pennsylvania
DEPARTMENT OF ENVIRONMENTAL PROTECTION

**Southcentral Regional Office**
**CLEAN WATER PROGRAM**

| | | | |
|---|---|---|---|
| Application Type | **Renewal** | Application No. | **PA0085871** |
| Facility Type | **Industrial** | APS ID | **110** |
| Major / Minor | **Minor** | Authorization ID | **1285478** |

# NPDES PERMIT FACT SHEET INDIVIDUAL INDUSTRIAL WASTE (IW) AND IW STORMWATER

## Applicant and Facility Information

| | | | |
|---|---|---|---|
| Applicant Name | **Mount Joy Borough Authority** | Facility Name | **Mt Joy Borough Water System** |
| Applicant Address | PO Box 25 | Facility Address | 1314 Carmany Road |
| | Mount Joy, PA 17552-0025 | | Mount Joy, PA 17552-9781 |
| Applicant Contact | Joseph Ardini | Facility Contact | Zach Dennis |
| Applicant Phone | (717) 653-5938 | Facility Phone | (717) 653-8534 |
| Client ID | 251531 | Site ID | 253425 |
| SIC Code | 4941 | Municipality | East Donegal Township |
| SIC Description | Trans. & Utilities - Water Supply | County | Lancaster |
| Date Application Received | August 9, 2019 | EPA Waived? | Yes |
| Date Application Accepted | August 28, 2019 | If No, Reason | |

Purpose of Application: NPDES permit renewal for discharge of treated industrial wastewater

## Summary of Review

### 1.0 General Discussion

This factsheet supports the renewal of an existing NPDES permit for a discharge of treated industrial wastewater from Mount Joy Borough(Borough) Authority's water treatment plant. The facility produces potable water by water filtration, water softening, and denitrification. Backwash from the filter is mostly recycled, with the remaining filtrate going to a final holding tank where it is pumped along with the nitrate removal backwash (anion exchange) to the Mount Joy Borough sewer system. The water softener backwash (cation exchange) is discharged to Unnamed Tributary to Donegal Creek which is classified for Cold Water Fishes(CWF) and Migratory Fishes (MF)

The previous factsheet indicated that in the past, both the cation exchange and anion exchange backwashes were sent to the Mount Joy Borough sewer system, but the combination of the cation and anion backwashes resulted in the formation of $CaCO_3$ deposition which began clogging the holding tank, pump and force main. It was decided to separate the anion and cation backwashes to address the problem. A wastewater treatment plant was designed to treat approximately 0.04 MGD of the softener backwash and discharge to the stream. The Borough plan to design a separate holding tank and pump for the softener to pump it to the sewers at a different time than the anion backwash if needed. The equalization tank needed for the stream discharge was designed with an orifice plate to control the discharge. The tank is located to serve as the future holding tank for the softener backwash when it will be necessary to pump to the sewers. The EQ tank was installed in 1998 along with the necessary piping for pumping.

In addition to the softener discharge, the filter backwash from the sand filtration unit has an occasional overflow of up to approximately 90,000GPD from the settling tank during times of heavy rainfall. Heavy rainfall causes higher turbidity in the

| Approve | Deny | Signatures | Date |
|---|---|---|---|
| X | | *J. Pascal Kwedza*<br>J. Pascal Kwedza, P.E. / Environmental Engineer | March 22, 2021 |
| X | | *Maria D. Bebenek for Daniel W. Martin*<br>Daniel W. Martin, P.E. / Environmental Engineer Manager | March 30, 2021 |
| X | | *Maria D. Bebenek*<br>Maria D. Bebenek, P.E./ Program Manager | March 30, 2021 |

**Summary of Review**

Borough's wells which increases the need for more frequent backwashing of the filter. This in return exceeds the holding capacity of the settling tank and the pump which recycles the water and allows the excess water to flow to the creek.

The facility is not covered by ELG but has technology-based treatment requirements developed by the Department. Storm water runoff from the plant site is also conveyed to the receiving stream. The existing permit was issued on March 17, 2015 with effective date of April 1, 2015 and expiration date of March 31, 2020. The permittee submitted a timely renewal application to the Department and has been operating under the conditions in the existing permit pending permit renewal

A topographic map showing the discharge location and schematic of the water flow at the facility are presented in attachment A and C respectively.

## 1.1 Public Participation

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

## 1.2 Change to the existing permit

An internal monitoring point has been added to monitor for compliance with DEP's water treatment technology-based limits for Aluminum, Total Iron, Total Manganese, pH and Total Suspended Solids anytime the filter backwash is discharged.

## 1.3 Existing Permit Limits:

| DISCHARGE LIMITATIONS | | | | | | | MONITORING REQUIREMENTS | |
|---|---|---|---|---|---|---|---|---|
| | Mass Units | | | Concentrations | | | | |
| Discharge Parameter | Average Monthly (lbs/mo) | Maximum Daily (lbs/day) | Total Annual (lbs/year) | Average Monthly (mg/L) | Maximum Daily (mg/L) | Inst. Maximum (mg/L) | Monitoring Frequency | Sample Type |
| Flow (MGD) | Report | Report | XXX | XXX | XXX | XXX | 1/day | Measured |
| pH (S.U.) | XXX | XXX | XXX | From 6.0 to 9.0 inclusive | | | 1/week | Grab |
| Osmotic Pressure | XXX | XXX | XXX | XXX | 535 | 665 | 2/month | 8-hour comp |

| 1.40Discharge, Receiving Waters and Water Supply Information | | | |
|---|---|---|---|
| Outfall No. | 001/ IMP 101 | Design Flow (MGD) | 0.04 / 0.09 |
| Latitude | 40° 06’ 42.1” | Longitude | 76° 32’ 28.3” |
| Quad Name | Columbia West | Quad Code | 1833 |
| Wastewater Description: | Water softener backwash, filter backwash overflow, and stormwater | | |
| Receiving Waters | Unnamed Tributary to Donegal Creek (CWF, MF) | Stream Code | 07924 |
| NHD Com ID | 57463337 | RMI | 2.37 |
| Drainage Area | 3.79 sq. mi. | Yield (cfs/mi$^2$) | 0.2 |
| $Q_{7-10}$ Flow (cfs) | 0.76 | $Q_{7-10}$ Basis | Gage Data / BPJ |
| Elevation (ft) | 350 | Slope (ft/ft) | |
| Watershed No. | 7-G | Chapter 93 Class. | CWF, MF |
| Existing Use | | Existing Use Qualifier | |
| Exceptions to Use | | Exceptions to Criteria | |
| Assessment Status | Impaired | | |
| Cause(s) of Impairment | Nutrients, Siltation, Organic Enrichment/Low D.O. | | |
| Source(s) of Impairment | Agriculture | | |
| TMDL Status | Final, 04/09/2000 | Name | Donegal Creek Watershed |
| Nearest Downstream Public Water Supply Intake | Wrightsville Water Supply Co. | | |
| PWS Waters | Susquehanna River | Flow at Intake (cfs) | |
| PWS RMI | | Distance from Outfall (mi) | 7.42 |

Changes Since Last Permit Issuance: None

**1.4.1 Public Water Supply:**

The nearest downstream public water supply intake is the Wrightsville Water Supply Co. on Susquehanna River in York County, approximately 7 miles downstream of this discharge. Considering distance and dilution, the discharge is not expected to impact the water supply.

## 2.0 Compliance History

### 2.1 DMR Data for Outfall 001 (from February 1, 2020 to January 31, 2021)

| Parameter | JAN-21 | DEC-20 | NOV-20 | OCT-20 | SEP-20 | AUG-20 | JUL-20 | JUN-20 | MAY-20 | APR-20 | MAR-20 | FEB-20 |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Flow (MGD) Average Monthly | 0.031 | 0.041 | 0.028 | 0.023 | 0.026 | 0.018 | 0.037 | 0.037 | 0.037 | 0.028 | 0.037 | 0.039 |
| Flow (MGD) Daily Maximum | 0.037 | 0.057 | 0.037 | 0.037 | 0.037 | 0.037 | 0.037 | 0.037 | 0.037 | 0.037 | 0.037 | 0.097 |
| pH (S.U.) Minimum | 7.3 | 7.1 | 7.1 | 7.2 | 7.2 | 7.1 | 7.2 | 7.1 | 7.2 | 7.2 | 7.2 | 7.2 |
| pH (S.U.) Maximum | 7.4 | 7.5 | 7.3 | 7.4 | 7.3 | 7.4 | 7.2 | 7.3 | 7.3 | 7.3 | 7.5 | 7.3 |
| Osmotic Pressure (mOs/kg) Daily Maximum | 219 | 463 | 279 | 424 | 292 | 270 | 385 | 239 | 324 | 306 | 243 | 262 |

### 2.2 Summary of DMRs:

Discharge Monitoring Reports (DMRs) review for the facility for the last 12 months of operation presented on the table above indicate permit limits have been met consistently. No permit violation noted on DMRs during the period reviewed.

### 2.3 Summary of Inspections:

The facility was inspected a couple of times during the past permit cycle. Inspection reports review for the facility during the period indicate permit limits have been met consistently. The facility has good compliance record.

## 3.0 Development of Effluent Limitations

**Outfall No.** 001 **Design Flow (MGD)** .137
**Latitude** 40º 6' 42.10" **Longitude** -76º 32' 28.30"
**Wastewater Description:** Water Treatment Effluent

### 3.1 Basis for Effluent Limitations

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

### 3.1.1 Technology-Based Limitations

Technology-based (BAT) effluent limits for water treatment plant wastewater discharges are presented in the Department's June 1989 Guidance document entitled, "Technology Based Controls for Discharges from Water Treatment Plants" as follows:

| Parameter | Monthly Avg mg/l | Daily Max. mg/l |
|---|---|---|
| Total Suspended Solids | 30 | 60 |
| Aluminum | 4 | 8 |
| Iron | 2 | 4 |
| TRC* | 0.5 | 1 |
| Manganese | 1 | 2 |
| pH | 6 - 9 S.U at all times | |

*TRC is not applicable to this discharge because Chlorine is not utilized at the facility.

### 3.2 Water Quality-Based Limitations

### 3.2.1 Stream Flow:

The previous protection report stated that Donegal Creek is known to geologists for its springs and high groundwater yield. A prior discussion with a Department hydrogeologist confirmed the previous permit writer's opinion that the stream is one of high yield and that the stream is largely composed of springs that cause it to have significantly more stable flows than the average Pennsylvania stream. Based on that information combined with gage data from Octoraro Creek in southern Lancaster County, it was recommended that a low flow yield of 0.2 cfs/mi$^2$ be used for this site. This permit will continue to utilize this recommendation. The drainage area taken from the previous factsheet is 3.79 mi$^2$ · The $Q_{7-10}$ at the discharge is calculated as follows:

$$Q_{7-10} = 0.2 \text{ cfs/mi}^2 \times 3.79 \text{ mi}^2 = 0.76 \text{ cfs}$$

**3.2.2** The **following input data were used for Toxic Management Spreadsheet (TMS) Analysis:**

- Discharge pH = 7.15 (DMR median July – Sept.)
- Stream pH = 7.0 (Default)
- Discharge Hardness = 277.7 mg/l (Application)
- Stream Hardness = 166 mg/l (Default)

### 3.2.3 Filter Backwash Overflow:

The previous factsheet indicated overflow of filter backwash water is infrequent, only occurs during periods of heavy rainfall, which also coincides with high creek flows. Samples of the overflow taken in 1996 show that the discharge is relatively clean with no elevated levels of metals, and TSS is less than 10 mg/L. It is recommended during the initial permit that no additional

sampling requirements for the overflow water be imposed since no significant impact to the stream was expected. Current data does not support that recommendation anymore, therefore that recommendation will be discontinued, and the facility will be required to comply with the technology limits presented in section 4.1.1 or water quality-based limits if needed at an internal monitoring point or at outfall 001 anytime there is a filter backwash overflow discharge.

### 3.2.4 Toxics

A reasonable potential (RP) was done for pollutant Groups 1 and 2 submitted with the application. All pollutants that were presented in the application sampling data were entered into the Toxics Management Spreadsheet(TMS) which combines logic in the existing Toxics Screening Analysis Spreadsheet and PENTOXSD Model to calculate WQBELs. WQBELs recommended by the TMS are presented in attachment B. The results of the TMS indicate that in exception of Total Aluminum and Total Cadmium, the discharge levels of all other pollutants are well below DEP's target quantitation limits and the calculated WQBELs therefore, no monitoring or limitation was recommended. Monitoring was recommended for Total Aluminum and Total Cadmium. Monitoring of Total Cadmium will be required in the permit in addition to the technology-based limits for water treatment plant discharges presented in section 4.1.1. Monitoring of these pollutants will be conducted at an internal motoring point prior to outfall 001 or at outfall 001 anytime there is a filter backwash overflow discharge. TRC is not application since chlorine is not used at the site. Mass loads will be reported following permit writer's manual No. 362-0400-001 Table 5-2, 10/1/97 Edition. The permittee had an opportunity to re-sample Total Cadmium which was reported as non-detect but used a less sensitive MDL for the analysis. If three 24-hour composite effluent samples for Total Cadmium are collected at least one week apart and analyzed using DEP's target QLs, and the results are non-detect Total Cadmium monitoring will be removed from the final permit.

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

### 3.2.5 Osmotic Pressure:

According to 25 Pa. Code § 93.7(a), the in-stream osmotic pressure criteria is a maximum of 50 mOsm/kg. The previous permit writer assumed a background osmotic pressure of 10 mOsm/kg based on past experience with other streams.

Using a mass balance equation with the below values, the osmotic pressure limit was be calculated as follows:

Osmotic pressure criteria: 50 mOsm/kg
Background osmotic pressure: 10 mOsm/kg
Discharge flow: 0.04 MGD * 1.547 cfs/MGD = 0.062 cfs
Stream flow: 0.76 cfs

$Q_{stream}$ (10 mOsm/kg) + $Q_{discharge}$ (Max. Daily Limit) = $Q_{total}$ (50 mOsm/kg)

Max. Daily Limit = [$Q_{total}$ (50 mOsm/kg) - $Q_{stream}$ (10 mOsm/kg)] / $Q_{discharge}$
Max. Daily Limit = [(0.76 cfs + 0.062 cfs)(50 mOsm/kg) – (0.76 cfs)(10 mOsm/kg)] / 0.062 cfs
Max. Daily Limit = 540 mOsm/kg

This limit is slightly less stringent than the existing limit. Per anti-backsliding policy, the existing maximum daily limit of 535 mOsm/kg will remain in the permit. The permittee has been consistently achieving concentrations well below this limit.

### 3.2.6 Chesapeake Bay Strategy:

In 2003, EPA established state-wide cap loads for Total Nitrogen and Total Phosphorus for Pennsylvania that are needed to ensure compliance with new water quality standards enacted to restore the water quality of the Chesapeake Bay. DEP released Pennsylvania's Chesapeake Bay Tributary Strategy (CBTS) in January of 2005 to guide Pennsylvania's efforts to meet those cap loads and revised the Strategy in 2006-2007 following a stakeholder process. Industrial discharges have been prioritized by Central Office based on their delivered TN and TP loadings to the Bay. Significant industrial wastewater dischargers are facilities that discharge more than 75 lbs/day of TN or 25 lbs/day of TP on an average annual basis and the rest are classified as non-significant dischargers. DEP developed Chesapeake Bay IW monitoring plan for all industrial facilities that discharge to the Chesapeake Bay. This facility is classified as a non-significant discharger with little or no potential to introduce nutrients to the receiving stream therefore no monitoring of TP and the TN series (nitrate-nitrite, TKN) is warranted at this time.

## 4.0 Other Requirements

### 4.1 Anti-backsliding

Not applicable to this permit

### 4.2 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.

### 4.3 Class A Wild Trout Fisheries

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

### 4.4 303(d) Listed Streams

This discharge is located on a 303(d) listed stream segment that is impaired for Nutrients, Siltation, and Organic Enrichment/Low D.O. due to agriculture. The Donegal Creek Watershed TMDL was finalized on April 9, 2000 for these impairments. For nutrients, the TMDL states that phosphorus is the limiting factor. Phosphorus is generally held to be the limiting nutrient in a waterbody when the nitrogen/phosphorus ratio exceed 10 to 1, the ratio in Donegal Creek is 37 to1. This discharge is not expected cause any significant impact to the stream as no significant amount of nutrients or organic enrichment is being added to the receiving stream by the Water Treatment Plant. No action is warranted at this time.

### 4.5 Basis for Effluent and Surface Water Monitoring

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

### 4.6 Effluent Monitoring

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

## 5.0 Proposed Effluent Limitations and Monitoring Requirements

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

**Outfall 001, Effective Period: 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 | Daily Maximum | Instant. Maximum | | |
| Flow (MGD) | Report | Report Daily Max | XXX | XXX | XXX | XXX | 1/day | Measured |
| pH (S.U.) | XXX | XXX | 6.0 Inst Min | XXX | XXX | 9.0 | 1/week | Grab |
| Osmotic Pressure (mOs/kg) | XXX | XXX | XXX | XXX | 535 | 665 | 2/month | 8-Hr Composite |

Compliance Sampling Location: Ay Outfall 001

## 5.1 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 101, Effective Period: Permit Effective Date through Permit Expiration Date**.

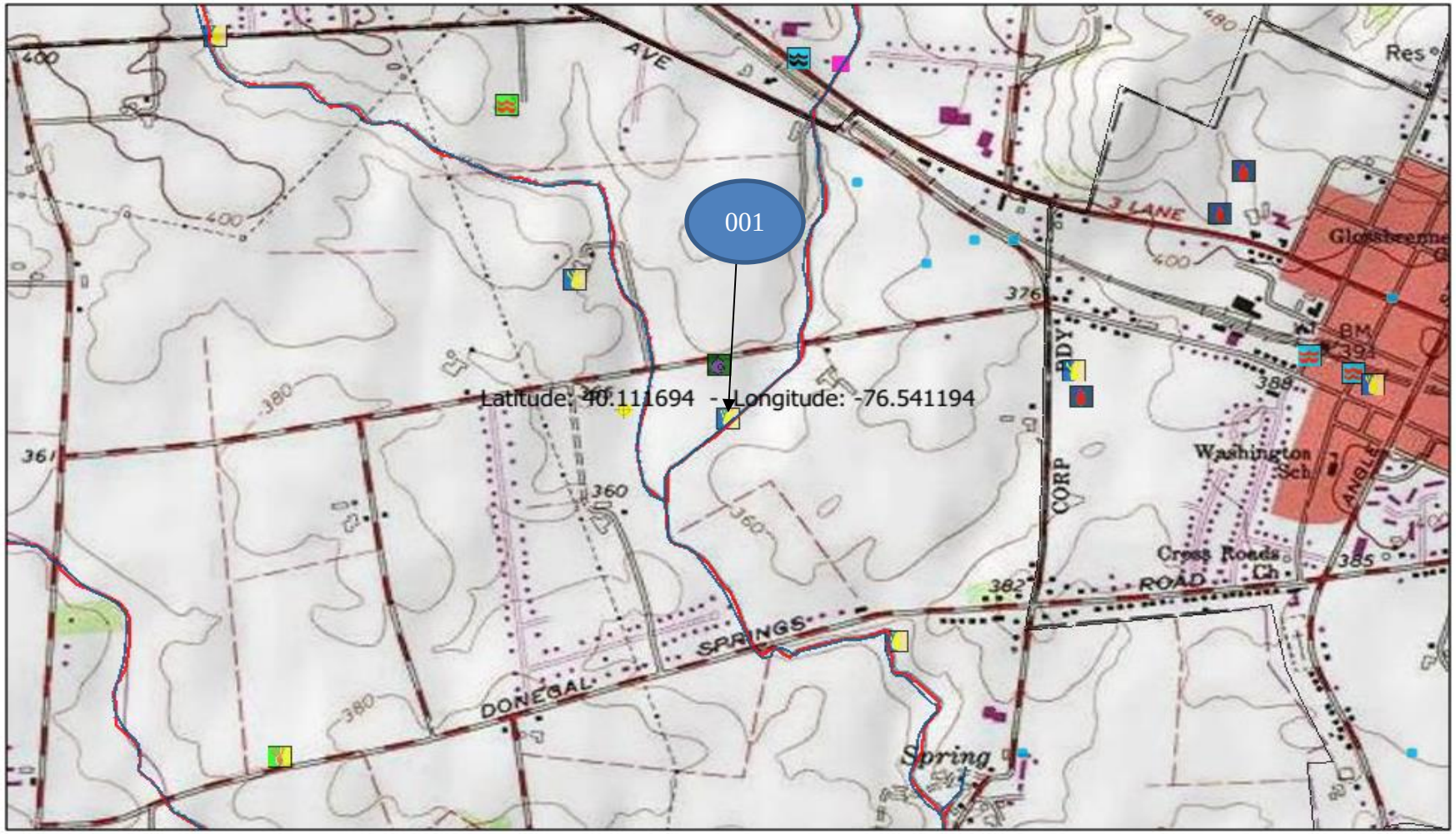
| Parameter | Effluent Limitations | | | | | | Monitoring Requirements | |
|---|---|---|---|---|---|---|---|---|
| | Mass Units (lbs/day) (1) | | Concentrations (mg/L) | | | | Minimum (2) Measurement Frequency | Required Sample Type |
| | Average Monthly | Daily Maximum | Minimum | Average Monthly | Daily Maximum | Instant. Maximum | | |
| Flow (MGD) | Report | Report | XXX | XXX | XXX | XXX | 1/discharge | Measured |
| pH (S.U.) | XXX | XXX | 6.0 Inst Min | XXX | XXX | 9.0 | 1/discharge | Grab |
| TSS | Report | Report | XXX | 30.0 | 60.0 | 75 | 1/discharge | 8-Hr Composite |
| Total Aluminum | Report | Report | XXX | 4.0 | 8.0 | 10 | 1/discharge | 8-Hr Composite |
| Total Iron | Report | Report | XXX | 2.0 | 4.0 | 5 | 1/discharge | 8-Hr Composite |
| Total Manganese | Report | Report | XXX | 1.0 | 2.0 | 2.5 | 1/discharge | 8-Hr Composite |
| Total Cadmium | Report | Report | XXX | Report | Report | XXX | 1/discharge | 8-Hr Composite |

Compliance Sampling Location: Prior to Outfall 001 or at Outfall 001

| 6.0 Tools and References Used to Develop Permit | |
|---|---|
| | |
| ☐ | WQM for Windows Model (see Attachment) |
| ☒ | Toxic Management Spreadsheet (see Attachment B) |
| ☐ | 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. |
| ☒ | Supplement to Phase II Watershed Implementation Plan, Revised 3/6/14. |
| ☒ | SOP – Establishing Effluent Limitations for Individual Industrial Permits, Revised 9/10/13. |

## 7.0 Attachments

### A. Topographical Map



B. **Toxic Management Spreadsheet Results**

pennsylvania
DEPARTMENT OF ENVIRONMENTAL PROTECTION

Toxics Management Spreadsheet
Version 1.3, March 2021

## Discharge Information

Instructions | Discharge | Stream

Facility: **Mt Joy Brorugh Carmany Water Plant** NPDES Permit No.: **PA0085871** Outfall No.: **001**

Evaluation Type: **Major Sewage / Industrial Waste** Wastewater Description: **Softener and filter backwash**

| Discharge Characteristics | | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|
| Design Flow (MGD)* | Hardness (mg/l)* | pH (SU)* | Partial Mix Factors (PMFs) | | | | Complete Mix Times (min) | |
| | | | AFC | CFC | THH | CRL | $Q_{7-10}$ | $Q_h$ |
| 0.09 | 277.7 | 7.15 | | | | | | |

| | | | | | 0 if left blank | | 0.5 if left blank | | 0 if left blank | | | 1 if left blank | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | Discharge Pollutant | Units | Max Discharge Conc | | Trib Conc | Stream Conc | Daily CV | Hourly CV | Stream CV | Fate Coeff | FOS | Criteria Mod | Chem Transl |
| Group 1 | Total Dissolved Solids (PWS) | mg/L | | 363 | | | | | | | | | |
| | Chloride (PWS) | mg/L | | 27.4 | | | | | | | | | |
| | Bromide | mg/L | < | 1 | | | | | | | | | |
| | Sulfate (PWS) | mg/L | | 23.9 | | | | | | | | | |
| | Fluoride (PWS) | mg/L | < | 0.4 | | | | | | | | | |
| Group 2 | Total Aluminum | µg/L | | 1400 | | | | | | | | | |
| | Total Antimony | µg/L | < | 0.4 | | | | | | | | | |
| | Total Arsenic | µg/L | < | 1 | | | | | | | | | |
| | Total Barium | µg/L | | 40 | | | | | | | | | |
| | Total Beryllium | µg/L | < | 0.4 | | | | | | | | | |
| | Total Boron | µg/L | < | 50 | | | | | | | | | |
| | Total Cadmium | µg/L | < | 0.4 | | | | | | | | | |
| | Total Chromium (III) | µg/L | < | 1 | | | | | | | | | |
| | Hexavalent Chromium | µg/L | | 0.51 | | | | | | | | | |
| | Total Cobalt | µg/L | < | 1 | | | | | | | | | |
| | Total Copper | µg/L | < | 2 | | | | | | | | | |
| | Free Cyanide | µg/L | | | | | | | | | | | |
| | Total Cyanide | µg/L | < | 5 | | | | | | | | | |
| | Dissolved Iron | µg/L | | 15 | | | | | | | | | |
| | Total Iron | µg/L | < | 100 | | | | | | | | | |
| | Total Lead | µg/L | < | 1 | | | | | | | | | |
| | Total Manganese | µg/L | < | 10 | | | | | | | | | |
| | Total Mercury | µg/L | < | 0.2 | | | | | | | | | |
| | Total Nickel | µg/L | | 1 | | | | | | | | | |
| | Total Phenols (Phenolics) (PWS) | µg/L | < | 5 | | | | | | | | | |
| | Total Selenium | µg/L | < | 2 | | | | | | | | | |
| | Total Silver | µg/L | < | 1 | | | | | | | | | |
| | Total Thallium | µg/L | < | 0.4 | | | | | | | | | |
| | Total Zinc | µg/L | < | 10 | | | | | | | | | |
| | Total Molybdenum | µg/L | < | 1 | | | | | | | | | |
| | Acrolein | µg/L | < | | | | | | | | | | |
| | Acrylamide | µg/L | < | | | | | | | | | | |
| | Acrylonitrile | µg/L | < | | | | | | | | | | |
| | Benzene | µg/L | < | | | | | | | | | | |
| | Bromoform | µg/L | < | | | | | | | | | | |

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Toxics Management Spreadsheet
Version 1.3, March 2021

# Stream / Surface Water Information

Mt Joy Brorugh Carmany Water Plant, NPDES Permit No. PA0085871, Outfall 001

Instructions | Discharge | Stream

Receiving Surface Water Name: **UNT to Donegal Creek**

No. Reaches to Model: 1

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

| Location | Stream Code* | RMI* | Elevation (ft)* | DA ($mi^2$)* | Slope (ft/ft) | PWS Withdrawal (MGD) | Apply Fish Criteria* |
|---|---|---|---|---|---|---|---|
| Point of Discharge | 007924 | 2.37 | 350 | 3.79 | | | Yes |
| End of Reach 1 | 007924 | 2.19 | 347 | 3.8 | | | Yes |

$Q_{7\text{-}10}$

| Location | RMI | LFY ($cfs/mi^2$)* | Flow (cfs) | | W/D Ratio | Width (ft) | Depth (ft) | Velocity (fps) | Travel Time (days) | Tributary | | Stream | | Analysis | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | | | Stream | Tributary | | | | | | Hardness | pH | Hardness* | pH* | Hardness | pH |
| Point of Discharge | 2.37 | 0.2 | | | | | | | | | | 166 | 7 | | |
| End of Reach 1 | 2.19 | 0.2 | | | | | | | | | | | | | |

$Q_h$

| Location | RMI | LFY ($cfs/mi^2$) | Flow (cfs) | | W/D Ratio | Width (ft) | Depth (ft) | Velocity (fps) | Travel Time (days) | Tributary | | Stream | | Analysis | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | | | Stream | Tributary | | | | | | Hardness | pH | Hardness | pH | Hardness | pH |
| Point of Discharge | 2.37 | | | | | | | | | | | | | | |
| End of Reach 1 | 2.19 | | | | | | | | | | | | | | |

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Version 1.3, March 2021

# Model Results

Mt Joy Brorugh Carmany Water Plant, NPDES Permit No. PA0085871, Outfall 001

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

☐ *Hydrodynamics*

☑ *Wasteload Allocations*

☑ ***AFC*** CCT (min): 7.852 PMF: 1 Analysis Hardness (mg/l): 183.33 Analysis pH: 7.02

| Pollutants | Stream Conc (µg/L) | Stream CV | Trib Conc (µg/L) | Fate Coef | WQC (µg/L) | WQ Obj (µg/L) | WLA (µg/L) | Comments |
|---|---|---|---|---|---|---|---|---|
| Total Dissolved Solids (PWS) | 0 | 0 | | 0 | N/A | N/A | N/A | |
| Chloride (PWS) | 0 | 0 | | 0 | N/A | N/A | N/A | |
| Sulfate (PWS) | 0 | 0 | | 0 | N/A | N/A | N/A | |
| Fluoride (PWS) | 0 | 0 | | 0 | N/A | N/A | N/A | |
| Total Aluminum | 0 | 0 | | 0 | 750 | 750 | 4,833 | |
| Total Antimony | 0 | 0 | | 0 | 1,100 | 1,100 | 7,089 | |
| Total Arsenic | 0 | 0 | | 0 | 340 | 340 | 2,191 | Chem Translator of 1 applied |
| Total Barium | 0 | 0 | | 0 | 21,000 | 21,000 | 135,329 | |
| Total Boron | 0 | 0 | | 0 | 8,100 | 8,100 | 52,198 | |
| Total Cadmium | 0 | 0 | | 0 | 3.629 | 3.95 | 25.5 | Chem Translator of 0.919 applied |
| Total Chromium (III) | 0 | 0 | | 0 | 936.029 | 2,962 | 19,089 | Chem Translator of 0.316 applied |
| Hexavalent Chromium | 0 | 0 | | 0 | 16 | 16.3 | 105 | Chem Translator of 0.982 applied |
| Total Cobalt | 0 | 0 | | 0 | 95 | 95.0 | 612 | |
| Total Copper | 0 | 0 | | 0 | 23.790 | 24.8 | 160 | Chem Translator of 0.96 applied |
| Dissolved Iron | 0 | 0 | | 0 | N/A | N/A | N/A | |
| Total Iron | 0 | 0 | | 0 | N/A | N/A | N/A | |
| Total Lead | 0 | 0 | | 0 | 124.106 | 177 | 1,138 | Chem Translator of 0.703 applied |
| Total Manganese | 0 | 0 | | 0 | N/A | N/A | N/A | |
| Total Mercury | 0 | 0 | | 0 | 1.400 | 1.65 | 10.6 | Chem Translator of 0.85 applied |
| Total Nickel | 0 | 0 | | 0 | 781.928 | 783 | 5,049 | Chem Translator of 0.998 applied |
| Total Phenols (Phenolics) (PWS) | 0 | 0 | | 0 | N/A | N/A | N/A | |
| Total Selenium | 0 | 0 | | 0 | N/A | N/A | N/A | Chem Translator of 0.922 applied |
| Total Silver | 0 | 0 | | 0 | 9.124 | 10.7 | 69.2 | Chem Translator of 0.85 applied |
| Total Thallium | 0 | 0 | | 0 | 65 | 65.0 | 419 | |
| Total Zinc | 0 | 0 | | 0 | 195.839 | 200 | 1,290 | Chem Translator of 0.978 applied |

☑ ***CFC*** CCT (min): 7.852 PMF: 1 Analysis Hardness (mg/l): 183.33 Analysis pH: 7.02

| Pollutants | Stream Conc (µg/L) | Stream CV | Trib Conc (µg/L) | Fate Coef | WQC (µg/L) | WQ Obj (µg/L) | WLA (µg/L) | Comments |
|---|---|---|---|---|---|---|---|---|
| Total Dissolved Solids (PWS) | 0 | 0 | | 0 | N/A | N/A | N/A | |
| Chloride (PWS) | 0 | 0 | | 0 | N/A | N/A | N/A | |
| Sulfate (PWS) | 0 | 0 | | 0 | N/A | N/A | N/A | |
| Fluoride (PWS) | 0 | 0 | | 0 | N/A | N/A | N/A | |
| Total Aluminum | 0 | 0 | | 0 | N/A | N/A | N/A | |
| Total Antimony | 0 | 0 | | 0 | 220 | 220 | 1,418 | |
| Total Arsenic | 0 | 0 | | 0 | 150 | 150 | 967 | Chem Translator of 1 applied |
| Total Barium | 0 | 0 | | 0 | 4,100 | 4,100 | 26,421 | |
| Total Boron | 0 | 0 | | 0 | 1,600 | 1,600 | 10,311 | |
| Total Cadmium | 0 | 0 | | 0 | 0.375 | 0.42 | 2.73 | Chem Translator of 0.884 applied |
| Total Chromium (III) | 0 | 0 | | 0 | 121.758 | 142 | 912 | Chem Translator of 0.86 applied |
| Hexavalent Chromium | 0 | 0 | | 0 | 10 | 10.4 | 67.0 | Chem Translator of 0.962 applied |
| Total Cobalt | 0 | 0 | | 0 | 19 | 19.0 | 122 | |
| Total Copper | 0 | 0 | | 0 | 15.033 | 15.7 | 101 | Chem Translator of 0.96 applied |
| Dissolved Iron | 0 | 0 | | 0 | N/A | N/A | N/A | |
| Total Iron | 0 | 0 | | 0 | 1,500 | 1,500 | 9,666 | WQC = 30 day average; PMF = 1 |
| Total Lead | 0 | 0 | | 0 | 4.836 | 6.88 | 44.4 | Chem Translator of 0.703 applied |
| Total Manganese | 0 | 0 | | 0 | N/A | N/A | N/A | |
| Total Mercury | 0 | 0 | | 0 | 0.770 | 0.91 | 5.84 | Chem Translator of 0.85 applied |
| Total Nickel | 0 | 0 | | 0 | 86.848 | 87.1 | 561 | Chem Translator of 0.997 applied |
| Total Phenols (Phenolics) (PWS) | 0 | 0 | | 0 | N/A | N/A | N/A | |
| Total Selenium | 0 | 0 | | 0 | 4.600 | 4.99 | 32.2 | Chem Translator of 0.922 applied |
| Total Silver | 0 | 0 | | 0 | N/A | N/A | N/A | Chem Translator of 1 applied |
| Total Thallium | 0 | 0 | | 0 | 13 | 13.0 | 83.8 | |
| Total Zinc | 0 | 0 | | 0 | 197.441 | 200 | 1,290 | Chem Translator of 0.986 applied |

☑ ***THH*** CCT (min): 7.852 PMF: 1 Analysis Hardness (mg/l): N/A Analysis pH: N/A

| Pollutants | Stream Conc (µg/L) | Stream CV | Trib Conc (µg/L) | Fate Coef | WQC (µg/L) | WQ Obj (µg/L) | WLA (µg/L) | Comments |
|---|---|---|---|---|---|---|---|---|
| Total Dissolved Solids (PWS) | 0 | 0 | | 0 | 500,000 | 500,000 | N/A | |
| Chloride (PWS) | 0 | 0 | | 0 | 250,000 | 250,000 | N/A | |
| Sulfate (PWS) | 0 | 0 | | 0 | 250,000 | 250,000 | N/A | |
| Fluoride (PWS) | 0 | 0 | | 0 | 2,000 | 2,000 | N/A | |
| Total Aluminum | 0 | 0 | | 0 | N/A | N/A | N/A | |
| Total Antimony | 0 | 0 | | 0 | 5.6 | 5.6 | 36.1 | |
| Total Arsenic | 0 | 0 | | 0 | 10 | 10.0 | 64.4 | |
| Total Barium | 0 | 0 | | 0 | 2,400 | 2,400 | 15,466 | |
| Total Boron | 0 | 0 | | 0 | 3,100 | 3,100 | 19,977 | |
| Total Cadmium | 0 | 0 | | 0 | N/A | N/A | N/A | |
| Total Chromium (III) | 0 | 0 | | 0 | N/A | N/A | N/A | |

| | | | | | | | | |
|---|---|---|---|---|---|---|---|---|
| Hexavalent Chromium | 0 | 0 | | 0 | N/A | N/A | N/A | |
| Total Cobalt | 0 | 0 | | 0 | N/A | N/A | N/A | |
| Total Copper | 0 | 0 | | 0 | N/A | N/A | N/A | |
| Dissolved Iron | 0 | 0 | | 0 | 300 | 300 | 1,933 | |
| Total Iron | 0 | 0 | | 0 | N/A | N/A | N/A | |
| Total Lead | 0 | 0 | | 0 | N/A | N/A | N/A | |
| Total Manganese | 0 | 0 | | 0 | 1,000 | 1,000 | 6,444 | |
| Total Mercury | 0 | 0 | | 0 | 0.050 | 0.05 | 0.32 | |
| Total Nickel | 0 | 0 | | 0 | 610 | 610 | 3,931 | |
| Total Phenols (Phenolics) (PWS) | 0 | 0 | | 0 | 5 | 5.0 | N/A | |
| Total Selenium | 0 | 0 | | 0 | N/A | N/A | N/A | |
| Total Silver | 0 | 0 | | 0 | N/A | N/A | N/A | |
| Total Thallium | 0 | 0 | | 0 | 0.24 | 0.24 | 1.55 | |
| Total Zinc | 0 | 0 | | 0 | N/A | N/A | N/A | |

☑ ***CRL*** CCT (min): 3.004 PMF: 1 Analysis Hardness (mg/l): N/A Analysis pH: N/A

| Pollutants | Stream Conc (µg/L) | Stream CV | Trib Conc (µg/L) | Fate Coef | WQC (µg/L) | WQ Obj (µg/L) | WLA (µg/L) | Comments |
|---|---|---|---|---|---|---|---|---|
| Total Dissolved Solids (PWS) | 0 | 0 | | 0 | N/A | N/A | N/A | |
| Chloride (PWS) | 0 | 0 | | 0 | N/A | N/A | N/A | |
| Sulfate (PWS) | 0 | 0 | | 0 | N/A | N/A | N/A | |
| Fluoride (PWS) | 0 | 0 | | 0 | N/A | N/A | N/A | |
| Total Aluminum | 0 | 0 | | 0 | N/A | N/A | N/A | |
| Total Antimony | 0 | 0 | | 0 | N/A | N/A | N/A | |
| Total Arsenic | 0 | 0 | | 0 | N/A | N/A | N/A | |
| Total Barium | 0 | 0 | | 0 | N/A | N/A | N/A | |
| Total Boron | 0 | 0 | | 0 | N/A | N/A | N/A | |
| Total Cadmium | 0 | 0 | | 0 | N/A | N/A | N/A | |
| Total Chromium (III) | 0 | 0 | | 0 | N/A | N/A | N/A | |
| Hexavalent Chromium | 0 | 0 | | 0 | N/A | N/A | N/A | |
| Total Cobalt | 0 | 0 | | 0 | N/A | N/A | N/A | |
| Total Copper | 0 | 0 | | 0 | N/A | N/A | N/A | |
| Dissolved Iron | 0 | 0 | | 0 | N/A | N/A | N/A | |
| Total Iron | 0 | 0 | | 0 | N/A | N/A | N/A | |
| Total Lead | 0 | 0 | | 0 | N/A | N/A | N/A | |
| Total Manganese | 0 | 0 | | 0 | N/A | N/A | N/A | |
| Total Mercury | 0 | 0 | | 0 | N/A | N/A | N/A | |
| Total Nickel | 0 | 0 | | 0 | N/A | N/A | N/A | |
| Total Phenols (Phenolics) (PWS) | 0 | 0 | | 0 | N/A | N/A | N/A | |
| Total Selenium | 0 | 0 | | 0 | N/A | N/A | N/A | |
| Total Silver | 0 | 0 | | 0 | N/A | N/A | N/A | |
| Total Thallium | 0 | 0 | | 0 | N/A | N/A | N/A | |
| Total Zinc | 0 | 0 | | 0 | N/A | N/A | N/A | |

☑ *Recommended WQBELs & Monitoring Requirements*

**No. Samples/Month:** 4

| | *Mass Limits* | | *Concentration Limits* | | | | | | |
|---|---|---|---|---|---|---|---|---|---|
| Pollutants | AML (lbs/day) | MDL (lbs/day) | AML | MDL | IMAX | Units | Governing WQBEL | WQBEL Basis | Comments |
| Total Aluminum | Report | Report | Report | Report | Report | µg/L | 3,098 | AFC | Discharge Conc > 10% WQBEL (no RP) |
| Total Cadmium | Report | Report | Report | Report | Report | µg/L | 2.73 | CFC | Discharge Conc > 10% WQBEL (no RP) |

☑ *Other Pollutants without Limits or Monitoring*

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

| Pollutants | Governing WQBEL | Units | Comments |
|---|---|---|---|
| Total Dissolved Solids (PWS) | N/A | N/A | PWS Not Applicable |
| Chloride (PWS) | N/A | N/A | PWS Not Applicable |
| Bromide | N/A | N/A | No WQS |
| Sulfate (PWS) | N/A | N/A | PWS Not Applicable |
| Fluoride (PWS) | N/A | N/A | PWS Not Applicable |
| Total Antimony | N/A | N/A | Discharge Conc < TQL |
| Total Arsenic | N/A | N/A | Discharge Conc < TQL |
| Total Barium | 15,466 | µg/L | Discharge Conc ≤ 10% WQBEL |
| Total Beryllium | N/A | N/A | No WQS |
| Total Boron | 10,311 | µg/L | Discharge Conc < TQL |
| Total Chromium (III) | 912 | µg/L | Discharge Conc < TQL |
| Hexavalent Chromium | 67.0 | µg/L | Discharge Conc ≤ 10% WQBEL |
| Total Cobalt | 122 | µg/L | Discharge Conc < TQL |
| Total Copper | 101 | µg/L | Discharge Conc < TQL |
| Total Cyanide | N/A | N/A | No WQS |
| Dissolved Iron | 1,933 | µg/L | Discharge Conc ≤ 10% WQBEL |
| Total Iron | 9,666 | µg/L | Discharge Conc ≤ 10% WQBEL |
| Total Lead | 44.4 | µg/L | Discharge Conc < TQL |
| Total Manganese | 6,444 | µg/L | Discharge Conc ≤ 10% WQBEL |
| Total Mercury | 0.32 | µg/L | Discharge Conc < TQL |
| Total Nickel | 561 | µg/L | Discharge Conc ≤ 10% WQBEL |
| Total Phenols (Phenolics) (PWS) | | µg/L | Discharge Conc < TQL |
| Total Selenium | 32.2 | µg/L | Discharge Conc < TQL |
| Total Silver | 44.3 | µg/L | Discharge Conc ≤ 10% WQBEL |
| Total Thallium | 1.55 | µg/L | Discharge Conc < TQL |
| Total Zinc | 827 | µg/L | Discharge Conc ≤ 10% WQBEL |
| Total Molybdenum | N/A | N/A | No WQS |

**C. Flow Schematic**