pennsylvania
DEPARTMENT OF ENVIRONMENTAL PROTECTION

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

| | | | |
|---|---|---|---|
| Application Type | **Renewal** | Application No. | **PA0255092** |
| Facility Type | **Industrial** | APS ID | **1060444** |
| Major / Minor | **Major** | Authorization ID | **1391160** |

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

## Applicant and Facility Information

| | | | |
|---|---|---|---|
| Applicant Name | **Hill Top Energy Center, LLC** | Facility Name | **Hill Top Energy Center, LLC** |
| Applicant Address | 278 Thomas Road | Facility Address | 278 Thomas Road |
| | Carmichaels, PA 15320-1660 | | Carmichaels, PA 15320-1660 |
| Applicant Contact | James Ryan | Facility Contact | Erin Schmitz |
| Applicant Phone | (518) 428-5929 | Facility Phone | (724) 600-2096 |
| Client ID | 323093 | Site ID | 811291 |
| SIC Code | 4911 | Municipality | Cumberland Township |
| SIC Description | Trans. & Utilities - Electric Services | County | Greene |
| Date Application Received | March 31, 2022 | EPA Waived? | No |
| Date Application Accepted | April 7, 2022 | If No, Reason | Major Power Plant > 500 MW |

Purpose of Application: Renewal of major NPDES permit for the existing discharge of treated industrial wastewater and stormwater from the natural gas-fired combine cycle electric generating station.

## Summary of Review

Background

Hill Top Energy Center (HTEC) submitted an application on March 31, 2022 to renew NPDES permit coverage of their natural gas-fired, combined cycle electric generating station in Cumberland Township of Greene County. The facility operates under SIC Code 4911 (Transportation & Utilities – Electric Services). The current NPDES permit was issued as a new permit on September 22, 2017 and expired on September 30, 2022. Permit amendments were issued on June 27, 2018, November 15, 2019, and January 12, 2022. Water Quality Management (WQM) permit 3018200 was approved on June 27, 2018 for the construction of a sodium bisulfite feed tank, to be used to consume free chlorine residual in cooling tower blowdown, and an oil/water separator (OWS).

The HTEC Plant was originally planned to be constructed in two phases, with each phase operating as a standalone 536 MW Unit. The initial permit application reflected the proposed plan to construct two power generating units at the project location. Only one generating unit (Unit 1) has been constructed thus far and there are no plans to construct the second unit. The facility has requested to maintain Unit 2 Internal Monitoring Points (IMPs) in the NPDES permit, in the event that construction commences.

HTEC began discharging process wastewaters to Outfall 001 in November 2020, prior to the completion and start-up of the facility, and began partial generation operations in late April 2021. Unit 1 IMPs 101, 201, and 301 began reporting operations in September 2021. Sampling and analysis for Group 1-5 parameters and the river water intake was conducted in September 2021.

| Approve | Deny | Signatures | Date |
|---|---|---|---|
| X | | Lauren Nolfi / Environmental Engineering Specialist | March 17, 2025 |
| X | | Michael E. Fifth, P.E. / Environmental Engineer Manager | March 31, 2025 |

**Summary of Review**

Property and Operations

Hill Top Energy Center (HTEC) operates as a 620-megawatt (MW) combined-cycle energy facility with a single gas turbine and a single steam turbine with a cooling tower. The facility is located on a 41.7-acre portion of the historic LTV Steel Nemacolin Coal Mine, purchased from Wellington. The generating unit is fueled by natural gas. Unit 1 uses a closed-cycle cooling system with make-up water withdrawn from and blowdown discharged to the Monongahela River. The river water intake is located upstream of the discharge by 0.27 miles. Locations of the intake structure and wastewater discharge are shown in Attachment A.

Internal wastewater streams including boiler water/ steam blowdowns, clarified water, service water, evaporative cooler blowdown, and reverse osmosis reject water are routed to the HRSG Blowdown Sump (IMP 101) and then recycled to the cooling tower basin for incorporation into the recirculation system. The cooling tower blowdown (IMP 301) flows into the Central Wastewater Collection Sump (CWCS) for periodic sampling, testing and dechlorination, as needed. The CSCS can also be recirculated back into the cooling tower basin or released to the Monongahela River. Sodium bisulfite is added for dechlorination as needed. Smaller volumes of plant containment sumps, plant drains and service waters are directed to an OWS. The OWS outlet (IMP 201) combines with the cooling tower blowdown at the CWCS before discharging continuously to the Monongahela River via Outfall 001. The facility's Site Plan is shown in Attachment B and the facility's Process Flow Diagram is shown in Attachment C.

Discharges from HTEC are regulated under the Steam Electric Power Generating Point Source Category. Applicable ELGs are the new source performance standards (NSPS) published in 40 CFR Part 423. 40 CFR Part 423 for the Steam Electric Power Generating Point Source Category does not include production-based effluent limitations.

Outfalls

The facility has two outfalls, Outfall 001 and Outfall 002, which discharge to the Monongahela River, designated in 25 PA Code Chapter 93 as a Warm Water Fishery (WWF). Outfall 001 discharges wastewater from Unit 1 operations at a design flow of 1.3 MGD and an average discharge flow of 0.46 MGD. Unit 1 wastewater consists of cooling tower blowdown from IMP 301 and low volume wastewater from IMPs 101 and 201. Only one generating unit has been constructed thus far and there are no plans to construct the second unit. The facility has requested to maintain Unit 2 IMPs (IMPs 401, 501, 601) in the NPDES permit, in the event that construction commences. Unit 2 wastewater would consist of cooling tower blowdown from IMP 601 and low volume wastewater from IMPs 401 and 501.

Outfall 002 receives stormwater from approximately a 31.4-acre 18% impervious area consisting of paved access roads. Catch basins direct stormwater from the facility's paved rectangular pad to a retention basin prior to discharging to the Monongahela River. The retention basin also receives any water generated due to the surface mining operation. HTEC's Stormwater Plan is shown in Attachment D. HTEC has not reported any discharges at Outfall 002 since the facility began operations in 2021. The facility has maintained an SPCC/ PPC/ SPR Plan since May 2021.

Permit Amendments

Permit amendment PA0255092 A-1 was issued on June 27, 2018 was issued as a minor amendment to reroute the intermittent discharge from the OWS so that it does not discharge into the cooling tower basin. The amendment resulted in the following changes to the permit:

- Addition of IMP 201 and 301;
- IMP 301 added to the cooling tower blowdown for compliance with ELGs under 40 CFR 423.15(b)(1) & (b)(10);
- Chromium and zinc effluent limits replaced with monitoring to ensure that water quality criteria is protected;
- ELG for free available chlorine applied at IMP 301 instead of Outfall 001;
- TRC limits applied at Outfall 001;
- Impingement sampling requirement removed based on use of wedge-wire screens for CWIS technology and Part C language modified to include sampling alternative and modify entrainment sampling language;
- DEP agreed to remove Groups 3, 4, 5 parameters from monitoring if the effluent concentrations of the parameters are not detectable after the initial 60 days of sampling after the commencement of discharge.

Permit amendment PA0255092 A-2 was issued on November 15, 2019 as a DEP-initiated minor amendment to move the Outfall 001 location further upstream of the potable water intake. The change was proposed to allow for safer outfall access for operations and maintenance and did not result in any changes to water quality modeling or limits.

**Summary of Review**

Permit amendment PA0255092 A-3 was issued on January 12, 2022 as a major amendment to remove pH limits from all current and future internal monitoring points. The amendment removed pH limits from IMPs 101, 201, 301, 401, 501, and 601.

Cooling Water Intake Structure

On August 15, 2014, EPA promulgated Clean Water Act Section 316(b) regulations applicable to cooling water intake structures. The regulations established best technology available ("BTA") standards to reduce impingement mortality and entrainment of all life stages of fish and shellfish at existing power generating and manufacturing facilities. The Final Rule took effect on October 14, 2014. Regulations implementing the 2014 Final Rule (and the previously promulgated Phase I Rule) are provided in 40 CFR Part 125, Subparts I and J for new facilities and existing facilities, respectively. Associated NPDES permit application requirements for facilities with cooling water intake structures are provided in 40 CFR Part 122, Subpart B – Permit Application and Special NPDES Program Requirements (§ 122.21(r)).

HTEC is a "new facility" as defined in 40 CFR § 125.83. As a new facility, the site is subject to 40 CFR Part 125, Subpart I – Requirements Applicable to Cooling Water Intake Structures for New Facilities Under Section 316(b) of the Clean Water Act (§§ 125.80 – 125.89) if the facility meets the rule's applicability criteria. Pursuant to the applicability criteria given by § 125.81(a), HTEC is subject to the requirements of §§ 125.84 – 125.89 if:

(1) The facility is a point source that uses or proposes to use a cooling water intake structure;

(2) The facility has at least one cooling water intake structure that uses at least 25 percent of the water it withdraws for cooling purposes. The threshold requirement that at least 25 percent of water withdrawn be used for cooling purposes must be measured on an average monthly basis. A new facility meets the 25 percent cooling water threshold if, based on the new facility's design, any monthly average over a year for the percentage of cooling water withdrawn is expected to equal to exceed 25 percent of the total water withdrawn.

(3) The facility has a design intake flow (DIF) greater than two (2) million gallons per day (MGD).

HTEC is a point source as defined in 40 CFR § 122.2. The site uses more than 25% of the water it withdraws for cooling purposes (>90%) and uses a cooling water intake structure with a Design Intake Flow greater than 2 MGD (5.04 MGD). Therefore, the site is subject to the requirements of §§ 125.84 – 125.89. HTEC was designed and built to comply with the Federal Phase I Rule for BTA for CWIS as the facility construction began after January 17, 2002. HTEC has chosen to comply with the Track I requirements in §§ 125.84(c).

HTEC withdraws cooling tower makeup water and process water from the Monongahela River through a cooling water intake structure (CWIS) at river mile 76.6. Since the generation facility operates as a baseload plant, the CWIS operates continuously except during periodic scheduled outages. Daily and seasonal changes in flow rate may occur depending on demand for electricity. HTEC's original design for the CWIS was for 9.35 MGD (6500 gpm) to support two electric generating units. Only one generating unit has been constructed thus far and there are no plans to construct the second unit. The capacity of the CWIS was reduced to a design intake flow (DIF) of 5.04 MGD (3500 gpm) to meet the requirements of Unit 1.

The near-shore CWIS withdraws river water through three submerged cylindrical wedge-wire passive intake screens. The intake screens are designed to include sufficient open area to pass a through-screen design intake velocity of less than 0.5 ft/s while allowing for 15% blockage from silt or debris build-up on the screen surface. Each screen has a diameter of 14 inches, length of 22.5 inches, and a slot width of 0.125 inches. The resulting surface area is 26.32 $ft^2$. The slots have a width of 5mm and will result in an open area of 63.78%. The through-screen velocity at the DIF is 0.30 ft/s. Accounting for up to 15% blockage from silt or debris on the screen surface between air bursts results in a final effective velocity of 0.35 ft/s.

An air-burst system is used once per 12-hour shift to ensure the screens remain clear below 15% blockage. The impingement control is achieved through a passive intake and entrainment is controlled by the closed-cycle recirculating cooling system. The evaporative cooling tower is normally operated at an average of 7-10 cycles of concentration to reduce make-up water demand to its practical limit while maintaining acceptable effluent water quality. By using closed-cycle cooling, the site meets the requirements under 40 CFR 125.84(b)(1).

HTEC has met the requirements in 40 CFR 125.84(b)(6) by submitting the required application information from 40 CFR 125.122.21(r) and §§ 125.86(b); Source Waterbody Physical Data Study, Cooling Water Intake Structure Data Study, Source Waterbody Baseline Biological Characterization Study, Track I Application Requirements and Biological Monitoring. To meet

**Summary of Review**

the requirements in 40 CFR 125.84(b)(7) and (8), the NPDES permit will include the requirements to implement monitoring requirements specified in §§ 125.87 and record-keeping requirements specified in §§ 125.88.

In the permit amendment PA0255092 A-1, the permit's impingement sampling requirement was removed based on HTEC's use of wedge-wire screens for CWIS technology. Part C.III.C.1 impingement language of the permit was modified to allow HTEC to utilize an air burst cleaning system to maintain the CWIS's through-screen velocity below 0.5 ft/s and to allow HTEC to rely on remote weekly inspections to verify that the screens are operated as designed. Part C.III.C.3 entrainment language of the permit was also modified to allow HTEC to monitor entrainment rates on a bimonthly, rather than biweekly, basis.

HTEC completed the first year of entrainment monitoring and submitted a report to DEP in November 2021. The results of the monitoring indicate low entrainment rates attributed to the location, design, and capacity of the CWIS. HTEC has requested the elimination of further entrainment monitoring requirements in the NPDES permit renewal for the facility.

HTEC Requests for Permit Changes

1. HTEC requests that the sampling frequency for oil and grease (O&G) for Outfall 001 be reduced from daily to weekly. Daily monitoring since the onset of the facility operation has indicated that 100% sampling results for this outfall have been below detection limits. Weekly sampling should be sufficient to demonstrate the compliance with O&G discharge requirements and daily sampling is overly burdensome.

   DEP Response:
   O&G sampling frequency was previously set to daily per the minimum sample frequency for process wastewater listed in Table 6.4 of the *Technical Guidance for the Development and Specification of Effluent Limitations and Other Permit Conditions in NPDES Permits (Document No. 362-0400-001, 10/97).*

   Effluent data obtained since HTEC began operations in 2021 may be used to support monitoring frequency reductions pursuant to EPA's *Interim Guidance for Performance-Based Reduction of NPDES Permit Monitoring Frequencies* (April 1996). HTEC has not reported any non-compliance with oil and grease effluent limitations at Outfall 001 since HTEC began operations.

   The two most recent years of monthly average effluent data representative of current operating conditions for O&G were used to calculate the long-term average discharge rate for use in Tables 1 and 2 of the EPA's guidance document. The baseline monitoring frequency of 7/wk is consistent with the existing monitoring frequency for HTEC's Outfall 001. A long-term average discharge rate of <5.04 mg/L and ratio long-term average to monthly average limit of 33.6% were calculated for Outfall 001. However, since all but one of HTEC's reported monthly average effluent data in the most recent two years was "not detectable", the ratio long-term average to monthly average limit can be assumed to be <25%. Based on Tables 1 and 2 of EPA's guidance document, this ratio would recommend a reduction in permit monitoring frequency to 1/week for Outfall 001.

2. HTEC requests that the monitoring requirement be eliminated for this parameter. Monitoring since the facility has been in operation, 94% of the samples have less than detectable concentrations of thallium. The facility does not contribute to the metal in the discharge and there is no reasonable potential to cause or contribute to exceedances of water quality standards for thallium.

   DEP Response:
   Thallium monitoring requirements have been removed from Outfall 001's effluent limitations and monitoring requirements, based on the application sample and reasonable potential analysis included below in this Fact Sheet.

3. HTEC requests that the monitoring requirements for the Group 3-5 parameters in the permit be eliminated. Monitoring since the facility has been in operation has indicated that 100% of the analyses to date are less than detectable levels. The facility does not contribute any of these parameters to the discharge and there is no reasonable potential to cause or contribute to exceedances of water quality standards for thallium.

   DEP Response:
   Monitoring requirements for all Group 3-5 parameters, with the exception of acrylamide and hexachlorobutadiene, have been removed from Outfall 001's effluent limitations and monitoring requirements, based on the application sample and reasonable potential analysis included below in this Fact Sheet.

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4. HTEC requests that the sampling frequency for TSS and O&G for IMPs 101 and 201 be reduced from daily to weekly. Monitoring since the facility has been in operation has indicated that 89% of TSS sampling results and 100% of sampling results O&G has been below detection limits. Weekly sampling should be sufficient to demonstrate the compliance with O&G discharge requirements and daily sampling is overburdensome. The IMP 101 process wastewater is pumped to the Cooling Tower basin and blowdown streams (IMP 301) before being discharged through Outfall 001. The IMP 201 process wastewater is pumped to the CWCS where it combines with the cooling tower blowdown before being discharged through Outfall 001. TSS and O&G are also monitored at Outfall 001.

   DEP Response:
   The daily sampling frequency for IMPs 101 and 201 was previously based on the federal ELG's most stringent requirement that the monthly average is a measurement of the "average of daily values for 30 consecutive days".

   Effluent data obtained since HTEC began operations in 2021 may be used to support monitoring frequency reductions pursuant to EPA's *Interim Guidance for Performance-Based Reduction of NPDES Permit Monitoring Frequencies* (April 1996). HTEC exceeded their effluent limitations for oil and grease at IMP 101 and IMP 201 on October 31, 2024. HTEC reported a daily maximum of 73.8 mg/L at IMP 101 and a daily maximum of 27.6 mg/L at IMP 201. The violations were a result of an operator over-greasing a bearing using food-grade grease. HTEC has reportedly made corrections to ensure this does not occur again.

   The two most recent years of monthly average effluent data representative of current operating conditions for O&G were used to calculate the long-term average discharge rate for use in Tables 1 and 2 of the EPA's guidance document. The baseline monitoring frequency of 7/wk is consistent with the existing monitoring frequency for HTEC's IMP 101 and IMP 201. A long-term average discharge rate of <5.12 mg/L and ratio long-term average to monthly average limit of 34.1% were calculated for IMP 101. A long-term average discharge rate of <5.08 mg/L and ratio long-term average to monthly average limit of 33.9% were calculated for IMP 201. However, since all of HTEC's reported monthly average effluent data in the most recent two years was "not detectable", the ratio long-term average to monthly average limit can be assumed to be <25%. Based on Tables 1 and 2 of EPA's guidance document, this ratio would recommend a reduction in permit monitoring frequency to 1/week for oil and grease at IMPs 101 and 201.

   The same analysis was completed with respect to TSS for IMPs 101 and 201. HTEC has not reported any non-compliance with TSS effluent limitations at IMPs 101 and 201 since HTEC began operations. A long-term average discharge rate of <4.04 mg/L and ratio long-term average to monthly average limit of 13.5% were calculated for IMP 101. A long-term average discharge rate of <6.73 mg/L and ratio long-term average to monthly average limit of 22.4% were calculated for IMP 101. All of HTEC's reported monthly average effluent data at IMP 101 and all but one of HTEC's reported monthly average effluent data at IMP 201 for TSS was "not detectable". Based on Tables 1 and 2 of EPA's guidance document, this ratio would recommend a reduction in permit monitoring frequency to 1/week for TSS at IMPs 101 and 201.

5. HTEC states that Item 1.a of the Biological Monitoring section states "Remote monitoring of the screens using video cameras should be conducted weekly, at a minimum, to ensure that intake structure technologies are maintained and operated to ensure that they will continue to function as designed". In an email communication from the PADEP Aquatic Biologist dated December 19, 2019, it was agreed that a diver for the annual inspection of the structural integrity of the submerged wedge-wire screens once a year would be an acceptable alternative to video monitoring. HTEC requests that this section in the permit be edited to reflect this agreement.

   DEP Response:
   DEP agrees that a diver for the annual inspection of the structural integrity of the submerged wedge-wire screens is an acceptable alternative to weekly video monitoring. CWIS language in Part C.III.C. of the NPDES permit has been edited to reflect this agreement.

6. HTEC states that Item 1.b of the Biological Monitoring section requires entrainment monitoring twice monthly for the months of April through September. HTEC has completed the first year of monitoring and submitted a report to the PADEP. A copy is included in Attachment 5. The results of the monitoring indicate very low entrainment rates attributed to the location, design, and capacity of the Cooling Water Intake Structure (CWIS). The facility employes a combined cycle generation technology which increases efficiency and reduces cooling water demand. The closed cycle recirculating cooling water system withdraws only about 0.1% of the mean annual flow of the source waterbody. Those design features, along with the incorporation of 0.125 inch slot-width wedge-wire screens that are

**Summary of Review**

positioned in the deeper part of the river away from the river bank, minimize impingement mortality and entrainment of fish, eggs, and larvae at the facility. HTEC believes that the design and operation of the CWIS exceeds the Best Technology Available requirements of the Clean Water Act 316(b) rule. Therefore, HTEC requests the elimination of further entrainment monitoring requirements in the new NPDES permit for the facility.

DEP Response:
Based on the results of the entrainment study, DEP aquatic biologists concluded that 316(b) monitoring requirements are waived for this permit cycle because the facility meets the Best Technology Available requirements of the Clean Water Act 316(b) rule. No entrainment monitoring is necessary in this permit cycle, but additional monitoring may still be required in future permit cycles, based on 40 CFR 125.87. Section §125.87(a) allows for less frequent monitoring following the initial study period, but states that subsequent monitoring should be sufficient "for the detection of any seasonal or daily variations". CWIS language in Part C.III.C. of the NPDES permit has been edited to reflect this waived monitoring requirement.

7. HTEC occasionally has the need to perform maintenance activities such as fire hydrant flushing and external building washdowns. HTEC requests that a list of allowable non-stormwater discharges to the facility's stormwater system, similar to the list included in the PAG-03 General Permit for Discharges of Stormwater Associated with Industrial Activity, be added to the NPDES permit. HTEC requests the following allowable non-stormwater discharges:

   - Discharges from emergency/unplanned fire-fighting activities;
   - Potable water – including water line flushings, fire suppression system flushings, and fire hydrant flushings – that does not contain measurable concentrations of Total Residual Chlorine (TRC), and where appropriate control measures are implemented to minimize discharges of mobilized solids and other pollutants (e.g., filtration, detention, settlement);
   - Uncontaminated condensate from air conditioners, coolers/chillers, and other compressors (if treatment through an oil/water separator is provided) and from the outside storage of refrigerated gases or liquids;
   - Irrigation drainage;
   - Landscape water if such water does not contain pesticides, herbicides or fertilizers;
   - Pavement wash waters, other than wash waters used on newly sealed pavement, where: no detergents or hazardous cleaning products are used; the wash waters do not come into contact with oil and grease deposits, sources of pollutants associated with industrial activities, or any other toxic or hazardous materials; and appropriate control measures are implemented to minimize discharges of mobilized solids and other pollutants (e.g., filtration, detention, settlement);
   - Routine external building washdown / power wash water that does not contain detergents or hazardous cleaning products (e.g., those containing bleach, hydrofluoric acid, muriatic acid, sodium hydroxide, nonylphenols) and where appropriate control measures are implemented to minimize discharges of mobilized solids and other pollutants (e.g., filtration, detention, settlement);
   - Uncontaminated ground water or spring water;
   - Foundation or footing drains where flows are not contaminated with process materials; and
   - Incidental windblown mist from cooling towers that collects on rooftops or adjacent portions of a facility, but not intentional discharges from the cooling tower.

   DEP Response:
   DEP has added the PAG-03 General Permit's list of allowable non-stormwater discharges to Part C. IV.B. Requirements Applicable to Stormwater Outfalls of the NPDES Permit.

8. HTEC notified the Department on March 21, 2025 that a proposed project was in discussion to add a line from their Clarified Water Tank to the HRSG Blowdown Sump during times of need. The Service/Fire Water Tank currently used for the cooling efforts of the HRSG Blowdown Sump is considered insufficient. The existing service water line is 8" at about 100 psi and steps down to 6". The new line is 4" at 30 psi. HTEC reported that the lines would only be run in tandem with the service water line to the HRSG Blowdown Tank and the new line to the HRSG Blowdown Sump. The combined line is 4" from IMP 101 into the cooling tower. This new line would not result in any increases in flow.

**Summary of Review**

DEP Response:
DEP requests that HTEC notify the Department when the proposed project is planned to occur and update the facility's process flow diagram accordingly. Any changes to the quantity and quality of the discharge to IMP 101 or Outfall 001 will require a permit amendment.

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.

Conclusion

Draft permit issuance is recommended.

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

| | | | |
|---|---|---|---|
| Outfall No. | 001 | Design Flow (MGD) | 1.3 |
| Latitude | 39º 53' 6.84" | Longitude | -79º 55' 6.49" |
| Quad Name | Carmichaels | Quad Code | 1906 |
| Wastewater Description: | Cooling tower blowdown (IMP 301) and low volume waste (IMP 101, IMP 201) | | |

| | | | |
|---|---|---|---|
| Receiving Waters | Monongahela River (WWF) | Stream Code | 37185 |
| NHD Com ID | 99415440 | RMI | 76.85 |
| Drainage Area | 4550 $mi^2$ | Yield ($cfs/mi^2$) | 0.116 |
| $Q_{7-10}$ Flow (cfs) | 530 | $Q_{7-10}$ Basis | U.S. Army Corps Engineers Grays Landing Lock & Dam |
| Elevation (ft) | 765 | Slope (ft/ft) | 0.0001 |
| Watershed No. | 19-B | Chapter 93 Class. | WWF |
| Existing Use | | Existing Use Qualifier | |
| Exceptions to Use | | Exceptions to Criteria | |
| Assessment Status | Attaining Use(s) | | |
| Cause(s) of Impairment | | | |
| Source(s) of Impairment | | | |
| TMDL Status | Final | Name | Monongahela River TMDL |

| Background/Ambient Data | | Data Source |
|---|---|---|
| pH (SU) | 7.0-7.5 | Ambient Sampling of Monongahela River |
| Temperature (°F) | 33.4-81.0 | Ambient Sampling of Monongahela River |
| Hardness (mg/L) | 97.7 | Ambient Sampling of Monongahela River |
| Other: | | |

| | | | |
|---|---|---|---|
| Nearest Downstream Public Water Supply Intake | | Municipal Authority Borough of Carmichaels | |
| PWS Waters | Monongahela River | Flow at Intake (cfs) | 1.55 |
| PWS RMI | 75.53 | Distance from Outfall (mi) | 1.32 |

Changes Since Last Permit Issuance:

Outfall 001 discharges wastewater from Unit 1 operations, consisting of cooling tower blowdown from IMP 301 and low volume wastewater from IMPs 101 and 201. Only one generating unit has been constructed thus far and there are no plans to construct the second unit.

Other Comments:

The USGS Stream Stats Data for the drainage area is displayed in Attachment F.

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

| | | | |
|---|---|---|---|
| Outfall No. | 002 | Design Flow (MGD) | 0 |
| Latitude | 39º 53' 40.17" | Longitude | -79º 55' 38.33" |
| Quad Name | Carmichaels | Quad Code | 1906 |
| Wastewater Description: | Stormwater | | |
| Receiving Waters | Monongahela River (WWF) | Stream Code | 37185 |
| NHD Com ID | 99415314 | RMI | 76.11 |
| Drainage Area | 4560 $mi^2$ | Yield ($cfs/mi^2$) | 0.116 |
| $Q_{7-10}$ Flow (cfs) | 530 | $Q_{7-10}$ Basis | U.S. Army Corps Engineers Grays Landing Lock & Dam |
| Elevation (ft) | 765 | Slope (ft/ft) | 0.0001 |
| Watershed No. | 19-B | Chapter 93 Class. | WWF |
| Existing Use | | Existing Use Qualifier | |
| Exceptions to Use | | Exceptions to Criteria | |
| Assessment Status | Attaining Use(s) | | |
| Cause(s) of Impairment | | | |
| Source(s) of Impairment | | | |
| TMDL Status | Final | Name | Monongahela River TMDL |

| Background/Ambient Data | | Data Source |
|---|---|---|
| pH (SU) | 7.0-7.5 | Ambient Sampling of Monongahela River |
| Temperature (°F) | 41.6-77.1 | Ambient Sampling of Monongahela River |
| Hardness (mg/L) | 96.5 | Ambient Sampling of Monongahela River |
| Other: | | |

| | | | |
|---|---|---|---|
| Nearest Downstream Public Water Supply Intake | | Municipal Authority Borough of Carmichaels | |
| PWS Waters | Monongahela River | Flow at Intake (cfs) | 1.55 |
| PWS RMI | 75.53 | Distance from Outfall (mi) | 0.58 |

Changes Since Last Permit Issuance:

HTEC has not reported any discharges at Outfall 002 since the facility began operations in 2021.

Other Comments:

The USGS Stream Stats Data for the drainage area is displayed in Attachment G.

**Treatment Facility Summary**

**Treatment Facility Name:** HTEC Energy Center LLC

| WQM Permit No. | Issuance Date |
|---|---|
| 3018200 | 6/27/18 |
| | |

| Waste Type | Degree of Treatment | Process Type | Disinfection | Avg Annual Flow (MGD) |
|---|---|---|---|---|
| Industrial | Water Chemistry Adjustment | pH adjustment, dechlorination | N/A | 0.62 |

| Hydraulic Capacity (MGD) | Organic Capacity (lbs/day) | Load Status | Biosolids Treatment | Biosolids Use/Disposal |
|---|---|---|---|---|
| 1.08 | N/A | N/A | N/A | N/A |

Changes Since Last Permit Issuance: None

Other Comments: Internal wastewater streams including boiler water/ steam blowdowns, clarified water, service water, evaporative cooler blowdown, and reverse osmosis reject water are routed to the HRSG Blowdown Sump (IMP 101) and then recycled to the cooling tower basin for incorporation into the recirculation system. The cooling tower blowdown (IMP 301) flows into the Central Wastewater Collection Sump (CWCS) for periodic sampling, testing and dechlorination, as needed. The CSCS can also be recirculated back into the cooling tower basin or released to the Monongahela River. Sodium bisulfite is added for dechlorination if needed.

## Compliance History

**DMR Data for Outfall 001 (from February 1, 2024 to January 31, 2025)**

| Parameter | JAN-25 | DEC-24 | NOV-24 | OCT-24 | SEP-24 | AUG-24 | JUL-24 | JUN-24 | MAY-24 | APR-24 | MAR-24 | FEB-24 |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Flow (MGD) Average Monthly | 0.36 | 0.39 | 0.42 | 0.35 | 0.573 | 0.66 | 0.67 | 0.53 | 0.46 | 0.38 | 0.34 | 0.35 |
| Flow (MGD) Daily Maximum | 0.42 | 0.55 | 0.33 | 0.68 | 0.687 | 0.85 | 0.79 | 0.71 | 0.68 | 0.59 | 0.41 | 0.4 |
| pH (S.U.) Daily Minimum | 7.3 | 6.91 | 7.16 | 7.29 | 6.83 | 7.43 | 7.29 | 7.0 | 6.9 | 7.0 | 7.1 | 7.0 |
| pH (S.U.) Instantaneous Maximum | 7.8 | 7.83 | 8.13 | 8.28 | 8.22 | 8.2 | 8.2 | 8.4 | 8.3 | 8.5 | 8.8 | 7.6 |
| TRC (mg/L) Average Monthly | < 0.02 | < 0.02 | < 0.05 | < 0.05 | < 0.05 | < 0.05 | < 0.05 | < 0.06 | < 0.06 | < 0.06 | < 0.06 | < 0.06 |
| TRC (mg/L) Instantaneous Maximum | < 0.02 | < 0.02 | < 0.05 | < 0.05 | < 0.05 | < 0.05 | < 0.05 | < 0.06 | < 0.06 | < 0.06 | < 0.06 | < 0.06 |
| Temperature (ºF) Average Monthly | 64.8 | 64.5 | 69.2 | 75.21 | 79.14 | 82.04 | 77.5 | 82 | 78 | 71 | 69 | 65 |
| Temperature (ºF) Instantaneous Maximum | 72.5 | 73.9 | 79.6 | 88.53 | 84.6 | 86.99 | 82.2 | 89 | 84 | 79 | 74 | 74 |
| TSS (mg/L) Average Monthly | 40 | 10.0 | 13 | 16 | 10 | 7 | < 8 | < 8 | 14 | 54 | 28 | 16 |
| TSS (mg/L) Daily Maximum | 87 | 19.0 | 14 | 26 | 13 | 8 | 11 | 10 | 17 | 125 | 41 | 21 |
| Total Dissolved Solids (mg/L) Average Monthly | 1037 | 898.0 | 1813 | 1072 | 1970 | 1913 | 2072 | 1680 | 1788 | 1158 | 1228 | 1233 |
| Total Dissolved Solids (mg/L) Daily Maximum | 1220 | 1220.0 | 2000 | 1580 | 2070 | 2150 | 2250 | 2010 | 1860 | 1970 | 1250 | 1380 |
| Oil and Grease (mg/L) Average Monthly | < 5.0 | < 5.0 | < 5.0 | 5.4 | < 5.0 | < 5.1 | < 5.0 | < 5.0 | < 5.0 | < 5.0 | < 5.0 | < 5.1 |
| Oil and Grease (mg/L) Instantaneous Maximum | < 5.0 | < 5.3 | < 5.0 | 15.6 | < 5.3 | < 5.4 | < 5.2 | 5.2 | < 5.1 | < 5.2 | < 5.3 | < 5.3 |
| Total Aluminum (mg/L) Average Monthly | 2.07 | 1.86 | 2.32 | 1823 | 1582 | 1218 | 1.2 | 1.03 | 1.2 | 3.43 | 4.0 | 3.1 |

| | | | | | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Total Aluminum (mg/L) Daily Maximum | 3.01 | 2.61 | 3.1 | 2900 | 1780 | 1340 | 1.5 | 1.20 | 1.3 | 6.4 | 4.9 | 3.6 |
| Dissolved Iron (mg/L) Average Monthly | < 0.05 | < 0.057 | < 0.05 | 0.0531 | < 0.05 | < 0.05 | < 0.05 | < 0.07 | < 0.05 | 0.053 | 0.12 | 0.19 |
| Dissolved Iron (mg/L) Instantaneous Maximum | < 0.1 | 0.0843 | < 0.05 | 0.0598 | < 0.05 | < 0.05 | < 0.05 | < 0.07 | < 0.05 | 0.064 | 0.16 | 0.38 |
| Sulfate (mg/L) Average Monthly | 480 | 373 | 1046 | 759 | 1260 | 1265 | 1292 | 1074 | 1065 | 593 | 621 | 622 |
| Sulfate (mg/L) Daily Maximum | 563 | 583 | 1250 | 969 | 1360 | 1390 | 1390 | 1250 | 1120 | 1090 | 636 | 716 |
| Total Thallium (ug/L) Average Monthly | < 0.0002 | < 0.0002 | < 0.0002 | < 0.002 | < 0.0002 | < 0.20 | < 0.20 | < 0.002 | < 0.20 | < 0.20 | < 0.20 | < 0.20 |
| Total Thallium (ug/L) Daily Maximum | < 0.0002 | < 0.0002 | < 0.0002 | < 0.002 | < 0.0002 | < 0.20 | < 0.20 | < 0.002 | < 0.20 | < 0.20 | < 0.20 | < 0.20 |
| 3,3-Dichloro-benzidine (ug/L) Average Monthly | < 0.003 | < 0.001 | < 0.003 | < 0.001 | < 0.001 | < 1.0 | < 1 | < 0.001 | < 1 | < 1 | < 1 | < 3 |
| 3,3-Dichloro-benzidine (ug/L) Daily Maximum | < 0.01 | < 0.001 | < 0.01 | < 0.001 | < 0.001 | < 1.0 | < 1 | < 0.001 | < 1 | < 1 | < 1 | < 10 |
| Pentachloro-phenol (ug/L) Average Monthly | < 0.01 | < 0.003 | < 0.003 | < 0.003 | < 0.003 | < 3.0 | < 3 | < 0.003 | < 3 | < 3 | < 3 | < 8 |
| Pentachloro-phenol (ug/L) Daily Maximum | < 0.03 | < 0.003 | < 0.003 | < 0.003 | < 0.003 | < 3.0 | < 3 | < 0.003 | < 3 | < 3 | < 3 | < 24 |
| Acrolein (ug/L) Average Monthly | < 0.01 | < 0.01 | < 0.01 | < 0.01 | < 0.01 | < 10.0 | < 4 | < 4 | < 4 | < 4 | < 4 | < 4 |
| Acrolein (ug/L) Daily Maximum | < 0.01 | < 0.01 | < 0.01 | < 0.01 | < 0.01 | < 10.0 | < 4 | < 4 | < 4 | < 4 | < 4 | < 4 |
| Acrylamide (ug/L) Average Monthly | < 10.0 | < 10.0 | < 10.0 | < 10 | < 10 | < 10000 | < 10000 | < 10000 | < 10000 | < 10000 | < 10000 | < 10000 |
| Acrylamide (ug/L) Daily Maximum | < 10.0 | < 10.0 | < 10.0 | < 10 | < 10 | < 10000 | < 10000 | < 10000 | < 10000 | < 10000 | < 10000 | < 10000 |
| Acrylonitrile (ug/L) Average Monthly | < 0.004 | < 0.004 | < 0.004 | < 0.004 | < 0.004 | < 4.0 | < 4 | < 4 | < 4 | < 4 | < 4 | < 4 |
| Acrylonitrile (ug/L) Daily Maximum | < 0.004 | < 0.004 | < 0.004 | < 0.004 | < 0.004 | < 4.0 | < 4 | < 4 | < 4 | < 4 | < 4 | < 4 |
| Hexachloro-benzene (ug/L) Average Monthly | < 0.003 | < 0.001 | < 0.003 | < 0.001 | < 0.001 | < 1.0 | < 1 | < 1 | < 1 | < 1 | < 1 | < 3 |

| | | | | | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Hexachloro-benzene (ug/L) Daily Maximum | < 0.01 | < 0.001 | < 0.01 | < 0.001 | < 0.001 | < 1.0 | < 1 | < 1 | < 1 | < 1 | < 1 | < 10 |
| Benzo(a)-Anthracene (ug/L) Average Monthly | < 0.003 | < 0.001 | < 0.003 | < 0.001 | < 0.001 | < 1.0 | < 1 | < 1 | < 1 | < 1 | < 1 | < 3 |
| Benzo(a)-Anthracene (ug/L) Daily Maximum | < 0.01 | < 0.001 | < 0.01 | < 0.001 | < 0.001 | < 1.0 | < 1 | < 1 | < 1 | < 1 | < 1 | < 10 |
| Benzo(a)Pyrene (ug/L) Average Monthly | < 0.003 | < 0.001 | < 0.003 | < 0.001 | < 0.001 | < 1.0 | < 1 | < 1 | < 1 | < 1 | < 1 | < 3 |
| Benzo(a)Pyrene (ug/L) Daily Maximum | < 0.01 | < 0.001 | < 0.01 | < 0.001 | < 0.001 | < 1.0 | < 1 | < 1 | < 1 | < 1 | < 1 | < 10 |
| Benzo(k)Fluor-anthene (ug/L) Average Monthly | < 0.003 | < 0.001 | < 0.003 | < 0.001 | < 0.001 | < 1.0 | < 1 | < 1 | < 1 | < 1 | < 1 | 3 |
| Benzo(k)Fluor-anthene (ug/L) Daily Maximum | < 0.01 | < 0.001 | < 0.01 | < 0.001 | < 0.001 | < 1.0 | < 1 | < 1 | < 1 | < 1 | < 1 | < 10 |
| 3,4-Benzo-fluoranthene (ug/L) Average Monthly | < 0.003 | < 0.001 | < 0.003 | < 0.001 | < 0.001 | < 1.0 | < 1 | < 1 | < 1 | < 1 | < 1 | < 3 |
| 3,4-Benzo-fluoranthene (ug/L) Daily Maximum | < 0.01 | < 0.001 | < 0.01 | < 0.001 | < 0.001 | < 1.0 | < 1 | < 1 | < 1 | < 1 | < 1 | < 10 |
| Chloride (mg/L) Average Monthly | 151 | 148 | 214 | 225.6 | 360 | 359 | 426 | 240 | < 134 | 91.7 | 171 | 221 |
| Chloride (mg/L) Daily Maximum | 192 | 199 | 269 | 384 | 531 | 459 | 549 | 283 | 315 | 162 | 240 | 336 |
| Bromide (mg/L) Average Monthly | < 0.5 | < 0.5 | < 0.5 | < 0.5 | < 0.5 | < 0.5 | < 0.5 | < 0.5 | < 0.5 | < 0.5 | < 0.5 | 0.5 |
| Bromide (mg/L) Daily Maximum | < 0.5 | < 0.5 | < 0.5 | < 0.5 | < 0.5 | < 0.5 | < 0.5 | < 0.5 | < 0.5 | < 0.5 | < 0.5 | < 0.5 |
| 1,2-Diphenyl-hydrazine (ug/L) Average Monthly | < 0.003 | < 0.001 | < 0.003 | < 0.001 | < 0.001 | < 1.0 | < 1 | < 1 | < 1 | < 1 | < 1 | < 3 |
| 1,2-Diphenyl-hydrazine (ug/L) Daily Maximum | < 0.01 | < 0.001 | < 0.01 | < 0.001 | < 0.001 | < 1.0 | < 1 | < 1 | < 1 | < 1 | < 1 | < 10 |
| Bis(2-Chloro-ethyl)Ether (ug/L) Average Monthly | < 0.003 | < 0.001 | < 0.003 | < 0.001 | < 0.001 | < 1.0 | < 1 | < 1 | < 1 | < 1 | < 1 | < 3 |

| | | | | | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Bis(2-Chloro-ethyl)Ether (ug/L) Daily Maximum | < 0.01 | < 0.001 | < 0.01 | < 0.001 | < 0.001 | < 1.0 | < 1 | < 1 | < 1 | < 1 | < 1 | < 10 |
| Chrysene (ug/L) Average Monthly | < 0.003 | < 0.001 | < 0.003 | < 0.001 | < 0.001 | < 1.0 | < 1 | < 1 | < 1 | < 1 | < 1 | < 3 |
| Chrysene (ug/L) Daily Maximum | < 0.01 | < 0.001 | < 0.01 | < 0.001 | < 0.001 | < 1.0 | < 1 | < 1 | < 1 | < 1 | < 1 | < 10 |
| Dibenzo(a,h)-Anthracene (ug/L) Average Monthly | < 0.003 | < 0.001 | < 0.003 | < 0.001 | < 0.001 | < 1.0 | < 1 | < 1 | < 1 | < 1 | < 1 | 3 |
| Dibenzo(a,h)-Anthracene (ug/L) Daily Maximum | < 0.01 | < 0.001 | < 0.01 | < 0.001 | < 0.001 | < 1.0 | < 1 | < 1 | < 1 | < 1 | < 1 | < 10 |
| Hexachloro-cyclopentadiene (ug/L) Average Monthly | < 0.003 | < 0.001 | < 0.003 | < 0.001 | < 0.001 | < 1.0 | < 1 | < 1 | < 1 | < 1 | < 1 | < 3 |
| Hexachloro-cyclopentadiene (ug/L) Daily Maximum | < 0.01 | < 0.001 | < 0.01 | < 0.001 | < 0.001 | < 1.0 | 1 | < 1 | < 1 | < 1 | < 1 | < 10 |
| Indeno(1,2,3-cd)Pyrene (ug/L) Average Monthly | < 0.003 | < 0.001 | < 0.003 | < 0.001 | < 0.001 | < 1.0 | < 1 | < 1 | < 1 | < 1 | < 1 | < 3 |
| Indeno(1,2,3-cd)Pyrene (ug/L) Daily Maximum | < 0.01 | < 0.001 | < 0.01 | < 0.001 | < 0.001 | < 1.0 | < 1 | < 1 | < 1 | < 1 | < 1 | < 10 |
| N-Nitroso-dimethylamine (ug/L) Average Monthly | < 0.003 | < 0.001 | < 0.003 | < 0.001 | < 0.001 | < 1.0 | < 1 | < 1 | < 1 | < 1 | < 1 | < 3 |
| N-Nitroso-dimethylamine (ug/L) Daily Maximum | < 0.01 | < 0.001 | < 0.01 | < 0.001 | < 0.001 | < 1.0 | < 1 | < 1 | < 1 | < 1 | < 1 | < 10 |
| N-Nitrosodi-N-Propylamine (ug/L) Average Monthly | < 0.003 | < 0.001 | < 0.003 | < 0.001 | < 0.001 | < 1.0 | < 1 | < 1 | < 1 | < 1 | < 1 | < 3 |
| N-Nitrosodi-N-Propylamine (ug/L) Daily Maximum | < 0.01 | < 0.001 | < 0.01 | < 0.001 | < 0.001 | < 1.0 | < 1 | < 1 | < 1 | < 1 | < 1 | < 10 |
| Phenanthrene (ug/L) Average Monthly | < 0.003 | < 0.001 | < 0.003 | < 0.001 | < 0.001 | < 1.0 | < 1 | < 1 | < 1 | < 1 | < 1 | < 3 |
| Phenanthrene (ug/L) Daily Maximum | < 0.01 | < 0.001 | < 0.01 | < 0.001 | < 0.001 | < 1.0 | < 1 | < 1 | < 1 | < 1 | < 1 | < 10 |
| Vinyl Chloride (ug/L) Average Monthly | < 0.001 | < 0.001 | < 0.001 | < 0.001 | < 0.001 | < 1.0 | < 1 | < 1 | < 1 | < 1 | < 1 | < 1 |

| | | | | | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Vinyl Chloride (ug/L) Daily Maximum | < 0.001 | < 0.001 | < 0.001 | < 0.001 | < 0.001 | < 1.0 | < 1 | < 1 | < 1 | < 1 | < 1 | < 1 |

**DMR Data for Outfall 101 (from February 1, 2024 to January 31, 2025)**

| Parameter | JAN-25 | DEC-24 | NOV-24 | OCT-24 | SEP-24 | AUG-24 | JUL-24 | JUN-24 | MAY-24 | APR-24 | MAR-24 | FEB-24 |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Flow (MGD) Internal Monitoring Point <br/> Average Monthly | 0.15 | 0.18 | 0.23 | 0.265 | 0.261 | 0.27 | 0.25 | 0.19 | 0.15 | 0.15 | 0.09 | 0.08 |
| Flow (MGD) Internal Monitoring Point <br/> Daily Maximum | 0.40 | 0.54 | 0.64 | 0.528 | 0.385 | 0.30 | 0.34 | 0.44 | 0.21 | 0.45 | 0.12 | 0.13 |
| TSS (mg/L) Internal Monitoring Point <br/> Average Monthly | < 4.0 | < 4.0 | < 4.0 | < 4.0 | < 4.0 | < 4.0 | < 4.0 | < 4.0 | < 4.0 | < 4.0 | < 4.0 | < 5.0 |
| TSS (mg/L) Internal Monitoring Point <br/> Daily Maximum | 5.0 | 4.0 | 4.0 | 4.0 | < 4.0 | 4.0 | 13.0 | < 4.0 | 4.0 | 15 | 5.0 | 15.0 |
| Oil and Grease (mg/L) Internal Monitoring Point <br/> Average Monthly | < 5.0 | < 5.0 | < 5.0 | < 7.7 | < 5.0 | < 5.1 | < 5.1 | < 5.0 | < 5.0 | < 5.0 | < 5.0 | < 5.0 |
| Oil and Grease (mg/L) Internal Monitoring Point <br/> Daily Maximum | < 5.2 | < 5.4 | < 5.0 | 73.8 | < 5.0 | < 5.4 | < 5.3 | 5.3 | < 5.2 | < 5.2 | < 5.2 | < 5.2 |

**DMR Data for Outfall 201 (from February 1, 2024 to January 31, 2025)**

| Parameter | JAN-25 | DEC-24 | NOV-24 | OCT-24 | SEP-24 | AUG-24 | JUL-24 | JUN-24 | MAY-24 | APR-24 | MAR-24 | FEB-24 |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Flow (MGD) Internal Monitoring Point <br/> Average Monthly | 0.038 | 0.035 | 0.036 | 0.0299 | 0.027 | 0.04 | 0.023 | 0.02 | 0.02 | 0.03 | 0.03 | 0.03 |

| | | | | | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Flow (MGD) Internal Monitoring Point <br/> Daily Maximum | 0.059 | 0.043 | 0.04 | 0.0468 | 0.0388 | 0.06 | 0.038 | 0.03 | 0.03 | 0.05 | 0.03 | 0.09 |
| TSS (mg/L) Internal Monitoring Point <br/> Average Monthly | < 7.0 | < 5.0 | < 5.0 | < 6.0 | < 5.0 | < 6.0 | < 5.0 | < 5.0 | < 8.0 | < 18.0 | 11.0 | < 10.0 |
| TSS (mg/L) Internal Monitoring Point <br/> Daily Maximum | 18.0 | 11.0 | 9.0 | 25.0 | 10.0 | 12.0 | 13.0 | 12.0 | 29.0 | 42.0 | 37.0 | 22.0 |
| Oil and Grease (mg/L) Internal Monitoring Point <br/> Average Monthly | < 5.0 | < 5.0 | < 5.0 | < 6.4 | < 5.0 | < 5.1 | < 5.0 | < 5.0 | < 5.0 | < 5.0 | < 5.0 | < 5.1 |
| Oil and Grease (mg/L) Internal Monitoring Point <br/> Daily Maximum | < 5.6 | < 5.3 | < 5.0 | 27.6 | < 5.3 | < 5.4 | < 5.2 | 5.1 | < 5.1 | < 5.2 | < 5.3 | < 5.4 |

**DMR Data for Outfall 301 (from February 1, 2024 to January 31, 2025)**

| Parameter | JAN-25 | DEC-24 | NOV-24 | OCT-24 | SEP-24 | AUG-24 | JUL-24 | JUN-24 | MAY-24 | APR-24 | MAR-24 | FEB-24 |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Flow (MGD) Internal Monitoring Point <br/> Average Monthly | 0.32 | 0.35 | 0.38 | 0.31 | 0.54 | 0.61 | 0.64 | 0.51 | 0.43 | 0.36 | 0.31 | 0.31 |
| Flow (MGD) Internal Monitoring Point <br/> Daily Maximum | 0.37 | 0.52 | 0.52 | 0.647 | 0.649 | 0.73 | 0.73 | 0.68 | 0.66 | 0.57 | 0.38 | 0.33 |
| Free Available Chlorine (mg/L) Internal Monitoring Point <br/> Average Monthly | < 0.02 | < 0.020 | < 0.05 | < 0.05 | < 0.06 | < 0.05 | < 0.05 | < 0.06 | < 0.06 | < 0.06 | < 0.06 | < 0.06 |
| Free Available Chlorine (mg/L) Internal Monitoring Point <br/> Daily Maximum | < 0.02 | < 0.02 | < 0.05 | < 0.05 | 0.21 | < 0.05 | < 0.05 | < 0.06 | < 0.06 | < 0.06 | < 0.06 | < 0.06 |

| | | | | | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Total Chromium (mg/L) Internal Monitoring Point <br/> Average Monthly | < 0.0025 | < 0.0025 | < 0.0025 | < 0.0025 | < 0.003 | < 0.003 | < 0.003 | < 0.003 | < 0.004 | < 0.004 | < 0.003 | < 0.003 |
| Total Chromium (mg/L) Internal Monitoring Point <br/> Daily Maximum | < 0.0025 | < 0.0025 | < 0.0025 | < 0.0025 | < 0.003 | < 0.003 | 0.003 | < 0.003 | < 0.005 | 0.005 | 0.004 | 0.003 |
| Total Zinc (mg/L) Internal Monitoring Point <br/> Average Monthly | 0.0246 | 0.0219 | 0.016 | 0.0173 | 0.0151 | < 0.02 | 0.016 | 0.018 | 0.025 | 0.049 | 0.045 | 0.051 |
| Total Zinc (mg/L) Internal Monitoring Point <br/> Daily Maximum | 0.0275 | 0.0279 | 0.02 | 0.0207 | 0.0163 | < 0.03 | 0.02 | 0.021 | 0.031 | 0.09 | 0.054 | 0.055 |

## Compliance History

**Effluent Violations for Outfall 101, from: March 1, 2024 To: January 31, 2025**

| Parameter | Date | SBC | DMR Value | Units | Limit Value | Units |
|---|---|---|---|---|---|---|
| Oil and Grease | 10/31/24 | Daily Max | 73.8 | mg/L | 20.0 | mg/L |

**Effluent Violations for Outfall 201, from: March 1, 2024 To: January 31, 2025**

| Parameter | Date | SBC | DMR Value | Units | Limit Value | Units |
|---|---|---|---|---|---|---|
| Oil and Grease | 10/31/24 | Daily Max | 27.6 | mg/L | 20.0 | mg/L |

Summary of Inspections: Hill Top Energy Center was most recently inspected on July 25, 2023 as a compliance evaluation. No violations were noted. The client has no open violations.

Other Comments: Hill Top Energy Center was issued a violation on September 9, 2021 for an effluent violation of pH of 9.2. The violation was immediately corrected and did not meet the EPA screening criteria of a 40% exceedance for a conventional parameter that would count as a violation to be counted towards SNC.

Hill Top Energy Center exceeded their effluent limitations for oil and grease at IMP 101 and IMP 201 on October 31, 2024. HTEC reported a daily maximum of 73.8 mg/L at IMP 101 and a daily maximum of 27.6 mg/L at IMP 201. The violations were a result of an operator over-greasing a bearing using food-grade grease. HTEC has reportedly made corrections to ensure this does not occur again.

**Development of Effluent Limitations**

| | | | |
|---|---|---|---|
| **Outfall No.** | 001 | **Design Flow (MGD)** | 1.3 |
| **Latitude** | 39º 53' 6.84" | **Longitude** | -79º 55' 6.49" |

**Wastewater Description:** Cooling tower blowdown (IMP 301) and low volume waste (IMP 101, IMP 201)

**Outfall 001** discharges wastewater from Unit 1 operations. Pending construction of Unit 2, Outfall 001 will also discharge wastewater from Unit 2 operations. Outfall 001's wastewater discharge currently consists of cooling tower blowdown from IMP 301 and low volume wastewater from IMPs 101 and 201. The maximum discharge flow for Unit 1 is 1.3 MGD; the average discharge flow is 0.46 MGD.

**Technology-Based Limitations**

Discharges from Outfall 001 are regulated under the Steam Electric Power Generating Point Source Category. Applicable ELGs are the new source performance standards (NSPS) published in 40 CFR Part 423. In the permit's A-1 minor amendment, issued on June 27, 2018, IMP 301 was added to the cooling tower blowdown for compliance with the ELGs under 40 CFR 423.15(b)(1) & (b)(10). The ELG for free available chlorine was applied at IMP 301 instead of at Outfall 001. Total Residual Chlorine (TRC) limits were imposed at Outfall 001 in the A-1 amendment. Technology-based federal effluent limits from the 40 CFR Part 423 ELG for the cooling tower blowdown are imposed at IMP 301 and at IMP 601, pending construction of Unit 2.

*Flow*

The cooling tower blowdown discharge is expected to be continuous and of a consistent quality. Flow will be metered continuously pursuant to 25 Pa. Code § 92a.61(d)(1) and Table 6-4 of the DEP Technical Guidance for the Development and Specification of Effluent Limitations and Other Permit Conditions in NPDES Permit (October 1997) Guidance Document.

*pH*

Per 40 CFR Part 423.15(b)(1), cooling tower blowdown is identified as a categorical waste. For all categorical waste streams, the pH must be maintained between 6.0 and 9.0 S.U. at all times.

*Free Available Chlorine and Total Residual Chlorine (TRC)*

The federal ELG for free available chlorine is applied at IMPs 301 at IMP 601, pending construction of Unit 2.

Pennsylvania regulations at 25 Pa. Code § 92a.48(b) require the imposition of technology-based TRC limits for facilities that use chlorination and that are not already subject to TRC limits based on applicable federal ELGs or a facility-specific BPJ evaluation. Effluent limitation/monitoring requirements for TRC will be applied at Outfall 001. The average monthly limitation of 0.5 mg/L for TRC under § 92a.48, and an IMAX limit of 1.6 mg/L (normally is BPJ) will be applied

*Oil and Grease*

Reclaimed water from the oil/water separator will be directed to cooling tower basin and is identified as a low volume waste. The federal ELGs will be addressed in the internal monitoring points. An oil and grease limit of 15.0 mg/L monthly average and 30.0 mg/L instantaneous maximum will be applied to Outfall 001 to ensure the 25 Pa. Code § 95.2(2)(ii) standard is not violated at the final discharge.

O&G sampling frequency was previously set to daily per the minimum sample frequency for process wastewater listed in Table 6.4 of the *Technical Guidance for the Development and Specification of Effluent Limitations and Other Permit Conditions in NPDES Permits (Document No. 362-0400-001, 10/97).*

Effluent data obtained since HTEC began operations in 2021 may be used to support monitoring frequency reductions pursuant to EPA's *Interim Guidance for Performance-Based Reduction of NPDES Permit Monitoring Frequencies* (April 1996). HTEC has not reported any non-compliance with oil and grease effluent limitations at Outfall 001 since HTEC began operations.

The two most recent years of monthly average effluent data representative of current operating conditions for O&G were used to calculate the long-term average discharge rate for use in Tables 1 and 2 of the EPA's guidance document. The baseline monitoring frequency of 7/wk is consistent with the existing monitoring frequency for HTEC's Outfall 001. A long-term average discharge rate of <5.04 mg/L and ratio long-term average to monthly average limit of 33.6% were calculated for Outfall 001. However, since all but one of HTEC's reported monthly average effluent data in the most recent two years was "not detectable", the ratio long-term average to monthly average limit can be assumed to be <25%. Based on Tables 1 and 2 of EPA's guidance document, this ratio would recommend a reduction in permit monitoring frequency to 1/week for Outfall 001.

*Total Suspended Solids (TSS)*

Technology-based federal ELG for TSS, related to low volume wastes as per 40 CFR § 423.15(c), is applied to internal monitoring points. Low volume waste is directed to cooling tower, and therefore, a reporting requirement for TSS will be applied in Outfall 001.

**Table 1: Outfall 001 Technology-Based Limitations**

| Parameter | Monthly Average | Daily Maximum | IMAX | TBEL Basis |
|---|---|---|---|---|
| Flow (MGD) | Monitor & Report | | - | 25 Pa. Code § 92a.61(d)(1) |
| pH (S.U.) | Between 6.0 and 9.0 | | | 40 CFR Part 423.15(b)(1) |
| Total Residual Chlorine (mg/L) | 0.5 | - | 1.6 | Pa. Code § 92a.48(b)(2) |
| Oil and Grease (mg/L) | 15.0 | | 30.0 | 25 Pa. Code § 95.2(2)(ii) |
| Total Suspended Solids (mg/L) | Monitor & Report | | - | 40 CFR § 423.15(c) |
| Dissolved Iron (mg/L) | - | - | 7.0 | 25 Pa. Code § 95.2(4) |

## Water Quality-Based Effluent Limitations (WQBELs)

Toxics Management Analysis

The Department's Toxics Management Spreadsheet (TMS) was utilized to facilitate calculations necessary for completing a reasonable potential analysis and determine Water Quality-Based Effluent Limitations (WQBELs) for discharges containing toxic pollutant concentrations. TMS combines the functionality of two (2) of the Department's analysis tools, Toxics Screening Analysis Spreadsheet and PENTOXSD water quality model.

DEP's procedures for evaluating reasonable potential are as follows:

1. For IW discharges, the design flow to use in modeling is the average flow during production or operation and may be taken form the permit application.

2. Perform a Toxics Screening Analysis to identify toxic pollutants of concern. All toxic pollutants, as reported in the permit application or on DMRs, are modeled by the TMS to determine the parameters of concern. [This includes pollutants reported as "Not Detectable" or as "<MDL" where the method detection limit for the analytical method used by the applicant is greater than the most stringent water quality criterion].

    - Establish limits in the draft permit where the maximum reported concentration equals or exceeds 50% of the WQBEL. Use the average monthly and maximum daily limits for the permit as recommended by TMS. Establish an IMAX limit at 2.5 times the average monthly limit.

    - For non-conservative pollutants, establish monitoring requirements where the maximum reported concentration is between 25% - 50% of the WQBEL.

    - For conservative pollutants, establish monitoring requirements where the maximum reported concentration is between 10% - 50% of the WQBEL.

A partial mix factor of 0.70 is used for the chronic fish criteria (CRC), threshold human health (THH) and cancer risk level (CRL) analyses in the TMS. DEP uses partial mix factors (PMFs) in the TMS to represent the fractional portion of the receiving stream that mixes with a discharge. A PMF of 0.70 provides the permittee with 70% of the receiving stream's Q7-10 flow for mixing and dilution. The PMF was manually input because the TMS, as a single discharge model, allocates high percentages of stream flow to individual discharges, which often results in those discharges being modeled with most or all of a stream's assimilative capacity. A higher PMF represents a higher percentage of discharge flow that has mixed with the stream flow. This would represent a significant dilution allowance on a large waterway like the Monongahela River and leave little or no assimilative capacity for other dischargers to the same receiving stream.

The Q7-10 flow of the Monongahela River is 530 cfs, which is the Q7-10 for the portion of the Allegheny River upstream of the Grays Landing Lock & Dam as identified in the U.S. Army Corp of Engineers Pittsburgh District Water Management.

Discharges from Outfall 001 are evaluated based on concentrations reported on the application and contained in the DMRs; data from those sources are used as inputs into the TMS. A summary of TMS Inputs is contained in Tables 2 and 3.

Output from the TMS mode runs is included in Attachment H. Based on the recommendations of the TMS and as shown below in Table 4, monitoring is to be imposed for the parameters aluminum and hexachlorobtadiene and effluent limits are to be imposed for the parameter acrylamide.

| Table 2: TMS Design Inputs | |
|---|---|
| **Parameter** | **Value** |
| Design Flow (MGD) | 1.3 |
| Hardness (mg/L) | 463 |
| pH (S.U.) | 9.2 |
| **Partial Mix Factors (PMFs)** | |
| AFC | calc. |
| CFC | 0.7 |
| THH | 0.7 |
| CRL | 0.7 |
| **Complete Mix Times** | |
| $Q_{7-10}$ (min) | calc. |
| $Q_h$ (min) | calc. |

| Table 3: TMS Stream Inputs | |
|---|---|
| **Parameter** | **Value** |
| Stream Code | 37185 |
| RMI | 76.85 |
| Elevation | 765 |
| Drainage Area ($mi^2$) | 4560 |
| Slope (ft/ft) | 0.0001 |
| PWS Withdrawal (MGD) | 1.0 |
| Apply Fish Criteria | Yes |
| Low Flow Yield ($cfs/mi^2$) | 0.116 |
| Stream Flow (cfs) | 530 |
| Tributary Flow (cfs) | N/A |
| Width (ft) | 550 |
| Stream Hardness (mg/L) | 100 |
| Stream pH (S.U.) | 7 |

The maximum reported values for acrylamide and hexaclorobutadiene were reported as "non-detect" using quantitation limits (QL) that exceed the Department's Target QL. If HTEC collects additional samples for the parameters acrylamide and hexaclorobutadiene using the Department's Target QLs and the additional samples indicate that these parameters are not pollutants of concern, those effluent limits may be removed from the final permit.

| Table 4: Outfall 001 Water Quality Based Effluent Limits | | | |
|---|---|---|---|
| **Parameter** | **Monthly Average (µg/L)** | **Daily Maximum (µg/L)** | **WQBEL Basis** |
| Aluminum, total | Report | Report | AFC |
| Acrylamide | 43.6 | 68.0 | CRL |
| Hexachlorobutadiene | Report | Report | CRL |

*TMDL*

Monongahela River has a final TMDL for PCBs and Chlordane from Point Marion L/D to Gray's Landing L/D. HTEC and its outfalls are located between Gray's Landing L/D and Maxwell L/D, downstream of the TMDL reach. No specific TMDL is listed for the current reach of concern in Monongahela River.

*WQM 7.0*

Per *SOP – Establishing Effluent Limitations for Individual Industrial Permits*, analysis with the WQM 7.0 Model is needed if the maximum BOD5/CBOD5 concentration exceeds 30/25 mg/L. The projected maximum BOD5 concentration in the effluent is below 20 mg/L, and therefore, WQM 7.0 Model analysis is not required.

*Total Residual Chlorine*

To determine if WQBELs are required for discharges containing total residual chlorine (TRC), a discharge evaluation is performed using a DEP program called TRC_CALC created with Microsoft Excel for Windows. TRC_CALC calculates

TRC Waste Load Allocations (WLAs) through the application of a mass balance model which considers TRC losses due to stream and discharge chlorine demands and first-order chlorine decay. Input values for the program include flow rates and chlorine demands for the receiving stream and the discharge, the number of samples taken per month, coefficients of TRC variability, partial mix factors, and an optional factor of safety. The mass balance model calculates WLAs for acute and chronic criteria that are then converted to long term averages using calculated multipliers. The multipliers are functions of the number of samples taken per month and the TRC variability coefficients (normally kept at default values unless site specific information is available). The most stringent limitation between the acute and chronic long-term averages is converted to an average monthly limit for comparison to the BAT average monthly limit of 0.5 mg/L from 25 Pa. Code § 92a.48(b)(2). The more stringent of these average monthly TRC limitations is imposed in the permit.

The stream flow and discharge flow entered in the TRC_CALC spreadsheet are 530 CFS and 1.3 MGD, respectively. A PMF of 0.16 is input for the acute criteria based on the TMS analysis of Outfall 001 and a PMF of 0.7 is input for the chronic criteria. The results of the analysis, included in Attachment J, indicate that no WQBELs are required for TRC and that BAT is the most stringent criteria for TRC at an average monthly limit of 0.5 mg/L.

*Temperature*

HTEC withdraws water for cooling purposes from and discharges non-contact cooling wastewater to the Monongahela River via Outfall 001. Based upon maximum pump withdrawal rates, HTEC is capable of withdrawing up to 5.04 MGD of river water for use in its industrial processes. HTEC reported, in the application's Module 5, that only one generating unit was constructed and there are no plans to construct a second unit. The total projected discharge volume from Outfall 001 (as provided in the NPDES permit application) is 1.3 MGD. Based upon average withdrawal and discharge estimates, the consumptive water use is calculated to be approximately 3.74 MGD.

Outfall 001 has a small discharge rate in comparison to the stream flow so high discharge temperatures are theoretically allowable based on the mass balance calculation. However, for the protection of human health, the Department's temperature guidance states that thermal discharges may not exceed 110°F at any point accessible to the general public.

The Department used the Thermal Discharge Limit Calculation Spreadsheet to evaluate the thermal impact of this discharge the Monongahela River. The spreadsheet is designed to calculate the appropriate thermal discharge limits for a facility discharging effluent above ambient temperature, assuming complete-mix between the discharge flow and the receiving stream flow. The design stream flow for temperature analysis is based on the $Q_{7\text{-}10}$ flow of the receiving stream, adjusted for each monthly or semimonthly time period.

An instantaneous maximum effluent limit of 110°F will be applied to Outfall 001 at 1.3 MGD. The results of the thermal analysis are included in Attachment I of this report. Daily temperature monitoring, as was previously imposed in the permit, will be maintained.

*Total Dissolved Solids (TDS) and Major Constituents Monitoring*

TDS and its major constituents, including sulfate, chloride, and bromide, were previously monitored per the Environmental Quality Board's monitoring initiative applied to DEP's NPDES program. Data collection for TDS and its major constituents is no longer in effect so special parameter monitoring requirements for TDS, bromide, chloride, sulfate and 1.4-dioxane requirements no longer apply. The water quality analysis above did not recommend any TDS limits or monitoring requirements at the downstream public water supply.

Integral to the implementation of 25 Pa. Code § 95.10 is the principle that existing, authorized mass loadings of TDS are exempt from any treatment requirements under these provisions. Existing mass loadings of TDS up to and including the maximum daily discharge loading for any existing discharge, provided that the loading was authorized prior to August 21, 2010, are exempt. Discharge loadings of TDS authorized by the Department are typically exempt from the treatment requirements of Chapter 95.10 until the net TDS loading is increased, an existing discharge proposes a hydraulic expansion or a change in the waste stream. If there are existing mass or production-based TDS effluent limits, then these are used as the basis for the existing mass loading.

New and expanding discharge loadings of TDS equal to or less than 5,000 pounds per day, measured as the annual average daily load, are not considered new and expanding mass loadings of TDS and are exempt from the treatment requirements of 25 Pa. Code § 95.10. HTEC is defined as a new and not expanding facility, with a maximum TDS

concentration of 1,830 mg/L and an annual average daily load of 19,841 lbs/day. The 25 Pa. Code § 95.10(c) requirement of discharges may not contain more than 2,000 mg/L as a monthly average and 4,000 mg/L as maximum daily limit, is applicable to the HTEC facility.

*Per- and Polyfluoroalkyl Substances (PFAS)*

In February 2024, DEP implemented a new monitoring initiative for PFAS consistent with an EPA memorandum that provides guidance to states for addressing PFAS discharges. PFAS are a family of thousands of synthetic organic chemicals that contain a chain of strong, carbon-fluorine bonds. Many PFAS are highly stable, water- and oil-resistant, and exhibit other properties that make them useful in a variety of consumer products and industrial processes. PFAS are resistant to biodegradation, photooxidation, direct photolysis, and hydrolysis and do not readily degrade naturally; thus, many PFAS accumulate over time. According to the United States Department of Health and Human Services, Agency for Toxic Substances and Disease Registry (ATSDR), the environmental persistence and mobility of some PFAS, combined with decades of widespread use, have resulted in their presence in surface water, groundwater, drinking water, rainwater, soil, sediment, ice caps, outdoor and indoor air, plants, animal tissue, and human blood serum across the globe. ATSDR also reported that exposure to certain PFAS can lead to adverse human health impacts Due to their durability, toxicity, persistence, and pervasiveness, PFAS have emerged as potentially significant pollutants of concern.

In accordance with Section II.I of DEP's "Standard Operating Procedure (SOP) for Clean Water Program – Establishing Effluent Limitations for Individual Industrial Permits" [SOP No. BCW-PMT-032] and under the authority of 25 Pa. Code § 92a.61(b), DEP has determined that monitoring for a subset of common/well-studied PFAS including Perfluorooctanoic acid (PFOA), Perfluorooctanesulfonic acid (PFOS), Perfluorobutanesulfonic acid (PFBS), and Hexafluoropropylene oxide dimer acid (HFPO-DA) is necessary to help understand the extent of environmental contamination by PFAS in the Commonwealth and the extent to which point source dischargers are contributors. SOP BCW-PMT-032 directs permit writers to consider special monitoring requirements for PFOA, PFOS, PFBS, and HFPO-DA in the following instances:

a. If sampling that is completed as part of the permit renewal application reveals a detection of PFOA, PFOS, HFPO-DA or PFBS (any of these compounds), the application manager will establish a quarterly monitoring requirement for PFOA, PFOS, HFPO-DA and PFBS (all of these compounds) in the permit.

b. If sampling that is completed as part of the permit renewal application demonstrates non-detect values at or below the Target QLs for PFOA, PFOS, HFPO-DA and PFBS (all of these compounds in a minimum of 3 samples), the application manager will establish an annual monitoring requirement for PFOA, PFOS, HFPO-DA and PFBS in the permit.

c. In all cases the application manager will include a condition in the permit that the permittee may cease monitoring for PFOA, PFOS, HFPO-DA and PFBS when the permittee reports non-detect values at or below the Target QL for four consecutive monitoring periods for each PFAS parameter that is analyzed. Use the following language: The permittee may discontinue monitoring for PFOA, PFOS, HFPO-DA, and PFBS if the results in 4 consecutive monitoring periods indicate non-detects at or below Quantitation Limits of 4.0 ng/L for PFOA, 3.7 ng/L for PFOS, 3.5 ng/L for PFBS and 6.4 ng/L for HFPO-DA. When monitoring is discontinued, permittees should enter a No Discharge Indicator (NODI) Code of "GG" on DMRs.

HTEC's application was submitted before the NPDES permit application forms were updated to require sampling for PFOA, PFOS, PFBS, and HFPO-DA. Also, according to EPA's guidance, HTEC does not operate in one of the industries EPA expects to be a source for PFAS. Therefore, annual reporting of PFOA, PFOS, PFBS, and HFPO-DA will be required consistent with Section II.I.b of SOP BCW-PMT-032. Even though HTEC did not report results for PFOA, PFOS, PFBS, and HFPO-DA on the permit application, as a facility operating in a suspected non-source industry, it is reasonable to conclude that if HTEC did report results for PFOA, PFOS, PFBS, and HFPO-DA on the application, the results may have been non-detect values, which would subject HTEC to the annual monitoring requirements described in Section II.I.b of the SOP. As stated in Section II.I.c of the SOP, if non-detect values at or below DEP's Target QLs are reported for four consecutive monitoring periods (i.e., four consecutive annual results in HTEC's case), then the monitoring may be discontinued.

**Anti-Backsliding**

The effluent limitations and monitoring requirements in Table 5 below are from the current permit, issued on January 12, 2022. Previous effluent limits and monitoring requirements can be used pursuant to EPA's anti-backsliding regulation, 40 CFR 122.44(l). Effluent limitations and monitoring requirements for dissolved iron (shown below in Table 5) have been removed from the permit because there is no reasonable potential for discharges from Outfall 001 to exceed 1 mg/L total iron. Furthermore, the instantaneous maximum limitation of 7 mg/L exceeds the Department's water quality criterion of 3 mg/L for dissolved iron.

**Table 5: Current Permit Effluent Limitations – Outfall 001 (Unit 1 and 2)**

| Parameter | Daily Minimum | Average Monthly | Maximum Daily | Instantaneous Maximum | Units | Monitoring Frequency | Sample Type |
|---|---|---|---|---|---|---|---|
| Flow | - | Report | Report | - | MGD | Continuous | Metered |
| pH | 6.0 | - | - | 9.0 | S.U. | 1/day | Grab |
| Total Residual Chlorine | - | 0.5 | - | 1.6 | mg/L | 1/day | Grab |
| Temperature | | Report | - | 110* | °F | 1/day | I-S |
| Oil and Grease | - | 15.0 | - | 30.0 | mg/L | 1/day | Grab |
| Total Suspended Solids | - | Report | Report | - | mg/L | 1/week | 24-Hr Composite |
| Dissolved Iron | - | Report | - | 7.0 | mg/L | 1/week | 24-Hr Composite |
| Total Dissolved Solids | - | Report | Report | - | mg/L | 1/week | 24-Hr Composite |
| Chloride | - | Report | Report | - | mg/L | 1/week | 24-Hr Composite |
| Bromide | - | Report | Report | - | mg/L | 1/week | 24-Hr Composite |
| Sulfate, total | - | Report | Report | - | mg/L | 1/week | 24-Hr Composite |
| Aluminum, total | - | 12.4 | 19.4 | 31.0 | mg/L | 1/week | 24-Hr Composite |
| Mercury, total | - | Report | Report | - | mg/L | 1/week | 24-Hr Composite |
| Thallium, total | - | 26.3 | 41.0 | 65.8 | µg/L | 1/week | 24-Hr Composite |
| Acrolein | - | Report | Report | - | µg/L | 1/week | Grab Composite** |
| Acrylamide | - | Report | Report | - | µg/L | 1/week | Grab Composite** |
| Acrylonitrile | - | Report | Report | - | µg/L | 1/week | Grab Composite** |
| Vinyl Chloride | - | Report | Report | - | µg/L | 1/week | Grab Composite** |
| Pentachlorophenol | - | Report | Report | - | µg/L | 1/week | 24-Hr Composite |
| Benzo(a)Anthracene | - | Report | Report | - | µg/L | 1/week | 24-Hr Composite |
| Benzo(a)Pyrene | - | Report | Report | - | µg/L | 1/week | 24-Hr Composite |
| 3,4-Benzofluoranthene | - | Report | Report | - | µg/L | 1/week | 24-Hr Composite |
| Benzo(k)Fluoranthene | - | Report | Report | - | µg/L | 1/week | 24-Hr Composite |
| Bis(2-Chloroethyl)Ether | - | Report | Report | - | µg/L | 1/week | 24-Hr Composite |
| Chrysene | - | Report | Report | - | µg/L | 1/week | 24-Hr Composite |
| Dibenzo(a,h)Anthrancene | - | Report | Report | - | µg/L | 1/week | 24-Hr Composite |

| | | | | | | | |
|---|---|---|---|---|---|---|---|
| 3,3-Dichlorobenzidine | - | Report | Report | - | µg/L | 1/week | 24-Hr Composite |
| 1,2-Diphenylhydrazine | - | Report | Report | - | µg/L | 1/week | 24-Hr Composite |
| Hexachlorobenzene | - | Report | Report | - | µg/L | 1/week | 24-Hr Composite |
| Hexachlorobutadiene | - | Report | Report | - | µg/L | 1/week | 24-Hr Composite |
| Hexachlorocyclopentadiene | - | Report | Report | - | µg/L | 1/week | 24-Hr Composite |
| Indeno(1,2,3-cd)Pyrene | - | Report | Report | - | µg/L | 1/week | 24-Hr Composite |
| n-Nitrosodimethylamine | - | Report | Report | - | µg/L | 1/week | 24-Hr Composite |
| n-Nitrosodi-n-Propylamine | - | Report | Report | - | µg/L | 1/week | 24-Hr Composite |
| Phenanthrene | - | Report | Report | - | µg/L | 1/week | 24-Hr Composite |

* The temperature is associated with the maximum design flow 2.33 MGD. The temperature must be kept at or below 110°F at all time.

**Effluent Limitations and Monitoring Requirements – Outfall 001**

Effluent limitations and monitoring requirements applicable at Outfall 001 are the most stringent of TBELs, WQBELs, and regulatory effluent standards and monitoring requirements, as summarized below in Table 6.

**Table 6: Outfall 001 Effluent Limitations and Monitoring Requirements**

| Parameter | Daily Minimum | Average Monthly | Maximum Daily | Instantaneous Maximum | Units | Monitoring Frequency | Sample Type |
|---|---|---|---|---|---|---|---|
| Flow | - | Report | Report | - | MGD | Continuous | Metered |
| pH | 6.0 | - | - | 9.0 | S.U. | 1/day | Grab |
| Total Residual Chlorine | - | 0.5 | - | 1.6 | mg/L | 1/day | Grab |
| Temperature | | Report | - | 110 (1) | °F | 1/day | I-S |
| Oil and Grease | - | 15.0 | - | 30.0 | mg/L | 1/week | Grab |
| Total Suspended Solids | | Report | Report | | mg/L | 1/week | 24-Hr Composite |
| Total Dissolved Solids | - | 2000 | 4000 | - | mg/L | 1/week | 24-Hr Composite |
| Aluminum | - | Report | Report | - | mg/L | 1/week | 24-Hr Composite |
| Acrylamide | - | 43.6 | 68.0 | - | µg/L | 1/week | Grab Composite (2) |
| Hexachlorobutadiene | - | Report | Report | - | µg/L | 1/week | 24-Hr Composite |
| PFOA (3) | - | - | Report | - | ng/L | 1/year | Grab |
| PFOS (3) | - | - | Report | - | ng/L | 1/year | Grab |
| PFBS (3) | - | - | Report | - | ng/L | 1/year | Grab |
| HFPO-DA (3) | - | - | Report | - | ng/L | 1/year | Grab |

(1) The temperature is associated with the maximum design flow 1.3 MGD. The temperature must be kept at or below 110°F at all time.
(2) Four grab samples should be collected during actual hours of discharge over a 24-hour period and need not be flow proportioned. The four samples will be combined at the immediately before analysis. Only one analysis is required, not four.
(3) The permittee may discontinue monitoring for PFOA, PFOS, HFPO-DA, and PFBS if the results in 4 consecutive monitoring periods indicate non-detects at or below Quantitation Limits of 4.0 ng/L for PFOA, 3.7 ng/L for PFOS, 3.5 ng/L for PFBS and 6.4 ng/L for HFPO-DA.

**Development of Effluent Limitations**

| | | | |
|---|---|---|---|
| **IMP No.** | 101 | **Design Flow (MGD)** | 0.9 |
| **Latitude** | 39º 53' 33" | **Longitude** | -79º 55' 27" |
| **Wastewater Description:** | Low volume waste (Heat Recovery Steam Generator Sump), Unit 1 | | |
| **IMP No.** | 201 | **Design Flow (MGD)** | 0.2 |
| **Latitude** | 39º 53' 33" | **Longitude** | -79º 55' 27" |
| **Wastewater Description:** | Low volume waste (Oil/ Water Separator), Unit 1 | | |

IMP 101 consists of low volume wastewater from Unit 1's Heat Recovery Steam Generator Sump (HRSG). The IMP discharges to Outfall 001 continuously with a design flow of 0.9 MGD and average flow of 0.35 MGD.

IMP 201 consists of low volume wastewater from Unit 1's oil/ water separator. The IMP discharges to Outfall 001 continuously with a design flow of 0.2 MGD and an average flow of 0.08 MGD.

In the permit's A-1 minor amendment, issued on June 27, 2018, IMP 201 was rerouted so that it does not discharge into the cooling tower basin and added to the permit. In the permit's A-3 major amendment, issued on January 12, 2022, pH limits were removed from IMP 101 and IMP 201. IMPs 101 and 201 began reporting operations in September 2021 with monitoring and reporting.

## Technology-Based Limitations

Flow monitoring is required pursuant to 25 Pa. Code § 92a.61(d)(1).

Federal Effluent Limitation Guidelines (ELGs)

Discharges from IMP 101 and IMP 201 are regulated under the Steam Electric Power Generating Point Source Category. Applicable ELGs are the new source performance standards (NSPS) published in 40 CFR Part 423. The technology-based federal effluent limits from the 40 CFR Part 423 ELG for low volume wastes are listed below in Table 7 and will be imposed at IMP 101 and IMP 201. Because this is a new source, the requirements at 40 CFR 423.15(a)(3) for new source performance standards (NSPSs) apply.

**Table 7: 40 CFR Part 423 ELGs for Low Volume Waste**
**Steam Electric Power Generating Point Source Category***

| Pollutant or pollutant property | NSPS effluent limitations | |
|---|---|---|
| | **Maximum for any 1 day (mg/L)** | **Average of daily values for 30 consecutive days shall not exceed (mg/L)** |
| Total suspended solids | 100.0 | 30.0 |
| Oil and grease | 20.0 | 15.0 |

*NSPS - 40 CFR 423 Subpart: 15(a)(3)

## Monitoring Frequencies for IMPs 101 and 201

The daily sampling frequency for IMPs 101 and 201 was previously based on the federal ELG's most stringent requirement that the monthly average is a measurement of the "average of daily values for 30 consecutive days".

Effluent data obtained since HTEC began operations in 2021 may be used to support monitoring frequency reductions pursuant to EPA's *Interim Guidance for Performance-Based Reduction of NPDES Permit Monitoring Frequencies* (April 1996). The two most recent years of monthly average effluent data representative of current operating conditions for O&G were used to calculate the long-term average discharge rate for use in Tables 1 and 2 of the EPA's guidance document. The baseline monitoring frequency of 7/wk is consistent with the existing monitoring frequency for HTEC's IMP 101 and IMP 201. A long-term average discharge rate of <5.12 mg/L and ratio long-term average to monthly average limit of

34.1% were calculated for IMP 101. A long-term average discharge rate of <5.08 mg/L and ratio long-term average to monthly average limit of 33.9% were calculated for IMP 201. However, since all of HTEC's reported monthly average effluent data in the most recent two years was "not detectable", the ratio long-term average to monthly average limit can be assumed to be <25%. Based on Tables 1 and 2 of EPA's guidance document, this ratio would recommend a reduction in permit monitoring frequency to 1/week for oil and grease at IMPs 101 and 201.

The same analysis was completed with respect to TSS for IMPs 101 and 201. HTEC has not reported any non-compliance with TSS effluent limitations at IMPs 101 and 201 since HTEC began operations. A long-term average discharge rate of <4.04 mg/L and ratio long-term average to monthly average limit of 13.5% were calculated for IMP 101. A long-term average discharge rate of <6.73 mg/L and ratio long-term average to monthly average limit of 22.4% were calculated for IMP 101. All of HTEC's reported monthly average effluent data at IMP 101 and all but one of HTEC's reported monthly average effluent data at IMP 201 for TSS was "not detectable". Based on Tables 1 and 2 of EPA's guidance document, this ratio would recommend a reduction in permit monitoring frequency to 1/week for TSS at IMPs 101 and 201.

## Water Quality-Based Limitations

Water quality limitations will not be placed on these internal monitoring points as this point is not a final discharge to surface waters of the Commonwealth. Water quality limitations will be placed on the final discharge point, Outfall 001.

## Anti-Backsliding

The effluent limitations and monitoring requirements in Table 8 below are from the current permit, issued on January 12, 2022. Previous effluent limits and monitoring requirements can be used pursuant to EPA's anti-backsliding regulation, 40 CFR 122.44(l).

**Table 8: Current Permit Effluent Limitations – IMPs 101 and 102**

| Parameters | Average Monthly | Daily Maximum | IMAX | Units | Monitoring Requirements | |
|---|---|---|---|---|---|---|
| | | | | | Monitoring Frequency | Sample Type |
| Flow | Monitor & Report | | - | MGD | Continuous | Metered |
| Total Suspended Solids | 30.0 | 100.0 | - | mg/L | 1/day | Grab |
| Oil and Grease | 15.0 | 20.0 | - | mg/L | 1/day | Grab |

## Effluent Limitations and Monitoring Requirements – IMPs 101 and 102

Effluent limitations and monitoring requirements applicable at IMPs 101 and 102 are the most stringent of TBELs and regulatory effluent standards and monitoring requirements, as summarized below in Table 9.

**Table 9: Effluent Limits and Monitoring Requirements – IMPs 101 and 102**

| Parameters | Average Monthly | Daily Maximum | IMAX | Units | Monitoring Requirements | |
|---|---|---|---|---|---|---|
| | | | | | Monitoring Frequency | Sample Type |
| Flow | Monitor & Report | | - | MGD | Continuous | Measured |
| Total Suspended Solids | 30.0 | 100.0 | - | mg/L | 1/week | Grab |
| Oil and Grease | 15.0 | 20.0 | - | mg/L | 1/week | Grab |

**Development of Effluent Limitations**

| | | | |
|---|---|---|---|
| **Outfall No.** | 301 | **Design Flow (MGD)** | 0.9 |
| **Latitude** | 39º 53' 32.55" | **Longitude** | -79º 55' 45.34" |

**Wastewater Description:** Cooling tower blowdown, Unit 1

IMP 301 consists of cooling tower blowdown from Unit 1. The IMP discharges to Outfall 001 continuously with a design flow of 0.9 MGD and average flow of 0.36 MGD.

In the permit's A-1 minor amendment, issued on June 27, 2018, IMP 301 was added to the cooling tower blowdown for compliance with the ELGs under 40 CFR 423.15(b)(1) & (b)(10). The ELG for free available chlorine was applied at IMP 301 instead of at Outfall 001. In the permit's A-3 major amendment, issued on January 12, 2022, pH limits were removed from IMP 301. IMP 301 began reporting operations in September 2021 with monitoring and reporting.

## Technology-Based Limitations

Flow monitoring is required pursuant to 25 Pa. Code § 92a.61(d)(1).

Federal Effluent Limitation Guidelines (ELGs)

Discharges from IMP 301 are regulated under the Steam Electric Power Generating Point Source Category. Applicable ELGs are the new source performance standards (NSPS) published in 40 CFR Part 423. The technology-based federal effluent limits from the 40 CFR Part 423 ELG for the cooling tower blowdown are listed below in Table 10 and will be imposed at IMP 301. Because this is a new source, the requirements at 40 CFR 423.15(b)(10) for new source performance standards (NSPSs) apply.

**Table 10: 40 CFR Part 423 ELGs for Cooling Tower Blowdown**
**Steam Electric Power Generating Point Source Category***

| Pollutant or pollutant property | NSPS effluent limitations | |
|---|---|---|
| | **Maximum Concentration (mg/L)** | **Average of daily values for 30 consecutive days shall not exceed (mg/L)** |
| Free Available Chlorine | 0.5 | 0.2 |
| **Pollutant or pollutant property** | **Maximum for any 1 day (mg/L)** | **Average of daily values for 30 consecutive days shall not exceed (mg/L)** |
| The 126 priority pollutants (Appendix A) contained in chemicals added for cooling tower maintenance, except: | ([1]) | ([1]) |
| Chromium, total | 0.2 | 0.2 |
| Zinc, total | 1.0 | 1.0 |

[1]No detectable amount.
*NSPS - 40 CFR 423 Subpart: 15(b)(10)

*Free Available Chlorine and Total Residual Chlorine (TRC)*

Per 25 PA Code § 92a.48(b) "For facilities or activities using chlorination, the following apply: (1) If the EPA adopts a National categorical ELG promulgating limits for Total Residual Chlorine (TRC) or free available chlorine for a specific industry or activity under section 301 or 304(b) of the Federal Act (33 U.S.C.A §§ 1311 and 1314(b)), that ELG constitutes BAT for the industry or activity. If the EPA has not promulgated a National ELG for TRC or free available chlorine for an industry or activity, the Department may develop a facility-specific BAT effluent limitation for TRC." Per the *SOP – Establishing Effluent Limitations for Individual Industrial Permits*, "If chlorination is used, the average monthly limitation of 0.5 mg/L for TRC is applicable under § 92a.48, and an IMAX limit of 1.6 mg/L normally is BPJ. If the federal ELG addresses chlorination or TRC,

apply the federal ELG. If a facility-specific BAT limit has been developed by DEP as per § 92a.48(b)(1), then apply the facility-specific BAT limit.". Based on 40 CFR Part 423.15(b)(10), an NSPS ELG limit for Free Available Chlorine will be applied to the cooling tower blowdown. The maximum daily limit (MDL) and the average monthly limit (AML) will be set to 0.5 mg/L and 0.2 mg/L, respectively.

The power plant will perform final pH adjustment and dechlorination on the final combined effluent. Total Residual Chlorine (TRC) is monitored at Outfall 001. Part C will also contain the 423.15(b)(10) statement regarding chlorine discharge time.

*Chromium and Zinc*

40 CFR Part 423 ELG places a limit of no detectable amount of the 126 priority pollutants (listed in Appendix A of the ELG) contained in chemicals added for cooling tower maintenance, except for chromium and zinc. If chromium and zinc are contained in the cooling tower maintenance chemicals, the maximum concentrations of the pollutants allowed are 0.2 mg/L and 1.0 mg/L, respectively. Permit Amendment A-1 states that "the ELG limits for chromium and zinc apply only to the contribution from the cooling tower maintenance chemicals, following EPA guidance and recent correspondence."

Additionally, Permit Amendment A-1 states that since "HTEC recirculates cooling water and will concentrate chromium and zinc that are present in the intake water and since the cooling water intake and blowdown discharge involve the same body of water, the elevated concentrations of chromium and zinc in the blowdown discharge may violate the water quality standards downstream in the future, per Technical Guidance for Development of NPDES Permit Requirements Steam Electric Industry (Doc No. 362-2183-004 12/97)." DEP determined to permit the use of engineering calculations for compliance with 40 CFR 423 effluent limitations but maintained a monitor and report requirement to collect data for evaluation to ensure that water quality criteria is protected. The enforcement of ELG limits for chromium and zinc is contingent upon data monitoring reports (DMRs), the selection and approval of chemical additives, and HTEC's engineering calculations.

## Water Quality-Based Limitations

Water quality limitations will not be placed on this internal monitoring point as this point is not a final discharge to surface waters of the Commonwealth. Water quality limitations will be placed on the final discharge point, Outfall 001.

## Anti-Backsliding

The effluent limitations and monitoring requirements in Table 11 below are from the current permit, issued on January 12, 2022. Previous effluent limits and monitoring requirements can be used pursuant to EPA's anti-backsliding regulation, 40 CFR 122.44(l).

**Table 11: Current Permit Effluent Limitations – IMP 301**

| Parameters | Average Monthly | Daily Maximum | IMAX | Units | Monitoring Requirements | |
|---|---|---|---|---|---|---|
| | | | | | Monitoring Frequency | Sample Type |
| Flow | Report | Report | - | MGD | Continuous | Metered |
| Free Available Chlorine | 0.2 | 0.5 | 0.5 | $^{mg}/_{L}$ | 1/day | Grab |
| Chromium | Report | Report | - | $^{mg}/_{L}$ | 1/week | Grab Composite (1) |
| Zinc | Report | Report | - | $^{mg}/_{L}$ | 1/week | Grab Composite (1) |

(1) Four grab samples should be collected during actual hours of discharge over a 24-hour period and need not be flow proportioned. The four samples will be combined at the immediately before analysis. Only one analysis is required, not four.

**Effluent Limitations and Monitoring Requirements – IMP 301**

Effluent limitations and monitoring requirements applicable at IMP 301 are the most stringent of TBELs and regulatory effluent standards and monitoring requirements, as summarized below in Table 12.

**Table 12: Effluent Limits and Monitoring Requirements – IMP 301**

| Parameter | Average Monthly | Maximum Daily | IMAX | Units | Monitoring Frequency | Sampling Type |
|---|---|---|---|---|---|---|
| Flow | Monitor & Report | | - | MGD | Continuous | Metered |
| Free Available Chlorine | 0.2 | 0.5 | 0.5 | $^{mg}/_{L}$ | 1/day | Grab |
| Chromium | Report | Report | - | $^{mg}/_{L}$ | 1/week | Grab Composite (1) |
| Zinc | Report | Report | - | $^{mg}/_{L}$ | 1/week | Grab Composite (1) |

(1) Four grab samples should be collected during actual hours of discharge over a 24-hour period and need not be flow proportioned. The four samples will be combined at the immediately before analysis. Only one analysis is required, not four.

**Development of Effluent Limitations**

| | | | |
|---|---|---|---|
| **IMP No.** | 401 | **Design Flow (MGD)** | 0.9 |
| **Latitude** | 39º 53' 37.5" | **Longitude** | -79º 55' 47.57" |
| **Wastewater Description:** | Low volume waste (Heat Recovery Steam Generator Sump), Unit 2 | | |
| **IMP No.** | 501 | **Design Flow (MGD)** | 0.2 |
| **Latitude** | 39º 53' 39.31" | **Longitude** | -79º 55' 51.73" |
| **Wastewater Description:** | Low volume waste (Oil/ Water Separator), Unit 2 | | |
| **IMP No.** | 601 | **Design Flow (MGD)** | 0.9 |
| **Latitude** | 39º 53' 37.92" | **Longitude** | -79º 55' 48.6" |
| **Wastewater Description:** | Cooling tower blowdown, Unit 2 | | |

In the permit's A-3 major amendment, issued on January 12, 2022, HTEC requested the addition of future IMPs 401, 501, and 601. IMPs 401, 501, and 601 will discharge to Outfall 001 following the construction of Unit 2. HTEC stated that there are currently no plans to construct Phase 2 of the facility, but requested to keep IMPs 401, 501, and 601 in the permit in an inactive state.

IMP 401 consists of low volume wastewater from Unit 2's Heat Recovery Steam Generator Sump (HRSG). The IMP will discharge to Outfall 001 continuously with a design flow of 0.9 MGD and average flow of 0.35 MGD. IMP 501 consists of low volume wastewater from Unit 2's oil/ water separator. The IMP will discharge to Outfall 001 continuously with a design flow of 0.2 MGD and an average flow of 0.08 MGD. IMP 601 consists of cooling tower blowdown from Unit 2. The IMP will discharge to Outfall 001 continuously with a design flow of 0.9 MGD and average flow of 0.36 MGD.

## Technology-Based Limitations

Flow monitoring is required pursuant to 25 Pa. Code § 92a.61(d)(1).

Federal Effluent Limitation Guidelines (ELGs)

Discharges from IMP 401 and IMP 501 are regulated under the Steam Electric Power Generating Point Source Category. Applicable ELGs are the new source performance standards (NSPS) published in 40 CFR Part 423. The technology-based federal effluent limits from the 40 CFR Part 423 ELG for low volume wastes are listed below in Table 13 and will be imposed at IMP 401 and IMP 501. Because this is a new source, the requirements at 40 CFR 423.15(a)(3) for new source performance standards (NSPSs) apply.

**Table 13: 40 CFR Part 423 ELGs for Low Volume Waste**
**Steam Electric Power Generating Point Source Category***

| Pollutant or pollutant property | NSPS effluent limitations | |
|---|---|---|
| | **Maximum for any 1 day (mg/L)** | **Average of daily values for 30 consecutive days shall not exceed (mg/L)** |
| Total suspended solids | 100.0 | 30.0 |
| Oil and grease | 20.0 | 15.0 |

*NSPS - 40 CFR 423 Subpart: 15(a)(3)

Discharges from IMP 601 are regulated under the Steam Electric Power Generating Point Source Category. Applicable ELGs are the new source performance standards (NSPS) published in 40 CFR Part 423. The technology-based federal effluent limits from the 40 CFR Part 423 ELG for the cooling tower blowdown are listed below in Table 14 and will be imposed at the IMP 601. Because this is a new source, the requirements at 40 CFR 423.15(b)(10) for new source performance standards (NSPS) apply.

| Table 14: 40 CFR Part 423 ELGs for Cooling Tower Blowdown Steam Electric Power Generating Point Source Category* | | |
|---|---|---|
| **Pollutant or pollutant property** | **NSPS effluent limitations** | |
| | **Maximum Concentration (mg/L)** | **Average of daily values for 30 consecutive days shall not exceed (mg/L)** |
| Free Available Chlorine | 0.5 | 0.2 |
| **Pollutant or pollutant property** | **Maximum for any 1 day (mg/L)** | **Average of daily values for 30 consecutive days shall not exceed (mg/L)** |
| The 126 priority pollutants (Appendix A) contained in chemicals added for cooling tower maintenance, except: | ([1]) | ([1]) |
| Chromium, total | 0.2 | 0.2 |
| Zinc, total | 1.0 | 1.0 |

[1]No detectable amount.
*NSPS - 40 CFR 423 Subpart: 15(b)(10)

*Free Available Chlorine and Total Residual Chlorine (TRC)*

Per 25 PA Code § 92a.48(b) "For facilities or activities using chlorination, the following apply: (1) If the EPA adopts a National categorical ELG promulgating limits for Total Residual Chlorine (TRC) or free available chlorine for a specific industry or activity under section 301 or 304(b) of the Federal Act (33 U.S.C.A §§ 1311 and 1314(b)), that ELG constitutes BAT for the industry or activity. If the EPA has not promulgated a National ELG for TRC or free available chlorine for an industry or activity, the Department may develop a facility-specific BAT effluent limitation for TRC." Per the *SOP – Establishing Effluent Limitations for Individual Industrial Permits*, "If chlorination is used, the average monthly limitation of 0.5 mg/L for TRC is applicable under § 92a.48, and an IMAX limit of 1.6 mg/L normally is BPJ. If the federal ELG addresses chlorination or TRC, apply the federal ELG. If a facility-specific BAT limit has been developed by DEP as per § 92a.48(b)(1), then apply the facility-specific BAT limit.". Based on 40 CFR Part 423.15(b)(10), an NSPS ELG limit for Free Available Chlorine will be applied to the cooling tower blowdown. The maximum daily limit (MDL) and the average monthly limit (AML) will be set to 0.5 mg/L and 0.2 mg/L, respectively.

The power plant will perform final pH adjustment and dechlorination on the final combined effluent. Total Residual Chlorine (TRC) is monitored at Outfall 001. Part C will also contain the 423.15(b)(10) statement regarding chlorine discharge time.

*Chromium and Zinc*

40 CFR Part 423 ELG places a limit of no detectable amount of the 126 priority pollutants (listed in Appendix A of the ELG) contained in chemicals added for cooling tower maintenance, except for chromium and zinc. If chromium and zinc are contained in the cooling tower maintenance chemicals, the maximum concentrations of the pollutants allowed are 0.2 mg/L and 1.0 mg/L, respectively. Permit Amendment A-1 states that "the ELG limits for chromium and zinc apply only to the contribution from the cooling tower maintenance chemicals, following EPA guidance and recent correspondence."

Additionally, Permit Amendment A-1 states that since "HTEC recirculates cooling water and will concentrate chromium and zinc that are present in the intake water and since the cooling water intake and blowdown discharge involve the same body of water, the elevated concentrations of chromium and zinc in the blowdown discharge may violate the water quality standards downstream in the future, per Technical Guidance for Development of NPDES Permit Requirements Steam Electric Industry (Doc No. 362-2183-004 12/97)." DEP determined to permit the use of engineering calculations for compliance with 40 CFR 423 effluent limitations but maintained a monitor and report requirement to collect data for evaluation to ensure that water quality criteria is protected. The enforcement of ELG limits for chromium and zinc is contingent upon data monitoring reports (DMRs), the selection and approval of chemical additives, and HTEC's engineering calculations.

**Monitoring Frequencies for IMPs 401 and 501**

The daily sampling frequency for IMPs 401 and 501 was previously based on the federal ELG's most stringent requirement that the monthly average is a measurement of the "average of daily values for 30 consecutive days". Proposed sampling frequencies for TSS and O&G are reduced to 1/week in accordance with IMPs 101 and 201.

**Water Quality-Based Limitations**

Water quality limitations will not be placed on these internal monitoring points as this point is not a final discharge to surface waters of the Commonwealth. Water quality limitations will be placed on the final discharge point, Outfall 001.

**Anti-Backsliding**

The effluent limitations and monitoring requirements in Tables 15 and 16 below are from the current permit, issued on January 12, 2022. Previous effluent limits and monitoring requirements can be used pursuant to EPA's anti-backsliding regulation, 40 CFR 122.44(l).

**Table 15: Current Permit Effluent Limitations – IMP 401 and 501**

| Parameters | Average Monthly | Daily Maximum | IMAX | Units | Monitoring Requirements | |
|---|---|---|---|---|---|---|
| | | | | | Monitoring Frequency | Sample Type |
| Flow | Report | Report | - | MGD | Continuous | Metered |
| Total Suspended Solids | 30.0 | 100.0 | - | mg/L | 1/day | Grab |
| Oil and Grease | 15.0 | 20.0 | - | mg/L | 1/day | Grab |

**Table 16: Current Permit Effluent Limitations – IMP 601**

| Parameters | Average Monthly | Daily Maximum | IMAX | Units | Monitoring Requirements | |
|---|---|---|---|---|---|---|
| | | | | | Monitoring Frequency | Sample Type |
| Flow | Report | Report | - | MGD | Continuous | Metered |
| Free Available Chlorine | 0.2 | 0.5 | 0.5 | $^{mg}/_{L}$ | 1/day | Grab |
| Chromium | Report | Report | - | $^{mg}/_{L}$ | 1/week | Grab Composite (1) |
| Zinc | Report | Report | - | $^{mg}/_{L}$ | 1/week | Grab Composite (1) |

(1) Four grab samples should be collected during actual hours of discharge over a 24-hour period and need not be flow proportioned. The four samples will be combined at the immediately before analysis. Only one analysis is required, not four.

**Effluent Limitations and Monitoring Requirements – IMPs 401, 501 and 601**

Effluent limitations and monitoring requirements applicable at IMPs 401, 501 and 601 are the most stringent of TBELs and regulatory effluent standards and monitoring requirements, as summarized below in Tables 17 and 18.

**Table 17: Effluent Limits and Monitoring Requirements – IMPs 401 and 501**

| Parameter | Average Monthly | Maximum Daily | IMAX | Units | Monitoring Frequency | Sampling Type |
|---|---|---|---|---|---|---|
| Flow | Monitor & Report | | - | MGD | Continuous | Metered |
| Total Suspended Solids | 30.0 | 100.0 | - | mg/L | 1/week | Grab |
| Oil and Grease | 15.0 | 20.0 | - | mg/L | 1/week | Grab |

| Table 18: Effluent Limits and Monitoring Requirements – IMP 601 | | | | | | |
|---|---|---|---|---|---|---|
| **Parameters** | **Average Monthly** | **Daily Maximum** | **IMAX** | **Units** | **Monitoring Requirements** | |
| | | | | | **Monitoring Frequency** | **Sample Type** |
| Flow | Report | Report | - | MGD | Continuous | Metered |
| Free Available Chlorine | 0.2 | 0.5 | 0.5 | $^{mg}/_{L}$ | 1/day | Grab |
| Chromium | Report | Report | - | $^{mg}/_{L}$ | 1/week | Grab Composite (1) |
| Zinc | Report | Report | - | $^{mg}/_{L}$ | 1/week | Grab Composite (1) |

(1) Four grab samples should be collected during actual hours of discharge over a 24-hour period and need not be flow proportioned. The four samples will be combined at the immediately before analysis. Only one analysis is required, not four.

**Development of Effluent Limitations**

**Outfall No.** 002 **Design Flow (MGD)** 0
**Latitude** 39º 53' 34.8" **Longitude** -79º 55' 40.08"
**Wastewater Description:** Stormwater (Units 1 & 2)

## Stormwater Drainage Overview

Outfall 002 receives stormwater from approximately a 31.4-acre 18% impervious area consisting of paved access roads. Catch basins direct stormwater from the facility's paved rectangular pad to a retention basin prior to discharging to the Monongahela River. The retention basin also receives any water generated due to the surface mining operation. HTEC's Stormwater Plan is shown in Attachment D. No chemicals or bulk materials are exposed to precipitation. BMPs conducted within the drainage area include proper vehicle maintenance, material storage, training, and procedures. HTEC has not reported any discharges at Outfall 002 since the facility began operations in 2021.

## Technology-Based Limitations

### Stormwater Technology Limits

Outfall 002 will be subject to PAG-03 General Stormwater Permit conditions as a minimum requirement because the outfall discharges stormwater. The SIC codes for the site is 4911 (Trans. & Utilities - Electric Services) and the corresponding appendix of the PAG-03 that would apply to the facility is Appendix H. The reporting requirements applicable to stormwater discharges are shown in Table 19 below. Along with the monitoring requirements, sector specific BMPs included in Appendix H (Steam Electric Generating Facilities) of the PAG-03 will also be included in Part C of the Draft Permit.

**Table 19: PAG-03 Appendix H Monitoring Requirements**

| Parameters | Average Monthly (mg/L) | Daily Maximum (mg/L) | Benchmark Values (mg/L) | Monitoring Requirements | |
|---|---|---|---|---|---|
| | | | | Monitoring Frequency | Sample Type |
| Nitrogen, total | - | Monitor & Report | - | 1/6 Months | Calculation(1) |
| Phosphorus, total | - | Monitor & Report | - | 1/6 Months | Grab |
| pH | - | Monitor & Report | 9.0 | 1/6 Months | Grab |
| Total Suspended Solids | - | Monitor & Report | 100 | 1/6 Months | Grab |
| Oil and Grease | - | Monitor & Report | 30 | 1/6 Months | Grab |
| Iron, total | - | Monitor & Report | - | 1/6 Months | Grab |

1. Total Nitrogen is the sum of Total Kjeldahl-N (TKN) plus Nitrite-Nitrate as N (NO2+NO3-N), where TKN and NO2+NO3-N are measured in the same sample.

## Water Quality-Based Limitations

### Stormwater WQBELs

Water quality analyses are typically performed under low-flow (Q7-10) conditions. Stormwater discharges occur at variable rates and frequencies but not however during Q7-10 conditions. Since the discharges from Outfall 002 are composed entirely of stormwater, a formal water quality analysis cannot be accurately conducted. Accordingly, water quality-based effluent limitations based on water quality analyses are not proposed.

## Anti-Backsliding

The monitoring requirements in Table 20 below are from the current permit, issued on January 12, 2022. Previous effluent limits and monitoring requirements can be used pursuant to EPA's anti-backsliding regulation, 40 CFR 122.44(l). No discharges have been reported at Outfall 002 since the facility began operations. Module 1 of the permit application

reported “no discharge” for Outfall 002’s stormwater sampling results. Flow and aluminum monitoring have been removed from Outfall 002, since they are not included in PAG-03 Appendix H reporting requirements.

| Table 20: Current Permit Effluent Limitations – Outfall 002 | | | | | |
|---|---|---|---|---|---|
| **Parameters** | **Average Monthly** | **Maximum Daily** | **Units** | **Monitoring Requirements** | |
| | | | | **Monitoring Frequency** | **Sample Type** |
| Flow | - | Report | MGD | 1/6 months | Estimated |
| pH | Not less than 6.0 nor greater than 9.0 at all times | | S.U. | 1/6 months | Grab |
| Total Suspended Solids | - | Report | mg/L | 1/6 months | Grab |
| Oil and Grease | - | Report | mg/L | 1/6 months | Grab |
| Iron, total | - | Report | mg/L | 1/6 months | Grab |
| Aluminum, total | - | Report | mg/L | 1/6 months | Grab |

## Proposed Effluent Limitations and Monitoring Requirements

Monitoring requirements applicable at Outfall 002 are the most stringent of Technology-Based Effluent Monitoring and Limitations and the current permit’s effluent monitoring and limitations. The proposed monitoring requirements are displayed below in Table 21.

A Part C condition is included in the Draft Permit requiring submission of a Corrective Action Plan when there are two consecutive exceedances of the benchmark values. The benchmark values are displayed below in Table 6 and included in the Part C condition. These values are from EPA’S 2021 Multisector General Permit document and are not effluent limitations. Exceedance of the benchmark values is not a violation. If there are two consecutive exceedances of the benchmark value, a Corrective Action Plan must be conducted to evaluate site stormwater controls and BMPs. Benchmark monitoring is a feedback tool, along with routine inspections and visual assessments, for assessing the effectiveness of stormwater controls and BMPs. An exceedance of the benchmark provides permittees with an indication that the facility’s controls may not be sufficiently controlling pollutants in stormwater.

| Table 21: Proposed Effluent Monitoring Requirements – Outfall 002 | | | | |
|---|---|---|---|---|
| **Parameters** | **Maximum Daily** | **Benchmark Values** | **Monitoring Requirements** | |
| | | | **Monitoring Frequency** | **Sample Type** |
| pH (S.U.) | Monitor & Report | 9.0 | 1/6 months | Grab |
| Total Suspended Solids (mg/L) | Monitor & Report | 100 | 1/6 months | Grab |
| Oil and Grease (mg/L) | Monitor & Report | 30 | 1/6 months | Grab |
| Iron, total (mg/L) | Monitor & Report | - | 1/6 months | Grab |
| Nitrogen, total (mg/L) | Monitor & Report | - | 1/6 months | Calculation[1] |
| Phosphorus, total (mg/L) | Monitor & Report | - | 1/6 months | Grab |

1. Total Nitrogen is the sum of Total Kjeldahl-N (TKN) plus Nitrite-Nitrate as N (NO2+NO3-N), where TKN and NO2+NO3-N are measured in the same sample.

| Tools and References Used to Develop Permit | |
|---|---|
| | |
| ☐ | WQM for Windows Model (see Attachment ) |
| ☒ | Toxics Management Spreadsheet (see Attachment **H**) |
| ☒ | TRC Model Spreadsheet (see Attachment **J**) |
| ☒ | Temperature Model Spreadsheet (see Attachment **I**) |
| ☐ | Water Quality Toxics Management Strategy, 361-0100-003, 4/06. |
| ☒ | Technical Guidance for the Development and Specification of Effluent Limitations, 386-0400-001, 10/97. |
| ☐ | Policy for Permitting Surface Water Diversions, 386-2000-019, 3/98. |
| ☐ | Policy for Conducting Technical Reviews of Minor NPDES Renewal Applications, 386-2000-018, 11/96. |
| ☐ | Technology-Based Control Requirements for Water Treatment Plant Wastes, 386-2183-001, 10/97. |
| ☒ | Technical Guidance for Development of NPDES Permit Requirements Steam Electric Industry, 386-2183-002, 12/97. |
| ☐ | Pennsylvania CSO Policy, 386-2000-002, 9/08. |
| ☐ | Water Quality Antidegradation Implementation Guidance, 391-0300-002, 11/03. |
| ☐ | Implementation Guidance Evaluation & Process Thermal Discharge (316(a)) Federal Water Pollution Act, 386-2000-008, 4/97. |
| ☒ | Determining Water Quality-Based Effluent Limits, 386-2000-004, 12/97. |
| ☐ | Implementation Guidance Design Conditions, 386-2000-007, 9/97. |
| ☐ | Technical Reference Guide (TRG) WQM 7.0 for Windows, Wasteload Allocation Program for Dissolved Oxygen and Ammonia Nitrogen, Version 1.0, 386-2000-016, 6/2004. |
| ☐ | Interim Method for the Sampling and Analysis of Osmotic Pressure on Streams, Brines, and Industrial Discharges, 386-2000-012, 10/1997. |
| ☐ | Implementation Guidance for Section 95.6 Management of Point Source Phosphorus Discharges to Lakes, Ponds, and Impoundments, 386-2000-009, 3/99. |
| ☒ | Technical Reference Guide (TRG) PENTOXSD for Windows, PA Single Discharge Wasteload Allocation Program for Toxics, Version 2.0, 386-2000-015, 5/2004. |
| ☐ | Implementation Guidance for Section 93.7 Ammonia Criteria, 386-2000-022, 11/97. |
| ☐ | Policy and Procedure for Evaluating Wastewater Discharges to Intermittent and Ephemeral Streams, Drainage Channels and Swales, and Storm Sewers, 386-2000-013, 4/2008. |
| ☒ | Implementation Guidance Total Residual Chlorine (TRC) Regulation, 386-2000-011, 11/1994. |
| ☒ | Implementation Guidance for Temperature Criteria, 386-2000-001, 4/09. |
| ☐ | Implementation Guidance for Section 95.9 Phosphorus Discharges to Free Flowing Streams, 386-2000-021, 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, 386-2000-020, 10/97. |
| ☐ | Field Data Collection and Evaluation Protocol for Determining Stream and Point Source Discharge Design Hardness, 386-2000-005, 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, 386-2000-010, 3/1999. |
| ☒ | Design Stream Flows, 386-2000-003, 9/98. |
| ☐ | Field Data Collection and Evaluation Protocol for Deriving Daily and Hourly Discharge Coefficients of Variation (CV) and Other Discharge Characteristics, 386-2000-006, 10/98. |
| ☐ | Evaluations of Phosphorus Discharges to Lakes, Ponds and Impoundments, 386-3200-001, 6/97. |
| ☐ | Pennsylvania's Chesapeake Bay Tributary Strategy Implementation Plan for NPDES Permitting, 4/07. |
| ☒ | SOP: Establishing Effluent Limitations for Individual Industrial Permits; Individual NPDES Permit Applications; General Water Quality Criteria Implementation |
| ☒ | Other: EPA's Interim Guidance for Performance-Based Reduction of NPDES Permit Monitoring Frequencies |

## Attachments

Attachment A: Site Location

Attachment B: Site Plan

Attachment C: Process Flow Diagram

Attachment D: Stormwater Plan

Attachment E: Cooling Water Intake Structure Plan

Attachment F: Outfall 001 StreamStats Report

Attachment G: Outfall 002 StreamStats Report

Attachment H: Outfall 001 Toxics Management Spreadsheet Model Output

Attachment I: Outfall 001 Thermal Discharge Evaluation

Attachment J: TRC Evaluation

# ATTACHMENT A:

Site Location

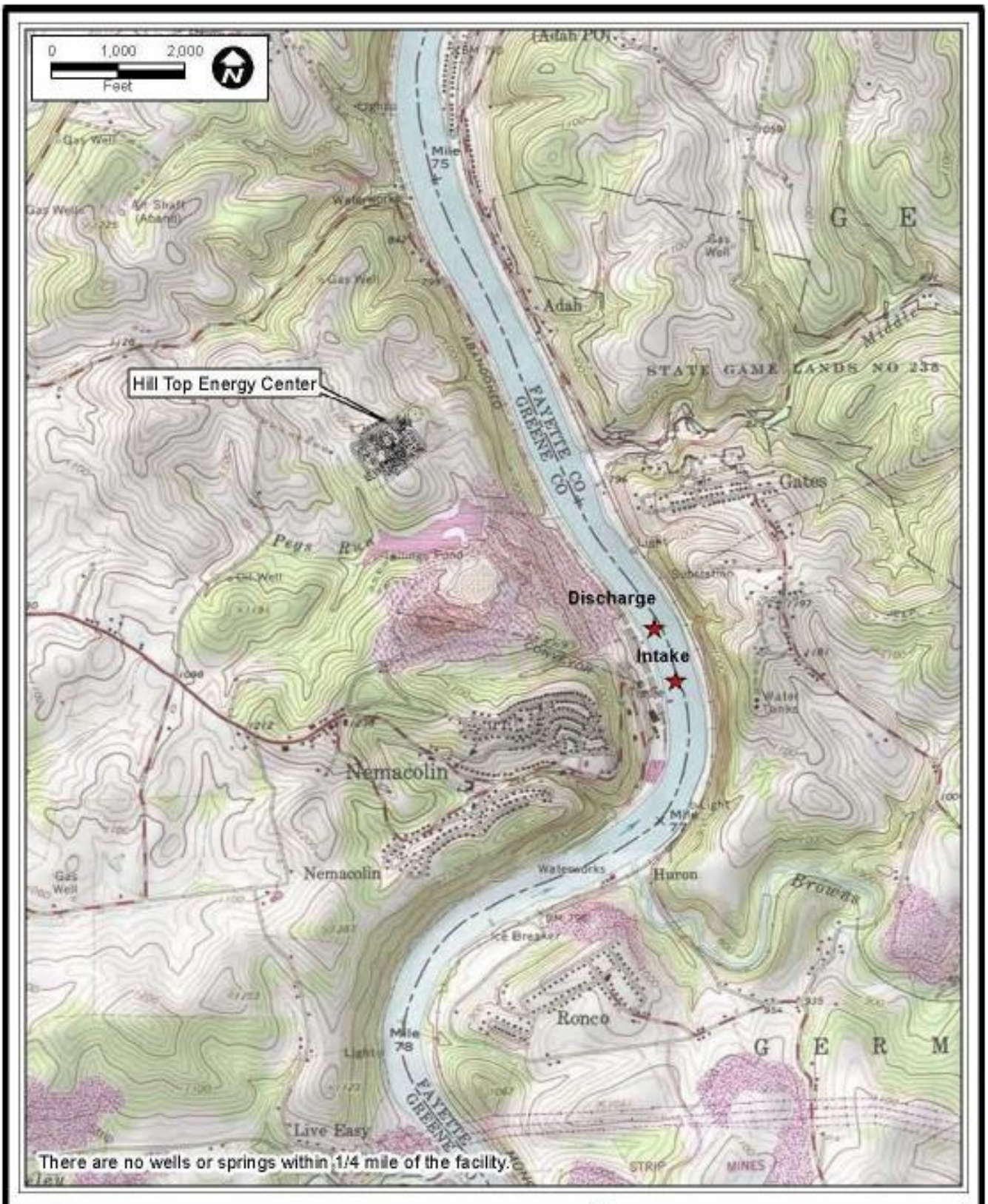



FIGURE 1.
SITE LOCATION
HILL TOP ENERGY CENTER
GREENE COUNTY, PA

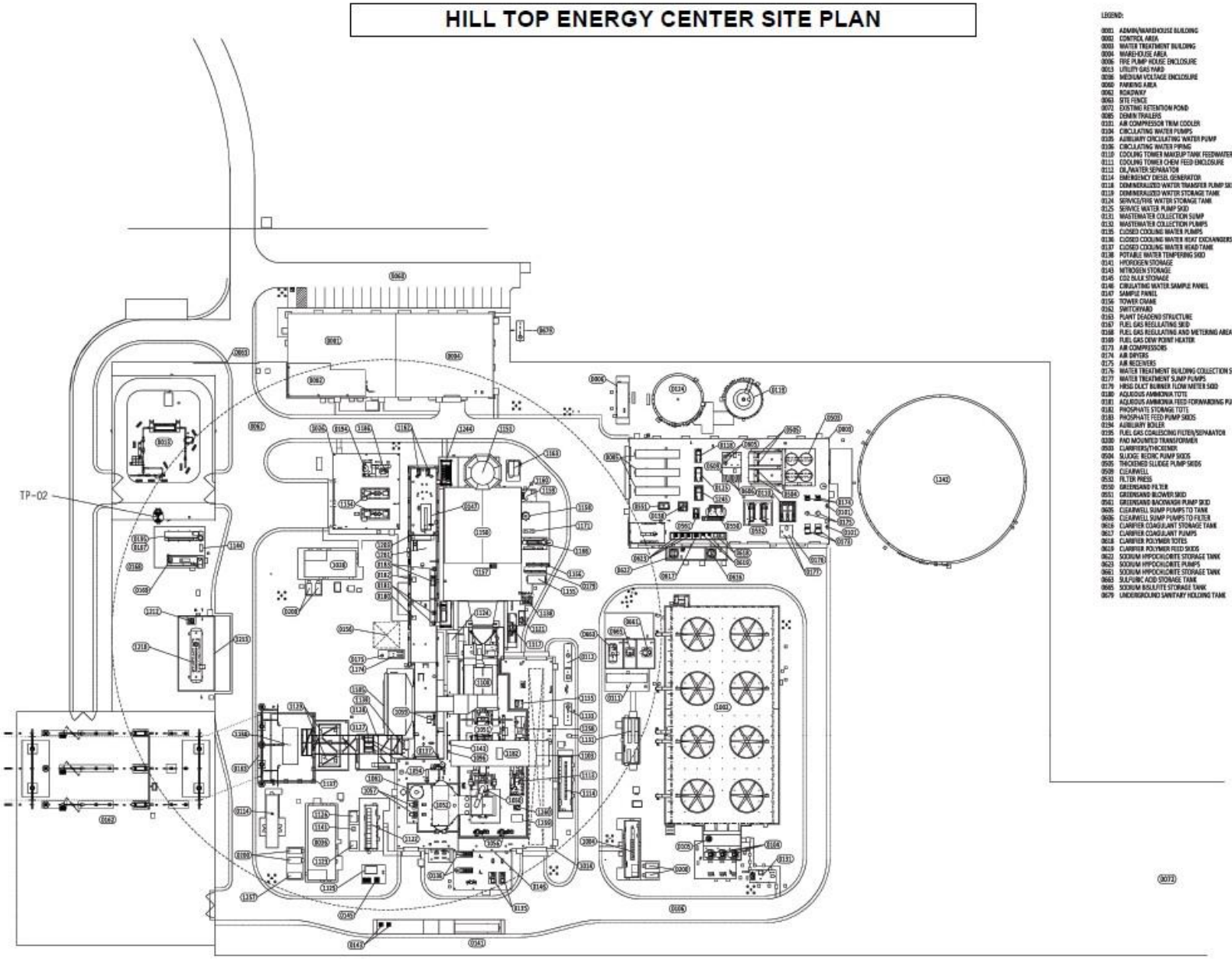
Sources: Esri Basemap Imagery; Fluor, 2016; ECT, 2016.

ECT Environmental Consulting & Technology, Inc.

# ATTACHMENT B:

Site Plan

# HILL TOP ENERGY CENTER SITE PLAN

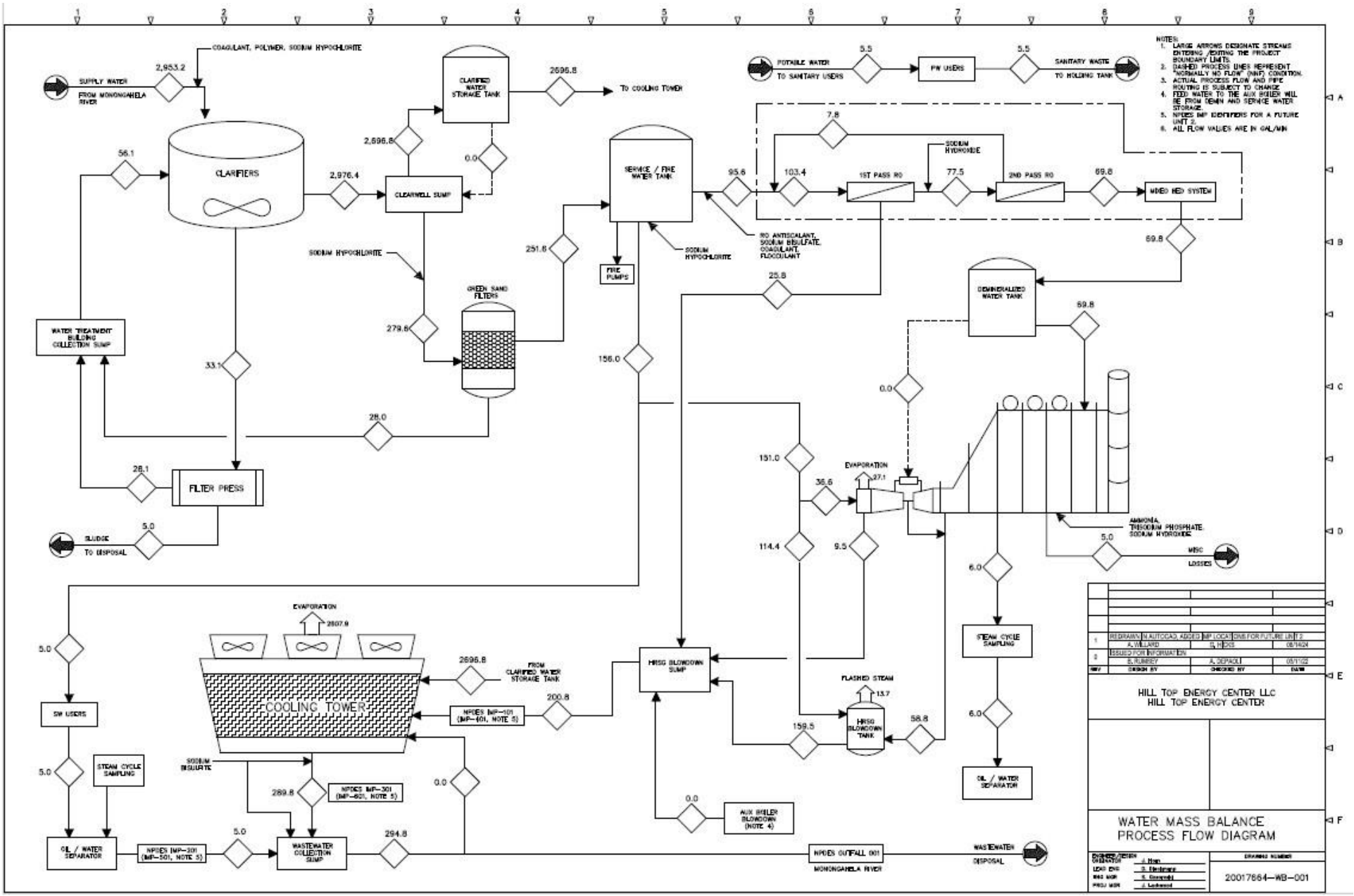



LEGEND:

8001 ADMIN/WAREHOUSE BUILDING
8002 CONTROL AREA
8003 WATER TREATMENT BUILDING
8004 WAREHOUSE AREA
8006 FIRE PUMP HOUSE ENCLOSURE
8013 UTILITY GAS YARD
8036 MEDIUM VOLTAGE ENCLOSURE
8060 PARKING AREA
8061 ROADWAY
8062 SITE FENCE
8072 EXISTING RETENTION POND
8085 DEMIN TRAILERS
0101 AIR COMPRESSOR TRIM COOLER
0104 CIRCULATING WATER PUMPS
0105 AUXILIARY CIRCULATING WATER PUMP
0106 CIRCULATING WATER PIPING
0110 COOLING TOWER MAKEUP TANK FEEDWATER PUMP SKID
0111 COOLING TOWER CHEM FEED ENCLOSURE
0112 OIL/WATER SEPARATOR
0114 EMERGENCY DIESEL GENERATOR
0116 DEMINERALIZED WATER TRANSFER PUMP SKID
0118 DEMINERALIZED WATER STORAGE TANK
0124 SERVICE/FIRE WATER STORAGE TANK
0125 SERVICE WATER PUMP SKID
0131 WASTEWATER COLLECTION SUMP
0132 WASTEWATER COLLECTION PUMPS
0135 CLOSED COOLING WATER PUMPS
0136 CLOSED COOLING WATER HEAT EXCHANGERS
0137 CLOSED COOLING WATER HEAD TANK
0138 POTABLE WATER TEMPERING SKID
0141 HYDROGEN STORAGE
0143 NITROGEN STORAGE
0145 CO2 BULK STORAGE
0146 CIRULATING WATER SAMPLE PANEL
0147 SAMPLE PANEL
0156 TOWER CRANE
0162 SWITCHYARD
0163 PLANT DEADEND STRUCTURE
0167 FUEL GAS REGULATING SKID
0168 FUEL GAS REGULATING AND METERING AREA
0169 FUEL GAS DEW POINT HEATER
0171 AIR COMPRESSORS
0174 AIR DRYERS
0175 AIR RECEIVERS
0176 WATER TREATMENT BUILDING COLLECTION SUMP
0177 WATER TREATMENT SUMP PUMPS
0179 HRSG DUCT BURNER FLOW METER SKID
0180 AQUEOUS AMMONIA TOTE
0181 AQUEOUS AMMONIA FEED FORWARDING PUMPS
0182 PHOSPHATE STORAGE TOTE
0183 PHOSPHATE FEED PUMP SKIDS
0194 AUXILIARY BOILER
0195 FUEL GAS COALESCING FILTER/SEPARATOR
0200 PAD MOUNTED TRANSFORMER
0503 CLARIFIERS/THICKENER
0504 SLUDGE RECIRC PUMP SKIDS
0505 THICKENED SLUDGE PUMP SKIDS
0509 CLEARWELL
0532 FILTER PRESS
0550 GREENSAND FILTER
0551 GREENSAND BLOWER SKID
0561 GREENSAND BACKWASH PUMP SKID
0605 CLEARWELL SUMP PUMPS TO TANK
0606 CLEARWELL SUMP PUMPS TO FILTER
0615 CLARIFIER COAGULANT STORAGE TANK
0617 CLARIFIER COAGULANT PUMPS
0618 CLARIFIER POLYMER TOTES
0619 CLARIFIER POLYMER FEED SKIDS
0622 SODIUM HYPOCHLORITE STORAGE TANK
0623 SODIUM HYPOCHLORITE PUMPS
0661 SODIUM HYPOCHLORITE STORAGE TANK
0663 SULFURIC ACID STORAGE TANK
0665 SODIUM BISULFITE STORAGE TANK
0675 UNDERGROUND SANITARY HOLDING TANK
1803 COOLING TOWER
1804 COOLING TOWER ELECTRICAL ENCLOSURE
1814 TURBINE BUILDING
1826 BOILER FEEDWATER PUMP/AUXILIARY BOILER BUILDING
1828 HRSG ELECTRICAL ENCLOSURE (MCC)
1850 STEAM TURBINE
1851 TURBINE GENERATOR
1852 CONDENSER
1854 GLAND STEAM CONDENSER
1856 CONDENSER VACUUM PUMP SKIDS
1857 CONDENSATE PUMPS
1859 ELECTRIC STEAM SUPERHEATER
1861 STEAM DRAINS TANK
1896 HYDROGEN CONTROL PANEL
1900 COMBUSTION TURBINE
1303 GENERATOR REMOVAL AREA
1305 AIR INLET
1313 COMBINED LUBE OIL, HYDRAULIC OIL, AND SEAL OIL MODULE
1314 PACKAGED ELECTRICAL ELECTRONIC CONTROL CENTER (PEECC)
1317 FUEL GAS PERFORMANCE HEAT EXCHANGER
1321 CT FUEL GAS DRAINS TANK
1322 LCI AND EXCITATION COMPARTMENT
1323 DC LINK REACTOR
1324 COMBUSTION TURBINE WATER MIST SKID
1325 ISOLATION TRANSFORMER
1326 EXCITATION TRANSFORMER
1327 GENERATOR BREAKER
1328 ISO PHASE BUS DUCT
1337 UAT TRANSFORMER
1338 STEP-UP TRANSFORMER
1339 BATTERY COMPARTMENT
1339 COMBUSTION TURBINE DRAINS TANK
1339 CT WATER WASH SKID
1337 PLANT EQUIPMENT FIRE WALL
1338 FUEL GAS ABSOLUTE SEPARATOR
1339 VT SURGE CUBICLE
1340 AC LINK REACTOR
1343 GAS DRYER
1344 FUEL GAS CHROMATOGRAPH
1350 HRSG
1351 STACK
1354 BOILER FEED WATER PUMPS
1355 DUCT BURNER PRESSURE REDUCING SKID
1356 LP FUEL GAS REGULATING SKID
1357 SCANNER COOLING AIR BLOWER
1358 HRSG BLOWDOWN TANK
1359 HRSG BLOWDOWN SUMP
1360 HRSG BLOWDOWN SUMP PUMP
1362 FINFITS RECIRC PUMPS
1363 CEMS ENCLOSURE
1367 SEAL OIL SUPPLY PANEL
1368 AQUEOUS AMMONIA FLOW CONTROL UNIT
1369 SEAL OIL DRAIN PANEL
1371 SCR REMOVAL AREA
1374 EVAPORATIVE COOLER
1382 BRIDGE CRANE
1398 AUXILIARY BOILER DEAERATOR
1203 PIPE RACK
1210 AQUEOUS AMMONIA STORAGE TANK
1212 AQUEOUS AMMONIA FORWARDING PUMPS
1213 AQUEOUS AMMONIA CONTAINMENT
1215 SULFURIC ACID DILUTION TROUGH
1342 CLARIFIED WATER STORAGE TANK
1244 HRSG STAIR TOWERS
1245 DEMINERALIZED MAKEUP WATER PUMP SKID
1253 RAW WATER PUMPS (OFF PAGE)
1254 MASTER WATER DISCHARGE BOX (OFF PAGE)
1257 ALTERNATE FEED TRANSFORMER
1258 STATOR COOLING WATER UNIT
1259 FORCED COOLING AIR SKID
1260 LUBE OIL PURIFIER
1261 LAB (OWNER SUPPLIED)

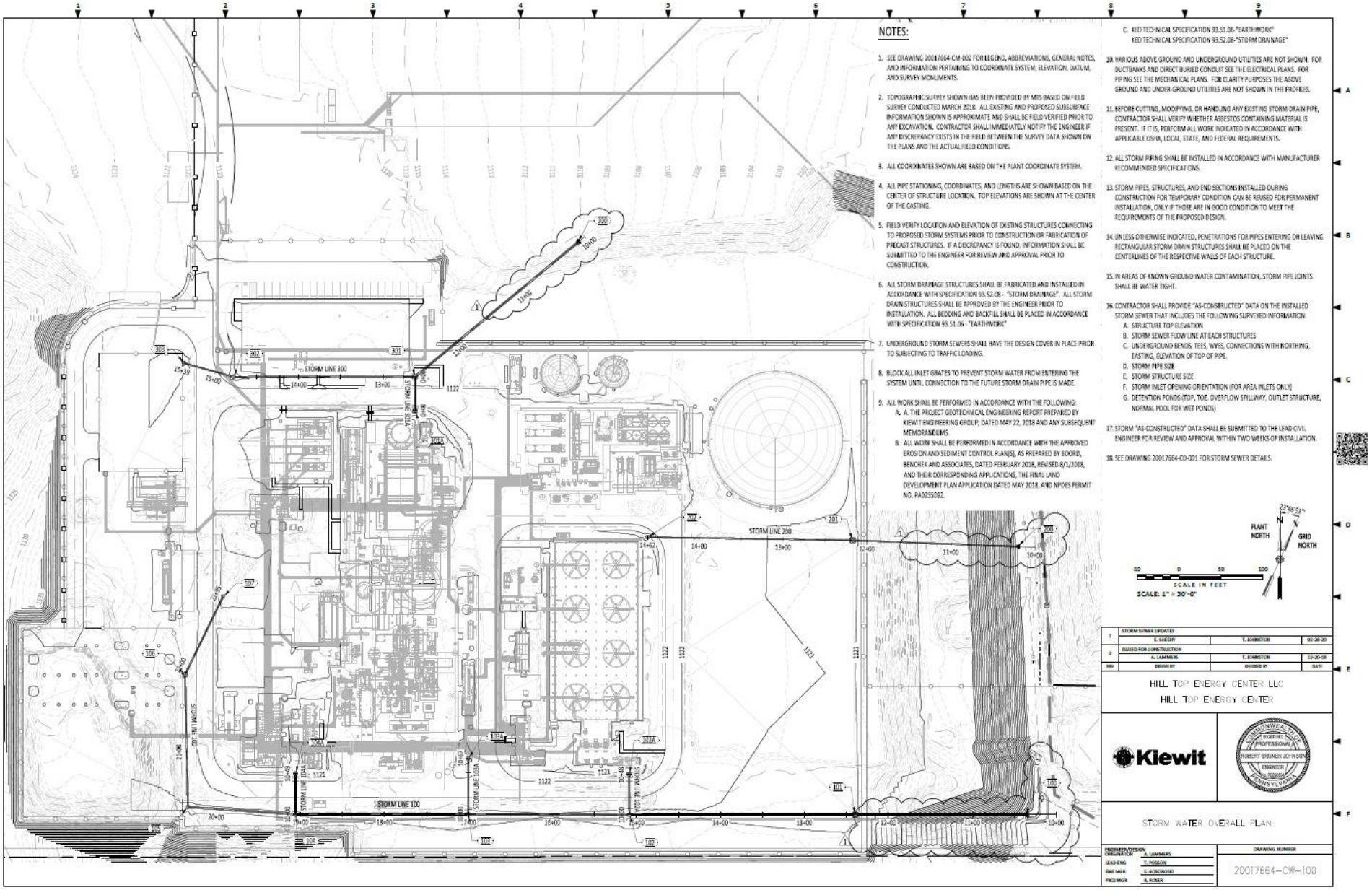
# ATTACHMENT C:

Process Flow Diagram


COAGULANT, POLYMER, SODIUM HYPOCHLORITE
SUPPLY WATER FROM MONONGAHELA RIVER
2,953.2
CLARIFIERS
56.1
2,976.4
CLEARWELL SUMP
CLARIFIED WATER STORAGE TANK
2,696.8
0.0
2696.8
TO COOLING TOWER
POTABLE WATER TO SANITARY USERS
5.5
PW USERS
SANITARY WASTE TO HOLDING TANK
NOTES:
1. LARGE ARROWS DESIGNATE STREAMS ENTERING/EXITING THE PROJECT BOUNDARY LIMITS.
2. DASHED PROCESS LINES REPRESENT "NORMALLY NO FLOW" (NNF) CONDITION.
3. ACTUAL PROCESS FLOW AND PIPE ROUTING IS SUBJECT TO CHANGE.
4. FEED WATER TO THE AUX BOILER WILL BE FROM DEMIN AND SERVICE WATER STORAGE.
5. NPDES IMP IDENTIFIERS FOR A FUTURE UNIT 2.
6. ALL FLOW VALUES ARE IN GAL/MIN
SERVICE / FIRE WATER TANK
95.6
7.8
103.4
SODIUM HYDROXIDE
1ST PASS RO
77.5
2ND PASS RO
69.8
MIXED BED SYSTEM
69.8
RO ANTISCALANT, SODIUM BISULFATE, COAGULANT, FLOCCULANT
SODIUM HYPOCHLORITE
251.6
FIRE PUMPS
SODIUM HYPOCHLORITE
GREEN SAND FILTERS
279.6
25.8
DEMINERALIZED WATER TANK
69.8
WATER TREATMENT BUILDING COLLECTION SUMP
33.1
156.0
0.0
28.0
28.1
FILTER PRESS
SLUDGE TO DISPOSAL
5.0
151.0
EVAPORATION
27.1
36.6
114.4
9.5
AMMONIA, TRISODIUM PHOSPHATE, SODIUM HYDROXIDE
5.0
MISC LOSSES
6.0
EVAPORATION
2607.9
5.0
SW USERS
5.0
STEAM CYCLE SAMPLING
OIL / WATER SEPARATOR
NPDES IMP-101 (IMP-501, NOTE 5)
5.0
WASTEWATER COLLECTION SUMP
294.8
2696.8
FROM CLARIFIED WATER STORAGE TANK
COOLING TOWER
SODIUM BISULFITE
289.8
NPDES IMP-101 (IMP-501, NOTE 5)
NPDES IMP-101 (IMP-401, NOTE 5)
200.8
0.0
HRSG BLOWDOWN SUMP
FLASHED STEAM
13.7
159.5
HRSG BLOWDOWN TANK
58.8
0.0
AUX BOILER BLOWDOWN (NOTE 4)
STEAM CYCLE SAMPLING
6.0
OIL / WATER SEPARATOR
NPDES OUTFALL 001
MONONGAHELA RIVER
WASTEWATER DISPOSAL
HILL TOP ENERGY CENTER LLC
HILL TOP ENERGY CENTER
WATER MASS BALANCE
PROCESS FLOW DIAGRAM
20017664-WB-001

# ATTACHMENT D:

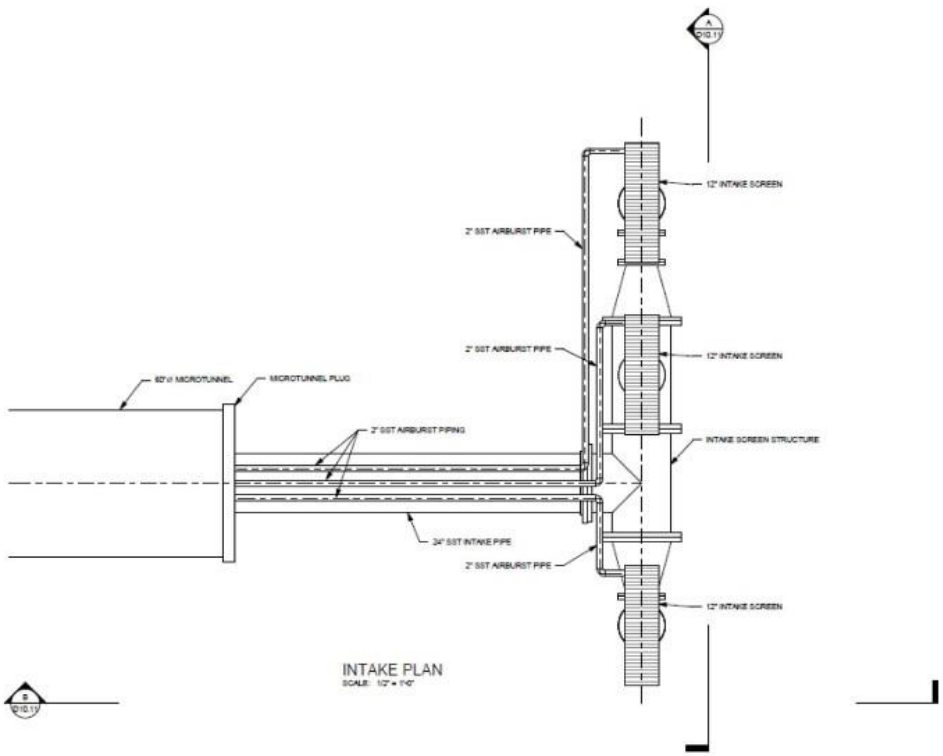
Stormwater Plan

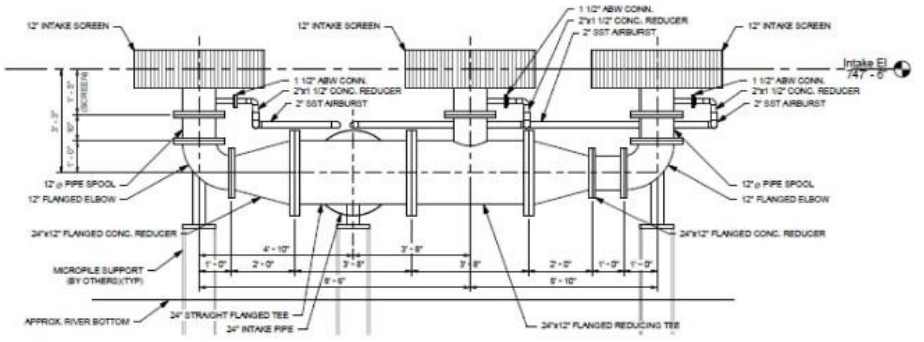

NOTES:
1. SEE DRAWING 20017664-CM-002 FOR LEGEND, ABBREVIATIONS, GENERAL NOTES, AND INFORMATION PERTAINING TO COORDINATE SYSTEM, ELEVATION, DATUM, AND SURVEY MONUMENTS.
2. TOPOGRAPHIC SURVEY SHOWN HAS BEEN PROVIDED BY MTS BASED ON FIELD SURVEY CONDUCTED MARCH 2018. ALL EXISTING AND PROPOSED SUBSURFACE INFORMATION SHOWN IS APPROXIMATE AND SHALL BE FIELD VERIFIED PRIOR TO ANY EXCAVATION. CONTRACTOR SHALL IMMEDIATELY NOTIFY THE ENGINEER IF ANY DISCREPANCY EXISTS IN THE FIELD BETWEEN THE SURVEY DATA SHOWN ON THE PLANS AND THE ACTUAL FIELD CONDITIONS.
3. ALL COORDINATES SHOWN ARE BASED ON THE PLANT COORDINATE SYSTEM.
4. ALL PIPE STATIONING, COORDINATES, AND LENGTHS ARE SHOWN BASED ON THE CENTER OF STRUCTURE LOCATION. TOP ELEVATIONS ARE SHOWN AT THE CENTER OF THE CASTING.
5. FIELD VERIFY LOCATION AND ELEVATION OF EXISTING STRUCTURES CONNECTING TO PROPOSED STORM SYSTEMS PRIOR TO CONSTRUCTION OR FABRICATION OF PRECAST STRUCTURES. IF A DISCREPANCY IS FOUND, INFORMATION SHALL BE SUBMITTED TO THE ENGINEER FOR REVIEW AND APPROVAL PRIOR TO CONSTRUCTION.
6. ALL STORM DRAINAGE STRUCTURES SHALL BE FABRICATED AND INSTALLED IN ACCORDANCE WITH SPECIFICATION 93.52.08 - "STORM DRAINAGE". ALL STORM DRAIN STRUCTURES SHALL BE APPROVED BY THE ENGINEER PRIOR TO INSTALLATION. ALL BEDDING AND BACKFILL SHALL BE PLACED IN ACCORDANCE WITH SPECIFICATION 93.51.06 - "EARTHWORK"
7. UNDERGROUND STORM SEWERS SHALL HAVE THE DESIGN COVER IN PLACE PRIOR TO SUBJECTING TO TRAFFIC LOADING.
8. BLOCK ALL INLET GRATES TO PREVENT STORM WATER FROM ENTERING THE SYSTEM UNTIL CONNECTION TO THE FUTURE STORM DRAIN PIPE IS MADE.
9. ALL WORK SHALL BE PERFORMED IN ACCORDANCE WITH THE FOLLOWING:
A. THE PROJECT GEOTECHNICAL ENGINEERING REPORT PREPARED BY KIEWIT ENGINEERING GROUP, DATED MAY 22, 2018 AND ANY SUBSEQUENT MEMORANDUMS.
B. ALL WORK SHALL BE PERFORMED IN ACCORDANCE WITH THE APPROVED EROSION AND SEDIMENT CONTROL PLAN(S), AS PREPARED BY BOORD, BENCHEK AND ASSOCIATES, DATED FEBRUARY 2018, REVISED 8/1/2018, AND THEIR CORRESPONDING APPLICATIONS, THE FINAL LAND DEVELOPMENT PLAN APPLICATION DATED MAY 2018, AND NPDES PERMIT NO. PA0255092.
C. KED TECHNICAL SPECIFICATION 93.51.06-"EARTHWORK"
KED TECHNICAL SPECIFICATION 93.52.08-"STORM DRAINAGE"
10. VARIOUS ABOVE GROUND AND UNDERGROUND UTILITIES ARE NOT SHOWN. FOR DUCTBANKS AND DIRECT BURIED CONDUIT SEE THE ELECTRICAL PLANS. FOR PIPING SEE THE MECHANICAL PLANS. FOR CLARITY PURPOSES THE ABOVE GROUND AND UNDER-GROUND UTILITIES ARE NOT SHOWN IN THE PROFILES.
11. BEFORE CUTTING, MODIFYING, OR HANDLING ANY EXISTING STORM DRAIN PIPE, CONTRACTOR SHALL VERIFY WHETHER ASBESTOS CONTAINING MATERIAL IS PRESENT. IF IT IS, PERFORM ALL WORK INDICATED IN ACCORDANCE WITH APPLICABLE OSHA, LOCAL, STATE, AND FEDERAL REQUIREMENTS.
12. ALL STORM PIPING SHALL BE INSTALLED IN ACCORDANCE WITH MANUFACTURER RECOMMENDED SPECIFICATIONS.
13. STORM PIPES, STRUCTURES, AND END SECTIONS INSTALLED DURING CONSTRUCTION FOR TEMPORARY CONDITION CAN BE REUSED FOR PERMANENT INSTALLATION, ONLY IF THOSE ARE IN GOOD CONDITION TO MEET THE REQUIREMENTS OF THE PROPOSED DESIGN.
14. UNLESS OTHERWISE INDICATED, PENETRATIONS FOR PIPES ENTERING OR LEAVING RECTANGULAR STORM DRAIN STRUCTURES SHALL BE PLACED ON THE CENTERLINES OF THE RESPECTIVE WALLS OF EACH STRUCTURE.
15. IN AREAS OF KNOWN GROUND WATER CONTAMINATION, STORM PIPE JOINTS SHALL BE WATER TIGHT.
16. CONTRACTOR SHALL PROVIDE "AS-CONSTRUCTED" DATA ON THE INSTALLED STORM SEWER THAT INCLUDES THE FOLLOWING SURVEYED INFORMATION:
A. STRUCTURE TOP ELEVATION
B. STORM SEWER FLOW LINE AT EACH STRUCTURES
C. UNDERGROUND BENDS, TEES, WYES, CONNECTIONS WITH NORTHING, EASTING, ELEVATION OF TOP OF PIPE.
D. STORM PIPE SIZE
E. STORM STRUCTURE SIZE
F. STORM INLET OPENING ORIENTATION (FOR AREA INLETS ONLY)
G. DETENTION PONDS (TOP, TOE, OVERFLOW SPILLWAY, OUTLET STRUCTURE, NORMAL POOL FOR WET PONDS)
17. STORM "AS-CONSTRUCTED" DATA SHALL BE SUBMITTED TO THE LEAD CIVIL ENGINEER FOR REVIEW AND APPROVAL WITHIN TWO WEEKS OF INSTALLATION.
18. SEE DRAWING 20017664-CD-001 FOR STORM SEWER DETAILS.
STORM LINE 300
STORM LINE 200
STORM LINE 100
PLANT NORTH
GRID NORTH
SCALE IN FEET
SCALE: 1" = 50'-0"
STORM SEWER UPDATES
ISSUED FOR CONSTRUCTION
HILL TOP ENERGY CENTER LLC
HILL TOP ENERGY CENTER
Kiewit
STORM WATER OVERALL PLAN
20017664-CW-100
FEB 27, 2020 - 1:55pm DRAWING NAME: R:\PGEN\20017664-Hill_Top_Energy_Center\DES\CIV\CW-Storm_Water\20017664-CW-100.dwg

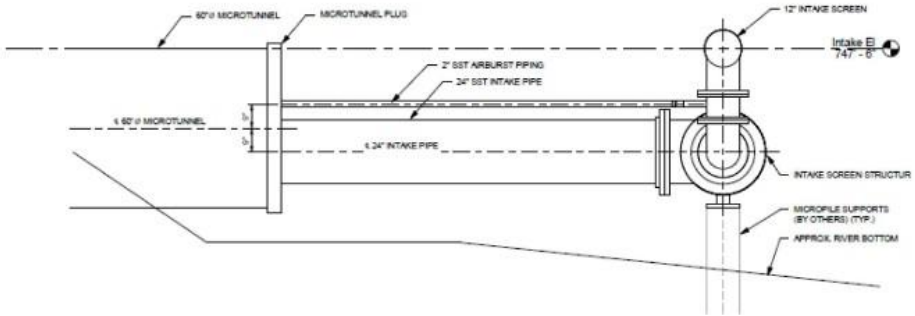
# ATTACHMENT E:

Cooling Water Intake Structure Plan

***Figure 1-2. Cooling Water Intake Structure Plan and Cross-section***




Source: 2020 Garney Construction Raw Water Intake Header and Screens - Final

Note: Installed screens are 14-inch diameter with 49-inch overall cylinder length

# ATTACHMENT F:

Outfall 001 StreamStats Report

## StreamStats Report

**Region ID:** PA
**Workspace ID:** PA20240710124438520000
**Clicked Point (Latitude, Longitude):** 39.88542, -79.91816
**Time:** 2024-07-10 08:45:03 -0400


Collapse All

### Basin Characteristics

| Parameter Code | Parameter Description | Value | Unit |
|---|---|---|---|
| DRNAREA | Area that drains to a point on a stream | 4550 | square miles |
| ELEV | Mean Basin Elevation | 1942 | 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 | 4550 | square miles | 2.26 | 1400 |
| ELEV | Mean Basin Elevation | 1942 | 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 | 617 | ft^3/s |
| 30 Day 2 Year Low Flow | 827 | ft^3/s |
| 7 Day 10 Year Low Flow | 350 | ft^3/s |

| Statistic | Value | Unit |
|---|---|---|
| 30 Day 10 Year Low Flow | 416 | ft^3/s |
| 90 Day 10 Year Low Flow | 629 | 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: 4.21.0
StreamStats Services Version: 1.2.22
NSS Services Version: 2.2.1

# ATTACHMENT G:

Outfall 002 StreamStats Report

# StreamStats Report

**Region ID:** PA
**Workspace ID:** PA20240710124859282000
**Clicked Point (Latitude, Longitude):** 39.89545, -79.92461
**Time:** 2024-07-10 08:49:25 -0400


Collapse All

## Basin Characteristics

| Parameter Code | Parameter Description | Value | Unit |
|---|---|---|---|
| DRNAREA | Area that drains to a point on a stream | 4560 | square miles |
| ELEV | Mean Basin Elevation | 1941 | 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 | 4560 | square miles | 2.26 | 1400 |
| ELEV | Mean Basin Elevation | 1941 | 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 | 618 | ft^3/s |
| 30 Day 2 Year Low Flow | 828 | ft^3/s |
| 7 Day 10 Year Low Flow | 351 | ft^3/s |
| 30 Day 10 Year Low Flow | 416 | ft^3/s |
| 90 Day 10 Year Low Flow | 630 | 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: 4.21.0
StreamStats Services Version: 1.2.22
NSS Services Version: 2.2.1

# ATTACHMENT H:

Outfall 001 Toxics Management Spreadsheet Model Output

# Discharge Information

Instructions | Discharge | Stream

Facility: Hill Top Energy Center NPDES Permit No.: PA0255092 Outfall No.: 001

Evaluation Type: Major Sewage / Industrial Waste Wastewater Description: Cooling tower blowdown and low volume w

| Discharge Characteristics | | | | | | | | |
|---|---|---|---|---|---|---|---|---|
| Design Flow (MGD)* | Hardness (mg/l)* | pH (SU)* | Partial Mix Factors (PMFs) | | | | Complete Mix Times (min) | |
| | | | AFC | CFC | THH | CRL | $Q_{7-10}$ | $Q_h$ |
| 1.3 | 463 | 9.2 | | 0.7 | 0.7 | 0.7 | | |

| | Discharge Pollutant | Units | Max Discharge Conc | | 0 if left blank: Trib Conc | 0 if left blank: Stream Conc | 0.5 if left blank: Daily CV | 0.5 if left blank: Hourly CV | 0 if left blank: Strea m CV | 0 if left blank: Fate Coeff | 0 if left blank: FOS | 1 if left blank: Criteri a Mod | 1 if left blank: Chem Transl |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Group 1 | Total Dissolved Solids (PWS) | mg/L | | 1830 | | | | | | | | | |
| | Chloride (PWS) | mg/L | | 274 | | | | | | | | | |
| | Bromide | mg/L | | 6.96 | | | | | | | | | |
| | Sulfate (PWS) | mg/L | | 1080 | | | | | | | | | |
| | Fluoride (PWS) | mg/L | | 0.477 | | | | | | | | | |
| Group 2 | Total Aluminum | µg/L | | 4900 | | | | | | | | | |
| | Total Antimony | µg/L | | 6.9 | | | | | | | | | |
| | Total Arsenic | µg/L | | 2 | | | | | | | | | |
| | Total Barium | µg/L | | 185 | | | | | | | | | |
| | Total Beryllium | µg/L | < | 5 | | | | | | | | | |
| | Total Boron | µg/L | | 371 | | | | | | | | | |
| | Total Cadmium | µg/L | < | 0.4 | | | | | | | | | |
| | Total Chromium (III) | µg/L | < | 5 | | | | | | | | | |
| | Hexavalent Chromium | µg/L | < | 10 | | | | | | | | | |
| | Total Cobalt | µg/L | < | 5 | | | | | | | | | |
| | Total Copper | µg/L | | 6 | | | | | | | | | |
| | Free Cyanide | µg/L | | | | | | | | | | | |
| | Total Cyanide | µg/L | | 14 | | | | | | | | | |
| | Dissolved Iron | µg/L | | 197 | | | | | | | | | |
| | Total Iron | µg/L | | 730 | | | | | | | | | |
| | Total Lead | µg/L | | 0.2 | | | | | | | | | |
| | Total Manganese | µg/L | | 99 | | | | | | | | | |
| | Total Mercury | µg/L | < | 0.2 | | | | | | | | | |
| | Total Nickel | µg/L | | 8 | | | | | | | | | |
| | Total Phenols (Phenolics) (PWS) | µg/L | < | 7.8 | | | | | | | | | |
| | Total Selenium | µg/L | | 3 | | | | | | | | | |
| | Total Silver | µg/L | | 0.3 | | | | | | | | | |
| | Total Thallium | µg/L | | 1 | | | | | | | | | |
| | Total Zinc | µg/L | | 39 | | | | | | | | | |
| | Total Molybdenum | µg/L | | 11 | | | | | | | | | |
| | Acrolein | µg/L | < | 4 | | | | | | | | | |
| | Acrylamide | µg/L | < | 10000 | | | | | | | | | |
| | Acrylonitrile | µg/L | < | 4 | | | | | | | | | |
| | Benzene | µg/L | < | 0.5 | | | | | | | | | |
| | Bromoform | µg/L | < | 0.5 | | | | | | | | | |

| | | | | | | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Group 3 | Carbon Tetrachloride | µg/L | < | 1 | | | | | | | | | |
| | Chlorobenzene | µg/L | < | 0.5 | | | | | | | | | |
| | Chlorodibromomethane | µg/L | | 0.71 | | | | | | | | | |
| | Chloroethane | µg/L | < | 1 | | | | | | | | | |
| | 2-Chloroethyl Vinyl Ether | µg/L | < | 5 | | | | | | | | | |
| | Chloroform | µg/L | | 7.3 | | | | | | | | | |
| | Dichlorobromomethane | µg/L | | 0.59 | | | | | | | | | |
| | 1,1-Dichloroethane | µg/L | < | 0.5 | | | | | | | | | |
| | 1,2-Dichloroethane | µg/L | < | 0.5 | | | | | | | | | |
| | 1,1-Dichloroethylene | µg/L | < | 0.5 | | | | | | | | | |
| | 1,2-Dichloropropane | µg/L | < | 0.5 | | | | | | | | | |
| | 1,3-Dichloropropylene | µg/L | < | 1 | | | | | | | | | |
| | 1,4-Dioxane | µg/L | < | 2.9 | | | | | | | | | |
| | Ethylbenzene | µg/L | < | 0.5 | | | | | | | | | |
| | Methyl Bromide | µg/L | < | 1 | | | | | | | | | |
| | Methyl Chloride | µg/L | < | 1 | | | | | | | | | |
| | Methylene Chloride | µg/L | < | 1 | | | | | | | | | |
| | 1,1,2,2-Tetrachloroethane | µg/L | < | 0.5 | | | | | | | | | |
| | Tetrachloroethylene | µg/L | < | 0.5 | | | | | | | | | |
| | Toluene | µg/L | < | 0.5 | | | | | | | | | |
| | 1,2-trans-Dichloroethylene | µg/L | < | 0.5 | | | | | | | | | |
| | 1,1,1-Trichloroethane | µg/L | < | 0.5 | | | | | | | | | |
| | 1,1,2-Trichloroethane | µg/L | < | 0.5 | | | | | | | | | |
| | Trichloroethylene | µg/L | < | 0.5 | | | | | | | | | |
| | Vinyl Chloride | µg/L | < | 1 | | | | | | | | | |
| Group 4 | 2-Chlorophenol | µg/L | < | 2.9 | | | | | | | | | |
| | 2,4-Dichlorophenol | µg/L | < | 2.9 | | | | | | | | | |
| | 2,4-Dimethylphenol | µg/L | < | 2.9 | | | | | | | | | |
| | 4,6-Dinitro-o-Cresol | µg/L | < | 5.9 | | | | | | | | | |
| | 2,4-Dinitrophenol | µg/L | < | 5.9 | | | | | | | | | |
| | 2-Nitrophenol | µg/L | < | 2.9 | | | | | | | | | |
| | 4-Nitrophenol | µg/L | < | 2.9 | | | | | | | | | |
| | p-Chloro-m-Cresol | µg/L | < | 1 | | | | | | | | | |
| | Pentachlorophenol | µg/L | < | 5.9 | | | | | | | | | |
| | Phenol | µg/L | < | 7.7 | | | | | | | | | |
| | 2,4,6-Trichlorophenol | µg/L | < | 2.9 | | | | | | | | | |
| Group 5 | Acenaphthene | µg/L | < | 1.5 | | | | | | | | | |
| | Acenaphthylene | µg/L | < | 1.5 | | | | | | | | | |
| | Anthracene | µg/L | < | 1.5 | | | | | | | | | |
| | Benzidine | µg/L | < | 3.9 | | | | | | | | | |
| | Benzo(a)Anthracene | µg/L | < | 1 | | | | | | | | | |
| | Benzo(a)Pyrene | µg/L | < | 1 | | | | | | | | | |
| | 3,4-Benzofluoranthene | µg/L | < | 1 | | | | | | | | | |
| | Benzo(ghi)Perylene | µg/L | < | 1.5 | | | | | | | | | |
| | Benzo(k)Fluoranthene | µg/L | < | 1 | | | | | | | | | |
| | Bis(2-Chloroethoxy)Methane | µg/L | < | 2.9 | | | | | | | | | |
| | Bis(2-Chloroethyl)Ether | µg/L | < | 1 | | | | | | | | | |
| | Bis(2-Chloroisopropyl)Ether | µg/L | < | 2.9 | | | | | | | | | |
| | Bis(2-Ethylhexyl)Phthalate | µg/L | < | 2.9 | | | | | | | | | |
| | 4-Bromophenyl Phenyl Ether | µg/L | < | 2.9 | | | | | | | | | |
| | Butyl Benzyl Phthalate | µg/L | < | 2.9 | | | | | | | | | |
| | 2-Chloronaphthalene | µg/L | < | 2.9 | | | | | | | | | |
| | 4-Chlorophenyl Phenyl Ether | µg/L | < | 2.9 | | | | | | | | | |
| | Chrysene | µg/L | < | 1 | | | | | | | | | |
| | Dibenzo(a,h)Anthrancene | µg/L | < | 1 | | | | | | | | | |
| | 1,2-Dichlorobenzene | µg/L | < | 1 | | | | | | | | | |
| | 1,3-Dichlorobenzene | µg/L | < | 1 | | | | | | | | | |
| | 1,4-Dichlorobenzene | µg/L | < | 1 | | | | | | | | | |
| | 3,3-Dichlorobenzidine | µg/L | < | 1 | | | | | | | | | |
| | Diethyl Phthalate | µg/L | < | 2.9 | | | | | | | | | |
| | Dimethyl Phthalate | µg/L | < | 2.9 | | | | | | | | | |
| | Di-n-Butyl Phthalate | µg/L | < | 2.9 | | | | | | | | | |
| | 2,4-Dinitrotoluene | µg/L | < | 2.9 | | | | | | | | | |

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|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | 2,6-Dinitrotoluene | µg/L | < | 2.9 | | | | | | | | | |
| | Di-n-Octyl Phthalate | µg/L | < | 2.9 | | | | | | | | | |
| | 1,2-Diphenylhydrazine | µg/L | < | 1 | | | | | | | | | |
| | Fluoranthene | µg/L | < | 15 | | | | | | | | | |
| | Fluorene | µg/L | < | 1.5 | | | | | | | | | |
| | Hexachlorobenzene | µg/L | < | 1 | | | | | | | | | |
| | Hexachlorobutadiene | µg/L | < | 2.9 | | | | | | | | | |
| | Hexachlorocyclopentadiene | µg/L | < | 1 | | | | | | | | | |
| | Hexachloroethane | µg/L | < | 2.9 | | | | | | | | | |
| | Indeno(1,2,3-cd)Pyrene | µg/L | < | 1 | | | | | | | | | |
| | Isophorone | µg/L | < | 2.9 | | | | | | | | | |
| | Naphthalene | µg/L | < | 1.5 | | | | | | | | | |
| | Nitrobenzene | µg/L | < | 2.9 | | | | | | | | | |
| | n-Nitrosodimethylamine | µg/L | < | 1 | | | | | | | | | |
| | n-Nitrosodi-n-Propylamine | µg/L | < | 1 | | | | | | | | | |
| | n-Nitrosodiphenylamine | µg/L | < | 1 | | | | | | | | | |
| | Phenanthrene | µg/L | < | 2.9 | | | | | | | | | |
| | Pyrene | µg/L | < | 1.5 | | | | | | | | | |
| | 1,2,4-Trichlorobenzene | µg/L | < | 2.9 | | | | | | | | | |
| Group 6 | Aldrin | µg/L | < | | | | | | | | | | |
| | alpha-BHC | µg/L | < | | | | | | | | | | |
| | beta-BHC | µg/L | < | | | | | | | | | | |
| | gamma-BHC | µg/L | < | | | | | | | | | | |
| | delta BHC | µg/L | < | | | | | | | | | | |
| | Chlordane | µg/L | < | | | | | | | | | | |
| | 4,4-DDT | µg/L | < | | | | | | | | | | |
| | 4,4-DDE | µg/L | < | | | | | | | | | | |
| | 4,4-DDD | µg/L | < | | | | | | | | | | |
| | Dieldrin | µg/L | < | | | | | | | | | | |
| | alpha-Endosulfan | µg/L | < | | | | | | | | | | |
| | beta-Endosulfan | µg/L | < | | | | | | | | | | |
| | Endosulfan Sulfate | µg/L | < | | | | | | | | | | |
| | Endrin | µg/L | < | | | | | | | | | | |
| | Endrin Aldehyde | µg/L | < | | | | | | | | | | |
| | Heptachlor | µg/L | < | | | | | | | | | | |
| | Heptachlor Epoxide | µg/L | < | | | | | | | | | | |
| | PCB-1016 | µg/L | < | | | | | | | | | | |
| | PCB-1221 | µg/L | < | | | | | | | | | | |
| | PCB-1232 | µg/L | < | | | | | | | | | | |
| | PCB-1242 | µg/L | < | | | | | | | | | | |
| | PCB-1248 | µg/L | < | | | | | | | | | | |
| | PCB-1254 | µg/L | < | | | | | | | | | | |
| | PCB-1260 | µg/L | < | | | | | | | | | | |
| | PCBs, Total | µg/L | < | | | | | | | | | | |
| | Toxaphene | µg/L | < | | | | | | | | | | |
| | 2,3,7,8-TCDD | ng/L | < | | | | | | | | | | |
| Group 7 | Gross Alpha | pCi/L | | | | | | | | | | | |
| | Total Beta | pCi/L | < | | | | | | | | | | |
| | Radium 226/228 | pCi/L | < | | | | | | | | | | |
| | Total Strontium | µg/L | < | | | | | | | | | | |
| | Total Uranium | µg/L | < | | | | | | | | | | |
| | Osmotic Pressure | mOs/kg | | | | | | | | | | | |
| | ChemChlor 160 | µg/L | < | 0.5 | | | | | | | | | |
| | CWT-360 | µg/L | | 59.74 | | | | | | | | | |
| | Sodium Bisulfite | µg/L | | 71.41 | | | | | | | | | |
| | Sulfuric Acid | µg/L | | 0.865 | | | | | | | | | |
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pennsylvania
DEPARTMENT OF ENVIRONMENTAL PROTECTION

Toxics Management Spreadsheet
Version 1.4, May 2023

## Stream / Surface Water Information

**Hill Top Energy Center, NPDES Permit No. PA0255092, Outfall 001**

Instructions | Discharge | Stream

Receiving Surface Water Name: **Monongahela River**

No. Reaches to Model: 1

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

| Location | Stream Code* | RMI* | Elevation (ft)* | DA (mi²)* | Slope (ft/ft) | PWS Withdrawal (MGD) | Apply Fish Criteria* |
|---|---|---|---|---|---|---|---|
| Point of Discharge | 037185 | 76.85 | 765 | 4560 | 0.0001 | | Yes |
| End of Reach 1 | 037185 | 75.53 | 764 | 4561 | 0.0001 | 1 | Yes |

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

| Location | RMI | LFY (cfs/mi²)* | Flow (cfs) | | W/D Ratio | Width (ft) | Depth (ft) | Velocity (fps) | Travel Time (days) | Tributary | | Stream | | Analysis | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | | | Stream | Tributary | | | | | | Hardness | pH | Hardness* | pH* | Hardness | pH |
| Point of Discharge | 76.85 | 0.116 | 530 | | | 550 | 17 | | | | | 100 | 7 | | |
| End of Reach 1 | 75.53 | 0.116 | 530 | | | | | | | | | | | | |

$Q_h$

| Location | RMI | LFY (cfs/mi²) | Flow (cfs) | | W/D Ratio | Width (ft) | Depth (ft) | Velocity (fps) | Travel Time (days) | Tributary | | Stream | | Analysis | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | | | Stream | Tributary | | | | | | Hardness | pH | Hardness | pH | Hardness | pH |
| Point of Discharge | 76.85 | | | | | | | | | | | | | | |
| End of Reach 1 | 75.53 | | | | | | | | | | | | | | |

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DEPARTMENT OF ENVIRONMENTAL PROTECTION

Toxics Management Spreadsheet
Version 1.4, May 2023

## Model Results

**Hill Top Energy Center, NPDES Permit No. PA0255092, Outfall 001**

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

☐ ***Hydrodynamics***

☑ ***Wasteload Allocations***

☑ ***AFC*** CCT (min): 15 PMF: 0.160 Analysis Hardness (mg/l): 108.42 Analysis pH: 7.01

| 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 | 32,344 | |
| Total Antimony | 0 | 0 | | 0 | 1,100 | 1,100 | 47,438 | |
| Total Arsenic | 0 | 0 | | 0 | 340 | 340 | 14,663 | Chem Translator of 1 applied |
| Total Barium | 0 | 0 | | 0 | 21,000 | 21,000 | 905,631 | |
| Total Boron | 0 | 0 | | 0 | 8,100 | 8,100 | 349,315 | |
| Total Cadmium | 0 | 0 | | 0 | 2.178 | 2.32 | 99.9 | Chem Translator of 0.941 applied |
| Total Chromium (III) | 0 | 0 | | 0 | 608.752 | 1,926 | 83,078 | Chem Translator of 0.316 applied |
| Hexavalent Chromium | 0 | 0 | | 0 | 16 | 16.3 | 703 | Chem Translator of 0.982 applied |
| Total Cobalt | 0 | 0 | | 0 | 95 | 95.0 | 4,097 | |
| Total Copper | 0 | 0 | | 0 | 14.502 | 15.1 | 651 | 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 | 70.514 | 90.5 | 3,902 | Chem Translator of 0.779 applied |
| Total Manganese | 0 | 0 | | 0 | N/A | N/A | N/A | |
| Total Mercury | 0 | 0 | | 0 | 1.400 | 1.65 | 71.0 | Chem Translator of 0.85 applied |
| Total Nickel | 0 | 0 | | 0 | 501.370 | 502 | 21,665 | 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 | 3.696 | 4.35 | 188 | Chem Translator of 0.85 applied |
| Total Thallium | 0 | 0 | | 0 | 65 | 65.0 | 2,803 | |
| Total Zinc | 0 | 0 | | 0 | 125.486 | 128 | 5,533 | Chem Translator of 0.978 applied |
| Acrolein | 0 | 0 | | 0 | 3 | 3.0 | 129 | |

| | | | | | | | | |
|---|---|---|---|---|---|---|---|---|
| Acrylamide | 0 | 0 | | 0 | N/A | N/A | N/A | |
| Acrylonitrile | 0 | 0 | | 0 | 650 | 650 | 28,031 | |
| Benzene | 0 | 0 | | 0 | 640 | 640 | 27,600 | |
| Bromoform | 0 | 0 | | 0 | 1,800 | 1,800 | 77,626 | |
| Carbon Tetrachloride | 0 | 0 | | 0 | 2,800 | 2,800 | 120,751 | |
| Chlorobenzene | 0 | 0 | | 0 | 1,200 | 1,200 | 51,750 | |
| Chlorodibromomethane | 0 | 0 | | 0 | N/A | N/A | N/A | |
| 2-Chloroethyl Vinyl Ether | 0 | 0 | | 0 | 18,000 | 18,000 | 776,255 | |
| Chloroform | 0 | 0 | | 0 | 1,900 | 1,900 | 81,938 | |
| Dichlorobromomethane | 0 | 0 | | 0 | N/A | N/A | N/A | |
| 1,2-Dichloroethane | 0 | 0 | | 0 | 15,000 | 15,000 | 646,879 | |
| 1,1-Dichloroethylene | 0 | 0 | | 0 | 7,500 | 7,500 | 323,440 | |
| 1,2-Dichloropropane | 0 | 0 | | 0 | 11,000 | 11,000 | 474,378 | |
| 1,3-Dichloropropylene | 0 | 0 | | 0 | 310 | 310 | 13,369 | |
| Ethylbenzene | 0 | 0 | | 0 | 2,900 | 2,900 | 125,063 | |
| Methyl Bromide | 0 | 0 | | 0 | 550 | 550 | 23,719 | |
| Methyl Chloride | 0 | 0 | | 0 | 28,000 | 28,000 | 1,207,508 | |
| Methylene Chloride | 0 | 0 | | 0 | 12,000 | 12,000 | 517,503 | |
| 1,1,2,2-Tetrachloroethane | 0 | 0 | | 0 | 1,000 | 1,000 | 43,125 | |
| Tetrachloroethylene | 0 | 0 | | 0 | 700 | 700 | 30,188 | |
| Toluene | 0 | 0 | | 0 | 1,700 | 1,700 | 73,313 | |
| 1,2-trans-Dichloroethylene | 0 | 0 | | 0 | 6,800 | 6,800 | 293,252 | |
| 1,1,1-Trichloroethane | 0 | 0 | | 0 | 3,000 | 3,000 | 129,376 | |
| 1,1,2-Trichloroethane | 0 | 0 | | 0 | 3,400 | 3,400 | 146,626 | |
| Trichloroethylene | 0 | 0 | | 0 | 2,300 | 2,300 | 99,188 | |
| Vinyl Chloride | 0 | 0 | | 0 | N/A | N/A | N/A | |
| 2-Chlorophenol | 0 | 0 | | 0 | 560 | 560 | 24,150 | |
| 2,4-Dichlorophenol | 0 | 0 | | 0 | 1,700 | 1,700 | 73,313 | |
| 2,4-Dimethylphenol | 0 | 0 | | 0 | 660 | 660 | 28,463 | |
| 4,6-Dinitro-o-Cresol | 0 | 0 | | 0 | 80 | 80.0 | 3,450 | |
| 2,4-Dinitrophenol | 0 | 0 | | 0 | 660 | 660 | 28,463 | |
| 2-Nitrophenol | 0 | 0 | | 0 | 8,000 | 8,000 | 345,002 | |
| 4-Nitrophenol | 0 | 0 | | 0 | 2,300 | 2,300 | 99,188 | |
| p-Chloro-m-Cresol | 0 | 0 | | 0 | 160 | 160 | 6,900 | |
| Pentachlorophenol | 0 | 0 | | 0 | 8.813 | 8.81 | 380 | |
| Phenol | 0 | 0 | | 0 | N/A | N/A | N/A | |
| 2,4,6-Trichlorophenol | 0 | 0 | | 0 | 460 | 460 | 19,838 | |
| Acenaphthene | 0 | 0 | | 0 | 83 | 83.0 | 3,579 | |
| Anthracene | 0 | 0 | | 0 | N/A | N/A | N/A | |
| Benzidine | 0 | 0 | | 0 | 300 | 300 | 12,938 | |
| Benzo(a)Anthracene | 0 | 0 | | 0 | 0.5 | 0.5 | 21.6 | |
| Benzo(a)Pyrene | 0 | 0 | | 0 | N/A | N/A | N/A | |
| 3,4-Benzofluoranthene | 0 | 0 | | 0 | N/A | N/A | N/A | |
| Benzo(k)Fluoranthene | 0 | 0 | | 0 | N/A | N/A | N/A | |
| Bis(2-Chloroethyl)Ether | 0 | 0 | | 0 | 30,000 | 30,000 | 1,293,759 | |
| Bis(2-Chloroisopropyl)Ether | 0 | 0 | | 0 | N/A | N/A | N/A | |
| Bis(2-Ethylhexyl)Phthalate | 0 | 0 | | 0 | 4,500 | 4,500 | 194,064 | |
| 4-Bromophenyl Phenyl Ether | 0 | 0 | | 0 | 270 | 270 | 11,644 | |

| | | | | | | | | |
|---|---|---|---|---|---|---|---|---|
| Butyl Benzyl Phthalate | 0 | 0 | | 0 | 140 | 140 | 6,038 | |
| 2-Chloronaphthalene | 0 | 0 | | 0 | N/A | N/A | N/A | |
| Chrysene | 0 | 0 | | 0 | N/A | N/A | N/A | |
| Dibenzo(a,h)Anthrancene | 0 | 0 | | 0 | N/A | N/A | N/A | |
| 1,2-Dichlorobenzene | 0 | 0 | | 0 | 820 | 820 | 35,363 | |
| 1,3-Dichlorobenzene | 0 | 0 | | 0 | 350 | 350 | 15,094 | |
| 1,4-Dichlorobenzene | 0 | 0 | | 0 | 730 | 730 | 31,481 | |
| 3,3-Dichlorobenzidine | 0 | 0 | | 0 | N/A | N/A | N/A | |
| Diethyl Phthalate | 0 | 0 | | 0 | 4,000 | 4,000 | 172,501 | |
| Dimethyl Phthalate | 0 | 0 | | 0 | 2,500 | 2,500 | 107,813 | |
| Di-n-Butyl Phthalate | 0 | 0 | | 0 | 110 | 110 | 4,744 | |
| 2,4-Dinitrotoluene | 0 | 0 | | 0 | 1,600 | 1,600 | 69,000 | |
| 2,6-Dinitrotoluene | 0 | 0 | | 0 | 990 | 990 | 42,694 | |
| 1,2-Diphenylhydrazine | 0 | 0 | | 0 | 15 | 15.0 | 647 | |
| Fluoranthene | 0 | 0 | | 0 | 200 | 200 | 8,625 | |
| Fluorene | 0 | 0 | | 0 | N/A | N/A | N/A | |
| Hexachlorobenzene | 0 | 0 | | 0 | N/A | N/A | N/A | |
| Hexachlorobutadiene | 0 | 0 | | 0 | 10 | 10.0 | 431 | |
| Hexachlorocyclopentadiene | 0 | 0 | | 0 | 5 | 5.0 | 216 | |
| Hexachloroethane | 0 | 0 | | 0 | 60 | 60.0 | 2,588 | |
| Indeno(1,2,3-cd)Pyrene | 0 | 0 | | 0 | N/A | N/A | N/A | |
| Isophorone | 0 | 0 | | 0 | 10,000 | 10,000 | 431,253 | |
| Naphthalene | 0 | 0 | | 0 | 140 | 140 | 6,038 | |
| Nitrobenzene | 0 | 0 | | 0 | 4,000 | 4,000 | 172,501 | |
| n-Nitrosodimethylamine | 0 | 0 | | 0 | 17,000 | 17,000 | 733,130 | |
| n-Nitrosodi-n-Propylamine | 0 | 0 | | 0 | N/A | N/A | N/A | |
| n-Nitrosodiphenylamine | 0 | 0 | | 0 | 300 | 300 | 12,938 | |
| Phenanthrene | 0 | 0 | | 0 | 5 | 5.0 | 216 | |
| Pyrene | 0 | 0 | | 0 | N/A | N/A | N/A | |
| 1,2,4-Trichlorobenzene | 0 | 0 | | 0 | 130 | 130 | 5,606 | |
| ChemChlor 160 | 0 | 0 | | 0 | 23.1 | 23.1 | 996 | |
| CWT-360 | 0 | 0 | | 0 | 38,462 | 38,462 | 1,658,685 | |
| Sodium Bisulfite | 0 | 0 | | 0 | 2716.9 | 2,717 | 117,167 | |
| Sulfuric Acid | 0 | 0 | | 0 | 2,280 | 2,280 | 98,326 | |

☑ *CFC* CCT (min): ####### PMF: 0.700 Analysis Hardness (mg/l): 101.96 Analysis pH: 7.00

| 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 | 40,805 | |
| Total Arsenic | 0 | 0 | | 0 | 150 | 150 | 27,821 | Chem Translator of 1 applied |
| Total Barium | 0 | 0 | | 0 | 4,100 | 4,100 | 760,452 | |

| | | | | | | | | |
|---|---|---|---|---|---|---|---|---|
| Total Boron | 0 | 0 | | 0 | 1,600 | 1,600 | 296,762 | |
| Total Cadmium | 0 | 0 | | 0 | 0.249 | 0.27 | 50.9 | Chem Translator of 0.908 applied |
| Total Chromium (III) | 0 | 0 | | 0 | 75.300 | 87.6 | 16,240 | Chem Translator of 0.86 applied |
| Hexavalent Chromium | 0 | 0 | | 0 | 10 | 10.4 | 1,928 | Chem Translator of 0.962 applied |
| Total Cobalt | 0 | 0 | | 0 | 19 | 19.0 | 3,524 | |
| Total Copper | 0 | 0 | | 0 | 9.105 | 9.48 | 1,759 | 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 | 396,806 | WQC = 30 day average; PMF = 1 |
| Total Lead | 0 | 0 | | 0 | 2.570 | 3.26 | 605 | Chem Translator of 0.788 applied |
| Total Manganese | 0 | 0 | | 0 | N/A | N/A | N/A | |
| Total Mercury | 0 | 0 | | 0 | 0.770 | 0.91 | 168 | Chem Translator of 0.85 applied |
| Total Nickel | 0 | 0 | | 0 | 52.866 | 53.0 | 9,835 | 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 | 925 | 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 | 2,411 | |
| Total Zinc | 0 | 0 | | 0 | 120.095 | 122 | 22,591 | Chem Translator of 0.986 applied |
| Acrolein | 0 | 0 | | 0 | 3 | 3.0 | 556 | |
| Acrylamide | 0 | 0 | | 0 | N/A | N/A | N/A | |
| Acrylonitrile | 0 | 0 | | 0 | 130 | 130 | 24,112 | |
| Benzene | 0 | 0 | | 0 | 130 | 130 | 24,112 | |
| Bromoform | 0 | 0 | | 0 | 370 | 370 | 68,626 | |
| Carbon Tetrachloride | 0 | 0 | | 0 | 560 | 560 | 103,867 | |
| Chlorobenzene | 0 | 0 | | 0 | 240 | 240 | 44,514 | |
| Chlorodibromomethane | 0 | 0 | | 0 | N/A | N/A | N/A | |
| 2-Chloroethyl Vinyl Ether | 0 | 0 | | 0 | 3,500 | 3,500 | 649,167 | |
| Chloroform | 0 | 0 | | 0 | 390 | 390 | 72,336 | |
| Dichlorobromomethane | 0 | 0 | | 0 | N/A | N/A | N/A | |
| 1,2-Dichloroethane | 0 | 0 | | 0 | 3,100 | 3,100 | 574,976 | |
| 1,1-Dichloroethylene | 0 | 0 | | 0 | 1,500 | 1,500 | 278,214 | |
| 1,2-Dichloropropane | 0 | 0 | | 0 | 2,200 | 2,200 | 408,048 | |
| 1,3-Dichloropropylene | 0 | 0 | | 0 | 61 | 61.0 | 11,314 | |
| Ethylbenzene | 0 | 0 | | 0 | 580 | 580 | 107,576 | |
| Methyl Bromide | 0 | 0 | | 0 | 110 | 110 | 20,402 | |
| Methyl Chloride | 0 | 0 | | 0 | 5,500 | 5,500 | 1,020,119 | |
| Methylene Chloride | 0 | 0 | | 0 | 2,400 | 2,400 | 445,143 | |
| 1,1,2,2-Tetrachloroethane | 0 | 0 | | 0 | 210 | 210 | 38,950 | |
| Tetrachloroethylene | 0 | 0 | | 0 | 140 | 140 | 25,967 | |
| Toluene | 0 | 0 | | 0 | 330 | 330 | 61,207 | |
| 1,2-trans-Dichloroethylene | 0 | 0 | | 0 | 1,400 | 1,400 | 259,667 | |
| 1,1,1-Trichloroethane | 0 | 0 | | 0 | 610 | 610 | 113,140 | |
| 1,1,2-Trichloroethane | 0 | 0 | | 0 | 680 | 680 | 126,124 | |
| Trichloroethylene | 0 | 0 | | 0 | 450 | 450 | 83,464 | |
| Vinyl Chloride | 0 | 0 | | 0 | N/A | N/A | N/A | |
| 2-Chlorophenol | 0 | 0 | | 0 | 110 | 110 | 20,402 | |

| | | | | | | | | |
|---|---|---|---|---|---|---|---|---|
| 2,4-Dichlorophenol | 0 | 0 | | 0 | 340 | 340 | 63,062 | |
| 2,4-Dimethylphenol | 0 | 0 | | 0 | 130 | 130 | 24,112 | |
| 4,6-Dinitro-o-Cresol | 0 | 0 | | 0 | 16 | 16.0 | 2,968 | |
| 2,4-Dinitrophenol | 0 | 0 | | 0 | 130 | 130 | 24,112 | |
| 2-Nitrophenol | 0 | 0 | | 0 | 1,600 | 1,600 | 296,762 | |
| 4-Nitrophenol | 0 | 0 | | 0 | 470 | 470 | 87,174 | |
| p-Chloro-m-Cresol | 0 | 0 | | 0 | 500 | 500 | 92,738 | |
| Pentachlorophenol | 0 | 0 | | 0 | 6.761 | 6.76 | 1,254 | |
| Phenol | 0 | 0 | | 0 | N/A | N/A | N/A | |
| 2,4,6-Trichlorophenol | 0 | 0 | | 0 | 91 | 91.0 | 16,878 | |
| Acenaphthene | 0 | 0 | | 0 | 17 | 17.0 | 3,153 | |
| Anthracene | 0 | 0 | | 0 | N/A | N/A | N/A | |
| Benzidine | 0 | 0 | | 0 | 59 | 59.0 | 10,943 | |
| Benzo(a)Anthracene | 0 | 0 | | 0 | 0.1 | 0.1 | 18.5 | |
| Benzo(a)Pyrene | 0 | 0 | | 0 | N/A | N/A | N/A | |
| 3,4-Benzofluoranthene | 0 | 0 | | 0 | N/A | N/A | N/A | |
| Benzo(k)Fluoranthene | 0 | 0 | | 0 | N/A | N/A | N/A | |
| Bis(2-Chloroethyl)Ether | 0 | 0 | | 0 | 6,000 | 6,000 | 1,112,857 | |
| Bis(2-Chloroisopropyl)Ether | 0 | 0 | | 0 | N/A | N/A | N/A | |
| Bis(2-Ethylhexyl)Phthalate | 0 | 0 | | 0 | 910 | 910 | 168,783 | |
| 4-Bromophenyl Phenyl Ether | 0 | 0 | | 0 | 54 | 54.0 | 10,016 | |
| Butyl Benzyl Phthalate | 0 | 0 | | 0 | 35 | 35.0 | 6,492 | |
| 2-Chloronaphthalene | 0 | 0 | | 0 | N/A | N/A | N/A | |
| Chrysene | 0 | 0 | | 0 | N/A | N/A | N/A | |
| Dibenzo(a,h)Anthrancene | 0 | 0 | | 0 | N/A | N/A | N/A | |
| 1,2-Dichlorobenzene | 0 | 0 | | 0 | 160 | 160 | 29,676 | |
| 1,3-Dichlorobenzene | 0 | 0 | | 0 | 69 | 69.0 | 12,798 | |
| 1,4-Dichlorobenzene | 0 | 0 | | 0 | 150 | 150 | 27,821 | |
| 3,3-Dichlorobenzidine | 0 | 0 | | 0 | N/A | N/A | N/A | |
| Diethyl Phthalate | 0 | 0 | | 0 | 800 | 800 | 148,381 | |
| Dimethyl Phthalate | 0 | 0 | | 0 | 500 | 500 | 92,738 | |
| Di-n-Butyl Phthalate | 0 | 0 | | 0 | 21 | 21.0 | 3,895 | |
| 2,4-Dinitrotoluene | 0 | 0 | | 0 | 320 | 320 | 59,352 | |
| 2,6-Dinitrotoluene | 0 | 0 | | 0 | 200 | 200 | 37,095 | |
| 1,2-Diphenylhydrazine | 0 | 0 | | 0 | 3 | 3.0 | 556 | |
| Fluoranthene | 0 | 0 | | 0 | 40 | 40.0 | 7,419 | |
| Fluorene | 0 | 0 | | 0 | N/A | N/A | N/A | |
| Hexachlorobenzene | 0 | 0 | | 0 | N/A | N/A | N/A | |
| Hexachlorobutadiene | 0 | 0 | | 0 | 2 | 2.0 | 371 | |
| Hexachlorocyclopentadiene | 0 | 0 | | 0 | 1 | 1.0 | 185 | |
| Hexachloroethane | 0 | 0 | | 0 | 12 | 12.0 | 2,226 | |
| Indeno(1,2,3-cd)Pyrene | 0 | 0 | | 0 | N/A | N/A | N/A | |
| Isophorone | 0 | 0 | | 0 | 2,100 | 2,100 | 389,500 | |
| Naphthalene | 0 | 0 | | 0 | 43 | 43.0 | 7,975 | |
| Nitrobenzene | 0 | 0 | | 0 | 810 | 810 | 150,236 | |

| | | | | | | | | |
|---|---|---|---|---|---|---|---|---|
| n-Nitrosodimethylamine | 0 | 0 | | 0 | 3,400 | 3,400 | 630,619 | |
| n-Nitrosodi-n-Propylamine | 0 | 0 | | 0 | N/A | N/A | N/A | |
| n-Nitrosodiphenylamine | 0 | 0 | | 0 | 59 | 59.0 | 10,943 | |
| Phenanthrene | 0 | 0 | | 0 | 1 | 1.0 | 185 | |
| Pyrene | 0 | 0 | | 0 | N/A | N/A | N/A | |
| 1,2,4-Trichlorobenzene | 0 | 0 | | 0 | 26 | 26.0 | 4,822 | |
| ChemChlor 160 | 0 | 0 | | 0 | 2.6 | 2.6 | 482 | |
| CWT-360 | 0 | 0 | | 0 | 4273.6 | 4,274 | 792,651 | |
| Sodium Bisulfite | 0 | 0 | | 0 | 301.9 | 302 | 55,995 | |
| Sulfuric Acid | 0 | 0 | | 0 | 250 | 250 | 46,369 | |

☑ ***THH*** CCT (min): ###### THH PMF: 0.700 Analysis Hardness (mg/l): N/A Analysis pH: N/A PWS PMF: 0.7

| 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 | 92,738,079 | WQC applied at RMI 75.53 with a design stream flow of 530 cfs |
| Chloride (PWS) | 0 | 0 | | 0 | 250,000 | 250,000 | 46,369,039 | WQC applied at RMI 75.53 with a design stream flow of 530 cfs |
| Sulfate (PWS) | 0 | 0 | | 0 | 250,000 | 250,000 | 46,369,039 | WQC applied at RMI 75.53 with a design stream flow of 530 cfs |
| Fluoride (PWS) | 0 | 0 | | 0 | 2,000 | 2,000 | 370,952 | WQC applied at RMI 75.53 with a design stream flow of 530 cfs |
| Total Aluminum | 0 | 0 | | 0 | N/A | N/A | N/A | |
| Total Antimony | 0 | 0 | | 0 | 5.6 | 5.6 | 1,481 | |
| Total Arsenic | 0 | 0 | | 0 | 10 | 10.0 | 2,645 | |
| Total Barium | 0 | 0 | | 0 | 2,400 | 2,400 | 634,890 | |
| Total Boron | 0 | 0 | | 0 | 3,100 | 3,100 | 820,066 | |
| 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 | 79,361 | |
| 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 | 264,537 | |
| Total Mercury | 0 | 0 | | 0 | 0.050 | 0.05 | 13.2 | |
| Total Nickel | 0 | 0 | | 0 | 610 | 610 | 161,368 | |
| Total Phenols (Phenolics) (PWS) | 0 | 0 | | 0 | 5 | 5.0 | 927 | WQC applied at RMI 75.53 with a design stream flow of 530 cfs |
| 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 | 63.5 | |
| Total Zinc | 0 | 0 | | 0 | N/A | N/A | N/A | |
| Acrolein | 0 | 0 | | 0 | 3 | 3.0 | 794 | |
| Acrylamide | 0 | 0 | | 0 | N/A | N/A | N/A | |
| Acrylonitrile | 0 | 0 | | 0 | N/A | N/A | N/A | |
| Benzene | 0 | 0 | | 0 | N/A | N/A | N/A | |
| Bromoform | 0 | 0 | | 0 | N/A | N/A | N/A | |

| | | | | | | | | |
|---|---|---|---|---|---|---|---|---|
| Carbon Tetrachloride | 0 | 0 | | 0 | N/A | N/A | N/A | |
| Chlorobenzene | 0 | 0 | | 0 | 100 | 100.0 | 26,454 | |
| Chlorodibromomethane | 0 | 0 | | 0 | N/A | N/A | N/A | |
| 2-Chloroethyl Vinyl Ether | 0 | 0 | | 0 | N/A | N/A | N/A | |
| Chloroform | 0 | 0 | | 0 | 5.7 | 5.7 | 1,508 | |
| Dichlorobromomethane | 0 | 0 | | 0 | N/A | N/A | N/A | |
| 1,2-Dichloroethane | 0 | 0 | | 0 | N/A | N/A | N/A | |
| 1,1-Dichloroethylene | 0 | 0 | | 0 | 33 | 33.0 | 8,730 | |
| 1,2-Dichloropropane | 0 | 0 | | 0 | N/A | N/A | N/A | |
| 1,3-Dichloropropylene | 0 | 0 | | 0 | N/A | N/A | N/A | |
| Ethylbenzene | 0 | 0 | | 0 | 68 | 68.0 | 17,989 | |
| Methyl Bromide | 0 | 0 | | 0 | 100 | 100.0 | 26,454 | |
| Methyl Chloride | 0 | 0 | | 0 | N/A | N/A | N/A | |
| Methylene Chloride | 0 | 0 | | 0 | N/A | N/A | N/A | |
| 1,1,2,2-Tetrachloroethane | 0 | 0 | | 0 | N/A | N/A | N/A | |
| Tetrachloroethylene | 0 | 0 | | 0 | N/A | N/A | N/A | |
| Toluene | 0 | 0 | | 0 | 57 | 57.0 | 15,079 | |
| 1,2-trans-Dichloroethylene | 0 | 0 | | 0 | 100 | 100.0 | 26,454 | |
| 1,1,1-Trichloroethane | 0 | 0 | | 0 | 10,000 | 10,000 | 2,645,374 | |
| 1,1,2-Trichloroethane | 0 | 0 | | 0 | N/A | N/A | N/A | |
| Trichloroethylene | 0 | 0 | | 0 | N/A | N/A | N/A | |
| Vinyl Chloride | 0 | 0 | | 0 | N/A | N/A | N/A | |
| 2-Chlorophenol | 0 | 0 | | 0 | 30 | 30.0 | 7,936 | |
| 2,4-Dichlorophenol | 0 | 0 | | 0 | 10 | 10.0 | 2,645 | |
| 2,4-Dimethylphenol | 0 | 0 | | 0 | 100 | 100.0 | 26,454 | |
| 4,6-Dinitro-o-Cresol | 0 | 0 | | 0 | 2 | 2.0 | 529 | |
| 2,4-Dinitrophenol | 0 | 0 | | 0 | 10 | 10.0 | 2,645 | |
| 2-Nitrophenol | 0 | 0 | | 0 | N/A | N/A | N/A | |
| 4-Nitrophenol | 0 | 0 | | 0 | N/A | N/A | N/A | |
| p-Chloro-m-Cresol | 0 | 0 | | 0 | N/A | N/A | N/A | |
| Pentachlorophenol | 0 | 0 | | 0 | N/A | N/A | N/A | |
| Phenol | 0 | 0 | | 0 | 4,000 | 4,000 | 1,058,149 | |
| 2,4,6-Trichlorophenol | 0 | 0 | | 0 | N/A | N/A | N/A | |
| Acenaphthene | 0 | 0 | | 0 | 70 | 70.0 | 18,518 | |
| Anthracene | 0 | 0 | | 0 | 300 | 300 | 79,361 | |
| Benzidine | 0 | 0 | | 0 | N/A | N/A | N/A | |
| Benzo(a)Anthracene | 0 | 0 | | 0 | N/A | N/A | N/A | |
| Benzo(a)Pyrene | 0 | 0 | | 0 | N/A | N/A | N/A | |
| 3,4-Benzofluoranthene | 0 | 0 | | 0 | N/A | N/A | N/A | |
| Benzo(k)Fluoranthene | 0 | 0 | | 0 | N/A | N/A | N/A | |
| Bis(2-Chloroethyl)Ether | 0 | 0 | | 0 | N/A | N/A | N/A | |
| Bis(2-Chloroisopropyl)Ether | 0 | 0 | | 0 | 200 | 200 | 52,907 | |
| Bis(2-Ethylhexyl)Phthalate | 0 | 0 | | 0 | N/A | N/A | N/A | |
| 4-Bromophenyl Phenyl Ether | 0 | 0 | | 0 | N/A | N/A | N/A | |
| Butyl Benzyl Phthalate | 0 | 0 | | 0 | 0.1 | 0.1 | 26.5 | |

| | | | | | | | | |
|---|---|---|---|---|---|---|---|---|
| 2-Chloronaphthalene | 0 | 0 | | 0 | 800 | 800 | 211,630 | |
| Chrysene | 0 | 0 | | 0 | N/A | N/A | N/A | |
| Dibenzo(a,h)Anthrancene | 0 | 0 | | 0 | N/A | N/A | N/A | |
| 1,2-Dichlorobenzene | 0 | 0 | | 0 | 1,000 | 1,000 | 264,537 | |
| 1,3-Dichlorobenzene | 0 | 0 | | 0 | 7 | 7.0 | 1,852 | |
| 1,4-Dichlorobenzene | 0 | 0 | | 0 | 300 | 300 | 79,361 | |
| 3,3-Dichlorobenzidine | 0 | 0 | | 0 | N/A | N/A | N/A | |
| Diethyl Phthalate | 0 | 0 | | 0 | 600 | 600 | 158,722 | |
| Dimethyl Phthalate | 0 | 0 | | 0 | 2,000 | 2,000 | 529,075 | |
| Di-n-Butyl Phthalate | 0 | 0 | | 0 | 20 | 20.0 | 5,291 | |
| 2,4-Dinitrotoluene | 0 | 0 | | 0 | N/A | N/A | N/A | |
| 2,6-Dinitrotoluene | 0 | 0 | | 0 | N/A | N/A | N/A | |
| 1,2-Diphenylhydrazine | 0 | 0 | | 0 | N/A | N/A | N/A | |
| Fluoranthene | 0 | 0 | | 0 | 20 | 20.0 | 5,291 | |
| Fluorene | 0 | 0 | | 0 | 50 | 50.0 | 13,227 | |
| Hexachlorobenzene | 0 | 0 | | 0 | N/A | N/A | N/A | |
| Hexachlorobutadiene | 0 | 0 | | 0 | N/A | N/A | N/A | |
| Hexachlorocyclopentadiene | 0 | 0 | | 0 | 4 | 4.0 | 1,058 | |
| Hexachloroethane | 0 | 0 | | 0 | N/A | N/A | N/A | |
| Indeno(1,2,3-cd)Pyrene | 0 | 0 | | 0 | N/A | N/A | N/A | |
| Isophorone | 0 | 0 | | 0 | 34 | 34.0 | 8,994 | |
| Naphthalene | 0 | 0 | | 0 | N/A | N/A | N/A | |
| Nitrobenzene | 0 | 0 | | 0 | 10 | 10.0 | 2,645 | |
| n-Nitrosodimethylamine | 0 | 0 | | 0 | N/A | N/A | N/A | |
| n-Nitrosodi-n-Propylamine | 0 | 0 | | 0 | N/A | N/A | N/A | |
| n-Nitrosodiphenylamine | 0 | 0 | | 0 | N/A | N/A | N/A | |
| Phenanthrene | 0 | 0 | | 0 | N/A | N/A | N/A | |
| Pyrene | 0 | 0 | | 0 | 20 | 20.0 | 5,291 | |
| 1,2,4-Trichlorobenzene | 0 | 0 | | 0 | 0.07 | 0.07 | 18.5 | |
| ChemChlor 160 | 0 | 0 | | 0 | 1,350 | 1,350 | 357,125 | |
| CWT-360 | 0 | 0 | | 0 | 66,080 | 66,080 | 17,480,629 | |
| Sodium Bisulfite | 0 | 0 | | 0 | N/A | N/A | N/A | |
| Sulfuric Acid | 0 | 0 | | 0 | N/A | N/A | N/A | |

☑ *CRL* CCT (min): ####### PMF: 0.700 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 | |
| Acrolein | 0 | 0 | | 0 | N/A | N/A | N/A | |
| Acrylamide | 0 | 0 | | 0 | 0.07 | 0.07 | 43.6 | |
| Acrylonitrile | 0 | 0 | | 0 | 0.06 | 0.06 | 37.4 | |
| Benzene | 0 | 0 | | 0 | 0.58 | 0.58 | 361 | |
| Bromoform | 0 | 0 | | 0 | 7 | 7.0 | 4,360 | |
| Carbon Tetrachloride | 0 | 0 | | 0 | 0.4 | 0.4 | 249 | |
| Chlorobenzene | 0 | 0 | | 0 | N/A | N/A | N/A | |
| Chlorodibromomethane | 0 | 0 | | 0 | 0.8 | 0.8 | 498 | |
| 2-Chloroethyl Vinyl Ether | 0 | 0 | | 0 | N/A | N/A | N/A | |
| Chloroform | 0 | 0 | | 0 | N/A | N/A | N/A | |
| Dichlorobromomethane | 0 | 0 | | 0 | 0.95 | 0.95 | 592 | |
| 1,2-Dichloroethane | 0 | 0 | | 0 | 9.9 | 9.9 | 6,166 | |
| 1,1-Dichloroethylene | 0 | 0 | | 0 | N/A | N/A | N/A | |
| 1,2-Dichloropropane | 0 | 0 | | 0 | 0.9 | 0.9 | 561 | |
| 1,3-Dichloropropylene | 0 | 0 | | 0 | 0.27 | 0.27 | 168 | |
| Ethylbenzene | 0 | 0 | | 0 | N/A | N/A | N/A | |
| Methyl Bromide | 0 | 0 | | 0 | N/A | N/A | N/A | |
| Methyl Chloride | 0 | 0 | | 0 | N/A | N/A | N/A | |
| Methylene Chloride | 0 | 0 | | 0 | 20 | 20.0 | 12,457 | |
| 1,1,2,2-Tetrachloroethane | 0 | 0 | | 0 | 0.2 | 0.2 | 125 | |
| Tetrachloroethylene | 0 | 0 | | 0 | 10 | 10.0 | 6,228 | |
| Toluene | 0 | 0 | | 0 | N/A | N/A | N/A | |
| 1,2-trans-Dichloroethylene | 0 | 0 | | 0 | N/A | N/A | N/A | |
| 1,1,1-Trichloroethane | 0 | 0 | | 0 | N/A | N/A | N/A | |
| 1,1,2-Trichloroethane | 0 | 0 | | 0 | 0.55 | 0.55 | 343 | |
| Trichloroethylene | 0 | 0 | | 0 | 0.6 | 0.6 | 374 | |
| Vinyl Chloride | 0 | 0 | | 0 | 0.02 | 0.02 | 12.5 | |

| | | | | | | | | |
|---|---|---|---|---|---|---|---|---|
| 2-Chlorophenol | 0 | 0 | | 0 | N/A | N/A | N/A | |
| 2,4-Dichlorophenol | 0 | 0 | | 0 | N/A | N/A | N/A | |
| 2,4-Dimethylphenol | 0 | 0 | | 0 | N/A | N/A | N/A | |
| 4,6-Dinitro-o-Cresol | 0 | 0 | | 0 | N/A | N/A | N/A | |
| 2,4-Dinitrophenol | 0 | 0 | | 0 | N/A | N/A | N/A | |
| 2-Nitrophenol | 0 | 0 | | 0 | N/A | N/A | N/A | |
| 4-Nitrophenol | 0 | 0 | | 0 | N/A | N/A | N/A | |
| p-Chloro-m-Cresol | 0 | 0 | | 0 | N/A | N/A | N/A | |
| Pentachlorophenol | 0 | 0 | | 0 | 0.030 | 0.03 | 18.7 | |
| Phenol | 0 | 0 | | 0 | N/A | N/A | N/A | |
| 2,4,6-Trichlorophenol | 0 | 0 | | 0 | 1.5 | 1.5 | 934 | |
| Acenaphthene | 0 | 0 | | 0 | N/A | N/A | N/A | |
| Anthracene | 0 | 0 | | 0 | N/A | N/A | N/A | |
| Benzidine | 0 | 0 | | 0 | 0.0001 | 0.0001 | 0.062 | |
| Benzo(a)Anthracene | 0 | 0 | | 0 | 0.001 | 0.001 | 0.62 | |
| Benzo(a)Pyrene | 0 | 0 | | 0 | 0.0001 | 0.0001 | 0.062 | |
| 3,4-Benzofluoranthene | 0 | 0 | | 0 | 0.001 | 0.001 | 0.62 | |
| Benzo(k)Fluoranthene | 0 | 0 | | 0 | 0.01 | 0.01 | 6.23 | |
| Bis(2-Chloroethyl)Ether | 0 | 0 | | 0 | 0.03 | 0.03 | 18.7 | |
| Bis(2-Chloroisopropyl)Ether | 0 | 0 | | 0 | N/A | N/A | N/A | |
| Bis(2-Ethylhexyl)Phthalate | 0 | 0 | | 0 | 0.32 | 0.32 | 199 | |
| 4-Bromophenyl Phenyl Ether | 0 | 0 | | 0 | N/A | N/A | N/A | |
| Butyl Benzyl Phthalate | 0 | 0 | | 0 | N/A | N/A | N/A | |
| 2-Chloronaphthalene | 0 | 0 | | 0 | N/A | N/A | N/A | |
| Chrysene | 0 | 0 | | 0 | 0.12 | 0.12 | 74.7 | |
| Dibenzo(a,h)Anthrancene | 0 | 0 | | 0 | 0.0001 | 0.0001 | 0.062 | |
| 1,2-Dichlorobenzene | 0 | 0 | | 0 | N/A | N/A | N/A | |
| 1,3-Dichlorobenzene | 0 | 0 | | 0 | N/A | N/A | N/A | |
| 1,4-Dichlorobenzene | 0 | 0 | | 0 | N/A | N/A | N/A | |
| 3,3-Dichlorobenzidine | 0 | 0 | | 0 | 0.05 | 0.05 | 31.1 | |
| Diethyl Phthalate | 0 | 0 | | 0 | N/A | N/A | N/A | |
| Dimethyl Phthalate | 0 | 0 | | 0 | N/A | N/A | N/A | |
| Di-n-Butyl Phthalate | 0 | 0 | | 0 | N/A | N/A | N/A | |
| 2,4-Dinitrotoluene | 0 | 0 | | 0 | 0.05 | 0.05 | 31.1 | |
| 2,6-Dinitrotoluene | 0 | 0 | | 0 | 0.05 | 0.05 | 31.1 | |
| 1,2-Diphenylhydrazine | 0 | 0 | | 0 | 0.03 | 0.03 | 18.7 | |
| Fluoranthene | 0 | 0 | | 0 | N/A | N/A | N/A | |
| Fluorene | 0 | 0 | | 0 | N/A | N/A | N/A | |
| Hexachlorobenzene | 0 | 0 | | 0 | 0.00008 | 0.00008 | 0.05 | |
| Hexachlorobutadiene | 0 | 0 | | 0 | 0.01 | 0.01 | 6.23 | |
| Hexachlorocyclopentadiene | 0 | 0 | | 0 | N/A | N/A | N/A | |
| Hexachloroethane | 0 | 0 | | 0 | 0.1 | 0.1 | 62.3 | |
| Indeno(1,2,3-cd)Pyrene | 0 | 0 | | 0 | 0.001 | 0.001 | 0.62 | |
| Isophorone | 0 | 0 | | 0 | N/A | N/A | N/A | |
| Naphthalene | 0 | 0 | | 0 | N/A | N/A | N/A | |

| | | | | | | | | |
|---|---|---|---|---|---|---|---|---|
| Nitrobenzene | 0 | 0 | | 0 | N/A | N/A | N/A | |
| n-Nitrosodimethylamine | 0 | 0 | | 0 | 0.0007 | 0.0007 | 0.44 | |
| n-Nitrosodi-n-Propylamine | 0 | 0 | | 0 | 0.005 | 0.005 | 3.11 | |
| n-Nitrosodiphenylamine | 0 | 0 | | 0 | 3.3 | 3.3 | 2,055 | |
| Phenanthrene | 0 | 0 | | 0 | N/A | N/A | N/A | |
| Pyrene | 0 | 0 | | 0 | N/A | N/A | N/A | |
| 1,2,4-Trichlorobenzene | 0 | 0 | | 0 | N/A | N/A | N/A | |
| ChemChlor 160 | 0 | 0 | | 0 | N/A | N/A | N/A | |
| CWT-360 | 0 | 0 | | 0 | N/A | N/A | N/A | |
| Sodium Bisulfite | 0 | 0 | | 0 | N/A | N/A | N/A | |
| Sulfuric Acid | 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 | 20,731 | AFC | Discharge Conc > 10% WQBEL (no RP) |
| Acrylamide | 0.47 | 0.74 | 43.6 | 68.0 | 109 | µg/L | 43.6 | CRL | Discharge Conc ≥ 50% WQBEL (RP) |
| Hexachlorobutadiene | Report | Report | Report | Report | Report | µg/L | 6.23 | CRL | Discharge Conc > 25% 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) | 92,738 | mg/L | Discharge Conc ≤ 10% WQBEL |
| Chloride (PWS) | 46,369 | mg/L | Discharge Conc ≤ 10% WQBEL |
| Bromide | N/A | N/A | No WQS |
| Sulfate (PWS) | 46,369 | mg/L | Discharge Conc ≤ 10% WQBEL |
| Fluoride (PWS) | 371 | mg/L | Discharge Conc ≤ 10% WQBEL |
| Total Antimony | 1,481 | µg/L | Discharge Conc ≤ 10% WQBEL |
| Total Arsenic | 2,645 | µg/L | Discharge Conc ≤ 10% WQBEL |
| Total Barium | 580,473 | µg/L | Discharge Conc ≤ 10% WQBEL |
| Total Beryllium | N/A | N/A | No WQS |
| Total Boron | 223,897 | µg/L | Discharge Conc ≤ 10% WQBEL |
| Total Cadmium | 50.9 | µg/L | Discharge Conc ≤ 10% WQBEL |
| Total Chromium (III) | 16,240 | µg/L | Discharge Conc ≤ 10% WQBEL |
| Hexavalent Chromium | 450 | µg/L | Discharge Conc ≤ 10% WQBEL |

| | | | |
|---|---|---|---|
| Total Cobalt | 2,626 | µg/L | Discharge Conc ≤ 10% WQBEL |
| Total Copper | 418 | µg/L | Discharge Conc ≤ 10% WQBEL |
| Total Cyanide | N/A | N/A | No WQS |
| Dissolved Iron | 79,361 | µg/L | Discharge Conc ≤ 10% WQBEL |
| Total Iron | 396,806 | µg/L | Discharge Conc ≤ 10% WQBEL |
| Total Lead | 605 | µg/L | Discharge Conc ≤ 10% WQBEL |
| Total Manganese | 264,537 | µg/L | Discharge Conc ≤ 10% WQBEL |
| Total Mercury | 13.2 | µg/L | Discharge Conc < TQL |
| Total Nickel | 9,835 | µg/L | Discharge Conc ≤ 10% WQBEL |
| Total Phenols (Phenolics) (PWS) | 927 | µg/L | Discharge Conc ≤ 10% WQBEL |
| Total Selenium | 925 | µg/L | Discharge Conc ≤ 10% WQBEL |
| Total Silver | 120 | µg/L | Discharge Conc ≤ 10% WQBEL |
| Total Thallium | 63.5 | µg/L | Discharge Conc ≤ 10% WQBEL |
| Total Zinc | 3,547 | µg/L | Discharge Conc ≤ 10% WQBEL |
| Total Molybdenum | N/A | N/A | No WQS |
| Acrolein | 82.9 | µg/L | Discharge Conc ≤ 25% WQBEL |
| Acrylonitrile | 37.4 | µg/L | Discharge Conc < TQL |
| Benzene | 361 | µg/L | Discharge Conc < TQL |
| Bromoform | 4,360 | µg/L | Discharge Conc < TQL |
| Carbon Tetrachloride | 249 | µg/L | Discharge Conc ≤ 25% WQBEL |
| Chlorobenzene | 26,454 | µg/L | Discharge Conc < TQL |
| Chlorodibromomethane | 498 | µg/L | Discharge Conc ≤ 25% WQBEL |
| Chloroethane | N/A | N/A | No WQS |
| 2-Chloroethyl Vinyl Ether | 497,548 | µg/L | Discharge Conc < TQL |
| Chloroform | 1,508 | µg/L | Discharge Conc ≤ 25% WQBEL |
| Dichlorobromomethane | 592 | µg/L | Discharge Conc ≤ 25% WQBEL |
| 1,1-Dichloroethane | N/A | N/A | No WQS |
| 1,2-Dichloroethane | 6,166 | µg/L | Discharge Conc < TQL |
| 1,1-Dichloroethylene | 8,730 | µg/L | Discharge Conc < TQL |
| 1,2-Dichloropropane | 561 | µg/L | Discharge Conc < TQL |
| 1,3-Dichloropropylene | 168 | µg/L | Discharge Conc ≤ 25% WQBEL |
| 1,4-Dioxane | N/A | N/A | No WQS |
| Ethylbenzene | 17,989 | µg/L | Discharge Conc < TQL |
| Methyl Bromide | 15,203 | µg/L | Discharge Conc ≤ 25% WQBEL |
| Methyl Chloride | 773,964 | µg/L | Discharge Conc ≤ 25% WQBEL |
| Methylene Chloride | 12,457 | µg/L | Discharge Conc ≤ 25% WQBEL |
| 1,1,2,2-Tetrachloroethane | 125 | µg/L | Discharge Conc < TQL |
| Tetrachloroethylene | 6,228 | µg/L | Discharge Conc < TQL |
| Toluene | 15,079 | µg/L | Discharge Conc < TQL |
| 1,2-trans-Dichloroethylene | 26,454 | µg/L | Discharge Conc < TQL |
| 1,1,1-Trichloroethane | 82,925 | µg/L | Discharge Conc < TQL |
| 1,1,2-Trichloroethane | 343 | µg/L | Discharge Conc < TQL |
| Trichloroethylene | 374 | µg/L | Discharge Conc < TQL |
| Vinyl Chloride | 12.5 | µg/L | Discharge Conc ≤ 25% WQBEL |
| 2-Chlorophenol | 7,936 | µg/L | Discharge Conc < TQL |

| | | | |
|---|---|---|---|
| 2,4-Dichlorophenol | 2,645 | µg/L | Discharge Conc < TQL |
| 2,4-Dimethylphenol | 18,243 | µg/L | Discharge Conc < TQL |
| 4,6-Dinitro-o-Cresol | 529 | µg/L | Discharge Conc < TQL |
| 2,4-Dinitrophenol | 2,645 | µg/L | Discharge Conc < TQL |
| 2-Nitrophenol | 221,133 | µg/L | Discharge Conc < TQL |
| 4-Nitrophenol | 63,576 | µg/L | Discharge Conc < TQL |
| p-Chloro-m-Cresol | 4,423 | µg/L | Discharge Conc < TQL |
| Pentachlorophenol | 18.7 | µg/L | Discharge Conc < TQL |
| Phenol | 1,058,149 | µg/L | Discharge Conc < TQL |
| 2,4,6-Trichlorophenol | 934 | µg/L | Discharge Conc < TQL |
| Acenaphthene | 2,294 | µg/L | Discharge Conc < TQL |
| Acenaphthylene | N/A | N/A | No WQS |
| Anthracene | 79,361 | µg/L | Discharge Conc < TQL |
| Benzidine | 0.062 | µg/L | Discharge Conc < TQL |
| Benzo(a)Anthracene | 0.62 | µg/L | Discharge Conc < TQL |
| Benzo(a)Pyrene | 0.062 | µg/L | Discharge Conc < TQL |
| 3,4-Benzofluoranthene | 0.62 | µg/L | Discharge Conc < TQL |
| Benzo(ghi)Perylene | N/A | N/A | No WQS |
| Benzo(k)Fluoranthene | 6.23 | µg/L | Discharge Conc < TQL |
| Bis(2-Chloroethoxy)Methane | N/A | N/A | No WQS |
| Bis(2-Chloroethyl)Ether | 18.7 | µg/L | Discharge Conc < TQL |
| Bis(2-Chloroisopropyl)Ether | 52,907 | µg/L | Discharge Conc < TQL |
| Bis(2-Ethylhexyl)Phthalate | 199 | µg/L | Discharge Conc < TQL |
| 4-Bromophenyl Phenyl Ether | 7,463 | µg/L | Discharge Conc < TQL |
| Butyl Benzyl Phthalate | 26.5 | µg/L | Discharge Conc < TQL |
| 2-Chloronaphthalene | 211,630 | µg/L | Discharge Conc < TQL |
| 4-Chlorophenyl Phenyl Ether | N/A | N/A | No WQS |
| Chrysene | 74.7 | µg/L | Discharge Conc < TQL |
| Dibenzo(a,h)Anthrancene | 0.062 | µg/L | Discharge Conc < TQL |
| 1,2-Dichlorobenzene | 22,666 | µg/L | Discharge Conc ≤ 25% WQBEL |
| 1,3-Dichlorobenzene | 1,852 | µg/L | Discharge Conc ≤ 25% WQBEL |
| 1,4-Dichlorobenzene | 20,178 | µg/L | Discharge Conc ≤ 25% WQBEL |
| 3,3-Dichlorobenzidine | 31.1 | µg/L | Discharge Conc < TQL |
| Diethyl Phthalate | 110,566 | µg/L | Discharge Conc < TQL |
| Dimethyl Phthalate | 69,104 | µg/L | Discharge Conc < TQL |
| Di-n-Butyl Phthalate | 3,041 | µg/L | Discharge Conc < TQL |
| 2,4-Dinitrotoluene | 31.1 | µg/L | Discharge Conc < TQL |
| 2,6-Dinitrotoluene | 31.1 | µg/L | Discharge Conc < TQL |
| Di-n-Octyl Phthalate | N/A | N/A | No WQS |
| 1,2-Diphenylhydrazine | 18.7 | µg/L | Discharge Conc < TQL |
| Fluoranthene | 5,291 | µg/L | Discharge Conc ≤ 25% WQBEL |
| Fluorene | 13,227 | µg/L | Discharge Conc < TQL |
| Hexachlorobenzene | 0.05 | µg/L | Discharge Conc < TQL |
| Hexachlorocyclopentadiene | 138 | µg/L | Discharge Conc < TQL |
| Hexachloroethane | 62.3 | µg/L | Discharge Conc < TQL |

| | | | |
|---|---|---|---|
| Indeno(1,2,3-cd)Pyrene | 0.62 | µg/L | Discharge Conc < TQL |
| Isophorone | 8,994 | µg/L | Discharge Conc < TQL |
| Naphthalene | 3,870 | µg/L | Discharge Conc ≤ 25% WQBEL |
| Nitrobenzene | 2,645 | µg/L | Discharge Conc < TQL |
| n-Nitrosodimethylamine | 0.44 | µg/L | Discharge Conc < TQL |
| n-Nitrosodi-n-Propylamine | 3.11 | µg/L | Discharge Conc < TQL |
| n-Nitrosodiphenylamine | 2,055 | µg/L | Discharge Conc < TQL |
| Phenanthrene | 138 | µg/L | Discharge Conc ≤ 25% WQBEL |
| Pyrene | 5,291 | µg/L | Discharge Conc < TQL |
| 1,2,4-Trichlorobenzene | 18.5 | µg/L | Discharge Conc ≤ 25% WQBEL |
| ChemChlor 160 | 482 | µg/L | Discharge Conc ≤ 25% WQBEL |
| CWT-360 | 792,651 | µg/L | Discharge Conc ≤ 25% WQBEL |
| Sodium Bisulfite | 55,995 | µg/L | Discharge Conc ≤ 25% WQBEL |
| Sulfuric Acid | 46,369 | µg/L | Discharge Conc ≤ 25% WQBEL |

# ATTACHMENT I:

Outfall 001 Thermal Discharge Evaluation

**Facility:** Hill Top Energy Center
**Permit Number:** PA0255092
**Stream Name:** Monongahela River
**Analyst/Engineer:** Lauren Nolfi
**Stream Q7-10 (cfs):** 530

| | Facility Flows[1] | | | | Stream Flows | |
|---|---|---|---|---|---|---|
| | Stream (Intake) (MGD) | External (Intake) (MGD) | Consumptive (Loss) (MGD) | Discharge (MGD) | Adj. Q7-10 Stream Flow (cfs) | Downstream[2] Stream Flow (cfs) |
| Jan 1-31 | 5.04 | 0 | 3.74 | 1.3 | 1696.0 | 1690.2 |
| Feb 1-29 | 5.04 | 0 | 3.74 | 1.3 | 1855.0 | 1849.2 |
| Mar 1-31 | 5.04 | 0 | 3.74 | 1.3 | 3710.0 | 3704.2 |
| Apr 1-15 | 5.04 | 0 | 3.74 | 1.3 | 4929.0 | 4923.2 |
| Apr 16-30 | 5.04 | 0 | 3.74 | 1.3 | 4929.0 | 4923.2 |
| May 1-15 | 5.04 | 0 | 3.74 | 1.3 | 2703.0 | 2697.2 |
| May 16-30 | 5.04 | 0 | 3.74 | 1.3 | 2703.0 | 2697.2 |
| Jun 1-15 | 5.04 | 0 | 3.74 | 1.3 | 1590.0 | 1584.2 |
| Jun 16-30 | 5.04 | 0 | 3.74 | 1.3 | 1590.0 | 1584.2 |
| Jul 1-31 | 5.04 | 0 | 3.74 | 1.3 | 901.0 | 895.2 |
| Aug 1-15 | 5.04 | 0 | 3.74 | 1.3 | 742.0 | 736.2 |
| Aug 16-31 | 5.04 | 0 | 3.74 | 1.3 | 742.0 | 736.2 |
| Sep 1-15 | 5.04 | 0 | 3.74 | 1.3 | 583.0 | 577.2 |
| Sep 16-30 | 5.04 | 0 | 3.74 | 1.3 | 583.0 | 577.2 |
| Oct 1-15 | 5.04 | 0 | 3.74 | 1.3 | 636.0 | 630.2 |
| Oct 16-31 | 5.04 | 0 | 3.74 | 1.3 | 636.0 | 630.2 |
| Nov 1-15 | 5.04 | 0 | 3.74 | 1.3 | 848.0 | 842.2 |
| Nov 16-30 | 5.04 | 0 | 3.74 | 1.3 | 848.0 | 842.2 |
| Dec 1-31 | 5.04 | 0 | 3.74 | 1.3 | 1272.0 | 1266.2 |

[1] Facility flows are not required (and will not affect the permit limits) if all intake flow is from the receiving stream (Case 1), consumptive losses are small, and permit limits will be expressed as Million BTUs/day.
[2] Downstream Stream Flow includes the discharge flow.

*Please forward all comments to Tom Starosta at 717-787-4317, tstarosta@state.pa.us.*
Version 1.0 -- 08/01/2004 Reference: Implementation Guidance for Temperature Criteria, DEP-ID: 391-2000-017
NOTE: The user can only edit fields that are blue.
NOTE: MGD x 1.547 = cfs.

Facility: **Hill Top Energy Center**
Permit Number: PA0255092
Stream: Monongahela River

| | WWF Ambient Stream Temperature (°F) (Default) | Ambient Stream Temperature (°F) (Site-specific data) | Target Maximum Stream Temp.[1] (°F) | WWF Daily WLA[2] (Million BTUs/day) | WWF Daily WLA[3] (°F) | at Discharge Flow (MGD) |
|---|---|---|---|---|---|---|
| Jan 1-31 | 35 | 0 | 40 | 45,551 | 110.0 | 1.3 |
| Feb 1-29 | 35 | 0 | 40 | 49,836 | 110.0 | 1.3 |
| Mar 1-31 | 40 | 0 | 46 | 119,794 | 110.0 | 1.3 |
| Apr 1-15 | 47 | 0 | 52 | 132,681 | 110.0 | 1.3 |
| Apr 16-30 | 53 | 0 | 58 | 132,681 | 110.0 | 1.3 |
| May 1-15 | 58 | 0 | 64 | 87,228 | 110.0 | 1.3 |
| May 16-30 | 62 | 0 | 72 | 145,380 | 110.0 | 1.3 |
| Jun 1-15 | 67 | 0 | 80 | 111,006 | 110.0 | 1.3 |
| Jun 16-30 | 71 | 0 | 84 | 111,006 | 110.0 | 1.3 |
| Jul 1-31 | 75 | 0 | 87 | 57,902 | 110.0 | 1.3 |
| Aug 1-15 | 74 | 0 | 87 | 51,587 | 110.0 | 1.3 |
| Aug 16-31 | 74 | 0 | 87 | 51,587 | 110.0 | 1.3 |
| Sep 1-15 | 71 | 0 | 84 | 40,445 | 110.0 | 1.3 |
| Sep 16-30 | 65 | 0 | 78 | 40,445 | 110.0 | 1.3 |
| Oct 1-15 | 60 | 0 | 72 | 40,762 | 110.0 | 1.3 |
| Oct 16-31 | 54 | 0 | 66 | 40,762 | 110.0 | 1.3 |
| Nov 1-15 | 48 | 0 | 58 | 45,395 | 110.0 | 1.3 |
| Nov 16-30 | 42 | 0 | 50 | 36,316 | 110.0 | 1.3 |
| Dec 1-31 | 37 | 0 | 42 | 34,124 | 110.0 | 1.3 |

[1] This is the maximum of the WWF WQ criterion or the ambient temperature. The ambient temperature may be either the design (median) temperature for WWF, or the ambient stream temperature based on site-specific data entered by the user. A minimum of 1°F above ambient stream temperature is allocated.
[2] The WLA expressed in Million BTUs/day is valid for Case 1 scenarios, and disabled for Case 2 scenarios.
[3] The WLA expressed in °F is valid only if the limit is tied to a daily discharge flow limit (may be used for Case 1 or Case 2). WLAs greater than 110°F are displayed as 110°F.

# ATTACHMENT J:

Outfall 001 TRC Evaluation

## TRC EVALUATION

| | | | |
|---|---|---|---|
| 530 | = Q stream (cfs) | 0.5 | = CV Daily |
| 1.3 | = Q discharge (MGD) | 0.5 | = CV Hourly |
| 4 | = no. samples | 0.16 | = AFC_Partial Mix Factor |
| 0.3 | = Chlorine Demand of Stream | 0.7 | = CFC_Partial Mix Factor |
| 0 | = Chlorine Demand of Discharge | 0 | = AFC_Criteria Compliance Time (min) |
| 0.5 | = BAT/BPJ Value | 0 | = CFC_Criteria Compliance Time (min) |
| 0 | = % Factor of Safety (FOS) | 0 | =Decay Coefficient (K) |

| Source | Reference | AFC Calculations | | Reference | CFC Calculations | |
|---|---|---|---|---|---|---|
| TRC | 1.3.2.iii | WLA afc = | 13.470 | 1.3.2.iii | WLA cfc = | 57.383 |
| PENTOXSD TRG | 5.1a | LTAMULT afc = | 0.373 | 5.1c | LTAMULT cfc = | 0.581 |
| PENTOXSD TRG | 5.1b | LTA_afc= | 5.019 | 5.1d | LTA_cfc = | 33.360 |

| Source | | Effluent Limit Calculations | | |
|---|---|---|---|---|
| PENTOXSD TRG | 5.1f | AML MULT = | 1.720 | |
| PENTOXSD TRG | 5.1g | AVG MON LIMIT (mg/l) = | 0.500 | BAT/BPJ |
| | | INST MAX LIMIT (mg/l) = | 1.170 | |

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