pennsylvania
DEPARTMENT OF ENVIRONMENTAL PROTECTION

Southcentral Regional Office
CLEAN WATER PROGRAM

Application Type	**Renewal**	Application No.	**PA0082708**
Facility Type	**Non-Municipal**	APS ID	**277920**
Major / Minor	**Minor**	Authorization ID	**1267370**

NPDES PERMIT FACT SHEET INDIVIDUAL SEWAGE

Applicant and Facility Information

Applicant Name	**Calamus Estates MHP**	Facility Name	**Calamus Estates MHP**
Applicant Address	652 Georgetown Road	Facility Address	652 Georgetown Road
	Ronks, PA 17572-9553		Ronks, PA 17572-9553
Applicant Contact	Sandra Whiteside	Facility Contact	Fred Walton
Applicant Phone	(717) 682-4780	Facility Phone	(484) 643-0024
Client ID	4611	Site ID	443872
Ch 94 Load Status	Not Overloaded	Municipality	Paradise Township
Connection Status	No Limitations	County	Lancaster
Date Application Received	March 21, 2019	EPA Waived?	Yes
Date Application Accepted	April 10, 2019	If No, Reason	

Purpose of Application: NPDES Renewal.

Summary of Review

Calamus Estates MHP has applied to the Pennsylvania Department of Environmental Protection (DEP) for reissuance of their National Pollutant Discharge Elimination System (NPDES) permit. The permit was issued on July 3, 2014 and became effective on August 1, 2014. The permit authorized discharge of treated sewage from the existing facility located in Paradise Township, Lancaster County into Calamus Run. The existing permit expiration date was July 31, 2019, and the permit has been administratively extended since that time.

Per the previous fact sheet, the site before the development of Calamus Estates was used as a pasture which resulted in bank erosion and weedy streambed conditions (according to two stream inspections performed in 1988). Downstream uses were the same. A 1999 evaluation showed an improvement from the development with stabilized banks and a more silted/gravel type substrate. Aquatic life was more prevalent. Downstream, the stream appeared to be impacted from farming/pasturing. As of spring 2004, the stream continued to look excellent within the site. The aquatic community was slightly more diverse that it was in 1999.

Changes to renewal: A more stringent Total Residual Chlorine (TRC) limit was added to the permit.

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

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*,

Approve	Deny	Signatures	Date
X		*Benjamin Lockwood* Benjamin R. Lockwood / Environmental Engineering Specialist	February 11, 2021
		Daniel W. Martin, P.E. / Environmental Engineer Manager	
		Maria D. Bebenek, P.E. / Program Manager	

Summary of Review
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. Supplemental information is provided at the end of this fact sheet.

Discharge, Receiving Waters and Water Supply Information

Outfall No.	001	Design Flow (MGD)	.015
Latitude	39º 58' 3"	Longitude	76º 7' 29"
Quad Name	Gap	Quad Code	1937
Wastewater Description:	Sewage Effluent		
Receiving Waters	Calamus Run (TSF, MF)	Stream Code	07495
NHD Com ID	57465193	RMI	2.6
Drainage Area	0.5 mi^2	Yield (cfs/mi^2)	0.134
Q_{7-10} Flow (cfs)	0.067	Q_{7-10} Basis	USGS PA StreamStats
Elevation (ft)	495	Slope (ft/ft)	
Watershed No.	7-K	Chapter 93 Class.	TSF, MF
Existing Use	N/A	Existing Use Qualifier	N/A
Exceptions to Use	N/A	Exceptions to Criteria	N/A
Assessment Status	Impaired		
Cause(s) of Impairment	Pathogens, Nutrients, Siltation, Organic Enrichment, Siltation, Habitat Alterations		
Source(s) of Impairment	Source Unknown, Agriculture, Agriculture, Agriculture, Habitat Modification – Other than Hydromodification, Habitat Modification – Other than Hydromodification		
TMDL Status	Final	Name	Pequea Creek
Nearest Downstream Public Water Supply Intake	Chester Water Authority		
PWS Waters	Susquehanna River	Flow at Intake (cfs)	
PWS RMI		Distance from Outfall (mi)	38

Changes Since Last Permit Issuance: USGS PA StreamStats provided a drainage area of 0.5 mi^2 and a Q_{7-10} flow of 0.067 cfs at the point of discharge.

Other Comments: None

Treatment Facility Summary				
Waste Type	**Degree of Treatment**	**Process Type**	**Disinfection**	**Avg Annual Flow (MGD)**
Sewage	Secondary	Activated Sludge	Chlorine With Dechlorination	0.015
Hydraulic Capacity (MGD)	**Organic Capacity (lbs/day)**	**Load Status**	**Biosolids Treatment**	**Biosolids Use/Disposal**
0.015		Not Overloaded	Sludge Holding	Other WWTP

Changes Since Last Permit Issuance: None

Other Comments: The WWTP train is as follows: Comminutor/Bar Screen – Equalization Tank – 3 Aeration Tanks – Chlorine Contact Tank – Post Settling Tank – Outfall 001 to Calamus Run. The system incorporates chemical addition in the form of calcium hypochlorite (disinfection), sodium sulfite (dechlorination), soda ash (pH control), and alum (phosphorus removal).

Compliance History	
Summary of DMRs:	A summary of the past 12-month DMR effluent data is presented on the next page of this fact sheet
Summary of Inspections:	3/10/2016: A routine inspection was conducted by Sheena Ripple, DEP Water Quality Specialist. The effluent at the facility discharge was clear, and the outfall was free of solids and debris. Upstream looked the same as downstream. Field readings were within permitted limits. 9/25/2018: A routine inspection was conducted by Tracy Tomtishen and Heather Dock. The pump station had a light layer of grease and debris present on the surface. The bar screen was clean. The EQ tank had approximately 12' of freeboard, with little to no accumulation of grease or debris. The anoxic portion of the treatment tank had a layer of foam/solids accumulation. The second aeration tank appeared the same as the first. The clarifier appeared clear with very little surface scum; the clarifier trough had some moss growth. Chlorine tablets were present. Calcium hypochlorite tablets were present in the dispenser entering the post aeration, and dechlorination tablets were present in the dispenser to the outfall. The post aeration tank appeared clear and was aerated. The Outfall 001 discharge was clear with very fine suspended solids. Field readings were within permitted limits.

Other Comments: There are currently no open violations associated with the permittee or the facility.

Compliance History

DMR Data for Outfall 001 (from January 1, 2020 to December 31, 2020)

Parameter	DEC-20	NOV-20	OCT-20	SEP-20	AUG-20	JUL-20	JUN-20	MAY-20	APR-20	MAR-20	FEB-20	JAN-20
Flow (MGD) Average Monthly	0.0043	0.0043	0.0042	0.0038	0.0042	0.0040	0.0037	0.0044	0.0043	0.0052	0.0048	0.0050
Flow (MGD) Daily Maximum	0.0074	0.0068	0.0051	0.0055	0.0077	0.0065	0.0055	0.0104	0.0070	0.0152	0.0089	0.0075
pH (S.U.) Minimum	6.97	6.96	7.04	7.39	7.17	7.29	7.44	7.22	6.09	6.92	6.85	6.44
pH (S.U.) Maximum	8.42	7.78	8.75	8.80	8.21	7.89	8.71	8.87	7.97	7.97	7.08	7.11
DO (mg/L) Minimum	9.8	9.1	8.1	7.3	6.5	7.0	6.8	7.3	9.5	8.8	6.8	7.5
TRC (mg/L) Average Monthly	0.05	0.03	0.05	0.07	0.04	0.03	0.04	0.05	0.03	0.03	0.03	0.02
TRC (mg/L) Instantaneous Maximum	0.15	0.07	0.49	0.29	0.23	0.15	0.15	0.39	0.06	0.15	0.27	0.05
CBOD5 (mg/L) Average Monthly	5.5	4.7	5.3	< 4.0	4.3	< 4.3	< 3.60	4.0	7.9	< 9.55	11.9	< 3.0
TSS (mg/L) Average Monthly	< 7.6	< 5	< 3.82	< 3.9	< 5.2	< 5.3	< 5.20	< 5.0	21.5	20.6	16.0	32.4
Fecal Coliform (CFU/100 ml) Geometric Mean	< 1	< 1	< 3	< 1	< 1	< 7	< 1	< 6	< 1	< 1	210	< 10
Fecal Coliform (CFU/100 ml) Instantaneous Maximum	< 1	< 1	33	< 1	< 1	55	< 1	35	1	< 1	260	96
Ammonia (mg/L) Average Monthly	< 0.16	< 0.27	< 0.10	< 0.13	< 0.20	< 0.19	0.39	0.38	< 2.40	< 1.06	0.11	0.38
Total Phosphorus (mg/L) Average Monthly	1.91	2.88	4.60	4.30	3.00	2.73	0.88	4.11	5.60	4.08	2.35	4.73
Total Phosphorus (lbs) Total Monthly	1.74	3.44	4.96	3.11	2.78	2.62	0.81	4.96	5.88	6.38	1.99	4.32

Existing Effluent Limitations and Monitoring Requirements

The table below summarizes the effluent limits and monitoring requirements implemented in the existing NPDES permit.

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

Parameter	Effluent Limitations						Monitoring Requirements	
	Mass Units (lbs/day)		Concentrations (mg/L)				Minimum Measurement Frequency	Required Sample Type
	Average Monthly	Total Annual	Minimum	Average Monthly	Maximum	Instant. Maximum		
Flow (MGD)	Report	Report Daily Max	XXX	XXX	XXX	XXX	Continuous	Measured
pH (S.U.)	XXX	XXX	6.0	XXX	XXX	9.0	1/day	Grab
DO	XXX	XXX	5.0	XXX	XXX	XXX	1/day	Grab
TRC	XXX	XXX	XXX	0.49	XXX	1.6	1/day	Grab
CBOD5	XXX	XXX	XXX	25	XXX	50	2/month	8-Hr Composite
TSS	XXX	XXX	XXX	30	XXX	60	2/month	8-Hr Composite
Fecal Coliform (No./100 ml) May 1 - Sep 30	XXX	XXX	XXX	200 Geo Mean	XXX	1,000	2/month	Grab
Fecal Coliform (No./100 ml) Oct 1 - Apr 30	XXX	XXX	XXX	2,000 Geo Mean	XXX	10,000	2/month	Grab
Ammonia May 1 - Oct 31	XXX	XXX	XXX	4.5	XXX	9.0	2/month	8-Hr Composite
Ammonia Nov 1 - Apr 30	XXX	XXX	XXX	13.5	XXX	27.0	2/month	8-Hr Composite
Nitrate-Nitrite as N	XXX	Report	XXX	Report Annl Avg	XXX	XXX	1/year	8-Hr Composite
TKN	XXX	Report	XXX	Report Annl Avg	XXX	XXX	1/year	8-Hr Composite
Total Nitrogen	XXX	Report	XXX	Report Annl Avg	XXX	XXX	1/year	Calculation
Total Phosphorus	Report Total Mo	XXX	XXX	Report	XXX	XXX	2/month	8-Hr Composite
Total Phosphorus	XXX	319	XXX	XXX	XXX	XXX	1/year	Calculation

Compliance Sampling Location: At discharge from facility

Development of Effluent Limitations

Outfall No. 001 **Design Flow (MGD)** .015
Latitude 39º 58' 3" **Longitude** 76º 7' 29"
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

Pursuant to 40 CFR § 122.44(d)(1)(i), more stringent requirements should be considered when pollutants are discharged at the levels which have the reasonable potential to cause or contribute to excursions above water quality standards.

WQM 7.0 ver. 1.0b is a water quality model designed to assist DEP in determining appropriate water quality based effluent limits (WQBELs) for carbonaceous biochemical oxygen demand ($CBOD_5$), ammonia (NH_3-N), and dissolved oxygen (D.O.). The model simulates two basic processes: In the NH_3-N module, the model simulates the mixing and degradation of NH_3-N in the stream and compares calculated instream NH_3-N concentrations to NH_3-N water quality criteria. In the D.O. module, the model simulates the mixing and consumption of D.O. in the stream due to the degradation of $CBOD_5$ and NH_3-N and compares calculated instream D.O. concentrations to D.O. water quality criteria. The model then determines the highest pollutant loadings that the stream can assimilate while still meeting water quality criteria under design conditions. DEP's Technical Guidance No. 391-2000-007 provides the technical methods contained in WQM 7.0 for determining wasteload allocations and for determining recommended NPDES effluent limits for point source discharges.

The model was utilized for this permit application. The flow data used to run the model was acquired from USGS PA StreamStats and is included in an attachment. Default stream pH and temperature inputs were used for this model run. The model output indicated a $CBOD_5$ average monthly limit of 25 mg/l, an NH_3-N average monthly limit of 8.78 mg/l, and a D.O. minimum limit of 5.0 mg/l were protective of water quality. The $CBOD_5$ limit is the same as the existing limit, which will remain in the permit. The existing NH_3-N limit of 4.5 mg/l is more stringent, and will remain in the permit.

There are no industrial/commercial users contributing industrial wastewater to the system and Calamus Estates MHP does not currently have an EPA-approved pretreatment program. Accordingly, evaluating reasonable potential of toxic pollutants is not necessary as effluent levels of toxic pollutants are expected to be insignificant.

Best Professional Judgement (BPJ) Limitations

Dissolved Oxygen (D.O.)

A minimum D.O. limit of 5.0 mg/L is a D.O. water quality criterion found in 25 Pa. Code § 93.7(a). This limit is included in the existing NPDES permit. This limit will continue to be included in the permit to ensure that the facility continues to achieve compliance with DEP water quality standards.

Total Residual Chlorine

The attached computer printout utilizes the equations and calculations as presented in the Department's May 1, 2003 Implementation Guidance for Total Residual Chlorine (TRC) (ID No. 391-2000-015) for developing chlorine limitations. The Guidance references Chapter 92, Section 92.2d (3) which establishes a standard BAT limit of 0.5 mg/l unless a facility-specific BAT has been developed. The attached printout indicates that a water quality limit of 0.43 mg/l would be needed to prevent toxicity concerns. It is recommended that a TRC limit of 0.43 mg/l monthly average and 1.4 mg/l instantaneous maximum be applied this permit cycle, which is slightly more stringent than the existing limit. Based on a review of the past year of DMR data, the facility is capable of meeting this limit.

Additional Considerations

Pequea Creek TMDL

A TMDL exists for Pequea Creek for phosphorus and sediment. The TMDL was completed and approved on April 9, 2001 and was revised in 2006. The TMDL established a permit limit for TP of 319 lbs/year for this facility. This limit will remain in the renewal permit.

Chesapeake Bay Total Maximum Daily Load (TMDL)

DEP developed a strategy to comply with the EPA and Chesapeake Bay Foundation requirements by reducing point source loadings of Total Nitrogen (TN) and Total Phosphorus (TP). This strategy can be located in the *Pennsylvania Chesapeake Watershed Implementation Plan* (WIP), dated January 11, 2011. Subsequently, an update to the WIP was published as the Phase 2 WIP. As part of the Phase 2 WIP, a *Phase 2 Watershed Implementation Plan Wastewater Supplement* (Phase 2 Supplement) was developed, providing an update on TMDL implementation for point sources and DEP's current implementation strategy for wastewater. A new update to the WIP was published as the Phase 3 WIP in August 2019. As part of the Phase 3 WIP, a *Phase 3 Watershed Implementation Plan Wastewater Supplement* (Phase 3 Supplement) was developed, and was most recently revised on December 17, 2019, and is the basis for the development of any Chesapeake Bay related permit parameters. Sewage discharges have been prioritized based on their design flow to the Bay. The highest priority (Phases 1, 2, and 3) dischargers will receive annual Cap Loads based on their design flow on August 29, 2005 and concentrations of 6 mg/l TN and 0.8 mg/l TP. These limits may be achieved through a combination of treatment technology, credits, or offsets. For Phase 4 and 5 facilities, Cap Loads are not currently being implemented for renewed or amended permits for facilities that do not increase design flow.

This facility is considered a Phase 5 non-significant discharger with a design flow less than 0.2 MGD but greater than 0.002 MGD. According to DEP's latest-revised Phase 3 Supplement, issuance of permits with monitoring and reporting for TN and TP is recommended for any Phase 5 non-significant sewage facilities. Furthermore, DEP's SOP No. BCW-PMT-033 states that in general, at a minimum, monitoring for TN and TP should be included in new and reissued permits for sewage discharges with design flows > 2,000 gpd. Therefore, TN and TP monitoring will be included in the renewed permit, which is consistent with the existing permit.

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.

303d Listed Streams

The discharge is located on a stream segment that has a recreational impairment from pathogens due to an unknown source. There is also an aquatic life impairment from agriculture due to nutrient, siltation, organic enrichment; habitat modification – other than hydromodification due to siltation and habitat alterations.

Class A Wild Trout Fisheries

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

Anti-Backsliding

Pursuant to 40 CFR § 122.44(l)(1), all proposed permit requirements addressed in this fact sheet are at least as stringent as the requirements implemented in the existing NPDES permit unless any exceptions are addressed by DEP in this fact sheet.

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	Total Annual	Minimum	Average Monthly	Maximum	Instant. Maximum		
Flow (MGD)	Report	Report Daily Max	XXX	XXX	XXX	XXX	Continuous	Measured
pH (S.U.)	XXX	XXX	6.0	XXX	XXX	9.0	1/day	Grab
DO	XXX	XXX	5.0	XXX	XXX	XXX	1/day	Grab
TRC	XXX	XXX	XXX	0.43	XXX	1.4	1/day	Grab
CBOD5	XXX	XXX	XXX	25	XXX	50	2/month	8-Hr Composite
TSS	XXX	XXX	XXX	30	XXX	60	2/month	8-Hr Composite
Fecal Coliform (No./100 ml) May 1 - Sep 30	XXX	XXX	XXX	200 Geo Mean	XXX	1,000	2/month	Grab
Fecal Coliform (No./100 ml) Oct 1 - Apr 30	XXX	XXX	XXX	2,000 Geo Mean	XXX	10,000	2/month	Grab
Ammonia May 1 - Oct 31	XXX	XXX	XXX	4.5	XXX	9.0	2/month	8-Hr Composite
Ammonia Nov 1 - Apr 30	XXX	XXX	XXX	13.5	XXX	27	2/month	8-Hr Composite
Nitrate-Nitrite as N	XXX	Report	XXX	Report Annl Avg	XXX	XXX	1/year	8-Hr Composite
TKN	XXX	Report	XXX	Report Annl Avg	XXX	XXX	1/year	8-Hr Composite
Total Nitrogen	XXX	Report	XXX	Report Annl Avg	XXX	XXX	1/year	Calculation

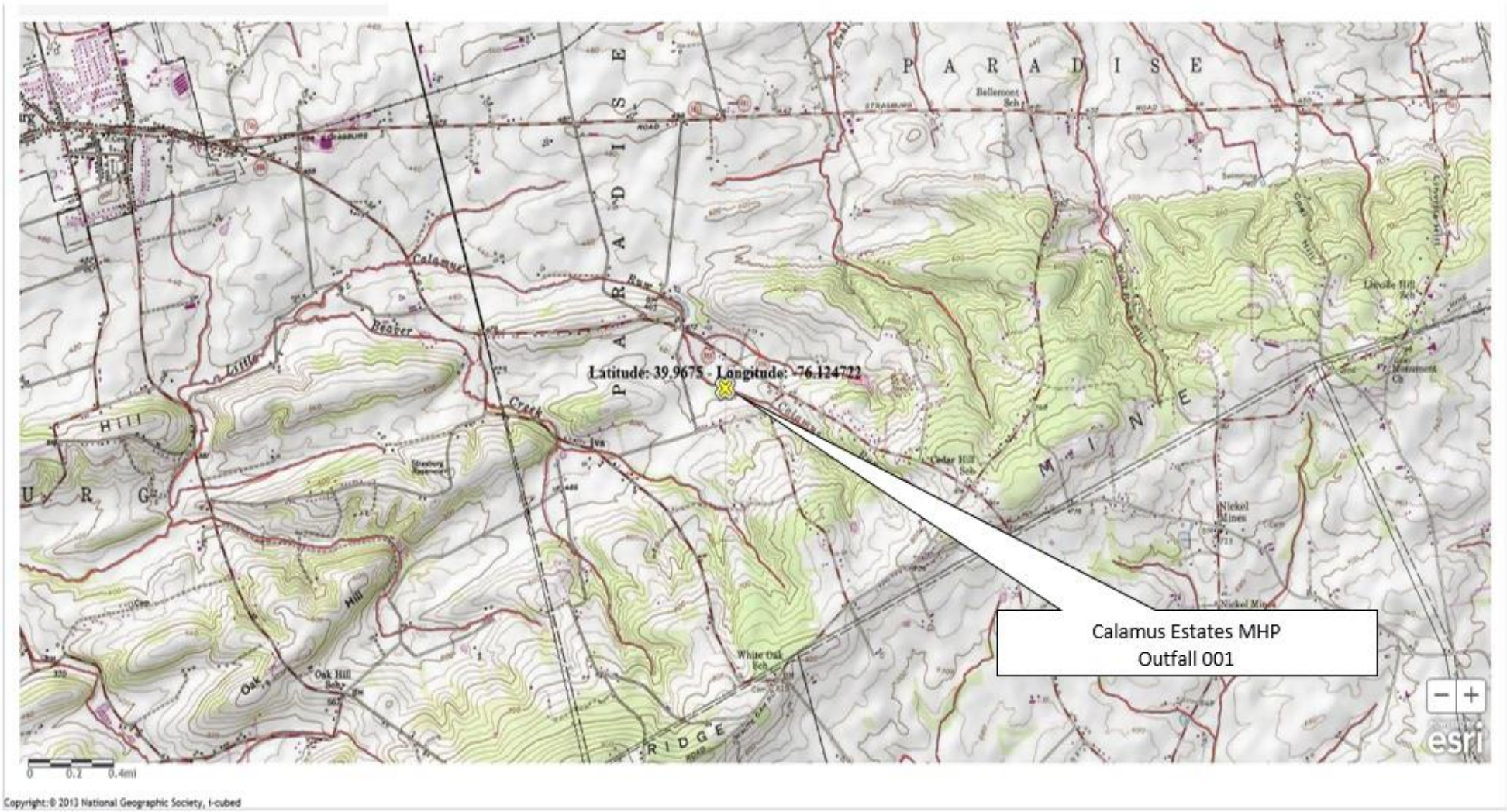
Outfall 001, Continued (from Permit Effective Date through Permit Expiration Date)

Parameter	Effluent Limitations						Monitoring Requirements	
	Mass Units (lbs/day) (1)		Concentrations (mg/L)				Minimum (2) Measurement Frequency	Required Sample Type
	Average Monthly	Total Annual	Minimum	Average Monthly	Maximum	Instant. Maximum		
Total Phosphorus	Report Total Mo	XXX	XXX	Report	XXX	XXX	2/month	8-Hr Composite
Total Phosphorus	XXX	319	XXX	XXX	XXX	XXX	1/year	Calculation

Compliance Sampling Location: At discharge from the facility

Other Comments: None

Tools and References Used to Develop Permit	
☒	WQM for Windows Model (see Attachment)
☐	Toxics Management Spreadsheet (see Attachment)
☒	TRC Model Spreadsheet (see Attachment)
☐	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: No. BCW-PMT-002, No. BCW-PMT-033
☐	Other:


Latitude: 39.9675 - Longitude: -76.124722
Calamus Estates MHP
Outfall 001
PARADISE
MINE
RIDGE
Calamus
Beaver
Little
Creek
Oak
Hill
Bellemont Sch
Cedar Hill Sch
Oak Hill Sch
White Oak Sch
Nickel Mines
0 0.2 0.4mi
esri
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TRC EVALUATION						
Input appropriate values in B4:B8 and E4:E7						
0.087	= Q stream (cfs)		0.5	= CV Daily		
0.015	= Q discharge (MGD)		0.5	= CV Hourly		
30	= no. samples		1	= AFC_Partial Mix Factor		
0.3	= Chlorine Demand of Stre		1	= CFC_Partial Mix Factor		
0	= Chlorine Demand of Disc		15	= AFC_Criteria Compliance Time (min)		
0.5	= BAT/BPJ Value		720	= CFC_Criteria Compliance Time (min)		
0	= % Factor of Safety (FOS)			=Decay Coefficient (K)		
Source	Reference	AFC Calculations		Reference	CFC Calculations	
TRC	1.3.2.iii	WLA afc = 0.940		1.3.2.iii	WLA cfc = 0.909	
PENTOXSD TRC	5.1a	LTAMULT afc = 0.373		5.1c	LTAMULT cfc = 0.581	
PENTOXSD TRC	5.1b	LTA_afc= 0.350		5.1d	LTA_cfc = 0.528	
Source		Effluent Limit Calculations				
PENTOXSD TRC	5.1f	AML MULT = 1.231				
PENTOXSD TRC	5.1g	AVG MON LIMIT (mg/l) = 0.431		AFC		
		INST MAX LIMIT (mg/l) = 1.410				

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)

(0.011/EXP(-K*CFC_tc/1440))+(((CFC_Yc*Qs*0.011)/(1.547*Qd)....
....*EXP(-K*CFC_tc/1440)))+Xd+(CFC_Yc*Qs*Xs/1.547*Qd))*(1-FOS/100)

Enter a report title and/or comments here that will display on the printed report. Use the print button below.

Enter report title:

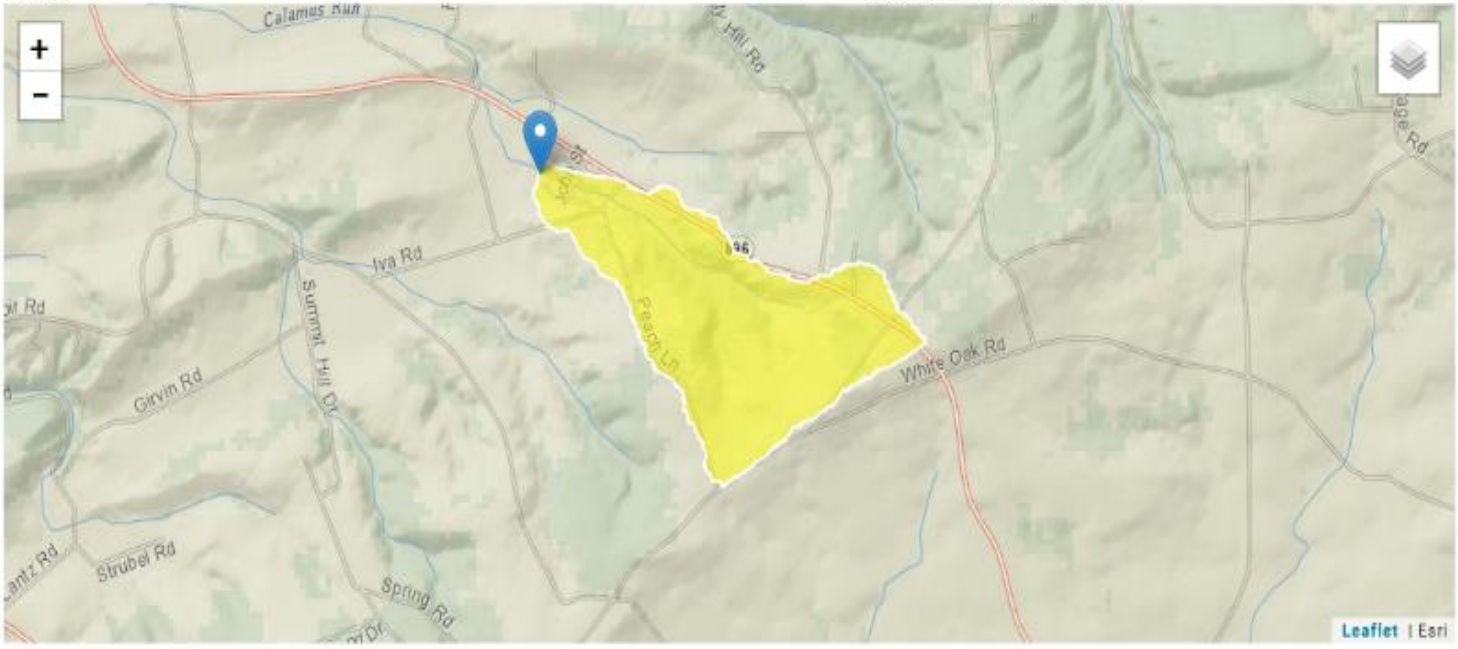
Calamus Estates MHP PA0082708 Outfall 001

Enter comments:

Some comments here

Calamus Estates MHP PA0082708 Outfall 001

Region ID:	PA
Workspace ID:	PA20210209220540421000
Clicked Point (Latitude, Longitude):	39.96752, -76.12476
Time:	2021-02-09 17:05:57 -0500



Basin Characteristics

Parameter Code	Parameter Description	Value	Unit
DRNAREA	Area that drains to a point on a stream	0.5	square miles
BSLOPD	Mean basin slope measured in degrees	5.4129	degrees
ROCKDEP	Depth to rock	5	feet
URBAN	Percentage of basin with urban development	0.9053	percent

Low-Flow Statistics Parameters[Low Flow Region 1]

Parameter Code	Parameter Name	Value	Units	Min Limit	Max Limit
DRNAREA	Drainage Area	0.5	square miles	4.78	1150
BSLOPD	Mean Basin Slope degrees	5.4129	degrees	1.7	6.4
ROCKDEP	Depth to Rock	5	feet	4.13	5.21
URBAN	Percent Urban	0.9053	percent	0	89

Low-Flow Statistics Disclaimers[Low Flow Region 1]

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

Low-Flow Statistics Flow Report[Low Flow Region 1]

Statistic	Value	Unit
7 Day 2 Year Low Flow	0.149	ft^3/s
30 Day 2 Year Low Flow	0.185	ft^3/s
7 Day 10 Year Low Flow	0.0669	ft^3/s
30 Day 10 Year Low Flow	0.0873	ft^3/s
90 Day 10 Year Low Flow	0.128	ft^3/s

Low-Flow Statistics Citations

Stuckey, M.H.,2006, Low-flow, base-flow, and mean-flow regression equations for Pennsylvania streams: U.S. Geological Survey Scientific Investigations Report 2006-5130, 84 p.

Application Version: 4.4.0

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Enter report title:

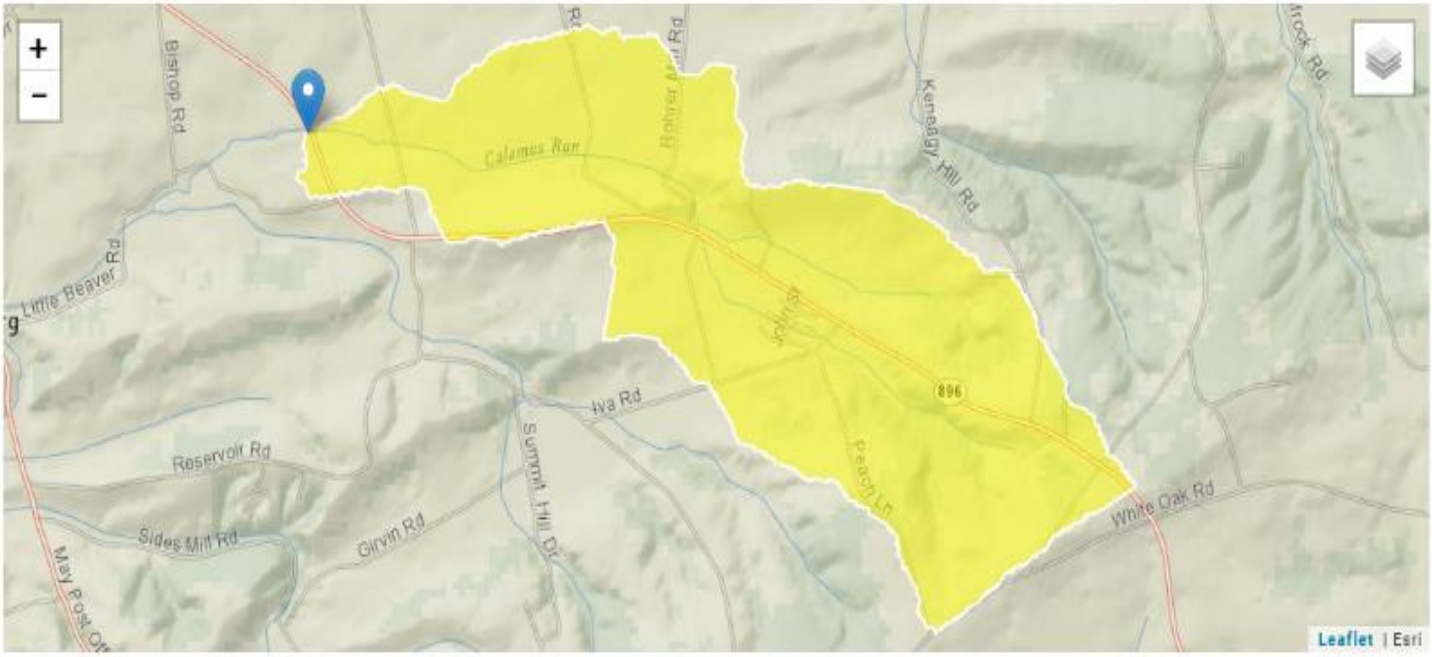
Calamus Estates MHP PA0082708 RMI 0.7

Enter comments:

Some comments here

Calamus Estates MHP PA0082708 RMI 0.7

Region ID:	PA
Workspace ID:	PA20210209220912018000
Clicked Point (Latitude, Longitude):	39.97483, -76.15343
Time:	2021-02-09 17:09:30 -0500



Basin Characteristics

Parameter Code	Parameter Description	Value	Unit
DRNAREA	Area that drains to a point on a stream	1.79	square miles
BSLOPD	Mean basin slope measured in degrees	3.9267	degrees
ROCKDEP	Depth to rock	5.2	feet
URBAN	Percentage of basin with urban development	0.9113	percent

Low-Flow Statistics Parameters[Low Flow Region 1]

Parameter Code	Parameter Name	Value	Units	Min Limit	Max Limit
DRNAREA	Drainage Area	1.79	square miles	4.78	1150
BSLOPD	Mean Basin Slope degrees	3.9267	degrees	1.7	6.4
ROCKDEP	Depth to Rock	5.2	feet	4.13	5.21
URBAN	Percent Urban	0.9113	percent	0	89

Low-Flow Statistics Disclaimers[Low Flow Region 1]

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

Low-Flow Statistics Flow Report[Low Flow Region 1]

Statistic	Value	Unit
7 Day 2 Year Low Flow	0.424	ft^3/s
30 Day 2 Year Low Flow	0.547	ft^3/s
7 Day 10 Year Low Flow	0.187	ft^3/s
30 Day 10 Year Low Flow	0.25	ft^3/s
90 Day 10 Year Low Flow	0.407	ft^3/s

Low-Flow Statistics Citations

Stuckey, M.H.,2006, Low-flow, base-flow, and mean-flow regression equations for Pennsylvania streams: U.S. Geological Survey Scientific Investigations Report 2006-5130, 84 p.

Application Version: 4.4.0

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
07K	7495	CALAMUS RUN	2.600	495.00	0.50	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	0.100	0.00	0.07	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
Calamus Estates	PA0082708	0.0150	0.0150	0.0150	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	5.00	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
07K	7495	CALAMUS RUN	0.700	406.00	1.79	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	0.100	0.00	0.19	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	25.00	7.00

Parameter Data

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

WQM 7.0 Hydrodynamic Outputs

SWP Basin	Stream Code	Stream Name
07K	7495	CALAMUS RUN

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												
2.600	0.07	0.00	0.07	.0232	0.00887	.348	3.89	11.18	0.07	1.740	21.29	7.00
Q1-10 Flow												
2.600	0.04	0.00	0.04	.0232	0.00887	NA	NA	NA	0.06	2.072	21.76	7.00
Q30-10 Flow												
2.600	0.09	0.00	0.09	.0232	0.00887	NA	NA	NA	0.08	1.524	21.01	7.00

WQM 7.0 Modeling Specifications

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

WQM 7.0 Wasteload Allocations

SWP Basin	Stream Code	Stream Name
07K	7495	CALAMUS RUN

NH3-N Acute Allocations

RMI	Discharge Name	Baseline Criterion (mg/L)	Baseline WLA (mg/L)	Multiple Criterion (mg/L)	Multiple WLA (mg/L)	Critical Reach	Percent Reduction
2.600	Calamus Estates	8.52	24.26	8.52	24.26	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
2.600	Calamus Estates	1.78	8.78	1.78	8.78	1	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)		
2.60	Calamus Estates	25	25	8.78	8.78	5	5	0	0

WQM 7.0 D.O.Simulation

SWP Basin	Stream Code	Stream Name
07K	7495	CALAMUS RUN

RMI	Total Discharge Flow (mgd)	Analysis Temperature (°C)	Analysis pH
2.600	0.015	21.286	7.000
Reach Width (ft)	**Reach Depth (ft)**	**Reach WDRatio**	**Reach Velocity (fps)**
3.888	0.348	11.181	0.067
Reach CBOD5 (mg/L)	**Reach Kc (1/days)**	**Reach NH3-N (mg/L)**	**Reach Kn (1/days)**
7.92	0.745	2.26	0.773
Reach DO (mg/L)	**Reach Kr (1/days)**	**Kr Equation**	**Reach DO Goal (mg/L)**
7.409	25.741	Owens	5
Reach Travel Time (days)			
1.740			

Subreach Results

TravTime (days)	CBOD5 (mg/L)	NH3-N (mg/L)	D.O. (mg/L)
0.174	6.90	1.97	8.05
0.348	6.01	1.73	8.05
0.522	5.24	1.51	8.05
0.696	4.57	1.32	8.05
0.870	3.98	1.15	8.05
1.044	3.47	1.01	8.05
1.218	3.02	0.88	8.05
1.392	2.63	0.77	8.05
1.566	2.29	0.67	8.05
1.740	2.00	0.59	8.05

WQM 7.0 Effluent Limits

SWP Basin	Stream Code	Stream Name
07K	7495	CALAMUS RUN

RMI	Name	Permit Number	Disc Flow (mgd)	Parameter	Effl. Limit 30-day Ave. (mg/L)	Effl. Limit Maximum (mg/L)	Effl. Limit Minimum (mg/L)
2.600	Calamus Estates	PA0082708	0.015	CBOD5	25		
				NH3-N	8.78	17.56	
				Dissolved Oxygen			5