pennsylvania
DEPARTMENT OF ENVIRONMENTAL PROTECTION

Northcentral Regional Office
CLEAN WATER PROGRAM

NPDES PERMIT FACT SHEET
INDIVIDUAL SEWAGE

Application Type	**Renewal**	Application No.	**PA0228478**
Facility Type	**Municipal**	APS ID	**1059302**
Major / Minor	**Minor**	Authorization ID	**1389301**

Applicant and Facility Information

Applicant Name	**Milton Region Sewer Authority Northumberland County**	Facility Name	**East Chillisquaque Potts Grove STP Sewer System**
Applicant Address	5585 State Route 405	Facility Address	4842 State Route 642
	Milton, PA 17847-7519		Milton, PA 17847
Applicant Contact	Genie Bausinger	Facility Contact	Genie Bausinger
Applicant Phone	(570) 742-3424	Facility Phone	(570) 742-3424
Client ID	201704	Site ID	550434
Ch 94 Load Status	Not Overloaded	Municipality	East Chillisquaque Township
Connection Status	No Limitations	County	Northumberland
Date Application Received	March 18, 2022	EPA Waived?	Yes
Date Application Accepted	March 23, 2022	If No, Reason	

Purpose of Application: Renewal of a NPDES Permit.

Summary of Review

The subject facility is a Publicly Owned Treatment Works (POTW) serving East Chillisquaque Township in the vicinity of the village of Potts Grove in Northumberland County. A map of the discharge location is attached (see Attachment A).

A map of the discharge location is attachments.

Sludge use and disposal description and location(s): The facility's digested sludge is transferred to other treatment plants for further processing. Per the application 0.673 dry tons were removed in the previous year.

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		*Keith C. Allison* Keith C. Allison / Project Manager	August 16, 2022
X		*Nicholas W. Hartranft* Nicholas W. Hartranft, P.E. / Environmental Engineer Manager	August 16, 2022

Discharge, Receiving Waters and Water Supply Information

Outfall No.	001	Design Flow (MGD)	0.04
Latitude	40º 59' 31.43"	Longitude	-76º 46' 43.46"
Quad Name	Northumberland, PA	Quad Code	
Wastewater Description:	Sewage Effluent		
Receiving Waters	Chillisquaque Creek (WWF)	Stream Code	18712
NHD Com ID	66919921	RMI	7.87
Drainage Area	51.3 mi^2	Yield (cfs/mi^2)	0.212
Q_{7-10} Flow (cfs)	10.9	Q_{7-10} Basis	USGS Gage 01553700 – Chillisquaque Creek @ Washingtonville (1981-2008)
Elevation (ft)	484	Slope (ft/ft)	0.00189
Watershed No.	10-D	Chapter 93 Class.	WWF
Existing Use	N/A	Existing Use Qualifier	N/A
Exceptions to Use	None	Exceptions to Criteria	None
Assessment Status	Impaired		
Cause(s) of Impairment	SILTATION		
Source(s) of Impairment	AGRICULTURE		
TMDL Status	None	Name	
Nearest Downstream Public Water Supply Intake	Sunbury Municipal Authority		
PWS Waters	Susquehanna River	Distance from Outfall (mi)	Approx. 15

Changes Since Last Permit Issuance: None. The above stream and drainage characteristics were determined for the previous review and remain adequate.

Other Comments:

No downstream water supply is expected to be affected by this discharge at this time with the limitations and the monitoring proposed.

The impairment by siltation to Chillisquaque Creek is specifically attributed to agriculture and the facility discharge consistently complies with its TSS limits. Therefore, no additional monitoring or limits will be applied to the discharge at this time to address the stream impairment.

Treatment Facility Summary

Treatment Facility Name: Pottsgrove STP

WQM Permit No.	Issuance Date
4901405	3/27/07 – T1
	1/3/02 – Original

Waste Type	Degree of Treatment	Process Type	Disinfection	Avg Annual Flow (MGD)
Sewage	Secondary	Extended Aeration	Hypochlorite	0.04

Hydraulic Capacity (MGD)	Organic Capacity (lbs/day)	Load Status	Biosolids Treatment	Biosolids Use/Disposal
0.04	91	Not Overloaded	Aerobic Digestion	Other WWTP

Changes Since Last Permit Issuance: None.

Other Comments: The treatment facility, as permitted under WQM No. 4901405 consists of comminution, extended aeration tank, two clarifiers, hypochlorite injection, chlorination, and aerobic digester.

Trucked-in Waste

The applicant has indicated in the application that the facility has received no hauled-in wastes in the past three years and does not expect to receive any hauled-in wastes over the next permit term.

Compliance History

DMR Data for Outfall 001 (from July 1, 2021 to June 30, 2022)

Parameter	JUN-22	MAY-22	APR-22	MAR-22	FEB-22	JAN-22	DEC-21	NOV-21	OCT-21	SEP-21	AUG-21	JUL-21
Flow (MGD) Average Monthly	0.012473	0.017842	0.019491	0.019628	0.020135	0.0158	0.014038	0.015315	0.014776	0.016552	0.01281	0.016316
Flow (MGD) Daily Maximum	0.016853	0.054757	0.035341	0.028159	0.032675	0.020472	0.022211	0.034148	0.043127	0.036837	0.025295	0.038547
pH (S.U.) Minimum	6.79	6.61	6.66	6.68	6.64	6.8	6.8	6.82	6.81	6.66	6.68	6.67
pH (S.U.) Maximum	7.12	7.13	7.04	7.06	7.01	7.12	7.35	7.32	7.32	7.28	7.17	7.06
DO (mg/L) Minimum	7.82	5.93	6.12	8.65	9.84	8.11	8.65	7.59	7.68	7.18	7.39	7.23
TRC (mg/L) Average Monthly	0.3	0.4	0.3	0.4	0.4	0.3	0.3	0.3	0.3	0.4	0.4	0.3
TRC (mg/L) Instantaneous Maximum	0.53	0.78	0.72	0.61	0.73	0.59	0.56	0.52	0.58	0.9	0.98	0.43
CBOD5 (lbs/day) Average Monthly	0.3	0.4	0.6	0.6	0.5	0.4	0.3	0.3	0.4	0.5	0.2	0.5
CBOD5 (lbs/day) Weekly Average	0.4	0.4	0.7	0.6	0.6	0.4	0.3	0.3	0.5	0.8	0.3	0.6
CBOD5 (mg/L) Average Monthly	3	3	4	4	4	3	3	3	4	4	3	3
CBOD5 (mg/L) Weekly Average	4	3	4	4	4	3	3	3	4	5	3	4
BOD5 (lbs/day) Raw Sewage Influent Average Monthly	36	38	34	38	61	40	48	39	31	24	41	52
BOD5 (mg/L) Raw Sewage Influent Average Monthly	380	280	215	234	435	316	453	368	281	192	453	341
TSS (lbs/day) Average Monthly	0.7	0.6	0.3	1.0	1.0	< 0.3	0.4	< 0.4	0.6	< 0.7	< 0.2	1.0
TSS (lbs/day) Raw Sewage Influent Average Monthly	49	32	120	44	47	42	54	52	47	35	36	72
TSS (lbs/day) Weekly Average	1.0	0.7	0.4	1.0	1.0	0.4	0.5	0.7	0.9	1.3	< 0.2	1.3
TSS (mg/L) Average Monthly	8	4	2	8	7	< 3	4	< 4	5	< 5	< 2	6

TSS (mg/L) Raw Sewage Influent Average Monthly	521	239	826	275	329	330	505	485	434	274	395	595
TSS (mg/L) Weekly Average	13	5	2	9	10	3	5	6	7	8	< 2	7
Fecal Coliform (CFU/100 ml) Geometric Mean	118	19	4	13	99	14	127	15	104	7	144	113
Fecal Coliform (CFU/100 ml) Instantaneous Maximum	119.8	90.9	18.3	30.9	144.5	62.4	365.4	25.6	140.1	53.7	1299.7	235.9
Total Nitrogen (lbs/day) Annual Average							< 3.53754					
Total Nitrogen (mg/L) Annual Average							< 37.57					
Ammonia (mg/L) Average Quarterly	E			0.1			0.07			0.22		
Ammonia (mg/L) Instantaneous Maximum	E			0.1			0.07			0.22		
Total Phosphorus (lbs/day) Annual Average							0.31290					
Total Phosphorus (mg/L) Annual Average							1.56					

Compliance History, Cont'd

Effluent Violations for Outfall 001, from: July 1, 2021 to: June 30, 2022

Parameter	Date	SBC	DMR Value	Units	Limit Value	Units
Fecal Coliform	08/31/21	IMAX	1299.7	CFU/100 ml	1000	CFU/100 ml

Compliance History, Cont'd	
Summary of Inspections:	The facility has been inspected annually by the Department over the past permit term. The most recent inspection on May 6, 2021 identified violations for failure to conduct sampling which was due to flooding at the plant.
Other Comments:	A query in WMS found no open violations in eFACTS for Milton Regional Sewer Authority

Existing Effluent Limitations and Monitoring Requirements

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	Metered
pH (S.U.)	XXX	XXX	6.0	XXX	XXX	9.0	1/day	Grab
DO	XXX	XXX	Report	XXX	XXX	XXX	1/day	Grab
TRC	XXX	XXX	XXX	0.5	XXX	1.6	1/day	Grab
CBOD5	8.0	13.0	XXX	25	40	50	2/month	8-Hr Composite
BOD5 Raw Sewage Influent	Report	XXX	XXX	Report	XXX	XXX	2/month	8-Hr Composite
TSS	10.0	15.0	XXX	30	45	60	2/month	8-Hr Composite
TSS Raw Sewage Influent	Report	XXX	XXX	Report	XXX	XXX	2/month	8-Hr Composite
Fecal Coliform (CFU/100 ml) Oct 1 - Apr 30	XXX	XXX	XXX	2000 Geo Mean	XXX	10000	2/month	Grab
Fecal Coliform (CFU/100 ml) May 1 - Sep 30	XXX	XXX	XXX	200 Geo Mean	XXX	1000	2/month	Grab
Total Nitrogen	Report Annl Avg	XXX	XXX	Report Annl Avg	XXX	XXX	1/year	8-Hr Composite
Ammonia	XXX	XXX	XXX	Report Avg Qrtly	XXX	Report	1/quarter	8-Hr Composite
Total Phosphorus	Report Annl Avg	XXX	XXX	Report Annl Avg	XXX	XXX	1/year	8-Hr Composite

Development of Effluent Limitations

Outfall No. 001 **Design Flow (MGD)** 0.04
Latitude 40º 59' 31.40" **Longitude** -76º 46' 43.50"
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)

Comments: The above limits are existing in the facility permit and will remain unchanged in this permit renewal.

Water Quality-Based Limitations

CBOD5, DO, and NH3-N

The WQM7.0 model allows the Department to evaluate point source discharges of dissolved oxygen (DO), carbonaceous BOD ($CBOD_5$), and ammonia nitrogen (NH_3-N) into free-flowing streams and rivers. To accomplish this, the model simulates two basic processes: the mixing and degradation of NH_3-N in the stream and the mixing and consumption of DO in the stream due to the degradation of $CBOD_5$ and NH_3-N. WQM7.0 modeling was performed for the discharge for the previous review and showed that the secondary treatment limits listed above for $CBOD_5$ are adequate to protect the receiving stream. See Attachment B.

TRC

The above Total Residual Chlorine limit from 92a.48(b)(2) is applicable to the facility. The Department uses a modeling spreadsheet to determine necessary WQBELs for TRC toxicity based on instream dilution. The attached modeling results from the previous review (See attachment C) show that the BAT limit of 0.5 mg/l is adequate to protect the receiving stream.

Toxics Management

No further "Reasonable Potential Analysis" was performed to determine additional parameters as candidates for limitations for this 0.04 MGD facility sewage treatment facility receiving no industrial influent.

Chesapeake Bay Requirements

A portion of the Chesapeake Bay and many of its tidal tributaries have been listed as impaired under Section 303(d) of the Water Pollution Control Act, 33 U.S.C. §1313(d). Total Nitrogen (TN) and Total Phosphorus (TP) cap loads have been established for significant dischargers in Pennsylvania to reduce the total nutrient load to the Bay and meet State of Maryland Water Quality Standards. The MRSA Potts Grove treatment plant is considered an existing Phase 5, insignificant Chesapeake Bay discharger per the Phase III Watershed Implementation Plan (WIP) and thus has received no Cap Loads. The existing permit included annual monitoring for TN and TP. The average TN was <29.54 mg/L and 4.15 lbs/day and the average TP was 3.65 mg/L and 0.543 lbs/day over the past permit term. Consistent with the Phase

III WIP the permittee has conducted adequate monitoring and no further monitoring for nutrients will be required at this time.

Best Professional Judgment (BPJ) Limitations

Comments: No BPJ limits are needed beyond the technology and water quality-based limits noted above.

Anti-Backsliding

No limitations have been made less stringent consistent with the anti-backsliding requirements of the Clean Water Act and 40 CFR 122.44(I).

Proposed Effluent Limitations and Monitoring Requirements

The limitations and monitoring requirements specified below are proposed for the draft permit, and reflect the most stringent limitations amongst technology, water quality and BPJ. Instantaneous Maximum (IMAX) limits are determined using multipliers of 2 (conventional pollutants) or 2.5 (toxic pollutants). Sample frequencies and types are derived from the "NPDES Permit Writer's Manual" (362-0400-001), SOPs and/or BPJ.

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

Parameter	Effluent Limitations						Monitoring Requirements	
	Mass Units (lbs/day) (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	Metered
pH (S.U.)	XXX	XXX	6.0	XXX	XXX	9.0	1/day	Grab
DO	XXX	XXX	Report	XXX	XXX	XXX	1/day	Grab
TRC	XXX	XXX	XXX	0.5	XXX	1.6	1/day	Grab
CBOD5	8.0	13.0	XXX	25	40	50	2/month	8-Hr Composite
BOD5 Raw Sewage Influent	Report	XXX	XXX	Report	XXX	XXX	2/month	8-Hr Composite
TSS	10.0	15.0	XXX	30	45	60	2/month	8-Hr Composite
TSS Raw Sewage Influent	Report	XXX	XXX	Report	XXX	XXX	2/month	8-Hr Composite
Fecal Coliform (No./100 ml) Oct 1 - Apr 30	XXX	XXX	XXX	2000 Geo Mean	XXX	10000	2/month	Grab
Fecal Coliform (No./100 ml) May 1 - Sep 30	XXX	XXX	XXX	200 Geo Mean	XXX	1000	2/month	Grab
Ammonia	XXX	XXX	XXX	Report Avg Qrtly	XXX	Report	1/quarter	8-Hr Composite
E. Coli	XXX	XXX	XXX	XXX	Report Daily Max	XXX	1/year	Grab

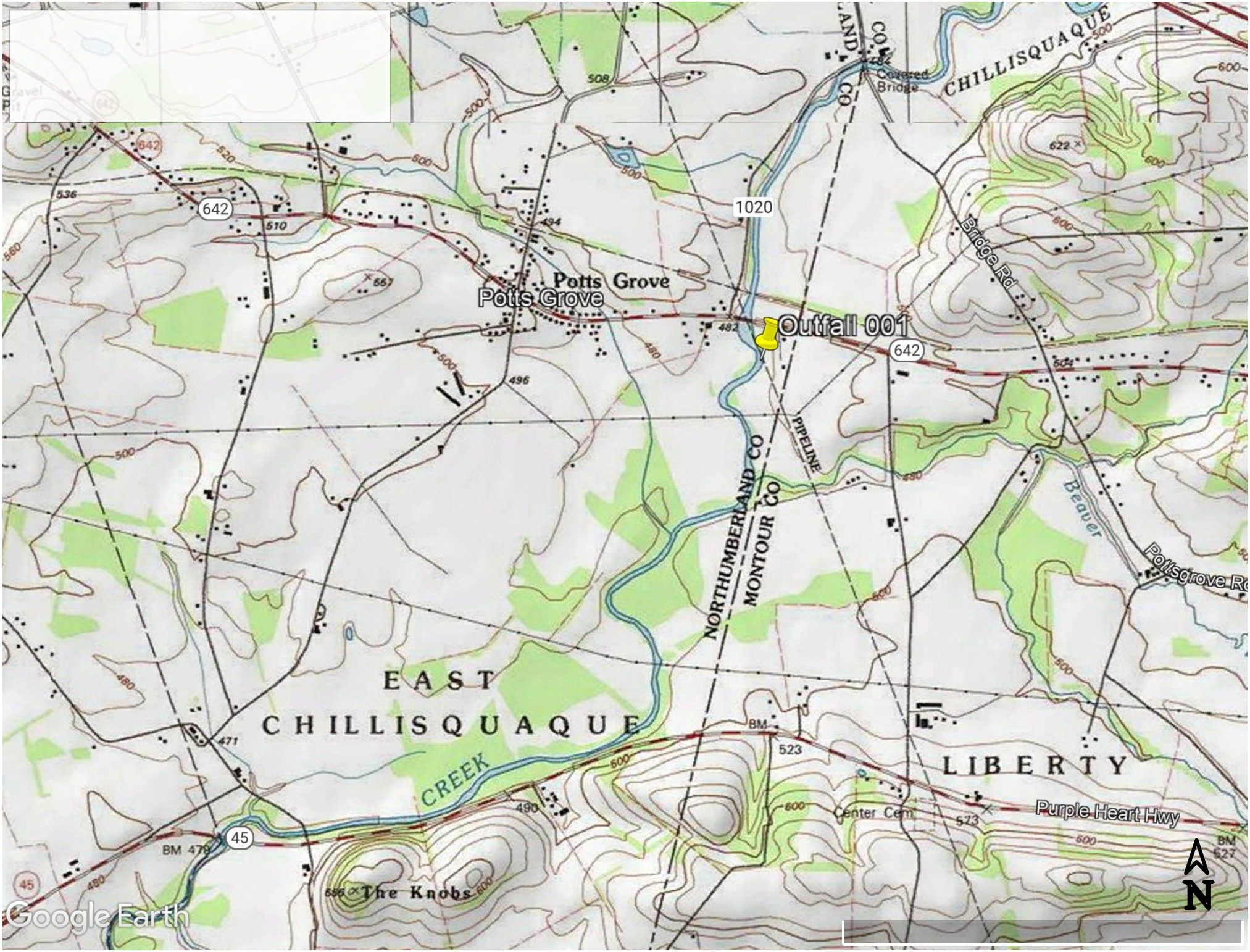
Compliance Sampling Location: Outfall 001

Other Comments: As mentioned above Total Nitrogen and Total Phosphorus monitoring have been removed. In addition, E. Coli monitoring will now be included in the permit consistent with recent changes to Chapter 93 of the Department's regulations and Department policy. The existing quarterly monitoring for NH_3-N is less than twice per month as is typically required for a 0.04 MGD facility. However, given the consistently low levels of NH3-N in the effluent (average <0.18 mg/L over the past permit term) the quarterly monitoring is adequate and will be kept.

Tools and References Used to Develop Permit	
☒	WQM for Windows Model (see Attachment **B**)
☐	Toxics Management Spreadsheet (see Attachment)
☒	TRC Model Spreadsheet (see Attachment **C**)
☐	Temperature Model Spreadsheet (see Attachment)
☒	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: Establishing Effluent Limitations for Individual Sewage Permits
☐	Other:

Attachments:

A. Discharge Location Map
B. WQM7.0 Model
C. TRC Model


Outfall 001
Potts Grove
Potts Grove
1020
642
642
Bridge Rd
Covered Bridge
CHILLISQUAQUE
NORTHUMBERLAND CO
MONTOUR CO
PIPELINE
Beaver
EAST
CHILLISQUAQUE
CREEK
LIBERTY
Purple Heart Hwy
Center Cem
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BM 479
BM 527
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WQM 7.0 H)ldrod)lnamic Out(!uts

SWP Basin	Stream Code	Stream Name
10D	18712	CHILLISQUAQUE CREEK

RMI	Stream Flow (els)	PWS With (els)	Net Stream Flow (els)	Disc Analysis Flow (els)	Reach Slope (ft/ft)	Depth (ft)	Width (ft)	WID Ratio	Velocity (fps)	Reach Trav Time (days)	Analysis Temp ('C)	Analysis pH
Q7-10 Flow												
7.870	mas	0.00	*mBB*	.0619	0.00189	.755	46.57	61.7	0.31	0.079	20.03	7.00
Q1-10 Flow												
7.870	6.96	0.00	6.96	.0619	0.00189	NA	NA	NA	0.24	0.101	20.04	7.00
Q30-10 Flow												
7.870	14.79	0.00	14.79	.0619	0.00189	NA	NA	NA	0.37	0.066	20.02	7.00

WQM 7.0 Modeling Specifications

Parameters	Both	Use Inputted Q1-10 and Q30-10 Flows	
WLAMethod	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.0. Goal	5		

WQM 7.0 Wasteload Allocations

SWP Basin	Stream Code	Stream Name
10D	18712	CHILLISQUAQUE 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
7.870	Potts Grove	9.64	50	9.64	50	0	0

NH3-N Chronic Allocations

RMI	Discharge Name	Baseline Criterion (mg/L)	Baseline WLA (mg/L)	Multiple Criterion (mg/L)	Multiple WLA (mg/L)	Critical Reach	Percent Reduction
7.870	Potts Grove	1.91	25	1.91	25	0	0

Dissolved Oxygen Allocations

RMI	Discharge Name	CBOD5		NH3wN		Dissolved Oxygen		Critical Reach	Percent Reduction
		Baseline (mg/L)	Multiple (mg/L)	Baseline (mg/L)	Multiple (mg/L)	Baseline (mg/L)	Multiple (mg/L)		
7.87	Potts Grove	25	25	25	25	3	3	0	a

WQM 7.0 D.O.Simulation

SWP Basin	Stream Code	Stream Name
10D	18712	CHILLISQUAQUE CREEK

RMI	Total Discharge Flow (mgd)	Analysis Temperature (°C)	Analysis pH
7.870	0.040	20.028	7.000
Reach Width (ft)	**Reach Depth (ft)**	**Reach WDRatio**	**Reach Velocity (fps)**
46.569	0.755	61.698	0.311
Reach CBOD5 (mg/L)	**Reach Kc (1/days)**	**Reach NH3-N (mg/L)**	**Reach Kn (1/days)**
2.13	0.094	0.14	0.702
Reach DO (mg/L)	**Reach Kr (1/days)**	**Kr Equation**	**Reach DO Goal (mg/l)**
8.213	4.024	Tsivoglou	5
Reach Travel Time (days)			
0.079			

Subreach Results

TravTime (days)	CBOD5 (mg/L)	NH3-N (mg/L)	D.O. (mg/L)
0.008	2.13	0.14	8.24
0.016	2.13	0.14	8.24
0.024	2.13	0.14	8.24
0.031	2.12	0.14	8.24
0.039	2.12	0.14	8.24
0.047	2.12	0.14	8.24
0.055	2.12	0.14	8.24
0.063	2.12	0.14	8.24
0.071	2.12	0.13	8.24
0.079	2.11	0.13	8.24

WQM 7.0 Effluent Limits

SWP Basin	Stream Code	Stream Name
10D	18712	CHILLISQUAQUE CREEK

RMI	Name	Permit Number	Disc Flow (mgd)	Parameter	Effl. Limit 30-day Ave. (mg/L)	Effl. Limit Maximum (mg/L)	Efft Limit Minimum (mg/L)
7.870	**Potts Grove**	PA0228478	0.040	C8OD5	25		
				NH3-N	25	50	
				Dissolved Oxygen			3

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
100	18712	CHILLISQUAQUE CREEK	**7.870**	484.00	51.30	0.00000	0.00	**0**

Stream Data

Design Cond.	LFY (efsm)	Trib Flow (efs)	Stream Flow (efs)	Reh Trav Time (days)	Reh Velocity (fps)	WO Ratio	Reh Width (ft)	Reh Depth (ft)	Tributary Temp ('C)	Tributary pH	Stream Temp ('C)	Stream pH
Q7-10	0.212	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
Potts Grove	PA0228478	0.0400	0.0000	0.0000	0.000	25.00	7.00

Parameter Data

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

Input Data WQM 7.0

SWP Basin	Stream Code	Stream Name	RMI	Elevation (ft)	Drainage Area (sq mi)	Slope (ft/ft)	PWS Withdrawal (mgd)	Apply FC
10D	18712	CHILLISQUAQUE CREEK	7.470	480.00	52.00	0.00000	0.00	

Stream Data

Design Cond.	LFY (efsm)	Trib Flow (els)	Stream Flow (els)	Reh Trav Time (days)	Reh Velocity (fps)	WD Ratio	Reh Width (ft)	Reh Depth (ft)	Tributary Temp ('C)	Tributary pH	Stream Temp ('C)	Stream pH
07-10	0.212	0.00	0.00	0.000	0.000	0.0	0.00	0.00	20.00	7.00	0.00	0.00
01-10		0.00	0.00	0.000	0.000							
Q30-10		0.00	0.00	0.000	0.000							

Discharge Data

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

Parameter Data

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

TRC EVALUATION

Client		Date	
10.9	= **Q stream (cfs)**	**0.5**	= **CV Daily**
0.04	= **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**
O	= **Chlorine Demand of Discharge**	**15**	= **AFC Criteria Compliance Time (min)**
0.5	= **BAT/BPJ Value**	**720**	= **CFC Criteria Compliance Time (min)**
	= % **Factor of Safety (FOS)**	**0**	**=Decay Coefficient (K)**

Source	Reference	AFC Calculations		Reference	CFC Calculations	
TRC	**1.3.2.iii**	WLAafc=	56.210	**1.3.2.iii**	WLAcfc=	54.793
PENTOXSD TRG	**5.1a**	LTAMULT afc =	0.373	**5.1c**	LTAMULTcfc=	0.581
PENTOXSD TRG	**5.1b**	LTA afc=	20.945	**5.1d**	LTA cfc=	31.854
		WQBEL ale=	**25.781**		WQBEL etc=	39.209

Source		Effluent Limit Calculations	
PENTOXSD TRG	5.11	AMLMULT= 1.231	
PENTOXSD TRG	5.1g	AVG MON LIMIT (mg/l)= 0.500	BAT/BPJ
		INST MAX LIMIT (mg/l)= 1.635	

WLAafc	**(.019/e(-k*AFC_tc))** + **[(AFC_Yc*Qs*.019/Qd*e(-k* AFC_tc))...**
	...+ Xd + (AFC_Yc*Qs*Xs/Qd)l*(1-FOS/100)
LTAMULTafc	EXP((0.5*LN(cvhA2+1))-2.326*LN(cvhA2+1)A0.5)
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)l*(1-FOS/100)
LTAMULT_cfc	EXP((0.5*LN(cvdA2/no_samples+1))·2.326*LN(cvdA2/no_samples+1)A0.5)
LTA_cfc	wla_cfc*LTAMULT_cfc
AML MULT	EXP(2.326*LN((cvdA2/no_samples+1)A0.5)-0.5*LN(cvdA2/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)**