pennsylvania
DEPARTMENT OF ENVIRONMENTAL PROTECTION

Northcentral Regional Office
CLEAN WATER PROGRAM

Application Type	**Renewal**	Application No.	**PA0208922**
Facility Type	**Municipal**	APS ID	**1012897**
Major / Minor	**Minor**	Authorization ID	**1308175**

NPDES PERMIT FACT SHEET INDIVIDUAL SEWAGE

Applicant and Facility Information

Applicant Name	**Woodward Township Sewer & Water Authority Clearfield County**	Facility Name	**Woodward Township S & W Authority Sanitary Sewer STP**
Applicant Address	PO Box 6 131 Punkin Hollow Drive Houtzdale, PA 16651-0006	Facility Address	131 Punkin Hollow Road Houtzdale, PA 16651-9651
Applicant Contact	David Stodart	Facility Contact	David Stodart
Applicant Phone	(814) 378-8211	Facility Phone	(814) 378-8211
Client ID	64368	Site ID	258054
Ch 94 Load Status	Not Overloaded	Municipality	Woodward Township
Connection Status	No Limitations	County	Clearfield
Date Application Received	March 4, 2020	EPA Waived?	No
Date Application Accepted	March 12, 2020	If No, Reason	Significant CBAY Discharger

Purpose of Application: Renewal of an existing NPDES permit for the discharge of treated sewage.

Summary of Review

The above permittee has submitted an NPDES renewal application for their existing discharge from their sewage treatment plant that serves the Woodward Township Sewer and Water Authority system in Clearfield County. Based on the following review, it is recommended a permit be drafted in accordance with the public participation as outlined below. Unless otherwise noted, all applicable Department Standard Operating Procedures (SOPs) have been followed during the review of this application.

Sludge use and disposal description and location(s): Landfill Disposal at the Greentree Landfill in Brockway, PA.

Public Participation

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

Approve	Deny	Signatures	Date
X		*Nicholas W. Hartranft* Nicholas W. Hartranft, P.E. / Environmental Engineer Manager	March 9, 2022
X		*Thomas M. Randis* Thomas M. Randis / Environmental Program Manager	March 9, 2022

Discharge, Receiving Waters and Water Supply Information

Outfall No.	001	Design Flow (MGD)	0.56
Latitude	40º 48' 18.53"	Longitude	-78º 20' 31.72"
Quad Name	Houtzdale	Quad Code	
Wastewater Description:	Sewage Effluent		
Receiving Waters	Whiteside Run (CWF)	Stream Code	25898
NHD Com ID	61833911	RMI	1.21
Drainage Area	3.97	Yield (cfs/mi^2)	0.1323
Q_{7-10} Flow (cfs)	0.53	Q_{7-10} Basis	Reference Gage 01542000
Elevation (ft)	1533	Slope (ft/ft)	0.03
Watershed No.	8-D	Chapter 93 Class.	CWF
Existing Use	CWF	Existing Use Qualifier	N/A
Exceptions to Use	None	Exceptions to Criteria	None
Assessment Status	Impaired		
Cause(s) of Impairment	METALS, SILTATION		
Source(s) of Impairment	ACID MINE DRAINAGE		
TMDL Status	Final	Name	Moshannon Creek Watershed
Nearest Downstream Public Water Supply Intake	PA-American Water Company, Milton, PA		
PWS Waters	West Branch Susquehanna River	Flow at Intake (cfs)	682
PWS RMI	10.5	Distance from Outfall (mi)	165

Changes Since Last Permit Issuance: None

Other Comments: The Q_{7-10} Stream flow has been based on a drainage area ratio evaluation using data in the USGS publication *Selected Stream Flow Characteristics for Streamgage Locations in and near Pennsylvania* (see Appendix A). Drainage area was determined using USGS StreamStats (see Appendix A). A downstream stream gage on Moshannon Creek near Osceola Mills, PA (Gage No. 01542000) was selected for the analysis.

$[Q_{(7-10)}$ @ Outfall 001] = $[Q_{(7-10)}$ @ Gage] × [Drainage Area @ Outfall 001] ÷ [Drainage Area @ Gage]

$[Q_{(7-10)}$ @ Outfall 001] = 9.1 mi^2 × 3.97 cfs ÷ 68.8 mi^2 = 0.53 cfs

Treatment Facility Summary				
Treatment Facility Name: Woodward Township Sewage & Water **Treatment Area**: This system treats the municipal sewage collected from individual residences in Woodward Township and Gulich Township as well as flows from the State Correctional Institute at Houtzdale				
Waste Type	**Degree of Treatment**	**Process Type**	**Disinfection**	**Avg Annual Flow (MGD)**
Sewage	Secondary	Extended Aeration	Gas Chlorine	0.56
Hydraulic Capacity (MGD)	**Organic Capacity (lbs/day)**	**Load Status**	**Biosolids Treatment**	**Biosolids Use/Disposal**
0.76	1740	Not Overloaded	Aerobic Digestion	Landfill

Treatment System

The individual components are as follows:

- One (1) SCI Screening Station.
- One (1) Grit / Grease Unit.
- One (1) EQ Tank / Bypass.
- Two (2) Aeration Tanks with Blowers.
- Two (2) Clarifiers with skimmers.
- Two (2) Sludge Concentrators.
- One (1) Gas Chlorination System.
- Two (2) Chlorine Contact Tanks.
- One (1) Effluent Flow Meter.
- One (1) Outfall 001.
- Two (2) Aerobic Sludge Digesters.
- One (1) Sludge Press with Polymer Feed System.
- One (1) Back-up Generator.
- Three (3) Digester Blowers.

Changes Since Last Permit Issuance: None

Other Comments: None

TMDL Impairment

The Department's Geographic Information System (eMapPA) shows that Whiteside Run is impaired and a TMDL does exist for the stream segment, but this facility was not accounted for in the waste load allocations listed in the TMDL. Metals in acidic discharge water from abandoned coal mines cause the impairment for this watershed. The TMDL for this watershed addresses the three primary metals associated with acid mine drainage (iron, manganese, aluminum), and acidity (pH). The TMDL for this sample point on Whiteside Run consists of a load allocation to all of the area upstream of sample point WHSD01 which includes the discharge from this facility.

Given the regulations contained in 40 CFR §122.44(d)(1)(ii)&(iii), it can be determined that the type of effluent from this facility has no "Reasonable potential to cause, or contributes to an in-stream excursion above the allowable ambient concentration of a State numeric criteria within a State water quality standard for an individual pollutant." Therefore, the permit will not be required to contain effluent limits for the pollutants addressed in the TMDL. Additionally, the facility has been required to monitor for metals (iron, manganese and aluminum) throughout the previous permit term. Sample results from 2017 through 2020 indicated the following maximum and average concentrations of each metal over the previous permit term. The maximum concentrations were input into the Toxic Management Spreadsheet which confirmed no limits or monitoring are required (see Appendix C) These monitoring requirements will be removed for the next permit term as it has been confirmed that this facility is not causing or contributing to the impairment of the stream.

Parameter	Average (mg/L)	Maximum (mg/L)
Fe	< 0.05	< 0.05
Mn	< 0.02	0.02
Al	0.10	0.19

Chesapeake Bay Requirements

In order to address the Chesapeake Bay TMDL, Pennsylvania developed a Chesapeake Bay Watershed Implementation Plan (WIP). Since the publication of Pennsylvania's Phase I Chesapeake WIP in January 2011 and the Chesapeake Bay TMDL, several activities have occurred that necessitated the development of the Phase II and Phase III WIPs. Initially, a phased approach was utilized which imposed TN and TP cap loads in reissued permits for significant sewage dischargers. In accordance with the Wastewater Supplement to the Phase III WIP, cap loads were established for this permit. Per the December 17, 2019 Phase III revisions to the Chesapeake Bay Watershed Implementation Plan (WIP), the minimum monitoring frequencies for the TN species and TP in renewed NPDES permits for significant sewage dischargers is to be 2/week.

The limitations and monitoring requirements specified below are proposed for the draft permit, to comply with Pennsylvania's Chesapeake Bay Tributary Strategy:

Chesapeake Bay Effluent Monitoring Requirements

	Limitations							
	Mass (lb/day)		Concentration (mg/L)				Monitoring	
Discharge Parameter	Total Monthly	Total Annual	Minimum	Average Monthly	Average Weekly	Instantaneous Maximum	Minimum Frequency	Sample Type
Ammonia---N	Report	Report		Report			2/ Week	8-hr Composite
Kjeldahl---N	Report			Report			2/ Week	8-hr Composite
Nitrate-Nitrite as N	Report			Report			2/ Week	8-hr Composite
Total Nitrogen	Report	Report		Report			1/ Month	Calculate
Total Phosphorous	Report	Report		Report			2/ Week	8-hr Composite
Net Total Nitrogen	Report	10,228* (lb/yr)					1/month	Calculation
Net Total Phosphorus	Report	1,364* (lb/yr)					1/month	Calculation

*Note: These cap loads are based on the design annual average daily flows of 0.560 MGD and

Compliance History	
Summary of DMRs:	A query in WMS found no effluent exceedances.
Summary of Inspections:	The most recent inspection conducted on 08/18/2021 indicated that the WWTP was operating normally and that no effluent exceedances were reported. No violations were noted.

Other Comments: None

Compliance History

DMR Data for Outfall 001 (from December 1, 2020 to November 30, 2021)

Parameter	NOV-21	OCT-21	SEP-21	AUG-21	JUL-21	JUN-21	MAY-21	APR-21	MAR-21	FEB-21	JAN-21	DEC-20
Flow (MGD) *Average Monthly*	0.192	0.181	0.192	0.190	0.0161	0.163	0.195	0.229	0.288	0.321	0.346	0.362
Flow (MGD) *Daily Maximum*	0.226	0.231	0.292	0.311	0.209	0.192	0.243	0.262	0.430	0.362	0.391	0.461
pH (S.U.) *Minimum*	6.2	6.4	6.5	6.5	6.5	6.5	6.5	6.6	6.6	6.7	6.6	6.6
pH (S.U.) *Maximum*	6.8	6.6	6.8	6.9	6.8	6.7	6.8	6.8	6.9	6.9	6.8	6.9
DO (mg/L) *Minimum*	3.8	4.3	4.8	4.0	4.7	5.2	4.7	4.1	4.7	5.0	5.6	5.0
TRC (mg/L) *Average Monthly*	0.5	0.5	0.5	0.4	0.4	0.4	0.4	0.4	0.4	0.4	0.4	0.4
TRC (mg/L) *Instantaneous Maximum*	0.8	0.7	0.7	0.6	0.6	0.6	0.6	0.6	0.6	0.6	0.6	0.5
CBOD5 (lbs/day) *Average Monthly*	9	11	7	7	< 4	< 4	< 6	15	15	12	9	< 7
CBOD5 (lbs/day) *Weekly Average*	15	16	10	10	6	5	11	21	28	13	10	9
CBOD5 (mg/L) *Average Monthly*	5.0	8.0	5.0	5.0	< 3.0	< 3.0	< 3.0	8.0	7.0	5.0	3.0	< 2.0
CBOD5 (mg/L) *Weekly Average*	9.0	11.0	6.0	7.0	4.0	3.0	6.0	10.0	14.0	5.0	3.0	3.0
BOD5 (lbs/day) *Raw Sewage Influent Average Monthly*	455	320	474	439	313	462	467	596	533	547	553	582
BOD5 (lbs/day) *Raw Sewage Influent Daily Maximum*	588	387	541	495	526	644	582	734	560	641	602	701
BOD5 (mg/L) *Raw Sewage Influent Average Monthly*	282	221	310	296	236	317	275	323	228	213	188	194
TSS (lbs/day) *Average Monthly*	14	12	6	6	5	< 5	8	15	17	13	16	< 18
TSS (lbs/day) *Raw Sewage Influent Average Monthly*	627	608	544	497	437	483	565	500	644	722	836	642
TSS (lbs/day) *Raw Sewage Influent Daily Maximum*	743	961	624	636	514	535	605	598	734	891	902	941
TSS (lbs/day) *Weekly Average*	18	22	12	6	6	7	9	18	26	26	19	29

TSS (mg/L) *Average Monthly*	8.0	8.0	4.0	4.0	4.0	< 3.0	5.0	8.0	7.0	5.0	6.0	< 6.0
TSS (mg/L) *Raw Sewage Influent* *Average Monthly*	389	413	356	332	328	334	338	276	270	280	285	215
TSS (mg/L) *Weekly Average*	11.0	14.0	6.0	4.0	5.0	5.0	6.0	9.0	11.0	10.0	6.0	10.0
Fecal Coli. (No./100 ml) *Geometric Mean*	< 1	< 2	< 2	< 2	< 2	< 1	< 1	< 1	< 5	< 2	< 1	< 2.0
Fecal Coli. (No./100 ml) *Instantaneous Maximum*	3.1	8.6	14.5	4.1	7.3	1	1	4.2	142.1	4.1	1	35.5
Nitrate-Nitrite (mg/L) *Average Monthly*	< 2.86	< 8.50	< 10.0	< 10.27	< 5.81	< 2.27	< 1.59	< 2.21	< 0.66	< 0.67	< 1.56	< 1.13
Nitrate-Nitrite (lbs) *Total Monthly*	< 142	< 391	< 485	< 472	< 244	< 98	< 81	< 124	< 48	< 50	< 143	< 103
Total Nitrogen (mg/L) *Average Monthly*	< 9.62	< 10.30	< 11.26	< 10.89	< 6.48	< 3.25	< 2.63	< 5.27	< 10.02	< 3.19	< 3.23	< 2.89
Total Nitrogen (lbs) Effluent Net *Total Monthly*	< 473	< 475	< 541	< 501	< 272	< 139	< 135	< 304	< 711	< 235	< 292	< 264
Total Nitrogen (lbs) *Total Monthly*	< 473	< 475	< 541	< 501	< 272	< 139	< 135	< 304	< 711	< 235	< 292	< 264
Ammonia (lbs/day) *Average Monthly*	7	< 0.2	< 0.2	< 0.4	< 0.2	< 0.3	< 0.2	< 4	16	0.6	0.5	< 0.5
Ammonia (lbs/day) *Daily Maximum*	12	0.4	0.5	1.0	< 0.7	< 0.7	0.2	16	31	1.0	0.7	0.9
Ammonia (mg/L) *Average Monthly*	4.31	< 0.15	< 0.14	< 0.29	< 0.16	< 0.2	< 0.12	< 1.85	7.32	0.25	0.19	< 0.19
Ammonia (mg/L) *Weekly Average*	7.84	0.22	0.27	0.46	< 0.3	< 0.3	0.14	6.57	11.68	0.38	0.23	0.27
Ammonia (lbs) *Total Monthly*	212	< 7	< 7	< 14	< 7	< 8	< 6	< 111	510	18	17	< 17
TKN (mg/L) *Average Monthly*	< 6.76	< 1.81	< 1.26	< 0.62	< 0.67	< 0.98	< 1.04	3.05	9.36	2.52	< 1.67	< 1.76
TKN (lbs) *Total Monthly*	< 331	< 84	< 56	< 29	< 28	< 42	< 54	180	663	185	< 149	< 162
Total Phosphorus (mg/L) *Average Monthly*	1.41	1.91	1.99	2.38	2.40	3.37	2.03	2.13	2.03	1.14	0.62	0.35
Total Phosphorus (lbs) Effluent Net *Total Monthly*	70	88	90	111	99	142	105	122	148	83	56	32
Total Phosphorus (lbs) *Total Monthly*	70	88	90	111	99	142	105	122	148	83	56	32

Existing Effluent Limitations and Monitoring Requirements

Existing Limits – Outfall 001

Discharge Parameter	Limitations							
	Mass (lb/day)		Concentration (mg/L)				Monitoring Requirements	
	Monthly Average	Daily Maximum	Minimum	Average Monthly	Average Weekly	Instantaneous Maximum	Minimum Frequency	Sample Type
Flow (MGD)	Report	Report					Continuous	Meter
pH (Std. Units)			6.0			9.0	1/ day	Grab
DO			Report				2/week	Grab
TRC				0.5		1.6	1/day	Grab
C-BOD_5	116	186 Wkly. Av.		25	40	50	1/ week	8-hr Composite
BOD_5 (Influent)	Report	Report		Report			1/week	8-hr Composite
TSS	140	210 Wkly. Av.		30	45	60	1/ week	8-hr Composite
TSS (Influent)	Report	Report		Report			1/week	8-hr Composite
Fecal Coliforms (5/1-9/30)				200 Geo Mean		1,000	1/week	Grab
Fecal Coliforms (10/1-4/30)				2,000 Geo Mean		10000	1/week	Grab
Ammonia -N	Report	Report		Report	Report		2/week	8-hr Composite
Total Al				Report An. Avg.			1/year	Grab
Total Fe				Report An. Avg.			1/year	Grab
Total Mn				Report An. Avg.			1/year	Grab

*The existing effluent limits for Outfall 001 were based on a design flow of 0.56 MGD.

Discharge Parameter	Limitations						
	Mass Units (lbs)		Concentration (mg/L)			Monitoring Requirements	
	Monthly	Annual	Minimum	Average Monthly	Maximum	Minimum Frequency	Sample Type
Ammonia – N	Report	Report		Report		2/week	8-Hr Composite
Kjeldahl---N	Report			Report		2/week	8-Hr Composite
Nitrate-Nitrite as N	Report			Report		2/week	8-Hr Composite
Total Nitrogen	Report	Report		Report		1/month	Calculation
Total Phosphorus	Report	Report		Report		2/week	8-Hr Composite
Net Total Nitrogen	Report	10,228				1/month	Calculation
Net Total Phosphorus	Report	1,364				1/month	Calculation

Development of Effluent Limitations

Outfall No. 001 **Design Flow (MGD)** 0.56
Latitude 40º 48' 17.50" **Longitude** -78º 20' 31.00"
Wastewater Description: Sewage Effluent

Technology-Based Limitations

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

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

Water Quality-Based Limitations

Treatment requirements for discharges to waters affected by abandoned mine drainage ("AMD") are established at 25 Pa. Code § 95.5. Specifically, § 95.5(a)(1) states that only secondary treatment is required when the receiving water is so polluted by AMD that aquatic communities are essentially excluded. Section 95.5(b) further states that a greater degree of treatment is only required when, 1) the water quality of the receiving water has or is expected to improve significantly, or 2) secondary treatment would cause pollution in downstream waters, so that designated stream uses would not be achievable.

In previous reviews of this permitted discharge, § 95.5 was applied to determine that no water quality modeling was necessary due to the AMD impairment of the receiving stream. The applicability of this methodology was re-evaluated during this renewal review by Department biologist staff by conducting an aquatic survey of the receiving stream on May 18, 2021. The findings of this survey are detailed in Appendix B of this Fact Sheet. In summary, the Department determined that, "this study indicated that the stream is recovering and supports a viable macroinvertebrate community with water quality conditions that met the Chapter 93 criteria for pH (6 -9 units). The presence of long-lived taxa in adequate numbers also indicated that water quality is maintained sufficiently throughout the year and that a point of first use is present at the discharge." Based on the existence of the TMDL and the findings of the survey, in accordance with § 95.5(b)(1), it appears that Whiteside Run is recovering from the impacts of abandoned mine drainage and that water quality has significantly improved in the watershed to a point that the current discharge should not be exempt from stricter limits. Water quality modeling, as detailed in the following sections, was conducted for applicable parameters with a point of first use at Outfall 001.

NH_3-N, $CBOD_5$ and DO:
WQM 7.0 for Windows (version 1.1) is a DEP computer model used to determine wasteload allocations and effluent limitations for CBOD5, NH_3-N and DO for single and multiple point source discharge scenarios. This model simulates two basic processes. The NH_3-N module simulates the mixing and degradation of NH_3-N in the stream and compares calculated instream NH_3-N concentrations to the water quality criteria. The DO module simulates the mixing and consumption of DO in the stream due to degradation of $CBOD_5$ and NH_3-N and compares the calculated instream DO

concentrations to the water quality criteria. The model then determines the highest pollutant loading the stream can assimilate and still meet water quality under design conditions.

The technology-based limits for $CBOD_5$ (25 mg/l) and NH_3-N (25.0 mg/l) were used as inputs for the modeling. The DO minimum criterion from §93.7 (5.0 mg/L for CWF) was used for the in-stream objective for the model. The summary of the output is as follows and detailed results can be found in Appendix D:

Parameter	Effluent Limitations (mg/L)		
	30 Day Average	Maximum	Minimum
$CBOD_5$	15.97		
NH_3-N	4.97	9.94	
DO			4.0

The associated mass-based limits (lbs/day) were based on the formula: design flow (0.56 MGD) x concentration limit (mg/L) at design flow x conversion factor (8.34).

All Average Monthly limits were then rounded down in accordance with the rounding rules established in Chapter 5 of DEP guidance document, *Technical Guidance for the Development and Specification of Effluent Limitations (362-0400-001)*. Weekly Average and Instantaneous Maximum effluent limit concentrations were calculated using multipliers of 1.5 and 2.0, respectively. These multipliers are outlined in Chapter 3 of that guidance document. The monitoring frequencies and sample types (8-Hr. Comp.) for $CBOD_5$ and DO correspond with Table 6-3 in that guidance document. The sample type for Ammonia was also determined by that guidance, but the monitoring frequency was determined by the Chesapeake Bay nutrient monitoring requirements outlined in the Phase III WIP.

Based on DMR data for the existing facility, reported values for DO, $CBOD_5$, and NH_3-N are routinely meeting the proposed effluent limits. A few instances of exceedance with the proposed limits were noted (once for DO, once for Average Monthly NH_3-N, and twice for Weekly Average NH_3-N) from the most recent 12 months of DMR data. The Department believes these instances can be avoided with operational oversight and is therefore not proposing a compliance schedule for these parameters.

pH:
CFR Title 40 §133.102(c) and 25 PA Code §95.2(1) provide the basis of effluent limitations for pH. The existing monitoring frequency (1/ Day) and monitoring sample type (Grab) for pH corresponds with the *Technical Guidance for the Development and Specification of Effluent Limitations* (362-0400-001) Table 6-3 and will remain.

Total Residual Chlorine (TRC):
A TRC model evaluation was conducted (Appendix E) by using in a BAT value of 0.5 mg/l as input, in accordance with 25 Pa. Code § 92a.48(b)(1). The attached TRC model, which was run at the point of first use, reveals that a more stringent water quality based effluent limit is required.

A 36-month compliance schedule to meet the proposed TRC limit is proposed to be included in the final permit. The Permittee must follow the condition found in Part C.II. of the proposed permit and determine if modifications to the facility are necessary and if so, obtain the applicable Water Quality Management Permits to make those modifications.

The existing monitoring frequency (Daily) and sample type (grab) for TRC correspond with the *Technical Guidance for the Development and Specification of Effluent Limitations* (362-0400-001) Table 6-3 and will remain.

Total Suspended Solids (TSS):
The previously applied technology based secondary treatment standards (25 PA Code §92a.47 (a) (1&2)) for TSS will remain. The associated mass-based limits (lbs/day) were based on the formula: design flow (0.56 MGD) x concentration limit (mg/L) at design flow x conversion factor (8.34). These limits were then rounded down in accordance with the rounding rules established in the *Technical Guidance for the Development and Specification of Effluent Limitations (362-0400-001)*, Chapter 5 - Specifying Effluent Limitations in NPDES Permits. The existing monitoring frequency (1/ Week) and sample type (8-Hr. Comp.) for TSS correspond with the *Technical Guidance for the Development and Specification of Effluent Limitations* (362-0400-001) Table 6-3 and will remain.

Flow:
The existing monitoring frequency (Continuous) and sample type (Meter) for Flow correspond with the *Technical Guidance for the Development and Specification of Effluent Limitations* (362-0400-001) Table 6-3. Reporting of the daily maximum flow will remain to correspond with monitoring requirements for other municipal treatment plants.

Fecal Coliforms:
The existing fecal coliform limits with I-max limits as specified in 25 PA Code § 92a.47 (a)(4)&(5) will remain. The existing monitoring frequency (1/ Week) and sample type (Grab) for Fecal Coliforms correspond with the *Technical Guidance for the Development and Specification of Effluent Limitations* (362-0400-001) Table 6-3 and will remain.

E.Coli:
A quarterly reporting requirement for E.Coli is proposed per the 2017 Triennial Review of Water Quality Standards, published in the PA Bulletin on July 11, 2020.

Influent BOD_5 and TSS:
Raw sewage influent monitoring for BOD_5 and TSS will remain. This monitoring provides the ability to monitor the percent removal of each parameter as stipulated in section 2 of the Part A conditions and maintain records of the BOD_5 loading as required by 25 Pa. Code Chapter 94. Also, the monitoring frequencies and sample types will be identical to the effluent sampling.

Best Professional Judgment (BPJ) Limitations:
No BPJ limitations are proposed.

Anti-Backsliding:
This draft permit does not propose to relax or make less stringent any of the existing effluent limitations.

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 the technology, water quality, and BPJ. Average weekly limits are determined 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) and/or BPJ.

Proposed Limits - Outfall 001, Effective Period: Permit Effective Date through Permit Expiration Date

Discharge Parameter	Limitations							
	Mass (lb/day)		Concentration (mg/L)				Monitoring Requirements	
	Monthly Average	Weekly Average	Minimum	Average Monthly	Average Weekly	Instantaneous Maximum	Minimum Frequency	Sample Type
Flow (MGD)	Report	Report (Daily Max)					Continuous	Meter
pH (Std. Units)			6.0			9.0	1/ Day	Grab
D.O.			4.0				1/ Day	Grab
TRC (Interim)				0.5		1.6	1/ Day	Grab
TRC (Final)[1]				0.09		0.32	1/Day	Grab
C-BOD_5	70	105		15.0	22.5	30	1/ Week	8-hr Composite
BOD_5 Raw Sewage Influent	Report	Report		Report			1/ Week	8-Hr. Comp.
TSS	140	210		30	45	60	1/ Week	8-hr Composite
TSS Raw Sewage Influent	Report	Report		Report			1/ Week	8-Hr. Comp.
NH_3-N	21	31		4.5	6.7	9.0	2/ Week	8-Hr. Comp.
Fecal Coliforms (5/1-9/30)	200 colonies/100 ml as a geometric mean					1,000	1/ Week	Grab
Fecal Coliforms (10/1-4/30)	2,000 colonies/100 ml as a geometric mean					10,000		
E.Coli						Report	1/quarter	Grab

*The proposed effluent limits for Outfall 001 were based on a design flow of 0.56 MGD.
1. Final TRC Effluent Limit will become effective approximately 3 years from the effective date of the permit.

Discharge Parameter	Limitations						
	Mass Units (lbs)		Concentration (mg/L)			Monitoring Requirements	
	Monthly	Annual	Minimum	Average Monthly	Maximum	Minimum Frequency	Sample Type
Ammonia – N	Report	Report		Report		2/week	8-Hr Composite
Kjeldahl---N	Report			Report		2/week	8-Hr Composite
Nitrate-Nitrite as N	Report			Report		2/week	8-Hr Composite
Total Nitrogen	Report	Report		Report		1/month	Calculation
Total Phosphorus	Report	Report		Report		2/week	8-Hr Composite
Net Total Nitrogen	Report	10,228				1/month	Calculation
Net Total Phosphorus	Report	1,364				1/month	Calculation

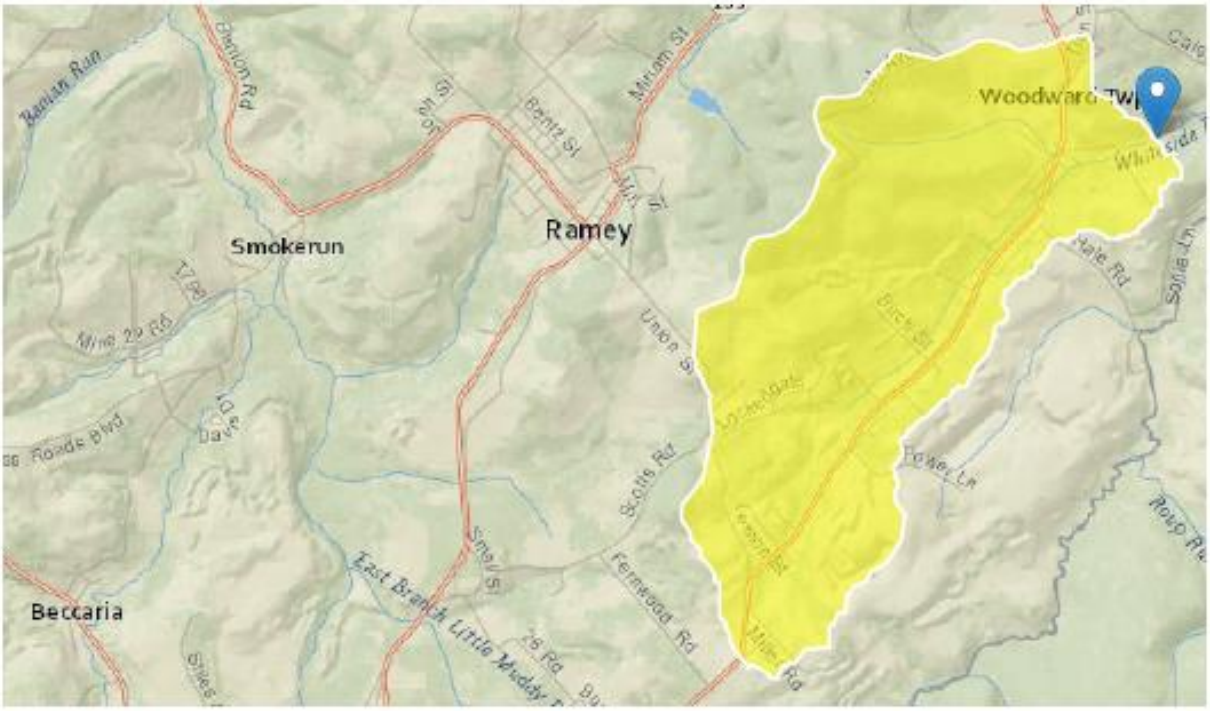
APPENDIX A

Q_{7-10} ANALYSIS AND STREAM DATA

Outfall 001

StreamStats Report

Region ID: PA
Workspace ID: PA20210924153044890000
Clicked Point (Latitude, Longitude): 40.80509, -78.34222
Time: 2021-09-24 11:31:04 -0400



Basin Characteristics

Parameter Code	Parameter Description	Value	Unit
DRNAREA	Area that drains to a point on a stream	3.97	square miles
ELEV	Mean Basin Elevation	1660	feet
PRECIP	Mean Annual Precipitation	39	inches

Low-Flow Statistics Parameters [Low Flow Region 3]

Parameter Code	Parameter Name	Value	Units	Min Limit	Max Limit

Parameter Code	Parameter Name	Value	Units	Min Limit	Max Limit
DRNAREA	Drainage Area	3.97	square miles	2.33	1720
ELEV	Mean Basin Elevation	1660	feet	898	2700
PRECIP	Mean Annual Precipitation	39	inches	38.7	47.9

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

PIl: Prediction Interval-Lower, Plu: Prediction Interval-Upper, ASEp: Average Standard Error of Prediction, SE: Standard Error (other -- see report)

Statistic	Value	Unit	SE	ASEp
7 Day 2 Year Low Flow	0.343	ft^3/s	43	43
30 Day 2 Year Low Flow	0.482	ft^3/s	38	38
7 Day 10 Year Low Flow	0.126	ft^3/s	54	54
30 Day 10 Year Low Flow	0.182	ft^3/s	49	49
90 Day 10 Year Low Flow	0.278	ft^3/s	41	41

Low-Flow Statistics Citations

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

Application Version: 4.6.2
StreamStats Services Version: 1.2.22
NSS Services Version: 2.1.2

USGS
science for a changing world

Prepared in cooperation with the Pennsylvania Department of Environmental Protection

Selected Streamflow Statistics for Streamgage Locations in and near Pennsylvania

Open-File Report 2011–1070

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

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

[Latitude and Longitude in decimal degrees; mi², square miles]

Streamgage number	Streamgage name	Latitude	Longitude	Drainage area (mi²)	Regulated[1]
01541303	West Branch Susquehanna River at Hyde, Pa.	41.005	-78.457	474	Y
01541308	Bradley Run near Ashville, Pa.	40.509	-78.584	6.77	N
01541500	Clearfield Creek at Dimeling, Pa.	40.972	-78.406	371	Y
01542000	Moshannon Creek at Osceola Mills, Pa.	40.850	-78.268	68.8	N
01542500	WB Susquehanna River at Karthaus, Pa.	41.118	-78.109	1,462	Y
01542810	Waldy Run near Emporium, Pa.	41.579	-78.293	5.24	N
01543000	Driftwood Branch Sinnemahoning Creek at Sterling Run, Pa.	41.413	-78.197	272	N
01543500	Sinnemahoning Creek at Sinnemahoning, Pa.	41.317	-78.103	685	N
01544000	First Fork Sinnemahoning Creek near Sinnemahoning, Pa.	41.402	-78.024	245	Y
01544500	Kettle Creek at Cross Fork, Pa.	41.476	-77.826	136	N
01545000	Kettle Creek near Westport, Pa.	41.320	-77.874	233	Y
01545500	West Branch Susquehanna River at Renovo, Pa.	41.325	-77.751	2,975	Y
01545600	Young Womans Creek near Renovo, Pa.	41.390	-77.691	46.2	N
01546000	North Bald Eagle Creek at Milesburg, Pa.	40.942	-77.794	119	N
01546400	Spring Creek at Houserville, Pa.	40.834	-77.828	58.5	N
01546500	Spring Creek near Axemann, Pa.	40.890	-77.794	87.2	N
01547100	Spring Creek at Milesburg, Pa.	40.932	-77.786	142	N
01547200	Bald Eagle Creek below Spring Creek at Milesburg, Pa.	40.943	-77.786	265	N
01547500	Bald Eagle Creek at Blanchard, Pa.	41.052	-77.604	339	Y
01547700	Marsh Creek at Blanchard, Pa.	41.060	-77.606	44.1	N
01547800	South Fork Beech Creek near Snow Shoe, Pa.	41.024	-77.904	12.2	N
01547950	Beech Creek at Monument, Pa.	41.112	-77.702	152	N
01548005	Bald Eagle Creek near Beech Creek Station, Pa.	41.081	-77.549	562	Y
01548500	Pine Creek at Cedar Run, Pa.	41.522	-77.447	604	N
01549000	Pine Creek near Waterville, Pa.	41.313	-77.379	750	N
01549500	Blockhouse Creek near English Center, Pa.	41.474	-77.231	37.7	N
01549700	Pine Creek below Little Pine Creek near Waterville, Pa.	41.274	-77.324	944	Y
01550000	Lycoming Creek near Trout Run, Pa.	41.418	-77.033	173	N
01551500	WB Susquehanna River at Williamsport, Pa.	41.236	-76.997	5,682	Y
01552000	Loyalsock Creek at Loyalsockville, Pa.	41.325	-76.912	435	N
01552500	Muncy Creek near Sonestown, Pa.	41.357	-76.535	23.8	N
01553130	Sand Spring Run near White Deer, Pa.	41.059	-77.077	4.93	N
01553500	West Branch Susquehanna River at Lewisburg, Pa.	40.968	-76.876	6,847	Y
01553700	Chillisquaque Creek at Washingtonville, Pa.	41.062	-76.680	51.3	N
01554000	Susquehanna River at Sunbury, Pa.	40.835	-76.827	18,300	Y
01554500	Shamokin Creek near Shamokin, Pa.	40.810	-76.584	54.2	N
01555000	Penns Creek at Penns Creek, Pa.	40.867	-77.048	301	N
01555500	East Mahantango Creek near Dalmatia, Pa.	40.611	-76.912	162	N
01556000	Frankstown Branch Juniata River at Williamsburg, Pa.	40.463	-78.200	291	N
01557500	Bald Eagle Creek at Tyrone, Pa.	40.684	-78.234	44.1	N
01558000	Little Juniata River at Spruce Creek, Pa.	40.613	-78.141	220	N
01559000	Juniata River at Huntingdon, Pa.	40.485	-78.019	816	LF
01559500	Standing Stone Creek near Huntingdon, Pa.	40.524	-77.971	128	N
01559700	Sulphur Springs Creek near Manns Choice, Pa.	39.978	-78.619	5.28	N
01560000	Dunning Creek at Belden, Pa.	40.072	-78.493	172	N

Table 2. Selected low-flow statistics for streamgage locations in and near Pennsylvania.—Continued

[ft³/s; cubic feet per second; —, statistic not computed; <, less than]

Streamgage number	Period of record used in analysis[1]	Number of years used in analysis	1-day, 10-year (ft³/s)	7-day, 10-year (ft³/s)	7-day, 2-year (ft³/s)	30-day, 10-year (ft³/s)	30-day, 2-year (ft³/s)	90-day, 10-year (ft³/s)
01530500	1940–2008	69	5.0	6.1	11.0	7.6	13	9.0
01531000	[2]1981–2008	28	138	147	237	169	296	203
01531000	[3]1905–1979	68	86.3	97.0	175	116	219	161
01531500	[2]1981–2008	28	550	592	1,030	733	1,340	952
01531500	[3]1915–1979	65	539	571	990	675	1,230	928
01532000	1915–2008	94	2.2	2.8	9.7	4.6	14.4	9.4
01532850	1967–1979	13	.1	.2	.4	.3	.8	.7
01533400	[2]1981–2008	28	602	648	1,110	790	1,430	1,060
01533500	1942–1958	17	.4	.6	1.5	.8	2.0	1.7
01533950	1962–1978	17	.2	.3	1.0	.6	1.4	1.0
01534000	1915–2008	94	15.2	17.3	35.9	24.2	51.0	38.7
01534300	1960–2008	49	1.1	1.7	5.1	2.8	7.6	4.8
01534500	[2]1961–2008	48	16.7	18.8	29.2	21.9	35.8	27.6
01534500	[3]1941–1959	19	18.8	23.0	33.3	25.6	39.2	34.9
01536000	[2]1961–2008	48	28.7	32.7	51.7	40.8	68.1	54.3
01536000	[3]1940–1959	20	77.8	93.9	119	105	138	124
01536500	[2]1981–2008	28	828	872	1,450	1,030	1,830	1,350
01536500	[3]1901–1979	79	778	811	1,350	927	1,640	1,260
01537000	1943–1993	51	1.3	2.0	4.9	3.1	6.4	4.7
01537500	1941–1990	50	.2	.3	1.9	.5	3.1	1.6
01538000	1921–2008	88	3.1	3.6	7.1	5.0	9.3	7.5
01539000	1940–2008	69	15.4	16.8	36.8	21.1	51.1	36.8
01539500	1942–1958	17	.1	.3	1.4	1.0	3.3	2.3
01540200	1965–1981	17	0	0	.3	.1	.3	.1
01540500	[2]1981–2008	28	1,080	1,120	1,870	1,320	2,330	1,690
01540500	[3]1906–1979	74	927	978	1,660	1,160	2,050	1,590
01541000	1915–2008	94	25.3	27.9	50.7	35.3	66.6	49.6
01541200	[2]1967–2008	40	34.6	45.2	66.0	63.1	100	92.4
01541200	[3]1957–1965	9	22.9	24.7	44.7	27.7	58.2	36.4
01541303	1980–2008	29	53.4	58.5	94.0	74.4	123	102
01541308	1969–1979	11	1.3	1.3	1.9	1.6	2.4	2.1
01541500	[2]1962–2008	47	39.0	41.9	66.5	51.9	86.3	70.6
01541500	[3]1915–1960	46	14.9	21.3	41.9	28.5	55.0	42.9
01542000	1942–1993	52	8.1	9.1	14.8	11.3	17.8	14.6
01542500	[2]1967–2008	33	216	235	326	285	435	402
01542500	[3]1941–1965	20	—	131	189	152	243	221
01542810	1966–2008	43	.1	.1	.3	.2	.5	.3
01543000	1915–2008	94	2.9	4.2	16.0	9.6	27.4	19.2
01543500	1940–2008	69	10.7	14.5	44.9	26.6	74.9	50.5
01544000	[2]1957–2008	52	3.3	6.9	19.0	11.2	31.1	19.0
01544500	1942–2008	67	4.2	4.9	12.5	7.5	17.4	11.7
01545000	[2]1964–2008	45	6.8	8.2	21.2	12.0	32.7	20.7
01545500	[2]1963–2008	46	217	238	446	306	629	428
01545500	[3]1909–1961	53	125	141	278	190	387	296
01545600	1966–2008	43	1.2	1.5	4.4	2.4	6.7	4.2

APPENDIX B

§95.5 AQUATIC SURVEY MEMORANDUM

COMMONWEALTH OF PENNSYLVANIA
Department of Environmental Protection
May 20, 2021

MEMO

SUBJECT: § 95.5 Aquatic Survey
Woodward Township Sewer and Water Authority
NPDES Permit # PA0208922
Whiteside Run: Stream Code 25898
Woodward Township, Clearfield County

TO: Nicholas Hartranft
Environmental Group Manager
Permits Section
Clean Water Program
North Central Region

From: Steven D. Means
Water Pollution Biologist 2
Operations Section
Clean Water Program
North Central Region
5/20/2021

Through: Anne Hughes 5/21/2021
Environmental Group Manager
Operations Section
Clean Water Program
North Central Region

This memo is in response to a request from the Clean Water Program Manager (Tom Randis) to determine whether Whiteside Run supports an aquatic community in accordance with PA Code 25 §95.5 regarding abandoned coal mine discharges and sewage treatment. The Woodward Township Sewer and Water Authority currently has a wastewater treatment plant (WWTP) that discharges into Whiteside Run under NPDES Permit No. PA0208922.

INTRODUCTION

The Woodward Township Sewer and Water Authority WWTP is located on the east end of the village of Whiteside at 131 Punkin Hollow Drive near Houtzdale Pennsylvania. The WWTP is permitted to discharge 0.56 MGD and most of the flow to the treatment plant comes from the Houtzdale State Correctional Institution. The WWTP discharges into a rock lined channel

northeast of the facility for approximately 500 feet before it discharges into Whiteside Run (Photo 1). Whiteside Run (PA Stream Code #25898) is a tributary to Moshannon Creek and is in the Upper West Branch Susquehanna River Hydrologic Unit (HUC 02050201) and the 8D State Water Plan. The stream is approximately 4-6 feet in width at the discharge point and has been previously impounded by beavers. The riparian zone is a mix of alder and grasses at the discharge point with a steeper hillside on the opposite bank containing overburden shale material from previous mining.

Whiteside Run is classified as cold-water fishes (CWF) in Chapter 93 and is listed as impaired in the 2020 Integrated report for Abandoned Mine Drainage with a cause of metals and siltation. Whiteside Run was listed as impaired in 2004 (20020419-1230-TAS) and is included in a TMDL developed for the Moshannon Creek Watershed (DEP 2009).

The drainage area of Whiteside Run upstream of the discharge is 3.95 square miles. Land use is 78% forest, 0.6% urban, and 1% impervious surface (USGS StreamStats 2021). Other land uses in the watershed includes areas that have been historically strip mined and residential homes. One known AMD treatment system was constructed in the watershed by Power Incorporated approximately 20 years ago (Dave Stodart, personal communication).

The Woodward Township WWTP discharge limit in the existing NPDES permit is based on criteria that the stream is impaired by abandoned coal mine drainage and excludes the presence of an aquatic community and applicable water quality standards in accordance with § 95.5 of the Chapter 95 Wastewater Treatment requirements. On May 18, 2021, I conducted an aquatic survey to determine if Whiteside Run still qualified for treatment exemptions under § 95.5.

Methods

Two stream reaches were evaluated in the study. The first stream reach (Reach 1) included a 200-foot section downstream of the Kirk Street bridge and adjacent to the Woodward Township pump station located approximately 1100 feet upstream of the WWTP discharge (40.80425; -78.34536). The second stream reach (Reach 2) included a 50-foot section located downstream of the WWTP discharge (40.80552; -78.34142; Figure 1). Field measurements of temperature, dissolved oxygen, pH, and specific conductance were collected with a YSI ProPlus meter. A 1-meter kick screen was used in riffle habitats to collect macroinvertebrates in each reach. Observations and collection of samples from rocks and woody debris were also conducted in each reach. Three kick screen samples were collected in Reach 1 and two kick screen samples were collected in Reach 2. Macroinvertebrates observed on the net were removed and placed in a sample bottle for later identification in the lab.

Results

WR01 – Whiteside Run at Kirk Street and upstream of WWTP Discharge (Reach 1)

The stream was mostly pool habitat with two small riffle areas and a woody debris jam. There was very little rock substrate in the reach for macroinvertebrate colonization and the rock substrate was covered with dark green filamentous algae on the surface. Silt and deposition of shale fines were present in the channel and the stream bottom was slightly stained with iron deposits (Photos 2 and 3) The riparian habitat was mowed lawn and grass. The water chemistry measured in the reach appeared normal with a temperature of 12.3-12.7 °C, dissolved oxygen = 9.2 mg/L and 87% saturation, pH = 6.7-6.87 units, and specific conductivity = 205 µS/cm. A total of eight different taxa were present in the sample with four EPT (Ephemeroptera, Plecoptera, and Trichoptera) taxa. The highest number of individuals were blackflies (*Simulium*), midges (Chironomidae), and stoneflies (*Isoperla*). One fish and a salamander were also observed in the sample reach.

WR02 – Whiteside Run approximately 50 feet Downstream of WWTP Discharge (Reach 2)

Several inches of sediment and organic material was present on the stream bottom which made it difficult to find and sample suitable macroinvertebrate habitat. The presence of silt deposition was associated with current and previous beaver activity in the sample reach in combination with shale fines. One riffle with fine silt deposits and sediment deposition was sampled and a run area with a few small rocks and faster velocities was sampled. (Photos 4-7). The riparian habitat was mostly palustrine emergent/scrub shrub wetland (PEM/PSS) that was dominated by grasses and alder. The water temperature was 15.7 °C and dissolved oxygen was 9.47 mg/L and 95.5% saturation. The pH was neutral at 7.09 units and specific conductance was 217 µS/cm. Sampling was very confined due to stream conditions. A total of seven different taxa were present in the sample with two EPT taxa. Snails (Physidae) and stoneflies (*Isoperla*) were the most common taxa.

A summary of all water chemistry and macroinvertebrate data is listed in Table 1 and 2, respectively.

DISCUSSION AND CONCLUSION

Results of this study indicated that the stream is recovering and supports a viable macroinvertebrate community with water quality conditions that met the Chapter 93 criteria for pH (6 -9 units). The presence of long-lived taxa in adequate numbers also indicated that water quality is maintained sufficiently throughout the year and that a point of first use is present at the discharge.

Based upon this survey, it appears Whiteside Run is recovering from the impacts of abandoned mine drainage and that water quality has significantly improved in the watershed to a point

that the current discharge should not be exempt from stricter limits according to 25 PA Code §95.5.

REFERENCES

Pennsylvania Department of Environmental Protection. 2009. Moshannon Creek Watershed TMDL, Clearfield and Centre Counties Pennsylvania. Harrisburg, PA.

Stodart, Dave. Woodward Township Sewage Treatment Operator, Woodward Township Sewer and Water Authority.

United States Geological Survey. 2021. The StreamStats program, online at http://streamstats.usgs.gov .

cc: Stream File – Whiteside Run (25898)
NPDES Permit # PA0208922
Tom Randis – NCRO Clean Water Program Manager
Michael Josh Lookenbill – CO, Environmental Group Manager

Figure 1 – A map of Whiteside Run (CWF) where an aquatic survey was conducted for §95.5 in relation to the Woodward Township Sewer and Water Authority Wastewater Treatment Plant discharge in Woodward Township, Clearfield County. Two stream reaches were sampled where water chemistry, rock picks, and macroinvertebrate kick screens were collected.

Table 1 – The field chemistry measurements recorded for each sampling reach upstream and downstream of the Woodward Township Sewer and Water Authority WWTP discharge in Woodward Township, Clearfield County.

Time	Reach	Station	Temperature (^{a}C)	DO (mg/L)	DO (%)	pH (units)	SPC (uS/cm)
10:34	1	WR01	12.3	9.21	86	6.73	205
10:59	1	WR01	12.7	9.22	87	6.89	205
11:47	2	WR02	15.7	9.47	96	7.09	217

Table 2 – The individual macroinvertebrate taxa identified, and the density of individuals counted in each sampling reach of Whiteside Run in Woodward Township, Clearfield County. Macroinvertebrate density was determined by the number of individuals where Rare (R) = < 3, Present (P) = 3-9, Common (C) = 10-25, and Abundant = > 25.

		Reach 1	Reach 2
		WR 01	WR 02
MAYFLIES			
Leptophlebiidae	*Paraleptophlebia*	R	
STONEFLIES			
Nemouridae	*Amphinemura*	R	
Perlodidae	*Isoperla*	C	P
CADDISFLIES			
Hydropsychidae	*Cheumatopsyche*		P
Limnephilidae	*Limnephilus*	R	
TRUE FLIES			
Chironomidae		C	
Simuliidae	*Simulium*	A	
MISC. INSECT TAXA			
Coenagrionidae	*Argia*		R
NON-INSECT TAXA			
Cambaridae		R	
Hirudinae			R
Oligochaeta			P
Physidae		P	C
Richness		8	6

Photo 1 – A view of the Woodward Township Sewer and Water Authority WWTP effluent channel that discharges to Whiteside Run.

Photo 2 – A view of Whiteside Run in Reach 1 looking upstream towards the Kirk Street Bridge.

Photo 3 – A view of Whiteside Run looking downstream in Reach 1.

Photo 4 – A view of Whiteside Run looking upstream in Reach 2 where the effluent channel from Woodward Township SWA enters the stream. Note the heavy vegetation and standing water.

Photo 5 – A view looking downstream in Reach 2 where macroinvertebrate and water quality measurements were collected. Note the shale overburden on the opposite stream bank that contributes to sediment deposition in the sample reach.

Photo 6 – A view of Whiteside Run looking upstream in Reach 2 before the confluence with the Woodward Township SWA discharge.

Photo 7 – A view looking downstream in Reach 2 where Whiteside Run enters an area previously impounded by beavers.

APPENDIX C

TOXICS MANAGEMENT SPREADSHEET INPUT/OUTPUT

pennsylvania
DEPARTMENT OF ENVIRONMENTAL PROTECTION

Toxics Management Spreadsheet
Version 1.3, March 2021

Discharge Information

Instructions | Discharge | Stream

Facility: Woodward Twp. NPDES Permit No.: PA0208922 Outfall No.: 001

Evaluation Type: Major Sewage / Industrial Waste Wastewater Description: Sewage Effluent

Discharge Characteristics								
Design Flow (MGD)*	Hardness (mg/l)*	pH (SU)*	Partial Mix Factors (PMFs)				Complete Mix Times (min)	
			AFC	CFC	THH	CRL	Q_{7-10}	Q_h
0.56	100	6.7						

	Discharge Pollutant	Units	Max Discharge Conc		0 if left blank: Trib Conc	0 if left blank: Stream Conc	0.5 if left blank: Daily CV	0.5 if left blank: Hourly CV	0 if left blank: Stream CV	0 if left blank: Fate Coeff	0 if left blank: FOS	1 if left blank: Criteria Mod	1 if left blank: Chem Transl
Group 1	Total Dissolved Solids (PWS)	mg/L											
	Chloride (PWS)	mg/L											
	Bromide	mg/L											
	Sulfate (PWS)	mg/L											
	Fluoride (PWS)	mg/L											
Group 2	Total Aluminum	µg/L		0.19									
	Total Antimony	µg/L											
	Total Arsenic	µg/L											
	Total Barium	µg/L											
	Total Beryllium	µg/L											
	Total Boron	µg/L											
	Total Cadmium	µg/L											
	Total Chromium (III)	µg/L											
	Hexavalent Chromium	µg/L											
	Total Cobalt	µg/L											
	Total Copper	µg/L											
	Free Cyanide	µg/L											
	Total Cyanide	µg/L											
	Dissolved Iron	µg/L											
	Total Iron	µg/L	<	0.05									
	Total Lead	µg/L											
	Total Manganese	µg/L		0.02									
	Total Mercury	µg/L											
	Total Nickel	µg/L											
	Total Phenols (Phenolics) (PWS)	µg/L											
	Total Selenium	µg/L											
	Total Silver	µg/L											
	Total Thallium	µg/L											
	Total Zinc	µg/L											
	Total Molybdenum	µg/L											
	Acrolein	µg/L	<										
	Acrylamide	µg/L	<										
	Acrylonitrile	µg/L	<										
	Benzene	µg/L	<										
	Bromoform	µg/L	<										

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

	2,6-Dinitrotoluene	µg/L	<											
	Di-n-Octyl Phthalate	µg/L	<											
	1,2-Diphenylhydrazine	µg/L	<											
	Fluoranthene	µg/L	<											
	Fluorene	µg/L	<											
	Hexachlorobenzene	µg/L	<											
	Hexachlorobutadiene	µg/L	<											
	Hexachlorocyclopentadiene	µg/L	<											
	Hexachloroethane	µg/L	<											
	Indeno(1,2,3-cd)Pyrene	µg/L	<											
	Isophorone	µg/L	<											
	Naphthalene	µg/L	<											
	Nitrobenzene	µg/L	<											
	n-Nitrosodimethylamine	µg/L	<											
	n-Nitrosodi-n-Propylamine	µg/L	<											
	n-Nitrosodiphenylamine	µg/L	<											
	Phenanthrene	µg/L	<											
	Pyrene	µg/L	<											
	1,2,4-Trichlorobenzene	µg/L	<											
Group 6	Aldrin	µg/L	<											
	alpha-BHC	µg/L	<											
	beta-BHC	µg/L	<											
	gamma-BHC	µg/L	<											
	delta BHC	µg/L	<											
	Chlordane	µg/L	<											
	4,4-DDT	µg/L	<											
	4,4-DDE	µg/L	<											
	4,4-DDD	µg/L	<											
	Dieldrin	µg/L	<											
	alpha-Endosulfan	µg/L	<											
	beta-Endosulfan	µg/L	<											
	Endosulfan Sulfate	µg/L	<											
	Endrin	µg/L	<											
	Endrin Aldehyde	µg/L	<											
	Heptachlor	µg/L	<											
	Heptachlor Epoxide	µg/L	<											
	PCB-1016	µg/L	<											
	PCB-1221	µg/L	<											
	PCB-1232	µg/L	<											
	PCB-1242	µg/L	<											
	PCB-1248	µg/L	<											
	PCB-1254	µg/L	<											
	PCB-1260	µg/L	<											
	PCBs, Total	µg/L	<											
	Toxaphene	µg/L	<											
	2,3,7,8-TCDD	ng/L	<											
Group 7	Gross Alpha	pCi/L												
	Total Beta	pCi/L	<											
	Radium 226/228	pCi/L	<											
	Total Strontium	µg/L	<											
	Total Uranium	µg/L	<											
	Osmotic Pressure	mOs/kg												

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Toxics Management Spreadsheet
Version 1.3, March 2021

Stream / Surface Water Information

Woodward Twp., NPDES Permit No. PA0208922, Outfall 001

Instructions | Discharge | Stream

Receiving Surface Water Name: Whiteside Run

No. Reaches to Model: 1

- (●) Statewide Criteria
- ( ) Great Lakes Criteria
- ( ) ORSANCO Criteria

Location	Stream Code*	RMI*	Elevation (ft)*	DA (mi²)*	Slope (ft/ft)	PWS Withdrawal (MGD)	Apply Fish Criteria*
Point of Discharge	025898	1.21	1533	3.97			Yes
End of Reach 1	025898	0.1	1512	5.06			Yes

Q_{7-10}

Location	RMI	LFY (cfs/mi²)*	Flow (cfs)		W/D Ratio	Width (ft)	Depth (ft)	Velocity (fps)	Travel Time (days)	Tributary		Stream		Analysis	
			Stream	Tributary						Hardness	pH	Hardness*	pH*	Hardness	pH
Point of Discharge	1.21	0.1	0.53									100	7		
End of Reach 1	0.1	0.1	0.67												

Q_h

Location	RMI	LFY (cfs/mi²)	Flow (cfs)		W/D Ratio	Width (ft)	Depth (ft)	Velocity (fps)	Travel Time (days)	Tributary		Stream		Analysis	
			Stream	Tributary						Hardness	pH	Hardness	pH	Hardness	pH
Point of Discharge	1.21														
End of Reach 1	0.1														

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Toxics Management Spreadsheet
Version 1.3, March 2021

Model Results

Woodward Twp., NPDES Permit No. PA0208922, Outfall 001

Instructions | Results | RETURN TO INPUTS | SAVE AS PDF | PRINT | ◉ All ○ Inputs ○ Results ○ Limits

☐ *Hydrodynamics*

☑ *Wasteload Allocations*

☑ *AFC* CCT (min): 1.772 PMF: 1 Analysis Hardness (mg/l): 100 Analysis pH: 6.79

Pollutants	Stream Conc (µg/L)	Stream CV	Trib Conc (µg/L)	Fate Coef	WQC (µg/L)	WQ Obj (µg/L)	WLA (µg/L)	Comments
Total Aluminum	0	0		0	750	750	1,209	
Total Iron	0	0		0	N/A	N/A	N/A	
Total Manganese	0	0		0	N/A	N/A	N/A	

☑ *CFC* CCT (min): 1.772 PMF: 1 Analysis Hardness (mg/l): 100 Analysis pH: 6.79

Pollutants	Stream Conc (µg/L)	Stream CV	Trib Conc (µg/L)	Fate Coef	WQC (µg/L)	WQ Obj (µg/L)	WLA (µg/L)	Comments
Total Aluminum	0	0		0	N/A	N/A	N/A	
Total Iron	0	0		0	1,500	1,500	2,418	WQC = 30 day average; PMF = 1
Total Manganese	0	0		0	N/A	N/A	N/A	

☑ *THH* CCT (min): 1.772 PMF: 1 Analysis Hardness (mg/l): N/A Analysis pH: N/A

Pollutants	Stream Conc (µg/L)	Stream CV	Trib Conc (µg/L)	Fate Coef	WQC (µg/L)	WQ Obj (µg/L)	WLA (µg/L)	Comments
Total Aluminum	0	0		0	N/A	N/A	N/A	
Total Iron	0	0		0	N/A	N/A	N/A	
Total Manganese	0	0		0	1,000	1,000	1,612	

☑ *CRL* CCT (min): 3.599 PMF: 1 Analysis Hardness (mg/l): N/A Analysis pH: N/A

Pollutants	Stream Conc (µg/L)	Stream CV	Trib Conc (µg/L)	Fate Coef	WQC (µg/L)	WQ Obj (µg/L)	WLA (µg/L)	Comments
Total Aluminum	0	0		0	N/A	N/A	N/A	

Total Iron	0	0		0	N/A	N/A	N/A	
Total Manganese	0	0		0	N/A	N/A	N/A	

☑ ***Recommended WQBELs & Monitoring Requirements***

No. Samples/Month: 4

	Mass Limits		*Concentration Limits*						
Pollutants	AML (lbs/day)	MDL (lbs/day)	AML	MDL	IMAX	Units	Governing WQBEL	WQBEL Basis	Comments

☑ ***Other Pollutants without Limits or Monitoring***

The following pollutants do not require effluent limits or monitoring based on water quality because reasonable potential to exceed water quality criteria was not determined and the discharge concentration was less than thresholds for monitoring, or the pollutant was not detected and a sufficiently sensitive analytical method was used (e.g., <= Target QL).

Pollutants	Governing WQBEL	Units	Comments
Total Aluminum	775	µg/L	Discharge Conc ≤ 10% WQBEL
Total Iron	N/A	N/A	Discharge Conc < TQL
Total Manganese	1,612	µg/L	Discharge Conc ≤ 10% WQBEL

APPENDIX D

WQM7.0 MODELING INPUT/OUTPUT

WQM 7.0 Effluent Limits

SWP Basin	Stream Code	Stream Name
08D	25898	WHITESIDE RUN

RMI	Name	Permit Number	Disc Flow (mgd)	Parameter	Eff. Limit 30-day Ave. (mg/L)	Eff. Limit Maximum (mg/L)	Eff. Limit Minimum (mg/L)
1.210	Woodward Twp.	PA0208922	0.560	CBOD5	15.97		
				NH3-N	4.97	9.94	
				Dissolved Oxygen			4

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
09D	25898	WHITESIDE RUN	1.210	1533.00	3.97	0.00000	0.00	☑

Stream Data

Design Cond.	LFY (cfs/m)	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	0.100	0.00	0.53	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
Woodward Twp	PA0208922	0.5600	0.5600	0.5600	0.000	25.00	7.00

Parameter Data

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

Input Data WQM 7.0

SWP Basin	Stream Code	Stream Name	RMI	Elevation (ft)	Drainage Area (sq mi)	Slope (ft/ft)	PWS Withdrawal (mgd)	Apply FC
06D	25898	WHITESIDE RUN	0.100	1512.00	5.06	0.00000	0.00	☑

Stream Data

Design Cond.	LFY (cfs/m)	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	0.100	0.00	0.67	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	3.00	8.24	0.00	0.00
NH3-N	25.00	0.00	0.00	0.70

WQM 7.0 Hydrodynamic Outputs

SWP Basin	Stream Code	Stream Name
08D	25898	WHITESIDE RUN

RMI	Stream Flow (cfs)	PWS With (cfs)	Net Stream Flow (cfs)	Disc Analysis Flow (cfs)	Reach Slope (ft/ft)	Depth (ft)	Width (ft)	WD Ratio	Velocity (fps)	Reach Trav Time (days)	Analysis Temp (°C)	Analysis pH
Q7-10 Flow												
1.210	0.53	0.00	0.53	.8663	0.00358	.532	14.43	27.14	0.18	0.373	23.10	7.00
Q1-10 Flow												
1.210	0.34	0.00	0.00	.8663	0.00358	NA	NA	NA	0.00	0.000	0.00	0.00
Q30-10 Flow												
1.210	0.72	0.00	0.00	.8663	0.00358	NA	NA	NA	0.00	0.000	0.00	0.00

WQM 7.0 Modeling Specifications

Parameters	D.O.	Use Inputted Q1-10 and Q30-10 Flows	☑
WLA Method	EMPR	Use Inputted W/D Ratio	☐
Q1-10/Q7-10 Ratio	0.64	Use Inputted Reach Travel Times	☐
Q30-10/Q7-10 Ratio	1.36	Temperature Adjust Kr	☑
D.O. Saturation	90.00%	Use Balanced Technology	☑
D.O. Goal	5		

WQM 7.0 Wasteload Allocations

SWP Basin	Stream Code	Stream Name
08D	25898	WHITESIDE RUN

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)		
1.21	Woodward Twp.	15.97	15.97	4.97	4.97	4	4	0	0

WQM 7.0 D.O.Simulation

SWP Basin	Stream Code	Stream Name
08D	25898	WHITESIDE RUN

RMI	Total Discharge Flow (mgd)	Analysis Temperature (°C)	Analysis pH
1.210	0.560	23.102	7.000
Reach Width (ft)	**Reach Depth (ft)**	**Reach WDRatio**	**Reach Velocity (fps)**
14.433	0.532	27.138	0.182
Reach CBOD5 (mg/L)	**Reach Kc (1/days)**	**Reach NH3-N (mg/L)**	**Reach Kn (1/days)**
10.66	0.875	3.08	0.889
Reach DO (mg/L)	**Reach Kr (1/days)**	**Kr Equation**	**Reach DO Goal (mg/L)**
5.611	6.666	Tsivoglou	5
Reach Travel Time (days)			
0.373			

Subreach Results

TravTime (days)	CBOD5 (mg/L)	NH3-N (mg/L)	D.O. (mg/L)
0.037	10.27	2.98	5.35
0.075	9.89	2.88	5.18
0.112	9.53	2.79	5.08
0.149	9.17	2.70	5.04
0.186	8.84	2.61	5.03
0.224	8.51	2.53	5.05
0.261	8.20	2.44	5.09
0.298	7.89	2.36	5.15
0.336	7.60	2.29	5.23
0.373	7.32	2.21	5.31

APPENDIX E

TRC ANALYSIS SPREADSHEET

TotalResidualChlorine_TRC_CALC (version 1)

TRC EVALUATION

Input appropriate values in A3:A9 and D3:D9

0.53	= Q stream (cfs)	0.5	= CV Daily
0.56	= 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)	0	=Decay Coefficient (K)

Source	Reference	AFC Calculations	Reference	CFC Calculations
TRC	1.3.2.iii	WLA afc = 0.214	1.3.2.iii	WLA cfc = 0.201
PENTOXSD TRG	5.1a	LTAMULT afc = 0.373	5.1c	LTAMULT cfc = 0.581
PENTOXSD TRG	5.1b	LTA_afc= 0.080	5.1d	LTA_cfc = 0.117

Source		Effluent Limit Calculations	
PENTOXSD TRG	5.1f	AML MULT = 1.231	
PENTOXSD TRG	5.1g	AVG MON LIMIT (mg/l) = 0.098	AFC
		INST MAX LIMIT (mg/l) = 0.321	

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)