

Application Type Renewal  
 Facility Type Non-Municipal  
 Major / Minor Minor

**NPDES PERMIT FACT SHEET  
INDIVIDUAL SEWAGE**

Application No. PA0032069  
 APS ID 1115368  
 Authorization ID 1488060

**Applicant and Facility Information**

Applicant Name	<u>St. Francis University</u>	Facility Name	<u>St. Francis University WTP</u>
Applicant Address	<u>111 Juniper Lane</u> <u>Loretto, PA 15940-9739</u>	Facility Address	<u>428 Metz Road</u> <u>Loretto, PA 15940-0600</u>
Applicant Contact	<u>David Williams</u>	Facility Contact	<u></u>
Applicant Phone	<u>(814) 472-3251</u>	Facility Phone	<u></u>
Client ID	<u>72523</u>	Site ID	<u>246281</u>
Ch 94 Load Status	<u>Not Overloaded</u>	Municipality	<u>Loretto Borough</u>
Connection Status	<u></u>	County	<u>Cambria</u>
Date Application Received	<u>June 5, 2024</u>	EPA Waived?	<u>Yes</u>
Date Application Accepted	<u>June 11, 2024</u>	If No, Reason	<u></u>
Purpose of Application	<u>Renewal of existing NPDES permit for discharge of treated sewage.</u>		

**Summary of Review**

The applicant has applied for renewal of NPDES Permit No. PA0032069 on June 5, 2024. The application was accepted June 11, 2024.

Act 14 Notification was provided to Cambria County, Allegheny Township, and Loretto Borough in the letters dated April 4, 2024.

There are no open violations associated with this facility.

The receiving stream, UNT to Clearfield Creek, is classified as a CWF and is located in State Watershed No. 8-C.

The existing facility is an extended aeration facility consisting of flow equalization, aeration tanks, final clarifiers, chlorination/dechlorination, and a belt filter press.

A WQM Permit, No. 1170405 A-1 was issued August 6, 2024. The WQM Permit authorizes construction of a facility to replace the existing facility. The new facility will consist of a headworks with screening, three sequencing batch reactor tanks, dual UV disinfection chambers, and effluent aeration. Solids are treated by aerobic digestion followed by a rotary sludge dewatering press.

Sludge use and disposal description and location(s): Hauled to landfill.

Issuance of the draft permit is recommended.

Approve	Deny	Signatures	Date
x		 Jack Price / Environmental Engineering Specialist	September 17, 2024
x		 Mahbuba Iasmin, Ph.D., P.E. / Environmental Engineering Manager	October 4, 2024

**Summary of Review**

Public Participation

DEP will publish notice of the receipt of the NPDES permit application and a tentative decision to issue the individual NPDES permit in the *Pennsylvania Bulletin* in accordance with 25 Pa. Code § 92a.82. Upon publication in the *Pennsylvania Bulletin*, DEP will accept written comments from interested persons for a 30-day period (which may be extended for one additional 15-day period at DEP's discretion), which will be considered in making a final decision on the application. Any person may request or petition for a public hearing with respect to the application. A public hearing may be held if DEP determines that there is significant public interest in holding a hearing. If a hearing is held, notice of the hearing will be published in the *Pennsylvania Bulletin* at least 30 days prior to the hearing and in at least one newspaper of general circulation within the geographical area of the discharge.

Discharge, Receiving Waters and Water Supply Information			
Outfall No.	<u>001</u>	Design Flow (MGD)	<u>0.318</u>
Latitude	<u>40° 29' 53.00</u>	Longitude	<u>-78° 37' 59.00"</u>
Quad Name	<u>Ebensburg</u>	Quad Code	<u>1516</u>
Wastewater Description: <u>Sewage Effluent</u>			
Receiving Waters	<u>Unnamed Tributary to Clearfield Creek (CWF, MF)</u>	Stream Code	<u>UNT 26573</u>
NHD Com ID	<u>61839135</u>	RMI	<u>2.54</u>
Drainage Area	<u>0.102</u>	Yield (cfs/mi <sup>2</sup> )	<u>0.0626</u>
Q <sub>7-10</sub> Flow (cfs)	<u>1.63</u>	Q <sub>7-10</sub> Basis	<u>USGS StreamStats (Attachment 1)</u>
Elevation (ft)	<u>1809.21</u>	Slope (ft/ft)	<u>0.00403</u>
Watershed No.	<u>8-C</u>	Chapter 93 Class.	<u>CWF, MF</u>
Existing Use	<u></u>	Existing Use Qualifier	<u></u>
Exceptions to Use	<u></u>	Exceptions to Criteria	<u></u>
Assessment Status	<u>Attaining Use(s)</u>		
Cause(s) of Impairment	<u></u>		
Source(s) of Impairment	<u></u>		
TMDL Status	<u>Final</u>	Name	<u>Clearfield Creek</u>
Background/Ambient Data	Data Source		
pH (SU)	<u></u>	<u></u>	
Temperature (°F)	<u></u>	<u></u>	
Hardness (mg/L)	<u></u>	<u></u>	
Other:	<u></u>	<u></u>	
Nearest Downstream Public Water Supply Intake	<u>Shawville Power Plant PWSID 6170333 (1.953 MGD)</u>		
PWS Waters	<u>West Branch Susquehanna River</u>	Flow at Intake (cfs)	<u></u>
PWS RMI	<u>164.27</u>	Distance from Outfall (mi)	<u>41.80 Linear Miles</u> <u>78.96 River Miles</u>

**Changes Since Last Permit Issuance**

A WQM Permit to modify the facility has been issued by DEP. WQM Permit 1170405 A-1 authorizes construction of a new facility to replace the existing facility. The new facility consists of a Sequencing Batch Reactor (SBR), with Ultraviolet (UV) Disinfection.

The previous permit listed PA American Water Company on the West Branch Susquehanna River as the nearest downstream PWS intake. A review of eMapPA has determined that the nearest downstream PWS is currently the Shawville Power Plant. The PWS intake is sufficiently far downstream from the discharge that modelling of the effluent effect on the intake is not necessary.

The previous model for Ammonia Nitrogen, DO, and CBOD<sub>5</sub> was in 1993. A new model in WQM 7.0 and TRC for this facility. USGS StreamStats was used as the Q<sub>7-10</sub> Basis.

**Changes Since Last Permit Issuance (continued)**

The following limitation was added based on the SOP for Sewage Effluent Limitations.

- Quarterly E. Coli monitoring is now added.

The following limitation was changed to correct a mistaken interpretation of policy:

- Minimum Dissolved Oxygen was revised from 6.0 mg/L to 4.0 mg/L.

Please see the Anti-Backsliding section for more information.

The following changes to permit limitations resulted from an Updated WQM 7.0 Model of the discharge:

- Average monthly Summer Ammonia Nitrogen concentration limit was reduced from 6.4 mg/L to 4.0 mg/L.
- Average monthly Summer Ammonia Nitrogen mass limit was reduced from 6.5 lbs/day to 5.8 lbs/day.
- Average Weekly Summer Ammonia Nitrogen concentration limit was reduced from 3.8 mg/L to 3.3 mg/L.
- Average Weekly Summer Ammonia Nitrogen mass limit was reduced from 10.0 lbs/day to 8.7 lbs/day.
- Instantaneous Summer Ammonia concentration limit was reduced from 5.0 mg/L to 4.4 mg/L.
- Average monthly Winter Ammonia Nitrogen concentration limit was reduced from 2.5 mg/L to 2.2 mg/L.
- Average monthly Winter Ammonia Nitrogen mass limit was reduced from 16.5 lbs/day to 10.0 lbs/day.
- Average Weekly Winter Ammonia Nitrogen concentration limit was reduced from 9.6 mg/L to 6.0 mg/L.
- Average Weekly Winter Ammonia Nitrogen mass limit was reduced from 25.0 lbs/day to 15.0 lbs/day.
- Instantaneous Winter Ammonia concentration limit was reduced from 12.8 mg/L to 8.0 mg/L.

The following change to permit limitations resulted from an updated TRC\_Calc model of the discharge:

- Average monthly TRC concentration limit was reduced from 0.11 mg/L to 0.03 mg/L.
- Instantaneous TRC concentration limit was reduced from 0.19 mg/L to 0.12 mg/L.

Treatment Facility Summary				
<b>Treatment Facility Name:</b> St. Francis University STP				
<b>WQM Permit No.</b>	<b>Issuance Date</b>			
1170405	06/16/1986			
1170405 A-1	08/06/2024			
Existing Facility				
<b>Waste Type</b>	<b>Degree of Treatment</b>	<b>Process Type</b>	<b>Disinfection</b>	<b>Avg Annual Flow (MGD)</b>
Sewage	Secondary with Ammonia Reduction	Extended Aeration	Chlorination with Dechlorination	0.263
New Facility				
<b>Waste Type</b>	<b>Degree of Treatment</b>	<b>Process Type</b>	<b>Disinfection</b>	<b>Design Flow (MGD)</b>
Sewage	Secondary with Ammonia Reduction	Sequencing Batch Reactor	Ultraviolet (UV)	0.318
<b>Hydraulic Capacity (MGD)</b>	<b>Organic Capacity (lbs/day)</b>	<b>Load Status</b>	<b>Biosolids Treatment</b>	<b>Biosolids Use/Disposal</b>
0.318	632	Not Overloaded	Rotary Press Sludge Dewatering	Hauled to landfill.

Changes Since Last Permit Issuance: The aforementioned WQM Permit No. 1170405 A-1 changes the treatment process type and the disinfection method. The permit limitations will be updated to reflect the change in disinfection method. Footnotes will be added to the Part A Effluent Limitation Conditions will be added to the Permit to reflect the upcoming change to a Sequencing Batch Reactor and the upcoming change in disinfection process.

## Operations Compliance Check Summary Report

**Facility:** St. Francis University STP

**NPDES Permit No.:** PA0032069

**Compliance Review Period:** 09/01/2019-07/01/2024

**Inspection Summary:**

INSPECTED DATE	INSP TYPE	AGENCY	INSPECTION RESULT DESC
11/23/2022	Administrative/File Review	PA Dept of Environmental Protection	No Violations Noted
02/25/2020	Compliance Evaluation	PA Dept of Environmental Protection	No Violations Noted

**Violation Summary:**

No eFACTS violations within the compliance review period.

**Open Violations by Client ID:**

No open violations for Client ID 72523.

**Enforcement Summary:**

No WMS Enforcement Actions within the compliance review period.

**Compliance Status:**

Facility does not currently have any open violations or pending enforcements. A final compliance status will be determined at permit issuance.

Compliance History

DMR Data for Outfall 001 (from August 1, 2023 to July 31, 2024)

Parameter	JUL-24	JUN-24	MAY-24	APR-24	MAR-24	FEB-24	JAN-24	DEC-23	NOV-23	OCT-23	SEP-23	AUG-23
Flow (MGD) Average Monthly	0.047	0.042	0.061	0.144	0.097	0.097	0.121	0.059	0.093	0.108	0.092	0.075
Flow (MGD) Daily Maximum	0.069	0.055	0.113	0.437	0.223	0.139	0.301	0.107	0.168	0.174	0.123	0.151
pH (S.U.) Daily Minimum	6.8	6.9	6.6	6.7	6.6	6.7	6.8	6.7	6.8	6.6	6.1	6.7
pH (S.U.) Daily Maximum	7.3	7.4	7.3	7.2	7.1	7.2	7.3	7.4	7.2	7.1	7.1	7.1
DO (mg/L) Daily Minimum	6.5	6.3	6.1	6.0	6.3	6.2	6.3	6.1	6.1	6.1	6.4	6.0
TRC (mg/L) Average Monthly	0.023	0.03	0.0232	0.041	0.03	0.019	0.019	0.02	0.019	0.033	0.038	0.02
TRC (mg/L) Instantaneous Maximum	0.17	0.15	0.16	0.49	0.14	0.14	0.12	0.06	0.11	0.16	0.18	0.13
CBOD5 (lbs/day) Average Monthly	< 0.22	< 0.12	< 0.26	< 3.38	< 0.4401	< 0.0957	< 0.1280	< 1.48	< 2.940	< 3.3	< 6.7	< 2.069
CBOD5 (lbs/day) Weekly Average	< 1.0	< 0.60	< 1.2	< 25.40	< 3.411	< 2.777	< 3.969	< 2.39	< 4.19	6.03	< 16.5	< 3.77
CBOD5 (mg/L) Average Monthly	< 0.5	< 0.10	< 0.11	< 1.33	0.563	< 0.114	< 0.1197	< 3.00	< 3.00	< 4.9	< 8.3	< 3.00
CBOD5 (mg/L) Weekly Average	< 2.2	< 0.5	< 0.5	< 9.97	< 4.37	< 3.30	< 3.712	< 3.00	< 3.00	10.5	< 20.0	< 3.00
TSS (lbs/day) Average Monthly	< 0.01	< 0.104	< 0.34	17.783	0.525	< 0.0776	0.1346	0.91	< 3.92	< 3.7	5.7	< 4.7
TSS (lbs/day) Weekly Average	< 0.04	< 0.45	< 1.5	133.37	4.07	< 2.251	4.174	1.28	8.94	8.1	6.7	18.12
TSS (mg/L) Average Monthly	< 0.02	< 0.08	< 0.12	5.98	0.607	< 0.093	0.1213	1.90	< 3.84	< 5.8	7.3	< 4.40
TSS (mg/L) Weekly Average	< 0.08	< 0.32	< 0.51	44.85	4.70	< 2.70	3.76	2.40	6.40	14.0	10.0	14.4
Fecal Coliform (No./100 ml) Geometric Mean	59.370	< 11.213	4.206	< 11.228	< 7.141	163.95	< 18.86	< 2.415	6.242	21.19	36.049	10.591

Fecal Coliform (No./100 ml) Instantaneous Maximum	313	50.4	9.8	7945.2	52.0	2419.6	122.3	8.5	37.4	361.0	290.9	133.4
Total Nitrogen (mg/L) Daily Maximum	< 36.79	< 41.24	< 45.68	< 31.11	< 42.71	< 49.06	25.93	< 44.22	48.32	< 55.4	57.08	< 41.48
Ammonia (lbs/day) Average Monthly	< 0.01	< 0.005	< 0.0112	< 0.1347	< 0.011	< 0.0029	< 0.016	< 0.0493	< 0.099	0.16	< 0.2830	< 0.1317
Ammonia (lbs/day) Weekly Average	< 0.04	< 0.02	< 0.0497	< 1.010	< 0.083	< 0.0837	< 0.4969	< 0.0798	< 0.140	0.32	0.5668	0.4393
Ammonia (mg/L) Average Monthly	< 0.02	< 0.004	< 0.0040	< 0.0502	< 0.013	< 0.1000	< 0.01616	< 0.1000	< 0.1000	0.22	< 0.3584	< 0.1873
Ammonia (mg/L) Weekly Average	< 0.07	< 0.02	< 0.0178	< 0.3768	< 0.1000	< 0.1000	< 0.5010	< 0.1000	< 0.100	0.43	0.6893	0.3493
Total Phosphorus (mg/L) Daily Maximum	5.78	7.69	3.376	5.40	4.24	5.32	4.58	5.34	5.42	5.80	6.35	7.25
Total Aluminum (mg/L) Daily Maximum									< 0.100			
Total Iron (mg/L) Daily Maximum									< 0.200			
Total Manganese (mg/L) Daily Maximum									< 0.0200			

**Compliance History**

**Effluent Violations for Outfall 001, from: September 1, 2023 To: July 31, 2024**

Parameter	Date	SBC	DMR Value	Units	Limit Value	Units
TRC	04/30/24	IMAX	0.49	mg/L	.19	mg/L
TSS	04/30/24	Wkly Avg	133.37	lbs/day	115.0	lbs/day

**Development of Effluent Limitations**

<b>Outfall No.</b> <u>001</u>	<b>Design Flow (MGD)</b> <u>.318</u>
<b>Latitude</b> <u>40° 29' 53.00"</u>	<b>Longitude</b> <u>-78° 37' 59.00"</u>
<b>Wastewater Description:</b> <u>Sewage Effluent</u>	

**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 <sub>5</sub>	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)

Comments: The proposed discharge was evaluated using WQM 7.0 to evaluate CBOD<sub>5</sub>, Ammonia Nitrogen, and Dissolved Oxygen Parameters. The modeling results show technology based effluent limitations for CBOD<sub>5</sub> (November 1st to April 30th) are sufficient, therefore the TBELs will be used for winter months.

**Water Quality-Based Limitations**

The following limitations were determined through water quality modeling (output files attached):

Parameter	Limit (mg/l)	SBC	Model
Ammonia-Nitrogen (May 1 to Oct 31)	2.2	Average Monthly	WQM 7.0 Version 1.1
Ammonia-Nitrogen (Nov 1 to Apr 30)	4.0	Average Monthly	WQM 7.0 Version 1.1
Dissolved Oxygen	4.0	Average Monthly	WQM 7.0 Version 1.1
TRC	0.03	Average Monthly	TRC_Calc

Comments: DMR Data shows that the applicant will be able to comply with the new more stringent ammonia nitrogen limitations. While there is an effluent violation for TRC Maximum, the facility is equipped with dechlorination equipment, and should be able to achieve the new TRC limit with proper operation. In addition, the facility will be changing to an Ultraviolet (UV) Disinfection system. This will eliminate the TRC discharge entirely.

The WQM Model was run for both winter and summer conditions, with the downstream Loretto Federal Corrections Institution (PA0034797) included in the model.

The TRC\_Calc Report recommends a limit of 0.039 mg/L. Applying the rounding guidance from the Permit Writers Manual, the TRC Limit is 0.03 mg/L.

The WQM 7.0 Model Report recommended a summer CBOD<sub>5</sub> limit of 25.0 mg/, however the existing limit of 20.0 mg/L is more stringent. The more stringent limit will be imposed as the effluent limitation. Please see the Anti-Backsliding section for more information on this decision.

### **Best Professional Judgment (BPJ) Limitations**

Comments: N/A

### **Anti-Backsliding**

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

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

*(40 CFR 122.44 (l)(2) Establishing limitations, standards, and other permit conditions., 40 CFR Ch. I (7-1-21 Edition))*

There is a permit limitation listed under the Proposed Backsliding section below that will be made less stringent under 112.44 (l)(2)(i). All other limits will remain the same or will become more stringent.

### **Proposed Backsliding**

The following exceptions to anti-backsliding are acceptable under EPA's anti-backsliding regulation 40 CFR 122.44(l)(2)(i):

(A) Material and substantial alterations or additions to the permitted facility occurred after permit issuance which justify the application of a less stringent effluent limitation;

(B)

(1) Information is available which was not available at the time of permit issuance (other than revised regulations, guidance, or test methods) and which would have justified the application of a less stringent effluent limitation at the time of permit issuance; or

(2) The Administrator determines that technical mistakes or mistaken interpretations of law were made in issuing the permit under section 402(a)(1)(b);

(C) A less stringent effluent limitation is necessary because of events over which the permittee has no control and for which there is no reasonably available remedy;

(D) The permittee has received a permit modification under section 301(c), 301(g), 301(h), 301(i), 301(k), 301(n), or 316(a); or

(E) The permittee has installed the treatment facilities required to meet the effluent limitations in the previous permit and has properly operated and maintained the facilities but has nevertheless been unable to achieve the previous effluent limitations, in which case the limitations in the reviewed, reissued, or modified permit may reflect the level of pollutant control actually achieved (but shall not be less stringent than required by effluent guidelines in effect at the time of permit renewal, reissuance, or modification).

*(40 CFR 122.44 (l)(2)(i) Establishing limitations, standards, and other permit conditions., 40 CFR Ch. I (7-1-21 Edition))*

The following list contains proposed effluent limitations that will be less stringent, along with a justification under the anti-backsliding regulation. All other permit limitations will be unchanged or will be more stringent than the existing limitations.

- The minimum Dissolved Oxygen will be reduced from 6.0 mg/L to 4.0 mg/L. The previous permit carried over a limit imposed based on a mistaken interpretation of policy. The WQM 7.0 Model report demonstrates that this discharge to the receiving waters in combination with other discharges to same receiving waters will not result in a violation of water quality standards. 40 CFR 122.44(l)(2)(i)(B)(2) allows a relaxation of effluent limitations under the circumstances described.

### **Chesapeake Bay TMDL**

The receiving stream for this discharge is an unnamed tributary to Clearfield Creek. The receiving stream for this discharge is located in the Chesapeake Bay Watershed. On December 29, 2010, the U.S. Environmental Protection Agency (EPA) published a final TMDL for Nitrogen, Phosphorus and Sediment in the Chesapeake Bay. Section 1 of the TMDL requires Pennsylvania to reduce its overall pollutant loading of nitrogen, phosphorus and sediment.

In August 2019, the PA Department of Environmental Protection (DEP) published the final Pennsylvania Phase 3 Chesapeake Bay Watershed Implementation Plan (Phase 3 WIP). The WIP was amended in 2022. Section 2 of the Phase 3 WIP describes Pennsylvania's strategy for reducing nutrients to the Chesapeake Bay from wastewater facilities. There is also a Phase 3 Watershed Implementation Plan Wastewater Supplement, revised July 2022, (Supplement) that provides an update on Chesapeake Bay TMDL implementation activities for point sources and DEP's current implementation strategy for wastewater.

The Saint Francis University STP is not listed as a Significant Chesapeake Bay Sewage Permit in the Phase 3 WIP or The Supplement. Section D of The Supplement will be used to meet the requirements of the Phase 3 WIP.

The Saint Francis University STP has a design flow of 0.318 MGD and is therefore a Phase 4 Sewage Facility as defined by The Supplement. There is no proposed increase in flow of this discharge for this renewal. Under Section III.D of The Supplement and Section IV.E.7 of the SOP for Sewage Effluent Limitations, monthly monitoring of Total Nitrogen and Total Phosphorus will be established for the discharge.

The Chesapeake Bay TMDL may be found at the following URL:  
<https://www.epa.gov/chesapeake-bay-tmdl/chesapeake-bay-tmdl-document>

The Phase 3 WIP may be found at the following URL:  
[https://files.dep.state.pa.us/Water/ChesapeakeBayOffice/WIPIII/FinalPlan/FINAL\\_AMENDED\\_PA\\_PHASE\\_3\\_WIP.pdf](https://files.dep.state.pa.us/Water/ChesapeakeBayOffice/WIPIII/FinalPlan/FINAL_AMENDED_PA_PHASE_3_WIP.pdf)

The Supplement may be found at the following URL:  
[https://files.dep.state.pa.us/water/Wastewater%20Management/eDMRPortalFiles/Phase\\_2\\_WIP\\_Supplement.pdf](https://files.dep.state.pa.us/water/Wastewater%20Management/eDMRPortalFiles/Phase_2_WIP_Supplement.pdf)

### **Clearfield Creek TMDL**

The receiving stream for this discharge is an unnamed tributary to Clearfield Creek. The receiving stream for this discharge is located in the Clearfield Creek Watershed. On January 19, 2007, the PA Department of Environmental Protection (DEP) published a final TMDL for Acid Mine Drainage (AMD) in the Clearfield Creek Watershed. Acid Mine Drainage parameters in this TMDL consist of Total Aluminum, Total Iron, Total Manganese, and pH.

The TMDL does not contain a waste load allocation for sewage facilities in general, nor Saint Francis University STP specifically. This discharge of treated sewage effluent is not expected to contribute to the impairment for AMD within the Clearfield Creek Watershed.

Under Section II.I of the SOP for Sewage Effluent Limitations and the Clearfield Creek TMDL, monitoring for Total Aluminum, Total Iron, and Total Manganese will be established for this discharge. Monitoring for these parameters will have the same sample type as is used for the other main parameters such as CBOD<sub>5</sub> and TSS. Monitoring for these parameters will be specified as Daily Max Reporting.

The Clearfield Creek TMDL may be found at the following URL:  
[https://www.dep.state.pa.us/dep/deputate/watermgt/wqp/wqstandards/TMDL/Clearfield\\_Creek\\_TMDL.PDF](https://www.dep.state.pa.us/dep/deputate/watermgt/wqp/wqstandards/TMDL/Clearfield_Creek_TMDL.PDF)

**Chlorine Disinfection**

Disinfection at this facility is provided by two chlorine contact tanks. Per the SOP for effluent limitations and the recommendations from the TRC\_Calc Model, a monthly limit of 0.03 mg/L and an instantaneous maximum of 0.12 mg/L is established for TRC. The chlorine disinfection equipment will be removed from service upon startup of the UV Disinfection facilities. Special footnote (3) has been added in Part A of the Draft Permit when TRC reporting is applicable.

*(Section I.A, Note 3, SOP for Clean Water Program, Establishing Effluent Limitations for Individual Sewage Permits, Final November 9, 2012, Revised March 24, 2021, Version 1.9 and 25 PA Code 92a.61(b).)*

**Ultraviolet Disinfection**

A WQM Permit approving construction of Ultraviolet (UV) disinfection facilities has been approved and will start up during this permit cycle. When Ultraviolet (UV) is the only disinfection process being used for a discharge, Total Residual Chlorine (TRC) limits are not applicable. Routine monitoring of UV intensity is at the same monitoring frequency that is used for TRC. Special footnote (4) has been added in Part A of the Draft Permit when UV reporting is applicable.

*(Section I.A, Note 4, SOP for Clean Water Program, Establishing Effluent Limitations for Individual Sewage Permits, Final November 9, 2012, Revised March 24, 2021, Version 1.9 and 25 PA Code 92a.61(b).)*

**Additional Considerations**

This facility is in the Chesapeake Bay Watershed and is considered a Phase 4 facility, therefore the Part C permit conditions for nutrient definitions are included in the permit.

*(Attachment A SOP-New and Reissuance Sewage Individual NPDES Permit Applications, Final November 9, 2012, Revised February 3, 2024, Version 2.0.)*

This facility will operate as Sequencing Batch Reactor (SBR) sewage treatment plant during the permit term, therefore the part C permit conditions applicable to SBRs are included in the permit.

*(Attachment A SOP-New and Reissuance Sewage Individual NPDES Permit Applications, Final November 9, 2012, Revised February 3, 2024, Version 2.0.)*

Sewage discharges will include monitoring, at a minimum, for *E. Coli*, in new and reissued permits, with a monitoring frequency of 1/quarter for design flows  $\geq 0.05$  and  $< 1$  MGD.

*(Note 12 SOP-Establishing Effluent Limitations for Individual Sewage Permits Final November 9, 2012, Revised February 5, 2024, Version 2.0. and 25 PA Code 92a.61(b).)*

**Additional Considerations (Continued)**

Rounding-Off Mathematical Values. Section 5 C.2. of the Permit Writers Manual contains general guidelines for rounding conventional and toxic pollutants, with instructions to round down to the nearest decimal place indicated.

<u>General Magnitude</u>	<u>Conventional Pollutants</u>	<u>Toxic Pollutants</u>
<0.01	to nearest 0.001	to nearest 0.001
0.01 - 0.1	to nearest 0.01	to nearest 0.01
0.1 - 1.0	to nearest 0.1	to nearest 0.01
1.0 - 10.0	to nearest 0.5	to nearest 0.01
10.0 - 60.0	to nearest 1.0	to nearest 0.01
60.0 or greater	to nearest 5.0	to nearest 0.10

*(Department Technical Guidance for the Development and Specification of Effluent Limitations and Other Permit Conditions in NPDES Permits, Updated June 28, 2023 (Document No. 362-0400-001))*

Section 2.C of the Permit Writers Manual contains the procedure for converting average monthly effluent limitations to average weekly, maximum daily, and instantaneous maximum effluent limitations. The average monthly limit is multiplied according to the following chart:

<u>Discharge Solution</u>	<u>Parameters</u>	<u>Average Weekly</u>	<u>Maximum Daily</u>	<u>Instantaneous Maximum Multiplier</u>
Sewage	All	1.5		2.0
Industrial	All		2.0	2.5*

*(Department Technical Guidance for the Development and Specification of Effluent Limitations and Other Permit Conditions in NPDES Permits, Updated June 28, 2023 (Document No. 362-0400-001))*

Monitoring frequency for the proposed effluent limits are based upon Table 6-3, Self-Monitoring Requirements for Sewage Dischargers.

**Table 6-3 – Self-Monitoring Requirements for SEWAGE Discharges**

Plant Design Flow (MGD)	Flow Monitoring	C-BOD <sub>5</sub> or BOD <sub>5</sub>	Suspended Solids	pH	Fecal Coliform	Chlorine Residual	NH <sub>3</sub> -N	Phosphorus	DO	Toxics
Single Residence (Individual Permit)	2/year by estimate	2/year*	2/year*	1/month*	2/year*	1/month*	2/year*	2/year*	2/year*	N/A
.0005 to .002	weekly, using average pump rate or weir (a)	1/month*	1/month*	daily*	1/month*	daily*	1/month*	1/month*	daily*	N/A
.002 to .01	weekly, using average pump rate or weir (a)	2/month*	2/month*	daily*	2/month*	daily*	2/month*	2/month*	daily*	N/A
0.01 to 0.1	weekly, using average pump rate or weir (a)	2/month*	2/month*	daily*	2/month*	daily*	2/month*	2/month*	Daily*	1/week*
0.1 to 1.0	meter	1/week**	1/week**	daily*	1/week*	daily*	1/week**	1/week**	daily*	1/week****
1.0 to 5.0	meter	2/week***	2/week***	daily*	2/week*	daily*	2/week***	2/week***	daily*	1/week****
5.0 to 25.0	meter	daily***	daily***	daily*	daily*	1/shift*	daily***	daily***	daily*	1/week****
over 25.0	meter	daily***	daily***	1/shift*	daily*	1/shift*	1/shift***	1/shift***	1/shift*	1/week****

\* Grab sample-these should be most representative of the effluent and are to be taken at a time when the normal daily maximum flow would reach the sampling point.

\*\* 8-hour composite sample.

\*\*\* 24-hour composite sample.

\*\*\*\* Same sample type as for Industrial Process Wastewater (See Table 6-4).

**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) <sup>(1)</sup>		Concentrations (mg/L)				Minimum <sup>(2)</sup> Measurement Frequency	Required Sample Type
	Average Monthly	Weekly Average	Minimum	Average Monthly	Weekly Average	Instant. Maximum		
Flow (MGD)	0.318	Report Daily Max	XXX	XXX	XXX	XXX	1/week	Metered
pH (S.U.)	XXX	XXX	6.0 Daily Min	XXX	9.0 Daily Max	XXX	1/day	Grab
DO	XXX	XXX	6.0 Daily Min	XXX	XXX	XXX	1/day	Grab
TRC <sup>(3)</sup>	XXX	XXX	XXX	0.03	XXX	0.12	1/day	Grab
CBOD5 Nov 1 - Apr 30	65.0	100.0	XXX	25.0	38.0	50	1/week	8-Hr Composite
CBOD5 May 1 - Oct 31	50.0	75.0	XXX	20.0	30.0	40.0	1/week	8-Hr Composite
TSS	75.0	115.0	XXX	30.0	45.0	60.0	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
E. Coli (No./100 ml)	XXX	XXX	XXX	XXX	XXX	Report	1/quarter	Grab
Total Nitrogen	XXX	XXX	XXX	XXX	Report Daily Max	XXX	1/month	24-Hr Composite
Ammonia-Nitrogen Nov 1 - Apr 30	10.0	15.0	XXX	4.0	6.0	8.0	1/week	8-Hr Composite
Ammonia-Nitrogen May 1 - Oct 31	5.8	8.7	XXX	2.2	3.3	4.4	1/week	8-Hr Composite

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

Parameter	Effluent Limitations						Monitoring Requirements	
	Mass Units (lbs/day) <sup>(1)</sup>		Concentrations (mg/L)				Minimum <sup>(2)</sup> Measurement Frequency	Required Sample Type
	Average Monthly	Weekly Average	Minimum	Average Monthly	Weekly Average	Instant. Maximum		
Total Phosphorus	XXX	XXX	XXX	XXX	Report Daily Max	XXX	1/month	24-Hr Composite
Total Aluminum	XXX	XXX	XXX	XXX	Report Daily Max	XXX	1/year	8-Hr Composite
Total Iron	XXX	XXX	XXX	XXX	Report Daily Max	XXX	1/year	8-Hr Composite
Total Manganese	XXX	XXX	XXX	XXX	Report Daily Max	XXX	1/year	8-Hr Composite
UV Dosage (mJoules/cm <sup>2</sup> ) <sup>(4)</sup>	XXX	XXX	Report Daily Min.	XXX	XXX	XXX	1/day	Recorded

Compliance Sampling Location: Outfall 001

Other Comments: Disinfection process will change from Chlorination to UV after startup of the new facility approved for construction under WQM Permit No. 1170405 A-1.

Footnotes

- (1) When sampling to determine compliance with mass effluent limitations, the discharge flow at the time of sampling must be measured and recorded.
- (2) This is the minimum number of sampling events required. Permittees are encouraged, and it may be advantageous in demonstrating compliance, to perform more than the minimum number of sampling events.
- (3) For all discharges where chlorine disinfection is the only available process for disinfection, a discharge code of "GG" shall be entered into the UV Dosage Parameter.
- (4) For all discharges where UV Disinfection is the only available process for disinfection, a discharge code of "GG" shall be entered into the TRC Parameter.

**Attachment 1-USGS StreamStats Reports**

**Upstream StreamStats Report**

Region ID: PA  
 Workspace ID: PA20240911182337419000  
 Clicked Point (Latitude, Longitude): 40.49778, -78.63288  
 Time: 2024-09-11 14:24:20 -0400



PA0032069 Outlet Elevation: 1809.21 ft.

Collapse All

**> Basin Characteristics**

Parameter Code	Parameter Description	Value	Unit
DRNAREA	Area that drains to a point on a stream	1.63	square miles
ELEV	Mean Basin Elevation	1948	feet
OUTLETXA83	X coordinate of the outlet, in NAD_1983_Albers,meters	-53647.2639	meters
OUTLETYA83	Y coordinate of the outlet, in NAD_1983_Albers, meters	166479.3886	meters
PRECIP	Mean Annual Precipitation	46	inches

**> Low-Flow Statistics**

Low-Flow Statistics Parameters [Low Flow Region 3]

Parameter Code	Parameter Name	Value	Units	Min Limit	Max Limit
DRNAREA	Drainage Area	1.63	square miles	2.33	1720

Parameter Code	Parameter Name	Value	Units	Min Limit	Max Limit
ELEV	Mean Basin Elevation	1948	feet	898	2700
PRECIP	Mean Annual Precipitation	46	inches	38.7	47.9

Low-Flow Statistics Disclaimers [Low Flow Region 3]

One or more of the parameters is outside the suggested range. Estimates were extrapolated with unknown errors.

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

Statistic	Value	Unit
7 Day 2 Year Low Flow	0.23	ft <sup>3</sup> /s
30 Day 2 Year Low Flow	0.339	ft <sup>3</sup> /s
7 Day 10 Year Low Flow	0.102	ft <sup>3</sup> /s
30 Day 10 Year Low Flow	0.14	ft <sup>3</sup> /s
90 Day 10 Year Low Flow	0.206	ft <sup>3</sup> /s

*Low-Flow Statistics Citations*

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

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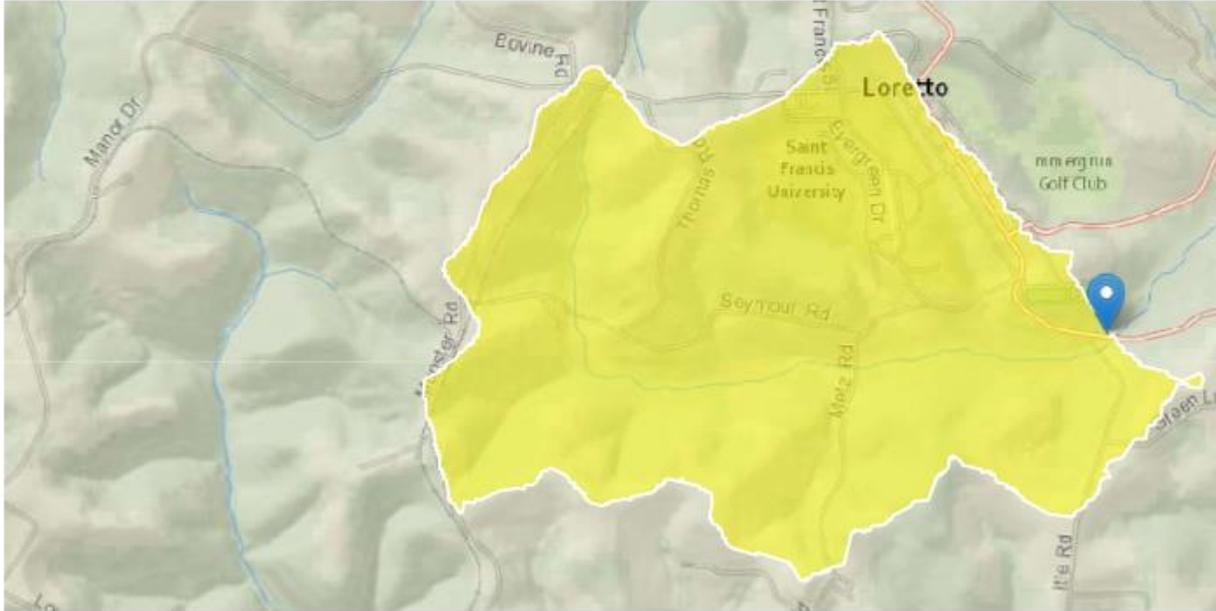
Application Version: 4.23.0

StreamStats Services Version: 1.2.22

NSS Services Version: 2.2.1

## Downstream StreamStats Report

Region ID: PA  
 Workspace ID: PA20240911183611091000  
 Clicked Point (Latitude, Longitude): 40.49825, -78.62578  
 Time: 2024-09-11 14:37:12 -0400



PA0032069 Outlet Elevation: 1801.15 ft.

[+ Collapse All](#)

### Basin Characteristics

Parameter Code	Parameter Description	Value	Unit
DRNAREA	Area that drains to a point on a stream	2.16	square miles
ELEV	Mean Basin Elevation	1940	feet
OUTLETXA83	X coordinate of the outlet, in NAD_1983_Albers, meters	-53042.3152	meters
OUTLETYA83	Y coordinate of the outlet, in NAD_1983_Albers, meters	166526.4956	meters
PRECIP	Mean Annual Precipitation	46	inches

➤ Low-Flow Statistics

Low-Flow Statistics Parameters [Low Flow Region 3]

Parameter Code	Parameter Name	Value	Units	Min Limit	Max Limit
DRNAREA	Drainage Area	2.16	square miles	2.33	1720
ELEV	Mean Basin Elevation	1940	feet	898	2700
PRECIP	Mean Annual Precipitation	46	inches	38.7	47.9

Low-Flow Statistics Disclaimers [Low Flow Region 3]

One or more of the parameters is outside the suggested range. Estimates were extrapolated with unknown errors.

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

Statistic	Value	Unit
7 Day 2 Year Low Flow	0.305	ft <sup>3</sup> /s
30 Day 2 Year Low Flow	0.448	ft <sup>3</sup> /s
7 Day 10 Year Low Flow	0.138	ft <sup>3</sup> /s
30 Day 10 Year Low Flow	0.187	ft <sup>3</sup> /s
90 Day 10 Year Low Flow	0.275	ft <sup>3</sup> /s

*Low-Flow Statistics Citations*

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

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Application Version: 4.23.0

StreamStats Services Version: 1.2.22

NSS Services Version: 2.2.1

## Attachment 2-WQM 7.0 Model Results

### Receiving Waters WQM 7.0 Model-Summer

#### 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
08C	26573	Trib 26573 to Clearfield Creek	2.540	1809.21	1.63	0.00000	0.00	<input checked="" type="checkbox"/>

#### 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)	pH	Stream Temp (°C)	pH
	Q7-10	0.063	0.00	0.00	0.000	0.000	10.0	0.00	0.00	20.00	7.00	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
SFU STP	PA0032069	0.3180	0.0000	0.0000	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	25.00	2.00	0.00	1.50
Dissolved Oxygen	4.00	9.17	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
08C	26573	Trib 26573 to Clearfield Creek	2.200	1801.98	1.63	0.00000	0.00	<input checked="" type="checkbox"/>

**Stream Data**

Design Cond.	LFY	Trib Flow	Stream Flow	Rch Trav Time	Rch Velocity	WD Ratio	Rch Width	Rch Depth	Tributary Temp	Tributary pH	Stream Temp	Stream pH
	(cfsm)	(cfs)	(cfs)	(days)	(fps)		(ft)	(ft)	(°C)		(°C)	
Q7-10	0.063	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
Loretto Prison	PA0034797	0.2000	0.0000	0.0000	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	25.00	2.00	0.00	1.50
Dissolved Oxygen	4.00	9.17	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
08C	26573	Trib 26573 to Clearfield Creek	2.160	1801.15	1.63	0.00000	0.00	<input checked="" type="checkbox"/>

**Stream Data**

Design Cond.	LFY	Trib Flow	Stream Flow	Rch Trav Time	Rch Velocity	WD Ratio	Rch Width	Rch Depth	Tributary		Stream	
	(cfsm)	(cfs)	(cfs)	(days)	(fps)		(ft)	(ft)	Temp (°C)	pH	Temp (°C)	pH
Q7-10	0.063	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	9.17	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
08C	26573	Trib 26573 to Clearfield Creek	1.820	1793.89	1.63	0.00000	0.00	<input checked="" type="checkbox"/>

**Stream Data**

Design Cond.	LFY	Trib Flow	Stream Flow	Rch Trav Time	Rch Velocity	WD Ratio	Rch Width	Rch Depth	Tributary Temp	Tributary pH	Stream Temp	Stream pH
	(cfsm)	(cfs)	(cfs)	(days)	(fps)		(ft)	(ft)	(°C)		(°C)	
Q7-10	0.063	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	9.17	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	<input checked="" type="checkbox"/>
WLA Method	EMPR	Use Inputted W/D Ratio	<input checked="" type="checkbox"/>
Q1-10/Q7-10 Ratio	0.64	Use Inputted Reach Travel Times	<input type="checkbox"/>
Q30-10/Q7-10 Ratio	1.36	Temperature Adjust Kr	<input checked="" type="checkbox"/>
D.O. Saturation	90.00%	Use Balanced Technology	<input checked="" type="checkbox"/>
D.O. Goal	5		

### WQM 7.0 Hydrodynamic Outputs

<u>SWP Basin</u>		<u>Stream Code</u>				<u>Stream Name</u>						
08C		26573				Trib 26573 to Clearfield 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
<b>Q7-10 Flow</b>												
2.540	0.10	0.00	0.10	.4919	0.00403	.655	6.55	10	0.14	0.150	20.00	7.00
2.200	0.10	0.00	0.10	.8013	0.00393	.719	7.19	10	0.17	0.014	20.00	7.00
2.160	0.10	0.00	0.10	.8013	0.00404	.718	7.18	10	0.18	0.119	20.00	7.00
<b>Q1-10 Flow</b>												
2.540	0.07	0.00	0.07	.4919	0.00403	NA	NA	NA	0.13	0.156	20.00	7.00
2.200	0.07	0.00	0.07	.8013	0.00393	NA	NA	NA	0.17	0.014	20.00	7.00
2.160	0.07	0.00	0.07	.8013	0.00404	NA	NA	NA	0.17	0.121	20.00	7.00
<b>Q30-10 Flow</b>												
2.540	0.14	0.00	0.14	.4919	0.00403	NA	NA	NA	0.14	0.145	20.00	7.00
2.200	0.14	0.00	0.14	.8013	0.00393	NA	NA	NA	0.18	0.014	20.00	7.00
2.160	0.14	0.00	0.14	.8013	0.00404	NA	NA	NA	0.18	0.116	20.00	7.00

### WQM 7.0 Wasteload Allocations

<u>SWP Basin</u>	<u>Stream Code</u>	<u>Stream Name</u>
08C	26573	Trib 26573 to Clearfield 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
2.540	SFU STP	9.67	10.96	9.67	10.86	2	1
2.200	Loretto Prison	9.67	11.72	9.67	11.61	2	1
2.160		NA	NA	9.67	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
2.540	SFU STP	1.92	2.46	1.92	2.27	2	8
2.200	Loretto Prison	1.92	2.78	1.92	2.57	2	8
2.160		NA	NA	1.92	NA	NA	NA

**Dissolved Oxygen Allocations**

RMI	Discharge Name	<u>CBOD5</u>		<u>NH3-N</u>		<u>Dissolved Oxygen</u>		Critical Reach	Percent Reduction
		Baseline (mg/L)	Multiple (mg/L)	Baseline (mg/L)	Multiple (mg/L)	Baseline (mg/L)	Multiple (mg/L)		
2.54	SFU STP	25	25	2.27	2.27	5	5	0	0
2.20	Loretto Prison	25	25	2.57	2.57	4	4	0	0
2.16		NA	NA	NA	NA	NA	NA	NA	NA

### WQM 7.0 D.O. Simulation

<u>SWP Basin</u>	<u>Stream Code</u>	<u>Stream Name</u>		
08C	26573	Trib 26573 to Clearfield Creek		
<u>RMI</u>	<u>Total Discharge Flow (mgd)</u>	<u>Analysis Temperature (°C)</u>	<u>Analysis pH</u>	
2.540	0.318	20.000	7.000	
<u>Reach Width (ft)</u>	<u>Reach Depth (ft)</u>	<u>Reach WDRatio</u>	<u>Reach Velocity (fps)</u>	
6.550	0.655	10.000	0.138	
<u>Reach CBOD5 (mg/L)</u>	<u>Reach Kc (1/days)</u>	<u>Reach NH3-N (mg/L)</u>	<u>Reach Kn (1/days)</u>	
21.05	1.473	1.88	0.700	
<u>Reach DO (mg/L)</u>	<u>Reach Kr (1/days)</u>	<u>Kr Equation</u>	<u>Reach DO Goal (mg/L)</u>	
5.716	12.619	Owens	5	
<u>Reach Travel Time (days)</u>	<b>Subreach Results</b>			
0.150	<u>TravTime (days)</u>	<u>CBOD5 (mg/L)</u>	<u>NH3-N (mg/L)</u>	<u>D.O. (mg/L)</u>
	0.015	20.59	1.86	5.60
	0.030	20.14	1.84	5.52
	0.045	19.70	1.82	5.46
	0.060	19.27	1.80	5.43
	0.075	18.85	1.78	5.42
	0.090	18.43	1.77	5.43
	0.105	18.03	1.75	5.44
	0.120	17.64	1.73	5.47
	0.135	17.25	1.71	5.51
	0.150	16.87	1.69	5.55
<u>RMI</u>	<u>Total Discharge Flow (mgd)</u>	<u>Analysis Temperature (°C)</u>	<u>Analysis pH</u>	
2.200	0.518	20.000	7.000	
<u>Reach Width (ft)</u>	<u>Reach Depth (ft)</u>	<u>Reach WDRatio</u>	<u>Reach Velocity (fps)</u>	
7.191	0.719	10.000	0.175	
<u>Reach CBOD5 (mg/L)</u>	<u>Reach Kc (1/days)</u>	<u>Reach NH3-N (mg/L)</u>	<u>Reach Kn (1/days)</u>	
19.66	1.483	1.99	0.700	
<u>Reach DO (mg/L)</u>	<u>Reach Kr (1/days)</u>	<u>Kr Equation</u>	<u>Reach DO Goal (mg/L)</u>	
5.016	12.411	Owens	5	
<u>Reach Travel Time (days)</u>	<b>Subreach Results</b>			
0.014	<u>TravTime (days)</u>	<u>CBOD5 (mg/L)</u>	<u>NH3-N (mg/L)</u>	<u>D.O. (mg/L)</u>
	0.001	19.62	1.99	5.02
	0.003	19.58	1.99	5.02
	0.004	19.54	1.99	5.02
	0.006	19.50	1.98	5.02
	0.007	19.45	1.98	5.03
	0.008	19.41	1.98	5.03
	0.010	19.37	1.98	5.03
	0.011	19.33	1.98	5.03
	0.013	19.29	1.97	5.04
	0.014	19.25	1.97	5.04

**WQM 7.0 D.O. Simulation**

<u>SWP Basin</u>	<u>Stream Code</u>	<u>Stream Name</u>		
08C	26573	Trib 26573 to Clearfield Creek		
<u>RMI</u>	<u>Total Discharge Flow (mgd)</u>	<u>Analysis Temperature (°C)</u>	<u>Analysis pH</u>	
2.160	0.518	20.000	7.000	
<u>Reach Width (ft)</u>	<u>Reach Depth (ft)</u>	<u>Reach WDRatio</u>	<u>Reach Velocity (fps)</u>	
7.182	0.718	10.000	0.175	
<u>Reach CBOD5 (mg/L)</u>	<u>Reach Kc (1/days)</u>	<u>Reach NH3-N (mg/L)</u>	<u>Reach Kn (1/days)</u>	
19.25	1.481	1.97	0.700	
<u>Reach DO (mg/L)</u>	<u>Reach Kr (1/days)</u>	<u>Kr Equation</u>	<u>Reach DO Goal (mg/L)</u>	
5.040	12.458	Owens	5	
<u>Reach Travel Time (days)</u>	<b>Subreach Results</b>			
0.119	<u>TravTime (days)</u>	<u>CBOD5 (mg/L)</u>	<u>NH3-N (mg/L)</u>	<u>D.O. (mg/L)</u>
	0.012	18.92	1.96	5.07
	0.024	18.59	1.94	5.10
	0.036	18.27	1.92	5.14
	0.047	17.95	1.91	5.18
	0.059	17.63	1.89	5.23
	0.071	17.33	1.88	5.27
	0.083	17.03	1.86	5.32
	0.095	16.73	1.85	5.37
	0.107	16.44	1.83	5.42
	0.119	16.15	1.81	5.47

**WQM 7.0 Effluent Limits**

<u>SWP Basin</u>		<u>Stream Code</u>		<u>Stream Name</u>			
08C		26573		Trib 26573 to Clearfield 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)
2.540	SFU STP	PA0032069	0.318	CBOD5	25		
				NH3-N	2.27	4.54	
				Dissolved Oxygen			5
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)
2.200	Loretto Prison	PA0034797	0.200	CBOD5	25		
				NH3-N	2.57	5.14	
				Dissolved Oxygen			4

Receiving Waters WQM 7.0 Model-Winter

**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
08C	26573	Trib 26573 to Clearfield Creek	2.540	1809.21	1.63	0.00000	0.00	<input checked="" type="checkbox"/>

**Stream Data**

Design Cond.	LFY	Trib Flow	Stream Flow	Rch Trav Time	Rch Velocity	WD Ratio	Rch Width	Rch Depth	Tributary Temp	pH	Stream Temp	pH
	(cfsm)	(cfs)	(cfs)	(days)	(fps)		(ft)	(ft)	(°C)		(°C)	
Q7-10	0.125	0.00	0.00	0.000	0.000	10.0	0.00	0.00	5.00	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
SFU STP	PA0032069	0.3180	0.0000	0.0000	0.000	15.00	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	4.00	12.80	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
08C	26573	Trib 26573 to Clearfield Creek	2.200	1801.98	1.63	0.00000	0.00	<input checked="" type="checkbox"/>

**Stream Data**

Design Cond.	LFY	Trib Flow	Stream Flow	Rch Trav Time	Rch Velocity	WD Ratio	Rch Width	Rch Depth	Tributary		Stream	
	(cfsm)	(cfs)	(cfs)	(days)	(fps)		(ft)	(ft)	Temp (°C)	pH	Temp (°C)	pH
Q7-10	0.125	0.00	0.00	0.000	0.000	10.0	0.00	0.00	5.00	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
Loretto Prison	PA0034797	0.2000	0.0000	0.0000	0.000	15.00	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	4.00	12.80	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
08C	26573	Trib 26573 to Clearfield Creek	2.160	1801.15	1.63	0.00000	0.00	<input checked="" type="checkbox"/>

**Stream Data**

Design Cond.	LFY	Trib Flow	Stream Flow	Rch Trav Time	Rch Velocity	WD Ratio	Rch Width	Rch Depth	Tributary		Stream	
	(cfsm)	(cfs)	(cfs)	(days)	(fps)		(ft)	(ft)	Temp (°C)	pH	Temp (°C)	pH
Q7-10	0.125	0.00	0.00	0.000	0.000	10.0	0.00	0.00	5.00	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	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	12.80	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
08C	26573	Trib 26573 to Clearfield Creek	1.820	1793.89	1.63	0.00000	0.00	<input checked="" type="checkbox"/>

**Stream Data**

Design Cond.	LFY	Trib Flow	Stream Flow	Rch Trav Time	Rch Velocity	WD Ratio	Rch Width	Rch Depth	Tributary		Stream	
	(cfsm)	(cfs)	(cfs)	(days)	(fps)		(ft)	(ft)	Temp (°C)	pH	Temp (°C)	pH
Q7-10	0.125	0.00	0.00	0.000	0.000	10.0	0.00	0.00	5.00	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	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	12.80	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
08C	26573	Trib 26573 to Clearfield Creek	1.000	1776.44	1.63	0.00000	0.00	<input checked="" type="checkbox"/>

**Stream Data**

Design Cond.	LFY	Trib Flow	Stream Flow	Rch Trav Time	Rch Velocity	WD Ratio	Rch Width	Rch Depth	Tributary		Stream	
	(cfsm)	(cfs)	(cfs)	(days)	(fps)		(ft)	(ft)	Temp (°C)	pH	Temp (°C)	pH
Q7-10	0.125	0.00	0.00	0.000	0.000	10.0	0.00	0.00	5.00	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	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	12.80	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	<input checked="" type="checkbox"/>
WLA Method	EMPR	Use Inputted W/D Ratio	<input checked="" type="checkbox"/>
Q1-10/Q7-10 Ratio	0.64	Use Inputted Reach Travel Times	<input type="checkbox"/>
Q30-10/Q7-10 Ratio	1.36	Temperature Adjust Kr	<input checked="" type="checkbox"/>
D.O. Saturation	90.00%	Use Balanced Technology	<input checked="" type="checkbox"/>
D.O. Goal	5		

### WQM 7.0 Hydrodynamic Outputs

<u>SWP Basin</u>		<u>Stream Code</u>				<u>Stream Name</u>						
08C		26573				Trib 26573 to Clearfield 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
<b>Q7-10 Flow</b>												
2.540	0.20	0.00	0.20	.4919	0.00403	.678	6.78	10	0.15	0.137	12.07	7.00
2.200	0.20	0.00	0.20	.8013	0.00393	.736	7.36	10	0.19	0.013	12.97	7.00
2.160	0.20	0.00	0.20	.8013	0.00404	.735	7.35	10	0.19	0.112	12.97	7.00
1.820	0.20	0.00	0.20	.8013	0.00403	.735	7.35	10	0.19	0.270	12.97	7.00
<b>Q1-10 Flow</b>												
2.540	0.13	0.00	0.13	.4919	0.00403	NA	NA	NA	0.14	0.146	12.90	7.00
2.200	0.13	0.00	0.13	.8013	0.00393	NA	NA	NA	0.18	0.014	13.60	7.00
2.160	0.13	0.00	0.13	.8013	0.00404	NA	NA	NA	0.18	0.117	13.60	7.00
1.820	0.13	0.00	0.13	.8013	0.00403	NA	NA	NA	0.18	0.281	13.60	7.00
<b>Q30-10 Flow</b>												
2.540	0.28	0.00	0.28	.4919	0.00403	NA	NA	NA	0.16	0.130	11.39	7.00
2.200	0.28	0.00	0.28	.8013	0.00393	NA	NA	NA	0.19	0.013	12.43	7.00
2.160	0.28	0.00	0.28	.8013	0.00404	NA	NA	NA	0.19	0.107	12.43	7.00
1.820	0.28	0.00	0.28	.8013	0.00403	NA	NA	NA	0.19	0.259	12.43	7.00

### WQM 7.0 Wasteload Allocations

<u>SWP Basin</u>	<u>Stream Code</u>	<u>Stream Name</u>
08C	26573	Trib 26573 to Clearfield 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
2.540	SFU STP	16.44	20.8	16.44	17.39	2	16
2.200	Loretto Prison	17.58	25	15.59	20.89	2	16
2.160		NA	NA	15.59	NA	NA	NA
1.820		NA	NA	15.59	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
2.540	SFU STP	3.66	5.72	3.66	4.15	2	27
2.200	Loretto Prison	3.99	7.58	3.38	5.49	2	28
2.160		NA	NA	3.38	NA	NA	NA
1.820		NA	NA	3.38	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)		
2.54	SFU STP	25	25	4.15	4.15	4	4	0	0
2.20	Loretto Prison	25	25	5.49	5.49	4	4	0	0
2.16		NA	NA	NA	NA	NA	NA	NA	NA
1.82		NA	NA	NA	NA	NA	NA	NA	NA

### WQM 7.0 D.O. Simulation

<u>SWP Basin</u>	<u>Stream Code</u>	<u>Stream Name</u>		
08C	26573	Trib 26573 to Clearfield Creek		
<hr/>				
<u>RMI</u>	<u>Total Discharge Flow (mgd)</u>	<u>Analysis Temperature (°C)</u>	<u>Analysis pH</u>	
2.540	0.318	12.068	7.000	
<u>Reach Width (ft)</u>	<u>Reach Depth (ft)</u>	<u>Reach WDRatio</u>	<u>Reach Velocity (fps)</u>	
6.783	0.678	10.000	0.151	
<u>Reach CBOD5 (mg/L)</u>	<u>Reach Kc (1/days)</u>	<u>Reach NH3-N (mg/L)</u>	<u>Reach Kn (1/days)</u>	
18.26	1.448	2.93	0.380	
<u>Reach DO (mg/L)</u>	<u>Reach Kr (1/days)</u>	<u>Kr Equation</u>	<u>Reach DO Goal (mg/L)</u>	
6.580	10.402	Owens	5	
<u>Reach Travel Time (days)</u>	<b>Subreach Results</b>			
0.137	<u>TravTime (days)</u>	<u>CBOD5 (mg/L)</u>	<u>NH3-N (mg/L)</u>	<u>D.O. (mg/L)</u>
	0.014	18.01	2.92	6.72
	0.027	17.76	2.90	6.85
	0.041	17.52	2.89	6.96
	0.055	17.27	2.87	7.07
	0.069	17.04	2.86	7.16
	0.082	16.80	2.84	7.25
	0.096	16.57	2.83	7.33
	0.110	16.35	2.81	7.41
	0.124	16.12	2.80	7.48
	0.137	15.90	2.78	7.54
<hr/>				
<u>RMI</u>	<u>Total Discharge Flow (mgd)</u>	<u>Analysis Temperature (°C)</u>	<u>Analysis pH</u>	
2.200	0.518	12.970	7.000	
<u>Reach Width (ft)</u>	<u>Reach Depth (ft)</u>	<u>Reach WDRatio</u>	<u>Reach Velocity (fps)</u>	
7.362	0.736	10.000	0.186	
<u>Reach CBOD5 (mg/L)</u>	<u>Reach Kc (1/days)</u>	<u>Reach NH3-N (mg/L)</u>	<u>Reach Kn (1/days)</u>	
18.70	1.467	3.62	0.408	
<u>Reach DO (mg/L)</u>	<u>Reach Kr (1/days)</u>	<u>Kr Equation</u>	<u>Reach DO Goal (mg/L)</u>	
6.452	5.863	Tsvoglou	5	
<u>Reach Travel Time (days)</u>	<b>Subreach Results</b>			
0.013	<u>TravTime (days)</u>	<u>CBOD5 (mg/L)</u>	<u>NH3-N (mg/L)</u>	<u>D.O. (mg/L)</u>
	0.001	18.67	3.61	6.44
	0.003	18.65	3.61	6.42
	0.004	18.62	3.61	6.40
	0.005	18.60	3.61	6.39
	0.007	18.57	3.61	6.37
	0.008	18.54	3.60	6.36
	0.009	18.52	3.60	6.34
	0.011	18.49	3.60	6.33
	0.012	18.47	3.60	6.31
	0.013	18.44	3.60	6.30

### WQM 7.0 D.O. Simulation

<u>SWP Basin</u>	<u>Stream Code</u>	<u>Stream Name</u>		
08C	26573	Trib 26573 to Clearfield Creek		
<hr/>				
<u>RMI</u>	<u>Total Discharge Flow (mgd)</u>	<u>Analysis Temperature (°C)</u>	<u>Analysis pH</u>	
2.160	0.518	12.970	7.000	
<u>Reach Width (ft)</u>	<u>Reach Depth (ft)</u>	<u>Reach WDRatio</u>	<u>Reach Velocity (fps)</u>	
7.353	0.735	10.000	0.186	
<u>Reach CBOD5 (mg/L)</u>	<u>Reach Kc (1/days)</u>	<u>Reach NH3-N (mg/L)</u>	<u>Reach Kn (1/days)</u>	
18.44	1.465	3.60	0.408	
<u>Reach DO (mg/L)</u>	<u>Reach Kr (1/days)</u>	<u>Kr Equation</u>	<u>Reach DO Goal (mg/L)</u>	
6.296	6.048	Tsivoglou	5	
<u>Reach Travel Time (days)</u>	<b>Subreach Results</b>			
0.112	<u>TravTime (days)</u>	<u>CBOD5 (mg/L)</u>	<u>NH3-N (mg/L)</u>	<u>D.O. (mg/L)</u>
	0.011	18.22	3.58	6.19
	0.022	18.01	3.56	6.09
	0.034	17.80	3.55	6.00
	0.045	17.59	3.53	5.92
	0.056	17.38	3.52	5.85
	0.067	17.17	3.50	5.79
	0.078	16.97	3.48	5.74
	0.089	16.77	3.47	5.69
	0.101	16.57	3.45	5.65
	0.112	16.38	3.44	5.62
<hr/>				
<u>RMI</u>	<u>Total Discharge Flow (mgd)</u>	<u>Analysis Temperature (°C)</u>	<u>Analysis pH</u>	
1.820	0.518	12.970	7.000	
<u>Reach Width (ft)</u>	<u>Reach Depth (ft)</u>	<u>Reach WDRatio</u>	<u>Reach Velocity (fps)</u>	
7.354	0.735	10.000	0.186	
<u>Reach CBOD5 (mg/L)</u>	<u>Reach Kc (1/days)</u>	<u>Reach NH3-N (mg/L)</u>	<u>Reach Kn (1/days)</u>	
16.38	1.457	3.44	0.407	
<u>Reach DO (mg/L)</u>	<u>Reach Kr (1/days)</u>	<u>Kr Equation</u>	<u>Reach DO Goal (mg/L)</u>	
5.620	6.026	Tsivoglou	5	
<u>Reach Travel Time (days)</u>	<b>Subreach Results</b>			
0.270	<u>TravTime (days)</u>	<u>CBOD5 (mg/L)</u>	<u>NH3-N (mg/L)</u>	<u>D.O. (mg/L)</u>
	0.027	15.92	3.40	5.56
	0.054	15.47	3.36	5.54
	0.081	15.04	3.32	5.53
	0.108	14.62	3.29	5.55
	0.135	14.21	3.25	5.58
	0.162	13.81	3.22	5.62
	0.189	13.42	3.18	5.68
	0.216	13.05	3.15	5.74
	0.243	12.68	3.11	5.81
	0.270	12.32	3.08	5.88

**WQM 7.0 Effluent Limits**

<u>SWP Basin</u>	<u>Stream Code</u>	<u>Stream Name</u>					
08C	26573	Trib 26573 to Clearfield 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)
2.540	SFU STP	PA0032069	0.318	CBOD5	25		
				NH3-N	4.15	8.3	
				Dissolved Oxygen			4
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)
2.200	Loretto Prison	PA0034797	0.200	CBOD5	25		
				NH3-N	5.49	10.98	
				Dissolved Oxygen			4

**Attachment 3-TRC Calc Report**

TRC\_CALC.xls

<b>TRC EVALUATION</b>				
Input appropriate values in A3:A9 and D3:D9				
0.102	= Q stream (cfs)		0.5	= CV Daily
0.318	= Q discharge (MGD)		0.5	= CV Hourly
30	= no. samples		1	= AFC_Partial Mix Factor
0.3	= Chlorine Demand of Stream		1	= CFC_Partial Mix Factor
0	= Chlorine Demand of Discharge		15	= AFC_Criteria Compliance Time (min)
0.5	= BAT/BPJ Value		720	= CFC_Criteria Compliance Time (min)
0	= % Factor of Safety (FOS)			=Decay Coefficient (K)
Source	Reference	AFC Calculations		Reference
TRC	1.3.2.iii	WLA_afc = 0.085		1.3.2.iii
PENTOXSD TRG	5.1a	LTAMULT_afc = 0.373		5.1c
PENTOXSD TRG	5.1b	LTA_afc = 0.032		5.1d
		WLA_cfc = 0.075		
		LTAMULT_cfc = 0.581		
		LTA_cfc = 0.044		
Source	Effluent Limit Calculations			
PENTOXSD TRG	5.1f	AML_MULT = 1.231		
PENTOXSD TRG	5.1g	AVG MON LIMIT (mg/l) = 0.039		AFC
		INST MAX LIMIT (mg/l) = 0.128		
WLA_afc	$(.019/e^{-k \cdot AFC\_tc}) + [(AFC\_Yc \cdot Qs \cdot .019 / Qd \cdot e^{-k \cdot AFC\_tc}) \dots + Xd + (AFC\_Yc \cdot Qs \cdot Xs / Qd)] \cdot (1 - FOS / 100)$			
LTAMULT_afc	$EXP((0.5 \cdot LN(cvh^2 + 1)) - 2.326 \cdot LN(cvh^2 + 1)^{0.5})$			
LTA_afc	wla_afc * LTAMULT_afc			
WLA_cfc	$(.011/e^{-k \cdot CFC\_tc}) + [(CFC\_Yc \cdot Qs \cdot .011 / Qd \cdot e^{-k \cdot CFC\_tc}) \dots + Xd + (CFC\_Yc \cdot Qs \cdot Xs / Qd)] \cdot (1 - FOS / 100)$			
LTAMULT_cfc	$EXP((0.5 \cdot LN(cvd^2 / no\_samples + 1)) - 2.326 \cdot LN(cvd^2 / no\_samples + 1)^{0.5})$			
LTA_cfc	wla_cfc * LTAMULT_cfc			
AML_MULT	$EXP(2.326 \cdot LN((cvd^2 / no\_samples + 1)^{0.5}) - 0.5 \cdot LN(cvd^2 / no\_samples + 1))$			
AVG MON LIMIT	MIN(BAT_BPJ, MIN(LTA_afc, LTA_cfc) * AML_MULT)			
INST MAX LIMIT	1.5 * ((av_mon_limit / AML_MULT) / LTAMULT_afc)			