pennsylvania
DEPARTMENT OF ENVIRONMENTAL PROTECTION

Southcentral Regional Office
CLEAN WATER PROGRAM

Application Type	**Renewal**	Application No.	**PA0081302**
Facility Type	**Municipal**	APS ID	**276590**
Major / Minor	**Minor**	Authorization ID	**1170691**

NPDES PERMIT FACT SHEET INDIVIDUAL SEWAGE

Applicant and Facility Information

Applicant Name	**South Londonderry Township Municipal Authority**	Facility Name	**South Londonderry Campbelltown West STP**
Applicant Address	27 W Market Street	Facility Address	777 S Lingle Road
	Palmyra, PA 17078-8736		Campbelltown, PA 17010
Applicant Contact	Scott Galbraith	Facility Contact	Scott Galbraith
Applicant Phone	(717) 838-5556	Facility Phone	(717) 838-5556
Client ID	43038	Site ID	250911
Ch 94 Load Status	Not Overloaded	Municipality	South Londonderry Township
Connection Status	No Limitations	County	Lebanon
Date Application Received	January 24, 2017	EPA Waived?	Yes
Date Application Accepted	February 28, 2017	If No, Reason	

Purpose of Application: NPDES permit renewal to discharge treated sewage

Summary of Review

1.0 General Discussion

This fact sheet supports the re-issuance of an existing NPDES permit for discharge of treated domestic wastewater from Campbelltown West wastewater treatment plant located in South Londonderry Township, Lebanon County. South Londonderry Township Municipal Authority owns and operates the wastewater treatment plant, which provides sanitary services to South Londonderry Township. The sewer collection system is not combined and there is no bypasses or overflows approved in the collection system. The oxidation ditch treatment plant at the site has a hydraulic design capacity of 0.215 MGD and an organic design capacity of 453 lbs/day- BOD5. The facility discharge to Spring Creek which is classified for Warm Water Fishes (WWF). The existing NPDES permit was issued on July 31, 2012 with an effective date of August 1, 2012 and expiration date of July 31, 2017. The applicant submitted an administratively complete NPDES renewal application to the Department on January 24, 2017 and is currently operating under the terms and conditions in the existing permit under administrative extension provisions pending Department action on the renewal application.

A topographic map showing the discharge location is presented in attachment A.

1.1 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-

Approve	Deny	Signatures	Date
X		J. Pascal Kwedza, P.E. / Environmental Engineer	June 18, 2019
		Daniel W. Martin, P.E. / Environmental Engineer Manager	
		Maria D. Bebenek, P.E. / Program Manager	

Summary of Review

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.

1.2 Changes to the existing Permit

- Monthly monitoring of Total nitrogen, Nitrate-Nitrite -N and TKN have been added to collect adequate data for the Chesapeake Bay Program.
- Total Copper monitoring/limitation has been added

1.3 Existing Permit Limits and Monitoring Requirements

DISCHARGE LIMITATIONS								MONITORING REQUIREMENTS	
	Mass Units lbs/day			Concentrations mg/l					
Discharge Parameter	Average Monthly	Average Weekly	Maximum Daily	Average Monthly	Average Weekly	Maximum Daily	Inst. Maximum	Monitoring Frequency	Sample Type
Flow (mgd)	Monitor & Report	XXX	Monitor & Report	XXX	XXX	XXX	XXX	Continuous	Measured
pH (S.U.)	XXX	XXX	XXX	From 6.0 to 9.0 inclusive				1/day	Grab
D.O.	XXX	XXX	XXX	Minimum of 5.0 mg/l at all times				1/day	Grab
TRC	XXX	XXX	XXX	<0.1	XXX	XXX	0.30	1/day	Grab
TSS	53.7	80.6	XXX	30	45	XXX	60	1/week	24-hour comp
$CBOD_5$ May 1 - Oct 31	35.8	53.7	XXX	20	30	XXX	40	1/week	24-hour comp
$CBOD_5$ Nov 1 - Apr 30	44.8	71.7	XXX	25	40	XXX	50	1/week	24-hour comp
NH3N (5/1 to 10/31)	5.3	XXX	XXX	3.0	XXX	XXX	6.0	1/week	24-hr comp
NH3N (11/1 to 4/30)	16.1	XXX	XXX	9.0	XXX	XXX	18	1/week	24-hr comp
Fecal Col. (5/1 to 9/30)	XXX	XXX	XXX	200	XXX	XXX	1000	1/week	Grab
Fecal Col. (10/1 to 4/30)	XXX	XXX	XXX	2,000	XXX	XXX	10,000	1/week	Grab
Total Phosphorus	3.5	XXX	XXX	2.0	XXX	XXX	4.0	1/week	24-hour comp

1.4 Discharge, Receiving Waters and Water Supply Information

Outfall No.	001	Design Flow (MGD)	.215
Latitude	40º 16' 41.14"	Longitude	-76º 35' 14.88"
Quad Name	Palmyra	Quad Code	1633
Wastewater Description:	Sewage Effluent		

Receiving Waters	Spring Creek	Stream Code	09507
NHD Com ID	56400739	RMI	6.5
Drainage Area	1.90	Yield (cfs/mi^2)	0.14
Q_{7-10} Flow (cfs)	0.20	Q_{7-10} Basis	USGS Gage Station
Elevation (ft)	440	Slope (ft/ft)	
Watershed No.	7-D	Chapter 93 Class.	WWF
Existing Use		Existing Use Qualifier	
Exceptions to Use		Exceptions to Criteria	
Assessment Status	Impaired		
Cause(s) of Impairment	Water/Flow Variability, Siltation		
Source(s) of Impairment	Natural Sources, Agriculture		
TMDL Status		Name	

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

Nearest Downstream Public Water Supply Intake	Suez Water		
PWS Waters	Swatara Creek	Flow at Intake (cfs)	
PWS RMI		Distance from Outfall (mi)	<16

Changes Since Last Permit Issuance: None

Other Comments:

1.4.1 Water Supply Intake

The nearest downstream water supply intake is approximately 16 miles downstream by Suez Water on Swatara Creek near Hummelstown, Dauphin County. No impact is expected from this discharge on the intake.

2.0 Treatment Facility Summary

Treatment Facility Name: S Londonderry Campbell W STP

WQM Permit No.	Issuance Date
3890401	

Waste Type	Degree of Treatment	Process Type	Disinfection	Avg Annual Flow (MGD)
Sewage	Secondary	Oxidation Ditch	Gas Chlorine	0.215

Hydraulic Capacity (MGD)	Organic Capacity (lbs/day)	Load Status	Biosolids Treatment	Biosolids Use/Disposal
0.215	453	Not Overloaded		

Changes Since Last Permit Issuance: Post aeration system was installed.

2.1 Treatment Facility

The treatment plant consists of muffin monster, bar screen as back-up, 1 oxidation ditch, 3 clarifiers 1 online and the rest used only during high flows, 1 chlorine contact tank, 1 de-chlorination tank, post aeration system, 2 sludge digesters and 4 reed beds. Ferric chloride is added for phosphorus removal, chlorine gas is used for disinfection, sulfur dioxide is added for de-chlorination and lime added for pH adjustment. Portions of the township's flow originally intended for the West Plant is pumped to the East plant via the Carriage Park Pump Station to preserve capacity at the West Plant for new development.

3.0 Compliance History

3.1 DMR Data for Outfall 001 (from February 1, 2018 to January 31, 2019)

Parameter	JAN-19	DEC-18	NOV-18	OCT-18	SEP-18	AUG-18	JUL-18	JUN-18	MAY-18	APR-18	MAR-18	FEB-18
Flow (MGD) Average Monthly	0.180	0.186	0.187	0.145	0.207	0.240	0.219	0.113	0.123	0.110	0.106	0.114
Flow (MGD) Daily Maximum	0.317	0.289	0.296	0.177	0.373	0.362	0.961	0.143	0.224	0.143	0.126	0.145
pH (S.U.) Minimum	6.74	6.67	6.44	6.70	6.84	6.72	6.18	6.47	6.10	6.59	6.45	6.46
pH (S.U.) Maximum	7.22	7.21	7.22	7.35	7.49	7.29	7.57	7.22	7.12	7.32	7.24	7.16
DO (mg/L) Minimum	5.95	4.77	6.16	5.09	5.36	5.20	4.86	5.26	5.22	5.45	5.13	5.99
TRC (mg/L) Average Monthly	0.05	0.04	0.03	0.01	0.04	0.01	0.01	0.02	0.01	0.00	0.02	0.03
TRC (mg/L) Instant. Maximum	0.28	0.27	0.24	0.09	0.21	0.08	0.07	0.16	0.08	0.05	0.28	0.20
CBOD5 (lbs/day) Average Monthly	5.72	3.58	4.12	< 3.55	< 5.07	< 5.26	< 6.15	4.76	3.18	6.06	10.13	4.09
CBOD5 (lbs/day) Weekly Average	10.58	5.75	5.31	5.67	7.54	6.69	15.65	7.84	4.73	8.17	18.90	5.95
CBOD5 (mg/L) Average Monthly	3.58	2.60	3.02	< 2.88	< 3.13	< 2.90	< 3.80	5.30	3.60	6.93	11.30	4.58
CBOD5 (mg/L) Weekly Average	4.10	3.50	4.40	4.20	4.50	4.60	5.10	8.70	5.30	9.07	20.60	7.00
BOD5 (lbs/day) Raw Sewage Influent Ave. Monthly	357	296	379	356	370	363	375	249	276	394	283	274
BOD5 (lbs/day) Raw Sewage Influent Daily Maximum	418	360	587	521	458	534	448	266	357	831	465	316
BOD5 (mg/L) Raw Sewage Influent Ave. Monthly	249	221	268	295	225	191	331	276	279	425	325	306
TSS (lbs/day) Average Monthly	< 8.21	< 6.72	< 7.40	< 6.04	< 8.24	< 9.51	< 47.08	6.06	< 6.08	25.63	< 69.64	< 6.40
TSS (lbs/day) Raw Sewage Influent Ave. Monthly	239	226	329	247	264	516	191	193	126	184	185	162

TSS (lbs/day) Raw Sewage Influent Daily Maximum	560	345	488	389	496	1442	270	298	222	251	279	222
TSS (lbs/day) Weekly Average	< 13.22	< 8.21	< 10.79	< 7.21	< 9.76	< 11.55	174.94	6.71	8.03	53.07	161.46	9.01
TSS (mg/L) Average Monthly	< 5.20	< 5.00	< 5.20	< 5.00	< 5.00	< 5.00	< 18.00	6.75	< 6.20	29.50	< 77.00	< 7.00
TSS (mg/L) Raw Sewage Influent Ave. Monthly	181	166	253	225	162	250	162	219	125	204	205	183
TSS (mg/L) Weekly Average	6.00	< 5.00	6.00	< 5.00	< 5.00	< 5.00	57.00	8.00	9.00	63.00	176.00	9.00
Fecal Coliform (CFU/100 ml) Geometric Mean	46	12	13	9	10	52	69	10	9	2	41	6
Fecal Coliform (CFU/100 ml) Instant. Maximum	12800	6300	131	182	26	3600	2200	53	24	20	8090	7
Nitrate-Nitrite (mg/L) Average Monthly	28.22	28.55	27.04	21.80	23.90	25.94	35.85	41.28	38.66	48.25	43.32	39.33
Nitrate-Nitrite (lbs) Total Monthly	1353.46	1190.09	1142.40	879.78	1164.90	1524.27	1216.75	1121.10	1184.82	1291.20	1184.82	999.88
Total Nitrogen (mg/L) Average Monthly	< 29.22	< 29.55	< 27.84	< 23.05	< 25.00	< 27.12	< 36.90	< 42.30	< 39.70	< 48.57	< 47.88	< 40.33
Total Nitrogen (lbs) Total Monthly	< 1402.44	< 1231.63	< 1103.10	< 924.73	< 1220.10	< 1594.33	< 1266.04	< 1149.00	< 1216.75	< 1357.80	< 1313.78	< 1025.08
Total Nitrogen (lbs) Total Annual					<14683. 70							
Ammonia (lbs/day) Average Monthly	0.351	< 0.292	< 0.411	0.460	0.210	< 0.707	1.017	0.473	0.807	0.734	0.519	0.211
Ammonia (mg/L) Average Monthly	0.220	< 0.210	< 0.259	0.401	0.350	< 0.393	1.125	0.505	0.839	0.820	0.599	0.236
TKN (mg/L) Average Monthly	< 1.00	< 1.00	< 1.00	< 1.25	< 1.10	< 1.18	< 1.05	< 1.03	1.04	< 2.55	< 4.56	< 1.00
TKN (lbs) Total Monthly	< 49.29	< 41.54	< 43.20	< 45.26	< 55.20	< 70.06	< 49.29	< 27.90	< 31.93	< 66.60	< 128.84	< 25.48
Total Phosphorus (lbs/day) Ave. Monthly	1.17	1.08	0.62	0.59	0.71	1.21	1.86	0.91	1.07	1.86	3.75	0.49
Total Phosphorus (mg/L) Ave. Monthly	0.74	0.80	0.43	0.48	0.43	0.63	0.93	1.01	1.07	2.13	4.15	0.54
Total Phosphorus (lbs) Total Monthly	36.27	33.48	18.60	18.29	21.30	37.51	57.66	27.30	33.17	55.80	116.31	13.72
Total Phosphorus (lbs) Total Annual					413.28							

Effluent Violations for Outfall 001, from: March 1, 2018 To: February 28, 2019

Parameter	Date	SBC	DMR Value	Units	Limit Value	Units
DO	07/31/18	Min	4.86	mg/L	5.0	mg/L
DO	12/31/18	Min	4.77	mg/L	5.0	mg/L
TSS	03/31/18	Avg Mo	< 69.64	lbs/day	53.7	lbs/day
TSS	03/31/18	Wkly Avg	161.46	lbs/day	80.6	lbs/day
TSS	07/31/18	Wkly Avg	174.94	lbs/day	80.6	lbs/day
TSS	03/31/18	Avg Mo	< 77.00	mg/L	30	mg/L
TSS	03/31/18	Wkly Avg	176.00	mg/L	45	mg/L
TSS	04/30/18	Wkly Avg	63.00	mg/L	45	mg/L
TSS	07/31/18	Wkly Avg	57.00	mg/L	45	mg/L
Fecal Coliform	01/31/19	IMAX	12800	CFU/100 ml	10000	CFU/100 ml
Fecal Coliform	07/31/18	IMAX	2200	CFU/100 ml	1000	CFU/100 ml
Fecal Coliform	08/31/18	IMAX	3600	CFU/100 ml	1000	CFU/100 ml
Total Phosphorus	03/31/18	Avg Mo	3.75	lbs/day	3.5	lbs/day
Total Phosphorus	04/30/18	Avg Mo	2.13	mg/L	2.0	mg/L
Total Phosphorus	03/31/18	Avg Mo	4.15	mg/L	2.0	mg/L
Fecal Coliform	02/28/19	IMAX	11800	CFU/100 ml	10000	CFU/100 ml
Fecal Coliform	01/31/19	IMAX	12800	CFU/100 ml	10000	CFU/100 ml

Seventeen effluent violations were noted on DMR during the past 12 months of operations as shown on the table above. TSS, D.O. Total Phosphorus and Fecal Coliform violation occurred during the period, no reasons were given for these violations. The violations need to be addressed satisfactorily prior to final permit issuance. The following paragraph will be added to the cover letter of the draft permit asking the permittee to address violations.

"According to DEP's records, there are unresolved violation(s) at one or more facilities you own or operate. In accordance with DEP's Clean Water Program standard operating procedures, an applicant's compliance history is considered prior to making a final decision on any permit application. Please take the opportunity to address these violations during this draft comment period. DEP may not be able to issue a final permit until the violation(s) are resolved"

The violations appear to be operation related, if structural adjustment to the treatment unit is required to address the violations, the facility will be required to submit a corrective action plan to the Department for approval.

3.3 Summary of Inspections:

The facility has been inspected 7 times during the past permit cycle. D.O and TSS violations occurred during plant inspection on April 9, 2018. A notice of violation was sent on May 21, 2018 for the violations on April 9, 2018 and DMR violations that occurred in March and April of 2018 shown on the effluent violation table above. A response to the NOV could not explain the unusual cloudy effluent experienced at the facility that led to the violations. It appears from DMR data that TSS and Phosphorus violations have been addressed. The director of Public Works for the Authority explained that, Fecal Coliform violations were due to malfunction of one of the disinfection treatment trains prior to combining in the chlorine contact tank. March and April Fecal Coliform results are well below permit limits.

4.0 Development of Effluent Limitations

Outfall No. 001 **Design Flow (MGD)** .215
Latitude 40º 16' 53.06" **Longitude** -76º 35' 27.31"
Wastewater Description: Sewage Effluent

4.1 Basis for Effluent Limitations

In general, the Clean Water Act(AWA) requires that the effluent limits for a particular pollutant be the more stringent of either technology-based limits or water quality-based limits. Technology-based limits are set according to the level of treatment that is achievable using available technology. A water quality-based effluent limit is designed to ensure that the water quality standards applicable to a waterbody are being met and may be more stringent than technology-based effluent limits.

4.1.1 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)

4.2 Mass-Based Limits

The federal regulation at 40 CFR 122.45(f) requires that effluent limits be expressed in terms of mass, if possible. The regulation at 40 CFR 122.45(b) requires that effluent limitations for POTWs be calculated based on the design flow of the facility. The mass based limits are expressed in pounds per day and are calculated as follows:

Mass based limit (lb/day) = concentration limit (mg/L) × design flow (mgd) × 8.34

4.3 Water Quality-Based Limitations

4.3.1 Receiving Stream

The receiving stream is Spring Creek. According to 25 PA § 93.9o, this stream is protected for Warm Water Fishes (WWF). It is located in Drainage List o and State Watershed 7-D. It has been assigned stream code 09507. According to the Department's Integrated Water Quality Monitoring and Assessment Report, Spring Creek is impaired due to siltation and flow variability. The Stream is listed as Category 4c Waterbodies, this pollution type does not require a TMDL. See 303d listed streams section of the report for further discussion.

4.3.2 Stream flows

The Technical Support Document for Water Quality-Based Toxics Control (TSD) (EPA, 1991) and the Pennsylvania Water Quality Standards PA WQS) recommend the flow conditions for use in calculating water quality-based effluent limits (WQBELs) using steady-state modeling. The TSD and the PA WQS state that WQBELs intended to protect aquatic life uses should be based on the lowest seven-day average flow rate expected to occur once every ten years ($Q_{7\text{-}10}$) for chronic criteria and the lowest one-day average flow rate expected to occur once every ten years ($Q_{1\text{-}10}$) for acute criteria. However, because the chronic criterion for ammonia is a 30-day average concentration not to be exceeded more than once every three years, EPA has used the $Q_{30\text{-}10}$ for the chronic ammonia criterion instead of the $Q_{7\text{-}10}$. The $Q_{30\text{-}10}$ is a biologically-based design flow intended to ensure an excursion frequency of once every three years for a 30-day average flow rate. These flows were determined by correlating with the yield of USGS gage No. 01573560 on Swatara Creek near Hershey. The $Q_{7\text{-}10}$ and drainage area at the gage is 67.7ft3/s and 483mi^2 respectively. The resulting yields are as follows:

- $Q_{7\text{-}10}$ = (67.7ft^3/s)/483 mi^2 = 0.14ft^3/s/ mi^2
- $Q_{30\text{-}10}$ / $Q_{7\text{-}10}$ = 0.89
- $Q_{1\text{-}10}$ / $Q_{7\text{-}10}$ = 1.23

The drainage area at the point of discharge calculated using StreamStats = 1.53 mi^2.

The summer $Q_{7\text{-}10}$ at discharge = 1.53 mi^2 x 0.14 ft^3/s/mi^2 = 0.21 ft^3/s.

4.3.3 NH_3N Calculations

NH_3N calculations will be based on the Department's Implementation Guidance of Section 93.7 Ammonia Criteria, dated 11/4/97 (ID No. 391-2000-013). The following data is necessary to determine the instream NH_3N criteria used in the attached computer model of the stream:

- Discharge pH = 6.7 (DMR median)
- Discharge Temperature = 25 ^{o} C (Default)
- Stream pH = 7.0 ((Default)
- Stream Temperature = 20 ^{o}C ((Default)
- Background NH_3-N = 0.0 (Default)
- Discharge flow = 0.02MGD

4.3.4 $CBOD_5$ & NH_3-N

WQM7.0 is a steady state model that simplifies many natural processes into a reach-by-reach simulation was used for the water quality analysis. The attached result of the WQM 7.0 stream model (attachment B) indicates that an average monthly limit of 25mg/l is adequate to protect the water quality of the stream. However due to anti-backsliding, the previous permit limit of 20mg/l for the summer months and 25mg/l for winter months will remain. Past DMRs and inspection reports show that the STP has been consistently achieving these limits.

The attached model results of the WQM 7.0 stream model (attachment B) also indicates that a summer limit of 3.0 mg/l NH_3 as a monthly average is necessary to protect the aquatic life from toxicity effects. Winter limit is 3 times the summer. This is consistent with the existing permit.

4.3.5 Dissolved Oxygen

The existing permit contains a limit of 5 mg/l for Dissolved Oxygen (DO). DEP's Technical Guidance for the Development and Specification of Effluent Limitations (362-0400-001, 10/97) suggests that either the adopted minimum stream D.O. criteria for the receiving stream or the effluent level determined through water quality modeling be used for the limit. Since the WQM 7.0 model was run using a minimum D.O. of 5.0 mg/l as well, this limit will be continued in the renewed permit with a daily monitoring requirement per DEP guidance.

4.3.6 Total Suspended Solids(TSS):

There is no water quality criterion for TSS. The existing limit of 30 mg/l AML based on the minimum level of effluent quality attainable by secondary treatment as defined in 40 CFR 133.102b(1), 40 CFR 133.102b(1), 25 PA § 92a.47(a)(1) and 92a.47(a)(2) will remain in the permit.

4.3.7 Chesapeake Bay Strategy:

The Department formulated a strategy in April 2007, to comply with the EPA and Chesapeake Bay Foundation requirements to reduce point source loadings of Total Nitrogen (TN) and Total Phosphorus (TP) to the Bay. In the Strategy, sewage dischargers have been prioritized by Central Office based on their delivered TN loadings to the Bay. The highest priority (Phases 1, 2, and 3) dischargers will receive annual loading caps based on their design flow on August 29, 2005 and concentrations of 6 mg/l TN and 0.8 mg/l TP. Phase 4 (0.2 -0.4mgd) and Phase 5(below 0.2mdg) will be required to monitor and report TN and TP during permit renewal at a monitoring frequency following Table 6-3 of DEP's Technical Guidance for Development and Specification of effluent Limitations (No. 362-0400-001). Any facility in Phases 4 and 5 that undergoes expansion is subjected to cap load right away.

EPA published the Chesapeake Bay Total Maximum Daily Load (TMDL) in December of 2010. Despite extensive restoration efforts during the past 25 years, the TMDL was prompted by insufficient progress and continued poor water quality in the Chesapeake Bay and its tidal tributaries.

In order to address the TMDL, Pennsylvania developed in addition to the Bay Strategy, a Chesapeake Watershed Implementation Plan (WIP) Phase 1 in January 2011 and Phase 2 in March 2012. In accordance with the Phase 2 WIP and its supplement, re-issuing permits for significant dischargers follow the same phased approach formulated in the original Bay strategy, whilst Phase 4 and Phase 5 will be required to monitor and report TN and TP during permit renewal. This facility is, classified as a phase 4, and had monitored Nitrate-Nitrite as N, Total Kjeldahl Nitrogen and Total Nitrogen is the past but is required to resume monthly monitoring during this permit cycle to collect data. There is limitation on Total Phosphorus in the permit, no monitoring is required.

4.3.8 Phosphorus

The existing phosphorus limitation of 2mg/l to control phosphorus discharges to the Lower Susquehanna River Basin is superseded by the Chesapeake Bay Strategy but would be continued due to anti-backsliding.

4.3.9 Total Residual Chlorine:

The attached computer printout presented in attachment C utilizes the equations and calculations as presented in the Department's 2003 Implementation Guidance for Residual Chlorine (TRC) (ID # 391-2000-015) for developing chlorine limitations. The results presented in attachment C indicates that a water quality limit of 0.09 mg/l and 0.31 mg/l IMAX would be needed to prevent toxicity concerns. The recommended limit is consistent with existing permit of <0.1 mg/l on an average and 0.30 mg/l maximum. Past DMRs document that the STP has been capable of achieving about 0.1 mg/l on an average and 0.3 mg/l maximum. Therefore, <0.1 mg/l on an average and 0.30 mg/l maximum is again recommended for the current permit renewal

4.3.10 Toxics

A reasonable potential (RP) analysis was done for pollutants submitted with the application. All pollutants were entered into a Toxics Screening Analysis spreadsheet to determine if any pollutants are parameters of concern that require PENTOXSD modeling. All pollutants above the most stringent Chapter 93 criteria are considered parameters of concern. This also includes samples that resulted in non-detect, but the method detection limit that was used is higher than DEP's target quantitation limit (QL). All pollutants that were determined to be candidates for PENTOXSD modeling were entered into the PENTOXSD model. The most stringent WQBELs recommended by the PENTOXSD model were then entered into the same Toxics Screening Analysis spreadsheet in order to determine which parameters of concern needs limitation or monitoring. Total Copper was determined to be parameter of concern and was analyzed with the PENTOXSD Model. The most stringent WQBELs recommended by the PENTOXSD model presented in attachment C was then entered into the same Toxics Screening Analysis spreadsheet in order to determine if limitation or monitoring was necessary. A monthly average limit of 0.015 mg/l was recommended for Total Copper. See the Toxic screenings spreadsheet presented in attachment E for details. The permit will require monitoring in the interim and offer the permittee an opportunity to collect

data to refine the PENTOXSD model and /or conduct a site-specific study for copper. The limit or an amended permit will become effective 3 years after permit issuance date.

The recommended limit follows the logic presented in DEPs SOP, to establish limits in the permit where the maximum reported concentration exceeds 50% of the WQBEL, or for non-conservative pollutants to establish monitoring requirements where the maximum reported concentration is between 25% - 50% of the WQBEL, or to establish monitoring requirements for conservative pollutants where the maximum reported concentration is between 10% - 50% of the WQBEL

4.3.11 TDS, Sulfate, Chloride, Bromide & 1,4-Dioxane

Under the authority of §92a.61, DEP has determined it should implement increased monitoring in NPDES permits for TDS, sulfate, chloride, bromide, and 1,4-dioxane. The following approach will be implemented for point source discharges upon issuance or reissuance of an individual NPDES permit:

- Where the concentration of TDS in the discharge exceeds 1,000 mg/L, or the net TDS load from a discharge exceeds 20,000 lbs/day, and the discharge flow exceeds 0.1 MGD, Part A of the permit should include monitor and report for TDS, sulfate, chloride, and bromide. Discharges of 0.1 MGD or less should monitor and report for TDS, sulfate, chloride, and bromide if the concentration of TDS in the discharge exceeds 5,000 mg/L.

- Where the concentration of bromide in a discharge exceeds 1 mg/L and the discharge flow exceeds 0.1 MGD, Part A of the permit should include monitor and report for bromide. Discharges of 0.1 MGD or less should monitor and report for bromide if the concentration of bromide in the discharge exceeds 10 mg/L.

- Where the concentration of 1,4-dioxane (CAS 123-91-1) in a discharge exceeds 10 µg/L and the discharge flow exceeds 0.1 MGD, Part A of the permit should include monitor and report for 1,4-dioxane. Discharges of 0.1 MGD or less should monitor and report for 1,4-dioxane if the concentration of 1,4-dioxane in the discharge exceeds 100 µg/L.

The maximum daily TDS discharge submitted with the application is 560 mg/L which is equivalent to 1,005lbs/day based on the permitted flow of 0.215 MGD. The discharge level for TDS is below the minimum 1000 mg/l and 20,000lbs/day, to require monitoring, therefore no monitoring of TDS, Chloride, Sulfate, and Bromide will be required in the permit. There is no data for 1,4-dioxane, therefore no monitoring is required for 1,4-dioxane

4.3.12 Influent BOD and TSS Monitoring

The permit will include influent BOD5 and TSS monitoring at the same frequency as is done for effluent in order to implement Chapter 94.12 and assess percent removal requirements.

4.3.13 Pretreatment Requirements

The design annual average flow of the treatment plant is 0.215 MGD and the facility receives flow from no significant Industrial users. There is no approved pretreatment program for the facility, however, the permit contains standard conditions requiring the permittee to monitor and control industrial users if applicable.

5.0 Other Requirements

5.1 Anti-backsliding

Not applicable to this permit

5.2 Stormwater:

No storm water outfall is associated with this facility

5.3 Special Permit Conditions

The permit will contain the following special conditions:

1. Stormwater Prohibition. 2. Approval Contingencies, 3. Management of collected screenings, slurries, sludges and other solids 4. Restrictions on flow acceptance under certain conditions. 5. Chlorine minimization

5.4 Biosolids Management

Digested sludge is hauled out by a licensed hauler (Gingrich Hauling) periodically or spread on reed beds onsite during warmer months.

5.5 Anti-Degradation (93.4)

The effluent limits for this discharge have been developed to ensure that existing instream water uses and the level of water quality necessary to protect the existing uses are maintained and protected. No High Quality Waters are impacted by this discharge. No Exceptional Value Waters are impacted by this discharge.

5.6 Class A Wild Trout Fisheries

No Class A Wild Trout Fisheries are impacted by this discharge.

5.7 303d Listed Streams:

The discharge is located on a 303d listed stream segment as impaired for aquatic life and recreational use due to pathogens, siltation and flow variability. The cause of the impairment for pathogens is unknown, siltation is agriculture and Urban Runoff/Storm Sewers. The Stream is listed as Category 4c Waterbodies, this pollution type does not require a TMDL. No action is warranted at this time.

5.8 Basis for Effluent and Surface Water Monitoring

Section 308 of the CWA and federal regulation 40 CFR 122.44(i) require monitoring in permits to determine compliance with effluent limitations. Monitoring may also be required to gather effluent and surface water data to determine if additional effluent limitations are required and/or to monitor effluent impacts on receiving water quality. The permittee is responsible for conducting the monitoring and for reporting results on Discharge Monitoring Reports (DMRs).

5.9 Effluent Monitoring

Monitoring frequencies are based on the nature and effect of the pollutant, as well as a determination of the minimum sampling necessary to adequately monitor the facility's performance. Permittees have the option of taking more frequent samples than are required under the permit. These samples can be used for averaging if they are conducted using EPA-approved test methods (generally found in 40 CFR 136) and if the Method Detection Limits are less than the effluent limits. The sampling location must be after the last treatment unit and prior to discharge to the receiving water. If no discharge occurs during the reporting period, "no discharge" shall be reported on the DMR.

6.0 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: Phase 1 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	Minimum	Average Monthly	Weekly Average	Instant. Maximum		
Flow (MGD)	Report	Report Daily Max	XXX	XXX	XXX	XXX	Continuous	Measured
pH (S.U.)	XXX	XXX	6.0 Daily Min	XXX	9.0 Daily Max	XXX	1/day	Grab
DO	XXX	XXX	5.0 Daily Min	XXX	XXX	XXX	1/day	Grab
TRC	XXX	XXX	XXX	<0.1	XXX	0.30	1/day	Grab
CBOD5 Nov 1 - Apr 30	44.8	71.7	XXX	25	40	50	1/week	24-Hr Composite
CBOD5 May 1 - Oct 31	35.8	53.7	XXX	20	30	40	1/week	24-Hr Composite
BOD5 Raw Sewage Influent	Report	Report Daily Max	XXX	Report	XXX	XXX	1/week	24-Hr Composite
TSS Raw Sewage Influent	Report	Report Daily Max	XXX	Report	XXX	XXX	1/week	24-Hr Composite
TSS	53.7	80.6	XXX	30	45	60	1/week	24-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
Nitrate-Nitrite	XXX	XXX	XXX	XXX	Report Daily Max	XXX	1/month	24-Hr Composite
Total Nitrogen	XXX	XXX	XXX	XXX	Report Daily Max	XXX	1/month	Calculation

Outfall 001, Continued (from Phase 1 through Permit Expiration Date)

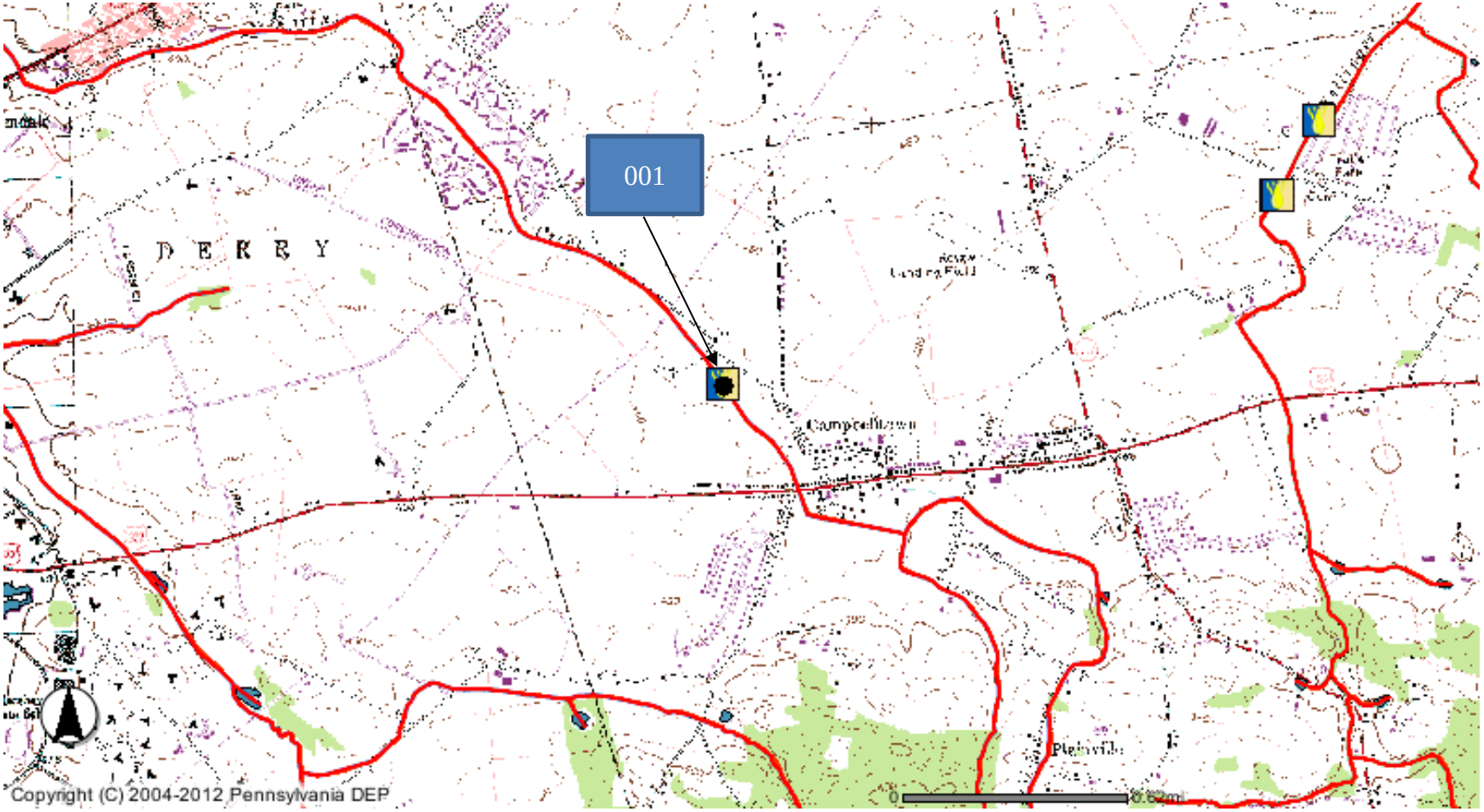
Parameter	Effluent Limitations						Monitoring Requirements	
	Mass Units (lbs/day) (1)		Concentrations (mg/L)				Minimum (2) Measurement Frequency	Required Sample Type
	Average Monthly	Weekly Average	Minimum	Average Monthly	Weekly Average	Instant. Maximum		
Ammonia Nov 1 - Apr 30	16.1	XXX	XXX	9.0	XXX	18	1/week	24-Hr Composite
Ammonia May 1 - Oct 31	5.3	XXX	XXX	3.0	XXX	6	1/week	24-Hr Composite
TKN	XXX	XXX	XXX	XXX	Report Daily Max	XXX	1/month	24-Hr Composite
Total Phosphorus	3.5	XXX	XXX	2.0	XXX	4	1/week	24-Hr Composite
Total Copper	0.027	XXX	XXX	0.015	XXX	0.030	1/week	24-Hr Composite

Compliance Sampling Location: Outfall 001

7.0 Tools and References Used to Develop Permit	
☒	WQM for Windows Model (see Attachment **B**)
☒	PENTOXSD for Windows Model (see Attachment **C**)
☒	TRC Model Spreadsheet (see Attachment **D**)
☐	Temperature Model Spreadsheet (see Attachment)
☒	Toxics Screening Analysis Spreadsheet (see Attachment **E**)
☒	Water Quality Toxics Management Strategy, 361-0100-003, 4/06.
☒	Technical Guidance for the Development and Specification of Effluent Limitations, 362-0400-001, 10/97.
☐	Policy for Permitting Surface Water Diversions, 362-2000-003, 3/98.
☐	Policy for Conducting Technical Reviews of Minor NPDES Renewal Applications, 362-2000-008, 11/96.
☐	Technology-Based Control Requirements for Water Treatment Plant Wastes, 362-2183-003, 10/97.
☐	Technical Guidance for Development of NPDES Permit Requirements Steam Electric Industry, 362-2183-004, 12/97.
☐	Pennsylvania CSO Policy, 385-2000-011, 9/08.
☐	Water Quality Antidegradation Implementation Guidance, 391-0300-002, 11/03.
☐	Implementation Guidance Evaluation & Process Thermal Discharge (316(a)) Federal Water Pollution Act, 391-2000-002, 4/97.
☒	Determining Water Quality-Based Effluent Limits, 391-2000-003, 12/97.
☒	Implementation Guidance Design Conditions, 391-2000-006, 9/97.
☒	Technical Reference Guide (TRG) WQM 7.0 for Windows, Wasteload Allocation Program for Dissolved Oxygen and Ammonia Nitrogen, Version 1.0, 391-2000-007, 6/2004.
☐	Interim Method for the Sampling and Analysis of Osmotic Pressure on Streams, Brines, and Industrial Discharges, 391-2000-008, 10/1997.
☐	Implementation Guidance for Section 95.6 Management of Point Source Phosphorus Discharges to Lakes, Ponds, and Impoundments, 391-2000-010, 3/99.
☐	Technical Reference Guide (TRG) PENTOXSD for Windows, PA Single Discharge Wasteload Allocation Program for Toxics, Version 2.0, 391-2000-011, 5/2004.
☐	Implementation Guidance for Section 93.7 Ammonia Criteria, 391-2000-013, 11/97.
☐	Policy and Procedure for Evaluating Wastewater Discharges to Intermittent and Ephemeral Streams, Drainage Channels and Swales, and Storm Sewers, 391-2000-014, 4/2008.
☐	Implementation Guidance Total Residual Chlorine (TRC) Regulation, 391-2000-015, 11/1994.
☐	Implementation Guidance for Temperature Criteria, 391-2000-017, 4/09.
☒	Implementation Guidance for Section 95.9 Phosphorus Discharges to Free Flowing Streams, 391-2000-018, 10/97.
☐	Implementation Guidance for Application of Section 93.5(e) for Potable Water Supply Protection Total Dissolved Solids, Nitrite-Nitrate, Non-Priority Pollutant Phenolics and Fluorides, 391-2000-019, 10/97.
☐	Field Data Collection and Evaluation Protocol for Determining Stream and Point Source Discharge Design Hardness, 391-2000-021, 3/99.
☐	Implementation Guidance for the Determination and Use of Background/Ambient Water Quality in the Determination of Wasteload Allocations and NPDES Effluent Limitations for Toxic Substances, 391-2000-022, 3/1999.
☒	Design Stream Flows, 391-2000-023, 9/98.
☐	Field Data Collection and Evaluation Protocol for Deriving Daily and Hourly Discharge Coefficients of Variation (CV) and Other Discharge Characteristics, 391-2000-024, 10/98.
☐	Evaluations of Phosphorus Discharges to Lakes, Ponds and Impoundments, 391-3200-013, 6/97.
☒	Pennsylvania's Chesapeake Bay Tributary Strategy Implementation Plan for NPDES Permitting, 4/07.
☒	SOP: 1. Establishing effluent limitation for individual sewage permit,
☐	Other:

Attachments

A. Topographical Map



B. WQM Model Results

WQM 7.0 Effluent Limits

SWP Basin	Stream Code	Stream Name
07D	9507	SPRING 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)
6.500	Campbelltown W	PA0081302	0.215	CBOD5	25		
				NH3-N	3.15	6.3	
				Dissolved Oxygen			5

Permit No. PA0081302

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
07D	9507	SPRING CREEK	**6.500**	440.00	1.53	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	0.140	0.00	0.00	0.000	0.000	0.0	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
Campbelltown W	PA0081302	0.2150	0.0000	0.0000	0.000	25.00	6.70

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	5.00	8.24	0.00	0.00
NH3-N	25.00	0.00	0.00	0.70

Permit No. PA0081302

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
07D	9507	SPRING CREEK	**3.500**	400.00	5.10	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	0.140	0.00	0.00	0.000	0.000	0.0	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	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	5.00	8.24	0.00	0.00
NH3-N	25.00	0.00	0.00	0.70

Permit No. PA0081302

WQM 7.0 Hydrodynamic Outputs

SWP Basin	Stream Code	Stream Name
07D	9507	SPRING 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												
6.500	0.21	0.00	0.21	.3326	0.00253	.469	9.05	19.3	0.13	1.422	23.04	6.79
Q1-10 Flow												
6.500	0.19	0.00	0.19	.3326	0.00253	NA	NA	NA	0.13	1.457	23.18	6.79
Q30-10 Flow												
6.500	0.26	0.00	0.26	.3326	0.00253	NA	NA	NA	0.14	1.355	22.79	6.81

Permit No. PA0081302

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	0.89	Use Inputted Reach Travel Times	☐
Q30-10/Q7-10 Ratio	1.23	Temperature Adjust Kr	☑
D.O. Saturation	90.00%	Use Balanced Technology	☑
D.O. Goal	5		

Permit No. PA0081302

WQM 7.0 Wasteload Allocations

SWP Basin	Stream Code	Stream Name
07D	9507	SPRING 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
6.500	Campbelltown W	8.66	13.63	8.66	13.63	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
6.500	Campbelltown W	1.76	3.15	1.76	3.15	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)		
6.50	Campbelltown W	25	25	3.15	3.15	5	5	0	0

Permit No. PA0081302

WQM 7.0 D.O.Simulation

SWP Basin	Stream Code	Stream Name
07D	9507	SPRING CREEK

RMI	Total Discharge Flow (mgd)	Analysis Temperature (°C)	Analysis pH
6.500	0.215	23.041	6.794
Reach Width (ft)	**Reach Depth (ft)**	**Reach WDRatio**	**Reach Velocity (fps)**
9.048	0.469	19.304	0.129
Reach CBOD5 (mg/L)	**Reach Kc (1/days)**	**Reach NH3-N (mg/L)**	**Reach Kn (1/days)**
15.99	1.244	1.91	0.885
Reach DO (mg/L)	**Reach Kr (1/days)**	**Kr Equation**	**Reach DO Goal (mg/L)**
6.270	24.017	Owens	5
Reach Travel Time (days)			
1.422			

Subreach Results

TravTime (days)	CBOD5 (mg/L)	NH3-N (mg/L)	D.O. (mg/L)
0.142	13.05	1.69	7.11
0.284	10.65	1.49	7.39
0.427	8.69	1.31	7.61
0.569	7.09	1.16	7.79
0.711	5.78	1.02	7.80
0.853	4.72	0.90	7.80
0.995	3.85	0.79	7.80
1.138	3.14	0.70	7.80
1.280	2.56	0.62	7.80
1.422	2.09	0.54	7.80

Permit No. PA0081302

C. PENTOXSD Model Results

PENTOXSD Analysis Results

Recommended Effluent Limitations

SWP Basin	Stream Code:	Stream Name:
07D	9507	SPRING CREEK

RMI	Name	Permit Number	Disc Flow (mgd)
6.50	Campbelltown W	PA0081302	0.2150

Parameter	Effluent Limit (µg/L)	Governing Criterion	Max. Daily Limit (µg/L)	Most Stringent WQBEL (µg/L)	Most Stringent WQBEL Criterion
COPPER	14.751	AFC	23.015	14.751	AFC

Permit No. PA0081302

PENTOXSD

Modeling Input Data

Stream Code	RMI	Elevation (ft)	Drainage Area (sq mi)	Slope	PWS With (mgd)	Apply FC
9507	6.50	440.00	1.53	0.00000	0.00	☑

Stream Data

	LFY	Trib Flow	Stream Flow	WD Ratio	Rch Width	Rch Depth	Rch Velocity	Rch Trav Time	Tributary Hard	Tributary pH	Stream Hard	Stream pH	Analysis Hard	Analysis pH
	(cfsm)	(cfs)	(cfs)		(ft)	(ft)	(fps)	(days)	(mg/L)		(mg/L)		(mg/L)	
Q7-10	0.14	0	0	0	0	0	0	0	100	7	0	0	0	0
Qh		0	0	0	0	0	0	0	100	7	0	0	0	0

Discharge Data

Name	Permit Number	Existing Disc Flow (mgd)	Permitted Disc Flow (mgd)	Design Disc Flow (mgd)	Reserve Factor	AFC PMF	CFC PMF	THH PMF	CRL PMF	Disc Hard (mg/L)	Disc pH
Campbelltown W	PA0081302	0.215	0	0	0	0	0	0	0	100	6.5

Parameter Data

Parameter Name	Disc Conc (µg/L)	Trib Conc (µg/L)	Disc Daily CV	Disc Hourly CV	Steam Conc (µg/L)	Stream CV	Fate Coef	FOS	Crit Mod	Max Disc Conc (µg/L)
COPPER	1000000	0	0.5	0.5	0	0	0	0	1	0

Stream Code	RMI	Elevation (ft)	Drainage Area (sq mi)	Slope	PWS With (mgd)	Apply FC
9507	3.50	400.00	5.10	0.00000	0.00	☑

Stream Data

	LFY	Trib Flow	Stream Flow	WD Ratio	Rch Width	Rch Depth	Rch Velocity	Rch Trav Time	Tributary Hard	Tributary pH	Stream Hard	Stream pH	Analysis Hard	Analysis pH
	(cfsm)	(cfs)	(cfs)		(ft)	(ft)	(fps)	(days)	(mg/L)		(mg/L)		(mg/L)	
Q7-10	0.14	0	0	0	0	0	0	0	100	7	0	0	0	0
Qh		0	0	0	0	0	0	0	100	7	0	0	0	0

Discharge Data

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

Parameter Data

Parameter Name	Disc Conc (µg/L)	Trib Conc (µg/L)	Disc Daily CV	Disc Hourly CV	Steam Conc (µg/L)	Stream CV	Fate Coef	FOS	Crit Mod	Max Disc Conc (µg/L)
COPPER	0	0	0.5	0.5	0	0	0	0	1	0

Permit No. PA0081302

PENTOXSD Analysis Results

Hydrodynamics

SWP Basin	Stream Code:	Stream Name:
07D	9507	SPRING CREEK

RMI	Stream Flow (cfs)	PWS With (cfs)	Net Stream Flow (cfs)	Disc Analysis Flow (cfs)	Reach Slope	Depth (ft)	Width (ft)	WD Ratio	Velocity (fps)	Reach Trav Time (days)	CMT (min)
Q7-10 Hydrodynamics											
6.500	0.2142	0	0.2142	0.3326	0.0025	0.4687	9.0484	19.304	0.1289	1.422	1.067
3.500	0.714	0	0.714	NA	0	0	0	0	0	0	NA
Qh Hydrodynamics											
6.500	1.9325	0	1.9325	0.3326	0.0025	0.8760	9.0484	10.329	0.2858	0.6415	1.982
3.500	5.5350	0	5.5350	NA	0	0	0	0	0	0	NA

Permit No. PA0081302

PENTOXSD Analysis Results

Wasteload Allocations

RMI	Name	Permit Number
6.50	**Campbelltown W**	**PA0081302**

AFC

Q7-10: **CCT (min)** 1.067 **PMF** 1 **Analysis pH** 6.635 **Analysis Hardness** 100

Parameter	Stream Conc (µg/L)	Stream CV	Trib Conc (µg/L)	Fate Coef	WQC (µg/L)	WQ Obj (µg/L)	WLA (µg/L)
COPPER	0	0	0	0	13.439	13.999	23.015

Dissolved WQC. Chemical translator of 0.96 applied.

CFC

Q7-10: **CCT (min)** 1.067 **PMF** 1 **Analysis pH** 6.635 **Analysis Hardness** 100

Parameter	Stream Conc. (µg/L)	Stream CV	Trib Conc. (µg/L)	Fate Coef	WQC (µg/L)	WQ Obj (µg/L)	WLA (µg/L)
COPPER	0	0	0	0	8.956	9.329	15.337

Dissolved WQC. Chemical translator of 0.96 applied.

THH

Q7-10: **CCT (min)** 1.067 **PMF** NA **Analysis pH** NA **Analysis Hardness** NA

Parameter	Stream Conc (µg/L)	Stream CV	Trib Conc (µg/L)	Fate Coef	WQC (µg/L)	WQ Obj (µg/L)	WLA (µg/L)
COPPER	0	0	0	0	NA	NA	NA

CRL

Qh: **CCT (min)** 1.982 **PMF** 1

Parameter	Stream Conc (µg/L)	Stream CV	Trib Conc (µg/L)	Fate Coef	WQC (µg/L)	WQ Obj (µg/L)	WLA (µg/L)
COPPER	0	0	0	0	NA	NA	NA

Permit No. PA0081302

D. TRC Calculations

1A	B	C	D	E	F	G
2	**TRC EVALUATION**			**Enter Facility Name in E3**		
3	Input appropriate values in B4:B8 and E4:E7					
4	0.2	= Q stream (cfs)		0.5	= CV Daily	
5	0.215	= Q discharge (MGD)		0.5	= CV Hourly	
6	30	= no. samples		1	= AFC_Partial Mix Factor	
7	0.3	= Chlorine Demand of Strear		1	= CFC_Partial Mix Factor	
8	0	= Chlorine Demand of Discha		15	= AFC_Criteria Compliance Time (min)	
9	0.5	= BAT/BPJ Value		720	= CFC_Criteria Compliance Time (min)	
		= % Factor of Safety (FOS)			=Decay Coefficient (K)	
10	Source	Reference	AFC Calculations		Reference	CFC Calculations
11	TRC	1.3.2.iii	WLA afc =	0.211	1.3.2.iii	WLA cfc = 0.198
12	PENTOXSD TRC	5.1a	LTAMULT afc =	0.373	5.1c	LTAMULT cfc = 0.581
13	PENTOXSD TRC	5.1b	LTA_afc=	0.079	5.1d	LTA_cfc = 0.115
14						
15	Source		Effluent Limit Calculations			
16	PENTOXSD TRC	5.1f	AML MULT =	1.231		
17	PENTOXSD TRC	5.1g	AVG MON LIMIT (mg/l) =	0.097	AFC	
18			INST MAX LIMIT (mg/l) =	0.316		

WLA afc	(.019/e(-k*AFC_tc)) + [(AFC_Yc*Qs*.019/Qd*e(-k*AFC_tc))...
	...+ Xd + (AFC_Yc*Qs*Xs/Qd)]*(1-FOS/100)
LTAMULT afc	EXP((0.5*LN(cvh^2+1))-2.326*LN(cvh^2+1)^0.5)
LTA_afc	wla_afc*LTAMULT_afc
WLA_cfc	(.011/e(-k*CFC_tc) + [(CFC_Yc*Qs*.011/Qd*e(-k*CFC_tc))...
	...+ Xd + (CFC_Yc*Qs*Xs/Qd)]*(1-FOS/100)
LTAMULT_cfc	EXP((0.5*LN(cvd^2/no_samples+1))-2.326*LN(cvd^2/no_samples+1)^0.5)
LTA_cfc	wla_cfc*LTAMULT_cfc
AML MULT	EXP(2.326*LN((cvd^2/no_samples+1)^0.5)-0.5*LN(cvd^2/no_samples+1))
AVG MON LIMIT	MIN(BAT_BPJ,MIN(LTA_afc,LTA_cfc)*AML_MULT)
INST MAX LIMIT	1.5*((av_mon_limit/AML_MULT)/LTAMULT_afc)

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E. Toxic Screening Analysis Spreadsheet

TOXICS SCREENING ANALYSIS
WATER QUALITY POLLUTANTS OF CONCERN
VERSION 2.5

Facility: **Cambelltown West STP** NPDES Permit No.: **PA0081302** Outfall: **001**
Analysis Hardness (mg/L): **100** Discharge Flow (MGD): **0.215** Analysis pH (SU): **7**

Parameter		Maximum Concentration in Application or DMRs (µg/L)	Most Stringent Criterion (µg/L)	Candidate for PENTOXSD Modeling?	Most Stringent WQBEL (µg/L)	Screening Recommendation
Total Dissolved Solids		560000	500000	Yes		
Chloride		120000	250000	No		
Bromide		200	N/A	No		
Sulfate		54200	250000	No		
Total Aluminum			750			
Total Antimony			5.6			
Total Arsenic			10			
Total Barium			2400			
Total Beryllium			N/A			
Total Boron			1600			
Total Cadmium			0.271			
Total Chromium			N/A			
Hexavalent Chromium			10.4			
Total Cobalt			19			
Total Copper		12	9.3	Yes	14.7	Establish Limits
Free Available Cyanide			5.2			
Total Cyanide			N/A			
Dissolved Iron			300			
Total Iron			1500			
Total Lead			3.2			
Total Manganese			1000			
Total Mercury			0.05			
Total Nickel			52.2			
Total Phenols (Phenolics)			5			
Total Selenium			5.0			
Total Silver			3.8			
Total Thallium			0.24			
Total Zinc		78	119.8	No		
Total Molybdenum			N/A			