pennsylvania
DEPARTMENT OF ENVIRONMENTAL PROTECTION

Southwest Regional Office
CLEAN WATER PROGRAM

Application Type	**Renewal**	Application No.	**PA0254401**
Facility Type	**Municipal**	APS ID	**916810**
Major / Minor	**Minor**	Authorization ID	**1396370**

NPDES PERMIT FACT SHEET
INDIVIDUAL SEWAGE

Applicant and Facility Information

Applicant Name	**Ligonier Township Municipal Authority**	Facility Name	**Darlington STP**
Applicant Address	One Municipal Park Drive	Facility Address	Darlington Road Sr 30
	Ligonier, PA 15658		Longbridge, PA 15658
Applicant Contact		Facility Contact	
Applicant Phone		Facility Phone	
Client ID	63553	Site ID	741279
Ch 94 Load Status	Not Overloaded	Municipality	Ligonier Township
Connection Status	No Limitations	County	Westmoreland
Date Application Received	May 11, 2022	EPA Waived?	Yes
Date Application Accepted	May 12, 2022	If No, Reason	

Purpose of Application: Renewal application to discharge treated sewage

Summary of Review

This review is in response to a renewal application received on May 11, 2022. The Ligonier Township Municipal Authority owns the Darlington STP in Ligonier Township, Westmoreland County. Sewage from Ligonier Township is treated at the Darlington Plant with a comminutor, flow equalization, aeration, clarification, UV disinfection and post-treatment aeration before discharging to the Loyalhanna Creek through outfall 001.

Sludge use and disposal description and location(s): none. The plant is designed for 0.156 MGD but only receives about 20 percent of that as an average flow. So the plant does not dispose of solids. The plant frequently takes what would be waste activated sludge and use it as return activated sludge. DEP operations should keep close tabs on this plant. Not disposing of solids is not an advisable way to operate a sewage treatment plant. Because this plant does not have solids processing equipment or a plan to dispose of solids, receiving hauled in wastes at this plant is prohibited.

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		James Vanek James Vanek, P.E. / Environmental Engineer	October 17, 2024
X		Mahbuba Iasmin Mahbuba Iasmin, Ph.D. / Environmental Engineering Manager	October 25, 2024

Discharge, Receiving Waters and Water Supply Information

Outfall No.	001	Design Flow (MGD)	.156
Latitude	40º 16' 28.56"	Longitude	-79º 18' 12.18"
Quad Name		Quad Code	
Wastewater Description:	Sewage Effluent		
Receiving Waters	Loyalhanna Creek (TSF)	Stream Code	43255
NHD Com ID	125293290	RMI	32.68
Drainage Area	164	Yield (cfs/mi^2)	0.0366
Q_{7-10} Flow (cfs)	6	Q_{7-10} Basis	Stream stats
Elevation (ft)	1080	Slope (ft/ft)	0.004
Watershed No.	18-C	Chapter 93 Class.	TSF
Existing Use		Existing Use Qualifier	
Exceptions to Use	none	Exceptions to Criteria	none
Assessment Status	Impaired		
Cause(s) of Impairment	SILTATION		
Source(s) of Impairment	HIGHWAY/ROAD/BRIDGE RUNOFF (NON-CONSTRUCTION RELATED)		
TMDL Status	Final	Name	Kiskiminetas-Conemaugh River Watersheds TMDL

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

Nearest Downstream Public Water Supply Intake	Buffalo Township Municipal Authority		
PWS Waters	Allegheny River	Flow at Intake (cfs)	
PWS RMI		Distance from Outfall (mi)	77

Changes Since Last Permit Issuance: none

Other Comments:

Treatment Facility Summary				
Treatment Facility Name: Darlington STP				
WQM Permit No.	**Issuance Date**			
6511402	07/14/2011			
Waste Type	**Degree of Treatment**	**Process Type**	**Disinfection**	**Avg Annual Flow (MGD)**
Sewage	Secondary with Ammonia Reduction	Extended Aeration	Ultraviolet	0.156
Hydraulic Capacity (MGD)	**Organic Capacity (lbs/day)**	**Load Status**	**Biosolids Treatment**	**Biosolids Use/Disposal**
0.156	322	Not Overloaded	Aerobic Digestion	Other WWTP

Compliance History

Effluent Violations for Outfall 001, from: May 1, 2023 To: March 31, 2024

Parameter	Date	SBC	DMR Value	Units	Limit Value	Units
CBOD5	05/31/23	Wkly Avg	81.6	mg/L	37.5	mg/L
TSS	05/31/23	Wkly Avg	49	mg/L	45	mg/L
Fecal Coliform	09/30/23	IMAX	2450	No./100 ml	1000	No./100 ml
Fecal Coliform	05/31/23	IMAX	2420	No./100 ml	1000	No./100 ml

Development of Effluent Limitations

Outfall No. 001 **Design Flow (MGD)** .156
Latitude 40º 16' 27.90" **Longitude** -79º 18' 12.40"
Wastewater Description: Sewage Effluent

Technology-Based Limitations

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

Pollutant	Limit (mg/l)	SBC	Federal Regulation	State Regulation
$CBOD_5$	25	Average Monthly	133.102(a)(4)(i)	92a.47(a)(1)
	40	Average Weekly	133.102(a)(4)(ii)	92a.47(a)(2)
Total Suspended Solids	30	Average Monthly	133.102(b)(1)	92a.47(a)(1)
	45	Average Weekly	133.102(b)(2)	92a.47(a)(2)
pH	6.0 – 9.0 S.U.	Min – Max	133.102(c)	95.2(1)
Fecal Coliform (5/1 – 9/30)	200 / 100 ml	Geo Mean	-	92a.47(a)(4)
Fecal Coliform (5/1 – 9/30)	1,000 / 100 ml	IMAX	-	92a.47(a)(4)
Fecal Coliform (10/1 – 4/30)	2,000 / 100 ml	Geo Mean	-	92a.47(a)(5)
Fecal Coliform (10/1 – 4/30)	10,000 / 100 ml	IMAX	-	92a.47(a)(5)
Total Residual Chlorine	0.5	Average Monthly	-	92a.48(b)(2)

Water Quality-Based Limitations

The WQM 7.0 model was run for Outfall 001 to determine whether WQBELs are necessary for $CBOD_5$, ammonia-nitrogen, and/or dissolved oxygen.

DEP's modeling for sewage discharges is a conditional two-step process. First, a discharge is modeled for the summer period (May through October) using warm temperatures for the discharge and the receiving stream. Modeling for the summer period is done first because allowable ammonia-nitrogen concentrations in a discharge are lower at higher temperatures (i.e., warm temperatures are more likely to result in critical loading conditions). Reduced dissolved oxygen levels also appear to increase ammonia toxicity and the maximum concentration of dissolved oxygen in water is lower at higher temperatures. The second step is to evaluate WQBELs for the winter period, but only if modeling shows that WQBELs are needed for the summer period. The model uses a mass balance between the wastewater flow and the Q_{7-10} flow of the stream. The Q_{7-10} was calculated from the USGS Stream Stats application. The USGS Stream Stats report is attached in the references section of this report. The Q_{7-10} was calculated to be 11.1 cfs with a standard error of 54%. The 11.1 cfs was reduced by that standard error of 54% resulting in a stream flow of 6 cfs which was used to give the most conservative analysis to see if seasonal $CBOD_5$, NH_3N and DO limits are necessary.

For the summer period, pursuant to DEP's "Implementation Guidance of Section 93.7 Ammonia Criteria" [Doc. No. 391-2000-013] (Ammonia Guidance) and in the absence of site-specific data, the discharge temperature is assumed to be 25°C and the design stream temperature and pH are assumed to be 20°C and 7.0 s.u., respectively, based on the recommendations for trout stocking fisheries. Input discharge concentrations for $CBOD_5$ and Ammonia-Nitrogen are the average monthly limits expected from secondary treatment (25 mg/L and 25 mg/L, respectively). The input discharge concentration for dissolved oxygen is 4.0 mg/L. The background dissolved oxygen concentration of Loyalhanna Creek at 20°C is assumed to be 7.74 mg/L.

The output from WQM7.0 is attached in the references section of the report. The model does not recommend water quality based limits for this discharge. All recommended limits are technology based effluent limits.

Best Professional Judgment (BPJ) Limitations

Dissolved oxygen will be limited at 4.0 mg/l instantaneous minimum limit.

Anti-Backsliding

No relaxation on permit limits or conditions was imposed in this renewed permit.

Mass Loadings

Per Department SOP "Establishing Effluent Limitations for Individual Sewage Permits" (BCW-PMT-033), mass loading limits will be established for POTWs for $CBOD_5$, TSS, ammonia nitrogen. Average monthly mass loading limits will be established for $CBOD_5$, TSS, and ammonia nitrogen. Average weekly mass loading limits will be established for $CBOD_5$ and TSS. Mass loading limits will be calculated according to the formula below:

$$average\ annual\ design\ flow\ (MGD) \times concentration\ limit\ \left(\frac{mg}{L}\right) \times 8.34\ (converstion\ factor) = mass\ loading\ limit\ (\frac{lbs}{day})$$

The following mass loading limitations were calculated:

Parameter	Average Monthly (lbs/day)	Average Weekly (lbs/day)
$CBOD_5$	32.5	49.0
TSS	39.0	58.5

The mass limits imposed during the previous cycle are more stringent than calculated limits above. Previous limits will be carried over in accordance with anti-backsliding requirements.

TMDL Kiskiminetas Watershed

There is a TMDL for metals in the Kiskiminetas River watershed. The contribution for metals from a sewage plant is expected to be less than water quality criteria and therefore not contributing to stream impairment. Annual monitoring is imposed for plants rated less than 0.499 mgd but greater than 2000 gpd. Monitoring for aluminum, iron and manganese is required to ensure there are no impacts on the quality of the receiving stream.

TN and TP Montoring

Nutrient monitoring is required to establish the nutrient load from the wastewater treatment facility and the impacts that load may have on the quality of the receiving stream(s). Sewage discharges with design flows > 2,000 gpd require monitoring, at a minimum, for Total Nitrogen and Total Phosphorus in new and reissued permits. Quarterly monitoring has been imposed.

Monitoring Frequency Considerations

For pH, Dissolved Oxygen (DO) and Total Residual Chlorine (TRC), a monitoring frequency of 1/day has been imposed. The daily monitoring frequencies are consistent with current policy and Table 6-3 of DEP's Technical Guidance for the Development and Specification of Effluent Limitations.

Influent Monitoring

For POTWs with design flows greater than 2,000 GPD influent BOD_5 and TSS monitoring must be established in the permit, and the monitoring should be consistent with the same frequency and sample type as is used for other effluent parameters.

Sample Types

For new or expanding facilities with design flows ≥ 0.1 MGD and < 1.0 MGD, 8-hour composite sampling will be used for conventional and toxic pollutants except where grab sampling is appropriate (e.g., TRC, Fecal Coliform, pH, DO, etc.) and unless site-specific justification is provided in the fact sheet for a deviation.

Industrial Customers

The renewal application lists Idlewild Amusement Park as the only industrial/commercial customer in the collection system. The amusement park does not have any federal effluent limitation guidelines regulating its wastewater.

Disinfection

Where ultraviolet (UV) disinfection is used, TRC limits are not applicable, but the limits table in Part A will generally contain, at a minimum, routine monitoring of UV transmittance (%), UV dosage (µWs/cm2 or mWs/cm2 or mjoules/cm2) or UV intensity (µW/cm2 or mW/cm2) at the same monitoring frequency that would be used for TRC.

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" (386-0400-001), SOPs and/or BPJ.

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

Parameter	Effluent Limitations						Monitoring Requirements	
	Mass Units (lbs/day) (1)		Concentrations (mg/L)				Minimum (2) Measurement Frequency	Required Sample Type
	Average Monthly	Weekly Average	Instantaneous Minimum	Average Monthly	Daily Maximum	Instant. Maximum		
Flow (MGD)	Report	Report Daily Max	XXX	XXX	XXX	XXX	Continuous	Recorded
pH (S.U.)	XXX	XXX	6.0	XXX	XXX	9.0	1/day	Grab
DO	XXX	XXX	4.0	XXX	XXX	XXX	1/day	Grab
CBOD5	32.1	48.2	XXX	25	37.5 Wkly Avg	50	1/week	8-Hr Composite
BOD5 Raw Sewage Influent	Report	Report Daily Max	XXX	Report	Report	XXX	2/month	8-Hr Composite
TSS Raw Sewage Influent	Report	Report Daily Max	XXX	Report	Report	XXX	2/month	8-Hr Composite
TSS	38.6	57.8	XXX	30	45 Wkly Avg	60	1/week	8-Hr Composite
Fecal Coliform (No./100 ml) Oct 1 - Apr 30	XXX	XXX	XXX	2000 Geo Mean	XXX	10000	1/week	Grab
Fecal Coliform (No./100 ml) May 1 - Sep 30	XXX	XXX	XXX	200 Geo Mean	XXX	1000	1/week	Grab
UV Intensity (mW/cm²)	XXX	XXX	Report	Report	XXX	XXX	1/day	Measured
Total Nitrogen	XXX	XXX	XXX	XXX	Report	XXX	1/year	8-Hr Composite

Outfall 001 , Continued (from 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	Weekly Average	Instantaneous Minimum	Average Monthly	Daily Maximum	Instant. Maximum		
Ammonia Nitrogen	XXX	XXX	XXX	Report	XXX	Report	2/month	8-Hr Composite
Total Phosphorus	XXX	XXX	XXX	XXX	Report	XXX	1/year	8-Hr Composite
Total Aluminum	XXX	XXX	XXX	XXX	Report	XXX	1/year	8-Hr Composite
Total Iron	XXX	XXX	XXX	XXX	Report	XXX	1/year	8-Hr Composite
Total Manganese	XXX	XXX	XXX	XXX	Report	XXX	1/year	8-Hr Composite

Compliance Sampling Location: at outfall 001

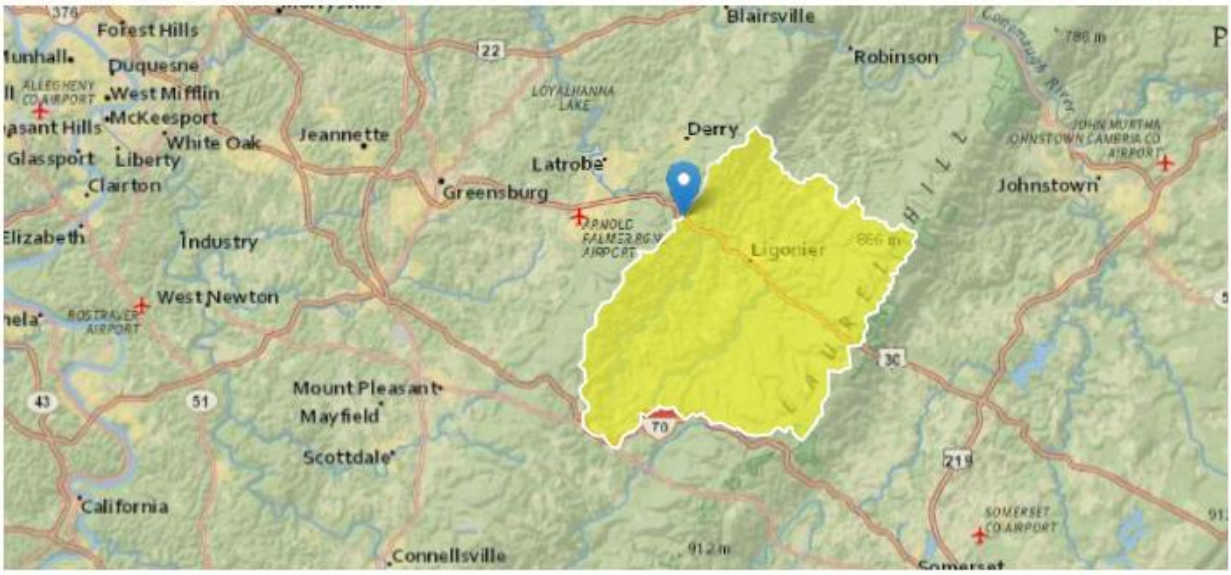
Other Comments:

References

USGS Stream Stats

StreamStats Report

Region ID: PA
Workspace ID: PA20241016134511131000
Clicked Point (Latitude, Longitude): 40.27466, -79.30357
Time: 2024-10-16 09:45:34 -0400



Collapse All

Basin Characteristics

Parameter Code	Parameter Description	Value	Unit
CARBON	Percentage of area of carbonate rock	0	percent
DRNAREA	Area that drains to a point on a stream	164	square miles
ELEV	Mean Basin Elevation	1727	feet
FOREST	Percentage of area covered by forest	79.5887	percent
PRECIP	Mean Annual Precipitation	44	inches
STORAGE	Percentage of area of storage (lakes ponds reservoirs wetlands)	0.37	percent
URBAN	Percentage of basin with urban development	2.1493	percent

Peak-Flow Statistics

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

Parameter Code	Parameter Name	Value	Units	Min Limit	Max Limit
DRNAREA	Drainage Area	164	square miles	0.92	1160

Parameter Code	Parameter Name	Value	Units	Min Limit	Max Limit
STORAGE	Percent Storage	0.37	percent	0	8.9

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

PIL: Lower 90% Prediction Interval, PIU: Upper 90% Prediction Interval, ASEp: Average Standard Error of Prediction, SE: Standard Error, PC: Percent Correct, RMSE: Root Mean Squared Error, PseudoR^2: Pseudo R Squared (other -- see report)

Statistic	Value	Unit	ASEp
50-percent AEP flood	4490	ft^3/s	26.1
20-percent AEP flood	6880	ft^3/s	27
10-percent AEP flood	8710	ft^3/s	28.9
4-percent AEP flood	11300	ft^3/s	31.6
2-percent AEP flood	13500	ft^3/s	34.8
1-percent AEP flood	15900	ft^3/s	37.8
0.5-percent AEP flood	18500	ft^3/s	41.6
0.2-percent AEP flood	22300	ft^3/s	46.1

Peak-Flow Statistics Citations

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

Low-Flow Statistics

Low-Flow Statistics Parameters [Low Flow Region 3]

Parameter Code	Parameter Name	Value	Units	Min Limit	Max Limit
DRNAREA	Drainage Area	164	square miles	2.33	1720
ELEV	Mean Basin Elevation	1727	feet	898	2700
PRECIP	Mean Annual Precipitation	44	inches	38.7	47.9

Low-Flow Statistics Flow Report [Low Flow Region 3]

PIL: Lower 90% Prediction Interval, PIU: Upper 90% Prediction Interval, ASEp: Average Standard Error of Prediction, SE: Standard Error, PC: Percent Correct, RMSE: Root Mean Squared Error, PseudoR^2: Pseudo R Squared (other -- see report)

Statistic	Value	Unit	SE	ASEp
7 Day 2 Year Low Flow	20.9	ft^3/s	43	43
30 Day 2 Year Low Flow	28.3	ft^3/s	38	38
7 Day 10 Year Low Flow	11.1	ft^3/s	54	54
30 Day 10 Year Low Flow	14.3	ft^3/s	49	49
90 Day 10 Year Low Flow	20.2	ft^3/s	41	41

Low-Flow Statistics Citations

Stuckey, M.H.,2006, Low-flow, base-flow, and mean-flow regression equations for Pennsylvania streams: U.S. Geological Survey Scientific Investigations Report 2006-5130, 84 p. (http://pubs.usgs.gov/sir/2006/5130/)

Annual Flow Statistics

Annual Flow Statistics Parameters [Statewide Mean and Base Flow]

Parameter Code	Parameter Name	Value	Units	Min Limit	Max Limit
DRNAREA	Drainage Area	164	square miles	2.26	1720
ELEV	Mean Basin Elevation	1727	feet	130	2700
PRECIP	Mean Annual Precipitation	44	inches	33.1	50.4
FOREST	Percent Forest	79.5887	percent	5.1	100
URBAN	Percent Urban	2.1493	percent	0	89

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

PIL: Lower 90% Prediction Interval, PIU: Upper 90% Prediction Interval, ASEp: Average Standard Error of Prediction, SE: Standard Error, PC: Percent Correct, RMSE: Root Mean Squared Error, PseudoR^2: Pseudo R Squared (other -- see report)

Statistic	Value	Unit	SE	ASEp
Mean Annual Flow	295	ft^3/s	12	12

Annual Flow Statistics Citations

Stuckey, M.H.,2006, Low-flow, base-flow, and mean-flow regression equations for Pennsylvania streams: U.S. Geological Survey Scientific Investigations Report 2006-5130, 84 p. (http://pubs.usgs.gov/sir/2006/5130/)

General Flow Statistics

General Flow Statistics Parameters [Statewide Mean and Base Flow]

Parameter Code	Parameter Name	Value	Units	Min Limit	Max Limit
DRNAREA	Drainage Area	164	square miles	2.26	1720
PRECIP	Mean Annual Precipitation	44	inches	33.1	50.4
CARBON	Percent Carbonate	0	percent	0	99
FOREST	Percent Forest	79.5887	percent	5.1	100
URBAN	Percent Urban	2.1493	percent	0	89

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

PIL: Lower 90% Prediction Interval, PIU: Upper 90% Prediction Interval, ASEp: Average Standard Error of Prediction, SE: Standard Error, PC: Percent Correct, RMSE: Root Mean Squared Error, PseudoR^2: Pseudo R Squared (other -- see report)

Statistic	Value	Unit	SE	ASEp
Harmonic Mean Streamflow	79	ft^3/s	38	38

General Flow Statistics Citations

Stuckey, M.H.,2006, Low-flow, base-flow, and mean-flow regression equations for Pennsylvania streams: U.S. Geological Survey Scientific Investigations Report 2006-5130, 84 p. (http://pubs.usgs.gov/sir/2006/5130/)

Application Version: 4.24.0
StreamStats Services Version: 1.2.22
NSS Services Version: 2.2.1

WQM7.0 Model Results

Input Data WQM 7.0

SWP Basin	Stream Code	Stream Name	RMI	Elevation (ft)	Drainage Area (sq mi)	Slope (ft/ft)	PWS Withdrawal (mgd)	Apply FC
18C	43255	LOYALHANNA CREEK	**32.600**	1080.00	164.00	0.00400	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	0.037	0.00	0.00	0.000	0.000	10.0	0.00	0.00	20.00	7.00	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
Darlington	PA0254401	0.1560	0.1560	0.1560	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

SWP Basin	Stream Code	Stream Name	RMI	Elevation (ft)	Drainage Area (sq mi)	Slope (ft/ft)	PWS Withdrawal (mgd)	Apply FC
18C	43255	LOYALHANNA CREEK	**31.600**	1059.00	180.00	0.00400	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	0.037	0.00	0.00	0.000	0.000	10.0	0.00	0.00	20.00	7.00	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

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	0.64	Use Inputted Reach Travel Times	☐
Q30-10/Q7-10 Ratio	1.36	Temperature Adjust Kr	☑
D.O. Saturation	85.00%	Use Balanced Technology	☑
D.O. Goal	6		

WQM 7.0 Hydrodynamic Outputs

SWP Basin	Stream Code	Stream Name
18C	43255	LOYALHANNA 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 (°C)	Analysis pH
Q7-10 Flow												
32.600	6.00	0.00	6.00	.2413	0.00400	.758	43.99	58.04	0.19	0.326	20.19	7.00
Q1-10 Flow												
32.600	3.84	0.00	3.84	.2413	0.00400	NA	NA	NA	0.15	0.414	20.30	7.00
Q30-10 Flow												
32.600	8.16	0.00	8.16	.2413	0.00400	NA	NA	NA	0.22	0.276	20.14	7.00

WQM 7.0 Wasteload Allocations

SWP Basin	Stream Code	Stream Name
18C	43255	LOYALHANNA 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
32.600	Darlington	16.35	50	16.35	50	0	0

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
32.600	Darlington	1.87	25	1.87	25	0	0

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)		
32.60	Darlington	25	25	25	25	3	3	0	0

WQM 7.0 D.O.Simulation

SWP Basin	Stream Code	Stream Name
18C	43255	LOYALHANNA CREEK

RMI	Total Discharge Flow (mgd)	Analysis Temperature (°C)	Analysis pH
32.600	0.156	20.193	7.000
Reach Width (ft)	**Reach Depth (ft)**	**Reach WDRatio**	**Reach Velocity (fps)**
43.987	0.758	58.043	0.187
Reach CBOD5 (mg/L)	**Reach Kc (1/days)**	**Reach NH3-N (mg/L)**	**Reach Kn (1/days)**
2.89	0.424	0.97	0.710
Reach DO (mg/L)	**Reach Kr (1/days)**	**Kr Equation**	**Reach DO Goal (mg/L)**
8.040	7.152	Tsivoglou	6
Reach Travel Time (days)			
0.326			

Subreach Results

TravTime (days)	CBOD5 (mg/L)	NH3-N (mg/L)	D.O. (mg/L)
0.033	2.85	0.94	7.76
0.065	2.81	0.92	7.76
0.098	2.77	0.90	7.76
0.131	2.73	0.88	7.76
0.163	2.69	0.86	7.76
0.196	2.66	0.84	7.76
0.228	2.62	0.82	7.76
0.261	2.58	0.80	7.76
0.294	2.55	0.78	7.76
0.326	2.51	0.77	7.76

WQM 7.0 Effluent Limits

SWP Basin	Stream Code	Stream Name
18C	43255	LOYALHANNA 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)
32.600	Darlington	PA0254401	0.156	CBOD5	25		
				NH3-N	25	50	
				Dissolved Oxygen			3