pennsylvania
DEPARTMENT OF ENVIRONMENTAL PROTECTION

**Southwest Regional Office**
**CLEAN WATER PROGRAM**

# NPDES PERMIT FACT SHEET
# INDIVIDUAL SEWAGE

| | | | |
|---|---|---|---|
| Application Type | **Renewal** | Application No. | **PA0096121** |
| Facility Type | **Non-Municipal** | APS ID | **1101905** |
| Major / Minor | **Minor** | Authorization ID | **1463625** |

## Applicant and Facility Information

| | | | |
|---|---|---|---|
| Applicant Name | **McGuffey School District** | Facility Name | **Joe Walker Elementary School** |
| Applicant Address | 90 McGuffey Drive | Facility Address | 2510 Park Avenue |
| | Claysville, PA 15323-2304 | | Washington, PA 15323 |
| Applicant Contact | Craig McKee | Facility Contact | Same as Applicant |
| Applicant Phone | (724) 948-3731 | Facility Phone | Same as Applicant |
| Client ID | 23970 | Site ID | 252115 |
| Ch 94 Load Status | Not Overloaded | Municipality | South Franklin Township |
| Connection Status | No Prohibitions | County | Washington |
| Date Application Received | November 30, 2023 | EPA Waived? | Yes |
| Date Application Accepted | December 7, 2023 | If No, Reason | |

Purpose of Application: NPDES Permit Renewal for Discharge of Treated Sewage Effluent.

## Summary of Review

DEP received an application for a renewal of NPDES Permit No. PA0096121, which was previously issued on June 1, 2019. The permit expired on May 31, 2024. A timely renewal application was received on November 30, 2023. The permit was originally issued in 1998.

The design discharge flow rate is 0.0045 MGD, and the discharge is to an unnamed tributary of Chartiers Creek, which is classified as warm water fisheries (WWF) and located in the State Watershed 20-F.

The WQM permit No. 6376412 issued on January 20, 1977 authorized the construction of this facility to serve Joe Walker Elementary School which consist of: comminutor and bar screen, equalization tank, aeration tank, clarifier, sludge digester, sand filters, chlorine contact tank and dechlorination.

An Operations Compliance Check Summary Report was completed by DEP's Operations Section on January 31, 2024 and concluded that there are currently no compliance issues with this sewage treatment plant. Checking on last time this facility was inspected, the inspection report on August 13, 2021 stated that no violations were noticed during this inspection.

The application stated that there were no changes to the facility conditions regarding discharge, receiving stream, or treatment technology. No changes are foreseen for the next five years, and therefore, Act 537 was not needed.

No industrial users are discharging to this facility per the application.

The applicant provides a proof of Act 14, P.L. 834 compliance with the November 28, 2023 letters. No comments were received.

| Approve | Deny | Signatures | Date |
|---|---|---|---|
| X | | Hazim Aldalli / Environmental Engineering Specialist | August 12, 2024 |
| X | | Mahbuba Iasmin / Environmental Engineering Manager | October 18, 2024 |

| **Summary of Review** |
|---|
| Sludge use and disposal description and location(s): Off site at Allegheny Valley JSA STP, there are no sludge been hauled/applied within this facility.<br><br>Public Participation<br><br>DEP will publish notice of the receipt of the NPDES permit application and a tentative decision to issue the individual NPDES permit in the *Pennsylvania Bulletin* in accordance with 25 Pa. Code § 92a.82. Upon publication in the *Pennsylvania Bulletin*, DEP will accept written comments from interested persons for a 30-day period (which may be extended for one additional 15-day period at DEP's discretion), which will be considered in making a final decision on the application. Any person may request or petition for a public hearing with respect to the application. A public hearing may be held if DEP determines that there is significant public interest in holding a hearing. If a hearing is held, notice of the hearing will be published in the *Pennsylvania Bulletin* at least 30 days prior to the hearing and in at least one newspaper of general circulation within the geographical area of the discharge. |

**Discharge, Receiving Waters and Water Supply Information**

| | | | |
|---|---|---|---|
| Outfall No. | 001 | Design Flow (MGD) | 0.0045 |
| Latitude | 40º 7' 15" | Longitude | -80º 17' 21" |
| Quad Name | Prosperity | Quad Code | 40080A3 |
| Wastewater Description: | Sewage Effluent | | |
| Receiving Waters | UNT Chartiers Creek (WWF) | Stream Code | 37157 |
| NHD Com ID | 99694830 | RMI | 0.07 |
| Drainage Area | 0.76 | Yield (cfs/mi$^2$) | 0.0078 |
| $Q_{7-10}$ Flow (cfs) | 0.00594 | $Q_{7-10}$ Basis | USGS StreamStats |
| Elevation (ft) | 1231 | Slope (ft/ft) | 0.0033 |
| Watershed No. | 20-F | Chapter 93 Class. | WWF |
| Existing Use | | Existing Use Qualifier | |
| Exceptions to Use | None. | Exceptions to Criteria | None. |
| Assessment Status | Impaired | | |
| Cause(s) of Impairment | NUTRIENTS, PATHOGENS, SILTATION | | |
| Source(s) of Impairment | GRAZING IN RIPARIAN OR SHORELINE ZONES, RURAL (RESIDENTIAL AREAS), SITE CLEARANCE (LAND DEVELOPMENT OR REDEVELOPMENT), SOURCE UNKNOWN | | |
| TMDL Status | Final | Name | Chartiers/Little Chartiers Creek TMDL for PCBs and Chlordane |

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

| | | | |
|---|---|---|---|
| Nearest Downstream Public Water Supply Intake | WESTERN PA W CO-WASHINGTON DIS | | |
| PWS Waters | CHARTIERS CREEK | Flow at Intake (cfs) | 0.197 |
| PWS RMI | 43.7 | Distance from Outfall (mi) | >4.0 |

Changes Since Last Permit Issuance:

- The receiving stream was evaluated as a dry/intermittent stream per the previous pollution report with zero (0.0 cfs) flow calculated. The report also stated that a $CBOD_5$ of 10 mg/L and TSS of 25 mg/L were assigned to this discharge to avoid public health nuisance. 300 ft northwest from the STP Outfall, the receiving stream is discharging to the Chartiers Creek.

- $Q_{7-10}$ flow, elevation, drainage area, and low flow yield were all updated to match USGS Stream Stats new data (see Attachment A).

- DEP updated its WQM 7.0 criteria for Ammonia-Nitrogen ($NH_3$-N) in 2019. Limits and conditions of this permit need to be redeveloped to an adequate level to protect water quality.

- *E. Coli* monitoring requirements will be introduced to this renewal which is in compliance with DEP SOP No. BCW-PMT-033 revised February 5, 2024.

**Treatment Facility Summary**

**Treatment Facility Name:** Joe Walker Elementary School

| WQM Permit No. | Issuance Date |
|---|---|
| 6376412 | January 20, 1977 |

| Waste Type | Degree of Treatment | Process Type | Disinfection | Avg Annual Flow (MGD) |
|---|---|---|---|---|
| Sewage | Tertiary | Aeration | Chlorination | 0.00156 |

| Hydraulic Capacity (MGD) | Organic Capacity (lbs/day) | Load Status | Biosolids Treatment | Biosolids Use/Disposal |
|---|---|---|---|---|
| 0.0045 | 34.62 | Not Overloaded | Sludge Digester | Landfill |

Changes Since Last Permit Issuance: None.

Other Comments: None.

**Compliance History**

# Operations Compliance Check Summary Report

**Facility:** Joe Walker Elementary School STP
**NPDES Permit No.:** PA0096121
**Compliance Review Period:** 1/1/19-1/31/24
**Inspection Summary:**

| INSPECTED DATE | INSP TYPE | AGENCY | INSPECTION RESULT DESC |
|---|---|---|---|
| 08/13/2021 | Compliance Evaluation | PA Dept of Environmental Protection | No Violations Noted |
| 08/13/2021 | Administrative/File Review | PA Dept of Environmental Protection | No Violations Noted |

**Violation Summary:**
No violations noted during review period
**Open Violations by Client ID:**
No open violations for Client ID 23970
**Enforcement Summary:**
No enforcements executed during review period
**Effluent Violation Summary:**

| MON PD_END | PARAMETER | SAMPLE | PERMIT | UNIT | STAT_BASE_CODE | FACILITY_COMMENTS |
|---|---|---|---|---|---|---|
| February-22 | Ammonia-Nitrogen | 14.15 | 9 | mg/L | Average Monthly | During the month of February this facility will have an Ammonia violation. This violation was caused by cold weather reducing the treatment process. With warmer months ahead we do not expect a violation moving forward. |
| September-19 | Fecal Coliform | 2420 | 1000 | No./100 ml | Instantaneous Maximum | The facility will have a fecal coliform max violation. The first sample of the month was just above the max limitation and all samples after were well below. The disinfection system was cleaned to allow for proper disinfection. |
| May-19 | Fecal Coliform | 1733 | 1000 | CFU/100 ml | Instantaneous Maximum | For the Fecal (max) violation the operator increased the Chlorine dose. |

**Compliance Status:** Facility is generally in compliance with no open violations or pending enforcements.
**Completed by:** Amanda Illar
**Completed date:** 1/31/24

Other Comments: None.

## Development of Effluent Limitations

| | | | |
|---|---|---|---|
| **Outfall No.** | 001 | **Design Flow (MGD)** | 0.0045 |
| **Latitude** | 40º 7' 15.00" | **Longitude** | -80º 17' 21.00" |
| **Wastewater Description:** | Treated 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) |
| *E. Coli* (No./100 ml) | Report | IMAX | - | 92a.61 |
| D.O. (mg/L) | 4.0 | Min | - | BPJ |
| $NH_3$-N (mg/L) | 25 | Average Monthly | - | BPJ |
| | 50 | IMAX | | |
| Total N (mg/L) | Report | Average Monthly | - | 92a.61 |
| Total P (mg/L) | Report | Average Monthly | - | 92a.61 |

### Water Quality-Based Limitations

The existing discharge was evaluated using WQM 7.0 for $CBOD_5$, Ammonia Nitrogen and Dissolved Oxygen. The Total Suspended Solids (TSS), pH, and Fecal Coliform parameters are not evaluated using WQM 7.0. The following limitations were determined through water quality modeling, output files attached (Attachment B and C):

| Parameter | Limit (mg/L) | SBC | Model |
|---|---|---|---|
| TRC | 0.15 | Average Monthly | DEP TRC Calculation |
| $CBOD_5$ (May1-Oct 31) | 25 | Average Monthly | WQM7.0 |
| $CBOD_5$ (Nov 1- Apr 30) | 25 | Average Monthly | WQM7.0 |
| $NH_3$-N (May1-Oct 31) | 3.4 | Average Monthly | WQM7.0 |
| $NH_3$-N (Nov 1- Apr 30) | 8.8 | Average Monthly | WQM7.0 |
| Dissolved Oxygen | 4.0 | Minimum | WQM7.0 |

Comments: WQM 7.0 was used to determine the newly WQBEL seasonal limits for Ammonia Nitrogen ($NH_3$-N) following PADEP's Implementation Guidance of Section 93.7 Ammonia Criteria, 1997.; The new Average Monthly Limits (AMLs) of 3.4 mg/L for the warm period is less stringent than the current permit limit of 3.0 mg/L. Previous limits will be carried over in accordance with anti-backsliding requirements. Also, WQM model produced a new AML of 8.8 mg/L for the cold period, which is more stringent than the current permit limit of 9.0 mg/L. Reviewing renewal application effluent sampling and eDMR values for Ammonia-Nitrogen, the facility can meet the newly imposed Ammonia-Nitrogen seasonal limit for the cold period as this plant has achieved lower than the new proposed limits. No compliance schedule is necessary. Weekly monitoring is required.

For the Carbonaceous Biochemical Oxygen Demand ($CBOD_5$), the WQM 7.0 model generated a WQBEL AML of 25 mg/L a year around, which is less stringent limit than the current permit limit of 10 mg/L. Therefore, previous limits will be carried over in accordance with the anti-backsliding requirements.

**Best Professional Judgment (BPJ) Limitations**

A minimum Dissolved Oxygen (DO) limit of 4.0 mg/L was established based on Best Professional Judgment (BPJ) to ensure adequate operation and maintenance as Technology-Based Effluent Limitation. Checking on the eDMRs, the facility can meet the newly imposed Dissolved Oxygen limit as the plant has achieved effluent limits of DO greater than the proposed limit. No compliance schedule is necessary.

**Anti-Backsliding**

The previously imposed limits for pH Effluent Limitation of (6.0 Minimum, and 9.0 Maximum SIU), Fecal Coliform AML Geo Mean seasonal limits of (200 & 2000 CFU/100 ml), TSS AML, and Ins. Max of (25, and 50 mg/L), Carbonaceous Biochemical Oxygen Demand CBOD5 yearly around AML, and Ins. Max of (10, and 20 mg/L), Ammonia-Nitrogen warm period limit of (3.0 mg/L), TRC AML of (0.10 mg/L) and Ins. Max of (0.3 mg/L); will be all unchanged due to Anti-Backsliding as stated in 40 CFR Section 122.44(l).

**Total Maximum Daily Load (TMDL) Considerations**

This facility discharges to the Chartiers Creek Watersheds. This Watershed has a Final TMDL and is impaired by Metals and PCBs. Abandoned mine drainage is the source of the TMDL impairment. Also, baren lands and urban areas are considered as contributing sources (see page 5 of the TMDL document). No Waste Load Allocations (WLAs) have been developed for this sewage discharge.

In accordance with 40 CFR § 122.44(d)(1)(vii)(B), when developing WQBELs, the permitting authority shall ensure that effluent limits developed to protect a narrative water quality criterion, a numeric water quality criterion, or both, are consistent with the assumptions and requirements of any available WLA pursuant to 40 CFR § 130.7.

The applicable water quality criteria for this watershed can be summarized in the following table:

| Parameter | Application Value (mg/L) | Criterion Value (mg/L) | Total Recoverable/Dissolved |
|---|---|---|---|
| Aluminum (Al) | 0.1 | 0.75 | Total Recoverable |
| Iron (Fe) | 0.05 | 1.5 | 30-day average; Total |
| Manganese (Mn) | 0.02 | 1.00 | Total Recoverable |
| pH | 6.8-8.0 | 6.0-9.0 | N/A |

When the applicant's effluent sampling results are compared with the water quality criteria that's assigned for the Chartiers Creek watershed (see page 12 of the TMDL document), the effluent concentrations for the TMDL parameters do not exceed the water quality criteria. Additionally, natural attenuation of PCB from sediments is expected to achieve the PCB TMDL goals. This sanitary sewage discharge is not expected to contribute to the stream Metals or PCB impairments. Annual monitoring requirements for Total Iron, Total Manganese, and Total Aluminum will be carried over and imposed for this renewal permit.

**TN and TP Monitoring**

Per SOP (No. BCW-PMT-033, *Establishing Effluent Limitations for Individual Sewage Permits, ver 2.0*):

- Nutrient monitoring is required, at a minimum, to establish the nutrient load from the wastewater treatment facility and the impacts that load may have on the quality of the receiving stream(s). Sewage discharges with design flows > 2,000 gpd require monitoring, at a minimum, for Total Nitrogen and Total Phosphorus in new and reissued permits.

The receiving stream (UNT of Chartiers Creek) is not impaired for nutrients (per PA eMAP and the reviewed eDMRs), therefore; advanced treatment requirements for TN, and TP will not be imposed. Also, the newly proposed more stringent Ammonia limits will help in lowering Total Nitrogen.

Annual monitoring is recommended.

## Disinfection

Total Residual Chlorine (TRC) AML limit of 0.15 mg/L and IMAX of 0.4 mg/L were calculated based on the DEP preset values entered in the Department Calculation Sheet (Appendix C) for chlorine stream and discharge demands. Due to anti-backsliding rules stated above; a limit of 0.1 mg/L and IMAX of 0.3 mg/L will be carried over from the previous permit for this renewal.

## *E. Coli*

Pursuant to 25 Pa. code § 92a.61(b) annual monitoring for *E. Coli* will be imposed at Outfall 001 to determine if *E. Coli* will be a pollutant of concern, which is consistent with DEP SOP No. BCW-PMT-033 revised February 5, 2024.

## Monitoring Frequency Considerations

The previous permit writer agreed with the facility manager to set the monitoring frequency for pH, TRC, and Dissolved Oxygen (DO) on a daily basis and moving from the current frequency of 3/weekday after the facility will start a project to upgrade their sampler, as stated in the previous factsheet dated February 26, 2019. This permit writer sent an email to authority to update DEP on this matter, the Authority responded that "We are requesting a reduction in field parameter (pH, Dissolved Oxygen, and Total Residual Chlorine) frequencies on the new permit. The facility is requesting three day per week field readings to coincide with their contract with the licensed wastewater operator. Also, the Authority mentioned in their response that this facility will be decommissioned once a public sewage line will run to the Elementary School. Currently there is no definite timeline as to when the facility will be connected to public sewer. Since the facility is generally in compliance with no open violation, the Department is allowing this exception during this renewed permit term. The monitoring frequency may be revised to be more stringent during the next permit renewal.

The monitoring frequencies justified above are consistent with current policy and Table 6-3 of DEP's Technical Guidance for the Development and Specification of 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 technology, water quality and BPJ. Instantaneous Maximum (IMAX) limits are determined using multipliers of 2 (conventional pollutants) or 2.5 (toxic pollutants). Sample frequencies and types are derived from the "NPDES Permit Writer's Manual" (386-0400-001), SOPs and/or BPJ.

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

| Parameter | Effluent Limitations | | | | | | Monitoring Requirements | |
|---|---|---|---|---|---|---|---|---|
| | Mass Units (lbs/day) (1) | | Concentrations (mg/L) | | | | Minimum (2) Measurement Frequency | Required Sample Type |
| | Average Monthly | Average Weekly | Minimum | Average Monthly | Maximum | Instant. Maximum | | |
| Flow (MGD) | 0.0045 | XXX | XXX | XXX | XXX | XXX | 2/month | Measured |
| pH (S.U.) | XXX | XXX | 6.0 Inst Min | XXX | XXX | 9.0 | 3/week | Grab |
| DO | XXX | XXX | 4.0 Inst Min | XXX | XXX | XXX | 3/week | Grab |
| TRC | XXX | XXX | XXX | 0.1 | XXX | 0.3 | 3/week | Grab |
| CBOD5 | XXX | XXX | XXX | 10.0 | XXX | 20.0 | 2/month | Grab |
| TSS | XXX | XXX | XXX | 25.0 | XXX | 50.0 | 2/month | Grab |
| 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 |
| Total Nitrogen | XXX | XXX | XXX | Report Daily Max | XXX | XXX | 1/year | Grab |
| Ammonia-Nitrogen Nov 1 - Apr 30 | XXX | XXX | XXX | 8.8 | XXX | 17.6 | 2/month | Grab |
| Ammonia-Nitrogen May 1 - Oct 31 | XXX | XXX | XXX | 3.0 | XXX | 6.0 | 2/month | Grab |
| *E. Coli* (No./100 ml) | XXX | XXX | XXX | XXX | XXX | Report Daily Max | 1/year | Grab |
| Total Phosphorus | XXX | XXX | XXX | Report Daily Max | XXX | XXX | 1/year | Grab |
| Total Aluminum | XXX | XXX | XXX | Report Daily Max | XXX | XXX | 1/year | Grab |

**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 | Average Weekly | Minimum | Average Monthly | Maximum | Instant. Maximum | | |
| Total Iron | XXX | XXX | XXX | Report Daily Max | XXX | XXX | 1/year | Grab |
| Total Manganese | XXX | XXX | XXX | Report Daily Max | XXX | XXX | 1/year | Grab |

Compliance Sampling Location: Outfall 001.

Other Comments: None.

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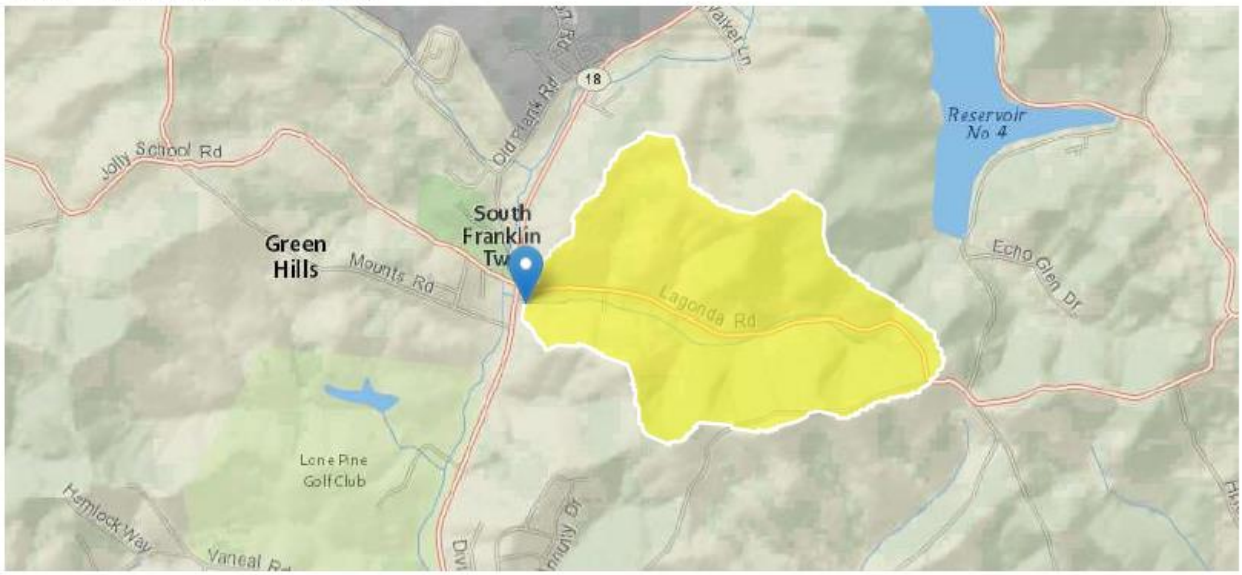
# ATTACHMENT A:
# USGS StreamStats

## StreamStats Report

**Region ID:** PA
**Workspace ID:** PA20231229161332587000
**Clicked Point (Latitude, Longitude):** 40.12077, -80.28883
**Time:** 2023-12-29 11:13:53 -0500




Collapse All

### Basin Characteristics

| Parameter Code | Parameter Description | Value | Unit |
|---|---|---|---|
| DRNAREA | Area that drains to a point on a stream | 0.76 | square miles |
| ELEV | Mean Basin Elevation | 1231 | feet |

### Low-Flow Statistics

#### Low-Flow Statistics Parameters [Low Flow Region 4]

| Parameter Code | Parameter Name | Value | Units | Min Limit | Max Limit |
|---|---|---|---|---|---|
| DRNAREA | Drainage Area | 0.76 | square miles | 2.26 | 1400 |
| ELEV | Mean Basin Elevation | 1231 | feet | 1050 | 2580 |

#### Low-Flow Statistics Disclaimers [Low Flow Region 4]

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 4]

| Statistic | Value | Unit |
|---|---|---|
| 7 Day 2 Year Low Flow | 0.021 | ft^3/s |
| 30 Day 2 Year Low Flow | 0.0411 | ft^3/s |
| 7 Day 10 Year Low Flow | 0.00594 | ft^3/s |
| 30 Day 10 Year Low Flow | 0.013 | ft^3/s |
| 90 Day 10 Year Low Flow | 0.0271 | 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. (http://pubs.usgs.gov/sir/2006/5130/)**



Application Version: 4.19.2
StreamStats Services Version: 1.2.22
NSS Services Version: 2.3.2

# ATTACHMENT B:
# WQM7.0 Model Results (Summer)

## Input Data WQM 7.0

| SWP Basin | Stream Code | Stream Name | RMI | Elevation (ft) | Drainage Area (sq mi) | Slope (ft/ft) | PWS Withdrawal (mgd) | Apply FC |
|---|---|---|---|---|---|---|---|---|
| 20F | 37157 | Trib 37157 to Chartiers Creek | **0.070** | 1231.00 | 0.76 | 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 | 0.008 | 0.01 | 0.00 | 0.000 | 0.000 | 10.0 | 0.00 | 0.00 | 25.00 | 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 |
|---|---|---|---|---|---|---|---|
| Joe Wak Elm STP | PA0096121 | 0.0045 | 0.0045 | 0.0045 | 0.000 | 20.00 | 7.00 |

### Parameter Data

| Parameter Name | Disc Conc (mg/L) | Trib Conc (mg/L) | Stream Conc (mg/L) | Fate Coef (1/days) |
|---|---|---|---|---|
| CBOD5 | 25.00 | 2.00 | 0.00 | 1.50 |
| Dissolved Oxygen | 4.00 | 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 |
|---|---|---|---|---|---|---|---|---|
| 20F | 37157 | Trib 37157 to Chartiers Creek | **0.000** | 1229.00 | 0.77 | 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 | 0.008 | 0.01 | 0.00 | 0.000 | 0.000 | 10.0 | 0.00 | 0.00 | 25.00 | 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 |
|---|---|---|---|---|---|---|---|
| Joe Wak Elm STP | PA0096121 | 0.0045 | 0.0045 | 0.0045 | 0.000 | 20.00 | 7.00 |

### Parameter Data

| Parameter Name | Disc Conc (mg/L) | Trib Conc (mg/L) | Stream Conc (mg/L) | Fate Coef (1/days) |
|---|---|---|---|---|
| CBOD5 | 25.00 | 2.00 | 0.00 | 1.50 |
| Dissolved Oxygen | 4.00 | 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 |
|---|---|---|
| 20F | 37157 | Trib 37157 to Chartiers Creek |

| RMI | Stream Flow (cfs) | PWS With (cfs) | Net Stream Flow (cfs) | Disc Analysis Flow (cfs) | Reach Slope (ft/ft) | Depth (ft) | Width (ft) | W/D Ratio | Velocity (fps) | Reach Trav Time (days) | Analysis Temp (°C) | Analysis pH |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| **Q7-10 Flow** | | | | | | | | | | | | |
| 0.070 | 0.01 | 0.00 | 0.01 | .007 | 0.00541 | .256 | 2.56 | 10 | 0.02 | 0.218 | 22.30 | 7.00 |
| **Q1-10 Flow** | | | | | | | | | | | | |
| 0.070 | 0.00 | 0.00 | 0.00 | .007 | 0.00541 | NA | NA | NA | 0.02 | 0.241 | 21.77 | 7.00 |
| **Q30-10 Flow** | | | | | | | | | | | | |
| 0.070 | 0.01 | 0.00 | 0.01 | .007 | 0.00541 | NA | NA | NA | 0.02 | 0.200 | 22.69 | 7.00 |

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## 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 | | |

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# WQM 7.0 D.O.Simulation

| SWP Basin | Stream Code | Stream Name |
|---|---|---|
| 20F | 37157 | Trib 37157 to Chartiers Creek |

| RMI | Total Discharge Flow (mgd) | Analysis Temperature (°C) | Analysis pH |
|---|---|---|---|
| 0.070 | 0.004 | 22.302 | 7.000 |
| **Reach Width (ft)** | **Reach Depth (ft)** | **Reach WDRatio** | **Reach Velocity (fps)** |
| 2.562 | 0.256 | 10.000 | 0.020 |
| **Reach CBOD5 (mg/L)** | **Reach Kc (1/days)** | **Reach NH3-N (mg/L)** | **Reach Kn (1/days)** |
| 14.41 | 1.386 | 1.84 | 0.836 |
| **Reach DO (mg/L)** | **Reach Kr (1/days)** | **Kr Equation** | **Reach DO Goal (mg/L)** |
| 5.954 | 20.458 | Owens | 5 |
| **Reach Travel Time (days)** | | | |
| 0.218 | | | |

**Subreach Results**

| TravTime (days) | CBOD5 (mg/L) | NH3-N (mg/L) | D.O. (mg/L) |
|---|---|---|---|
| 0.022 | 13.94 | 1.81 | 6.27 |
| 0.044 | 13.48 | 1.78 | 6.50 |
| 0.065 | 13.03 | 1.74 | 6.66 |
| 0.087 | 12.60 | 1.71 | 6.79 |
| 0.109 | 12.19 | 1.68 | 6.89 |
| 0.131 | 11.78 | 1.65 | 6.97 |
| 0.152 | 11.40 | 1.62 | 7.04 |
| 0.174 | 11.02 | 1.59 | 7.10 |
| 0.196 | 10.66 | 1.56 | 7.16 |
| 0.218 | 10.31 | 1.54 | 7.22 |

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# WQM 7.0 Wasteload Allocations

| SWP Basin | Stream Code | Stream Name |
|---|---|---|
| 20F | 37157 | Trib 37157 to Chartiers 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 |
|---|---|---|---|---|---|---|---|
| 0.070 | Joe Wak Elm ST | 8.51 | 13.16 | 8.51 | 13.16 | 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 |
|---|---|---|---|---|---|---|---|
| 0.070 | Joe Wak Elm ST | 1.58 | 3.41 | 1.58 | 3.41 | 0 | 0 |

## Dissolved Oxygen Allocations

| RMI | Discharge Name | CBOD5 | | NH3-N | | Dissolved Oxygen | | Critical Reach | Percent Reduction |
|---|---|---|---|---|---|---|---|---|---|
| | | Baseline (mg/L) | Multiple (mg/L) | Baseline (mg/L) | Multiple (mg/L) | Baseline (mg/L) | Multiple (mg/L) | | |
| 0.07 | Joe Wak Elm STP | 25 | 25 | 3.41 | 3.41 | 4 | 4 | 0 | 0 |

## WQM 7.0 Effluent Limits

| SWP Basin | Stream Code | Stream Name |
|---|---|---|
| 20F | 37157 | Trib 37157 to Chartiers Creek |

| RMI | Name | Permit Number | Disc Flow (mgd) | Parameter | Effl. Limit 30-day Ave. (mg/L) | Effl. Limit Maximum (mg/L) | Effl. Limit Minimum (mg/L) |
|---|---|---|---|---|---|---|---|
| 0.070 | Joe Wak Elm STP | PA0096121 | 0.004 | CBOD5 | 25 | | |
| | | | | NH3-N | 3.41 | 6.82 | |
| | | | | Dissolved Oxygen | | | 4 |

# ATTACHMENT B:
# WQM7.0 Model Results (Winter)

## Input Data WQM 7.0

| SWP Basin | Stream Code | Stream Name | RMI | Elevation (ft) | Drainage Area (sq mi) | Slope (ft/ft) | PWS Withdrawal (mgd) | Apply FC |
|---|---|---|---|---|---|---|---|---|
| 20F | 37157 | Trib 37157 to Chartiers Creek | **0.070** | 1231.00 | 0.76 | 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 | 0.016 | 0.01 | 0.00 | 0.000 | 0.000 | 10.0 | 0.00 | 0.00 | 5.00 | 7.00 | 0.00 | 0.00 |
| Q1-10 | | 0.00 | 0.00 | 0.000 | 0.000 | | | | | | | |
| Q30-10 | | 0.00 | 0.00 | 0.000 | 0.000 | | | | | | | |

### Discharge Data

| Name | Permit Number | Existing Disc Flow (mgd) | Permitted Disc Flow (mgd) | Design Disc Flow (mgd) | Reserve Factor | Disc Temp (°C) | Disc pH |
|---|---|---|---|---|---|---|---|
| Joe Wak Elm STP | PA0096121 | 0.0045 | 0.0045 | 0.0045 | 0.000 | 15.00 | 7.00 |

### Parameter Data

| Parameter Name | Disc Conc (mg/L) | Trib Conc (mg/L) | Stream Conc (mg/L) | Fate Coef (1/days) |
|---|---|---|---|---|
| CBOD5 | 25.00 | 2.00 | 0.00 | 1.50 |
| Dissolved Oxygen | 4.00 | 12.51 | 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 |
|---|---|---|---|---|---|---|---|---|
| 20F | 37157 | Trib 37157 to Chartiers Creek | **0.000** | 1229.00 | 0.77 | 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 | 0.016 | 0.01 | 0.00 | 0.000 | 0.000 | 10.0 | 0.00 | 0.00 | 5.00 | 7.00 | 0.00 | 0.00 |
| Q1-10 | | 0.00 | 0.00 | 0.000 | 0.000 | | | | | | | |
| Q30-10 | | 0.00 | 0.00 | 0.000 | 0.000 | | | | | | | |

### Discharge Data

| Name | Permit Number | Existing Disc Flow (mgd) | Permitted Disc Flow (mgd) | Design Disc Flow (mgd) | Reserve Factor | Disc Temp (°C) | Disc pH |
|---|---|---|---|---|---|---|---|
| Joe Wak Elm STP | PA0096121 | 0.0045 | 0.0045 | 0.0045 | 0.000 | 15.00 | 7.00 |

### Parameter Data

| Parameter Name | Disc Conc (mg/L) | Trib Conc (mg/L) | Stream Conc (mg/L) | Fate Coef (1/days) |
|---|---|---|---|---|
| CBOD5 | 25.00 | 2.00 | 0.00 | 1.50 |
| Dissolved Oxygen | 4.00 | 12.51 | 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 |
|---|---|---|
| 20F | 37157 | Trib 37157 to Chartiers Creek |

| RMI | Stream Flow (cfs) | PWS With (cfs) | Net Stream Flow (cfs) | Disc Analysis Flow (cfs) | Reach Slope (ft/ft) | Depth (ft) | Width (ft) | W/D Ratio | Velocity (fps) | Reach Trav Time (days) | Analysis Temp (°C) | Analysis pH |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| **Q7-10 Flow** | | | | | | | | | | | | |
| 0.070 | 0.01 | 0.00 | 0.01 | .007 | 0.00541 | .256 | 2.56 | 10 | 0.02 | 0.218 | 10.40 | 7.00 |
| **Q1-10 Flow** | | | | | | | | | | | | |
| 0.070 | 0.00 | 0.00 | 0.00 | .007 | 0.00541 | NA | NA | NA | 0.02 | 0.241 | 11.47 | 7.00 |
| **Q30-10 Flow** | | | | | | | | | | | | |
| 0.070 | 0.01 | 0.00 | 0.01 | .007 | 0.00541 | NA | NA | NA | 0.02 | 0.200 | 9.63 | 7.00 |

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## 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 | | |

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# WQM 7.0 D.O.Simulation

| SWP Basin | Stream Code | Stream Name |
|---|---|---|
| 20F | 37157 | Trib 37157 to Chartiers Creek |

| RMI | Total Discharge Flow (mgd) | Analysis Temperature (°C) | Analysis pH |
|---|---|---|---|
| 0.070 | 0.004 | 10.396 | 7.000 |
| **Reach Width (ft)** | **Reach Depth (ft)** | **Reach WDRatio** | **Reach Velocity (fps)** |
| 2.562 | 0.256 | 10.000 | 0.020 |
| **Reach CBOD5 (mg/L)** | **Reach Kc (1/days)** | **Reach NH3-N (mg/L)** | **Reach Kn (1/days)** |
| 14.41 | 1.394 | 4.76 | 0.334 |
| **Reach DO (mg/L)** | **Reach Kr (1/days)** | **Kr Equation** | **Reach DO Goal (mg/L)** |
| 7.918 | 15.425 | Owens | 5 |
| **Reach Travel Time (days)** | | | |
| 0.218 | | | |

**Subreach Results**

| TravTime (days) | CBOD5 (mg/L) | NH3-N (mg/L) | D.O. (mg/L) |
|---|---|---|---|
| 0.022 | 14.13 | 4.72 | 8.35 |
| 0.044 | 13.86 | 4.69 | 8.67 |
| 0.065 | 13.59 | 4.65 | 8.91 |
| 0.087 | 13.33 | 4.62 | 9.09 |
| 0.109 | 13.07 | 4.59 | 9.22 |
| 0.131 | 12.82 | 4.55 | 9.32 |
| 0.152 | 12.57 | 4.52 | 9.40 |
| 0.174 | 12.33 | 4.49 | 9.47 |
| 0.196 | 12.09 | 4.46 | 9.52 |
| 0.218 | 11.85 | 4.42 | 9.57 |

# WQM 7.0 Wasteload Allocations

| SWP Basin | Stream Code | Stream Name |
|---|---|---|
| 20F | 37157 | Trib 37157 to Chartiers 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 |
|---|---|---|---|---|---|---|---|
| 0.070 | Joe Wak Elm ST | 18.36 | 28.38 | 18.36 | 28.38 | 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 |
|---|---|---|---|---|---|---|---|
| 0.070 | Joe Wak Elm ST | 4.08 | 8.82 | 4.08 | 8.82 | 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) | | |
| 0.07 | Joe Wak Elm STP | 25 | 25 | 8.82 | 8.82 | 4 | 4 | 0 | 0 |

## WQM 7.0 Effluent Limits

| SWP Basin | Stream Code | Stream Name |
|---|---|---|
| 20F | 37157 | Trib 37157 to Chartiers Creek |

| RMI | Name | Permit Number | Disc Flow (mgd) | Parameter | Effl. Limit 30-day Ave. (mg/L) | Effl. Limit Maximum (mg/L) | Effl. Limit Minimum (mg/L) |
|---|---|---|---|---|---|---|---|
| 0.070 | Joe Wak Elm STP | PA0096121 | 0.004 | CBOD5 | 25 | | |
| | | | | NH3-N | 8.82 | 17.64 | |
| | | | | Dissolved Oxygen | | | 4 |

# ATTACHMENT C:
# DEP TRC Calculation Sheet

## TRC EVALUATION

Input appropriate values in A3:A9 and D3:D9

| | | | |
|---|---|---|---|
| 0.00594 | = Q stream (cfs) | 0.5 | = CV Daily |
| 0.0045 | = Q discharge (MGD) | 0.5 | = CV Hourly |
| 12 | = no. samples | 1 | = AFC_Partial Mix Factor |
| 0.3 | = Chlorine Demand of Stream | 1 | = CFC_Partial Mix Factor |
| 0 | = Chlorine Demand of Discharge | 15 | = AFC_Criteria Compliance Time (min) |
| 0.5 | = BAT/BPJ Value | 720 | = CFC_Criteria Compliance Time (min) |
| 0 | = % Factor of Safety (FOS) | | =Decay Coefficient (K) |

| Source | Reference | AFC Calculations | Reference | CFC Calculations |
|---|---|---|---|---|
| TRC | 1.3.2.iii | WLA afc = 0.291 | 1.3.2.iii | WLA cfc = 0.276 |
| PENTOXSD TRG | 5.1a | LTAMULT afc = 0.373 | 5.1c | LTAMULT cfc = 0.581 |
| PENTOXSD TRG | 5.1b | LTA_afc= 0.109 | 5.1d | LTA_cfc = 0.161 |

| Source | | Effluent Limit Calculations | |
|---|---|---|---|
| PENTOXSD TRG | 5.1f | AML MULT = 1.382 | |
| PENTOXSD TRG | 5.1g | AVG MON LIMIT (mg/l) = 0.150 | AFC |
| | | INST MAX LIMIT (mg/l) = 0.437 | |

| | |
|---|---|
| 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)** |