pennsylvania
DEPARTMENT OF ENVIRONMENTAL PROTECTION

Northcentral Regional Office
CLEAN WATER PROGRAM

Application Type	**Renewal**	Application No.	**PA0007455**
Facility Type	**Industrial**	APS ID	**1062870**
Major / Minor	**Minor**	Authorization ID	**1395450**

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

Applicant and Facility Information

Applicant Name	**Lycoming Engines**	Facility Name	**Lycoming Engines**
Applicant Address	652 Oliver Street Williamsport, PA 17701-4410	Facility Address	652 Oliver Street Williamsport, PA 17701-4410
Applicant Contact	Patrick Hann	Facility Contact	Patrick Hann
Applicant Phone	(570) 327-6181	Facility Phone	(570) 327-6181
Client ID	25767	Site ID	2887
SIC Code	3724	Municipality	City of Williamsport
SIC Description	Manufacturing - Aircraft Engines And Engine Parts	County	Lycoming
Date Application Received	May 5, 2022	EPA Waived?	No
Date Application Accepted	May 9, 2022	If No, Reason	TMDL

Purpose of Application: Renewal of an existing NPDES permit for the discharge of industrial waste and stormwater.

1.0 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.

Approve	Deny	Signatures	Date
X		*Derek S. Garner* Derek S. Garner / Project Manager	April 13, 2023
X		*Nicholas W. Hartranft* Nicholas W. Hartranft, P.E. / Environmental Engineer Manager	April 17, 2023

2.0 Facility Summary

Lycoming Engines specializes in the engineering, manufacturing, assembly, test, and support of piston aircraft engines. Lycoming Engines' factory produces horizontally opposed, air-cooled, four-, six-, and eight-cylinder engines. Process wastewater generated during electroplating and air scrubbing processes, as well as boiler steam line condensate, are treated at an onsite industrial wastewater treatment plant ("IWTP") prior to discharge via Outfall 001. The treatment process prior to discharge at Outfall 001 is as follows:

- Cyanide destruction
  - pH adjustment
  - Chlorination
  - Dechlorination
- Chromium reduction
  - pH adjustment
- Equalization
- pH adjustment
- Chemical precipitation
- Final pH adjustment
- Sand filtration

In addition to the above processes, Lycoming Engines reclaims Varsol, a petroleum solvent. Per EPA's Mid-Atlantic Superfund website, poor housekeeping practices led to contamination of the site. Because of the Varsol leak, trichloroethylene ("TCE") has been identified as a contaminant of concern. Additionally, shallow groundwater beneath the facility's property was contaminated with chromium. Several groundwater recovery wells are located onsite that are currently treating polluted groundwater via air stripping prior to discharge through Outfalls 003, 004, and 005. The chromium has been treated by injecting molasses into the groundwater to anaerobically reduce the hexavalent chromium to the less toxic chromium(III).

All sanitary waste and boiler blowdown is sent to Williamsport Sanitary Authority's West Plant (NPDES Permit No. PA00027049).

Outfall 006 is designated as the site's representative stormwater outfall for sampling.

See Attachment A for the Facility and Discharge Location Map.

3.0 Discharge, Receiving Waters and Water Supply Information

3.1 Outfall 001

Outfall 001 discharges IWTP effluent eight hours a day, six days a week. The discharge leaves the property via the Olive Street storm sewer. For the purpose of developing effluent limits, Outfall 001's location is considered to be where the storm sewer discharges to Lycoming Creek.

Table 3-1. Outfall 001 Information

Outfall No.	001	Design Flow (MGD)	0.0126
Latitude	41º 14' 51.45"	Longitude	-77º 2' 8.33"
Quad Name	Williamsport	Quad Code	0929
Wastewater Description:	IW Process Effluent with ELG		

Receiving Waters	Lycoming Creek	Stream Code	20501
NHD Com ID	66915833	RMI	0.88
Drainage Area	271	Yield (cfs/mi^2)	0.046
Q_{7-10} Flow (cfs)	12.6	Q_{7-10} Basis	Streamgage No. 01550000
Elevation (ft)	505	Slope (ft/ft)	n/a
Watershed No.	10-A	Chapter 93 Class.	WWF
Existing Use	Exceptional Value	Existing Use Qualifier	RBP - Antidegradation
Exceptions to Use	n/a	Exceptions to Criteria	n/a
Assessment Status	Attaining Use(s)		
Cause(s) of Impairment	n/a		
Source(s) of Impairment	n/a		
TMDL Status	Finalized	Name	West Branch Susquehanna River

Nearest Downstream Public Water Supply Intake	Pennsylvania-American Water Company		
PWS Waters	West Branch Susquehanna River	Flow at Intake (cfs)	679.73
PWS RMI	10.65	Distance from Outfall (mi)	31.33

3.4 Outfall 003

Treated groundwater from the Elm Park Recovery System is continuously discharged via Outfall 003 directly to Lycoming Creek.

The Elm Park Recovery System, consisting of one well head and one air stripper, was installed to control contaminants which had migrated offsite.

Table 3-2. Outfall 003 Information

Outfall No.	003	Design Flow (MGD)	0.0388
Latitude	41º 14' 21.82"	Longitude	-77º 2' 31.16"
Quad Name	Williamsport	Quad Code	0929
Wastewater Description:	Groundwater Cleanup Discharge		

Receiving Waters	Lycoming Creek	Stream Code	20501
NHD Com ID	66915833	RMI	0.93
Drainage Area	271	Yield (cfs/mi^2)	0.046
Q_{7-10} Flow (cfs)	12.6	Q_{7-10} Basis	Streamgage No. 01550000
Elevation (ft)	505	Slope (ft/ft)	n/a
Watershed No.	10-A	Chapter 93 Class.	WWF
Existing Use	Exceptional Value	Existing Use Qualifier	RBP - Antidegradation
Exceptions to Use	n/a	Exceptions to Criteria	n/a
Assessment Status	Attaining Use(s)		
Cause(s) of Impairment	n/a		
Source(s) of Impairment	n/a		
TMDL Status	Finalized	Name	West Branch Susquehanna River

Nearest Downstream Public Water Supply Intake	Pennsylvania-American Water Company		
PWS Waters	West Branch Susquehanna River	Flow at Intake (cfs)	679.73
PWS RMI	10.65	Distance from Outfall (mi)	31.38

3.5 Outfall 004

Treated groundwater from the Third Street Recovery System is continuously discharged via Outfall 004 directly to Lycoming Creek.

The Third Street Recovery System, consisting of one well and one air stripper, was installed to act as a barrier to the Williamsport Municipal Water Authority well field located approximately 3,000 ft. south west of the facility.

Table 3-3. Outfall 004 Information

Outfall No.	004	Design Flow (MGD)	0.9449
Latitude	41º 14' 6.23"	Longitude	-77º 2' 31.13"
Quad Name	Williamsport	Quad Code	0929
Wastewater Description:	Groundwater Cleanup Discharge		

Receiving Waters	Lycoming Creek	Stream Code	20501
NHD Com ID	66915833	RMI	0.61
Drainage Area	271	Yield (cfs/mi^2)	0.046
Q_{7-10} Flow (cfs)	12.6	Q_{7-10} Basis	Streamgage No. 01550000
Elevation (ft)	509	Slope (ft/ft)	n/a
Watershed No.	10-A	Chapter 93 Class.	WWF
Existing Use	Exceptional Value	Existing Use Qualifier	RBP - Antidegradation
Exceptions to Use	n/a	Exceptions to Criteria	n/a
Assessment Status	Attaining Use(s)		
Cause(s) of Impairment	n/a		
Source(s) of Impairment	n/a		
TMDL Status	Finalized	Name	West Branch Susquehanna River

Nearest Downstream Public Water Supply Intake	Pennsylvania-American Water Company		
PWS Waters	West Branch Susquehanna River	Flow at Intake (cfs)	679.73
PWS RMI	10.65	Distance from Outfall (mi)	31.06

3.6 Outfall 005

Treated groundwater from the East Parking Lot, Central Area, and Memorial Avenue Recovery Wells is discharged via Outfall 005 to the Memorial Street storm sewer, which conveys flows to the Oliver Street storm sewer, which ultimately discharges to Lycoming Creek.

The East Parking Lot System was installed to address TCE. The system includes four extraction wells which recover groundwater from the contaminated areas and conveys it to the Memorial Avenue System for treatment.

The Central Area System was installed to address an area identified with a light non-aqueous phase liquid, which is believed to originate from former underground storage tanks that stored a type of mineral spirits. The system consists of six extraction wells (only one remains active), which are pumped to an oil/water separator in the Central Area Treatment Building. From the Central Area Treatment Building, the wastewater is conveyed to the Memorial Avenue System for treatment.

The Memorial Avenue System consists of 15 extraction wells located around the facility to control migration of the contaminated plume.

Table 3-4. Outfall 005 Information

Outfall No.	005	Design Flow (MGD)	0.0477
Latitude	41º 14' 51.45"	Longitude	-77º 2' 8.33"
Quad Name	Williamsport	Quad Code	0929
Wastewater Description:	Groundwater Cleanup Discharge		

Receiving Waters	Lycoming Creek	Stream Code	20501
NHD Com ID	66915833	RMI	0.88
Drainage Area	271	Yield (cfs/mi^2)	0.046
Q_{7-10} Flow (cfs)	12.6	Q_{7-10} Basis	Streamgage No. 01550000
Elevation (ft)	505	Slope (ft/ft)	n/a
Watershed No.	10-A	Chapter 93 Class.	WWF
Existing Use	Exceptional Value	Existing Use Qualifier	RBP - Antidegradation
Exceptions to Use	n/a	Exceptions to Criteria	n/a
Assessment Status	Attaining Use(s)		
Cause(s) of Impairment	n/a		
Source(s) of Impairment	n/a		
TMDL Status	Finalized	Name	West Branch Susquehanna River

Nearest Downstream Public Water Supply Intake	Pennsylvania-American Water Company		
PWS Waters	West Branch Susquehanna River	Flow at Intake (cfs)	679.73
PWS RMI	10.65	Distance from Outfall (mi)	31.33

3.5 Outfall 006

Outfall 006 drains approximately 464,486 sq. ft. of the facility. The area consists of roof drains over material storage areas, machining areas, engines assembly areas (including production painting), engine test areas, the chemistry laboratory, and shipping and receiving docks. Additionally, Outfall 006 drains stormwater from surface run-off from all the paved areas to the east of the liquid propane tank which consists of; the general receiving dock, the engines shipping docks, the unloading area for aviation gasoline, the unloading area for mineral spirits, the loading area for waste oil, the loading area from the waste oily-water, and the storage and loading areas for the chipsters and scrap hoppers. Stormwater from the Park Avenue aviation gasoline delivery area also drains to Outfall 006. The discharge is to the Cemetery Run storm sewer, which ultimately discharges into an Unnamed Tributary to Lycoming Creek known locally as "Cemetery Run."

Outfall 006 has been selected as a representative outfall since it has the largest drainage area out all six stormwater outfalls and includes a variety of industrial activities. By establishing one outfall as representative of the quality of stormwater exiting the site it will cut down on redundant sampling and permit requirements.

Table 3-5. Outfall 006 Information

Outfall No.	006	Design Flow (MGD)	n/a
Latitude	41º 14' 33.16"	Longitude	-77º 2' 12.91"
Quad Name	Williamsport	Quad Code	0929
Wastewater Description:	Stormwater		

Receiving Waters	UNT to Lycoming Creek	Stream Code	20502
NHD Com ID	66915365	RMI	0.7
Drainage Area	n/a	Yield (cfs/mi^2)	n/a
Q_{7-10} Flow (cfs)	n/a	Q_{7-10} Basis	n/a
Elevation (ft)	536	Slope (ft/ft)	n/a
Watershed No.	10-A	Chapter 93 Class.	WWF
Existing Use	n/a	Existing Use Qualifier	n/a
Exceptions to Use	n/a	Exceptions to Criteria	n/a
Assessment Status	Attaining Use(s)		
Cause(s) of Impairment	n/a		
Source(s) of Impairment	n/a		
TMDL Status	n/a	Name	n/a

Nearest Downstream Public Water Supply Intake	Pennsylvania-American Water Company		
PWS Waters	West Branch Susquehanna River	Flow at Intake (cfs)	679.73
PWS RMI	10.65	Distance from Outfall (mi)	32.03

3.6 Lycoming Creek and West Branch Susquehanna River

As summarized in Sections 3.1 through 3.5, all outfalls at Lycoming Engines, except for stormwater outfall 006, ultimately discharge to Lycoming Creek. As of June 2011, Lycoming Creek's mainstem, from Sugar Works Run to the mouth, has an existing use of Exceptional Value ("EV"). The discharges predate the EV designation, there are no proposed changes to the effluent characteristics, no increased or new discharges are proposed, and none of the discharges are chlorinated. Accordingly, the existing use should not impact this renewal.

The Q7-10 of Lycoming Creek at Lycoming Engines was calculated using thirty years of the most recent flow data, from 1990 to 2020, at USGS Stream Gage No. 01550000 (Lycoming Creek near Trout Run, PA). A Q7-10 was developed using DFLOW in USGS SW Toolbox to achieve a flow of 8.86 cfs. Based on the stream gage's drainage area of 173 mi^2 a low-flow yield of 0.051 cfs/mi^2 was developed. Since Outfalls 001 through 005 are all located in relatively close proximity to one another without any major tributaries in between, they all have the same drainage area of approximately 271 mi^2. Applying the low-flow yield to the outfalls' drainage areas results in a calculated Q7-10 of 13.90 cfs. A Q7-10 of 13.93 cfs at RMI 0.0 (the mouth) was calculated for modeling purposes. See Attachment B for Q7-10 calculations and supporting documentation.

Lycoming Creek is a tributary to the West Branch Susquehanna River. A TMDL for the West Branch Susquehanna River Watershed was approved by the U.S. Environmental Protection Agency ("EPA") in July 2009. The TMDL was developed to address low pH, and in some cases, high levels of metals (Al, Fe, Mn) in the watershed caused by abandoned mine drainage. In the TMDL, Lycoming Engines (Textron Lycoming in the TMDL) and Wirerope Works, Inc. are assigned an aggregate wasteload allocation ("WLA") of 0.15 lbs/day Iron and 0.03 lbs/day Manganese. It is assumed the TMDL only addresses Lycoming Engines' IWTP discharge at Outfall 001 and not the groundwater recovery discharges at Outfalls 003, 004, and 005. How the West Branch Susquehanna River Watershed TMDL impacts the effluent limits is discussed below in Section 5.2.1.

3.7 Downstream Public Water Supply Intake

The nearest downstream water supply intake is located in Milton, PA, approximately 31 river miles downstream. The discharges are not expected to impact the water.

4.0 Compliance History

4.1 Inspection Reports

The facility was most recently inspected by DEP on August 17, 2022. No violations were identified during the inspection.

4.2 Violations

The following permit violations occurred over the existing permit term:

Table 4-1. Violation Summary

Noncompliance Report	Noncompliance Description	Parameter	Sample Value	Violations Condition	Permit Value	Units	SBC
3/1/2018	Late DMR Submission	n/a	n/a	n/a	n/a	n/a	n/a
8/27/2018 (1)	Violation of permit condition	pH	9.12	>	9	S.U.	IMAX
10/23/2020 (2)	Violation of permit condition	Cadmium, Total	0.0164	>	0.01	lbs/day	Average Monthly
3/28/2022	Violation of permit condition	Cadmium, Total	0.02864	>	0.01	lbs/day	Average Monthly

(1) Exceedance was on July 12, 2018 with a value of 9.12. The prior week, Lycoming had an annual shut down week for maintenance. During start-up of wastewater equipment, the pump that sends acid to adjust pH did not have an adequate prime and could not properly adjust pH. The problem was realized, and the pump was repaired in a timely manner.

(2) Operation notes from sampling date were reviewed and operator was interviewed with no apparent abnormal operating conditions. After review of cadmium concentrations through 2019 and 2020 YTD, concentrations have risen slightly overall, which may indicate cleaning of tanks is warranted at this time. Subsequent monthly sampling for October shows concentration/loading is compliant with limits. Corrective actions include cleaning critical tanks in the treatment system, discuss internally the need for current third-party review of the WWT system, and reviewing sample analysis results and performing loading calculations upon receipt to ensure compliance before month end.

There are no open violations associated with the permittee.

5.0 Development of Effluent Limitations

Effluent limits are the most stringent of technology-based effluent limitations ("TBELs"), water quality-based effluent limitations ("WQBELs"), or best professional judgment ("BPJ").

5.1 Technology-based Effluent Limitations

The first step in developing effluent limitations is to recognize and develop applicable TBELs based on the industrial activity that takes place at the facility for each outfall. TEBELs are subject to the development of more stringent WQBELs or BPJ.

5.1.1. Outfall 001

ELG Parameters

Outfall 001 discharges treated industrial waste from the IWTP, described in Section 2.0 above. Lycoming Engines' electroplating process wastewater is covered under 40 CFR Part 433, Subpart A – Metal Finishing Subcategory. The effluent limit guidelines ("ELGs") in Subpart A establish best practicable control technology currently available (BPT) and best available technology economically achievable (BAT) effluent limitations as follows:

Table 5-1. ELG Parameters

Pollutant	Maximum Daily (mg/l)	Average Monthly (mg/l)	BPT	BAT
Cadmium	0.69	0.26	X	X
Chromium	2.77	1.71	X	X
Copper	3.38	2.07	X	X
Lead	0.69	0.43	X	X
Nickel	3.98	2.38	X	X
Silver	0.43	0.24	X	X
Zinc	2.31	1.48	X	X
Cyanide (1)	1.20	0.65	X	X
TTO (2)	2.13	--	X	X
Oil & Grease	52	26	X	
Total suspended solids	60	31	X	
pH	Within 6.0 to 9.0		X	

(1) DEP proposes to continue to include the following condition in Part C of the permit to satisfy § 433.12(c): *"Sampling for cyanide must be conducted after cyanide treatment and before dilution with other streams. (40 CFR 433.12(c))"*

(2) DEP proposes to continue to include the following condition in the permit to satisfy § 433.12(a):

In lieu of sampling for TTO, the permittee may make the following certification statement: "Based on my inquiry of the person or persons directly responsible for managing compliance with the permit limitation for total toxic organics (TTO), I certify that, to the best of my knowledge and belief, no dumping of concentrated toxic organics into the wastewaters has occurred since filing of the last discharge monitoring report. I further certify that this facility is implementing the toxic organic management plan submitted to the Department." This statement shall be included as a "comment" on the discharge monitoring report. If sampling is necessary to demonstrate compliance with the TTO limit, the permittee may choose to only sample for those pollutants which would reasonably be expected to be present. (40 CFR 433.12(a))

In requesting the certification alternative, the permittee shall submit a solvent management plan that specifies to the satisfaction of the Department the toxic organic compounds used; the method of disposal used instead of dumping, such as reclamation, contract hauling, or incineration; and procedures for ensuring that toxic organics do not routinely spill or leak into the wastewater. Upon approval by the Department, the plan shall be incorporated as a provision of this permit. (40 CFR 433.12(b))

Chapter 95 Industrial Waste Treatment Standards

In addition to the ELG requirements above, 25 PA Code Chapter 95 establishes industrial waste treatment standards for pH, oil and grease, and dissolved iron as follows:

Table 5-2. Chapter 95 Treatment Standards

Parameter	Limit (mg/l)	SBC	State Regulation
pH	6.0	Minimum	95.2(1)
	9.0	IMAX	95.2(1)
Oil and Grease	15	Average Monthly	95.2(2)
	30	IMAX	95.2(2)
Dissolved Iron [(1)]	7.0	Average Monthly	95.2(4)

[(1)] Sampling performed for the renewal application indicates a maximum dissolved iron concentration of 0.154 mg/l at Outfall 001. Since there is no reasonable potential to exceed the 7.0 mg/l TBEL, a dissolved iron limitation will not be established in the permit.

5.1.2 Outfalls 003, 004, and 005

Outfalls 003, 004, and 005 are subject to industrial treatment standards at Chapter 95. However, since these outfalls discharge treated groundwater and no additives are introduced into the remediation systems, elevated concentrations of oil and grease and dissolved iron are not anticipated. Accordingly, no limits or monitoring requirements will be established for these pollutants at Outfalls 003, 004, or 005. Establishing the pH range of 6.0 to 9.0 is still appropriate.

5.1.3 Outfall 006

There are no applicable TBELs for stormwater discharges associated with SIC Code 3724.

5.2 Water Quality-based Effluent Limitations

After developing the TBELs, the next step is to determine if there are more stringent WQBELs that must be applied. An analysis using DEP's WQM 7.0 v1.1 and the Toxics Management Spreadsheet v1.3 ("TMS") was performed for the discharges. WQM 7.0 is a multiple source discharge model that is used to determine NPDES effluent limits for ammonia-nitrogen, CBOD5, and dissolved oxygen, if applicable. TMS is a single discharge model that is used to determine NPDES effluent limitations for toxics, if applicable. A thermal discharge analysis was not completed since there is no thermal loading added to the discharges.

Background data of Lycoming Creek was taken from WQN0409, a gage located upstream of Lycoming Engines that is part of DEP's water quality network. The background data was entered in the appropriate models to better characterize the water quality of the acute and chronic mixing zones.

See Attachment C for model input / output data and supporting documentation.

5.2.1 Outfall 001

WQM 7.0

WQM 7.0 was used to determine if ammonia-nitrogen, CBOD5, or dissolved oxygen WQBELs are appropriate for the discharge at Outfall 001. A reach was created in WQM 7.0 from Outfall 001 to the mouth of Lycoming Creek to accurately model in-stream conditions downstream of the discharge. The model indicates that there is minimal impact on the dissolved oxygen levels in Lycoming Creek; therefore, the reach size and number of reaches utilized is appropriate.

Table 5-3. WQM 7.0 Outfall 001 Modeling Results

Parameter	Effluent Limit (mg/l)		
	Average Monthly	Daily Maximum	Minimum
CBOD5 (1)	62.4	--	--
Ammonia-nitrogen (1)	1.9	3.8	--
Dissolved Oxygen	--	--	3

(1) Sample result taken from Pollutant Group 1 of the renewal application.

The model output indicates that the existing discharge characteristics for CBOD5, ammonia-nitrogen, and dissolved oxygen will not negatively impact Lycoming Creek. No limits or monitoring requirements are required for these parameters.

Toxics Management Spreadsheet

TMS was used to determine if WQBELs are appropriate for toxics found in the discharge. For Outfall 001, the maximum daily TBEL concentrations or the maximum discharge concentrations taken from sampling completed for the renewal application were used as inputs.

TMS recommends the following effluent limits and monitoring requirements:

Table 5-4. TMS Outfall 001 Modeling Results

Pollutants	Mass Limits		Concentration Limits			Units	Governing WQBEL	WQBEL Basis
	AML (lbs/day)	MDL (lbs/day)	AML	MDL	IMAX			
Total Cadmium (1)	0.02	0.032	0.19	0.3	0.48	Mg/l	0.19	CFC
Total Copper (1)	0.14	0.22	1.34	2.1	3.36	Mg/l	1.34	AFC
Total Lead (2)	Report	Report	Report	Report	Report	Mg/l	2.27	CFC
Total Nickel (2)	Report	Report	Report	Report	Report	Mg/l	37.2	CFC
Total Silver (1)	0.042	0.065	0.4	0.62	0.99	Mg/l	0.4	AFC

(1) Discharge Concentration ≥ 50% WQBEL (RP)
(2) Discharge Concentration > 10% WQBEL (no RP)

West Branch Susquehanna River TMDL

A maximum total iron concentration of 0.244 mg/l was reported at Outfall 001 in sampling completed for the application. At a design flow rate of 0.0126 MGD this equates to a loading of 0.02 lbs/day. Wirerope Works, Inc. has a reported maximum concentration of 0.130 mg/l which equates to a maximum loading of 0.05 lbs/day at a design flow rate of 0.05 MGD. At a combined actual loading of 0.07 lbs/day, the discharges show no reasonable potential to exceed the TMDL's aggregate WLA of 0.15 lbs/day total iron. Accordingly, it is not necessary to establish monitoring requirements or an effluent limit for total iron at Outfall 001.

A maximum total manganese concentration of 0.0055 mg/l was reported at Outfall 001 in sampling completed for the application. At a design flow rate of 0.0126 MGD this equates to a loading of 0.0005 lbs/day. Unlike total iron above, the TMDL does not recognize any manganese from Wirerope Works, Inc. in the aggregate WLA. Accordingly, since the discharge shows no reasonable potential to exceed the TMDL's WLA of 0.03 lbs/day total manganese, it is not necessary to establish monitoring requirements or an effluent limit for total manganese at Outfall 001.

5.2.2 Outfalls 003, 004, and 005

WQM 7.0

Outfalls 003, 004, and 005 were not evaluated in WQM 7.0. A groundwater discharge is not expected to contain elevated amounts of CBOD5 or ammonia-nitrogen, and dissolved oxygen levels should not be depressed following air stripping and discharge to the storm sewer.

Toxics Management Spreadsheet

Outfalls 003, 004, and 005 were not evaluated in TMS. Sample results included with the application indicate that for all pollutants sampled, none were detected. pH ranged from 6.96 to 8.0.

5.2.3 Outfall 006

DEP does not have an established procedure for modeling stormwater discharges. Accordingly, no water quality-based limitations are proposed.

5.3 Best Professional Judgment

After applying the TBELs and determining if there are more stringent WQBELs, the next step is to apply best professional judgment ("BPJ"), if applicable.

5.3.1 Outfall 001

TCE

An existing TCE maximum daily limitation of 0.20 mg/l is required at Outfall 001 due to historic groundwater contamination discussed above in Section 2.0. The 0.20 mg/l limitation is based on the RREL Treatability Database v5.0 and applied using BPJ. The RREL Treatability Database was an effort initiated in the 1980s, but development ceased around 1993. Copies of the database are no longer available.

Total Dissolved Solids

This facility has historically been classified as a non-natural gas wastewater discharge under Section VI Authorized Load / NO Increase of the *Policy and Procedure for NPDES Permitting of Discharges of Total Dissolved Solids (TDS) -- 25 Pa. Code §95.10 (385-2100-002, 11/12/11)*. The previous renewal's fact sheet established a baseline loading of 112 lbs/day and noted an observed maximum loading of 306 lbs/day occurred in September 2013.

The permittee has not proposed any expansions or changes in wastestream since the previous renewal. Accordingly, per the TDS policy, no TDS limits or additional monitoring is necessary.

5.3.2 Outfall 003

BPJ was not used to establish monitoring requirements or effluent limits at Outfall 003.

5.3.3 Outfall 004

BPJ was not used to establish monitoring requirements or effluent limits at Outfall 004.

5.3.4 Outfall 005

A 2006 BPJ determination established a total chromium effluent limit based on BAT taken from 40 CFR § 433.14. There have been no changes to the facility to indicate this determination is no longer valid. Accordingly, DEP recommends that the limit remains in the permit.

5.3.5 Outfall 006

Outfall 006 is designated as the facility's representative outfall for stormwater sampling. Lycoming Engine's industrial activity falls under Appendix J of the PAG-03, which historically has only required semi-annual monitoring for total suspended solids and oil and grease. However, since the permit's last renewal, the PAG-03 has also been renewed and Appendix J now contains several more parameters. To ensure the permit is at least as stringent as the general stormwater permit, DEP recommends the following monitoring requirements that mirror Appendix J:

Table 5-6. Outfall 006 Stormwater Monitoring Requirements

Pollutant	Monitoring Requirements		Benchmark Values
	Minimum Measurement Frequency	Sample Type	
Total Nitrogen (mg/L) (1)	1 / 6 months	Calculation	XXX
Total Phosphorus (mg/L)	1 /6 months	Grab	XXX
Total Suspended Solids (TSS) (mg/L)	1 /6 months	Grab	100
Oil and Grease (mg/L)	1 /6 months	Grab	30
pH (S.U.)	1 /6 months	Grab	9.0
Chemical Oxygen Demand (COD) (mg/L)	1 /6 months	Grab	120

(1) Total Nitrogen is the sum of Total Kjeldahl-N (TKN) plus Nitrite-Nitrate as N (NO_2+NO_3-N), where TKN and NO_2+NO_3-N are measured in the same sample.

Stormwater best management practices (BMPs) will continue to be included in Part C of the permit.

5.4 Chesapeake Bay

5.4.1 Outfall 001

Lycoming Engines is classified as a non-significant industrial discharge per the Phase 3 Watershed Implementation Plan ("WIP") Wastewater Supplement. The WIP Wastewater Supplement recommends quarterly monitoring for total nitrogen ("TN") and total phosphorus ("TP") for metal finishing discharges, which matches the current permit's monitoring requirements. Accordingly, DEP recommends quarterly nutrient monitoring for TN and TP remain in the permit.

5.4.2 Outfalls 003, 004, and 005

The groundwater remediation discharges should not cause a net increase to the TN and TP loadings since there is no chemical addition. Accordingly, nutrient monitoring for these outfalls is not necessary.

5.4.6 Outfall 006

It is not anticipated that the storm water will have a net increase in total nitrogen or phosphorus. Accordingly, no nutrient monitoring is proposed for Outfall 006.

Existing Effluent Limitations and Monitoring Requirements

The existing limitations and monitoring requirements are as follows:

Outfall 001, Effective Period: Permit Effective Date through Permit Expiration Date.

Parameter	Effluent Limitations						Monitoring Requirements	
	Mass Units (lbs/day)		Concentrations (mg/L)				Minimum Measurement Frequency	Required Sample Type
	Average Monthly	Daily Maximum	Minimum	Average Monthly	Daily Maximum	Instant. Maximum		
Flow (MGD)	Report	Report	XXX	XXX	XXX	XXX	Continuous	Metered
pH (S.U.)	XXX	XXX	6.0	XXX	XXX	9.0	Continuous	Metered
Total Suspended Solids	Report	Report	XXX	31.0	60.0	75	1/month	24-Hr Composite
Oil and Grease	Report	Report	XXX	15	XXX	30	1/month	24-Hr Composite
Total Nitrogen	Report Avg Qrtly	XXX	XXX	Report Avg Qrtly	XXX	XXX	1/quarter	24-Hr Composite
Total Phosphorus	Report Avg Qrtly	XXX	XXX	Report Avg Qrtly	XXX	XXX	1/quarter	24-Hr Composite
Cadmium, Total	0.01	0.03	XXX	0.43	0.86	1.07	1/month	24-Hr Composite
Chromium, Total	Report	Report	XXX	1.71	2.77	4.27	1/month	24-Hr Composite
Copper, Total	0.07	0.14	XXX	1.78	3.56	4.42	1/month	24-Hr Composite
Cyanide, Total (3)	Report	Report	XXX	0.65	1.20	1.62	1/month	24-Hr Composite
Lead, Total	Report	Report	XXX	0.43	0.69	1.07	1/month	24-Hr Composite
Nickel, Total	Report	Report	XXX	2.38	3.98	5.95	1/month	24-Hr Composite
Silver, Total	0.03	0.06	XXX	0.80	1.60	2	1/month	24-Hr Composite
Zinc, Total	Report	Report	XXX	1.48	2.61	3.7	1/month	24-Hr Composite
Total Toxic Organics	XXX	XXX	XXX	XXX	2.13	XXX	1/year	See Permit (4)
Trichloroethylene	XXX	Report	XXX	XXX	0.20	0.3	1/month	Grab

Outfall 003, Effective Period: Permit Effective Date through Permit Expiration Date.

Parameter	Effluent Limitations						Monitoring Requirements	
	Mass Units (lbs/day)		Concentrations (mg/L)				Minimum Measurement Frequency	Required Sample Type
	Average Monthly	Daily Maximum	Minimum	Average Monthly	Daily Maximum	Instant. Maximum		
Flow (MGD)	Report	Report	XXX	XXX	XXX	XXX	Continuous	Metered
pH	XXX	XXX	6.0	XXX	XXX	9.0	1/month	Grab
Trichloroethylene	XXX	0.02	XXX	XXX	0.06	0.09	1/month	Grab

Outfall 004, Effective Period: Permit Effective Date through Permit Expiration Date.

Parameter	Effluent Limitations						Monitoring Requirements	
	Mass Units (lbs/day)		Concentrations (mg/L)				Minimum Measurement Frequency	Required Sample Type
	Average Monthly	Daily Maximum	Minimum	Average Monthly	Daily Maximum	Instant. Maximum		
Flow (MGD)	Report	Report	XXX	XXX	XXX	XXX	Continuous	Metered
pH	XXX	XXX	6.0	XXX	XXX	9.0	1/month	Grab
Trichloroethylene	XXX	Report	XXX	XXX	0.01	0.015	1/month	Grab

Outfall 005, Effective Period: Permit Effective Date through Permit Expiration Date.

Parameter	Effluent Limitations						Monitoring Requirements	
	Mass Units (lbs/day)		Concentrations (mg/L)				Minimum Measurement Frequency	Required Sample Type
	Average Monthly	Daily Maximum	Minimum	Average Monthly	Daily Maximum	Instant. Maximum		
Flow (MGD)	Report	Report	XXX	XXX	XXX	XXX	Continuous	Metered
pH	XXX	XXX	6.0	XXX	XXX	9.0	1/month	Grab
Chromium, Total	Report	Report	XXX	1.71	2.77	4.28	1/quarter	Grab
Trichloroethylene	XXX	Report	XXX	XXX	0.20	0.3	1/month	Grab

Outfall 006, 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		
Total Suspended Solids	XXX	XXX	XXX	XXX	Report	XXX	1/6 months	Grab
Oil and Grease	XXX	XXX	XXX	XXX	Report	XXX	1/6 months	Grab

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 001, Effective Period: Permit Effective Date through Permit Expiration Date.

Parameter	Effluent Limitations						Monitoring Requirements	
	Mass Units (lbs/day)		Concentrations (mg/L)				Minimum Measurement Frequency	Required Sample Type
	Average Monthly	Daily Maximum	Minimum	Average Monthly	Daily Maximum	Instant. Maximum		
Flow (MGD)	Report	Report	XXX	XXX	XXX	XXX	Continuous	Metered
pH (S.U.)	XXX	XXX	6.0 Inst Min	XXX	XXX	9.0	Continuous	Metered
Total Suspended Solids	Report	Report	XXX	31.0	60.0	75	1/month	24-Hr Composite
Oil and Grease	Report	Report	XXX	15	XXX	30	1/month	24-Hr Composite
Total Nitrogen	Report Avg Qrtly	XXX	XXX	Report Avg Qrtly	XXX	XXX	1/quarter	24-Hr Composite
Total Phosphorus	Report Avg Qrtly	XXX	XXX	Report Avg Qrtly	XXX	XXX	1/quarter	24-Hr Composite
Cadmium, Total	0.02	0.032	XXX	0.19	0.30	0.48	1/month	24-Hr Composite
Chromium, Total	Report	Report	XXX	1.71	2.77	4.27	1/month	24-Hr Composite
Copper, Total	0.14	0.22	XXX	1.34	2.10	3.36	1/month	24-Hr Composite
Cyanide, Total	Report	Report	XXX	0.65	1.20	1.62	1/month	24-Hr Composite
Lead, Total	Report	Report	XXX	0.43	0.69	1.07	1/month	24-Hr Composite
Nickel, Total	Report	Report	XXX	2.38	3.98	5.95	1/month	24-Hr Composite
Silver, Total	0.042	0.065	XXX	0.40	0.62	0.99	1/month	24-Hr Composite
Zinc, Total	Report	Report	XXX	1.48	2.61	3.7	1/month	24-Hr Composite

Outfall 001, Continued (from Permit Effective Date through Permit Expiration Date)

Parameter	Effluent Limitations						Monitoring Requirements	
	Mass Units (lbs/day)		Concentrations (mg/L)				Minimum Measurement Frequency	Required Sample Type
	Average Monthly	Daily Maximum	Minimum	Average Monthly	Daily Maximum	Instant. Maximum		
Total Toxic Organics	XXX	XXX	XXX	XXX	2.13	XXX	1/year	See Permit
Trichloroethylene	XXX	Report	XXX	XXX	0.20	0.3	1/month	Grab

Compliance Sampling Location: Outfall 001

Outfall 003, Effective Period: Permit Effective Date through Permit Expiration Date.

Parameter	Effluent Limitations						Monitoring Requirements	
	Mass Units (lbs/day)		Concentrations (mg/L)				Minimum Measurement Frequency	Required Sample Type
	Average Monthly	Daily Maximum	Minimum	Average Monthly	Daily Maximum	Instant. Maximum		
Flow (MGD)	Report	Report	XXX	XXX	XXX	XXX	Continuous	Metered
pH (S.U.)	XXX	XXX	6.0 Inst Min	XXX	XXX	9.0	1/month	Grab
Trichloroethylene	XXX	0.02	XXX	XXX	0.06	0.09	1/month	Grab

Compliance Sampling Location: Outfall 003

Outfall 004, Effective Period: Permit Effective Date through Permit Expiration Date.

Parameter	Effluent Limitations						Monitoring Requirements	
	Mass Units (lbs/day)		Concentrations (mg/L)				Minimum Measurement Frequency	Required Sample Type
	Average Monthly	Daily Maximum	Minimum	Average Monthly	Daily Maximum	Instant. Maximum		
Flow (MGD)	Report	Report	XXX	XXX	XXX	XXX	Continuous	Metered
pH (S.U.)	XXX	XXX	6.0 Inst Min	XXX	XXX	9.0	1/month	Grab
Trichloroethylene	XXX	Report	XXX	XXX	0.01	0.015	1/month	Grab

Compliance Sampling Location: Outfall 004

Outfall 005, Effective Period: Permit Effective Date through Permit Expiration Date.

Parameter	Effluent Limitations						Monitoring Requirements	
	Mass Units (lbs/day)		Concentrations (mg/L)				Minimum Measurement Frequency	Required Sample Type
	Average Monthly	Daily Maximum	Minimum	Average Monthly	Daily Maximum	Instant. Maximum		
Flow (MGD)	Report	Report	XXX	XXX	XXX	XXX	Continuous	Metered
pH (S.U.)	XXX	XXX	6.0 Inst Min	XXX	XXX	9.0	1/month	Grab
Chromium, Total	Report Avg Qrtly	Report	XXX	1.71 Avg Qrtly	2.77	4.28	1/quarter	Grab
Trichloroethylene	XXX	Report	XXX	XXX	0.20	0.3	1/month	Grab

Compliance Sampling Location: Outfall 005

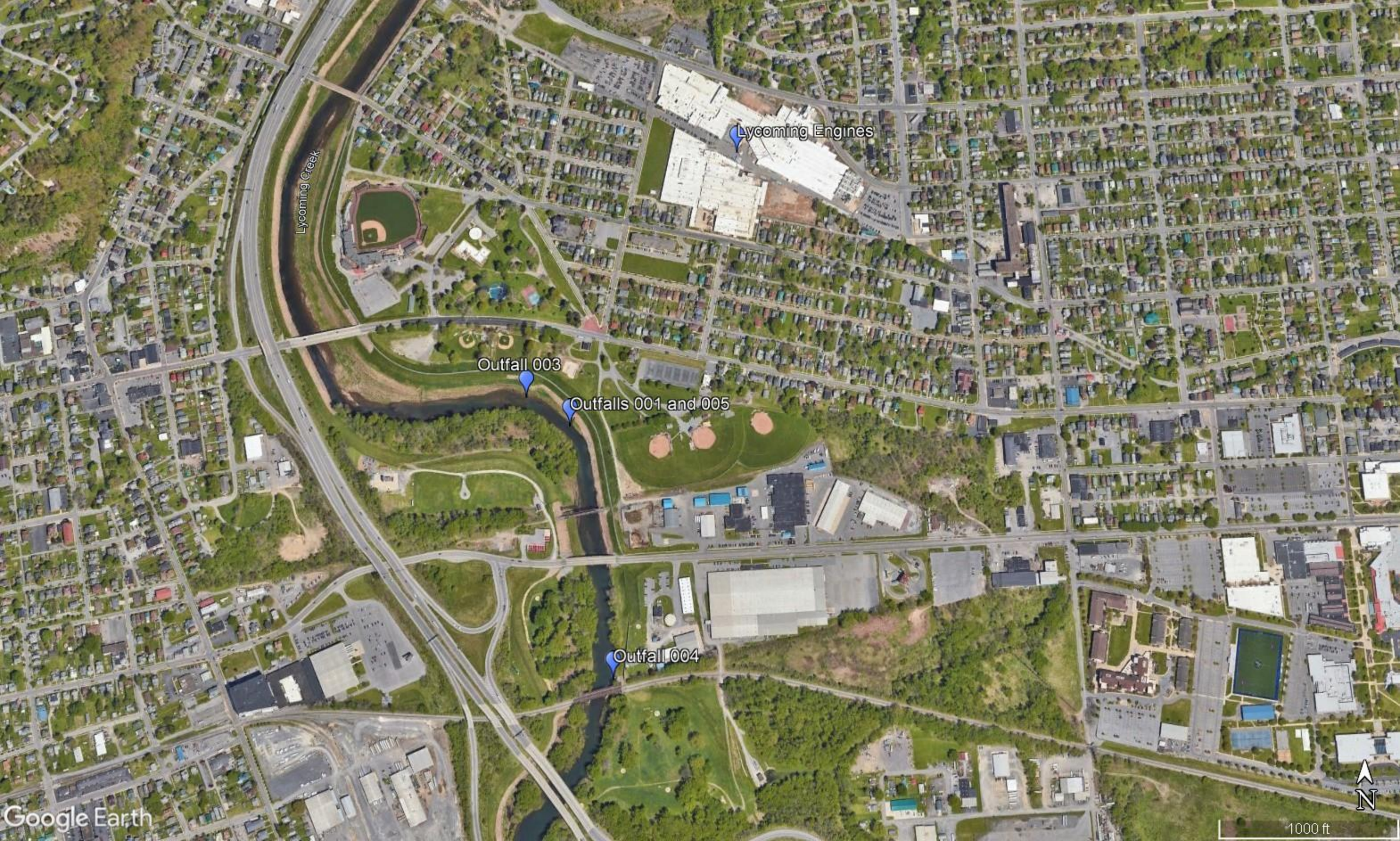
Outfall 006, Effective Period: Permit Effective Date through Permit Expiration Date.

Parameter	Effluent Limitations						Monitoring Requirements	
	Mass Units (lbs/day)		Concentrations (mg/L)				Minimum Measurement Frequency	Required Sample Type
	Average Monthly	Average Weekly	Minimum	Average Monthly	Daily Maximum	Instant. Maximum		
pH (S.U.)	XXX	XXX	XXX	XXX	Report	XXX	1/6 months	Grab
Chemical Oxygen Demand (COD)	XXX	XXX	XXX	XXX	Report	XXX	1/6 months	Grab
Total Suspended Solids	XXX	XXX	XXX	XXX	Report	XXX	1/6 months	Grab
Oil and Grease	XXX	XXX	XXX	XXX	Report	XXX	1/6 months	Grab
Total Nitrogen	XXX	XXX	XXX	XXX	Report	XXX	1/6 months	Calculation
Total Phosphorus	XXX	XXX	XXX	XXX	Report	XXX	1/6 months	Grab

Compliance Sampling Location: Outfall 006

ATTACHMENT A

Facility and Discharge Location Map


Lycoming Engines
Lycoming Creek
Outfall 003
Outfalls 001 and 005
Outfall 004
Google Earth
N
1000 ft

ATTACHMENT B

Q7-10 Calculations and Supporting Documentation

USGS
science for a changing world

Prepared in cooperation with the Pennsylvania Department of Environmental Protection

Selected Streamflow Statistics for Streamgage Locations in and near Pennsylvania

Open-File Report 2011-1070

U.S. Department of the Interior
U.S. Geological Survey

Table 1. List of U.S. Geological Survey streamgage locations in and near Pennsylvania with updated streamflow statistics.—Continued

[Latitude and Longitude in decimal degrees; mi^2, square miles]

Streamgage number	Streamgage name	Latitude	Longitude	Drainage area (mi^2)	Regulated[1]
01541303	West Branch Susquehanna River at Hyde, Pa.	41.005	-78.457	474	Y
01541308	Bradley Run near Ashville, Pa.	40.509	-78.584	6.77	N
01541500	Clearfield Creek at Dimeling, Pa.	40.972	-78.406	371	Y
01542000	Moshannon Creek at Osceola Mills, Pa.	40.850	-78.268	68.8	N
01542500	WB Susquehanna River at Karthaus, Pa.	41.118	-78.109	1,462	Y
01542810	Waldy Run near Emporium, Pa.	41.579	-78.293	5.24	N
01543000	Driftwood Branch Sinnemahoning Creek at Sterling Run, Pa.	41.413	-78.197	272	N
01543500	Sinnemahoning Creek at Sinnemahoning, Pa.	41.317	-78.103	685	N
01544000	First Fork Sinnemahoning Creek near Sinnemahoning, Pa.	41.402	-78.024	245	Y
01544500	Kettle Creek at Cross Fork, Pa.	41.476	-77.826	136	N
01545000	Kettle Creek near Westport, Pa.	41.320	-77.874	233	Y
01545500	West Branch Susquehanna River at Renovo, Pa.	41.325	-77.751	2,975	Y
01545600	Young Womans Creek near Renovo, Pa.	41.390	-77.691	46.2	N
01546000	North Bald Eagle Creek at Milesburg, Pa.	40.942	-77.794	119	N
01546400	Spring Creek at Houserville, Pa.	40.834	-77.828	58.5	N
01546500	Spring Creek near Axemann, Pa.	40.890	-77.794	87.2	N
01547100	Spring Creek at Milesburg, Pa.	40.932	-77.786	142	N
01547200	Bald Eagle Creek below Spring Creek at Milesburg, Pa.	40.943	-77.786	265	N
01547500	Bald Eagle Creek at Blanchard, Pa.	41.052	-77.604	339	Y
01547700	Marsh Creek at Blanchard, Pa.	41.060	-77.606	44.1	N
01547800	South Fork Beech Creek near Snow Shoe, Pa.	41.024	-77.904	12.2	N
01547950	Beech Creek at Monument, Pa.	41.112	-77.702	152	N
01548005	Bald Eagle Creek near Beech Creek Station, Pa.	41.081	-77.549	562	Y
01548500	Pine Creek at Cedar Run, Pa.	41.522	-77.447	604	N
01549000	Pine Creek near Waterville, Pa.	41.313	-77.379	750	N
01549500	Blockhouse Creek near English Center, Pa.	41.474	-77.231	37.7	N
01549700	Pine Creek below Little Pine Creek near Waterville, Pa.	41.274	-77.324	944	Y
01550000	Lycoming Creek near Trout Run, Pa.	41.418	-77.033	173	N
01551500	WB Susquehanna River at Williamsport, Pa.	41.236	-76.997	5,682	Y
01552000	Loyalsock Creek at Loyalsockville, Pa.	41.325	-76.912	435	N
01552500	Muncy Creek near Sonestown, Pa.	41.357	-76.535	23.8	N
01553130	Sand Spring Run near White Deer, Pa.	41.059	-77.077	4.93	N
01553500	West Branch Susquehanna River at Lewisburg, Pa.	40.968	-76.876	6,847	Y
01553700	Chillisquaque Creek at Washingtonville, Pa.	41.062	-76.680	51.3	N
01554000	Susquehanna River at Sunbury, Pa.	40.835	-76.827	18,300	Y
01554500	Shamokin Creek near Shamokin, Pa.	40.810	-76.584	54.2	N
01555000	Penns Creek at Penns Creek, Pa.	40.867	-77.048	301	N
01555500	East Mahantango Creek near Dalmatia, Pa.	40.611	-76.912	162	N
01556000	Frankstown Branch Juniata River at Williamsburg, Pa.	40.463	-78.200	291	N
01557500	Bald Eagle Creek at Tyrone, Pa.	40.684	-78.234	44.1	N
01558000	Little Juniata River at Spruce Creek, Pa.	40.613	-78.141	220	N
01559000	Juniata River at Huntingdon, Pa.	40.485	-78.019	816	LF
01559500	Standing Stone Creek near Huntingdon, Pa.	40.524	-77.971	128	N
01559700	Sulphur Springs Creek near Manns Choice, Pa.	39.978	-78.619	5.28	N
01560000	Dunning Creek at Belden, Pa.	40.072	-78.493	172	N

DFLOW Results

All available data from Apr 1, 1991 through Mar 31, 2021 are included in analysis.

Gage	Period	Days in Record	Zero/Missing	1B3	Percentile	Excur per 3 yr	1Q10	Percentile	Excur per 3 yr	1Qy Type	xQy	Percentile	Harmonic	Percentile
01550000 - Lycoming Creek near Trout Run, PA	1990/04/01 - 2020/04/01	10,958	0/0	7.9	0.14%	1	7.3	0.06%	0.4	1Q7	7.59	0.09%	79.1	25.96%
Gage	**Period**	**Days in Record**	**Zero/Missing**	**1B3**	**Percentile**	**Excur per 3 yr**	**7Q10**	**Percentile**	**Excur per 3 yr**	**7Qy Type**	**xQy**	**Percentile**	**Harmonic**	**Percentile**
01550000 - Lycoming Creek near Trout Run, PA	1990/04/01 - 2020/04/01	10,958	0/0	7.9	0.14%	1	8.86	0.26%	1.2	7Q11	7.65	0.10%	79.1	25.96%
Gage	**Period**	**Days in Record**	**Zero/Missing**	**1B3**	**Percentile**	**Excur per 3 yr**	**30Q10**	**Percentile**	**Excur per 3 yr**	**30Qy Type**	**xQy**	**Percentile**	**Harmonic**	**Percentile**
01550000 - Lycoming Creek near Trout Run, PA	1990/04/01 - 2020/04/01	10,958	0/0	7.9	0.14%	1	12.6	1.68%	5.3	> 30 years	N/A	N/A	79.1	25.96%

Low-Flow (Q_{7-10}) Calculation

Facility: **Lycoming Engines**
NPDES Permit No. **PA0007455**

Gage Information

Drainage Area: **173** mi²
Q_{7-10}: **8.86** cfs
LFY: **0.051** cfsm

Outfall Information

Drainage Area: **271** mi²
Q_{7-10}: **13.9** cfs

Downstream Locations

RMI: **0**
Drainage Area: **272** mi²
Q_{7-10}: **13.93** cfs

RMI:
Drainage Area: mi²
Q_{7-10}: cfs

RMI:
Drainage Area: mi²
Q_{7-10}: cfs

RMI:
Drainage Area: mi²
Q_{7-10}: cfs

RMI:
Drainage Area: mi²
Q_{7-10}: cfs

RMI:
Drainage Area: mi²
Q_{7-10}: cfs

RMI:
Drainage Area: mi²
Q_{7-10}: cfs

RMI:
Drainage Area: mi²
Q_{7-10}: cfs

ATTACHMENT C

Model Input / Output Data

Input Data WQM 7.0

Stream Code	Stream Name	RMI	Elevation (ft)	Drainage Area (sq mi)	Slope (ft/ft)	PWS Withdrawal (mgd)	Apply FC
20501	LYCOMING CREEK	**0.880**	505.00	271.00	0.00000	0.00	☑

Stream Data

Design Cond.	LFY (cfsm)	Trib Flow (cfs)	Stream Flow (cfs)	Rch Trav Time (days)	Rch Velocity (fps)	WD Ratio	Rch Width (ft)	Rch Depth (ft)	Tributary Temp (°C)	Tributary pH	Stream Temp (°C)	Stream pH
Q7-10	0.046	0.00	0.00	0.000	0.000	0.0	0.00	0.00	20.00	6.50	20.00	0.00
Q1-10		0.00	0.00	0.000	0.000							
Q30-10		0.00	0.00	0.000	0.000							

Discharge Data

Name	Permit Number	Existing Disc Flow (mgd)	Permitted Disc Flow (mgd)	Design Disc Flow (mgd)	Reserve Factor	Disc Temp (°C)	Disc pH
LE Outfall 001	PA0007455	0.0126	0.0126	0.0126	0.000	20.00	7.00

Parameter Data

Parameter Name	Disc Conc (mg/L)	Trib Conc (mg/L)	Stream Conc (mg/L)	Fate Coef (1/days)
CBOD5	62.40	2.00	0.00	1.50
Dissolved Oxygen	3.00	8.24	0.00	0.00
NH3-N	1.90	0.00	0.00	0.70

Input Data WQM 7.0

Stream Code	Stream Name	RMI	Elevation (ft)	Drainage Area (sq mi)	Slope (ft/ft)	PWS Withdrawal (mgd)	Apply FC
20501	LYCOMING CREEK	**0.879**	504.99	271.01	0.00000	0.00	☑

Stream Data

Design Cond.	LFY (cfsm)	Trib Flow (cfs)	Stream Flow (cfs)	Rch Trav Time (days)	Rch Velocity (fps)	WD Ratio	Rch Width (ft)	Rch Depth (ft)	Tributary Temp (°C)	Tributary pH	Stream Temp (°C)	Stream pH
Q7-10	0.046	0.00	0.00	0.000	0.000	0.0	0.00	0.00	20.00	6.50	0.00	0.00
Q1-10		0.00	0.00	0.000	0.000							
Q30-10		0.00	0.00	0.000	0.000							

Discharge Data

Name	Permit Number	Existing Disc Flow (mgd)	Permitted Disc Flow (mgd)	Design Disc Flow (mgd)	Reserve Factor	Disc Temp (°C)	Disc pH
		0.0000	0.0000	0.0000	0.000	25.00	7.00

Parameter Data

Parameter Name	Disc Conc (mg/L)	Trib Conc (mg/L)	Stream Conc (mg/L)	Fate Coef (1/days)
CBOD5	25.00	2.00	0.00	1.50
Dissolved Oxygen	3.00	8.24	0.00	0.00
NH3-N	25.00	0.00	0.00	0.70

Input Data WQM 7.0

Stream Code	Stream Name	RMI	Elevation (ft)	Drainage Area (sq mi)	Slope (ft/ft)	PWS Withdrawal (mgd)	Apply FC
20501	LYCOMING CREEK	**0.000**	503.00	272.00	0.00000	0.00	☑

Stream Data

Design Cond.	LFY (cfsm)	Trib Flow (cfs)	Stream Flow (cfs)	Rch Trav Time (days)	Rch Velocity (fps)	WD Ratio	Rch Width (ft)	Rch Depth (ft)	Tributary Temp (°C)	Tributary pH	Stream Temp (°C)	Stream pH
Q7-10	0.046	0.00	0.00	0.000	0.000	0.0	0.00	0.00	20.00	6.50	20.00	0.00
Q1-10		0.00	0.00	0.000	0.000							
Q30-10		0.00	0.00	0.000	0.000							

Discharge Data

Name	Permit Number	Existing Disc Flow (mgd)	Permitted Disc Flow (mgd)	Design Disc Flow (mgd)	Reserve Factor	Disc Temp (°C)	Disc pH
		0.0000	0.0000	0.0000	0.000	0.00	7.00

Parameter Data

Parameter Name	Disc Conc (mg/L)	Trib Conc (mg/L)	Stream Conc (mg/L)	Fate Coef (1/days)
CBOD5	25.00	2.00	0.00	1.50
Dissolved Oxygen	3.00	8.24	0.00	0.00
NH3-N	25.00	0.00	0.00	0.70

WQM 7.0 Hydrodynamic Outputs

SWP Basin	Stream Code	Stream Name
10A	20501	LYCOMING CREEK

RMI	Stream Flow (cfs)	PWS With (cfs)	Net Stream Flow (cfs)	Disc Analysis Flow (cfs)	Reach Slope (ft/ft)	Depth (ft)	Width (ft)	W/D Ratio	Velocity (fps)	Reach Trav Time (days)	Analysis Temp (ºC)	Analysis pH
Q7-10 Flow												
0.880	12.47	0.00	12.47	.0195	0.00190	.853	63.02	73.91	0.23	0.000	20.00	6.50
0.879	12.47	0.00	12.47	.0195	0.00043	.894	67.96	75.99	0.21	0.262	20.00	6.50
Q1-10 Flow												
0.880	10.22	0.00	10.22	.0195	0.00190	NA	NA	NA	0.21	0.000	20.00	6.50
0.879	10.22	0.00	10.22	.0195	0.00043	NA	NA	NA	0.18	0.292	20.00	6.50
Q30-10 Flow												
0.880	17.70	0.00	17.70	.0195	0.00190	NA	NA	NA	0.28	0.000	20.00	6.50
0.879	17.70	0.00	17.70	.0195	0.00043	NA	NA	NA	0.25	0.215	20.00	6.50

WQM 7.0 Modeling Specifications

Parameters	Both	Use Inputted Q1-10 and Q30-10 Flows	☑
WLA Method	EMPR	Use Inputted W/D Ratio	☐
Q1-10/Q7-10 Ratio	0.82	Use Inputted Reach Travel Times	☐
Q30-10/Q7-10 Ratio	1.42	Temperature Adjust Kr	☑
D.O. Saturation	90.00%	Use Balanced Technology	☑
D.O. Goal	5		

WQM 7.0 Wasteload Allocations

SWP Basin	Stream Code	Stream Name
10A	20501	LYCOMING CREEK

NH3-N Acute Allocations

RMI	Discharge Name	Baseline Criterion (mg/L)	Baseline WLA (mg/L)	Multiple Criterion (mg/L)	Multiple WLA (mg/L)	Critical Reach	Percent Reduction
0.880	LE Outfall 001	22.67	3.8	22.67	3.8	0	0
0.879		NA	NA	22.67	NA	NA	NA

NH3-N Chronic Allocations

RMI	Discharge Name	Baseline Criterion (mg/L)	Baseline WLA (mg/L)	Multiple Criterion (mg/L)	Multiple WLA (mg/L)	Critical Reach	Percent Reduction
0.880	LE Outfall 001	2.13	1.9	2.13	1.9	0	0
0.879		NA	NA	2.13	NA	NA	NA

Dissolved Oxygen Allocations

RMI	Discharge Name	CBOD5		NH3-N		Dissolved Oxygen		Critical Reach	Percent Reduction
		Baseline (mg/L)	Multiple (mg/L)	Baseline (mg/L)	Multiple (mg/L)	Baseline (mg/L)	Multiple (mg/L)		
0.88	LE Outfall 001	62.4	62.4	1.9	1.9	3	3	0	0
0.88		NA	NA	NA	NA	NA	NA	NA	NA

WQM 7.0 D.O.Simulation

SWP Basin	Stream Code	Stream Name
10A	20501	LYCOMING CREEK

RMI	Total Discharge Flow (mgd)	Analysis Temperature (ºC)	Analysis pH
0.880	0.013	20.000	6.500
Reach Width (ft)	**Reach Depth (ft)**	**Reach WDRatio**	**Reach Velocity (fps)**
63.015	0.853	73.906	0.232
Reach CBOD5 (mg/L)	**Reach Kc (1/days)**	**Reach NH3-N (mg/L)**	**Reach Kn (1/days)**
2.09	0.070	0.00	0.700
Reach DO (mg/L)	**Reach Kr (1/days)**	**Kr Equation**	**Reach DO Goal (mg/L)**
8.235	3.006	Tsivoglou	5
Reach Travel Time (days)			
0.000			

Subreach Results

TravTime (days)	CBOD5 (mg/L)	NH3-N (mg/L)	D.O. (mg/L)
0.000	2.09	0.00	8.23
0.000	2.09	0.00	8.23
0.000	2.09	0.00	8.24
0.000	2.09	0.00	8.24
0.000	2.09	0.00	8.24
0.000	2.09	0.00	8.24
0.000	2.09	0.00	8.24
0.000	2.09	0.00	8.24
0.000	2.09	0.00	8.24
0.000	2.09	0.00	8.24

RMI	Total Discharge Flow (mgd)	Analysis Temperature (ºC)	Analysis pH
0.879	0.013	20.000	6.500
Reach Width (ft)	**Reach Depth (ft)**	**Reach WDRatio**	**Reach Velocity (fps)**
67.965	0.894	75.991	0.205
Reach CBOD5 (mg/L)	**Reach Kc (1/days)**	**Reach NH3-N (mg/L)**	**Reach Kn (1/days)**
2.09	0.058	0.00	0.700
Reach DO (mg/L)	**Reach Kr (1/days)**	**Kr Equation**	**Reach DO Goal (mg/L)**
8.235	0.601	Tsivoglou	5
Reach Travel Time (days)			
0.262			

Subreach Results

TravTime (days)	CBOD5 (mg/L)	NH3-N (mg/L)	D.O. (mg/L)
0.026	2.09	0.00	8.24
0.052	2.09	0.00	8.24
0.078	2.08	0.00	8.24
0.105	2.08	0.00	8.24
0.131	2.08	0.00	8.24
0.157	2.08	0.00	8.24
0.183	2.07	0.00	8.24
0.209	2.07	0.00	8.24
0.235	2.07	0.00	8.24
0.262	2.06	0.00	8.24

WQM 7.0 Effluent Limits

SWP Basin	Stream Code	Stream Name
10A	20501	LYCOMING CREEK

RMI	Name	Permit Number	Disc Flow (mgd)	Parameter	Effl. Limit 30-day Ave. (mg/L)	Effl. Limit Maximum (mg/L)	Effl. Limit Minimum (mg/L)
0.880	LE Outfall 001	PA0007455	0.013	CBOD5	62.4		
				NH3-N	1.9	3.8	
				Dissolved Oxygen			3

Discharge Information

Instructions | Discharge | Stream

Facility: **Lycoming Engines** NPDES Permit No.: **PA0007455** Outfall No.: **001**

Evaluation Type: **Major Sewage / Industrial Waste** Wastewater Description: **Electroplating wastewater**

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
0.0126	450	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		5590		42.83							
	Chloride (PWS)	mg/L		710		3.15							
	Bromide	mg/L	<	0.1									
	Sulfate (PWS)	mg/L		3580									
	Fluoride (PWS)	mg/L		0.53									
Group 2	Total Aluminum	µg/L		25.9		52							
	Total Antimony	µg/L	<	20									
	Total Arsenic	µg/L	<	20		3							
	Total Barium	µg/L		5.2		21.7							
	Total Beryllium	µg/L	<	1									
	Total Boron	µg/L		240									
	Total Cadmium	mg/L		0.69									
	Total Chromium (III)	mg/L		2.77									
	Hexavalent Chromium	µg/L	<	10									
	Total Cobalt	µg/L	<	5									
	Total Copper	mg/L		3.38		0.001							
	Free Cyanide	µg/L											
	Total Cyanide	mg/L		1.2									
	Dissolved Iron	µg/L		154									
	Total Iron	µg/L		254		0.12							
	Total Lead	mg/L		0.69									
	Total Manganese	µg/L		5.5		15.1							
	Total Mercury	µg/L		0.2									
	Total Nickel	mg/L		3.98									
	Total Phenols (Phenolics) (PWS)	µg/L	<	50									
	Total Selenium	µg/L	<	20									
	Total Silver	mg/L	<	0.43									
	Total Thallium	µg/L	<	10									
	Total Zinc	µg/L	<	20		6.6							
	Total Molybdenum	µg/L	<	5									
	Acrolein	µg/L	<	4									
	Acrylamide	µg/L	<										
	Acrylonitrile	µg/L	<	4									
	Benzene	µg/L	<	1									
	Bromoform	µg/L		1.4									

Group 3	Carbon Tetrachloride	µg/L	<	1									
	Chlorobenzene	µg/L		1									
	Chlorodibromomethane	µg/L	<	1									
	Chloroethane	µg/L	<	1									
	2-Chloroethyl Vinyl Ether	µg/L	<	2									
	Chloroform	µg/L		6.8									
	Dichlorobromomethane	µg/L		2.1									
	1,1-Dichloroethane	µg/L	<	1									
	1,2-Dichloroethane	µg/L	<	1									
	1,1-Dichloroethylene	µg/L	<	1									
	1,2-Dichloropropane	µg/L	<	1									
	1,3-Dichloropropylene	µg/L	<	2									
	1,4-Dioxane	µg/L	<	3									
	Ethylbenzene	µg/L	<	1									
	Methyl Bromide	µg/L	<	1									
	Methyl Chloride	µg/L	<	1									
	Methylene Chloride	µg/L	<	1									
	1,1,2,2-Tetrachloroethane	µg/L	<	1									
	Tetrachloroethylene	µg/L	<	1									
	Toluene	µg/L	<	1									
	1,2-trans-Dichloroethylene	µg/L	<	1									
	1,1,1-Trichloroethane	µg/L	<	1									
	1,1,2-Trichloroethane	µg/L	<	1									
	Trichloroethylene	mg/L		0.2									
	Vinyl Chloride	µg/L	<	1									
Group 4	2-Chlorophenol	µg/L	<	1.3									
	2,4-Dichlorophenol	µg/L	<	1.3									
	2,4-Dimethylphenol	µg/L	<	1.3									
	4,6-Dinitro-o-Cresol	µg/L	<	3.3									
	2,4-Dinitrophenol	µg/L	<	3.3									
	2-Nitrophenol	µg/L	<	1.3									
	4-Nitrophenol	µg/L	<	1.3									
	p-Chloro-m-Cresol	µg/L	<	1.1									
	Pentachlorophenol	µg/L	<	3.3									
	Phenol	µg/L	<	1.3									
	2,4,6-Trichlorophenol	µg/L	<	1.3									
Group 5	Acenaphthene	µg/L	<	1.3									
	Acenaphthylene	µg/L	<	1.3									
	Anthracene	µg/L	<	1.3									
	Benzidine	µg/L	<	20									
	Benzo(a)Anthracene	µg/L	<	1.3									
	Benzo(a)Pyrene	µg/L	<	1.3									
	3,4-Benzofluoranthene	µg/L	<	1.3									
	Benzo(ghi)Perylene	µg/L	<	1.3									
	Benzo(k)Fluoranthene	µg/L	<	1.3									
	Bis(2-Chloroethoxy)Methane	µg/L	<	1.3									
	Bis(2-Chloroethyl)Ether	µg/L	<	1.3									
	Bis(2-Chloroisopropyl)Ether	µg/L	<	1.3									
	Bis(2-Ethylhexyl)Phthalate	µg/L	<	3.3									
	4-Bromophenyl Phenyl Ether	µg/L	<	1.3									
	Butyl Benzyl Phthalate	µg/L	<	3.3									
	2-Chloronaphthalene	µg/L	<	1.3									
	4-Chlorophenyl Phenyl Ether	µg/L	<	1.3									
	Chrysene	µg/L	<	1.3									
	Dibenzo(a,h)Anthrancene	µg/L	<	1.3									
	1,2-Dichlorobenzene	µg/L	<	1									
	1,3-Dichlorobenzene	µg/L	<	1									
	1,4-Dichlorobenzene	µg/L	<	1									
	3,3-Dichlorobenzidine	µg/L	<	1.3									
	Diethyl Phthalate	µg/L	<	1.3									
	Dimethyl Phthalate	µg/L	<	1.3									
	Di-n-Butyl Phthalate	µg/L	<	1.3									
	2,4-Dinitrotoluene	µg/L	<	1.3									

	2,6-Dinitrotoluene	µg/L	<	1.3									
	Di-n-Octyl Phthalate	µg/L		5.5									
	1,2-Diphenylhydrazine	µg/L	<	1.3									
	Fluoranthene	µg/L	<	1.3									
	Fluorene	µg/L	<	1.3									
	Hexachlorobenzene	µg/L	<	1.3									
	Hexachlorobutadiene	µg/L	<	1									
	Hexachlorocyclopentadiene	µg/L	<	1.3									
	Hexachloroethane	µg/L	<	1.3									
	Indeno(1,2,3-cd)Pyrene	µg/L	<	1.3									
	Isophorone	µg/L	<	1.3									
	Naphthalene	µg/L	<	1									
	Nitrobenzene	µg/L	<	1.3									
	n-Nitrosodimethylamine	µg/L	<	1.3									
	n-Nitrosodi-n-Propylamine	µg/L	<	1.3									
	n-Nitrosodiphenylamine	µg/L	<	1.3									
	Phenanthrene	µg/L	<	1.3									
	Pyrene	µg/L	<	1.3									
	1,2,4-Trichlorobenzene	µg/L	<	1									
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											

Stream / Surface Water Information

Lycoming Engines, NPDES Permit No. PA0007455, Outfall 001

Instructions | Discharge | *Stream*

Receiving Surface Water Name: **Lycoming Creek**

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	020501	0.88	511	271			Yes
End of Reach 1	020501	0	508	272			Yes

Q *7-10*

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	0.88	0.051										100	7		
End of Reach 1	0	0.051													

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	0.88														
End of Reach 1	0														

Model Results

Lycoming Engines, NPDES Permit No. PA0007455, Outfall 001

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

☑ ***Hydrodynamics***

Q 7-10

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)
0.88	13.82		13.82	0.019	0.00065	0.889	69.155	77.789	0.225	0.239	306.895
0	13.87		13.872								

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)
0.88	73.76		73.76	0.019	0.00065	1.856	69.155	37.251	0.575	0.094	101.931
0	73.998		74.00								

☑ ***Wasteload Allocations***

☑ ***AFC*** CCT (min): 15 PMF: 0.221 Analysis Hardness (mg/l): 102.22 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)	42830	0		0	N/A	N/A	N/A	
Chloride (PWS)	3150	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	52	0		0	750	750	110,167	
Total Antimony	0	0		0	1,100	1,100	173,534	
Total Arsenic	3	0		0	340	340	53,167	Chem Translator of 1 applied
Total Barium	21.7	0		0	21,000	21,000	3,309,516	
Total Boron	0	0		0	8,100	8,100	1,277,840	
Total Cadmium	0	0		0	2.057	2.18	344	Chem Translator of 0.943 applied
Total Chromium (III)	0	0		0	580.096	1,836	289,604	Chem Translator of 0.316 applied
Hexavalent Chromium	0	0		0	16	16.3	2,570	Chem Translator of 0.982 applied
Total Cobalt	0	0		0	95	95.0	14,987	
Total Copper	1	0		0	13.720	14.3	2,098	Chem Translator of 0.96 applied

Dissolved Iron	0	0		0	N/A	N/A	N/A	
Total Iron	0.12	0		0	N/A	N/A	N/A	
Total Lead	0	0		0	66.142	84.0	13,245	Chem Translator of 0.788 applied
Total Manganese	15.1	0		0	N/A	N/A	N/A	
Total Mercury	0	0		0	1.400	1.65	260	Chem Translator of 0.85 applied
Total Nickel	0	0		0	477.009	478	75,403	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	3.340	3.93	620	Chem Translator of 0.85 applied
Total Thallium	0	0		0	65	65.0	10,254	
Total Zinc	6.6	0		0	119.380	122	18,222	Chem Translator of 0.978 applied
Acrolein	0	0		0	3	3.0	473	
Acrylonitrile	0	0		0	650	650	102,543	
Benzene	0	0		0	640	640	100,965	
Bromoform	0	0		0	1,800	1,800	283,964	
Carbon Tetrachloride	0	0		0	2,800	2,800	441,722	
Chlorobenzene	0	0		0	1,200	1,200	189,310	
Chlorodibromomethane	0	0		0	N/A	N/A	N/A	
2-Chloroethyl Vinyl Ether	0	0		0	18,000	18,000	2,839,644	
Chloroform	0	0		0	1,900	1,900	299,740	
Dichlorobromomethane	0	0		0	N/A	N/A	N/A	
1,2-Dichloroethane	0	0		0	15,000	15,000	2,366,370	
1,1-Dichloroethylene	0	0		0	7,500	7,500	1,183,185	
1,2-Dichloropropane	0	0		0	11,000	11,000	1,735,338	
1,3-Dichloropropylene	0	0		0	310	310	48,905	
Ethylbenzene	0	0		0	2,900	2,900	457,498	
Methyl Bromide	0	0		0	550	550	86,767	
Methyl Chloride	0	0		0	28,000	28,000	4,417,223	
Methylene Chloride	0	0		0	12,000	12,000	1,893,096	
1,1,2,2-Tetrachloroethane	0	0		0	1,000	1,000	157,758	
Tetrachloroethylene	0	0		0	700	700	110,431	
Toluene	0	0		0	1,700	1,700	268,189	
1,2-trans-Dichloroethylene	0	0		0	6,800	6,800	1,072,754	
1,1,1-Trichloroethane	0	0		0	3,000	3,000	473,274	
1,1,2-Trichloroethane	0	0		0	3,400	3,400	536,377	
Trichloroethylene	0	0		0	2,300	2,300	362,843	
Vinyl Chloride	0	0		0	N/A	N/A	N/A	
2-Chlorophenol	0	0		0	560	560	88,344	
2,4-Dichlorophenol	0	0		0	1,700	1,700	268,189	
2,4-Dimethylphenol	0	0		0	660	660	104,120	
4,6-Dinitro-o-Cresol	0	0		0	80	80.0	12,621	
2,4-Dinitrophenol	0	0		0	660	660	104,120	
2-Nitrophenol	0	0		0	8,000	8,000	1,262,064	
4-Nitrophenol	0	0		0	2,300	2,300	362,843	
p-Chloro-m-Cresol	0	0		0	160	160	25,241	
Pentachlorophenol	0	0		0	8.723	8.72	1,376	
Phenol	0	0		0	N/A	N/A	N/A	
2,4,6-Trichlorophenol	0	0		0	460	460	72,569	

Acenaphthene	0	0		0	83	83.0	13,094	
Anthracene	0	0		0	N/A	N/A	N/A	
Benzidine	0	0		0	300	300	47,327	
Benzo(a)Anthracene	0	0		0	0.5	0.5	78.9	
Benzo(a)Pyrene	0	0		0	N/A	N/A	N/A	
3,4-Benzofluoranthene	0	0		0	N/A	N/A	N/A	
Benzo(k)Fluoranthene	0	0		0	N/A	N/A	N/A	
Bis(2-Chloroethyl)Ether	0	0		0	30,000	30,000	4,732,739	
Bis(2-Chloroisopropyl)Ether	0	0		0	N/A	N/A	N/A	
Bis(2-Ethylhexyl)Phthalate	0	0		0	4,500	4,500	709,911	
4-Bromophenyl Phenyl Ether	0	0		0	270	270	42,595	
Butyl Benzyl Phthalate	0	0		0	140	140	22,086	
2-Chloronaphthalene	0	0		0	N/A	N/A	N/A	
Chrysene	0	0		0	N/A	N/A	N/A	
Dibenzo(a,h)Anthrancene	0	0		0	N/A	N/A	N/A	
1,2-Dichlorobenzene	0	0		0	820	820	129,362	
1,3-Dichlorobenzene	0	0		0	350	350	55,215	
1,4-Dichlorobenzene	0	0		0	730	730	115,163	
3,3-Dichlorobenzidine	0	0		0	N/A	N/A	N/A	
Diethyl Phthalate	0	0		0	4,000	4,000	631,032	
Dimethyl Phthalate	0	0		0	2,500	2,500	394,395	
Di-n-Butyl Phthalate	0	0		0	110	110	17,353	
2,4-Dinitrotoluene	0	0		0	1,600	1,600	252,413	
2,6-Dinitrotoluene	0	0		0	990	990	156,180	
1,2-Diphenylhydrazine	0	0		0	15	15.0	2,366	
Fluoranthene	0	0		0	200	200	31,552	
Fluorene	0	0		0	N/A	N/A	N/A	
Hexachlorobenzene	0	0		0	N/A	N/A	N/A	
Hexachlorobutadiene	0	0		0	10	10.0	1,578	
Hexachlorocyclopentadiene	0	0		0	5	5.0	789	
Hexachloroethane	0	0		0	60	60.0	9,465	
Indeno(1,2,3-cd)Pyrene	0	0		0	N/A	N/A	N/A	
Isophorone	0	0		0	10,000	10,000	1,577,580	
Naphthalene	0	0		0	140	140	22,086	
Nitrobenzene	0	0		0	4,000	4,000	631,032	
n-Nitrosodimethylamine	0	0		0	17,000	17,000	2,681,886	
n-Nitrosodi-n-Propylamine	0	0		0	N/A	N/A	N/A	
n-Nitrosodiphenylamine	0	0		0	300	300	47,327	
Phenanthrene	0	0		0	5	5.0	789	
Pyrene	0	0		0	N/A	N/A	N/A	
1,2,4-Trichlorobenzene	0	0		0	130	130	20,509	

☑ ***CFC*** CCT (min): ###### PMF: 1 Analysis Hardness (mg/l): 100.49 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)	42830	0		0	N/A	N/A	N/A	

Chloride (PWS)	3150	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	52	0		0	N/A	N/A	N/A	
Total Antimony	0	0		0	220	220	156,212	
Total Arsenic	3	0		0	150	150	104,381	Chem Translator of 1 applied
Total Barium	21.7	0		0	4,100	4,100	2,895,830	
Total Boron	0	0		0	1,600	1,600	1,136,085	
Total Cadmium	0	0		0	0.247	0.27	193	Chem Translator of 0.909 applied
Total Chromium (III)	0	0		0	74.414	86.5	61,439	Chem Translator of 0.86 applied
Hexavalent Chromium	0	0		0	10	10.4	7,381	Chem Translator of 0.962 applied
Total Cobalt	0	0		0	19	19.0	13,491	
Total Copper	1	0		0	8.993	9.37	5,943	Chem Translator of 0.96 applied
Dissolved Iron	0	0		0	N/A	N/A	N/A	
Total Iron	0.12	0		0	1,500	1,500	1,064,994	WQC = 30 day average; PMF = 1
Total Lead	0	0		0	2.530	3.2	2,273	Chem Translator of 0.79 applied
Total Manganese	15.1	0		0	N/A	N/A	N/A	
Total Mercury	0	0		0	0.770	0.91	643	Chem Translator of 0.85 applied
Total Nickel	0	0		0	52.223	52.4	37,193	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	3,543	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	9,231	
Total Zinc	6.6	0		0	118.632	120	80,751	Chem Translator of 0.986 applied
Acrolein	0	0		0	3	3.0	2,130	
Acrylonitrile	0	0		0	130	130	92,307	
Benzene	0	0		0	130	130	92,307	
Bromoform	0	0		0	370	370	262,720	
Carbon Tetrachloride	0	0		0	560	560	397,630	
Chlorobenzene	0	0		0	240	240	170,413	
Chlorodibromomethane	0	0		0	N/A	N/A	N/A	
2-Chloroethyl Vinyl Ether	0	0		0	3,500	3,500	2,485,185	
Chloroform	0	0		0	390	390	276,921	
Dichlorobromomethane	0	0		0	N/A	N/A	N/A	
1,2-Dichloroethane	0	0		0	3,100	3,100	2,201,164	
1,1-Dichloroethylene	0	0		0	1,500	1,500	1,065,079	
1,2-Dichloropropane	0	0		0	2,200	2,200	1,562,116	
1,3-Dichloropropylene	0	0		0	61	61.0	43,313	
Ethylbenzene	0	0		0	580	580	411,831	
Methyl Bromide	0	0		0	110	110	78,106	
Methyl Chloride	0	0		0	5,500	5,500	3,905,291	
Methylene Chloride	0	0		0	2,400	2,400	1,704,127	
1,1,2,2-Tetrachloroethane	0	0		0	210	210	149,111	
Tetrachloroethylene	0	0		0	140	140	99,407	
Toluene	0	0		0	330	330	234,317	

1,2-trans-Dichloroethylene	0	0		0	1,400	1,400	994,074	
1,1,1-Trichloroethane	0	0		0	610	610	433,132	
1,1,2-Trichloroethane	0	0		0	680	680	482,836	
Trichloroethylene	0	0		0	450	450	319,524	
Vinyl Chloride	0	0		0	N/A	N/A	N/A	
2-Chlorophenol	0	0		0	110	110	78,106	
2,4-Dichlorophenol	0	0		0	340	340	241,418	
2,4-Dimethylphenol	0	0		0	130	130	92,307	
4,6-Dinitro-o-Cresol	0	0		0	16	16.0	11,361	
2,4-Dinitrophenol	0	0		0	130	130	92,307	
2-Nitrophenol	0	0		0	1,600	1,600	1,136,085	
4-Nitrophenol	0	0		0	470	470	333,725	
p-Chloro-m-Cresol	0	0		0	500	500	355,026	
Pentachlorophenol	0	0		0	6.693	6.69	4,752	
Phenol	0	0		0	N/A	N/A	N/A	
2,4,6-Trichlorophenol	0	0		0	91	91.0	64,615	
Acenaphthene	0	0		0	17	17.0	12,071	
Anthracene	0	0		0	N/A	N/A	N/A	
Benzidine	0	0		0	59	59.0	41,893	
Benzo(a)Anthracene	0	0		0	0.1	0.1	71.0	
Benzo(a)Pyrene	0	0		0	N/A	N/A	N/A	
3,4-Benzofluoranthene	0	0		0	N/A	N/A	N/A	
Benzo(k)Fluoranthene	0	0		0	N/A	N/A	N/A	
Bis(2-Chloroethyl)Ether	0	0		0	6,000	6,000	4,260,317	
Bis(2-Chloroisopropyl)Ether	0	0		0	N/A	N/A	N/A	
Bis(2-Ethylhexyl)Phthalate	0	0		0	910	910	646,148	
4-Bromophenyl Phenyl Ether	0	0		0	54	54.0	38,343	
Butyl Benzyl Phthalate	0	0		0	35	35.0	24,852	
2-Chloronaphthalene	0	0		0	N/A	N/A	N/A	
Chrysene	0	0		0	N/A	N/A	N/A	
Dibenzo(a,h)Anthrancene	0	0		0	N/A	N/A	N/A	
1,2-Dichlorobenzene	0	0		0	160	160	113,608	
1,3-Dichlorobenzene	0	0		0	69	69.0	48,994	
1,4-Dichlorobenzene	0	0		0	150	150	106,508	
3,3-Dichlorobenzidine	0	0		0	N/A	N/A	N/A	
Diethyl Phthalate	0	0		0	800	800	568,042	
Dimethyl Phthalate	0	0		0	500	500	355,026	
Di-n-Butyl Phthalate	0	0		0	21	21.0	14,911	
2,4-Dinitrotoluene	0	0		0	320	320	227,217	
2,6-Dinitrotoluene	0	0		0	200	200	142,011	
1,2-Diphenylhydrazine	0	0		0	3	3.0	2,130	
Fluoranthene	0	0		0	40	40.0	28,402	
Fluorene	0	0		0	N/A	N/A	N/A	
Hexachlorobenzene	0	0		0	N/A	N/A	N/A	
Hexachlorobutadiene	0	0		0	2	2.0	1,420	

Hexachlorocyclopentadiene	0	0		0	1	1.0	710	
Hexachloroethane	0	0		0	12	12.0	8,521	
Indeno(1,2,3-cd)Pyrene	0	0		0	N/A	N/A	N/A	
Isophorone	0	0		0	2,100	2,100	1,491,111	
Naphthalene	0	0		0	43	43.0	30,532	
Nitrobenzene	0	0		0	810	810	575,143	
n-Nitrosodimethylamine	0	0		0	3,400	3,400	2,414,180	
n-Nitrosodi-n-Propylamine	0	0		0	N/A	N/A	N/A	
n-Nitrosodiphenylamine	0	0		0	59	59.0	41,893	
Phenanthrene	0	0		0	1	1.0	710	
Pyrene	0	0		0	N/A	N/A	N/A	
1,2,4-Trichlorobenzene	0	0		0	26	26.0	18,461	

☑ ***THH*** CCT (min): ###### 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 Dissolved Solids (PWS)	42830	0		0	500,000	500,000	N/A	
Chloride (PWS)	3150	0		0	250,000	250,000	N/A	
Sulfate (PWS)	0	0		0	250,000	250,000	N/A	
Fluoride (PWS)	0	0		0	2,000	2,000	N/A	
Total Aluminum	52	0		0	N/A	N/A	N/A	
Total Antimony	0	0		0	5.6	5.6	3,976	
Total Arsenic	3	0		0	10	10.0	4,973	
Total Barium	21.7	0		0	2,400	2,400	1,688,740	
Total Boron	0	0		0	3,100	3,100	2,201,164	
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	1	0		0	N/A	N/A	N/A	
Dissolved Iron	0	0		0	300	300	213,016	
Total Iron	0.12	0		0	N/A	N/A	N/A	
Total Lead	0	0		0	N/A	N/A	N/A	
Total Manganese	15.1	0		0	1,000	1,000	699,346	
Total Mercury	0	0		0	0.050	0.05	35.5	
Total Nickel	0	0		0	610	610	433,132	
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	170	
Total Zinc	6.6	0		0	N/A	N/A	N/A	
Acrolein	0	0		0	3	3.0	2,130	
Acrylonitrile	0	0		0	N/A	N/A	N/A	
Benzene	0	0		0	N/A	N/A	N/A	

Bromoform	0	0		0	N/A	N/A	N/A	
Carbon Tetrachloride	0	0		0	N/A	N/A	N/A	
Chlorobenzene	0	0		0	100	100.0	71,005	
Chlorodibromomethane	0	0		0	N/A	N/A	N/A	
2-Chloroethyl Vinyl Ether	0	0		0	N/A	N/A	N/A	
Chloroform	0	0		0	5.7	5.7	4,047	
Dichlorobromomethane	0	0		0	N/A	N/A	N/A	
1,2-Dichloroethane	0	0		0	N/A	N/A	N/A	
1,1-Dichloroethylene	0	0		0	33	33.0	23,432	
1,2-Dichloropropane	0	0		0	N/A	N/A	N/A	
1,3-Dichloropropylene	0	0		0	N/A	N/A	N/A	
Ethylbenzene	0	0		0	68	68.0	48,284	
Methyl Bromide	0	0		0	100	100.0	71,005	
Methyl Chloride	0	0		0	N/A	N/A	N/A	
Methylene Chloride	0	0		0	N/A	N/A	N/A	
1,1,2,2-Tetrachloroethane	0	0		0	N/A	N/A	N/A	
Tetrachloroethylene	0	0		0	N/A	N/A	N/A	
Toluene	0	0		0	57	57.0	40,473	
1,2-trans-Dichloroethylene	0	0		0	100	100.0	71,005	
1,1,1-Trichloroethane	0	0		0	10,000	10,000	7,100,529	
1,1,2-Trichloroethane	0	0		0	N/A	N/A	N/A	
Trichloroethylene	0	0		0	N/A	N/A	N/A	
Vinyl Chloride	0	0		0	N/A	N/A	N/A	
2-Chlorophenol	0	0		0	30	30.0	21,302	
2,4-Dichlorophenol	0	0		0	10	10.0	7,101	
2,4-Dimethylphenol	0	0		0	100	100.0	71,005	
4,6-Dinitro-o-Cresol	0	0		0	2	2.0	1,420	
2,4-Dinitrophenol	0	0		0	10	10.0	7,101	
2-Nitrophenol	0	0		0	N/A	N/A	N/A	
4-Nitrophenol	0	0		0	N/A	N/A	N/A	
p-Chloro-m-Cresol	0	0		0	N/A	N/A	N/A	
Pentachlorophenol	0	0		0	N/A	N/A	N/A	
Phenol	0	0		0	4,000	4,000	2,840,211	
2,4,6-Trichlorophenol	0	0		0	N/A	N/A	N/A	
Acenaphthene	0	0		0	70	70.0	49,704	
Anthracene	0	0		0	300	300	213,016	
Benzidine	0	0		0	N/A	N/A	N/A	
Benzo(a)Anthracene	0	0		0	N/A	N/A	N/A	
Benzo(a)Pyrene	0	0		0	N/A	N/A	N/A	
3,4-Benzofluoranthene	0	0		0	N/A	N/A	N/A	
Benzo(k)Fluoranthene	0	0		0	N/A	N/A	N/A	
Bis(2-Chloroethyl)Ether	0	0		0	N/A	N/A	N/A	
Bis(2-Chloroisopropyl)Ether	0	0		0	200	200	142,011	
Bis(2-Ethylhexyl)Phthalate	0	0		0	N/A	N/A	N/A	
4-Bromophenyl Phenyl Ether	0	0		0	N/A	N/A	N/A	

Butyl Benzyl Phthalate	0	0		0	0.1	0.1	71.0	
2-Chloronaphthalene	0	0		0	800	800	568,042	
Chrysene	0	0		0	N/A	N/A	N/A	
Dibenzo(a,h)Anthrancene	0	0		0	N/A	N/A	N/A	
1,2-Dichlorobenzene	0	0		0	1,000	1,000	710,053	
1,3-Dichlorobenzene	0	0		0	7	7.0	4,970	
1,4-Dichlorobenzene	0	0		0	300	300	213,016	
3,3-Dichlorobenzidine	0	0		0	N/A	N/A	N/A	
Diethyl Phthalate	0	0		0	600	600	426,032	
Dimethyl Phthalate	0	0		0	2,000	2,000	1,420,106	
Di-n-Butyl Phthalate	0	0		0	20	20.0	14,201	
2,4-Dinitrotoluene	0	0		0	N/A	N/A	N/A	
2,6-Dinitrotoluene	0	0		0	N/A	N/A	N/A	
1,2-Diphenylhydrazine	0	0		0	N/A	N/A	N/A	
Fluoranthene	0	0		0	20	20.0	14,201	
Fluorene	0	0		0	50	50.0	35,503	
Hexachlorobenzene	0	0		0	N/A	N/A	N/A	
Hexachlorobutadiene	0	0		0	N/A	N/A	N/A	
Hexachlorocyclopentadiene	0	0		0	4	4.0	2,840	
Hexachloroethane	0	0		0	N/A	N/A	N/A	
Indeno(1,2,3-cd)Pyrene	0	0		0	N/A	N/A	N/A	
Isophorone	0	0		0	34	34.0	24,142	
Naphthalene	0	0		0	N/A	N/A	N/A	
Nitrobenzene	0	0		0	10	10.0	7,101	
n-Nitrosodimethylamine	0	0		0	N/A	N/A	N/A	
n-Nitrosodi-n-Propylamine	0	0		0	N/A	N/A	N/A	
n-Nitrosodiphenylamine	0	0		0	N/A	N/A	N/A	
Phenanthrene	0	0		0	N/A	N/A	N/A	
Pyrene	0	0		0	20	20.0	14,201	
1,2,4-Trichlorobenzene	0	0		0	0.07	0.07	49.7	

☑ ***CRL*** CCT (min): ###### 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 Dissolved Solids (PWS)	42830	0		0	N/A	N/A	N/A	
Chloride (PWS)	3150	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	52	0		0	N/A	N/A	N/A	
Total Antimony	0	0		0	N/A	N/A	N/A	
Total Arsenic	3	0		0	N/A	N/A	N/A	
Total Barium	21.7	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	1	0		0	N/A	N/A	N/A	
Dissolved Iron	0	0		0	N/A	N/A	N/A	
Total Iron	0.12	0		0	N/A	N/A	N/A	
Total Lead	0	0		0	N/A	N/A	N/A	
Total Manganese	15.1	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	N/A	N/A	N/A	
Total Thallium	0	0		0	N/A	N/A	N/A	
Total Zinc	6.6	0		0	N/A	N/A	N/A	
Acrolein	0	0		0	N/A	N/A	N/A	
Acrylonitrile	0	0		0	0.06	0.06	227	
Benzene	0	0		0	0.58	0.58	2,195	
Bromoform	0	0		0	7	7.0	26,496	
Carbon Tetrachloride	0	0		0	0.4	0.4	1,514	
Chlorobenzene	0	0		0	N/A	N/A	N/A	
Chlorodibromomethane	0	0		0	0.8	0.8	3,028	
2-Chloroethyl Vinyl Ether	0	0		0	N/A	N/A	N/A	
Chloroform	0	0		0	N/A	N/A	N/A	
Dichlorobromomethane	0	0		0	0.95	0.95	3,596	
1,2-Dichloroethane	0	0		0	9.9	9.9	37,472	
1,1-Dichloroethylene	0	0		0	N/A	N/A	N/A	
1,2-Dichloropropane	0	0		0	0.9	0.9	3,407	
1,3-Dichloropropylene	0	0		0	0.27	0.27	1,022	
Ethylbenzene	0	0		0	N/A	N/A	N/A	
Methyl Bromide	0	0		0	N/A	N/A	N/A	
Methyl Chloride	0	0		0	N/A	N/A	N/A	
Methylene Chloride	0	0		0	20	20.0	75,701	
1,1,2,2-Tetrachloroethane	0	0		0	0.2	0.2	757	
Tetrachloroethylene	0	0		0	10	10.0	37,851	
Toluene	0	0		0	N/A	N/A	N/A	
1,2-trans-Dichloroethylene	0	0		0	N/A	N/A	N/A	
1,1,1-Trichloroethane	0	0		0	N/A	N/A	N/A	
1,1,2-Trichloroethane	0	0		0	0.55	0.55	2,082	
Trichloroethylene	0	0		0	0.6	0.6	2,271	
Vinyl Chloride	0	0		0	0.02	0.02	75.7	
2-Chlorophenol	0	0		0	N/A	N/A	N/A	
2,4-Dichlorophenol	0	0		0	N/A	N/A	N/A	
2,4-Dimethylphenol	0	0		0	N/A	N/A	N/A	
4,6-Dinitro-o-Cresol	0	0		0	N/A	N/A	N/A	

2,4-Dinitrophenol	0	0		0	N/A	N/A	N/A	
2-Nitrophenol	0	0		0	N/A	N/A	N/A	
4-Nitrophenol	0	0		0	N/A	N/A	N/A	
p-Chloro-m-Cresol	0	0		0	N/A	N/A	N/A	
Pentachlorophenol	0	0		0	0.030	0.03	114	
Phenol	0	0		0	N/A	N/A	N/A	
2,4,6-Trichlorophenol	0	0		0	1.5	1.5	5,678	
Acenaphthene	0	0		0	N/A	N/A	N/A	
Anthracene	0	0		0	N/A	N/A	N/A	
Benzidine	0	0		0	0.0001	0.0001	0.38	
Benzo(a)Anthracene	0	0		0	0.001	0.001	3.79	
Benzo(a)Pyrene	0	0		0	0.0001	0.0001	0.38	
3,4-Benzofluoranthene	0	0		0	0.001	0.001	3.79	
Benzo(k)Fluoranthene	0	0		0	0.01	0.01	37.9	
Bis(2-Chloroethyl)Ether	0	0		0	0.03	0.03	114	
Bis(2-Chloroisopropyl)Ether	0	0		0	N/A	N/A	N/A	
Bis(2-Ethylhexyl)Phthalate	0	0		0	0.32	0.32	1,211	
4-Bromophenyl Phenyl Ether	0	0		0	N/A	N/A	N/A	
Butyl Benzyl Phthalate	0	0		0	N/A	N/A	N/A	
2-Chloronaphthalene	0	0		0	N/A	N/A	N/A	
Chrysene	0	0		0	0.12	0.12	454	
Dibenzo(a,h)Anthrancene	0	0		0	0.0001	0.0001	0.38	
1,2-Dichlorobenzene	0	0		0	N/A	N/A	N/A	
1,3-Dichlorobenzene	0	0		0	N/A	N/A	N/A	
1,4-Dichlorobenzene	0	0		0	N/A	N/A	N/A	
3,3-Dichlorobenzidine	0	0		0	0.05	0.05	189	
Diethyl Phthalate	0	0		0	N/A	N/A	N/A	
Dimethyl Phthalate	0	0		0	N/A	N/A	N/A	
Di-n-Butyl Phthalate	0	0		0	N/A	N/A	N/A	
2,4-Dinitrotoluene	0	0		0	0.05	0.05	189	
2,6-Dinitrotoluene	0	0		0	0.05	0.05	189	
1,2-Diphenylhydrazine	0	0		0	0.03	0.03	114	
Fluoranthene	0	0		0	N/A	N/A	N/A	
Fluorene	0	0		0	N/A	N/A	N/A	
Hexachlorobenzene	0	0		0	0.00008	0.00008	0.3	
Hexachlorobutadiene	0	0		0	0.01	0.01	37.9	
Hexachlorocyclopentadiene	0	0		0	N/A	N/A	N/A	
Hexachloroethane	0	0		0	0.1	0.1	379	
Indeno(1,2,3-cd)Pyrene	0	0		0	0.001	0.001	3.79	
Isophorone	0	0		0	N/A	N/A	N/A	
Naphthalene	0	0		0	N/A	N/A	N/A	
Nitrobenzene	0	0		0	N/A	N/A	N/A	
n-Nitrosodimethylamine	0	0		0	0.0007	0.0007	2.65	
n-Nitrosodi-n-Propylamine	0	0		0	0.005	0.005	18.9	
n-Nitrosodiphenylamine	0	0		0	3.3	3.3	12,491	

Phenanthrene	0	0		0	N/A	N/A	N/A	
Pyrene	0	0		0	N/A	N/A	N/A	
1,2,4-Trichlorobenzene	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
Total Cadmium	0.02	0.032	0.19	0.3	0.48	mg/L	0.19	CFC	Discharge Conc ≥ 50% WQBEL (RP)
Total Copper	0.14	0.22	1.34	2.1	3.36	mg/L	1.34	AFC	Discharge Conc ≥ 50% WQBEL (RP)
Total Lead	Report	Report	Report	Report	Report	mg/L	2.27	CFC	Discharge Conc > 10% WQBEL (no RP)
Total Nickel	Report	Report	Report	Report	Report	mg/L	37.2	CFC	Discharge Conc > 10% WQBEL (no RP)
Total Silver	0.042	0.065	0.4	0.62	0.99	mg/L	0.4	AFC	Discharge Conc ≥ 50% WQBEL (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
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)	N/A	N/A	PWS Not Applicable
Total Aluminum	70,613	µg/L	Discharge Conc ≤ 10% WQBEL
Total Antimony	3,976	µg/L	Discharge Conc ≤ 10% WQBEL
Total Arsenic	4,973	µg/L	Discharge Conc ≤ 10% WQBEL
Total Barium	1,688,740	µg/L	Discharge Conc ≤ 10% WQBEL
Total Beryllium	N/A	N/A	No WQS
Total Boron	819,044	µg/L	Discharge Conc ≤ 10% WQBEL
Total Chromium (III)	61.4	mg/L	Discharge Conc ≤ 10% WQBEL
Hexavalent Chromium	1,648	µg/L	Discharge Conc ≤ 10% WQBEL
Total Cobalt	9,606	µg/L	Discharge Conc ≤ 10% WQBEL
Total Cyanide	N/A	N/A	No WQS
Dissolved Iron	213,016	µg/L	Discharge Conc ≤ 10% WQBEL
Total Iron	1,064,994	µg/L	Discharge Conc ≤ 10% WQBEL
Total Manganese	699,346	µg/L	Discharge Conc ≤ 10% WQBEL
Total Mercury	35.5	µg/L	Discharge Conc ≤ 10% WQBEL
Total Phenols (Phenolics) (PWS)		µg/L	PWS Not Applicable
Total Selenium	3,543	µg/L	Discharge Conc ≤ 10% WQBEL
Total Thallium	170	µg/L	Discharge Conc ≤ 10% WQBEL

Total Zinc	11,680	µg/L	Discharge Conc ≤ 10% WQBEL
Total Molybdenum	N/A	N/A	No WQS
Acrolein	303	µg/L	Discharge Conc ≤ 25% WQBEL
Acrylonitrile	227	µg/L	Discharge Conc < TQL
Benzene	2,195	µg/L	Discharge Conc ≤ 25% WQBEL
Bromoform	26,496	µg/L	Discharge Conc ≤ 25% WQBEL
Carbon Tetrachloride	1,514	µg/L	Discharge Conc ≤ 25% WQBEL
Chlorobenzene	71,005	µg/L	Discharge Conc ≤ 25% WQBEL
Chlorodibromomethane	3,028	µg/L	Discharge Conc ≤ 25% WQBEL
Chloroethane	N/A	N/A	No WQS
2-Chloroethyl Vinyl Ether	1,820,097	µg/L	Discharge Conc < TQL
Chloroform	4,047	µg/L	Discharge Conc ≤ 25% WQBEL
Dichlorobromomethane	3,596	µg/L	Discharge Conc ≤ 25% WQBEL
1,1-Dichloroethane	N/A	N/A	No WQS
1,2-Dichloroethane	37,472	µg/L	Discharge Conc ≤ 25% WQBEL
1,1-Dichloroethylene	23,432	µg/L	Discharge Conc ≤ 25% WQBEL
1,2-Dichloropropane	3,407	µg/L	Discharge Conc ≤ 25% WQBEL
1,3-Dichloropropylene	1,022	µg/L	Discharge Conc ≤ 25% WQBEL
1,4-Dioxane	N/A	N/A	No WQS
Ethylbenzene	48,284	µg/L	Discharge Conc ≤ 25% WQBEL
Methyl Bromide	55,614	µg/L	Discharge Conc ≤ 25% WQBEL
Methyl Chloride	2,831,262	µg/L	Discharge Conc ≤ 25% WQBEL
Methylene Chloride	75,701	µg/L	Discharge Conc ≤ 25% WQBEL
1,1,2,2-Tetrachloroethane	757	µg/L	Discharge Conc ≤ 25% WQBEL
Tetrachloroethylene	37,851	µg/L	Discharge Conc ≤ 25% WQBEL
Toluene	40,473	µg/L	Discharge Conc ≤ 25% WQBEL
1,2-trans-Dichloroethylene	71,005	µg/L	Discharge Conc ≤ 25% WQBEL
1,1,1-Trichloroethane	303,349	µg/L	Discharge Conc ≤ 25% WQBEL
1,1,2-Trichloroethane	2,082	µg/L	Discharge Conc ≤ 25% WQBEL
Trichloroethylene	2.27	mg/L	Discharge Conc ≤ 25% WQBEL
Vinyl Chloride	75.7	µg/L	Discharge Conc ≤ 25% WQBEL
2-Chlorophenol	21,302	µg/L	Discharge Conc < TQL
2,4-Dichlorophenol	7,101	µg/L	Discharge Conc < TQL
2,4-Dimethylphenol	66,737	µg/L	Discharge Conc < TQL
4,6-Dinitro-o-Cresol	1,420	µg/L	Discharge Conc < TQL
2,4-Dinitrophenol	7,101	µg/L	Discharge Conc < TQL
2-Nitrophenol	808,932	µg/L	Discharge Conc < TQL
4-Nitrophenol	232,568	µg/L	Discharge Conc < TQL
p-Chloro-m-Cresol	16,179	µg/L	Discharge Conc < TQL
Pentachlorophenol	114	µg/L	Discharge Conc < TQL
Phenol	2,840,211	µg/L	Discharge Conc < TQL
2,4,6-Trichlorophenol	5,678	µg/L	Discharge Conc < TQL
Acenaphthene	8,393	µg/L	Discharge Conc < TQL
Acenaphthylene	N/A	N/A	No WQS
Anthracene	213,016	µg/L	Discharge Conc < TQL

Benzidine	0.38	µg/L	Discharge Conc < TQL
Benzo(a)Anthracene	3.79	µg/L	Discharge Conc < TQL
Benzo(a)Pyrene	0.38	µg/L	Discharge Conc < TQL
3,4-Benzofluoranthene	3.79	µg/L	Discharge Conc < TQL
Benzo(ghi)Perylene	N/A	N/A	No WQS
Benzo(k)Fluoranthene	37.9	µg/L	Discharge Conc < TQL
Bis(2-Chloroethoxy)Methane	N/A	N/A	No WQS
Bis(2-Chloroethyl)Ether	114	µg/L	Discharge Conc < TQL
Bis(2-Chloroisopropyl)Ether	142,011	µg/L	Discharge Conc < TQL
Bis(2-Ethylhexyl)Phthalate	1,211	µg/L	Discharge Conc < TQL
4-Bromophenyl Phenyl Ether	27,301	µg/L	Discharge Conc < TQL
Butyl Benzyl Phthalate	71.0	µg/L	Discharge Conc < TQL
2-Chloronaphthalene	568,042	µg/L	Discharge Conc < TQL
4-Chlorophenyl Phenyl Ether	N/A	N/A	No WQS
Chrysene	454	µg/L	Discharge Conc < TQL
Dibenzo(a,h)Anthrancene	0.38	µg/L	Discharge Conc < TQL
1,2-Dichlorobenzene	82,916	µg/L	Discharge Conc ≤ 25% WQBEL
1,3-Dichlorobenzene	4,970	µg/L	Discharge Conc ≤ 25% WQBEL
1,4-Dichlorobenzene	73,815	µg/L	Discharge Conc ≤ 25% WQBEL
3,3-Dichlorobenzidine	189	µg/L	Discharge Conc < TQL
Diethyl Phthalate	404,466	µg/L	Discharge Conc < TQL
Dimethyl Phthalate	252,791	µg/L	Discharge Conc < TQL
Di-n-Butyl Phthalate	11,123	µg/L	Discharge Conc < TQL
2,4-Dinitrotoluene	189	µg/L	Discharge Conc < TQL
2,6-Dinitrotoluene	189	µg/L	Discharge Conc < TQL
Di-n-Octyl Phthalate	N/A	N/A	No WQS
1,2-Diphenylhydrazine	114	µg/L	Discharge Conc < TQL
Fluoranthene	14,201	µg/L	Discharge Conc < TQL
Fluorene	35,503	µg/L	Discharge Conc < TQL
Hexachlorobenzene	0.3	µg/L	Discharge Conc < TQL
Hexachlorobutadiene	37.9	µg/L	Discharge Conc ≤ 25% WQBEL
Hexachlorocyclopentadiene	506	µg/L	Discharge Conc < TQL
Hexachloroethane	379	µg/L	Discharge Conc < TQL
Indeno(1,2,3-cd)Pyrene	3.79	µg/L	Discharge Conc < TQL
Isophorone	24,142	µg/L	Discharge Conc < TQL
Naphthalene	14,156	µg/L	Discharge Conc ≤ 25% WQBEL
Nitrobenzene	7,101	µg/L	Discharge Conc < TQL
n-Nitrosodimethylamine	2.65	µg/L	Discharge Conc < TQL
n-Nitrosodi-n-Propylamine	18.9	µg/L	Discharge Conc < TQL
n-Nitrosodiphenylamine	12,491	µg/L	Discharge Conc < TQL
Phenanthrene	506	µg/L	Discharge Conc < TQL
Pyrene	14,201	µg/L	Discharge Conc < TQL
1,2,4-Trichlorobenzene	49.7	µg/L	Discharge Conc ≤ 25% WQBEL