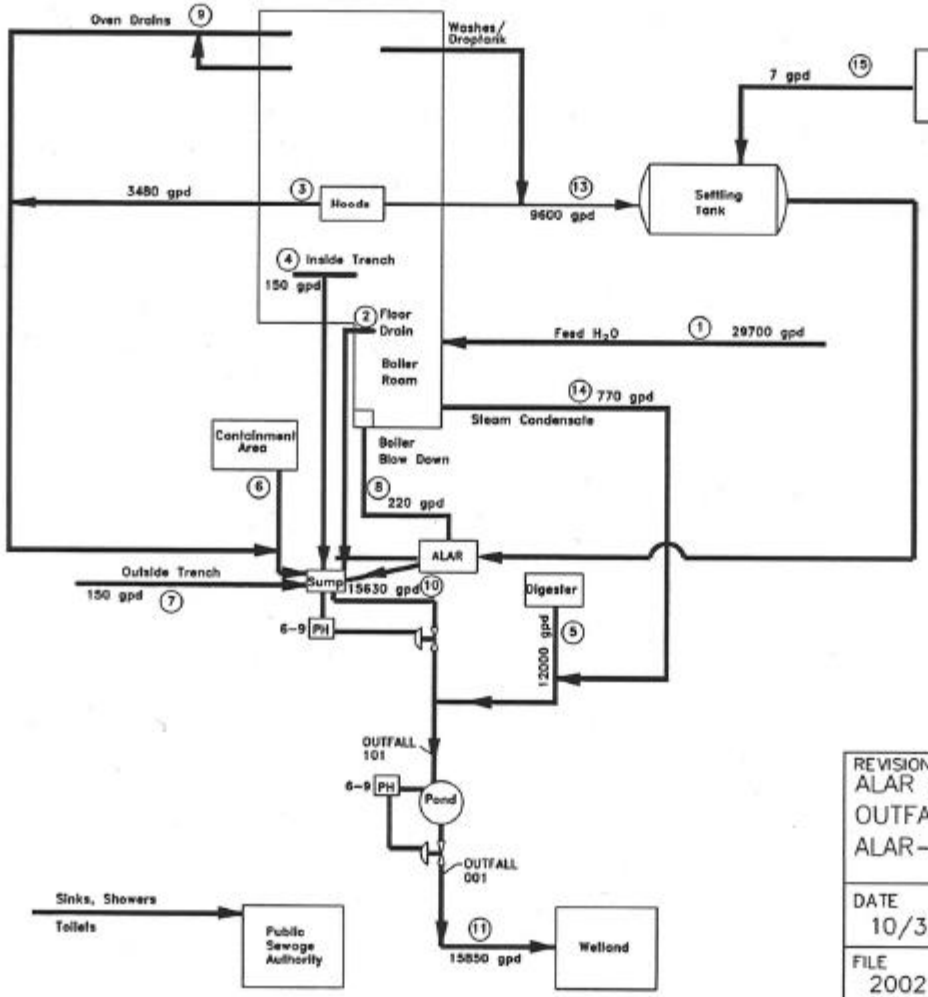
Source		Effluent Limit Calculations	
PENTOXSD TRG	5.1f	AML MULT = 1.720	
PENTOXSD TRG	5.1g	AVG MON LIMIT (mg/l) = 0.500	BAT/BPJ
		INST MAX LIMIT (mg/l) = 1.170	

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)**

Attachment D – Water Flow Diagram

Mypodiamond H_2O Flow
9/11/02

WATER BALANCE DIAGRAM



Note:
All water will be Non-Contact with the Exception of Numbers 13, and 15, Hoods, Washes, Centrifuge and Scrubber.

REVISIONS	
ALAR SYSTEM	1/6/05 RD
OUTFALL 101 LOCATION	4/1/09 KW
ALAR-SUMP-POND	4/1/09 KW

DATE	SCALE	JOB NO.	BOOK NO.
10/3/02	N.T.S.	2002-58	ME *

FILE	DRAWN BY	CAD FILE
2002-58	GS	2002-58

McMILLEN ENGINEERING
115 Wayland Smith Drive Uniontown, Pa. 15401

Attachment E – USGS StreamStats Output

StreamStats Report - Pureon Outfall 001 to Georges Creek

Region ID:	PA
Workspace ID:	PA20210610124601300000
Clicked Point (Latitude, Longitude):	39.80588, -79.77269
Time:	2021-06-10 08:46:19 -0400

Basin Characteristics

Parameter Code	Parameter Description	Value	Unit
DRNAREA	Area that drains to a point on a stream	13.6	square miles
STORAGE	Percentage of area of storage (lakes ponds reservoirs wetlands)	0.16	percent
ELEV	Mean Basin Elevation	1442	feet
PRECIP	Mean Annual Precipitation	45	inches
FOREST	Percentage of area covered by forest	60.0192	percent
URBAN	Percentage of basin with urban development	10.8982	percent
CARBON	Percentage of area of carbonate rock	0	percent

Peak-Flow Statistics Parameters [Peak Flow Region 2 SIR 2019 5094]

Parameter Code	Parameter Name	Value	Units	Min Limit	Max Limit
DRNAREA	Drainage Area	13.6	square miles	0.92	1160
STORAGE	Percent Storage	0.16	percent	0	8.9

Peak-Flow Statistics Flow Report [Peak Flow Region 2 SIR 2019 5094]

PII: Prediction Interval-Lower, PIu: Prediction Interval-Upper, SEp: Standard Error of Prediction, SE: Standard Error (other -- see report)

Statistic	Value	Unit	SEp
50-percent AEP flood	567	ft^3/s	26.1
20-percent AEP flood	909	ft^3/s	27
10-percent AEP flood	1180	ft^3/s	28.9
4-percent AEP flood	1570	ft^3/s	31.6
2-percent AEP flood	1890	ft^3/s	34.8
1-percent AEP flood	2250	ft^3/s	37.8
0.5-percent AEP flood	2640	ft^3/s	41.6
0.2-percent AEP flood	3220	ft^3/s	46.1

Peak-Flow Statistics Citations

https://streamstats.usgs.gov/ss/ 6/10/2021

Roland, M.A., and Stuckey, M.H.,2019, Development of regression equations for the estimation of flood flows at ungaged streams in Pennsylvania: U.S. Geological Survey Scientific Investigations Report 2019–5094, 36 p. (https:// doi.org/10.3133/sir20195094)

Low-Flow Statistics Parameters [Low Flow Region 4]

Parameter Code	Parameter Name	Value	Units	Min Limit	Max Limit
DRNAREA	Drainage Area	13.6	square miles	2.26	1400
ELEV	Mean Basin Elevation	1442	feet	1050	2580

Low-Flow Statistics Flow Report [Low Flow Region 4]

PII: Prediction Interval-Lower, PIu: Prediction Interval-Upper, SEp: Standard Error of Prediction, SE: Standard Error (other -- see report)

Statistic	Value	Unit	SE	SEp
7 Day 2 Year Low Flow	0.64	ft^3/s	43	43
30 Day 2 Year Low Flow	1.11	ft^3/s	38	38
7 Day 10 Year Low Flow	0.228	ft^3/s	66	66
30 Day 10 Year Low Flow	0.408	ft^3/s	54	54
90 Day 10 Year Low Flow	0.766	ft^3/s	41	41

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/)

Annual Flow Statistics Parameters [Statewide Mean and Base Flow]

Parameter Code	Parameter Name	Value	Units	Min Limit	Max Limit
DRNAREA	Drainage Area	13.6	square miles	2.26	1720
ELEV	Mean Basin Elevation	1442	feet	130	2700
PRECIP	Mean Annual Precipitation	45	inches	33.1	50.4
FOREST	Percent Forest	60.0192	percent	5.1	100
URBAN	Percent Urban	10.8982	percent	0	89

Annual Flow Statistics Flow Report [Statewide Mean and Base Flow]

PII: Prediction Interval-Lower, PIu: Prediction Interval-Upper, SEp: Standard Error of Prediction, SE: Standard Error (other -- see report)

Statistic	Value	Unit	SE	SEp
Mean Annual Flow	24.1	ft^3/s	12	12

Annual 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/)

General Flow Statistics Parameters [Statewide Mean and Base Flow]

Parameter Code	Parameter Name	Value	Units	Min Limit	Max Limit
DRNAREA	Drainage Area	13.6	square miles	2.26	1720
PRECIP	Mean Annual Precipitation	45	inches	33.1	50.4
CARBON	Percent Carbonate	0	percent	0	99
FOREST	Percent Forest	60.0192	percent	5.1	100
URBAN	Percent Urban	10.8982	percent	0	89

General Flow Statistics Flow Report [Statewide Mean and Base Flow]

PII: Prediction Interval-Lower, PIu: Prediction Interval-Upper, SEp: Standard Error of Prediction, SE: Standard Error (other -- see report)

Statistic	Value	Unit	SE	SEp

Statistic	Value	Unit	SE	SEp
Harmonic Mean Streamflow	6.02	ft^3/s	38	38

General 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/)

Base Flow Statistics Parameters [Statewide Mean and Base Flow]

Parameter Code	Parameter Name	Value	Units	Min Limit	Max Limit
DRNAREA	Drainage Area	13.6	square miles	2.26	1720
PRECIP	Mean Annual Precipitation	45	inches	33.1	50.4
CARBON	Percent Carbonate	0	percent	0	99
FOREST	Percent Forest	60.0192	percent	5.1	100
URBAN	Percent Urban	10.8982	percent	0	89

Base Flow Statistics Flow Report [Statewide Mean and Base Flow]

PII: Prediction Interval-Lower, PIu: Prediction Interval-Upper, SEp: Standard Error of Prediction, SE: Standard Error (other -- see report)

Statistic	Value	Unit	SE	SEp
Base Flow 10 Year Recurrence Interval	8.84	ft^3/s	21	21
Base Flow 25 Year Recurrence Interval	7.87	ft^3/s	21	21
Base Flow 50 Year Recurrence Interval	7.31	ft^3/s	23	23

Base 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/)

Bankfull Statistics Parameters [Statewide Bankfull Noncarbonate 2018 5066]

Parameter Code	Parameter Name	Value	Units	Min Limit	Max Limit
DRNAREA	Drainage Area	13.6	square miles	2.62	207
CARBON	Percent Carbonate	0	percent		

Bankfull Statistics Flow Report [Statewide Bankfull Noncarbonate 2018 5066]

PII: Prediction Interval-Lower, PIu: Prediction Interval-Upper, SEp: Standard Error of Prediction, SE: Standard Error (other -- see report)

Statistic	Value	Unit	SE
Bankfull Area	98.2	ft^2	64
Bankfull Streamflow	437	ft^3/s	74
Bankfull Width	47.4	ft	59
Bankfull Depth	2.1	ft	56

Bankfull Statistics Citations

Clune, J.W., Chaplin, J.J., and White, K.E.,2018, Comparison of regression relations of bankfull discharge and channel geometry for the glaciated and nonglaciated settings of Pennsylvania and southern New York: U.S. Geological Survey Scientific Investigations Report 2018 -5066, 20 p. (https://doi.org/10.3133/sir20185066)

Application Version: 4.5.3
StreamStats Services Version: 1.2.22
NSS Services Version: 2.1.2