pennsylvania
DEPARTMENT OF ENVIRONMENTAL PROTECTION

Northwest Regional Office
CLEAN WATER PROGRAM

Application Type	**Renewal**	Application No.	**PA0005053**
Facility Type	**Industrial**	APS ID	**924752**
Major / Minor	**Minor**	Authorization ID	**1154466**

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

Applicant and Facility Information

Applicant Name	**GenOn REMA LLC (formerly NRG REMA LLC)**	Facility Name	**Warren Generating Station**
Applicant Address	250 Power Plant Drive	Facility Address	20085 Route 6
	Shawville, PA 16873		Warren, PA 16365-3655
Applicant Contact	Stephen M. Frank, Sr. Mgr., Environmental	Facility Contact	William J. Weaver, Plant Manager
Applicant Phone	724-249-3610	Facility Phone	
Client ID	135779	Site ID	263250
SIC Code	4911	Municipality	Conewango Township
SIC Description	Trans. & Utilities - Electric Services	County	Warren
Date Application Received	September 29, 2016	EPA Waived?	Yes
Date Application Accepted	December 7, 2016	If No, Reason	

Purpose of Application: NPDES permit renewal

Summary of Review

The Warren Generating Station steam units have been deactivated and this portion of the facility is closed. The combustion turbine (CT) continues to be operate.

NRG recently changed their operational name to GenOn Holdings, Inc. As a result of this name change, the applicant submitted a letter received on June 18, 2019 to request that the applicant name be changed from “NRG REMA LLC” to “GenOn REMA LLC”. The facility was originally permitted as “GenOn REMA LLC” in the last permit renewal dated March 8, 2012 but the name was changed to “NRG REMA LLC” through a permit amendment dated March 31, 2014. The applicant is now proposing to revert back to the “GenOn REMA LLC” name and was advised on July 11, 2019 that a permit amendment application would be required for this change. The applicant is preparing the application and submittal is expected soon. It is anticipated that this will happen prior to final permit issuance and the amendment can be simultaneously completed at the time of the final permit issuance. The combustion turbine (CT) is reportedly going to be transferred to a different entity (Warren Power LLC). A permit amendment to address this change is anticipated in the near future.

Contact information since the original September 29, 2016 NPDES permit renewal submittal has changed as follows:

Applicant: Stephen M. Frank, P.E.
Senior Manager, Environmental
Stephen.Frank@GenOn.com
724-249-3610

or Karen E. McClelland
Senior Environmental Specialist
Karen.McClelland@GenOn.com
724-877-4462

Facility: William J. Weaver
Plant Manager
William.Weaver@GenOn.com

Approve	Deny	Signatures	Date
X		Justin C. Dickey, P.E. / Environmental Engineer Manager	
X		John A. Holden, P.E. / Environmental Program Manager	

Summary of Review

It was determined during the permit renewal review that this facility's discharge should be regulated under the revised Steam Electric Subcategory (40 CFR 423) as combustion residual leachate. This wastestream is defined in 40 CFR 423.11(r) as "leachate from landfills or surface impoundments containing combustion residuals. Leachate is composed of liquid, including any suspended or dissolved constituents in the liquid, that has percolated through waste or other materials emplaced in a landfill, or that passes through the surface impoundment's containment structure (e.g., bottom, dikes, berms). Combustion residual leachate includes seepage and/or leakage from a combustion residual landfill or impoundment unit. Combustion residual leachate includes wastewater from landfills and surface impoundments located on non-adjoining property when under the operational control of the permitted facility."

The Chapter 92a fee category will be changed to "Minor IW with ELG" upon issuance of this permit.

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)	N/A
Latitude	41º 50' 07"	Longitude	-79º 11' 20"
Outfall No.	003	Design Flow (MGD)	N/A
Latitude	41º 50' 07"	Longitude	-79º 11' 40"
Outfall No.	004	Design Flow (MGD)	N/A
Latitude	41º 50' 07"	Longitude	-79º 11' 28"
Quad Name	Warren	Quad Code	01073
Wastewater Description:	Stormwater		

Receiving Waters	Allegheny River (WWF)	Stream Code	42122
NHD Com ID	112375359	RMI	-
Drainage Area	-	Yield (cfs/mi^2)	-
Q_{7-10} Flow (cfs)	-	Q_{7-10} Basis	-
Elevation (ft)	-	Slope (ft/ft)	-
Watershed No.	16-B	Chapter 93 Class.	WWF
Existing Use	-	Existing Use Qualifier	-
Exceptions to Use	-	Exceptions to Criteria	-
Assessment Status	Impaired		
Cause(s) of Impairment	MERCURY, PATHOGENS		
Source(s) of Impairment	SOURCE UNKNOWN, SOURCE UNKNOWN		
TMDL Status		Name	

Changes Since Last Permit Issuance: None

Other Comments: These stormwater outfalls meet the requirements for being eligible for a no exposure exemption. Therefore, the will not be included in the NPDES permit.

Discharge, Receiving Waters and Water Supply Information

Outfall No.	002	Design Flow (MGD)	.029
Latitude	41º 50' 04"	Longitude	-79º 11' 31"
Quad Name		Quad Code	
Wastewater Description:	Treated ash disposal site leachate and stormwater		

Receiving Waters	Allegheny River (WWF)	Stream Code	42122
NHD Com ID	112375359	RMI	186.21
Drainage Area	3140	Yield (cfs/mi^2)	0.324
Q_{7-10} Flow (cfs)	1017.88	Q_{7-10} Basis	See below
Elevation (ft)	1163	Slope (ft/ft)	0.0003
Watershed No.	16-B	Chapter 93 Class.	WWF
Existing Use	-	Existing Use Qualifier	-
Exceptions to Use	-	Exceptions to Criteria	-
Assessment Status	Impaired		
Cause(s) of Impairment	MERCURY, PATHOGENS		
Source(s) of Impairment	SOURCE UNKNOWN, SOURCE UNKNOWN		
TMDL Status		Name	

Background/Ambient Data		Data Source
pH (SU)	7.4	9/98-6/04 sampling @ WQN #866 – Alleg. R. near Warren
Temperature (°F)	25	Default temp for a WWF stream
Hardness (mg/L)	31	Avg. value of samples from WQN #866 (1/95-12/98)
Other:	-	-

Nearest Downstream Public Water Supply Intake		Aqua Pa, Emlenton	
PWS Waters	Allegheny River	Flow at Intake (cfs)	1376
PWS RMI	90.67	Distance from Outfall (mi)	96 miles (approximate)

Changes Since Last Permit Issuance: N/A

Q_{7-10} Flow Calculations:

USGS 03016000 – Allegheny River @ West Hickory (1/1985-9/2010*) – Q7,10 = 1060 cfs; D.A. = 3660 mi^2;
*No flow data was collected at the West Hickory gage from 10/2004 to 9/2007. D-Flow was used to find Q_{7-10}.

USGS 03012600 – Allegheny River @ Kinzua Dam (1935-1965) – Yield = 0.081 cfsm

Flow will be subtracted between West Hickory Gage and Outfall 002 using yield rate prior to construction of Kinzua Dam.

Q7-10 at Outfall 002 = 1060 cfs – [(3660-3140 mi)(0.081 cfsm)] = 1017.88 cfs
Q7-10 at Downstream Point = 1060 cfs –[(3660-3141 mi)(0.081 cfsm)] = 1017.96 cfs
(Just below Morse Run confluence – RMI 184.76)
Q7-10 at PWS (Aqua At Emlenton – RMI 90.57) = 1376 cfs

Discharge, Receiving Waters and Water Supply Information

Outfall No.	005	Design Flow (MGD)	N/A
Latitude	41º 50' 07"	Longitude	-79º 11' 28"
Quad Name		Quad Code	
Wastewater Description:	Stormwater		
Receiving Waters	UNT to Allegheny River (WWF)	Stream Code	42122
NHD Com ID	112375331	RMI	-
Drainage Area	-	Yield (cfs/mi^2)	-
Q_{7-10} Flow (cfs)	-	Q_{7-10} Basis	-
Elevation (ft)	-	Slope (ft/ft)	-
Watershed No.	16-B	Chapter 93 Class.	WWF
Existing Use	-	Existing Use Qualifier	-
Exceptions to Use	-	Exceptions to Criteria	-
Assessment Status	-		
Cause(s) of Impairment	-		
Source(s) of Impairment	-		
TMDL Status	-	Name	-

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

Nearest Downstream Public Water Supply Intake			
PWS Waters		Flow at Intake (cfs)	
PWS RMI		Distance from Outfall (mi)	

Changes Since Last Permit Issuance: None

Other Comments: This stormwater outfalls meet the requirements for being eligible for a no exposure exemption. Therefore, the will not be included in the NPDES permit.

Treatment Facility Summary

Treatment Facility Name: Warren Generating Station

WQM Permit No.	Issuance Date
6274203-T3	3/31/2014
6203201-T1	5/4/2011

Waste Type	Degree of Treatment	Process Type	Disinfection	Avg Annual Flow (MGD)
Industrial	Chemical (Industrial Waste)	Chemical Precipitation	No Disinfection	---

Hydraulic Capacity (MGD)	Organic Capacity (lbs/day)	Load Status	Biosolids Treatment	Biosolids Use/Disposal
2.21	000	---	Dewatering	Landfill

Changes Since Last Permit Issuance: None

6274203-T3: Ash disposal ponds (original permit issued on 5/19/75)

6203201-T1: Leachate storage pond, pump station, leachate treatment consisting of 2-stage pH adjustment and aeration, settling, sludge thickening, filter press, sludge hopper, and ancillary equipment. (original permit issued on 4/9/2003)

Compliance History

DMR Data for Outfall 002 (from June 1, 2018 to May 31, 2019)

Parameter	MAY-19	APR-19	MAR-19	FEB-19	JAN-19	DEC-18	NOV-18	OCT-18	SEP-18	AUG-18	JUL-18	JUN-18
Flow (MGD) Average Monthly	0.03	0.02	0.02	0.03	0.02	0.02	0.01	0.01	0.01	0.02	0.02	0.02
pH (S.U.) Minimum	7.3	7.0	7.2	7.4	7.1	7.2	7.2	7.0	7.0	7.2	7.1	7.2
pH (S.U.) Maximum	8.0	7.9	7.8	7.9	7.9	7.9	7.9	7.9	8.0	7.8	8.2	7.8
TSS (mg/L) Average Monthly	< 0.2	< 3.8	2.3	4.3	3.2	4.8	5.0	< 2.8	3.8	4.5	2.8	2.5
TSS (mg/L) Daily Maximum	2.0	7.0	3.0	7.0	5.0	6.0	9.0	6.0	6.0	5.0	4.0	4.0
Total Iron (mg/L) Average Monthly	0.4	0.35	< 0.26	0.28	0.24	0.24	0.17	0.08	0.27	0.11	0.33	0.34
Total Iron (mg/L) Daily Maximum	0.48	0.54	0.26	0.35	0.35	0.27	0.36	0.12	0.72	0.13	0.65	0.39

Development of Effluent Limitations

Outfall No. 002 **Design Flow (MGD)** .029
Latitude 41º 50' 4" **Longitude** -79º 11' 31"
Wastewater Description: Treated ash disposal site leachate and stormwater (IW Process Effluent without ELG)

Technology-Based Limitations

The following technology-based limitations apply, subject to water quality analysis and BPJ where applicable:

Table 1. Applicable Technology Limits (Federal and State):

Parameter	Limit (mg/l)	SBC	Federal Regulation	State Regulation
Oil and Grease	15	Average Monthly	423.12(b)(11)*	95.2(2)(i)
	20	Daily Maximum	423.12(b)(11)*	
	30	IMAX		95.2(2)(i)
Total Suspended Solids	30	Average Monthly	423.12(b)(11)*	
	100	Daily Maximum	423.12(b)(11)*	
pH	6.0 – 9.0 S.U.	Min – Max	423,12(b)(1)*	95.2(1)
Dissolved Iron	7.0	Daily Maximum		95.2(4)

*** Federal Effluent Limitation Guidelines ("ELGs"):** DEP previously determined that no ELGs apply to outfall 002's wastewater. However, the 2015 Final Rule revising the Steam Electric Power Generating ELGs included effluent limits for sources that were previously regulated as part of "low volume waste sources" or that were otherwise unregulated. Pursuant to 40 CFR § 423.11(r), combustion residual leachate is a regulated wastewater under 40 CFR §§ 423.12(b)(11) and 423.13(l). Leachate from the old ash disposal site would be classified as "combustion residual leachate" pursuant to the specialized definition in § 423.11(r). Applicable ELG requirements are listed in the table below.

DEP previously imposed the following case-by-case effluent limits and monitoring requirements pursuant to 40 CFR § 125.3 and Best Professional Judgement (BPJ).

Table 2. BPJ TBELs for Old Ash Disposal Site:

Pollutant	Average of daily values for 30 consecutive days (mg/L)	Maximum for any 1 day (mg/L)
TSS	30.0	70.0
Iron	3.5	7.0
pH	within the range of 6.0 to 10.0	

Comments: The permit currently has a BAT daily maximum limit of 70 mg/l for TSS which was derived from the Acid or Ferruginous Mine Drainage ELG (40 CFR 434.32) which is still being achieved. The previous limit will remain as a BPJ limit in the permit since it is more stringent than the current ELG (see "Anti-Backsliding" discussion). Since the existing BPJ TBEL for total iron using the multiplier is the same as the tech-based dissolved Iron daily max, the dissolved limit is not needed and was omitted.

Water Quality-Based Limitations

A "Reasonable Potential Analysis" (Attachment 1) determined the following parameters were candidates for limitations: Total Dissolved Solids (TDS), Total Boron, Dissolved Iron, Total Manganese, Total Mercury, Total Nickel, Total Phenols (Phenolics), and Total Thallium.

The following limitations were determined through water quality modeling (Attachment 2): N/A

Best Professional Judgment (BPJ) Limitations

Table 3. Summary of BPJ Limitations:

Parameter	Limit (mg/l)	SBC	Model
Chloride	Monitor & Report	Average Quarterly	Collecting data to evaluate mussel protection
Nickel	Monitor & Report	Average Quarterly	Collecting data to evaluate mussel protection

Comments: Chloride and Nickel monitoring is proposed due the presence of threatened and endangered mussel species in the Allegheny River. See the ''Threatened and Endangered Mussel Species Concerns and Considerations" discussion on Page 9 of this Fact Sheet.

Anti-Backsliding

EPA's anti-backsliding regulation at 40 CFR § 122.44(l)(1) requires that reissued permits contain effluent limitations, standards, or conditions that are at least as stringent as the effluent limitations, standards, or conditions in the previous permit even if less stringent Federal Effluent Limitations Guidelines applicable to the discharge were promulgated after the BPJ TBELs were imposed. Therefore, both the ELG TBELs and BPJ TBELs will apply with the more stringent of the overlapping limits (70 mg/L TSS maximum daily limit) imposed in the permit consistent with 40 CFR § 122.44(l)(2).[1]

Other Comments

The Oil and Grease sampling frequency has been established as 1/month rather than 1/week due to the non-detect results provided in the application sampling data oil and grease is not expected to be present in the effluent.

[1] 40 CFR § 122.44(l)(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."

Threatened and Endangered Mussel Species Concerns and Considerations

The Allegheny River is known to contain state and federally listed threatened and endangered mussel species. Due to this being a direct discharge to the Allegheny River, potential impacts were evaluated.

The USFWS has indicated in comment letters on other NPDES permits, that to protect threatened and endangered mussel species, wastewater discharges containing ammonia-nitrogen (NH3-N), chloride (Cl-) and nickel, where mussels or their habitat exist, can be no more than 1.9 mg/l, 78 mg/l and 7.3 µg/l, respectively.

Although the current application form associated with the subject NPDES permit renewal does require sampling for ammonia-nitrogen, chloride, and nickel, NPDES permits for industrial wastewater treatment facilities of this nature do not, generally, include routine monitoring requirements for pollutants such as ammonia-nitrogen, chloride and nickel. Chloride sampling was not completed at the time of this permit renewal application submittal as received on September 29, 2016. Therefore, with exception of the permit renewal application sampling for ammonia-nitrogen and nickel, the Department has limited data to support its determination that a properly constructed, operated and maintained industrial wastewater treatment facility of this size is expected to produce an effluent that would be protective of all the uses of the receiving stream including threatened and endangered mussels.

A summary of the data is as follows:

Sampling Data for USFWS Parameters of Concern		
Parameter	**Min.**	**Max.**
Ammonia-Nitrogen (NH_3-N) (mg/L)	0.42	0.44
Chloride (mg/L)	Not Sampled	Not Sampled
Nickel (µg/L)	49.9	52.6
NOTES: 1. *The samples are all composite samples.*		

Based on this sampling data, the existing discharge from the generating station is not believed to be having any adverse impacts to threatened or endangered mussel species in the Allegheny River. The ammonia-nitrogen concentration is far below the USFWS criteria. Although the nickel concentration in the effluent exceeds the USFWS criteria (52.6 µg/L compared to 7.3 µg/L), nickel in the Allegheny River at the point of discharge is not expected to be measurable at levels that would exceed the USFWS criteria considering the instantaneous assimilative capacity of the Allegheny River is expected (0.029 MGD = 0.045 cfs wastestream compared to the 1017.88 cfs $Q_{7\text{-}10}$ stream flow => 1:22620 ratio of waste flow to stream flow).

Considering the lack of data for Chloride and the exceedance of the nickel criteria, the Department will establish quarterly effluent monitoring for Chloride and Nickel to develop a dataset to further evaluating potential impacts in the upcoming permit term. Chloride and Nickel monitoring would not typically be required for a permit of this nature.

Proposed Effluent Limitations and Monitoring Requirements

The limitations and monitoring requirements specified below are proposed for the draft permit, and reflect the most stringent limitations amongst technology, water quality and BPJ. Instantaneous Maximum (IMAX) limits are determined using multipliers of 2 (conventional pollutants) or 2.5 (toxic pollutants). Sample frequencies and types are derived from the "NPDES Permit Writer's Manual" (362-0400-001), SOPs and/or BPJ.

Outfall 002, Effective Period: Permit Effective Date through Permit Expiration Date.

Parameter	Effluent Limitations						Monitoring Requirements	
	Mass Units (lbs/day) (1)		Concentrations (mg/L)				Minimum (2) Measurement Frequency	Required Sample Type
	Average Monthly	Average Weekly	Minimum	Average Monthly	Daily Maximum	Instant. Maximum		
Flow (MGD)	Report	XXX	XXX	XXX	XXX	XXX	Continuous	Measured
pH (S.U.)	XXX	XXX	6.0 Daily Min	XXX	9.0 Daily Max	XXX	Continuous	Recorded
TSS	XXX	XXX	XXX	30	70	75	1/week	24-Hr Composite
Total Iron	XXX	XXX	XXX	3.5	7.0	8.8	1/week	24-Hr Composite
Oil and Grease	XXX	XXX	XXX	15	20	30	1/month	Grab
Chloride	XXX	XXX	XXX	Report Avg Qrtly	XXX	XXX	1/quarter	24-Hr Composite
Total Nickel (µg/l)	XXX	XXX	XXX	Report Avg Qrtly	XXX	XXX	1/quarter	24-Hr Composite

Compliance Sampling Location: at Outfall 002

Other Comments: Changes include Oil and Grease limits and monitoring requirements, Chloride monitoring requirements, and nickel monitoring requirements.

Figure 1: eMAP – Stream Designation

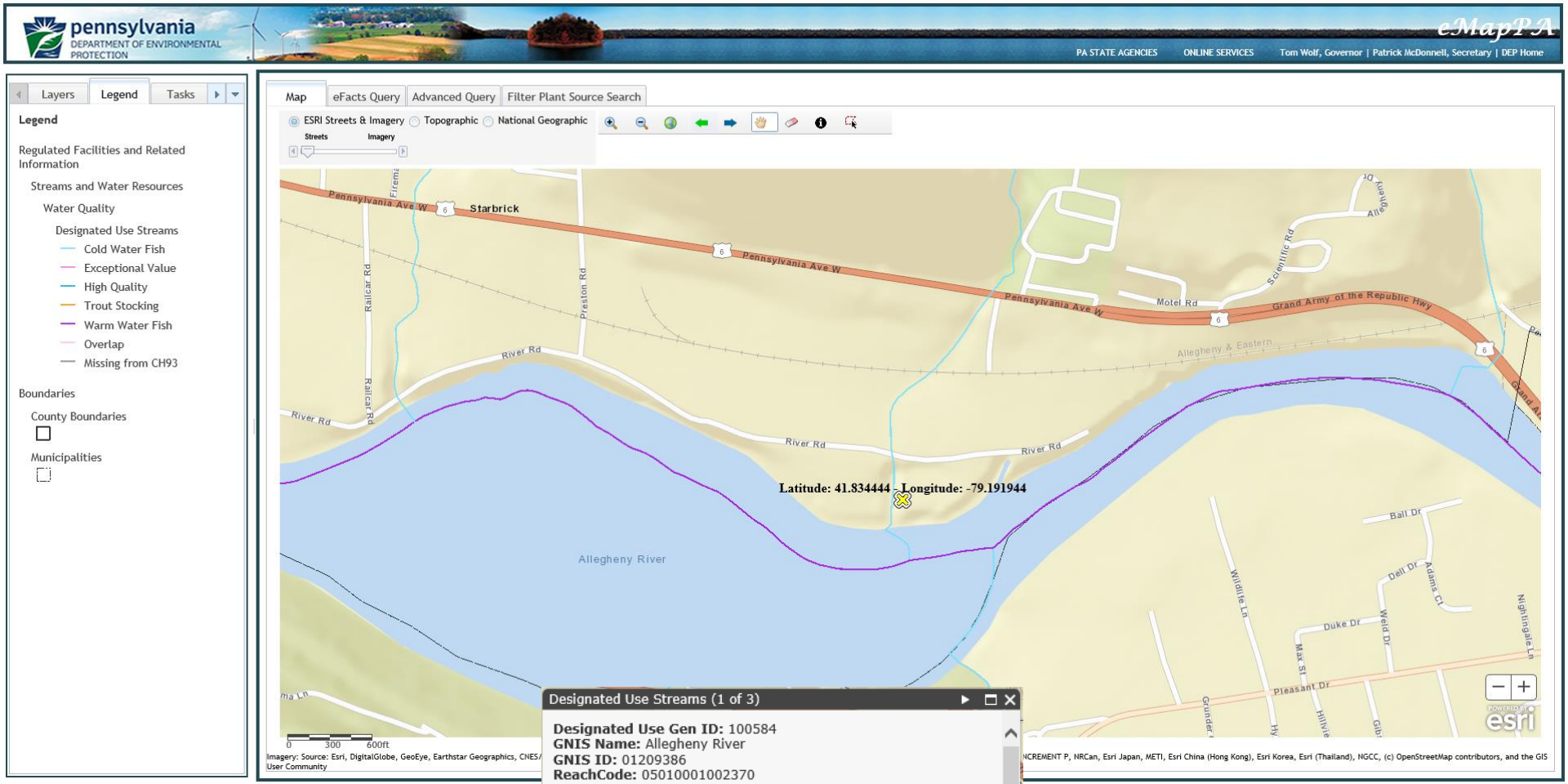

Figure 2: Google Earth Aerial Imagery

ATTACHMENTS

ATTACHMENT A: Toxics Screening Analysis Spreadsheets

ATTACHMENT B: PENTOXSD Modeling Results

ATTACHMENT C: USGS StreamStats Reports

ATTACHMENT A

Toxics Screening Analysis Spreadsheets

TOXICS SCREENING ANALYSIS
WATER QUALITY POLLUTANTS OF CONCERN
VERSION 2.6

Facility: Warren Generating Station NPDES Permit No.: PA0005053 Outfall: 002
Analysis Hardness (mg/L): 31 Discharge Flow (MGD): 0.029 Analysis pH (SU): 7.4
Stream Flow, Q_{7-10} (cfs): 1017

	Parameter		Maximum Concentration in Application or DMRs (µg/L)	Most Stringent Criterion (µg/L)	Candidate for PENTOXSD Modeling?	Most Stringent WQBEL (µg/L)	Screening Recommendation
Group 1	Total Dissolved Solids		2550000	500000	Yes	1.53E+10	No Limits/Monitoring
	Chloride			250000			
	Bromide			N/A			
	Sulfate			250000			
	Fluoride			2000			
Group 2	Total Aluminum		61.6	750	No		
	Total Antimony	<	0.5	5.6	No (Value < QL)		
	Total Arsenic	<	0.5	10	No (Value < QL)		
	Total Barium		10.4	2400	No		
	Total Beryllium		0.7	N/A	No		
	Total Boron		2640	1600	Yes	2610000	No Limits/Monitoring
	Total Cadmium	<	0.1	0.271	No (Value < QL)		
	Total Chromium	<	2	N/A	No		
	Hexavalent Chromium	<	10	10.4	No		
	Total Cobalt		18.2	19	No		
	Total Copper	<	0.5	9.3	No (Value < QL)		
	Total Cyanide	<	10	N/A	No		
	Total Iron		7000	1500	Yes	34030000	No Limits/Monitoring
	Dissolved Iron		7000	300	Yes	1040000	No Limits/Monitoring
	Total Lead	<	0.2	3.2	No (Value < QL)		
	Total Manganese		4880	1000	Yes	3480000	No Limits/Monitoring
	Total Mercury		0.1	0.05	Yes	174.218	No Limits/Monitoring
	Total Molybdenum		180	N/A	No		
	Total Nickel		52.6	52.2	Yes	56457.03	No Limits/Monitoring
	Total Phenols (Phenolics)		10	5	Yes	153360.8	No Limits/Monitoring
	Total Selenium		0.8	5.0	No		
	Total Silver	<	0.1	3.8	No (Value < QL)		
	Total Thallium		0.3	0.24	Yes	836.248	No Limits/Monitoring
	Total Zinc		8.4	119.8	No		
Group 3	Acrolein	<		3			
	Acrylamide	<		0.07			
	Acrylonitrile	<		0.051			
	Benzene	<		1.2			
	Bromoform	<		4.3			
	Carbon Tetrachloride	<		0.23			
	Chlorobenzene	<		130			
	Chlorodibromomethane	<		0.4			
	Chloroethane	<		N/A			
	2-Chloroethyl Vinyl Ether	<		3500			
	Chloroform	<		5.7			
	Dichlorobromomethane	<		0.55			
	1,1-Dichloroethane	<		N/A			
	1,2-Dichloroethane	<		0.38			
	1,1-Dichloroethylene	<		33			
	1,2-Dichloropropane	<		2200			
	1,3-Dichloropropylene	<		0.34			
	Ethylbenzene	<		530			
	Methyl Bromide	<		47			
	Methyl Chloride	<		5500			
	Methylene Chloride	<		4.6			
	1,1,2,2-Tetrachloroethane	<		0.17			
	Tetrachloroethylene	<		0.69			
	Toluene	<		330			
	1,2-trans-Dichloroethylene	<		140			
	1,1,1-Trichloroethane	<		610			
	1,1,2-Trichloroethane	<		0.59			
	Trichloroethylene	<		2.5			
	Vinyl Chloride	<		0.025			
Group 4	2-Chlorophenol	<		81			
	2,4-Dichlorophenol	<		77			
	2,4-Dimethylphenol	<		130			
	4,6-Dinitro-o-Cresol	<		13			
	2,4-Dinitrophenol	<		69			
	2-Nitrophenol	<		1600			
	4-Nitrophenol	<		470			
	p-Chloro-m-Cresol	<		30			
	Pentachlorophenol	<		0.27			
	Phenol	<		10400			
	2,4,6-Trichlorophenol	<		1.4			

Toxics Screening Analysis Spreadsheet (v 2.6), 8/26/2019

ATTACHMENT B

PENTOXSD Modeling Results

PENTOXSD Analysis Results

Recommended Effluent Limitations

SWP Basin	Stream Code:	Stream Name:
18A	42122	ALLEGHENY RIVER

RMI	Name	Permit Number	Disc Flow (mgd)
186.21	Warren Gen Sta	PA0005053	0.0290

Parameter	Effluent Limit (µg/L)	Governing Criterion	Max. Daily Limit (µg/L)	Most Stringent WQBEL (µg/L)	Most Stringent WQBEL Criterion
BORON	2640	INPUT	4118.824	2610000	AFC
DISSOLVED IRON	7000	INPUT	10921.13	1040000	THH
MANGANESE	4880	INPUT	7613.584	3480000	THH
MERCURY	0.1	INPUT	0.156	174.218	THH
NICKEL	52.6	INPUT	82.064	56457.03	AFC
PHENOLICS (PWS)	10	INPUT	15.602	153360.8	THH
THALLIUM	0.3	INPUT	0.468	836.248	THH
TOTAL DISSOLVED SOLIDS (PWS	2550000	INPUT	3970000	.533607E+10	THH
TOTAL IRON	7000	INPUT	10921.13	3.403E+07	CFC

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PENTOXSD

Modeling Input Data

Stream Code	RMI	Elevation (ft)	Drainage Area (sq mi)	Slope	PWS With (mgd)	Apply FC
42122	186.21	1163.00	3140.00	0.00000	0.00	☑

Stream Data

	LFY	Trib Flow	Stream Flow	WD Ratio	Rch Width	Rch Depth	Rch Velocity	Rch Trav Time	Tributary Hard	Tributary pH	Stream Hard	Stream pH	Analysis Hard	Analysis pH
	(cfsm)	(cfs)	(cfs)		(ft)	(ft)	(fps)	(days)	(mg/L)		(mg/L)		(mg/L)	
Q7-10	0.1	1017.88	0	0	0	0	0	0	31	7.4	0	0	0	0
Qh		0	0	0	0	0	0	0	100	7	0	0	0	0

Discharge Data

Name	Permit Number	Existing Disc Flow	Permitted Disc Flow	Design Disc Flow	Reserve Factor	AFC PMF	CFC PMF	THH PMF	CRL PMF	Disc Hard	Disc pH
		(mgd)	(mgd)	(mgd)						(mg/L)	
Warren Gen Sta	PA0005053	0.029	0.029	0.029	0	0	0	0	0	100	7

Parameter Data

Parameter Name	Disc Conc (µg/L)	Trib Conc (µg/L)	Disc Daily CV	Disc Hourly CV	Steam Conc (µg/L)	Stream CV	Fate Coef	FOS	Crit Mod	Max Disc Conc (µg/L)
BORON	2640	0	0.5	0.5	0	0	0	0	1	0
DISSOLVED IRON	7000	0	0.5	0.5	0	0	0	0	1	0
MANGANESE	4880	0	0.5	0.5	0	0	0	0	1	0
MERCURY	0.1	0	0.5	0.5	0	0	0	0	1	0
NICKEL	52.6	0	0.5	0.5	0	0	0	0	1	0
PHENOLICS (PWS)	10	0	0.5	0.5	0	0	0	0	1	0
THALLIUM	0.3	0	0.5	0.5	0	0	0	0	1	0
TOTAL DISSOLVED SOLIDS (PWS)	2550000	0	0.5	0.5	0	0	0	0	1	0
TOTAL IRON	7000	0	0.5	0.5	0	0	0	0	1	0

Stream Code	RMI	Elevation (ft)	Drainage Area (sq mi)	Slope	PWS With (mgd)	Apply FC
42122	184.76	1161.00	3141.00	0.00000	0.00	☑

Stream Data

	LFY	Trib Flow	Stream Flow	WD Ratio	Rch Width	Rch Depth	Rch Velocity	Rch Trav Time	Tributary Hard	Tributary pH	Stream Hard	Stream pH	Analysis Hard	Analysis pH
	(cfsm)	(cfs)	(cfs)		(ft)	(ft)	(fps)	(days)	(mg/L)		(mg/L)		(mg/L)	
Q7-10	0.1	0	1017.96	0	0	0	0	0	100	7	0	0	0	0
Qh		0	0	0	0	0	0	0	100	7	0	0	0	0

Discharge Data

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

Parameter Data

Parameter Name	Disc Conc (µg/L)	Trib Conc (µg/L)	Disc Daily CV	Disc Hourly CV	Steam Conc (µg/L)	Stream CV	Fate Coef	FOS	Crit Mod	Max Disc Conc (µg/L)
BORON	0	0	0.5	0.5	0	0	0	0	1	0
DISSOLVED IRON	0	0	0.5	0.5	0	0	0	0	1	0
MANGANESE	0	0	0.5	0.5	0	0	0	0	1	0
MERCURY	0	0	0.5	0.5	0	0	0	0	1	0
NICKEL	0	0	0.5	0.5	0	0	0	0	1	0
PHENOLICS (PWS)	0	0	0.5	0.5	0	0	0	0	1	0
THALLIUM	0	0	0.5	0.5	0	0	0	0	1	0
TOTAL DISSOLVED SOLIDS (PWS)	0	0	0.5	0.5	0	0	0	0	1	0
TOTAL IRON	0	0	0.5	0.5	0	0	0	0	1	0

Stream Code	RMI	Elevation (ft)	Drainage Area (sq mi)	Slope	PWS With (mgd)	Apply FC
42122	90.67	864.00	3600.00	0.00000	0.50	☑

Stream Data

	LFY	Trib Flow	Stream Flow	WD Ratio	Rch Width	Rch Depth	Rch Velocity	Rch Trav Time	Tributary Hard	Tributary pH	Stream Hard	Stream pH	Analysis Hard	Analysis pH
	(cfsm)	(cfs)	(cfs)		(ft)	(ft)	(fps)	(days)	(mg/L)		(mg/L)		(mg/L)	
Q7-10	0.1	0	1376	0	0	0	0	0	100	7	0	0	0	0
Qh		0	0	0	0	0	0	0	100	7	0	0	0	0

Discharge Data

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

Parameter Data

Parameter Name	Disc Conc (µg/L)	Trib Conc (µg/L)	Disc Daily CV	Disc Hourly CV	Steam Conc (µg/L)	Stream CV	Fate Coef	FOS	Crit Mod	Max Disc Conc (µg/L)
BORON	0	0	0.5	0.5	0	0	0	0	1	0
DISSOLVED IRON	0	0	0.5	0.5	0	0	0	0	1	0
MANGANESE	0	0	0.5	0.5	0	0	0	0	1	0
MERCURY	0	0	0.5	0.5	0	0	0	0	1	0
NICKEL	0	0	0.5	0.5	0	0	0	0	1	0
PHENOLICS (PWS)	0	0	0.5	0.5	0	0	0	0	1	0
THALLIUM	0	0	0.5	0.5	0	0	0	0	1	0
TOTAL DISSOLVED SOLIDS (PWS)	0	0	0.5	0.5	0	0	0	0	1	0
TOTAL IRON	0	0	0.5	0.5	0	0	0	0	1	0

PENTOXSD Analysis Results

Hydrodynamics

SWP Basin	Stream Code:	Stream Name:
18A	42122	ALLEGHENY RIVER

RMI	Stream Flow (cfs)	PWS With (cfs)	Net Stream Flow (cfs)	Disc Analysis Flow (cfs)	Reach Slope	Depth (ft)	Width (ft)	WD Ratio	Velocity (fps)	Reach Trav Time (days)	CMT (min)
Q7-10 Hydrodynamics											
186.210	1017.9	0	1017.9	0.04486	0.0003	1.0836	637.43	588.26	1.4738	0.0601	1000+
184.760	1018	0	1018	NA	0.0006	1.0725	615.40	573.82	1.5424	3.728	NA
90.670	1376	0.7735	1375.2	NA	0	0	0	0	0	0	NA
Qh Hydrodynamics											
186.210	3160.2	0	3160.2	0.04486	0.0003	1.7838	637.43	357.35	2.7794	0.0319	1000+
184.760	3160.4	0	3160.4	NA	0.0006	1.7655	615.40	348.57	2.9088	1.9767	NA
90.670	4112.8	0.7735	4112.1	NA	0	0	0	0	0	0	NA

PENTOXSD Analysis Results

Wasteload Allocations

RMI	Name	Permit Number
186.21	Warren Gen Sta	PA0005053

AFC

Q7-10: **CCT (min)** 15 **PMF** 0.022 **Analysis pH** 7.398 **Analysis Hardness** 31.136

Parameter	Stream Conc (µg/L)	Stream CV	Trib Conc (µg/L)	Fate Coef	WQC (µg/L)	WQ Obj (µg/L)	WLA (µg/L)
PHENOLICS (PWS)	0	0	0	0	NA	NA	NA
TOTAL IRON	0	0	0	0	NA	NA	NA
DISSOLVED IRON	0	0	0	0	NA	NA	NA
MANGANESE	0	0	0	0	NA	NA	NA
MERCURY	0	0	0	0	1.4	1.647	829.756
	Dissolved WQC. Chemical translator of 0.85 applied.						
NICKEL	0	0	0	0	174.492	174.842	88082.04
	Dissolved WQC. Chemical translator of 0.998 applied.						
THALLIUM	0	0	0	0	65	65	32745.74
BORON	0	0	0	0	8100	8100	4080000
TOTAL DISSOLVED SOLIDS (PWS)	0	0	0	0	NA	NA	NA

CFC

Q7-10: **CCT (min)** 720 **PMF** 0.153 **Analysis pH** 7.399 **Analysis Hardness** 31.019

Parameter	Stream Conc. (µg/L)	Stream CV	Trib Conc. (µg/L)	Fate Coef	WQC (µg/L)	WQ Obj (µg/L)	WLA (µg/L)
PHENOLICS (PWS)	0	0	0	0	NA	NA	NA
TOTAL IRON	0	0	0	0	1500	1500	3.403E+07
	WQC = 30 day average. PMF = 1.						
DISSOLVED IRON	0	0	0	0	NA	NA	NA
MANGANESE	0	0	0	0	NA	NA	NA
MERCURY	0	0	0	0	0.77	0.906	3156.426
	Dissolved WQC. Chemical translator of 0.85 applied.						
NICKEL	0	0	0	0	19.319	19.377	67517.02
	Dissolved WQC. Chemical translator of 0.997 applied.						
THALLIUM	0	0	0	0	13	13	45296.77
BORON	0	0	0	0	1600	1600	5570000

PENTOXSD Analysis Results

Wasteload Allocations

RMI	Name	Permit Number						
186.21	**Warren Gen Sta**	**PA0005053**						
TOTAL DISSOLVED SOLIDS (PWS)			0	0	0	0	NA	NA	NA

THH

Q7-10: **CCT (min)** 720 **PMF** 1 **Analysis pH** NA **Analysis Hardness** NA

Parameter	Stream Conc (µg/L)	Stream CV	Trib Conc (µg/L)	Fate Coef	WQC (µg/L)	WQ Obj (µg/L)	WLA (µg/L)
PHENOLICS (PWS)	0	0	0	0	5	5	153360.8
WQC applied at RMI 90.67 with a design stream flow of 1376.							
TOTAL IRON	0	0	0	0	NA	NA	NA
DISSOLVED IRON	0	0	0	0	300	300	1040000
MANGANESE	0	0	0	0	1000	1000	3480000
MERCURY	0	0	0	0	0.05	0.05	174.218
NICKEL	0	0	0	0	610	610	2120000
THALLIUM	0	0	0	0	0.24	0.24	836.248
BORON	0	0	0	0	3100	3100	1.08E+07
TOTAL DISSOLVED SOLIDS (PWS)	0	0	0	0	500000	500000	1.533607E+10
WQC applied at RMI 90.67 with a design stream flow of 1376.							

CRL

Qh: **CCT (min)** 720 **PMF** 0.223

Parameter	Stream Conc (µg/L)	Stream CV	Trib Conc (µg/L)	Fate Coef	WQC (µg/L)	WQ Obj (µg/L)	WLA (µg/L)
PHENOLICS (PWS)	0	0	0	0	NA	NA	NA
TOTAL IRON	0	0	0	0	NA	NA	NA
DISSOLVED IRON	0	0	0	0	NA	NA	NA
MANGANESE	0	0	0	0	NA	NA	NA
MERCURY	0	0	0	0	NA	NA	NA
NICKEL	0	0	0	0	NA	NA	NA

PENTOXSD Analysis Results

Wasteload Allocations

RMI	Name	Permit Number						
186.21	**Warren Gen Sta**	**PA0005053**						
	THALLIUM	0	0	0	0	NA	NA	NA
	BORON	0	0	0	0	NA	NA	NA
	TOTAL DISSOLVED SOLIDS (PWS)	0	0	0	0	NA	NA	NA

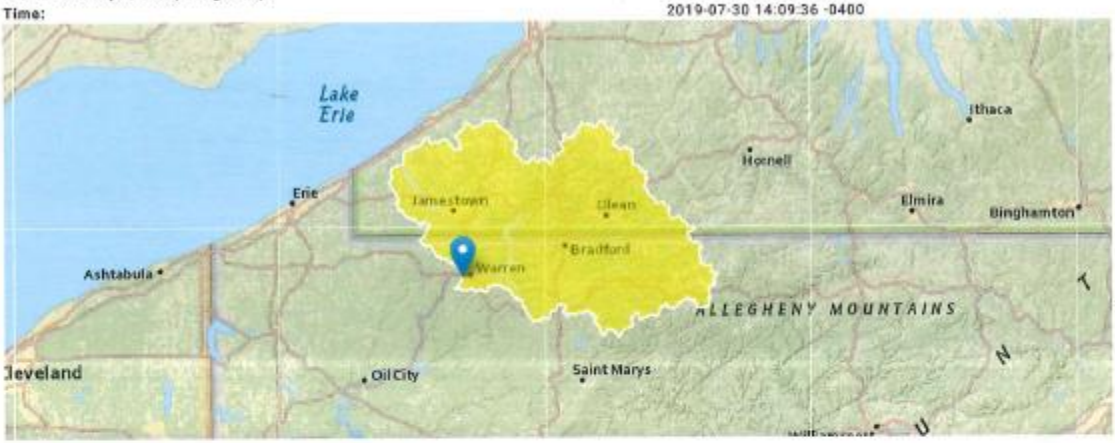
ATTACHMENT C

USGS StreamStats Reports

StreamStats

Warren Generating Station - Outfall 002 (RMI 186.21)

Region ID: PA
Workspace ID: PA20190730180911085000
Clicked Point (Latitude, Longitude): 41.83333, -79.19132
Time: 2019-07-30 14:09:36 -0400



Basin Characteristics

Parameter Code	Parameter Description	Value	Unit
DRNAREA	Area that drains to a point on a stream	3140	square miles
ELEV	Mean Basin Elevation	1784.2	feet
PRECIP	Mean Annual Precipitation	43	inches

Low-Flow Statistics Parameters[90 Percent (3110 square miles) Low Flow Region 3]

Parameter Code	Parameter Name	Value	Units	Min Limit	Max Limit
DRNAREA	Drainage Area	3140	square miles	2.33	1720
ELEV	Mean Basin Elevation	1784.2	feet	898	2700
PRECIP	Mean Annual Precipitation	43	inches	38.7	47.9

Low-Flow Statistics Disclaimers[90 Percent (3110 square miles) Low Flow Region 3]

One or more of the parameters is outside the suggested range. Estimates were extrapolated with unknown errors.Weighted flows were not calculated. Users should be careful to evaluate the applicability of the provided estimates. Percentage of area falls outside where region is undefined. Whole estimates have been provided using available regional equations.

Low-Flow Statistics Flow Report[90 Percent (3110 square miles) Low Flow Region 3]

Statistic	Value	Unit
7 Day 2 Year Low Flow	413	ft^3/s
30 Day 2 Year Low Flow	527	ft^3/s
7 Day 10 Year Low Flow	250	ft^3/s
30 Day 10 Year Low Flow	303	ft^3/s
90 Day 10 Year Low Flow	416	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/)

1017.88 cfs

https://streamstats.usgs.gov/ss/ 7/30/2019

Allegheny River just below Morse Run (RMI 184.76)

Region ID:	PA
Workspace ID:	PA20190730184108134000
Clicked Point (Latitude, Longitude):	41.83811, -79.21667
Time:	2019-07-30 14:41:35 -0400

Basin Characteristics

Parameter Code	Parameter Description	Value	Unit
DRNAREA	Area that drains to a point on a stream	3140	square miles
ELEV	Mean Basin Elevation	1783.7	feet
PRECIP	Mean Annual Precipitation	43	inches

Low-Flow Statistics Parameters

Parameter Code	Parameter Name	Value	Units	Min Limit	Max Limit
DRNAREA	Drainage Area	3140	square miles	2.33	1720
ELEV	Mean Basin Elevation	1783.7	feet	898	2700
PRECIP	Mean Annual Precipitation	43	inches	38.7	47.9

Low-Flow Statistics Disclaimers

One or more of the parameters is outside the suggested range. Estimates were extrapolated with unknown errorsWeighted flows were not calculated. Users should be careful to evaluate the applicability of the provided estimates. Percentage of area falls outside where region is undefined. Whole estimates have been provided using available regional equations.

Low-Flow Statistics Flow Report

Statistic	Value	Unit
7 Day 2 Year Low Flow	413	ft^3/s
30 Day 2 Year Low Flow	527	ft^3/s
7 Day 10 Year Low Flow	250	ft^3/s
30 Day 10 Year Low Flow	303	ft^3/s
90 Day 10 Year Low Flow	416	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/)

1017.96 cfs

Nearest PWS - Aqua Pa, Emlenton (RMI 90.67)

Region ID: PA
Workspace ID: PA20190801130051240000
Clicked Point (Latitude, Longitude): 41.17625, -79.71358
Time: 2019-08-01 09:01:15 -0400

Basin Characteristics

Parameter Code	Parameter Description	Value	Unit
DRNAREA	Area that drains to a point on a stream	6390	square miles

Application Version: 4.3.8