pennsylvania
DEPARTMENT OF ENVIRONMENTAL PROTECTION

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

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|---|---|---|---|
| Application Type | **Renewal** | Application No. | **PA0219312** |
| Facility Type | **Industrial** | APS ID | **1078152** |
| Major / Minor | **Minor** | Authorization ID | **1425997** |

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

## Applicant and Facility Information

| | | | |
|---|---|---|---|
| Applicant Name | **Apollo Resources, LLC** | Facility Name | **Brinkerton Treatment Facility** |
| Applicant Address | 150 North Avenue PO Box 235 | Facility Address | Brinkerton Road |
| | Yatesboro, PA 16263 | | United, PA 15689 |
| Applicant Contact | Jesse Colangelo | Facility Contact | Michael Bucheit |
| Applicant Phone | 814-421-6303 | Facility Phone | 724-771-4275 |
| Applicant e-mail | jcolangelo@apolloresourcesllc.com | Facility e-mail | mbucheit@wpa.net |
| Client ID | 306576 | Site ID | 604365 |
| SIC Code | 1389 | Municipality | Mount Pleasant Township |
| SIC Description | Mining - Oil and Gas Field Services, NEC | County | Westmoreland |
| Date Application Received | December 30, 2022 | EPA Waived? | Yes |
| Date Application Accepted | January 4, 2023 | If No, Reason | |

Purpose of Application: Renewal NPDES permit coverage of treated industrial wastewater

## Summary of Review

The Department received a renewal NOI from Apollo Resources, LLC for the Brinkerton Treatment Facility on December 30, 2022. The Brinkerton Treatment Facility ("Brinkerton") is an existing treatment facility for the treatment of water generated by dewatering coal seams from which methane gas is extracted; also known as coal bed methane extraction. 25 coalbed methane gas wells produce water from this activity in a given area and the generated wastewater, known as coalbed methane connate water ("connate"), is conveyed via pipe to a treatment facility.

Connate enters the facility via several collection pipelines. It passes through two U-shaped settling basins in series where it is treated using settling, oxidation and passive aeration. A minimum of two feet of freeboard is maintained in both ponds. The system uses no treatment chemical additives. Settled solids removed from the basins are disposed of in a DEP approved landfill or other DEP approved site. After passing through the second settling basin, the water discharges via Outfall 001 to Sewickley Creek, designated in 25 PA Code Chapter 93 as a warm water fishery (WWF).). Stormwater is diverted around the ponds to the greatest extent possible. The ponds are the only infrastructure at the facility so there are no other outfalls associated with the facility.

The facility is not subject to any ELG's as the collected and treated connate from multiple wells is not a centralized waste facility subject to 40 CFR 437. The site is no longer subject to the ELG in 40 CFR 435 Oil and Gas Extraction Point Source, as the EPA decided to discontinue the effort for a coalbed methane rulemaking in the Fall of 2014. The effluent limits currently imposed at the facility were derived from; the Oil & Gas Wastewater Permitting Manual, the Sewickley Creek Watershed TMDL, the previous permit, and effluent standards from Chapter 16 and 93 of DEP's Rules and Regulations and 40 CFR 434 of EPA's Rules and Regulations and will be continued to be imposed in the Draft permit.

| Approve | Deny | Signatures | Date |
|---|---|---|---|
| X | | Adam Olesnanik / Project Manager | February 17, 2023 |
| X | | Michael E. Fifth, P.E. / Environmental Engineer Manager | February 17, 2023 |

**Summary of Review**

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.

## Discharge, Receiving Waters and Water Supply Information

| | | | |
|---|---|---|---|
| Outfall No. | 001 | Design Flow (MGD) | 0.2 |
| Latitude | 40º 13' 06" | Longitude | -79º 31' 05" |
| Quad Name | Mount Pleasant | Quad Code | 1709 |
| Wastewater Description: | Coalbed methane production water. | | |

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|---|---|---|---|
| Receiving Waters | Sewickley Creek | Stream Code | 37556 |
| NHD Com ID | 69913055 | RMI | 23.83 |
| Drainage Area | 28.9 | Yield (cfs/mi$^2$) | 0.0183 |
| $Q_{7-10}$ Flow (cfs) | 0.528 | $Q_{7-10}$ Basis | USGS StreamStats |
| Elevation (ft) | 960 | Slope (ft/ft) | 0.0001 |
| Watershed No. | 19-D | Chapter 93 Class. | WWF |
| Existing Use | | Existing Use Qualifier | |
| Exceptions to Use | | Exceptions to Criteria | |
| Assessment Status | Impaired | | |
| Cause(s) of Impairment | Pathogens, Siltation, pH | | |
| Source(s) of Impairment | Abandoned Mine Drainage, Agriculture, Source Unknown | | |
| TMDL Status | Final | Name | Sewickley Creek Watershed |

| | | | |
|---|---|---|---|
| Nearest Downstream Public Water Supply Intake | West County Municipal Authority - McKeesport | | |
| PWS Waters | Youghiogheny River | Flow at Intake (cfs) | 510 |
| PWS RMI | 1.4 | Distance from Outfall (mi) | 39.61 |

## Development of Effluent Limitations

**Outfall No.** 001 **Design Flow (MGD)** 0.2
**Latitude** 40º 13' 06" **Longitude** -79º 31' 05"
**Wastewater Description:** IW Process Effluent with ELG

### Technology-Based Limitations

Federal Effluent Limitation Guidelines (ELGs)

While Brinkerton does collect and treat connate from multiple wells categorizing it as a centralized waste treatment facility, it is not a Centralized Waste Treatment Facility subject to the effluent limit guideline ("ELG") 40 CFR 437. The applicability section of the ELG, 40 CFR 437.1(b), states, "This part does not apply to the following discharges of wastewater from a CWT facility: … (3) Wastewater from the treatment of wastes received from off-site via conduit (e.g., pipelines, channels, ditches, trenches, etc.) from the facility that generates the wastes unless the resulting wastewaters are commingled with other wastewaters subject to this provision." In this case the connate is being generated at the well and then delivered via a conduit (pipelines) to the treatment facility where it is processed and discharged. The connate from individual coal bed methane wells is conveyed to a central wastewater treatment facility. Only coal bed methane production wastewater is accepted; it is not comingled with any other wastes. In other words, Outfall 001 is not subject to 40 CFR 437. Outfall 001 is no longer subject to 40 CFR 435, the Oil and Gas Extraction Point Source discharge ELG as EPA has not promulgated effluent limitation guidelines and standards for pollutant discharges from coalbed methane extraction facilities. EPA had initiated a coalbed methane rulemaking, but announced its decision to discontinue this effort in Fall 2014.

The connate is subject to the provisions in the Oil & Gas Wastewater Permitting Manual ("OGPM"). Chapter IV Section C.1, Minimum Treatment Requirements for NPDES Permits, of the OGPM is in Attachment B. The OGPM stipulates technology based effluent limitations shown in Table 1.

**Table 1: TBELs from the Oil & Gas Wastewater Permitting Manual**

| Parameter | Minimum | Average Monthly | Instantaneous Maximum |
|---|---|---|---|
| Total Suspended Solids (mg/L) | - | 30 | 60 |
| Oil and Grease (mg/L) | - | 15 | 30 |
| Iron, Total (mg/L) | - | 3.5 | 7.0 |
| Acidity (mg/L) | - | Less than Alkalinity* | |
| pH (s.u.) | 6.0 | - | 9.0 |

Additionally, the OGPM stipulates that the treatment facilities must incorporate the following:

- Flow equalization to ensure optimum treatment efficiency of the facilities and minimization of water quality impacts.
- Gravity separation and surface skimming, or equivalent technology, for oil and grease removal.
- Chemical addition for pH control and metals removal, if necessary (a pH range of 8.0-8.5 is desirable).
- Aeration, or equivalent technology, for reducing volatile petroleum hydrocarbons and oxidation for metals removal.
- Settling (retention) or filtration for removal of solids, including oxidized metals.

*Due to the nature of the limits in the Draft Permit, monitoring for Acidity and Alkalinity will be imposed as well as Effluent Net Alkalinity. The Effluent Net Alkalinity will have a minimum limit of 0.0 mg/L, that way any time the Net Alkalinity value is a positive number, the facility is in compliance. Effluent Net Alkalinity is the difference between the Acidity and Alkalinity.

Chapter 95.10 Total Dissolved Solids Considerations

Outfall 001 is also subject to Chapter 95.10 Effluent Standards for total dissolved solids (TDS). The provisions of Chapter 95.10 were adopted on August 20, 2010 and became effective August 21, 2010. Chapter 95.10 of the Department's regulations establishes the effluent standards applicable to new and expanding discharges of TDS. Under the provisions of this regulation, dischargers that are subject to the requirements of 95.10 must be identified; discharges that are exempt from any treatment requirements under this chapter must be identified; the existing mass loadings of TDS that are exempt

from the treatment requirements must be identified and quantified; and discharges of new and expanding mass loadings of TDS must be evaluated.

Integral to the implementation of §95.10 is the principle that existing, authorized mass loadings of TDS are exempt from any treatment requirements under §95.10. Section 95.10(a)(1) effectively exempts any existing mass loading 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. In addition, §95.10 (a)(7) sets a de minimus threshold value of 5,000 lb/d on an average annual basis, below which DEP will not consider the expanding mass loading as sufficient to trigger the treatment requirements. If there is a net increase in TDS loading of more than 5,000 lb/d above the previously authorized loading, treatment requirements may be required for certain discharges, but the treatment requirements are only applicable for the expanding mass loading (the wastewater associated with the portion of the loading in excess of the existing mass loading, as per §95.10 (a)(1)(ii)).

The discharge from Outfall 001 were authorized and existed prior to August 21, 2010. Therefore, the discharge is considered to be an existing, authorized mass loading of TDS and is exempt from any treatment requirements.

The existing mass loadings of TDS have been designated within Part C, III of the current permit, indicating that the average mass loading to be 596.81 lbs/day. The average mass loading of TDS that was reported in the permit application was 18.66 lb/day. The TDS discharge did not exceed 5,000 lb/day; therefore, the load is not expanding, and the loading rates will not be reevaluated. Effluent limitations for TDS are not proposed but the TDS Part C condition containing the mass loadings will remain in the permit.

The previous Part C condition related to TDS and 25 PA Code Chapter 95.10 was associated with the 40 CFR 437. However, the site is not subject to this Federal ELG, and thus this Part C condition has been replaced with a revised TDS condition to better reflect how the site is subject to 25 PA Code Chapter 95.10.

Regulatory Effluent Standards and Monitoring Requirements

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

Effluent standards for oil and grease will be imposed per 25 Pa. Code § 95.2(2)

Effluent standards for pH are also imposed on industrial wastes by 25 Pa. Code § 95.2(1) as indicated in Table 2.

**Table 2: Regulatory Effluent Standards and Monitoring Requirements for Outfall 001**

| Parameter | Monthly Average | Daily Maximum | Units |
|---|---|---|---|
| Flow | Monitor and Report | | MGD |
| Oil & Grease | 15.0 | 30.0 | mg/L |
| pH | Not less than 6.0 nor greater than 9.0 | | S.U. |

**Water Quality-Based Limitations**

Toxics Management Spread Sheet

The Department of Environmental Protection (DEP) has developed the DEP Toxics Management Spreadsheet ("TMS") to facilitate calculations necessary for completing a reasonable potential (RP) analysis and determining water quality-based effluent limitations for discharges of toxic pollutants. The Toxics Management Spreadsheet is a macro-enabled Excel binary file that combines the functions of the PENTOXSD model and the Toxics Screening Analysis spreadsheet to evaluate the reasonable potential for discharges to cause excursions above water quality standards and to determine WQBELs. The Toxics Management Spread Sheet is a single discharge, mass-balance water quality calculation spread sheet that includes consideration for mixing, first-order decay and other factors to determine recommended WQBELs for toxic substances and several non-toxic substances. Required input data including stream code, river mile index, elevation, drainage area, discharge name, NPDES permit number, discharge flow rate and the discharge concentrations for parameters in the permit application or in DMRs, which are entered into the spread sheet to establish site-specific discharge conditions. Other data such as low flow yield, reach dimensions and partial mix factors may also be entered to further characterize the conditions of the discharge and receiving water. Discharge concentrations for the parameters are chosen to represent the "worst case" quality of the discharge (i.e., maximum reported discharge concentrations). The spread sheet then evaluates each parameter by computing a Waste Load Allocation for each applicable criterion, determining a recommended maximum WQBEL and comparing that recommended WQBEL with the input discharge concentration to determine which is more stringent. Based on this evaluation, the Toxics Management Spread sheet recommends average monthly and maximum daily WQBELs.

Reasonable Potential Analysis and WQBEL Development for Outfall 001

Discharges from Outfall 001 are evaluated based on concentrations reported on the application and on DMRs; data from those sources are entered into the Toxics Management Spread Sheet. The maximum reported value of the parameters from the application form or from previous DMRs is used as the input concentration in the Toxics Management Spread Sheet. All toxic pollutants whose maximum concentrations, as reported in the permit application or on DMRs, are greater than the most stringent applicable water quality criterion are considered to be pollutants 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]. The Toxics Management Spread Sheet is run with the discharge and receiving stream characteristics shown in Table 3. For IW discharges, the design flow used in modeling is the average flow during production or operation taken from the permit application. Pollutants for which water quality standards have not been promulgated (e.g., TSS, oil and grease) are excluded from the analysis. All the parameters are evaluated using the model to determine the water quality-based effluent limits applicable to the discharge and the receiving stream. The spreadsheet then compares the reported discharge concentrations to the calculated water quality-based effluent limitations to determine if a reasonable potential exists to exceed the calculated WQBELs. Effluent limitations are established in the draft permit where a pollutant's maximum reported discharge concentration equals or exceeds 50% of the WQBEL. For non-conservative pollutants, monitoring requirements are established where the maximum reported concentration is between 25% - 50% of the WQBEL. For conservative pollutants, monitoring requirements are established where the maximum reported concentration is between 10% - 50% of the WQBEL. The information described above including the maximum reported discharge concentrations, the most stringent water quality criteria, the pollutant-of-concern (reasonable potential) determinations, the calculated WQBELs, and the WQBEL/monitoring recommendations are displayed in the Toxics Management Spread Sheet in Attachment C of this Fact Sheet. The Toxics Management Spread Sheet did not recommend any WQBELs for Outfall 001.

***Table 3: TMS Inputs for Outfall 001***

| **Parameter** | **Value** |
|---|---|
| River Mile Index | 23.83 |
| Discharge Flow (MGD) | 0.00067 |
| **Basin/Stream Characteristics** | |
| **Parameter** | **Value** |
| Area in Square Miles | 28.9 |
| $Q_{7-10}$ (cfs) | 0.528 |
| Low-flow yield (cfs/mi$^2$) | 0.0183 |
| Elevation (ft) | 960 |
| Slope | 0.0001 |

Total Maximum Daily Loads

Wastewater discharges from Brinkerton are located within the Sewickley Creek Watershed for which the Department has developed a TMDL. Section 303(d) of the Clean Water Act and the U.S. Environmental Protection Agency's; Quality Planning and Management Regulations (codified at Title 40 of the *Code of Federal Regulations* Part 130) require states to develop a TMDL for impaired water bodies. A TMDL establishes the amount of a pollutant that a water body can assimilate without exceeding the water quality criteria for that pollutant. TMDLs provide the scientific basis for a state to establish water quality-based controls to reduce pollution from both point and non-point sources in order to restore and maintain the quality of the state's water resources (USEPA 1991a). The TMDL was developed for segments in the Sewickley Creek Watershed. These were done to address the impairments noted on the 1996 Pennsylvania Section 303(d) list of impaired waters, required under the Clean Water act, and covers one segment on that list and additional segments on later list/reports. Sewickley Creek was listed as impaired for metals. All impairments resulted from drainage

from abandoned coalmines. The TMDL addresses the three primary metal associated with abandoned mine drainage (iron, manganese, aluminum) and pH. Stream data is used to calculate minimum pollutant reductions that are necessary to attain water quality criteria levels. Target concentrations published in the TMDL were based on established water quality criteria of 0.750 $^{mg}/_{L}$ total recoverable aluminum, 1.5 $^{mg}/_{L}$ total recoverable iron based on a 30-day average and 1.0 $^{mg}/_{L}$ total recoverable manganese. TMDLs prescribe allocations that minimally achieve water quality criteria (i.e., 100 percent use of a stream's assimilative capacity).

One of the major components of a TMDL is the establishment for an instream numeric endpoint, which is used to evaluate the attainment of applicable water quality. An instream numeric endpoint, therefore, represents the water quality goal that is to be achieved by implementing the load reduction specified in the TMDL. The endpoint allows for a comparison between observed instream conditions and conditions that are expected to restore designated uses. The endpoint is based on either narrative or numeric criteria available in water quality standards. Because the pollution sources in the watershed are nonpoint sources, the TMDLs' component makeup will be load allocations (LAs) with waste load allocations (WLAs) for permitted discharges. All allocations will be specified as long-term average daily concentrations. These long-term average concentrations are expected to meet water-quality criteria 99% of the time as required in PA Title 25 Chapter 96.3(c).

The TMDL for Sewickley Creek consist of load allocations to four sampling sites on Sewickley Creek (SC1-3), six sites in the Welty Run Watershed (WELTY1, 4-8), eight sites in the Buffalo Run Watershed (BUFF1-3, BUFF6-10), and ten sites in the Jacks Run Watershed (JACK1-10). Sample data sets were collected in 2007 and 2008. An allowable long-term average in-stream concentration was determined at each sample pint for metals and acidity. The analysis is designed to produce an average value that, when met, will be protective of the water-quality criterion for that parameter 99% of the time. An analysis was performed using Monte Carlo simulation to determine the necessary long-term average concentration needed to attain water-quality criteria 99% of the time. The simulation was run assuming the data set was log normally distributed. Using the mean and standard deviation of the data set, 5000 iterations of sampling were completed, and compared against the water-quality criterion for that parameter. For each sampling event a percent reduction was calculated, if necessary, to meet water-quality criteria. A second simulation that multiplied the percent reduction times the sampled value was run to ensure that criteria were met 99% of the time. The mean value from this data set represents the long-term average concentration that needs to be met to achieve water-quality standards.

Outfall 001 discharges upstream of sample point SC3. The TMDL reference table is displayed in Attachment E. The TMDL for sampling point SC3 consists of a load allocation for all of the area between points WELTY1/Jack1 and SC3. The load allocation for this segment of Sewickley Creek was computed using water-quality sample data collected at point SC3. The average flow, measured at the sampling point SC3 (75.62 MGD), is used for these computations. Sample data at point SC3 shows pH ranging between 8.2 and 8.4; pH will not be addressed because water quality standards are being met. Table 4 shows the measured and allowable concentrations and loads at SC3.

**Table 4. SC3 TMDL Waste Allocation**

| Parameters | Measured | | Allowable | |
|---|---|---|---|---|
| | Concentration (mg/L) | Load (lbs/day) | Concentration (mg/L) | Load (lbs/day) |
| Aluminum | 0.50 | 317.07 | 0.25 | 155.36 |
| Iron | 0.41 | 255.73 | 0.41 | 255.73 |
| Manganese | 0.09 | 57.71 | 0.09 | 57.71 |
| Acidity | -118.00 | -74418.25 | -118.00 | -74418.25 |
| Alkalinity | 131.45 | 82900.67 | | |

The TMDL prescribes an allowable discharge concentration that is more stringent than the water quality criterion for all of the parameters under consideration. In NPDES permitting; where there is no available assimilative capacity in the surface water the numeric value of the most stringent applicable water quality criterion is applied as effluent limits. Therefore, the water quality criterion for aluminum will be imposed in order to ensure compliance with the TMDL.

The specific water quality criterion for aluminum is expressed as an acute or maximum daily in 25 Pa. Code Chapter 93. Discharges of aluminum may only be authorized to the extent that they will not cause or contribute to any violation of the water quality standards. Therefore, the water quality criterion for aluminum (0.75 mg/L) is imposed as a maximum daily effluent limit (MDL). Whenever the most stringent criterion is selected for the MDL, the Department should also impose an average monthly limit (AML) and instantaneous maximum limit (IMAX) if applicable. The imposition of an AML that is more stringent than the MDL is typically not appropriate because the water quality concerns have already been fully addressed by setting the MDL equal to the most stringent applicable criterion. Therefore, where the MDL is set at the

value of the most stringent applicable criterion, the AML should be set equal to the MDL. Accordingly, TMDL aluminum limits are proposed for Outfall 001. The proposed aluminum limits are shown in Table 8.

The specific water quality criterion for iron is expressed as a 30-day average of 1.5 $^{mg}/_{L}$ in 25 Pa. Code § 93.7(a). The criterion is based on the protection of aquatic life and is associated with chronic exposure. There are no other criteria for total iron. Since the duration of the total iron criterion coincides with the 30-day duration of the AML, the 30-day average criterion for total iron is set equal to the AML.

In addition, because the total iron criterion is associated with chronic exposure, the MDL (representing acute exposure) and the IMAX may be made less stringent according to established procedures described in Section III.C.3.h on Page 13 of the Water Quality Toxics Management Strategy (Doc. # 361-0100-003). These procedures state that a MDL and IMAX may be set at 2 times and 2.5 times the AML, respectively, or there is the option to use multipliers from EPA's Technical Support Document for Water Quality-based Toxics Control, if data are available to support the use of alternative multipliers. Accordingly, TMDL iron limits are proposed for Outfall 001. The proposed iron limits are shown in Table 5.

The specific water quality criterion for manganese is expressed as an acute or maximum daily of 1.0 mg/L in 25 Pa. Code § 93.7(a). The criterion is based on the protection of human health and is associated with chronic exposure associated with a potable water supply (PWS). Since no duration is given in Chapter 93 for the manganese criterion, a duration of 30 days is used based on the water quality criteria duration for Threshold Human Health (THH) criteria given in Section III.C.3.a., Table 1 on Page 10 of DEP's Water Quality Toxics Management Strategy. The 30-day duration for THH criteria coincides with the 30-day duration of an AML, which is why the manganese criterion is set equal to the AML for a "permitting at criteria" scenario.

Because the manganese criterion is interpreted as having chronic exposure, the manganese MDL and IMAX may be made less stringent according to procedures established in Section III.C.2.h. of the Water Quality Toxics Management Strategy (AML multipliers of 2.0 and 2.5 for the MDL and IMAX respectively). Accordingly, TMDL manganese limits are proposed for Outfall 001. The proposed manganese limits are shown in Table 5.

**Table 5 – TMDL Limits for Outfall 001**

| Parameter | TMDL Limits | | Units |
|---|---|---|---|
| | Average Monthly | Daily Maximum | |
| Aluminum, total | 0.75 | 0.75 | mg/L |
| Iron, total | 1.5 | 3.0 | mg/L |
| Manganese, total | 1.0 | 2.0 | mg/L |

In this case, aluminum, iron and manganese limits were imposed in order to ensure compliance with the TMDL.

**Anti-Backsliding**

Previous limits can be used pursuant to EPA's anti-backsliding regulation, 40 CFR 122.44(l) and are displayed in Table 6 below.

**Table 6. Previous Effluent Limitations**

| Parameter | Daily Minimum (mg/L) | Average monthly (mg/L) | Daily Maximum (mg/L) | Instantaneous Maximum (mg/L) | Sample Frequency | Sample type |
|---|---|---|---|---|---|---|
| Flow (mgd) | | | 0.6 | | Daily | Measured |
| Oil and Grease | | 15.0 | 30.0 | | 2/Month | Grab |
| Total Suspended Solids | | 30.0 | | 60.0 | 2/Month | Grab |
| Acidity | | | Monitor | | 2/Month | Grab |
| Alkalinity | | | Monitor | | 2/Month | Grab |
| Alkalinity (Effluent Net) | 0.0 | | | | 2/Month | Calculate |
| pH (S.U) | 6.0 | | 9.0 | | 2/Month | Grab |
| Total Dissolved Solids | | Monitor | Monitor | | 2/Month | Grab |
| Chloride | | Monitor | Monitor | | 2/Month | Grab |
| Bromide | | Monitor | Monitor | | 2/Month | Grab |
| Sulfate | | Monitor | Monitor | | 2/Month | Grab |

| | | | | | | |
|---|---|---|---|---|---|---|
| Total Barium | | Monitor | Monitor | | 2/Month | Grab |
| Osmotic Pressure (mOs/kg) | | | Monitor | | 2/Month | Grab |
| Aluminum (total) | | 0.75 | 0.75 | | 2/Month | Grab |
| Iron (total) | | 1.5 | 3.0 | | 2/Month | Grab |
| Manganese (total) | | 1.0 | 2.0 | | 2/Month | Grab |

**Final Effluent limitations**

Final effluent limitation and monitor requirements for Outfall 001 are displayed below in Table 7.

**Table 7. Final Effluent Limitations**

| Parameter | Instant. Minimum (mg/L) | Average monthly (mg/L) | Daily Maximum (mg/L) | Instantaneous Maximum (mg/L) | Sample Frequency | Sample type |
|---|---|---|---|---|---|---|
| Flow (mgd) | | | 0.6 | | Daily | Measured |
| Oil and Grease | | 15.0 | 30.0 | | 2/Month | Grab |
| Total Suspended Solids | | 30.0 | | 60.0 | 2/Month | Grab |
| Acidity | | | Monitor | | 2/Month | Grab |
| Alkalinity | | | Monitor | | 2/Month | Grab |
| Alkalinity (Effluent Net) | 0.0 | | | | 2/Month | Calculate |
| pH (S.U) | 6.0 | | | 9.0 | 2/Month | Grab |
| Total Dissolved Solids | | Monitor | Monitor | | 2/Month | Grab |
| Chloride | | Monitor | Monitor | | 2/Month | Grab |
| Bromide | | Monitor | Monitor | | 2/Month | Grab |
| Sulfate | | Monitor | Monitor | | 2/Month | Grab |
| Total Barium | | Monitor | Monitor | | 2/Month | Grab |
| Osmotic Pressure (mOs/kg) | | | Monitor | | 2/Month | Grab |
| Aluminum (total) | | 0.75 | 0.75 | | 2/Month | Grab |
| Iron (total) | | 1.5 | 3.0 | | 2/Month | Grab |
| Manganese (total) | | 1.0 | 2.0 | | 2/Month | Grab |

| Tools and References Used to Develop Permit | |
|---|---|
| | |
| ☐ | WQM for Windows Model (see Attachment ) |
| ☒ | Toxics Management Spreadsheet (see Attachment **C**) |
| ☐ | TRC Model Spreadsheet (see Attachment ) |
| ☐ | Temperature Model Spreadsheet (see Attachment ) |
| ☐ | Water Quality Toxics Management Strategy, 361-0100-003, 4/06. |
| ☐ | Technical Guidance for the Development and Specification of Effluent Limitations, 362-0400-001, 10/97. |
| ☐ | Policy for Permitting Surface Water Diversions, 362-2000-003, 3/98. |
| ☐ | Policy for Conducting Technical Reviews of Minor NPDES Renewal Applications, 362-2000-008, 11/96. |
| ☐ | Technology-Based Control Requirements for Water Treatment Plant Wastes, 362-2183-003, 10/97. |
| ☐ | Technical Guidance for Development of NPDES Permit Requirements Steam Electric Industry, 362-2183-004, 12/97. |
| ☐ | Pennsylvania CSO Policy, 385-2000-011, 9/08. |
| ☐ | Water Quality Antidegradation Implementation Guidance, 391-0300-002, 11/03. |
| ☐ | Implementation Guidance Evaluation & Process Thermal Discharge (316(a)) Federal Water Pollution Act, 391-2000-002, 4/97. |
| ☐ | Determining Water Quality-Based Effluent Limits, 391-2000-003, 12/97. |
| ☐ | Implementation Guidance Design Conditions, 391-2000-006, 9/97. |
| ☐ | Technical Reference Guide (TRG) WQM 7.0 for Windows, Wasteload Allocation Program for Dissolved Oxygen and Ammonia Nitrogen, Version 1.0, 391-2000-007, 6/2004. |
| ☐ | Interim Method for the Sampling and Analysis of Osmotic Pressure on Streams, Brines, and Industrial Discharges, 391-2000-008, 10/1997. |
| ☐ | Implementation Guidance for Section 95.6 Management of Point Source Phosphorus Discharges to Lakes, Ponds, and Impoundments, 391-2000-010, 3/99. |
| ☐ | Technical Reference Guide (TRG) PENTOXSD for Windows, PA Single Discharge Wasteload Allocation Program for Toxics, Version 2.0, 391-2000-011, 5/2004. |
| ☐ | Implementation Guidance for Section 93.7 Ammonia Criteria, 391-2000-013, 11/97. |
| ☐ | Policy and Procedure for Evaluating Wastewater Discharges to Intermittent and Ephemeral Streams, Drainage Channels and Swales, and Storm Sewers, 391-2000-014, 4/2008. |
| ☐ | Implementation Guidance Total Residual Chlorine (TRC) Regulation, 391-2000-015, 11/1994. |
| ☐ | Implementation Guidance for Temperature Criteria, 391-2000-017, 4/09. |
| ☐ | Implementation Guidance for Section 95.9 Phosphorus Discharges to Free Flowing Streams, 391-2000-018, 10/97. |
| ☐ | Implementation Guidance for Application of Section 93.5(e) for Potable Water Supply Protection Total Dissolved Solids, Nitrite-Nitrate, Non-Priority Pollutant Phenolics and Fluorides, 391-2000-019, 10/97. |
| ☐ | Field Data Collection and Evaluation Protocol for Determining Stream and Point Source Discharge Design Hardness, 391-2000-021, 3/99. |
| ☐ | Implementation Guidance for the Determination and Use of Background/Ambient Water Quality in the Determination of Wasteload Allocations and NPDES Effluent Limitations for Toxic Substances, 391-2000-022, 3/1999. |
| ☐ | Design Stream Flows, 391-2000-023, 9/98. |
| ☐ | Field Data Collection and Evaluation Protocol for Deriving Daily and Hourly Discharge Coefficients of Variation (CV) and Other Discharge Characteristics, 391-2000-024, 10/98. |
| ☐ | Evaluations of Phosphorus Discharges to Lakes, Ponds and Impoundments, 391-3200-013, 6/97. |
| ☐ | Pennsylvania's Chesapeake Bay Tributary Strategy Implementation Plan for NPDES Permitting, 4/07. |
| ☐ | SOP: |
| ☒ | Other: Oil & Gas Wastewater Permitting Manual (Chapter IV Section C.1 is in **Attachment B**) |
| ☒ | Other: Sewickley Creek Watershed TMDL |

## Attachments

Attachment A: USGS Stream Stats Data

Attachment B: Chapter IV Section C.1 of the Oil & Gas Wastewater Permitting Manual

Attachment C: Toxics Management Spread Sheet Results for Outfall 001

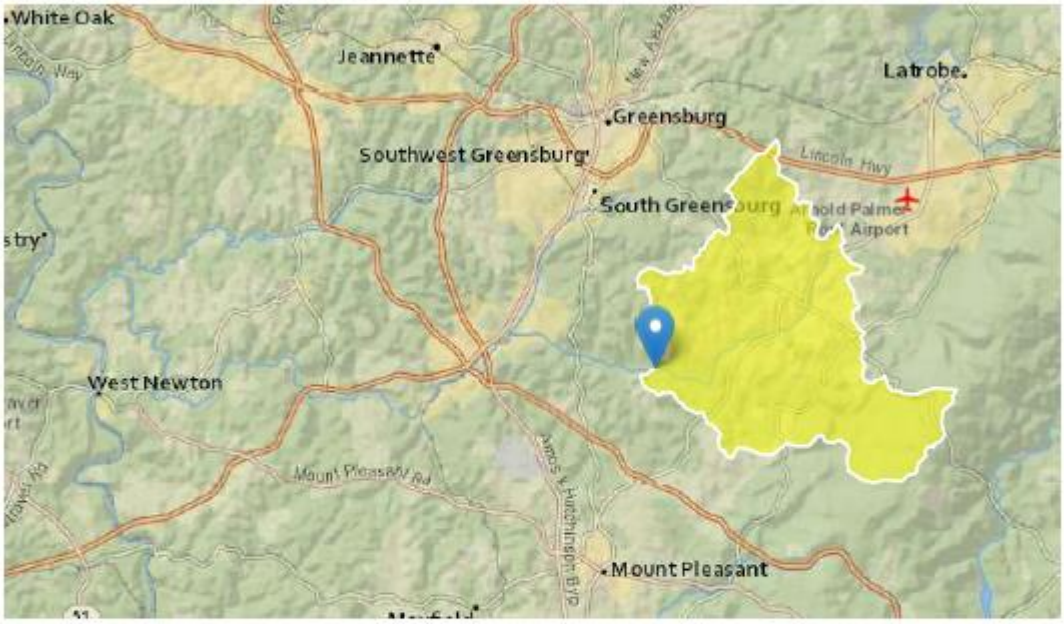
Attachment E: Sewickley Creek Watershed TMDL – Stream Segment SC3 Maps and Load Allocations

## Attachment A:

## USGS Stream Stats Data

## StreamStats Report

**Region ID:** PA
**Workspace ID:** PA20230104175502947000
**Clicked Point (Latitude, Longitude):** 40.21849, -79.51849
**Time:** 2023-01-04 12:55:28 -0500




Collapse All

### Basin Characteristics

| Parameter Code | Parameter Description | Value | Unit |
|---|---|---|---|
| DRNAREA | Area that drains to a point on a stream | 28.9 | square miles |
| ELEV | Mean Basin Elevation | 1230 | feet |

Low-Flow Statistics Parameters [99.9 Percent (28.9 square miles) Low Flow Region 4]

| Parameter Code | Parameter Name | Value | Units | Min Limit | Max Limit |
|---|---|---|---|---|---|
| DRNAREA | Drainage Area | 28.9 | square miles | 2.26 | 1400 |
| ELEV | Mean Basin Elevation | 1230 | feet | 1050 | 2580 |

Low-Flow Statistics Flow Report [99.9 Percent (28.9 square miles) Low Flow Region 4]

PII: Prediction Interval-Lower, Plu: Prediction Interval-Upper, ASEp: Average Standard Error of Prediction, SE: Standard Error (other -- see report)

| Statistic | Value | Unit | SE | ASEp |
|---|---|---|---|---|
| 7 Day 2 Year Low Flow | 1.32 | ft^3/s | 43 | 43 |
| 30 Day 2 Year Low Flow | 2.18 | ft^3/s | 38 | 38 |
| 7 Day 10 Year Low Flow | 0.528 | ft^3/s | 66 | 66 |
| 30 Day 10 Year Low Flow | 0.879 | ft^3/s | 54 | 54 |
| 90 Day 10 Year Low Flow | 1.54 | ft^3/s | 41 | 41 |

*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/)**

## Attachment B:

## Chapter IV Section C.1 of the Oil & Gas Wastewater Permitting Manual

## C. Determination of Wastewater Treatment Requirements

The effluent limits developed and included in a NPDES permit may be either water quality-based or technology-based, the result of a "best management practices" approach to controlling or abating a pollution problem, or a combination of any or all of the above.

The treatment and discharge of wastewater from oil and gas well drilling, stimulation, and production activities to surface waters is permissible, subject to the legal and technical considerations described as follows:

### 1. Minimum Treatment Required

All oil and gas well wastewater discharges must be treated or managed in such a way as to not violate the existing uses of the receiving stream, which are identified in Chapter 93 of the Department's Rules and Regulations.

NPDES permits may not be issued for discharges to "High Quality" or "Exceptional Value" waters (also identified in Chapter 93) unless a finding has been made by the Department that the antidegradation requirements in Chapter 93 of the Department's Rules and Regulations have been satisfied. Further discussion involving "Special Protection" waters is included in the next subsection.

Chapters 78 and 95 of the Rules and Regulations address several requirements pertaining to treatment and discharge of wastewaters. Section 95.2(c) specifies the minimum level of treatment required for waste discharges as that defined by EPA under the Federal Water Pollution Control Act (33 U.S.C.A. §§ 1311, 1314 and 1342), or in absence of the minimum treatment defined by EPA, an equivalent degree of treatment or technology as determined by the Department.

EPA has established technology-based effluent limitation guidelines for certain subcategories of the oil and gas extraction industry as noted in 40 CFR 435. Subpart C of these guidelines, which relates to the Onshore Subcategory, prohibits the discharge of produced fluids from oil and gas well drilling, stimulation, and production activities to surface waters. The only apparent exception to this prohibition is identified by Subpart F, which pertains to "stripper" oil wells (i.e., those wells producing 10 barrels or less of crude oil per day and which do not produce natural gas in excess of 15,000 cubic feet of gas per one barrel (42 gallons) of petroleum liquids). Discharges from these wells can be covered under a general permit (see Chapter V).

At this time, technology-based effluent limitations guidelines do not exist for Subpart F, although EPA is currently reviewing portions of this category in order to establish new guidelines. Thus, since "stripper" oil wells are not subject to the "no discharge" requirement, individual "stripper" well discharges may be permitted where circumstances warrant utilizing, at a minimum, the technology-based effluent limitations established by the Department.

Discharges of wastewaters to surface waters from oil and gas well operations may be approved under NPDES permits if the wastewaters are removed to an "off-site" treatment facility, provided the discharge will meet all the requirements discussed above. The term "off-site" includes:

a. A central wastewater collection and treatment facility associated with a multiple-well operation.

b. A wastewater treatment facility owned and operated by another party or group of operators.

NPDES permits will contain technology-based effluent limitations at least as stringent as the following:

| Parameter | Average Monthly (mg/L) | Instantaneous Maximum (mg/L) |
|---|---|---|
| Total Suspended Solids | 30 | 60 |
| Oils and Grease | 15 | 30 |
| Iron, Total | 3.5 | 7.0 |
| Acidity | Less than Alkalinity | |
| pH | 6 to 9 Standard Units | |

The design of the treatment facilities must incorporate the following:

a. Flow equalization to ensure optimum treatment efficiency of the facilities and minimization of water quality impacts.

b. Gravity separation and surface skimming, or equivalent technology, for oil and grease removal.

c. Chemical addition for pH control and metals removal, if necessary (a pH range of 8.0 - 8.5 is desirable).

d. Aeration, or equivalent technology, for reducing volatile petroleum hydrocarbons and oxidation for metals removal.

e. Settling (retention) or filtration for removal of solids, including oxidized metals.

More stringent or additional limitations on other parameters (e.g., total dissolved solids, specific conductance, osmotic pressure, heavy metals, organics, etc.) will be imposed as needed to protect the water quality of the receiving stream, or to serve as indicators of the effectiveness of the treatment facilities.

Multiple discharges may be covered under a single NPDES permit, if the management of those facilities is under the control of one owner/operator and the geographic area is small enough to allow for effective operation and monitoring of the facilities.

## Attachment C:
## Toxics Management Spread Sheet Results for Outfall 001

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Toxics Management Spreadsheet
Version 1.3, March 2021

# Discharge Information

Instructions | Discharge | Stream

Facility: **Brinkerton Treatment Facility** NPDES Permit No.: **PA0219312** Outfall No.: **001**

Evaluation Type: **Major Sewage / Industrial Waste** Wastewater Description: **Coalbed Methane Production Water**

| Discharge Characteristics | | | | | | | | |
|---|---|---|---|---|---|---|---|---|
| Design Flow (MGD)* | Hardness (mg/l)* | pH (SU)* | Partial Mix Factors (PMFs) | | | | Complete Mix Times (min) | |
| | | | AFC | CFC | THH | CRL | $Q_{7-10}$ | $Q_h$ |
| 0.000672 | 308 | 7.6 | | | | | | |

| | | | | | 0 if left blank | | 0.5 if left blank | | 0 if left blank | | | 1 if left blank | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | Discharge Pollutant | Units | Max Discharge Conc | | Trib Conc | Stream Conc | Daily CV | Hourly CV | Stream CV | Fate Coeff | FOS | Criteria Mod | Chem Transl |
| Group 1 | Total Dissolved Solids (PWS) | mg/L | | 6230 | | | | | | | | | |
| | Chloride (PWS) | mg/L | | 3000 | | | | | | | | | |
| | Bromide | mg/L | | 18.4 | | | | | | | | | |
| | Sulfate (PWS) | mg/L | | 0.972 | | | | | | | | | |
| | Fluoride (PWS) | mg/L | | 0.57 | | | | | | | | | |
| Group 2 | Total Aluminum | µg/L | | 30 | | | | | | | | | |
| | Total Antimony | µg/L | | 20 | | | | | | | | | |
| | Total Arsenic | µg/L | | 8 | | | | | | | | | |
| | Total Barium | µg/L | | 15300 | | | | | | | | | |
| | Total Beryllium | µg/L | | 0.4 | | | | | | | | | |
| | Total Boron | µg/L | | 156 | | | | | | | | | |
| | Total Cadmium | µg/L | | 0.4 | | | | | | | | | |
| | Total Chromium (III) | µg/L | | 27 | | | | | | | | | |
| | Hexavalent Chromium | µg/L | | 0.1 | | | | | | | | | |
| | Total Cobalt | µg/L | | 0.003 | | | | | | | | | |
| | Total Copper | µg/L | | 0.002 | | | | | | | | | |
| | Free Cyanide | µg/L | | | | | | | | | | | |
| | Total Cyanide | µg/L | | 3 | | | | | | | | | |
| | Dissolved Iron | µg/L | | 122 | | | | | | | | | |
| | Total Iron | µg/L | | 99.9 | | | | | | | | | |
| | Total Lead | µg/L | | 0.0003 | | | | | | | | | |
| | Total Manganese | µg/L | | 10200 | | | | | | | | | |
| | Total Mercury | µg/L | | 0.01 | | | | | | | | | |
| | Total Nickel | µg/L | | 2 | | | | | | | | | |
| | Total Phenols (Phenolics) (PWS) | µg/L | | 50 | | | | | | | | | |
| | Total Selenium | µg/L | | 37 | | | | | | | | | |
| | Total Silver | µg/L | | 1 | | | | | | | | | |
| | Total Thallium | µg/L | | 0.4 | | | | | | | | | |
| | Total Zinc | µg/L | | 0.012 | | | | | | | | | |
| | Total Molybdenum | µg/L | | 18 | | | | | | | | | |
| | Acrolein | µg/L | < | | | | | | | | | | |
| | Acrylamide | µg/L | < | | | | | | | | | | |
| | Acrylonitrile | µg/L | < | | | | | | | | | | |
| | Benzene | µg/L | < | | | | | | | | | | |
| | Bromoform | µg/L | < | | | | | | | | | | |

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Toxics Management Spreadsheet
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# Stream / Surface Water Information

**Brinkerton Treatment Facility, NPDES Permit No. PA0219312, Outfall 001**

Instructions | Discharge | *Stream*

Receiving Surface Water Name: **Sewickly Creek**

No. Reaches to Model: **1**

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

| Location | Stream Code* | RMI* | Elevation (ft)* | DA ($mi^2$)* | Slope (ft/ft) | PWS Withdrawal (MGD) | Apply Fish Criteria* |
|---|---|---|---|---|---|---|---|
| Point of Discharge | 037556 | 23.83 | 960 | 28.9 | 0.0001 | | Yes |
| End of Reach 1 | 037556 | 22.83 | 959 | 29 | | | Yes |

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

| Location | RMI | LFY ($cfs/mi^2$)* | Flow (cfs) | | W/D Ratio | Width (ft) | Depth (ft) | Velocity (fps) | Travel Time (days) | Tributary | | Stream | | Analysis | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | | | Stream | Tributary | | | | | | Hardness | pH | Hardness* | pH* | Hardness | pH |
| Point of Discharge | 23.83 | 0.1 | 0.528 | | | | | | | | | 100 | 7 | | |
| End of Reach 1 | 22.83 | 0.1 | | | | | | | | | | | | | |

$Q_h$

| Location | RMI | LFY ($cfs/mi^2$) | Flow (cfs) | | W/D Ratio | Width (ft) | Depth (ft) | Velocity (fps) | Travel Time (days) | Tributary | | Stream | | Analysis | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | | | Stream | Tributary | | | | | | Hardness | pH | Hardness | pH | Hardness | pH |
| Point of Discharge | 23.83 | | | | | | | | | | | | | | |
| End of Reach 1 | 22.83 | | | | | | | | | | | | | | |

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Toxics Management Spreadsheet
Version 1.3, March 2021

# Model Results

**Brinkerton Treatment Facility, NPDES Permit No. PA0219312, Outfall 001**

Instructions | *Results* | RETURN TO INPUTS | SAVE AS PDF | PRINT | (•) All | ( ) Inputs | ( ) Results | ( ) Limits

☐ ***Hydrodynamics***

☑ ***Wasteload Allocations***

☑ ***AFC*** CCT (min): 15 PMF: 0.377 Analysis Hardness (mg/l): 101.08 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 | 750 | 750 | 144,517 | |
| Total Antimony | 0 | 0 | | 0 | 1,100 | 1,100 | 211,958 | |
| Total Arsenic | 0 | 0 | | 0 | 340 | 340 | 65,514 | Chem Translator of 1 applied |
| Total Barium | 0 | 0 | | 0 | 21,000 | 21,000 | 4,046,478 | |
| Total Boron | 0 | 0 | | 0 | 8,100 | 8,100 | 1,560,784 | |
| Total Cadmium | 0 | 0 | | 0 | 2.035 | 2.16 | 416 | Chem Translator of 0.944 applied |
| Total Chromium (III) | 0 | 0 | | 0 | 574.796 | 1,819 | 350,497 | Chem Translator of 0.316 applied |
| Hexavalent Chromium | 0 | 0 | | 0 | 16 | 16.3 | 3,140 | Chem Translator of 0.982 applied |
| Total Cobalt | 0 | 0 | | 0 | 95 | 95.0 | 18,305 | |
| Total Copper | 0 | 0 | | 0 | 13.576 | 14.1 | 2,725 | 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 | 65.341 | 82.8 | 15,949 | Chem Translator of 0.789 applied |
| Total Manganese | 0 | 0 | | 0 | N/A | N/A | N/A | |
| Total Mercury | 0 | 0 | | 0 | 1.400 | 1.65 | 317 | Chem Translator of 0.85 applied |
| Total Nickel | 0 | 0 | | 0 | 472.508 | 473 | 91,230 | 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 | 3.277 | 3.85 | 743 | Chem Translator of 0.85 applied |
| Total Thallium | 0 | 0 | | 0 | 65 | 65.0 | 12,525 | |
| Total Zinc | 0 | 0 | | 0 | 118.251 | 121 | 23,298 | Chem Translator of 0.978 applied |
| Total Strontium | 0 | 0 | | 0 | N/A | N/A | N/A | |

| | | | | | | | | |
|---|---|---|---|---|---|---|---|---|
| Osmotic Pressure | 0 | 0 | | 0 | 50 | 50.0 | 9,634 | |

☑ *CFC* CCT (min): ###### PMF: 1 Analysis Hardness (mg/l): 100.41 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 | 111,957 | |
| Total Arsenic | 0 | 0 | | 0 | 150 | 150 | 76,334 | Chem Translator of 1 applied |
| Total Barium | 0 | 0 | | 0 | 4,100 | 4,100 | 2,086,471 | |
| Total Boron | 0 | 0 | | 0 | 1,600 | 1,600 | 814,233 | |
| Total Cadmium | 0 | 0 | | 0 | 0.247 | 0.27 | 138 | Chem Translator of 0.909 applied |
| Total Chromium (III) | 0 | 0 | | 0 | 74.363 | 86.5 | 44,003 | Chem Translator of 0.86 applied |
| Hexavalent Chromium | 0 | 0 | | 0 | 10 | 10.4 | 5,290 | Chem Translator of 0.962 applied |
| Total Cobalt | 0 | 0 | | 0 | 19 | 19.0 | 9,669 | |
| Total Copper | 0 | 0 | | 0 | 8.987 | 9.36 | 4,764 | 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 | 763,343 | WQC = 30 day average; PMF = 1 |
| Total Lead | 0 | 0 | | 0 | 2.528 | 3.2 | 1,628 | Chem Translator of 0.79 applied |
| Total Manganese | 0 | 0 | | 0 | N/A | N/A | N/A | |
| Total Mercury | 0 | 0 | | 0 | 0.770 | 0.91 | 461 | Chem Translator of 0.85 applied |
| Total Nickel | 0 | 0 | | 0 | 52.186 | 52.3 | 26,637 | 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 | 2,539 | 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 | 6,616 | |
| Total Zinc | 0 | 0 | | 0 | 118.548 | 120 | 61,185 | Chem Translator of 0.986 applied |
| Total Strontium | 0 | 0 | | 0 | N/A | N/A | N/A | |
| Osmotic Pressure | 0 | 0 | | 0 | N/A | N/A | N/A | |

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

| Pollutants | Stream Conc (µg/L) | Stream CV | Trib Conc (µg/L) | Fate Coef | WQC (µg/L) | WQ Obj (µg/L) | WLA (µg/L) | Comments |
|---|---|---|---|---|---|---|---|---|
| Total Dissolved Solids (PWS) | 0 | 0 | | 0 | 500,000 | 500,000 | N/A | |
| Chloride (PWS) | 0 | 0 | | 0 | 250,000 | 250,000 | N/A | |
| Sulfate (PWS) | 0 | 0 | | 0 | 250,000 | 250,000 | N/A | |
| Fluoride (PWS) | 0 | 0 | | 0 | 2,000 | 2,000 | N/A | |
| Total Aluminum | 0 | 0 | | 0 | N/A | N/A | N/A | |
| Total Antimony | 0 | 0 | | 0 | 5.6 | 5.6 | 2,850 | |
| Total Arsenic | 0 | 0 | | 0 | 10 | 10.0 | 5,089 | |
| Total Barium | 0 | 0 | | 0 | 2,400 | 2,400 | 1,221,349 | |

| | | | | | | | | |
|---|---|---|---|---|---|---|---|---|
| Total Boron | 0 | 0 | | 0 | 3,100 | 3,100 | 1,577,576 | |
| 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 | 152,669 | |
| 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 | 508,895 | |
| Total Mercury | 0 | 0 | | 0 | 0.050 | 0.05 | 25.4 | |
| Total Nickel | 0 | 0 | | 0 | 610 | 610 | 310,426 | |
| Total Phenols (Phenolics) (PWS) | 0 | 0 | | 0 | 5 | 5.0 | N/A | |
| Total Selenium | 0 | 0 | | 0 | N/A | N/A | N/A | |
| Total Silver | 0 | 0 | | 0 | N/A | N/A | N/A | |
| Total Thallium | 0 | 0 | | 0 | 0.24 | 0.24 | 122 | |
| Total Zinc | 0 | 0 | | 0 | N/A | N/A | N/A | |
| Total Strontium | 0 | 0 | | 0 | 4,000 | 4,000 | 2,035,582 | |
| Osmotic Pressure | 0 | 0 | | 0 | N/A | N/A | N/A | |

☑ *CRL* CCT (min): 26.700 PMF: 1 Analysis Hardness (mg/l): N/A Analysis pH: N/A

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

| | | | | | | | | |
|---|---|---|---|---|---|---|---|---|
| Total Selenium | 0 | 0 | | 0 | N/A | N/A | N/A | |
| Total Silver | 0 | 0 | | 0 | N/A | N/A | N/A | |
| Total Thallium | 0 | 0 | | 0 | N/A | N/A | N/A | |
| Total Zinc | 0 | 0 | | 0 | N/A | N/A | N/A | |
| Total Strontium | 0 | 0 | | 0 | N/A | N/A | N/A | |
| Osmotic Pressure | 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 |
| | | | | | | | | | |
| | | | | | | | | | |
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☑ ***Other Pollutants without Limits or Monitoring***

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

| Pollutants | Governing WQBEL | Units | Comments |
|---|---|---|---|
| Total Dissolved Solids (PWS) | N/A | N/A | PWS Not Applicable |
| Chloride (PWS) | N/A | N/A | PWS Not Applicable |
| Bromide | N/A | N/A | No WQS |
| Sulfate (PWS) | N/A | N/A | PWS Not Applicable |
| Fluoride (PWS) | N/A | N/A | PWS Not Applicable |
| Total Aluminum | 92,630 | µg/L | Discharge Conc ≤ 10% WQBEL |
| Total Antimony | 2,850 | µg/L | Discharge Conc ≤ 10% WQBEL |
| Total Arsenic | 5,089 | µg/L | Discharge Conc ≤ 10% WQBEL |
| Total Barium | 1,221,349 | µg/L | Discharge Conc ≤ 10% WQBEL |
| Total Beryllium | N/A | N/A | No WQS |
| Total Boron | 814,233 | µg/L | Discharge Conc ≤ 10% WQBEL |
| Total Cadmium | 138 | µg/L | Discharge Conc ≤ 10% WQBEL |
| Total Chromium (III) | 44,003 | µg/L | Discharge Conc ≤ 10% WQBEL |
| Hexavalent Chromium | 2,012 | µg/L | Discharge Conc ≤ 10% WQBEL |

| | | | |
|---|---|---|---|
| Total Cobalt | 9,669 | µg/L | Discharge Conc ≤ 10% WQBEL |
| Total Copper | 1,747 | µg/L | Discharge Conc ≤ 10% WQBEL |
| Total Cyanide | N/A | N/A | No WQS |
| Dissolved Iron | 152,669 | µg/L | Discharge Conc ≤ 10% WQBEL |
| Total Iron | 763,343 | µg/L | Discharge Conc ≤ 10% WQBEL |
| Total Lead | 1,628 | µg/L | Discharge Conc ≤ 10% WQBEL |
| Total Manganese | 508,895 | µg/L | Discharge Conc ≤ 10% WQBEL |
| Total Mercury | 25.4 | µg/L | Discharge Conc ≤ 10% WQBEL |
| Total Nickel | 26,637 | µg/L | Discharge Conc ≤ 10% WQBEL |
| Total Phenols (Phenolics) (PWS) | | µg/L | PWS Not Applicable |
| Total Selenium | 2,539 | µg/L | Discharge Conc ≤ 10% WQBEL |
| Total Silver | 476 | µg/L | Discharge Conc ≤ 10% WQBEL |
| Total Thallium | 122 | µg/L | Discharge Conc ≤ 10% WQBEL |
| Total Zinc | 14,933 | µg/L | Discharge Conc ≤ 10% WQBEL |
| Total Molybdenum | N/A | N/A | No WQS |
| Gross Alpha | N/A | N/A | No WQS |
| Total Beta | N/A | N/A | No WQS |
| Radium 226/228 | N/A | N/A | No WQS |
| Total Strontium | 2,035,582 | µg/L | Discharge Conc ≤ 10% WQBEL |
| Total Uranium | N/A | N/A | No WQS |
| Osmotic Pressure | 6,175 | mOs/kg | Discharge Conc ≤ 10% WQBEL |

## Attachment D:

## Sewickley Creek Watershed TMDL – Stream Segment SC3 Maps and Load Allocations

*TMDL calculations – SC3 – Sewickley Creek downstream of Jacks Run*

The TMDL for sampling point SC3 consists of a load allocation to all of the area between points WELTY1/JACK1 and SC3 shown in Attachment A. The load allocation for this segment of Sewickley Creek was computed using water-quality sample data collected at point SC3. The average flow, computed using the USGS StreamStats program at SC3 (75.62 MGD), is used for these computations.

Sample data at point SC3 shows pH ranging between 8.2 and 8.4; pH will not be addressed because water quality standards area being met. Table D43 shows the measured and allowable concentrations and loads at SC3. Table D44 shows the load reductions necessary to meet water quality standards at SC3.

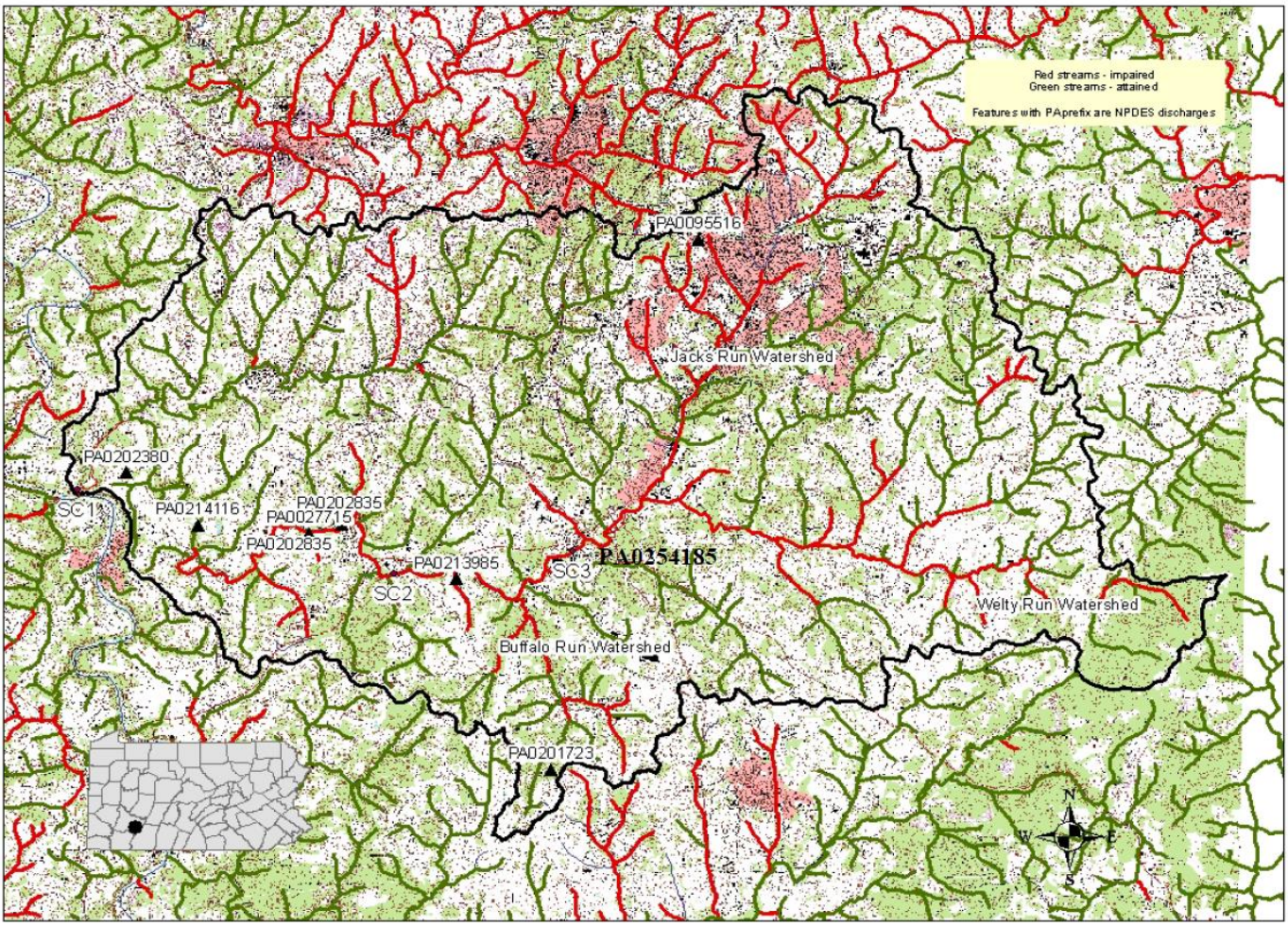
| Table D43 | | Measured | | Allowable | |
|---|---|---|---|---|---|
| | | Concentration | Load | Concentration | Load |
| | | mg/L | lbs/day | mg/L | lbs/day |
| | Aluminum | 0.50 | 317.07 | 0.25 | 155.36 |
| | Iron | 0.41 | 255.73 | 0.41 | 255.73 |
| | Manganese | 0.09 | 57.71 | 0.09 | 57.71 |
| | Acidity | -118.00 | -74418.25 | -118.00 | -74418.25 |
| | Alkalinity | 131.45 | 82900.67 | | |

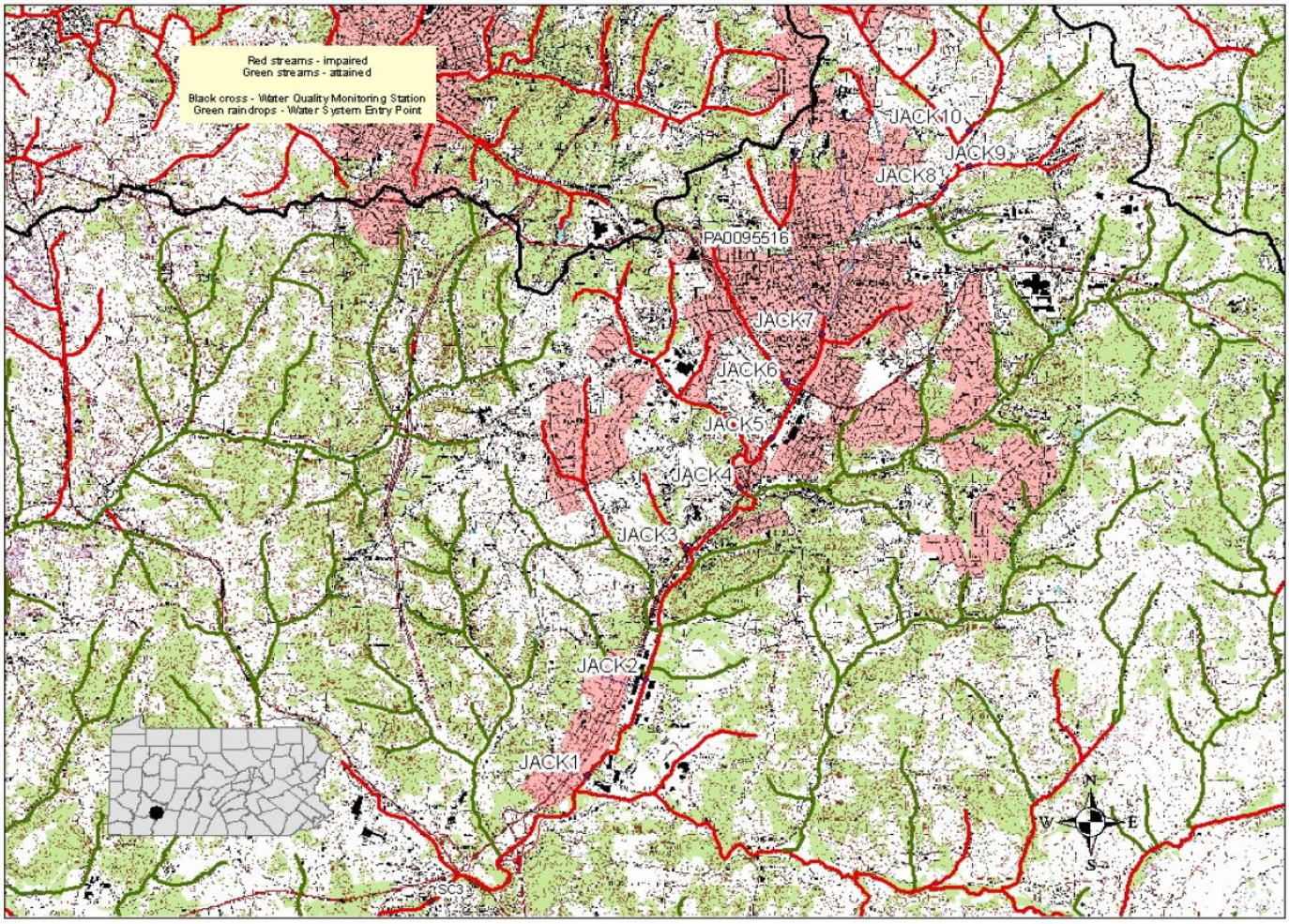
The measured and allowable loading for point SC3 for aluminum was computed using water-quality sample data collected at the point. This was based on the sample data for the point and did not account for any loads already specified from upstream sources. The additional load from points WELTY1/JACK1 shows the total load that was permitted from upstream sources. This value was added to the difference in existing loads between points WELTY1/JACK1 and SC3 to determine a total load tracked for the segment of stream between SC3 and WELTY1/JACK1. This load will be compared to the allowable load to determine if further reductions are needed to meet the calculated TMDL at SC3.

| Table D44. Allocations SC3 | |
|---|---|
| SC3 | Al (Lbs/day) |
| Existing Load @ SC3 | 317.07 |
| Difference in measured loads between the loads that enter and existing SC3 | 209.80 |
| Additional load tracked from above sample | 59.00 |
| Total load tracked between WELTY1/JACK1 and SC3 | 268.80 |
| Allowable Load @ SC3 | 155.36 |
| Load Reduction @ SC3 | 113.44 |
| % Reduction required @ SC3 | 43% |

A waste load allocation for future mining was included at BUFF10 allowing for one operation with two active pits (1500' x 300') to be permitted in the future on this segment.

| Table D45. Waste load allocations for future mining operations | | | |
|---|---|---|---|
| Parameter | Allowable Conc. (mg/L) | Average Flow (MGD) | Allowable Load (lbs/day) |
| Future Operation 1 | | | |
| Al | 0.75 | 0.090 | 0.56 |
| Fe | 3.0 | 0.090 | 2.26 |
| Mn | 2.0 | 0.090 | 1.50 |


Red streams - impaired
Green streams - attained
Features with PAprefix are NPDES discharges
PA0095516
Jacks Run Watershed
PA0202380
SC1
PA0214116
PA0202835
PA0027715
PA0202835
PA0213985
SC2
SC3
PA0254185
Welty Run Watershed
Buffalo Run Watershed
PA0201723
N
W
E
S


Red streams - impaired
Green streams - attained
Black cross - Water Quality Monitoring Station
Green raindrops - Water System Entry Point
JACK10
JACK9
JACK8
PA0096516
JACK7
JACK6
JACK5
JACK4
JACK3
JACK2
JACK1
N
W
E
S