

Application Type Renewal  
Facility Type Municipal  
Major / Minor Major

## NPDES PERMIT FACT SHEET INDIVIDUAL SEWAGE

Application No. PA0218413  
APS ID 758875  
Authorization ID 1221240

### Applicant and Facility Information

|   |   |
|---|---|
| Applicant Name <u>Economy Borough Municipal Authority</u>                         | Facility Name <u>Big Sewickley Creek WWTP</u>                       |
| Applicant Address <u>2860 Conway Wallrose Road</u><br><u>Baden, PA 15005-2306</u> | Facility Address <u>120 Wine Road</u><br><u>Sewickley, PA 15143</u> |
| Applicant Contact <u>Ms. Janet Miklos</u>   | Facility Contact <u>Mr. Joseph DeLuca</u>                           |
| Applicant Phone <u>(724) 869-3201</u>   | Facility Phone <u>(724) 869-3201</u>                                |
| Client ID <u>64903</u>  | Site ID <u>532567</u>   |
| Ch 94 Load Status <u>Not Overloaded</u>   | Municipality <u>Economy Borough</u>                                 |
| Connection Status <u>No Limitations</u>   | County <u>Beaver</u>  |
| Date Application Received <u>March 15, 2018</u>                                   | EPA Waived? <u>No</u>   |
| Date Application Accepted <u>March 20, 2018</u>                                   | If No, Reason <u>Major Facility</u>                                 |

Purpose of Application Application for a renewal of an existing NPDES Permit for the discharge of treated Sewage.

### Summary of Review

The applicant has applied for a renewal of an existing NPDES Permit, Permit No. PA0218413, which was previously issued by the Department on August 27, 2013. That permit expired on August 31, 2018.

WQM Permit 400406, issued on August 29, 2001, approved construction of a STP with a hydraulic design capacity of 1.25 MGD. The existing treatment process consists of SBRs, UV Disinfection and aerobic digestion. Solids are dewatered via a belt filter press and disposed of at a municipal landfill.

The receiving stream, Big Sewickley Creek, is classified as a TSF and is located in State Watershed No. 20-G.

The applicant has complied with Act 14 Notifications and no comments were received.

Please note that any reference to 36<sup>th</sup> or 37<sup>th</sup> Month in the draft NPDES Permit will be changed to a specific date once PED has been established. I will also request additional sampling from the Authority for dissolved Iron, total mercury, total selenium, total zinc, and free cyanide. Based upon the results, these parameters will be reevaluated prior to issuance.

#### 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.

| Approve | Deny | Signatures  | Date          |
|---------|------|---|---------------|
| X       |      | <a href="#">William C. Mitchell</a><br>William C. Mitchell, E.I.T. / Environmental Engineering Specialist | June 18, 2020 |
| X       |      | <a href="#">Donald J. Leone</a><br>Donald J. Leone, P.E. / Environmental Engineer Manager                 | June 24, 2020 |

| Discharge, Receiving Waters and Water Supply Information |                                   |                            |  |
|--|-----------------------------------|----------------------------|--|
| Outfall No.  | 001                               | Design Flow (MGD)          | 1.25   |
| Latitude   | 40° 35' 51.00"                    | Longitude                  | -81° 11' 05.00"                              |
| Quad Name  | Ambridge                          | Quad Code                  | 1404   |
| Wastewater Description: Sewage Effluent                  |                                   |                            |  |
| Receiving Waters   | Big Sewickley Creek (TSF)         | Stream Code                | 36596  |
| NHD Com ID   | 99681622                          | RMI                        | 3.43   |
| Drainage Area  | 26.41                             | Yield (cfs/mi²)            | 0.0058                                       |
| Q <sub>7-10</sub> Flow (cfs)                             | 0.1532                            | Q <sub>7-10</sub> Basis    | USGS Low Flow Statistics,<br>Sta. # 03086100 |
| Elevation (ft)   |                                   | Slope (ft/ft)              | 0.0057                                       |
| Watershed No.  | 20-G                              | Chapter 93 Class.          | TSF  |
| 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  |                                   | Name                       |  |
| Background/Ambient Data                                  |                                   | Data Source                |  |
| pH (SU)  |                                   |                            |  |
| Temperature (°F)   |                                   |                            |  |
| Hardness (mg/L)  | 116.8                             | Sampled by the Authority   |  |
| Other:   |                                   |                            |  |
| Nearest Downstream Public Water Supply Intake            | Nova Chemical Beaver Valley Plant |                            |  |
| PWS Waters   | Ohio River                        | Flow at Intake (cfs)       |  |
| PWS RMI  |                                   | Distance from Outfall (mi) |  |

Changes Since Last Permit Issuance: None.

| Treatment Facility Summary                  |                                  |                |                                     |   |
|---|----------------------------------|----------------|-------------------------------------|---|
| Treatment Facility Name: Big Sewickley WWTP |                                  |                |                                     |   |
| WQM Permit No.                              | Issuance Date                    |                |                                     |   |
| 400406                                      | 08/29/2001                       |                |                                     |   |
|   |                                  |                |                                     |   |
| Waste Type                                  | Degree of Treatment              | Process Type   | Disinfection                        | Avg Annual Flow (MGD)                               |
| Sewage                                      | Secondary with Ammonia Reduction | SBRs           | Ultraviolet                         | 0.412   |
|   |                                  |                |                                     |   |
| Hydraulic Capacity (MGD)                    | Organic Capacity (lbs/day)       | Load Status    | Biosolids Treatment                 | Biosolids Use/Disposal                              |
| 1.25  | 2290                             | Not Overloaded | Aerobic Digestion/Belt Filter Press | Dewatered Solids are Hauled to a Municipal Landfill |

Changes Since Last Permit Issuance: None

### Compliance History

#### Operations Compliance Check Summary Report

**Facility:** Big Sewickley Creek WWTP

**NPDES Permit No.:** PA0218413

**Compliance Review Period:** 6/2015 – 6/2020

#### Inspection Summary:

| INSP ID | INSPECTED DATE | INSP TYPE             | INSPECTION RESULT DESC |
|---------|----------------|-----------------------|------------------------|
| 2875331 | 05/02/2019     | Compliance Evaluation | Violation(s) Noted     |
| 2768899 | 08/22/2018     | Compliance Evaluation | Violation(s) Noted     |
| 2596928 | 05/04/2017     | Compliance Evaluation | Violation(s) Noted     |
| 2452992 | 02/25/2016     | Compliance Evaluation | No Violations Noted    |

#### Violation Summary:

| VIOL ID | VIOLATION DATE | VIOLATION TYPE | VIOLATION TYPE DESC  | RESOLVED DATE |
|---------|----------------|----------------|--|---------------|
| 848465  | 05/02/2019     | 92A.44         | NPDES - Violation of effluent limits in Part A of permit                                     |               |
| 848466  | 05/02/2019     | 92A.47(C)      | NPDES - Illegal discharge to waters of the Commonwealth from a sanitary sewer overflow (SSO) |               |

**NPDES Permit Fact Sheet**  
**Big Sewickley Creek WWTP**

**NPDES Permit No. PA0218413**

|        |            |              |  |            |
|--------|------------|--------------|--|------------|
| 826641 | 08/22/2018 | 92A.41(A)1   | NPDES - Non-compliance with an issued permit, not classified by any other code | 08/22/2018 |
| 826642 | 08/22/2018 | 92A.41(A)10C | NPDES - Failure to collect representative samples                              | 08/22/2018 |
| 826643 | 08/22/2018 | 92A.44       | NPDES - Violation of effluent limits in Part A of permit                       | 08/22/2018 |
| 786366 | 05/04/2017 | 92A.41(A)1   | NPDES - Non-compliance with an issued permit, not classified by any other code | 05/24/2017 |
| 786367 | 05/04/2017 | 92A.44       | NPDES - Violation of effluent limits in Part A of permit                       | 05/24/2017 |

**Open Violations by Client ID:**

| CLIENT ID | INSP ID | VIOLATION ID | VIOLATION DATE | VIOLATION CODE | VIOLATION  |
|-----------|---------|--------------|----------------|----------------|--|
| 64903     | 2875331 | 848465       | 05/02/2019     | 92A.44         | NPDES - Violation of effluent limits in Part A of permit                                     |
| 64903     | 2875331 | 848466       | 05/02/2019     | 92A.47(C)      | NPDES - Illegal discharge to waters of the Commonwealth from a sanitary sewer overflow (SSO) |

**Enforcement Summary:**

| ENF ID | ENF TYPE | ENF TYPE DESC       | ENF CREATION DATE | VIOLATIONS                             | # OF VIOLATIONS | ENF FINALSTATUS          | ENF CLOSED DATE |
|--------|----------|---------------------|-------------------|--|-----------------|--------------------------|-----------------|
| 376126 | NOV      | Notice of Violation | 06/17/2019        | 92A.44;<br>92A.47(C)                   | 2               |                          |                 |
| 367063 | NOV      | Notice of Violation | 08/29/2018        | 92A.41(A)1;<br>92A.41(A)10C;<br>92A.44 | 3               | Administrative Close Out | 08/30/2019      |
| 353606 | NOV      | Notice of Violation | 05/24/2017        | 92A.41(A)1;<br>92A.44                  | 2               | Administrative Close Out | 08/30/2019      |

**DMR Violation Summary:**

| MONITORING START DATE | MONITORING END DATE | NON COMPLIANCE CATEGORY            | PARAMETER                  | SAMPLE VALUE | PERMIT VALUE | UNIT OF MEASURE | STATISTICAL BASE CODE |
|-----------------------|---------------------|------------------------------------|----------------------------|--------------|--------------|-----------------|-----------------------|
| 04/01/2020            | 04/30/2020          | Concentration 3 Effluent Violation | Bis(2-Ethylhexyl)Phthalate | < 0.005      | 0.003        | mg/L            | Daily Maximum         |
| 04/01/2020            | 04/30/2020          | Concentration 3 Effluent Violation | Cyanide, Free              | 0.011        | 0.009        | mg/L            | Daily Maximum         |
| 05/01/2019            | 05/31/2019          | Concentration 2 Effluent Violation | Ammonia-Nitrogen           | 3.8          | 2.0          | mg/L            | Average Monthly       |
| 01/01/2019            | 01/31/2019          | Concentration 3 Effluent           | Cyanide, Free              | 0.012        | 0.009        | mg/L            | Daily Maximum         |

**NPDES Permit Fact Sheet  
Big Sewickley Creek WWTP**

**NPDES Permit No. PA0218413**

|            |            | Violation                                |                  |         |       |         |                    |
|------------|------------|--|------------------|---------|-------|---------|--------------------|
| 12/01/2018 | 12/31/2018 | Concentration<br>1 Effluent<br>Violation | Dissolved Oxygen | 5.47    | 6.0   | mg/L    | Minimum            |
| 08/01/2018 | 08/31/2018 | Concentration<br>3 Effluent<br>Violation | Cyanide, Free    | 0.014   | 0.009 | mg/L    | Daily<br>Maximum   |
| 08/01/2018 | 08/31/2018 | Concentration<br>2 Effluent<br>Violation | Cyanide, Free    | 0.009   | 0.006 | mg/L    | Average<br>Monthly |
| 06/01/2018 | 06/30/2018 | Concentration<br>3 Effluent<br>Violation | Cyanide, Free    | 0.025   | 0.009 | mg/L    | Daily<br>Maximum   |
| 06/01/2018 | 06/30/2018 | Concentration<br>2 Effluent<br>Violation | Cyanide, Free    | 0.013   | 0.006 | mg/L    | Average<br>Monthly |
| 05/01/2018 | 05/31/2018 | Concentration<br>2 Effluent<br>Violation | Cyanide, Free    | 0.008   | 0.006 | mg/L    | Average<br>Monthly |
| 05/01/2018 | 05/31/2018 | Concentration<br>3 Effluent<br>Violation | Cyanide, Free    | 0.015   | 0.009 | mg/L    | Daily<br>Maximum   |
| 04/01/2018 | 04/30/2018 | Concentration<br>3 Effluent<br>Violation | Cyanide, Free    | 0.024   | 0.009 | mg/L    | Daily<br>Maximum   |
| 04/01/2018 | 04/30/2018 | Concentration<br>2 Effluent<br>Violation | Cyanide, Free    | 0.020   | 0.006 | mg/L    | Average<br>Monthly |
| 03/01/2018 | 03/31/2018 | Concentration<br>3 Effluent<br>Violation | Cyanide, Free    | 0.019   | 0.009 | mg/L    | Daily<br>Maximum   |
| 03/01/2018 | 03/31/2018 | Concentration<br>2 Effluent<br>Violation | Cyanide, Free    | < 0.010 | 0.006 | mg/L    | Average<br>Monthly |
| 03/01/2018 | 03/31/2018 | Load 2<br>Effluent<br>Violation          | Cyanide, Free    | 0.100   | 0.094 | lbs/day | Daily<br>Maximum   |
| 02/01/2018 | 02/28/2018 | Load 2<br>Effluent<br>Violation          | Cyanide, Free    | 0.100   | 0.094 | lbs/day | Daily<br>Maximum   |
| 01/01/2018 | 01/31/2018 | Concentration<br>3 Effluent<br>Violation | Cyanide, Free    | 0.011   | 0.009 | mg/L    | Daily<br>Maximum   |
| 01/01/2018 | 01/31/2018 | Concentration<br>2 Effluent<br>Violation | Cyanide, Free    | 0.008   | 0.006 | mg/L    | Average<br>Monthly |
| 12/01/2017 | 12/31/2017 | Concentration<br>2 Effluent<br>Violation | Copper, Total    | 0.020   | 0.012 | mg/L    | Average<br>Monthly |
| 12/01/2017 | 12/31/2017 | Concentration<br>3 Effluent<br>Violation | Copper, Total    | 0.019   | 0.018 | mg/L    | Daily<br>Maximum   |
| 11/01/2017 | 11/30/2017 | Concentration<br>2 Effluent<br>Violation | Cyanide, Free    | 0.010   | 0.006 | mg/L    | Average<br>Monthly |
| 11/01/2017 | 11/30/2017 | Concentration<br>3 Effluent              | Cyanide, Free    | 0.027   | 0.009 | mg/L    | Daily<br>Maximum   |

**NPDES Permit Fact Sheet**  
**Big Sewickley Creek WWTP**

**NPDES Permit No. PA0218413**

|            |            | Violation                                |                            |         |       |         |                    |
|------------|------------|--|----------------------------|---------|-------|---------|--------------------|
| 10/01/2017 | 10/31/2017 | Concentration<br>3 Effluent<br>Violation | Cyanide, Free              | 0.159   | 0.009 | mg/L    | Daily<br>Maximum   |
| 10/01/2017 | 10/31/2017 | Concentration<br>2 Effluent<br>Violation | Copper, Total              | 0.074   | 0.012 | mg/L    | Average<br>Monthly |
| 10/01/2017 | 10/31/2017 | Concentration<br>2 Effluent<br>Violation | Cyanide, Free              | 0.050   | 0.006 | mg/L    | Average<br>Monthly |
| 10/01/2017 | 10/31/2017 | Load 2<br>Effluent<br>Violation          | Cyanide, Free              | 0.300   | 0.094 | lbs/day | Daily<br>Maximum   |
| 10/01/2017 | 10/31/2017 | Load 2<br>Effluent<br>Violation          | Copper, Total              | 0.600   | 0.188 | lbs/day | Daily<br>Maximum   |
| 10/01/2017 | 10/31/2017 | Load 1<br>Effluent<br>Violation          | Copper, Total              | 0.200   | 0.125 | lbs/day | Average<br>Monthly |
| 10/01/2017 | 10/31/2017 | Concentration<br>3 Effluent<br>Violation | Copper, Total              | 0.264   | 0.018 | mg/L    | Daily<br>Maximum   |
| 10/01/2017 | 10/31/2017 | Load 1<br>Effluent<br>Violation          | Cyanide, Free              | 0.090   | 0.063 | lbs/day | Average<br>Monthly |
| 09/01/2017 | 09/30/2017 | Concentration<br>3 Effluent<br>Violation | Cyanide, Free              | 0.028   | 0.009 | mg/L    | Daily<br>Maximum   |
| 09/01/2017 | 09/30/2017 | Concentration<br>2 Effluent<br>Violation | Cyanide, Free              | 0.020   | 0.006 | mg/L    | Average<br>Monthly |
| 08/01/2017 | 08/31/2017 | Concentration<br>3 Effluent<br>Violation | Cyanide, Free              | 0.025   | 0.009 | mg/L    | Daily<br>Maximum   |
| 08/01/2017 | 08/31/2017 | Concentration<br>3 Effluent<br>Violation | Bis(2-Ethylhexyl)Phthalate | 0.005   | 0.003 | mg/L    | Daily<br>Maximum   |
| 08/01/2017 | 08/31/2017 | Concentration<br>2 Effluent<br>Violation | Cyanide, Free              | < 0.010 | 0.006 | mg/L    | Average<br>Monthly |
| 07/01/2017 | 07/31/2017 | Concentration<br>3 Effluent<br>Violation | Cyanide, Free              | 0.022   | 0.009 | mg/L    | Daily<br>Maximum   |
| 07/01/2017 | 07/31/2017 | Concentration<br>2 Effluent<br>Violation | Cyanide, Free              | 0.010   | 0.006 | mg/L    | Average<br>Monthly |
| 06/01/2017 | 06/30/2017 | Concentration<br>2 Effluent<br>Violation | Cyanide, Free              | 0.020   | 0.006 | mg/L    | Average<br>Monthly |
| 06/01/2017 | 06/30/2017 | Concentration<br>3 Effluent<br>Violation | Cyanide, Free              | 0.028   | 0.009 | mg/L    | Daily<br>Maximum   |
| 05/01/2017 | 05/31/2017 | Concentration<br>2 Effluent<br>Violation | Cyanide, Free              | < 0.010 | 0.006 | mg/L    | Average<br>Monthly |
| 05/01/2017 | 05/31/2017 | Concentration<br>3 Effluent              | Cyanide, Free              | 0.016   | 0.009 | mg/L    | Daily<br>Maximum   |

|            |            | Violation                                |                            |         |       |         |                    |
|------------|------------|--|----------------------------|---------|-------|---------|--------------------|
| 03/01/2017 | 03/31/2017 | Concentration<br>2 Effluent<br>Violation | Cyanide, Free              | 0.009   | 0.006 | mg/L    | Average<br>Monthly |
| 03/01/2017 | 03/31/2017 | Concentration<br>3 Effluent<br>Violation | Cyanide, Free              | 0.019   | 0.009 | mg/L    | Daily<br>Maximum   |
| 02/01/2017 | 02/28/2017 | Concentration<br>2 Effluent<br>Violation | Bis(2-Ethylhexyl)Phthalate | < 0.005 | 0.002 | mg/L    | Average<br>Monthly |
| 02/01/2017 | 02/28/2017 | Concentration<br>3 Effluent<br>Violation | Bis(2-Ethylhexyl)Phthalate | 0.009   | 0.003 | mg/L    | Daily<br>Maximum   |
| 01/01/2017 | 01/31/2017 | Concentration<br>3 Effluent<br>Violation | Cyanide, Free              | 0.020   | 0.009 | mg/L    | Daily<br>Maximum   |
| 01/01/2017 | 01/31/2017 | Concentration<br>2 Effluent<br>Violation | Cyanide, Free              | < 0.010 | 0.006 | mg/L    | Average<br>Monthly |
| 01/01/2017 | 01/31/2017 | Load 1<br>Effluent<br>Violation          | Cyanide, Free              | < 0.080 | 0.063 | lbs/day | Average<br>Monthly |
| 01/01/2017 | 01/31/2017 | Load 2<br>Effluent<br>Violation          | Cyanide, Free              | 0.200   | 0.094 | lbs/day | Daily<br>Maximum   |
| 12/01/2016 | 12/31/2016 | Concentration<br>2 Effluent<br>Violation | Cyanide, Free              | 0.007   | 0.006 | mg/L    | Average<br>Monthly |
| 12/01/2016 | 12/31/2016 | Concentration<br>2 Effluent<br>Violation | Cyanide, Free              | 0.007   | 0.006 | mg/L    | Average<br>Monthly |
| 09/01/2016 | 09/30/2016 | Concentration<br>2 Effluent<br>Violation | Bis(2-Ethylhexyl)Phthalate | < 0.033 | 0.002 | mg/L    | Average<br>Monthly |
| 09/01/2016 | 09/30/2016 | Concentration<br>2 Effluent<br>Violation | Copper, Total              | 0.013   | 0.012 | mg/L    | Average<br>Monthly |
| 09/01/2016 | 09/30/2016 | Load 2<br>Effluent<br>Violation          | Bis(2-Ethylhexyl)Phthalate | 0.385   | 0.031 | lbs/day | Daily<br>Maximum   |
| 09/01/2016 | 09/30/2016 | Concentration<br>3 Effluent<br>Violation | Cyanide, Free              | 0.020   | 0.009 | mg/L    | Daily<br>Maximum   |
| 09/01/2016 | 09/30/2016 | Load 1<br>Effluent<br>Violation          | Bis(2-Ethylhexyl)Phthalate | 0.096   | 0.021 | lbs/day | Average<br>Monthly |
| 09/01/2016 | 09/30/2016 | Concentration<br>3 Effluent<br>Violation | Bis(2-Ethylhexyl)Phthalate | 0.130   | 0.003 | mg/L    | Daily<br>Maximum   |
| 09/01/2016 | 09/30/2016 | Load 2<br>Effluent<br>Violation          | Bis(2-Ethylhexyl)Phthalate | 0.400   | 0.031 | lbs/day | Daily<br>Maximum   |
| 09/01/2016 | 09/30/2016 | Concentration<br>2 Effluent<br>Violation | Bis(2-Ethylhexyl)Phthalate | < 0.033 | 0.002 | mg/L    | Average<br>Monthly |
| 09/01/2016 | 09/30/2016 | Load 1<br>Effluent                       | Bis(2-Ethylhexyl)Phthalate | < 0.100 | 0.021 | lbs/day | Average<br>Monthly |

|            |            | Violation                          | e                          |         |       |            |                 |
|------------|------------|------------------------------------|----------------------------|---------|-------|------------|-----------------|
| 09/01/2016 | 09/30/2016 | Load 2 Effluent Violation          | Bis(2-Ethylhexyl)Phthalate | 0.400   | 0.031 | lbs/day    | Daily Maximum   |
| 09/01/2016 | 09/30/2016 | Concentration 2 Effluent Violation | Cyanide, Free              | < 0.009 | 0.006 | mg/L       | Average Monthly |
| 09/01/2016 | 09/30/2016 | Load 1 Effluent Violation          | Bis(2-Ethylhexyl)Phthalate | < 0.100 | 0.021 | lbs/day    | Average Monthly |
| 09/01/2016 | 09/30/2016 | Concentration 2 Effluent Violation | Cyanide, Free              | < 0.009 | 0.006 | mg/L       | Average Monthly |
| 09/01/2016 | 09/30/2016 | Concentration 2 Effluent Violation | Bis(2-Ethylhexyl)Phthalate | 0.032   | 0.002 | mg/L       | Average Monthly |
| 09/01/2016 | 09/30/2016 | Concentration 3 Effluent Violation | Cyanide, Free              | 0.020   | 0.009 | mg/L       | Daily Maximum   |
| 09/01/2016 | 09/30/2016 | Concentration 3 Effluent Violation | Bis(2-Ethylhexyl)Phthalate | 0.130   | 0.003 | mg/L       | Daily Maximum   |
| 09/01/2016 | 09/30/2016 | Concentration 3 Effluent Violation | Cyanide, Free              | 0.020   | 0.009 | mg/L       | Daily Maximum   |
| 09/01/2016 | 09/30/2016 | Concentration 3 Effluent Violation | Bis(2-Ethylhexyl)Phthalate | 0.130   | 0.003 | mg/L       | Daily Maximum   |
| 06/01/2016 | 06/30/2016 | Concentration 2 Effluent Violation | Fecal Coliform             | 250     | 200   | CFU/100 ml | Geometric Mean  |

**Compliance Status:**

Ongoing .

**Completed by:** John Murphy

**Completed date:** 6/18/20

**Development of Effluent Limitations**

Outfall No. 001  
Latitude 40° 35' 51.00"  
Wastewater Description: Sewage Effluent

Design Flow (MGD) 1.25  
Longitude -80° 11' 5.00"

**Technology-Based Limitations**

The following technology-based limitations apply, subject to water quality analysis and BPJ where applicable:

| Pollutant                       | Limit (mg/l)    | SBC             | Federal Regulation | State Regulation |
|---------------------------------|-----------------|-----------------|--------------------|------------------|
| CBOD <sub>5</sub>               | 25              | Average Monthly | 133.102(a)(4)(i)   | 92a.47(a)(1)     |
|                                 | 40              | Average Weekly  | 133.102(a)(4)(ii)  | 92a.47(a)(2)     |
| Total Suspended Solids          | 30              | Average Monthly | 133.102(b)(1)      | 92a.47(a)(1)     |
|                                 | 45              | Average Weekly  | 133.102(b)(2)      | 92a.47(a)(2)     |
| pH                              | 6.0 – 9.0 S.U.  | Min – Max       | 133.102(c)         | 95.2(1)          |
| Fecal Coliform<br>(5/1 – 9/30)  | 200 / 100 ml    | Geo Mean        | -                  | 92a.47(a)(4)     |
| Fecal Coliform<br>(5/1 – 9/30)  | 1,000 / 100 ml  | IMAX            | -                  | 92a.47(a)(4)     |
| Fecal Coliform<br>(10/1 – 4/30) | 2,000 / 100 ml  | Geo Mean        | -                  | 92a.47(a)(5)     |
| Fecal Coliform<br>(10/1 – 4/30) | 10,000 / 100 ml | IMAX            | -                  | 92a.47(a)(5)     |
| Total Residual Chlorine         | 0.5             | Average Monthly | -                  | 92a.48(b)(2)     |

**Water Quality-Based Limitations**

A "Reasonable Potential Analysis" (Attached Toxics Screening Analysis Spreadsheet Version 2.7) determined the following parameters were candidates for limitations: total copper, free cyanide, dissolved iron, total lead, total mercury, total selenium, and total zinc.

Based upon the PENTOXSD, Version 2.0c, modeling results (output files attached), the Toxics Screening Analysis Spreadsheet recommends Monitoring for total lead and the following QBELs in the table below.

The discharge was previously modeled using WQAM63 to evaluate the CBOD<sub>5</sub>, Ammonia Nitrogen and Dissolved Oxygen parameters. Because there have been no changes to the discharge or the receiving stream, the limits for those parameters are based on the previously approved modeling results (output files attached). It is unnecessary to remodel those three parameters using the current WQM 7.0.

The following limitations were determined through water quality modeling (output files attached):

| Parameter                            | Limit (mg/l) | SBC             | Model                  |
|--------------------------------------|--------------|-----------------|------------------------|
| CBOD <sub>5</sub><br>May 1 - Oct 31  | 15           | Average Monthly | WQAM63                 |
| CBOD <sub>5</sub><br>Nov 1 - Apr 30  | 25           | Average Monthly | WQAM63                 |
| Dissolved Oxygen                     | 6.0          | Minimum         | WQAM63                 |
| Ammonia-Nitrogen<br>(May 1 – Oct 31) | 2.0          | Average Monthly | WQAM63                 |
| Ammonia-Nitrogen<br>(Nov 1 – Apr 30) | 3.5          | Average Monthly | WQAM63                 |
| Iron, Dissolved                      | 0.323        | Average Monthly | PENTOXSD, Version 2.0c |
| Mercury, Total (ug/L)                | 0.054        | Average Monthly | PENTOXSD, Version 2.0c |
| Selenium, Total                      | 0.005        | Average Monthly | PENTOXSD, Version 2.0c |
| Zinc, Total                          | 0.104        | Average Monthly | PENTOXSD, Version 2.0c |
| Copper, Total                        | 0.012        | Average Monthly | PENTOXSD, Version 2.0c |
| Cyanide, Free                        | 0.006        | Average Monthly | PENTOXSD, Version 2.0c |

**Best Professional Judgment (BPJ) Limitations**

Comments: N/A

**Anti-Backsliding**

N/A

**Additional Considerations:**

Ultraviolet (UV) disinfection is used therefore Total Residual Chlorine (TRC) limits are not applicable. Routine monitoring of UV Transmittance will be at the same monitoring frequency that is used for TRC.

For pH, Dissolved Oxygen (DO) and UV Transmittance, a monitoring frequency 1/day has been imposed. In general, less frequent monitoring may be established only when the permittee demonstrates that there will be no discharge on days where monitoring is not required.

Nutrient monitoring is required to establish the nutrient load from the waste water treatment facility and the impacts that load may have on the quality of the receiving stream(s). A 1/quarter monitor and report requirement for Total N & Total P has been added to the permit as per Chapter 92.a.61.

Mass loading limits are applicable for publicly owned treatment works. Current policy requires average monthly mass loading limits be established for CBOD<sub>5</sub>, TSS, and NH<sub>3</sub>-N and average weekly mass loading limits be established for CBOD<sub>5</sub> and TSS. Average monthly mass loading limits (lbs/day) are based on the formula: design flow (MGD) x concentration limit (mg/L) x conversion factor (8.34).

Please note that changes were made to the Average Monthly & Average Weekly Mass Effluent Limitations for CBOD<sub>5</sub>, TSS and Ammonia Nitrogen. These changes were necessary to be consistent with rounding guidelines found in Chapter 5.C.2, Rounding-Off Mathematically Values, of the Department's Technical Guidance for the Development and Specification of Effluent Limitations, 362-0400-001.

For POTWs with design flows greater than 2,000 GPD influent BOD<sub>5</sub> and TSS monitoring must be established in the permit, and the monitoring should be consistent with the same frequency and sample type as is used for other effluent parameters.

Monitoring frequency for the proposed effluent limits are based upon Table 6-3, Self-Monitoring Requirements for Sewage Dischargers, from the Department's Technical Guidance for the Development and Specification of Effluent Limitations. Please note that Monitoring Requirements were changed for Flow to 2/week Metered to be consistent with the guidance.

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

Total Dissolved Solids (TDS) and its major constituents including sulfate, chloride, and bromide have emerged as pollutants of concern in several major watersheds in the Commonwealth. The conservative nature of these solids allows them to accumulate in surface waters and they may remain a concern even if the immediate downstream public water supply is not directly impacted. Bromide has been linked to formation of disinfection byproducts at increased levels in public water systems. In addition, as a consequence of actions associated with Triennial Review 13, the Environmental Quality Board has directed DEP to collect additional data related to sulfate, chloride, and 1,4-dioxane. Furthermore, in an August 2013 letter from Jon Capacasa of the Region III Water Protection Program to DEP (attached), EPA has expressed concern related to bromide and the importance of monitoring all point sources for bromide when it may be present.

Based on these concerns and under the authority of §92a.61, DEP has determined it should implement increased monitoring in NPDES permits for these parameters: TDS, sulfate, chloride, bromide, and 1,4-dioxane.

Increased monitoring in NPDES permits will only occur when the following conditions are met:

- Where the concentration of TDS in the discharge exceeds 1,000 mg/L, or the net TDS load from a discharge exceeds 20,000 lbs/day, and the discharge flow exceeds 0.1 MGD, Part A of the permit should include monitor and report for TDS, sulfate, chloride, and bromide. Discharges of 0.1 MGD or less should monitor and report for TDS, sulfate, chloride, and bromide if the concentration of TDS in the discharge exceeds 5,000 mg/L.

- Where the concentration of bromide in a discharge exceeds 1 mg/L and the discharge flow exceeds 0.1 MGD, Part A of the permit should include monitor and report for bromide. Discharges of 0.1 MGD or less should monitor and report for bromide if the concentration of bromide in the discharge exceeds 10 mg/L.
- Where the concentration of 1,4-dioxane (CAS 123-91-1) in a discharge exceeds 10 µg/L and the discharge flow exceeds 0.1 MGD, Part A of the permit should include monitor and report for 1,4-dioxane. Discharges of 0.1 MGD or less should monitor and report for 1,4-dioxane if the concentration of 1,4-dioxane in the discharge exceeds 100 µg/L.

Monitoring is not required for TDS, sulfate, chloride, bromide & 1,4-dioxane. Concentrations of bromide is less than 1 mg/L (application reports <0.1 mg/L), TDS is less than 1000 mg/L (application reports 436 mg/L) & 1,4-dioxane is less than 10 ug/L (application reports <5.0 ug/L).

**Whole Effluent Toxicity (WET)**

For Outfall 001, ☐ **Acute** ☒ **Chronic** WET Testing was completed:

- ☒ For the permit renewal application (4 tests).  
☐ Quarterly throughout the permit term.  
☐ Quarterly throughout the permit term and a TIE/TRE was conducted.  
☐ Other:

The dilution series used for the tests was: 100%, 97%, 93%, 47%, and 23%. The Target Instream Waste Concentration (TIWC) to be used for analysis of the results is: 93 %.

**Summary of Four Most Recent Test Results**

TST Data Analysis

(NOTE – Please see the attached DEP WET Analysis Spreadsheet).

| Test Date  | Ceriodaphnia Results (Pass/Fail) |              | Pimephales Results (Pass/Fail) |        |
|------------|----------------------------------|--------------|--------------------------------|--------|
|            | Survival                         | Reproduction | Survival                       | Growth |
| 11/16/2014 | PASS                             | PASS         | PASS                           | PASS   |
| 11/10/2015 | PASS                             | PASS         | PASS                           | PASS   |
| 11/22/2016 | PASS                             | PASS         | PASS                           | PASS   |
| 11/07/2017 | PASS                             | PASS         | PASS                           | PASS   |

\* A “passing” result is that in which the replicate data for the TIWC is not statistically significant from the control condition. This is exhibited when the calculated t value (“T-Test Result”) is greater than the critical t value. A “failing” result is exhibited when the calculated t value (“T-Test Result”) is less than the critical t value.

Is there reasonable potential for an excursion above water quality standards based on the results of these tests? (NOTE – In general, reasonable potential is determined anytime there is at least one test failure in the previous four tests).

☐ YES ☒ NO

Comments: No

**Evaluation of Test Type, IWC and Dilution Series for Renewed Permit**

Acute Partial Mix Factor (PMFa): 1.0

Chronic Partial Mix Factor (PMFc): 1.0

**1. Determine IWC – Acute (IWCa):**

$$(Q_d \times 1.547) / ((Q_{7-10} \times \text{PMFa}) + (Q_d \times 1.547))$$

$$[(1.25 \text{ MGD} \times 1.547) / ((0.1532 \text{ cfs} \times 1.0) + (1.25 \text{ MGD} \times 1.547))] \times 100 = 92.66\%$$

Is IWCa < 1%? ☐ YES ☒ NO (Chronic Test Required)

**Type of Test for Permit Renewal: Chronic Testing**

**2b. Determine Target IWCC (If Chronic Tests Required)**

$$(Q_d \times 1.547) / (Q_{7-10} \times \text{PMFc}) + (Q_d \times 1.547)$$

$$[(1.25 \text{ MGD} \times 1.547) / ((0.1532 \text{ cfs} \times 1.0) + (1.25 \text{ MGD} \times 1.547))] \times 100 = 92.66\%$$

**3. Determine Dilution Series**

(NOTE – check Attachment C of WET SOP for dilution series based on TIWCa or TIWCC, whichever applies).

Dilution Series = 100%, 97%, 93%, 47%, and 23%.

**WET Limits**

Has reasonable potential been determined? ☐ YES ☒ NO

Will WET limits be established in the permit? ☐ YES ☒ NO

**Proposed Effluent Limitations and Monitoring Requirements**

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

**Outfall 001, Effective Period: Permit Effective Date through 36<sup>th</sup> Month.**

| Parameter            | Effluent Limitations                |                  |                       |                    |                  |                     | Monitoring Requirements                            |                            |
|----------------------|-------------------------------------|------------------|-----------------------|--------------------|------------------|---------------------|--|----------------------------|
|                      | Mass Units (lbs/day) <sup>(1)</sup> |                  | Concentrations (mg/L) |                    |                  |                     | Minimum <sup>(2)</sup><br>Measurement<br>Frequency | Required<br>Sample<br>Type |
|                      | Average<br>Monthly                  | Daily<br>Maximum | Minimum               | Average<br>Monthly | Daily<br>Maximum | Instant.<br>Maximum |  |                            |
| Dissolved Iron       | Report                              | Report           | XXX                   | Report             | Report           | XXX                 | 1/week   | 24-Hr<br>Composite         |
| Total Mercury (ug/L) | XXX                                 | XXX              | XXX                   | Report             | Report           | XXX                 | 1/week   | 24-Hr<br>Composite         |
| Total Selenium       | Report                              | Report           | XXX                   | Report             | Report           | XXX                 | 1/week   | 24-Hr<br>Composite         |
| Total Zinc           | Report                              | Report           | XXX                   | Report             | Report           | XXX                 | 1/week   | 24-Hr<br>Composite         |

Compliance Sampling Location: Outfall # 001

**Proposed Effluent Limitations and Monitoring Requirements**

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

**Outfall 001, Effective Period: 37<sup>th</sup> Month through Permit Expiration Date.**

| Parameter            | Effluent Limitations                |                  |                       |                    |                  |                     | Monitoring Requirements                            |                            |
|----------------------|-------------------------------------|------------------|-----------------------|--------------------|------------------|---------------------|--|----------------------------|
|                      | Mass Units (lbs/day) <sup>(1)</sup> |                  | Concentrations (mg/L) |                    |                  |                     | Minimum <sup>(2)</sup><br>Measurement<br>Frequency | Required<br>Sample<br>Type |
|                      | Average<br>Monthly                  | Daily<br>Maximum | Minimum               | Average<br>Monthly | Daily<br>Maximum | Instant.<br>Maximum |  |                            |
| Dissolved Iron       | 3.0                                 | 5.0              | XXX                   | 0.323              | 0.505            | 0.809               | 1/week   | 24-Hr<br>Composite         |
| Total Mercury (ug/L) | XXX                                 | XXX              | XXX                   | 0.054              | 0.084            | 0.135               | 1/week   | 24-Hr<br>Composite         |
| Total Selenium       | 0.051                               | 0.083            | XXX                   | 0.005              | 0.008            | 0.012               | 1/week   | 24-Hr<br>Composite         |
| Total Zinc           | 1.0                                 | 1.5              | XXX                   | 0.104              | 0.162            | 0.26                | 1/week   | 24-Hr<br>Composite         |

Compliance Sampling Location: Outfall # 001

**Proposed Effluent Limitations and Monitoring Requirements**

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

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

| Parameter                                     | Effluent Limitations                |                   |                          |                    |                  |                     | Monitoring Requirements                            |                            |
|---|-------------------------------------|-------------------|--------------------------|--------------------|------------------|---------------------|--|----------------------------|
|   | Mass Units (lbs/day) <sup>(1)</sup> |                   | Concentrations (mg/L)    |                    |                  |                     | Minimum <sup>(2)</sup><br>Measurement<br>Frequency | Required<br>Sample<br>Type |
|   | Average<br>Monthly                  | Daily<br>Maximum  | Instantaneous<br>Minimum | Average<br>Monthly | Daily<br>Maximum | Instant.<br>Maximum |  |                            |
| Flow (MGD)                                    | Report                              | Report            | XXX                      | XXX                | XXX              | XXX                 | 2/week   | Metered                    |
| pH (S.U.)                                     | XXX                                 | XXX               | 6.0                      | XXX                | XXX              | 9.0                 | 1/day  | Grab                       |
| DO  | XXX                                 | XXX               | 6.0                      | XXX                | XXX              | XXX                 | 1/day  | Grab                       |
| CBOD5<br>Nov 1 - Apr 30                       | 260.0                               | 410.0<br>Wkly Avg | XXX                      | 25.0               | 40.0<br>Wkly Avg | 50                  | 2/week   | 24-Hr<br>Composite         |
| CBOD5<br>May 1 - Oct 31                       | 155.0                               | 235.0<br>Wkly Avg | XXX                      | 15.0               | 23.0<br>Wkly Avg | 30                  | 2/week   | 24-Hr<br>Composite         |
| BOD5<br>Raw Sewage Influent                   | Report                              | Report            | XXX                      | Report             | XXX              | XXX                 | 2/week   | 24-Hr<br>Composite         |
| TSS   | 310.0                               | 465.0<br>Wkly Avg | XXX                      | 30.0               | 45.0<br>Wkly Avg | 60                  | 2/week   | 24-Hr<br>Composite         |
| TSS<br>Raw Sewage Influent                    | Report                              | Report            | XXX                      | Report             | XXX              | XXX                 | 2/week   | 24-Hr<br>Composite         |
| Fecal Coliform (No./100 ml)<br>Oct 1 - Apr 30 | XXX                                 | XXX               | XXX                      | 2000<br>Geo Mean   | XXX              | 10000               | 2/week   | Grab                       |
| Fecal Coliform (No./100 ml)<br>May 1 - Sep 30 | XXX                                 | XXX               | XXX                      | 200<br>Geo Mean    | XXX              | 1000                | 2/week   | Grab                       |
| UV Transmittance (%)                          | XXX                                 | XXX               | Report                   | XXX                | XXX              | XXX                 | 1/day  | Measured                   |
| Total Nitrogen                                | XXX                                 | XXX               | XXX                      | XXX                | Report           | XXX                 | 1/quarter  | 24-Hr<br>Composite         |
| Ammonia-Nitrogen<br>Nov 1 - Apr 30            | 36.0                                | XXX               | XXX                      | 3.5                | XXX              | 7                   | 2/week   | 24-Hr<br>Composite         |
| Ammonia-Nitrogen<br>May 1 - Oct 31            | 20.0                                | XXX               | XXX                      | 2.0                | XXX              | 4                   | 2/week   | 24-Hr<br>Composite         |

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

| Parameter        | Effluent Limitations                |                  |                          |                    |                  |                     | Monitoring Requirements                            |                            |
|------------------|-------------------------------------|------------------|--------------------------|--------------------|------------------|---------------------|--|----------------------------|
|                  | Mass Units (lbs/day) <sup>(1)</sup> |                  | Concentrations (mg/L)    |                    |                  |                     | Minimum <sup>(2)</sup><br>Measurement<br>Frequency | Required<br>Sample<br>Type |
|                  | Average<br>Monthly                  | Daily<br>Maximum | Instantaneous<br>Minimum | Average<br>Monthly | Daily<br>Maximum | Instant.<br>Maximum |  |                            |
| Total Phosphorus | XXX                                 | XXX              | XXX                      | XXX                | Report           | XXX                 | 1/quarter  | 24-Hr<br>Composite         |
| Total Copper     | 0.125                               | 0.188            | XXX                      | 0.012              | 0.018            | 0.029               | 1/week   | 24-Hr<br>Composite         |
| Free Cyanide     | 0.063                               | 0.094            | XXX                      | 0.006              | 0.009            | 0.015               | 1/week   | 24-Hr<br>Composite         |
| Total Lead       | Report                              | Report           | XXX                      | Report             | Report           | XXX                 | 1/week   | 24-Hr<br>Composite         |

Compliance Sampling Location: Outfall # 001

TOXICS SCREENING ANALYSIS  
WATER QUALITY POLLUTANTS OF CONCERN  
VERSION 2.7

Facility: **Big Sewickley Creek WWTP**  
Analysis Hardness (mg/L): **116.8**  
Stream Flow, Q<sub>7-10</sub> (cfs): **0.153**

NPDES Permit No.: **PA0218413**  
Discharge Flow (MGD): **1.25**

Outfall: **001**  
Analysis pH (SU): **7**

|         | Parameter                  | Maximum Concentration in Application or DMRs (µg/L) | Most Stringent Criterion (µg/L) | Candidate for PENTOXSD Modeling? | Most Stringent WQBEL (µg/L) | Screening Recommendation |
|---------|----------------------------|---|---------------------------------|----------------------------------|-----------------------------|--------------------------|
| Group 1 | Total Dissolved Solids     | 436000  | 500000                          | Yes                              |                             |                          |
|         | Chloride                   | 144000  | 250000                          | Yes                              |                             |                          |
|         | Bromide                    | < 100   | N/A                             | No                               |                             |                          |
|         | Sulfate                    | 46300   | 250000                          | No                               |                             |                          |
| Group 2 | Total Aluminum             | 200   | 750                             | No                               |                             |                          |
|         | Total Antimony             | 0.8   | 5.6                             | No                               |                             |                          |
|         | Total Arsenic              | 2   | 10                              | No                               |                             |                          |
|         | Total Barium               | 118   | 2400                            | No                               |                             |                          |
|         | Total Beryllium            | 0.8   | N/A                             | No                               |                             |                          |
|         | Total Boron                | 302   | 1600                            | No                               |                             |                          |
|         | Total Cadmium              | < 0.08  | 0.304                           | No (Value < QL)                  |                             |                          |
|         | Total Chromium             | 2   | N/A                             | No                               |                             |                          |
|         | Hexavalent Chromium        | < 5   | 10.4                            | No                               |                             |                          |
|         | Total Cobalt               | 2   | 19                              | No                               |                             |                          |
|         | Total Copper               | 16  | 10.7                            | Yes                              | 12.479                      | Establish Limits         |
|         | Free Available Cyanide     | < 3.6   | 5.2                             | Yes                              | 5.612                       | Establish Limits         |
|         | Total Cyanide              |   | N/A                             |                                  |                             |                          |
|         | Dissolved Iron             | 200   | 300                             | Yes                              | 323.764                     | Establish Limits         |
|         | Total Iron                 | 26  | 1500                            | No                               |                             |                          |
|         | Total Lead                 | 2   | 3.9                             | Yes                              | 4.837                       | Monitor                  |
|         | Total Manganese            | 20  | 1000                            | No                               |                             |                          |
|         | Total Mercury              | 0.03  | 0.05                            | Yes                              | 0.054                       | Establish Limits         |
|         | Total Nickel               | 1   | 59.5                            | No                               |                             |                          |
|         | Total Phenols (Phenolics)  | < 5   | 5                               | No (Value < QL)                  |                             |                          |
|         | Total Selenium             | 4   | 5.0                             | Yes                              | 5.384                       | Establish Limits         |
|         | Total Silver               | 2   | 4.9                             | No                               |                             |                          |
|         | Total Thallium             | < 0.8   | 0.24                            | No (Value < QL)                  |                             |                          |
|         | Total Zinc                 | 77  | 136.7                           | Yes                              | 136.7                       | Establish Limits         |
|         | Total Molybdenum           | 2   | N/A                             | No                               |                             |                          |
| Group 3 | Acrolein                   | < 1   | 3                               | No (Value < QL)                  |                             |                          |
|         | Acrylonitrile              | < 0.5   | 0.051                           | No (Value < QL)                  |                             |                          |
|         | Benzene                    | < 0.5   | 1.2                             | No (Value < QL)                  |                             |                          |
|         | Bromoform                  | < 0.5   | 4.3                             | No (Value < QL)                  |                             |                          |
|         | Carbon Tetrachloride       | < 0.5   | 0.23                            | No (Value < QL)                  |                             |                          |
|         | Chlorobenzene              | < 0.5   | 130                             | No (Value < QL)                  |                             |                          |
|         | Chlorodibromomethane       | < 0.5   | 0.4                             | No (Value < QL)                  |                             |                          |
|         | Chloroethane               | < 0.5   | N/A                             | No                               |                             |                          |
|         | 2-Chloroethyl Vinyl Ether  | < 0.5   | 3500                            | No (Value < QL)                  |                             |                          |
|         | Chloroform                 | < 0.7   | 5.7                             | No                               |                             |                          |
|         | Dichlorobromomethane       | < 0.5   | 0.55                            | No (Value < QL)                  |                             |                          |
|         | 1,1-Dichloroethane         | < 0.5   | N/A                             | No                               |                             |                          |
|         | 1,2-Dichloroethane         | < 0.5   | 0.38                            | No (Value < QL)                  |                             |                          |
|         | 1,1-Dichloroethylene       | < 0.5   | 33                              | No (Value < QL)                  |                             |                          |
|         | 1,2-Dichloropropane        | < 0.5   | 2200                            | No (Value < QL)                  |                             |                          |
|         | 1,3-Dichloropropylene      | < 0.5   | 0.34                            | No (Value < QL)                  |                             |                          |
|         | 1,4-Dioxane                | < 5   | N/A                             | No                               |                             |                          |
|         | Ethylbenzene               | < 0.5   | 530                             | No (Value < QL)                  |                             |                          |
|         | Methyl Bromide             | < 0.5   | 47                              | No (Value < QL)                  |                             |                          |
|         | Methyl Chloride            | < 0.5   | 5500                            | No (Value < QL)                  |                             |                          |
|         | Methylene Chloride         | < 0.5   | 4.6                             | No (Value < QL)                  |                             |                          |
|         | 1,1,2,2-Tetrachloroethane  | < 0.5   | 0.17                            | No (Value < QL)                  |                             |                          |
|         | Tetrachloroethylene        | < 0.5   | 0.69                            | No (Value < QL)                  |                             |                          |
|         | Toluene                    | < 0.5   | 330                             | No (Value < QL)                  |                             |                          |
|         | 1,2-trans-Dichloroethylene | < 0.5   | 140                             | No (Value < QL)                  |                             |                          |
|         | 1,1,1-Trichloroethane      | < 0.5   | 610                             | No (Value < QL)                  |                             |                          |
|         | 1,1,2-Trichloroethane      | < 0.5   | 0.59                            | No (Value < QL)                  |                             |                          |
|         | Trichloroethylene          | < 0.5   | 2.5                             | No (Value < QL)                  |                             |                          |
|         | Vinyl Chloride             | < 0.5   | 0.025                           | No (Value < QL)                  |                             |                          |
| Group 4 | 2-Chlorophenol             | < 1   | 81                              | No (Value < QL)                  |                             |                          |
|         | 2,4-Dichlorophenol         | < 1   | 77                              | No (Value < QL)                  |                             |                          |
|         | 2,4-Dimethylphenol         | < 1   | 130                             | No (Value < QL)                  |                             |                          |
|         | 4,6-Dinitro-o-Cresol       | < 1   | 13                              | No (Value < QL)                  |                             |                          |
|         | 2,4-Dinitrophenol          | < 1   | 69                              | No (Value < QL)                  |                             |                          |
|         | 2-Nitrophenol              | < 1   | 1600                            | No (Value < QL)                  |                             |                          |
|         | 4-Nitrophenol              | < 1   | 470                             | No (Value < QL)                  |                             |                          |
|         | p-Chloro-m-Cresol          | < 1   | 30                              | No (Value < QL)                  |                             |                          |
|         | Pentachlorophenol          | < 1   | 0.27                            | No (Value < QL)                  |                             |                          |
|         | Phenol                     | < 5   | 10400                           | No (Value < QL)                  |                             |                          |
|         | 2,4,6-Trichlorophenol      | < 1   | 1.4                             | No (Value < QL)                  |                             |                          |

|         |                             |   |      |             |                 |  |
|---------|-----------------------------|---|------|-------------|-----------------|--|
| Group 5 | Acenaphthene                | < | 1    | 17          | No (Value < QL) |  |
|         | Acenaphthylene              | < | 1    | N/A         | No              |  |
|         | Anthracene                  | < | 1    | 8300        | No (Value < QL) |  |
|         | Benzo(a)Anthracene          | < | 5    | 0.000086    | No (Value < QL) |  |
|         | Benzo(a)Pyrene              | < | 1    | 0.0038      | No (Value < QL) |  |
|         | 3,4-Benzofluoranthene       | < | 1    | 0.0038      | No (Value < QL) |  |
|         | Benzo(ghi)Perylene          | < | 1    | N/A         | No              |  |
|         | Benzo(k)Fluoranthene        | < | 1    | 0.0038      | No (Value < QL) |  |
|         | Bis(2-Chloroethoxy)Methane  | < | 1    | N/A         | No              |  |
|         | Bis(2-Chloroethyl)Ether     | < | 1    | 0.03        | No (Value < QL) |  |
|         | Bis(2-Chloroisopropyl)Ether | < | 1    | 1400        | No (Value < QL) |  |
|         | Bis(2-Ethylhexyl)Phthalate  | < | 3    | 1.2         | No (Value < QL) |  |
|         | 4-Bromophenyl Phenyl Ether  | < | 1    | 54          | No (Value < QL) |  |
|         | Butyl Benzyl Phthalate      | < | 1    | 35          | No (Value < QL) |  |
|         | 2-Chloronaphthalene         | < | 1    | 1000        | No (Value < QL) |  |
|         | 4-Chlorophenyl Phenyl Ether | < | 1    | N/A         | No              |  |
|         | Chrysene                    | < | 1    | 0.0038      | No (Value < QL) |  |
|         | Dibenz(a,h)Anthracene       | < | 1    | 0.0038      | No (Value < QL) |  |
|         | 1,2-Dichlorobenzene         | < | 0.5  | 160         | No (Value < QL) |  |
|         | 1,3-Dichlorobenzene         | < | 0.5  | 69          | No (Value < QL) |  |
|         | 1,4-Dichlorobenzene         | < | 0.5  | 150         | No (Value < QL) |  |
|         | 3,3-Dichlorobenzidine       | < | 1    | 0.021       | No (Value < QL) |  |
|         | Diethyl Phthalate           | < | 5.13 | 800         | No              |  |
|         | Dimethyl Phthalate          | < | 1    | 500         | No (Value < QL) |  |
|         | Di-n-Butyl Phthalate        | < | 3    | 21          | No (Value < QL) |  |
|         | 2,4-Dinitrotoluene          | < | 1    | 0.05        | No (Value < QL) |  |
|         | 2,6-Dinitrotoluene          | < | 1    | 0.05        | No (Value < QL) |  |
|         | Di-n-Octyl Phthalate        | < | 3    | N/A         | No              |  |
|         | 1,2-Diphenylhydrazine       | < | 1    | 0.036       | No (Value < QL) |  |
|         | Fluoranthene                | < | 1    | 40          | No (Value < QL) |  |
|         | Fluorene                    | < | 1    | 1100        | No (Value < QL) |  |
|         | Hexachlorobenzene           | < | 1    | 0.00028     | No (Value < QL) |  |
|         | Hexachlorobutadiene         | < | 0.5  | 0.44        | No (Value < QL) |  |
|         | Hexachlorocyclopentadiene   | < | 0.5  | 1           | No (Value < QL) |  |
|         | Hexachloroethane            | < | 1    | 1.4         | No (Value < QL) |  |
|         | Indeno(1,2,3-cd)Pyrene      | < | 1    | 0.0038      | No (Value < QL) |  |
|         | Isophorone                  | < | 1    | 35          | No (Value < QL) |  |
|         | Naphthalene                 | < | 1    | 43          | No              |  |
|         | Nitrobenzene                | < | 1    | 17          | No (Value < QL) |  |
|         | n-Nitrosodimethylamine      | < | 1    | 0.00069     | No (Value < QL) |  |
|         | n-Nitrosodi-n-Propylamine   | < | 1    | 0.005       | No (Value < QL) |  |
|         | n-Nitrosodiphenylamine      | < | 1    | 3.3         | No (Value < QL) |  |
|         | Phenanthrene                | < | 1    | 1           | No (Value < QL) |  |
|         | Pyrene                      | < | 1    | 830         | No (Value < QL) |  |
|         | 1,2,4-Trichlorobenzene      | < | 1    | 26          | No              |  |
| Group 6 | Aldrin                      | < |      | 0.000049    |                 |  |
|         | alpha-BHC                   | < |      | 0.0026      |                 |  |
|         | beta-BHC                    | < |      | 0.0091      |                 |  |
|         | gamma-BHC                   | < |      | 0.098       |                 |  |
|         | delta BHC                   | < |      | N/A         |                 |  |
|         | Chlordane                   | < |      | 0.0008      |                 |  |
|         | 4,4-DDT                     | < |      | 0.00022     |                 |  |
|         | 4,4-ODE                     | < |      | 0.00022     |                 |  |
|         | 4,4-ODD                     | < |      | 0.00031     |                 |  |
|         | Dieldrin                    | < |      | 0.000052    |                 |  |
|         | alpha-Endosulfan            | < |      | 0.056       |                 |  |
|         | beta-Endosulfan             | < |      | 0.056       |                 |  |
|         | Endosulfan Sulfate          | < |      | N/A         |                 |  |
|         | Endrin                      | < |      | 0.036       |                 |  |
|         | Endrin Aldehyde             | < |      | 0.29        |                 |  |
|         | Heptachlor                  | < |      | 0.000079    |                 |  |
|         | Heptachlor Epoxide          | < |      | 0.000039    |                 |  |
| Group 7 | Toxaphene                   | < |      | 0.0002      |                 |  |
|         | 2,3,7,8-TCDD                | < |      | 0.000000005 |                 |  |
|         | Gross Alpha (pCi/L)         | < |      | N/A         |                 |  |
|         | Total Beta (pCi/L)          | < |      | N/A         |                 |  |
|         | Radium 226/228 (pCi/L)      | < |      | N/A         |                 |  |
|         | Total Strontium             | < |      | 4000        |                 |  |
|         | Total Uranium               | < |      | N/A         |                 |  |
|         |                             |   |      |             |                 |  |
|         |                             |   |      |             |                 |  |
|         |                             |   |      |             |                 |  |
|         |                             |   |      |             |                 |  |
|         |                             |   |      |             |                 |  |
|         |                             |   |      |             |                 |  |
|         |                             |   |      |             |                 |  |
|         |                             |   |      |             |                 |  |

PENTOXSD

Modeling Input Data

| Stream Code | RMI  | Elevation (ft) | Drainage Area (sq mi) | Slope   | PWS With (mgd) | Apply FC                            |
|-------------|------|----------------|-----------------------|---------|----------------|-------------------------------------|
| 36596       | 3.43 | 787.00         | 26.41                 | 0.00000 | 0.00           | <input checked="" type="checkbox"/> |

Stream Data

| LFY    | Trib Flow | Stream Flow | WD Ratio | Rch Width | Rch Depth | Rch Velocity | Rch Trav Time | Tributary Hard | pH    | Stream Hard | pH | Analysis Hard | pH |
|--------|-----------|-------------|----------|-----------|-----------|--------------|---------------|----------------|-------|-------------|----|---------------|----|
| (cfsm) | (cfs)     | (cfs)       |          | (ft)      | (ft)      | (fps)        | (days)        | (mg/L)         |       | (mg/L)      |    | (mg/L)        |    |
| Q7-10  | 0.0058    | 0           | 0        | 18        | 27        | 1.5          | 0             | 0              | 116.8 | 7           | 0  | 0             | 0  |
| Qh     |           | 0           | 0        | 0         | 0         | 0            | 0             | 0              | 100   | 7           | 0  | 0             | 0  |

Discharge Data

| Name            | Permit Number | Existing Disc Flow | Permitted Disc Flow | Design Disc Flow | Reserve Factor | AFC PMF | CFC PMF | THH PMF | CRL PMF | Disc Hard | Disc pH |
|-----------------|---------------|--------------------|---------------------|------------------|----------------|---------|---------|---------|---------|-----------|---------|
|                 |               | (mgd)              | (mgd)               | (mgd)            |                |         |         |         |         | (mg/L)    |         |
| B Sewickley STP | PA0218413     | 0                  | 1.25                | 0                | 0              | 0       | 0       | 0       | 0       | 132       | 7       |

Parameter Data

| Parameter Name | Disc Conc | Trib Conc | Disc Daily CV | Disc Hourly CV | Stream Conc | Stream CV | Fate Coef | FOS | Crit Mod | Max Disc Conc |
|----------------|-----------|-----------|---------------|----------------|-------------|-----------|-----------|-----|----------|---------------|
|                | (µg/L)    | (µg/L)    |               |                | (µg/L)      |           |           |     |          | (µg/L)        |
| COPPER         | 1E+07     | 0         | 0.5           | 0.5            | 0           | 0         | 0         | 0   | 1        | 0             |
| CYANIDE, FREE  | 1E+07     | 0         | 0.5           | 0.5            | 0           | 0         | 0         | 0   | 1        | 0             |
| DISSOLVED IRON | 1E+07     | 0         | 0.5           | 0.5            | 0           | 0         | 0         | 0   | 1        | 0             |
| LEAD           | 1E+07     | 0         | 0.5           | 0.5            | 0           | 0         | 0         | 0   | 1        | 0             |
| MERCURY        | 1E+07     | 0         | 0.5           | 0.5            | 0           | 0         | 0         | 0   | 1        | 0             |
| SELENIUM       | 1E+07     | 0         | 0.5           | 0.5            | 0           | 0         | 0         | 0   | 1        | 0             |
| ZINC           | 1E+07     | 0         | 0.5           | 0.5            | 0           | 0         | 0         | 0   | 1        | 0             |

| Stream Code | RMI  | Elevation (ft) | Drainage Area (sq mi) | Slope   | PWS With (mgd) | Apply FC                            |  |
|-------------|------|----------------|-----------------------|---------|----------------|-------------------------------------|--|
| 36596       | 2.91 | 772.00         | 26.57                 | 0.00000 | 0.00           | <input checked="" type="checkbox"/> |  |

  

| Stream Data |           |             |          |           |           |              |               |           |     |        |    |          |    |
|-------------|-----------|-------------|----------|-----------|-----------|--------------|---------------|-----------|-----|--------|----|----------|----|
| LFY         | Trib Flow | Stream Flow | WD Ratio | Rch Width | Rch Depth | Rch Velocity | Rch Trav Time | Tributary |     | Stream |    | Analysis |    |
|             | (cfs)     | (cfs)       |          | (ft)      | (ft)      | (fps)        | (days)        | Hard      | pH  | Hard   | pH | Hard     | pH |
|             | (cfs)     | (cfs)       |          | (ft)      | (ft)      | (fps)        | (days)        | (mg/L)    |     | (mg/L) |    | (mg/L)   |    |
| Q7-10       | 0.0058    | 0           | 0        | 18        | 27        | 1.5          | 0             | 0         | 100 | 7      | 0  | 0        | 0  |
| Qh          |           | 0           | 0        | 0         | 0         | 0            | 0             | 0         | 100 | 7      | 0  | 0        | 0  |

  

| Discharge Data |               |                    |                     |                  |                |         |         |         |         |           |         |  |
|----------------|---------------|--------------------|---------------------|------------------|----------------|---------|---------|---------|---------|-----------|---------|--|
| Name           | Permit Number | Existing Disc Flow | Permitted Disc Flow | Design Disc Flow | Reserve Factor | AFC PMF | CFC PMF | THH PMF | CRL PMF | Disc Hard | Disc pH |  |
|                |               | (mgd)              | (mgd)               | (mgd)            |                |         |         |         |         | (mg/L)    |         |  |
|                |               | 0                  | 0                   | 0                | 0              | 0       | 0       | 0       | 0       | 100       | 7       |  |

  

| Parameter Data |           |           |               |                |            |           |           |     |          |               |  |
|----------------|-----------|-----------|---------------|----------------|------------|-----------|-----------|-----|----------|---------------|--|
| Parameter Name | Disc Conc | Trib Conc | Disc Daily CV | Disc Hourly CV | Steam Conc | Stream CV | Fate Coef | FOS | Crit Mod | Max Disc Conc |  |
|                | (µg/L)    | (µg/L)    |               |                | (µg/L)     |           |           |     |          | (µg/L)        |  |
| COPPER         | 0         | 0         | 0.5           | 0.5            | 0          | 0         | 0         | 0   | 1        | 0             |  |
| CYANIDE, FREE  | 0         | 0         | 0.5           | 0.5            | 0          | 0         | 0         | 0   | 1        | 0             |  |
| DISSOLVED IRON | 0         | 0         | 0.5           | 0.5            | 0          | 0         | 0         | 0   | 1        | 0             |  |
| LEAD           | 0         | 0         | 0.5           | 0.5            | 0          | 0         | 0         | 0   | 1        | 0             |  |
| MERCURY        | 0         | 0         | 0.5           | 0.5            | 0          | 0         | 0         | 0   | 1        | 0             |  |
| SELENIUM       | 0         | 0         | 0.5           | 0.5            | 0          | 0         | 0         | 0   | 1        | 0             |  |
| ZINC           | 0         | 0         | 0.5           | 0.5            | 0          | 0         | 0         | 0   | 1        | 0             |  |

**PENTOXSD Analysis Results**

**Hydrodynamics**

| <u>SWP Basin</u>           |                      | <u>Stream Code:</u> |                          | <u>Stream Name:</u>         |             |               |               |          |                   |                           |              |
|----------------------------|----------------------|---------------------|--------------------------|-----------------------------|-------------|---------------|---------------|----------|-------------------|---------------------------|--------------|
| 20G                        |                      | 36596               |                          | BIG SEWICKLEY CREEK         |             |               |               |          |                   |                           |              |
| RMI                        | Stream Flow<br>(cfs) | PWS With<br>(cfs)   | Net Stream Flow<br>(cfs) | Disc Analysis Flow<br>(cfs) | Reach Slope | Depth<br>(ft) | Width<br>(ft) | WD Ratio | Velocity<br>(fps) | Reach Trav Time<br>(days) | CMT<br>(min) |
| <b>Q7-10 Hydrodynamics</b> |                      |                     |                          |                             |             |               |               |          |                   |                           |              |
| 3.430                      | 0.1532               | 0                   | 0.1532                   | 1.93375                     | 0.0055      | 1.5           | 27            | 18       | 0.0515            | 0.6167                    | .039         |
| 2.910                      | 0.1541               | 0                   | 0.1541                   | NA                          | 0           | 0             | 0             | 0        | 0                 | 0                         | NA           |
| <b>Qh Hydrodynamics</b>    |                      |                     |                          |                             |             |               |               |          |                   |                           |              |
| 3.430                      | 1.4416               | 0                   | 1.4416                   | 1.93375                     | 0.0055      | 1.8534        | 27            | 14.568   | 0.0675            | 0.4711                    | .977         |
| 2.910                      | 1.4492               | 0                   | 1.4492                   | NA                          | 0           | 0             | 0             | 0        | 0                 | 0                         | NA           |

# PENTOXSD Analysis Results

## Wasteload Allocations

| RMI    | Name            | Permit Number  |           |                   |             |            |                   |            |
|--------|-----------------|--|-----------|-------------------|-------------|------------|-------------------|------------|
| 3.43   | B Sewickley STP | PA0218413  |           |                   |             |            |                   |            |
| AFC    |                 |  |           |                   |             |            |                   |            |
| Q7-10: | CCT (min)       | 0.039  | PMF       | 1                 | Analysis pH | 7          | Analysis Hardness | 130.884    |
|        | Parameter       | Stream Conc (µg/L)                                   | Stream CV | Trib Conc (µg/L)  | Fate Coef   | WQC (µg/L) | WQ Obj (µg/L)     | WLA (µg/L) |
|        | COPPER          | 0  | 0         | 0                 | 0           | 17.318     | 18.04             | 19.469     |
|        |                 | Dissolved WQC. Chemical translator of 0.96 applied.  |           |                   |             |            |                   |            |
|        | LEAD            | 0  | 0         | 0                 | 0           | 86.461     | 115.008           | 124.118    |
|        |                 | Dissolved WQC. Chemical translator of 0.752 applied. |           |                   |             |            |                   |            |
|        | MERCURY         | 0  | 0         | 0                 | 0           | 1.4        | 1.647             | 1.778      |
|        |                 | Dissolved WQC. Chemical translator of 0.85 applied.  |           |                   |             |            |                   |            |
|        | SELENIUM        | 0  | 0         | 0                 | 0           | NA         | NA                | NA         |
|        | ZINC            | 0  | 0         | 0                 | 0           | 147.195    | 150.506           | 162.429    |
|        |                 | Dissolved WQC. Chemical translator of 0.978 applied. |           |                   |             |            |                   |            |
|        | CYANIDE, FREE   | 0  | 0         | 0                 | 0           | 22         | 22                | 23.743     |
|        | DISSOLVED IRON  | 0  | 0         | 0                 | 0           | NA         | NA                | NA         |
| CFC    |                 |  |           |                   |             |            |                   |            |
| Q7-10: | CCT (min)       | 0.039  | PMF       | 1                 | Analysis pH | 7          | Analysis Hardness | 130.884    |
|        | Parameter       | Stream Conc. (µg/L)                                  | Stream CV | Trib Conc. (µg/L) | Fate Coef   | WQC (µg/L) | WQ Obj (µg/L)     | WLA (µg/L) |
|        | COPPER          | 0  | 0         | 0                 | 0           | 11.272     | 11.741            | 12.671     |
|        |                 | Dissolved WQC. Chemical translator of 0.96 applied.  |           |                   |             |            |                   |            |
|        | LEAD            | 0  | 0         | 0                 | 0           | 3.369      | 4.482             | 4.837      |
|        |                 | Dissolved WQC. Chemical translator of 0.752 applied. |           |                   |             |            |                   |            |
|        | MERCURY         | 0  | 0         | 0                 | 0           | 0.77       | 0.906             | 0.978      |
|        |                 | Dissolved WQC. Chemical translator of 0.85 applied.  |           |                   |             |            |                   |            |
|        | SELENIUM        | 0  | 0         | 0                 | 0           | 4.6        | 4.989             | 5.384      |
|        |                 | Dissolved WQC. Chemical translator of 0.922 applied. |           |                   |             |            |                   |            |
|        | ZINC            | 0  | 0         | 0                 | 0           | 148.399    | 150.506           | 162.429    |
|        |                 | Dissolved WQC. Chemical translator of 0.986 applied. |           |                   |             |            |                   |            |
|        | CYANIDE, FREE   | 0  | 0         | 0                 | 0           | 5.2        | 5.2               | 5.612      |
|        | DISSOLVED IRON  | 0  | 0         | 0                 | 0           | NA         | NA                | NA         |
| THH    |                 |  |           |                   |             |            |                   |            |
| Q7-10: | CCT (min)       | 0.039  | PMF       | NA                | Analysis pH | NA         | Analysis Hardness | NA         |
|        | Parameter       | Stream Conc (µg/L)                                   | Stream CV | Trib Conc (µg/L)  | Fate Coef   | WQC (µg/L) | WQ Obj (µg/L)     | WLA (µg/L) |
|        | COPPER          | 0  | 0         | 0                 | 0           | NA         | NA                | NA         |

**PENTOXSD Analysis Results**

**Wasteload Allocations**

| RMI  | Name            | Permit Number |   |   |   |      |      |         |
|------|-----------------|---------------|---|---|---|------|------|---------|
| 3.43 | B Sewickley STP | PA0218413     |   |   |   |      |      |         |
|      | LEAD            | 0             | 0 | 0 | 0 | NA   | NA   | NA      |
|      | MERCURY         | 0             | 0 | 0 | 0 | 0.05 | 0.05 | 0.054   |
|      | SELENIUM        | 0             | 0 | 0 | 0 | NA   | NA   | NA      |
|      | ZINC            | 0             | 0 | 0 | 0 | NA   | NA   | NA      |
|      | CYANIDE, FREE   | 0             | 0 | 0 | 0 | 140  | 140  | 151.09  |
|      | DISSOLVED IRON  | 0             | 0 | 0 | 0 | 300  | 300  | 323.764 |

**CRL**

| Qh: | CCT (min)      | 0.977                    | PMF          | 1                      |              |               |                     |               |
|-----|----------------|--------------------------|--------------|------------------------|--------------|---------------|---------------------|---------------|
|     | Parameter      | Stream<br>Conc<br>(µg/L) | Stream<br>CV | Trib<br>Conc<br>(µg/L) | Fate<br>Coef | WQC<br>(µg/L) | WQ<br>Obj<br>(µg/L) | WLA<br>(µg/L) |
|     | COPPER         | 0                        | 0            | 0                      | 0            | NA            | NA                  | NA            |
|     | LEAD           | 0                        | 0            | 0                      | 0            | NA            | NA                  | NA            |
|     | MERCURY        | 0                        | 0            | 0                      | 0            | NA            | NA                  | NA            |
|     | SELENIUM       | 0                        | 0            | 0                      | 0            | NA            | NA                  | NA            |
|     | ZINC           | 0                        | 0            | 0                      | 0            | NA            | NA                  | NA            |
|     | CYANIDE, FREE  | 0                        | 0            | 0                      | 0            | NA            | NA                  | NA            |
|     | DISSOLVED IRON | 0                        | 0            | 0                      | 0            | NA            | NA                  | NA            |

**PENTOXSD Analysis Results**

**Recommended Effluent Limitations**

| <u>SWP Basin</u> | <u>Stream Code:</u> | <u>Stream Name:</u> |
|------------------|---------------------|---------------------|
| 20G              | 36596               | BIG SEWICKLEY CREEK |

  

| RMI  | Name            | Permit Number | Disc Flow (mgd) |
|------|-----------------|---------------|-----------------|
| 3.43 | B Sewickley STP | PA0218413     | 1.2500          |

  

| Parameter      | Effluent Limit<br>(µg/L) | Governing Criterion | Max. Daily Limit<br>(µg/L) | Most Stringent  |                    |
|----------------|--------------------------|---------------------|----------------------------|-----------------|--------------------|
|                |                          |                     |                            | WQBEL<br>(µg/L) | WQBEL<br>Criterion |
| COPPER         | 12.479                   | AFC                 | 19.469                     | 12.479          | AFC                |
| CYANIDE, FREE  | 5.612                    | CFC                 | 8.755                      | 5.612           | CFC                |
| DISSOLVED IRON | 323.764                  | THH                 | 505.124                    | 323.764         | THH                |
| LEAD           | 4.837                    | CFC                 | 7.546                      | 4.837           | CFC                |
| MERCURY        | 0.054                    | THH                 | 0.084                      | 0.054           | THH                |
| SELENIUM       | 5.384                    | CFC                 | 8.4                        | 5.384           | CFC                |
| ZINC           | 104.11                   | AFC                 | 162.429                    | 104.11          | AFC                |

HEADWATER DATA

page

Q<sub>7-10</sub> = 0.153, 0.31 *winter period*  
TEMP. = 25°C, 5°C  
pH = 7  
D.O. = -  
CBOD<sub>5</sub> = 2  
NH<sub>3</sub>-N = 0.1  
K<sub>c</sub> = 0

Q<sub>d</sub> = 1.25 MGD  
TEMP. = 20°C, 15°C  
pH = 7  
D.O. = 2  
CBOD<sub>5</sub> = 25  
NH<sub>3</sub>-N = 25  
K<sub>c</sub> = 1.5

Q<sub>t</sub> = 0  
TEMP. =  
pH =  
CBOD<sub>5</sub> =  
NH<sub>3</sub>-N =

D.O. = 6  
K<sub>a</sub> = 0.6  
Slope = 0.0057  
~~Length~~ = 2700  
D.A. = 26.41  
W/D ratio = 18/1

$27/1.5 = 18$

Q<sub>d</sub> =  
TEMP. =  
pH =  
D.O. =  
CBOD<sub>5</sub> =  
NH<sub>3</sub>-N =  
K<sub>c</sub> =

Q<sub>t</sub> =  
TEMP. =  
pH =  
CBOD<sub>5</sub> =  
NH<sub>3</sub>-N =

D.O. =  
K<sub>a</sub> =  
Slope =  
Length =  
D.A. =  
W/D ratio =

Directory: BSewk

File: Sum  
Sum 2 Q<sub>7-10</sub> modified for July  
Wint



## Low-Flow Statistics for Pennsylvania Streams



Developed by the U.S. Geological Survey for the  
Pennsylvania Department of Environmental Protection

### Pennsylvania Low-Flow Statistics - Query Results

#### LOW-FLOW STATISTICS

[All flow statistics in cubic feet per second (ft<sup>3</sup>/s)]

Query run on 05/05/00

Mouse over or click on table headings to view definition of statistic

|   |  |                                      |
|---|--|--------------------------------------|
| <b>STREAM NAME:</b> Big Sewickley Creek | <b>COUNTY:</b> ALLEGHENY                     | <b>LATITUDE:</b> 40° 36' 27"         |
| <b>GAGE OR BRIDGE SITE:</b> gage        | <b>USGS QUAD:</b> Ambridge                   | <b>LONGITUDE:</b> 80° 09' 49"        |
| <b>STATION ID:</b> 03086100             | <b>PERIOD OF RECORD<sup>1</sup>:</b> 1968-78 | <b>DRAINAGE AREA (sq. mi.):</b> 15.6 |

| Q <sub>1,10</sub> | Q <sub>7,10</sub> | Q <sub>30,10</sub> | MEAN  | MEDIAN | HARMONIC MEAN |
|-------------------|-------------------|--------------------|-------|--------|---------------|
| **                | 0.09              | 0.13               | 17.27 | 7.60   | 1.14          |

| FLOW DURATION TABLE (Probability of Exceedance) |       |       |       |       |      |      |      |      |      |      |
|---|-------|-------|-------|-------|------|------|------|------|------|------|
| P5  | P10   | P20   | P30   | P40   | P50  | P60  | P70  | P80  | P90  | P95  |
| 65.30   | 41.00 | 25.60 | 17.30 | 11.90 | 7.60 | 4.90 | 3.10 | 1.60 | 0.58 | 0.29 |

<sup>1</sup>Period of Record for climatic year, April 1 through March 31

\*\* Statistic has not been computed

$$0.09 \text{ cfs} / 15.6 \text{ mi}^2 = 0.0058 \text{ cfs/mi}^2$$

$$Q_{30}/Q_7 = .13/.09 = 1.44$$

RETURN TO PREVIOUS PAGE

RETURN TO START PAGE

This system designed and developed by the U.S. Geological Survey, Water Resources Division, Lemoyne, Pa. © 1999.

FILE: a:\bsewk\sum.wqm  
Big Sewickley STP

Default Data

a. Stream Values

|    |                              |        |
|----|------------------------------|--------|
| 1  | Q1-10/Q7-10 ratio.....       | : .64  |
| 2  | Q30-10/Q7-10 ratio.....      | : 1.44 |
| 3  | Temperature.....             | : 25   |
| 4  | pH.....                      | : 7    |
| 5  | C-BOD5.....                  | : 2    |
| 6  | NH3-N.....                   | : .1   |
| 7  | D.O. Saturation (%).....     | : .85  |
| 8  | D.O. Goal.....               | : 6    |
| 9  | Width/Depth ratio.....       | : 18   |
| 10 | KC...(Headwaters only!)..... | : 0    |
| 11 | KN.....                      | : .6   |

b. Discharge Values (30-day avgs.)

|    |                                    |       |
|----|------------------------------------|-------|
| 12 | C-BOD5.....                        | : 25  |
| 13 | NH3-N.....                         | : 25  |
| 14 | Effluent D.O.....                  | : 3   |
| 15 | Effluent Temp.....                 | : 20  |
| 16 | KC.....                            | : 1.5 |
| 17 | Balanced Technology(1=y 0=no)..... | : 0   |

(WQAM63.EXE) Release 1.2 05-25-2000 09:04:42

FILE: a:\bsewk\sum.wqm  
Big Sewickley STP

REACH # 1  
Headwaters and Tributary data

No. of Reaches : 1

| Rh | Q7-10<br>(cfs) | T<br>(c) | pH<br>(su) | DO<br>(mg/l) | CBOD5<br>(mg/l) | NH3-N<br>(mg/l) |
|----|----------------|----------|------------|--------------|-----------------|-----------------|
| HW | 0.1530         | 25       | 7          | 7.12         | 2               | .1              |
| 1  | 0.0000         |          |            |              |                 |                 |

FILE: a:\bsewk\sum.wqm  
Big Sewickley STP

Stream Characteristics

| Rh | Q7-10<br>(cfs) | T<br>(c) | pH<br>(su) | DO<br>(mg/l) | CBOD5<br>(mg/l) | NH3-N<br>(mg/l) |
|----|----------------|----------|------------|--------------|-----------------|-----------------|
| 1  | .15            | 25       | 7          | 7.12         | 2               | .1              |

Q 1-10/Q 7-10 = .64  
Q 30-10/Q 7-10 = 1.44

FILE: a:\bsewk\sum.wqm  
Big Sewickley STP

DISCHARGE # 1  
Discharger Data  
Q7-10 Design Conditions

| Rh | FLOW<br>(MGD) | T<br>(c) | pH<br>(su) | DO<br>(mg/l) | CBOD5<br>(mg/l) | NH3-N<br>(mg/l) | KC<br>(1/days) |
|----|---------------|----------|------------|--------------|-----------------|-----------------|----------------|
| 1  | 1.2500        | 20       | 7          | 5            | 25              | 25              | 1.5            |

FILE: a:\bsewk\sum.wqm  
Big Sewickley STP

REACH # 1  
Reach Characteristics

| Rh | D.O.<br>GOAL | KN<br>(/D) | RCH.<br>SL.<br>(FT/FT) | RCH.<br>LEN.<br>(FT.) | DRAIN<br>AREA<br>(MI^2) | W/D |
|----|--------------|------------|------------------------|-----------------------|-------------------------|-----|
| 1  | 6            | .6         | 0.00570                | 2700                  | 26.41                   | 18  |

4

FILE: a:\bsewk\sum.wqm  
Big Sewickley STP

REACH # 1  
Reach Characteristics

Rh  
KR TT  
(/D) (Days)  
-----

1 0 0

- Default to EPA velocity based equation

FILE: a:\bsewk\sum.wqm  
Big Sewickley STP

NH3-N Discharge Allocations at Q30-10 (EMPR)

| DIS | Q<br>(mgd) | BASE.<br>CONC.<br>(mg/l) | MULT.<br>CONC.<br>(mg/l) | CRIT.<br>RCH. | PCT.<br>RED.<br>(%) | NH3-N<br>CRIT.<br>(mg/l) |
|-----|------------|--------------------------|--------------------------|---------------|---------------------|--------------------------|
|     |            |                          |                          |               |                     |                          |
| 1   | 1.2500     | 2.05                     | 2.05                     | 0             | 0                   | 1.85                     |

5

FILE: a:\bsewk\sum.wqm  
Big Sewickley STP

NH3-N Discharge Allocations at Q1-10 (EMPR)

| DIS | Q      | BASE.<br>CONC. | MULT.<br>CONC. | CRIT.<br>RCH. | PCT.<br>RED. | NH3-N<br>CRIT. |
|-----|--------|----------------|----------------|---------------|--------------|----------------|
|     | (mgd)  | (mg/l)         | (mg/l)         |               | (%)          | (mg/l)         |
| 1   | 1.2500 | 9.98           | 9.98           | 0             | 0            | 9.51           |

FILE: a:\bsewk\sum.wqm  
Big Sewickley STP

D.O. Allocations (EMPR)

| DIS<br># | Q<br>(MGD) | ----NH3-N---- |               | ----CBOD5---- |               | CRIT.<br>RCH. | PCT.<br>REM. |
|----------|------------|---------------|---------------|---------------|---------------|---------------|--------------|
|          |            | IND.<br>Conc. | CUM.<br>Conc. | IND.<br>Conc. | CUM.<br>Conc. |               |              |
|          |            | (mg/l)        | (mg/l)        | (mg/l)        | (mg/l)        |               | (%)          |
| 1        | 1.2500     | 2             | 2             | 15.6          | 15.6          | 0             | 0            |

6

FILE: a:\bsewk\sum.wqm  
Big Sewickley STP

(Total) Discharge = 1.25 MGD  
 Temp = 20.4 pH = 7 Width = 15.51  
 CBOD-5 = 14.6 NH3-N = 1.86 Depth = 0.86  
 D.O. = 6.08 D.O. Goal = 6 Velocity = 0.156  
 KC' = .924 KN = .6 W/D RATIO = 18  
 KR = 8.453 (TSIVOGLOU)  
 Dis. 1 Rch. 1 Trvl Time: .2

| Tr.Tm.<br>(Days) | CBOD-5<br>(mg/l) | NH3-N<br>(mg/l) | D.O.<br>(mg/l) |
|------------------|------------------|-----------------|----------------|
| 0.020            | 14.33            | 1.84            | 6.08           |
| 0.040            | 14.06            | 1.82            | 6.09           |
| 0.060            | 13.80            | 1.79            | 6.10           |
| 0.080            | 13.54            | 1.77            | 6.12           |
| 0.100            | 13.29            | 1.75            | 6.14           |
| 0.120            | 13.04            | 1.73            | 6.17           |
| 0.140            | 12.80            | 1.71            | 6.20           |
| 0.160            | 12.56            | 1.69            | 6.23           |
| 0.180            | 12.33            | 1.66            | 6.27           |
| 0.200            | 12.10            | 1.64            | 6.31           |

no sug < 6 mg/l

FILE: a:\bsewk\sum.wqm  
Big Sewickley STP

*Summer*  
Effluent Limitations Display

| DIS # | Q MGD | NH3-N TOX. 1 DAY | 30 DAY | DISS. OXYGEN C-BOD5 30-DAY | NH3-N 30-DAY | EFF. D.O. |
|-------|-------|------------------|--------|----------------------------|--------------|-----------|
| 1     | 1.25  | 4.1              | 2      | 15.6                       | 2            | 6         |

7

FILE: a:\bsewk\wint.wqm  
winter period analysis

REACH # 1  
Headwaters and Tributary data

No. of Reaches : 1

| Rh | Q7-10<br>(cfs) | T<br>(c) | pH<br>(su) | DO<br>(mg/l) | CBOD5<br>(mg/l) | NH3-N<br>(mg/l) |
|----|----------------|----------|------------|--------------|-----------------|-----------------|
| HW | 0.3100         | 5        | 7          | 10.82        | 2               | .1              |
| 1  | 0.0000         |          |            |              |                 |                 |

FILE: a:\bsewk\wint.wqm  
winter period analysis

Stream Characteristics

| Rh | Q7-10<br>(cfs) | T<br>(c) | pH<br>(su) | DO<br>(mg/l) | CBOD5<br>(mg/l) | NH3-N<br>(mg/l) |
|----|----------------|----------|------------|--------------|-----------------|-----------------|
| 1  | .31            | 5        | 7          | 10.82        | 2               | .1              |

Q 1-10/Q 7-10 = .64  
Q 30-10/Q 7-10 = 1.36

FILE: a:\bsewk\wint.wqm  
winter period analysis

DISCHARGE # 1  
Discharger Data  
Q7-10 Design Conditions

| Rh | FLOW<br>(MGD) | T<br>(c) | pH<br>(su) | DO<br>(mg/l) | CBOD5<br>(mg/l) | NH3-N<br>(mg/l) | KC<br>(1/days) |
|----|---------------|----------|------------|--------------|-----------------|-----------------|----------------|
| 1  | 1.2500        | 15       | 7          | 6            | 25              | 6               | 1.5            |

FILE: a:\bsewk\wint.wqm  
winter period analysis

REACH # 1  
Reach Characteristics

| Rh | D.O.<br>GOAL | KN<br>(/D) | RCH.<br>SL.<br>(FT/FT) | RCH.<br>LEN.<br>(FT.) | DRAIN<br>AREA<br>(MI^2) | W/D |
|----|--------------|------------|------------------------|-----------------------|-------------------------|-----|
| 1  | 6            | .6         | 0.00570                | 2700                  | 26.41                   | 18  |

9

FILE: a:\bsewk\wint.wqm  
winter period analysis

REACH # 1  
Reach Characteristics

Rh  
KR TT  
(/D) (Days)

1 0 0 - Default to EPA velocity based equation

FILE: a:\bsewk\wint.wqm  
winter period analysis

NH3-N Discharge Allocations at Q30-10 (EMPR)

| DIS | Q<br>(mgd) | BASE.<br>CONC.<br>(mg/l) | MULT.<br>CONC.<br>(mg/l) | CRIT.<br>RCH. | PCT.<br>RED.<br>(%) | NH3-N<br>CRIT.<br>(mg/l) |
|-----|------------|--------------------------|--------------------------|---------------|---------------------|--------------------------|
| 1   | 1.2500     | 3.85                     | 3.85                     | 0             | 0                   | 3.18                     |

10

FILE: a:\bsewk\wint.wqm  
winter period analysis

NH3-N Discharge Allocations at Q1-10 (EMPR)

| DIS | Q      | BASE.<br>CONC. | MULT.<br>CONC. | CRIT.<br>RCH. | PCT.<br>RED. | NH3-N<br>CRIT. |
|-----|--------|----------------|----------------|---------------|--------------|----------------|
|     | (mgd)  | (mg/l)         | (mg/l)         |               | (%)          | (mg/l)         |
| 1   | 1.2500 | 12.00          | 12.00          | 0             | 0            | 15.04          |

FILE: a:\bsewk\wint.wqm  
winter period analysis

D.O. Allocations (EMPR)

| DIS<br># | Q<br>(MGD) | ---NH3-N---             |                         | ---CBOD5---             |                         | CRIT.<br>RCH. | PCT.<br>REM. |
|----------|------------|-------------------------|-------------------------|-------------------------|-------------------------|---------------|--------------|
|          |            | IND.<br>Conc.<br>(mg/l) | CUM.<br>Conc.<br>(mg/l) | IND.<br>Conc.<br>(mg/l) | CUM.<br>Conc.<br>(mg/l) |               |              |
| 1        | 1.2500     | 3.9                     | 3.9                     | 25                      | 25                      | 0             | 0            |

11

FILE: a:\bsewk\wint.wqm  
winter period analysis

(Total) Discharge = 1.25 MGD  
 Temp = 13.6 pH = 7 Width = 15.76  
 CBOD-5 = 21.82 NH3-N = 3.37 Depth = 0.88  
 D.O. = 6.67 D.O. Goal = 6 Velocity = 0.163  
 KC' = 1.479 KN = .6 W/D RATIO = 18  
 KR = 8.804 (TSIVOGLOU)  
 Dis. 1 Rch. 1 Trvl Time: .192

| Tr.Tm.<br>(Days) | CBOD-5<br>(mg/l) | NH3-N<br>(mg/l) | D.O.<br>(mg/l) |
|------------------|------------------|-----------------|----------------|
| 0.019            | 21.36            | 3.35            | 6.52           |
| 0.038            | 20.92            | 3.33            | 6.40           |
| 0.058            | 20.48            | 3.30            | 6.32           |
| 0.077            | 20.05            | 3.28            | 6.27           |
| 0.096            | 19.63            | 3.26            | 6.23           |
| 0.115            | 19.21            | 3.24            | 6.22           |
| 0.135            | 18.81            | 3.21            | 6.22           |
| 0.154            | 18.42            | 3.19            | 6.23           |
| 0.173            | 18.03            | 3.17            | 6.25           |
| 0.192            | 17.65            | 3.14            | 6.28           |

FILE: a:\bsewk\wint.wqm  
winter period analysis

Effluent Limitations Display

| DIS # | Q<br>MGD | NH3-N<br>1 DAY | TOX.<br>30 DAY | DISS. OXYGEN<br>C-BOD5<br>30-DAY | NH3-N<br>30-DAY | EFF.<br>D.O. |
|-------|----------|----------------|----------------|----------------------------------|-----------------|--------------|
| 1     | 1.25     | 7.7            | 3.9            | 25                               | 3.9             | 6            |

7 3.5

Round down to nearest 0.5 mg/l, as per ammonia implementation guidance.

| DEP Whole Effluent Toxicity (WET) Analysis Spreadsheet |              |  |               |   |  |
|--|--------------|--|---------------|---|--|
| Type of Test   | Chronic      |  | Facility Name | Economy Borough MA - Big Sewickley Creek WWTP |  |
| Species Tested   | Ceriodaphnia |  | Permit No.    | PA0218413                                     |  |
| Endpoint   | Reproduction |  |               |   |  |
| TIWC (decimal)   | 0.93         |  |               |   |  |
| No. Per Replicate                                      | 1            |  |               |   |  |
| TST b value  | 0.75         |  |               |   |  |
| TST alpha value  | 0.2          |  |               |   |  |

  

| Test Completion Date<br>11/18/2014 |         |      | Test Completion Date<br>11/10/2015 |         |      |
|------------------------------------|---------|------|------------------------------------|---------|------|
| Replicate No.                      | Control | TIWC | Replicate No.                      | Control | TIWC |
| 1                                  | 21      | 31   | 1                                  | 4       | 37   |
| 2                                  | 30      | 36   | 2                                  | 34      | 37   |
| 3                                  | 26      | 37   | 3                                  | 36      | 37   |
| 4                                  | 22      | 36   | 4                                  | 40      | 36   |
| 5                                  | 32      | 37   | 5                                  | 35      | 40   |
| 6                                  | 25      | 32   | 6                                  | 31      | 42   |
| 7                                  | 22      | 30   | 7                                  | 38      | 39   |
| 8                                  | 26      | 31   | 8                                  | 36      | 38   |
| 9                                  | 25      | 32   | 9                                  | 36      | 36   |
| 10                                 | 20      | 38   | 10                                 | 32      | 31   |
| 11                                 |         |      | 11                                 |         |      |
| 12                                 |         |      | 12                                 |         |      |
| 13                                 |         |      | 13                                 |         |      |
| 14                                 |         |      | 14                                 |         |      |
| 15                                 |         |      | 15                                 |         |      |

  

|              |        |        |              |        |        |
|--------------|--------|--------|--------------|--------|--------|
| Mean         | 24.900 | 34.000 | Mean         | 32.200 | 37.300 |
| Std Dev.     | 3.872  | 3.055  | Std Dev.     | 10.250 | 2.908  |
| # Replicates | 10     | 10     | # Replicates | 10     | 10     |

  

|                  |         |                  |        |
|------------------|---------|------------------|--------|
| T-Test Result    | 11.4980 | T-Test Result    | 5.0594 |
| Deg. of Freedom  | 17      | Deg. of Freedom  | 16     |
| Critical T Value | 0.8633  | Critical T Value | 0.8647 |
| Pass or Fail     | PASS    | Pass or Fail     | PASS   |

  

| Test Completion Date<br>11/22/2016 |         |      | Test Completion Date<br>11/7/2017 |         |      |
|------------------------------------|---------|------|-----------------------------------|---------|------|
| Replicate No.                      | Control | TIWC | Replicate No.                     | Control | TIWC |
| 1                                  | 29      | 41   | 1                                 | 25      | 27   |
| 2                                  | 31      | 40   | 2                                 | 24      | 28   |
| 3                                  | 32      | 34   | 3                                 | 26      | 29   |
| 4                                  | 31      | 44   | 4                                 | 29      | 33   |
| 5                                  | 36      | 43   | 5                                 | 26      | 33   |
| 6                                  | 34      | 39   | 6                                 | 26      | 35   |
| 7                                  | 36      | 42   | 7                                 | 28      | 32   |
| 8                                  | 25      | 43   | 8                                 | 27      | 17   |
| 9                                  | 33      | 42   | 9                                 | 26      | 35   |
| 10                                 | 40      | 40   | 10                                | 27      | 33   |
| 11                                 |         |      | 11                                |         |      |
| 12                                 |         |      | 12                                |         |      |
| 13                                 |         |      | 13                                |         |      |
| 14                                 |         |      | 14                                |         |      |
| 15                                 |         |      | 15                                |         |      |

  

|              |        |        |              |        |        |
|--------------|--------|--------|--------------|--------|--------|
| Mean         | 32.700 | 40.800 | Mean         | 26.400 | 30.200 |
| Std Dev.     | 4.165  | 2.860  | Std Dev.     | 1.430  | 5.412  |
| # Replicates | 10     | 10     | # Replicates | 10     | 10     |

  

|                  |         |                  |        |
|------------------|---------|------------------|--------|
| T-Test Result    | 12.1530 | T-Test Result    | 5.9610 |
| Deg. of Freedom  | 17      | Deg. of Freedom  | 11     |
| Critical T Value | 0.8633  | Critical T Value | 0.8755 |
| Pass or Fail     | PASS    | Pass or Fail     | PASS   |

| DEP Whole Effluent Toxicity (WET) Analysis Spreadsheet |              |  |               |   |  |
|--|--------------|--|---------------|---|--|
| Type of Test   | Chronic      |  | Facility Name | Economy Borough MA - Big Sewickley Creek WWTP |  |
| Species Tested   | Ceriodaphnia |  | Permit No.    | PA0218413                                     |  |
| Endpoint   | Survival     |  |               |   |  |
| TIWC (decimal)   | 0.83         |  |               |   |  |
| No. Per Replicate                                      | 1            |  |               |   |  |
| TST b value  | 0.75         |  |               |   |  |
| TST alpha value  | 0.2          |  |               |   |  |

  

| Test Completion Date |         |      | Test Completion Date |         |      |
|----------------------|---------|------|----------------------|---------|------|
| Replicate No.        | Control | TIWC | Replicate No.        | Control | TIWC |
| 1                    | 1       | 1    | 1                    | 0       | 1    |
| 2                    | 1       | 1    | 2                    | 1       | 1    |
| 3                    | 1       | 1    | 3                    | 1       | 1    |
| 4                    | 1       | 1    | 4                    | 1       | 1    |
| 5                    | 1       | 1    | 5                    | 1       | 1    |
| 6                    | 1       | 1    | 6                    | 1       | 1    |
| 7                    | 1       | 1    | 7                    | 1       | 1    |
| 8                    | 1       | 1    | 8                    | 1       | 1    |
| 9                    | 1       | 1    | 9                    | 1       | 1    |
| 10                   | 1       | 1    | 10                   | 1       | 1    |
| 11                   |         |      | 11                   |         |      |
| 12                   |         |      | 12                   |         |      |
| 13                   |         |      | 13                   |         |      |
| 14                   |         |      | 14                   |         |      |
| 15                   |         |      | 15                   |         |      |

  

|              |       |       |              |       |       |
|--------------|-------|-------|--------------|-------|-------|
| Mean         | 1.000 | 1.000 | Mean         | 0.900 | 1.000 |
| Std Dev.     | 0.000 | 0.000 | Std Dev.     | 0.316 | 0.000 |
| # Replicates | 10    | 10    | # Replicates | 10    | 10    |

  

|                  |      |                  |      |
|------------------|------|------------------|------|
| T-Test Result    |      | T-Test Result    |      |
| Deg. of Freedom  |      | Deg. of Freedom  |      |
| Critical T Value |      | Critical T Value |      |
| Pass or Fail     | PASS | Pass or Fail     | PASS |

  

| Test Completion Date |         |      | Test Completion Date |         |      |
|----------------------|---------|------|----------------------|---------|------|
| Replicate No.        | Control | TIWC | Replicate No.        | Control | TIWC |
| 1                    | 1       | 1    | 1                    | 1       | 1    |
| 2                    | 1       | 1    | 2                    | 1       | 1    |
| 3                    | 1       | 1    | 3                    | 1       | 1    |
| 4                    | 1       | 1    | 4                    | 1       | 1    |
| 5                    | 1       | 1    | 5                    | 1       | 1    |
| 6                    | 1       | 1    | 6                    | 1       | 1    |
| 7                    | 1       | 1    | 7                    | 1       | 1    |
| 8                    | 1       | 1    | 8                    | 1       | 0    |
| 9                    | 1       | 1    | 9                    | 1       | 1    |
| 10                   | 1       | 1    | 10                   | 1       | 1    |
| 11                   |         |      | 11                   |         |      |
| 12                   |         |      | 12                   |         |      |
| 13                   |         |      | 13                   |         |      |
| 14                   |         |      | 14                   |         |      |
| 15                   |         |      | 15                   |         |      |

  

|              |       |       |              |       |       |
|--------------|-------|-------|--------------|-------|-------|
| Mean         | 1.000 | 1.000 | Mean         | 1.000 | 0.900 |
| Std Dev.     | 0.000 | 0.000 | Std Dev.     | 0.000 | 0.316 |
| # Replicates | 10    | 10    | # Replicates | 10    | 10    |

  

|                  |      |                  |      |
|------------------|------|------------------|------|
| T-Test Result    |      | T-Test Result    |      |
| Deg. of Freedom  |      | Deg. of Freedom  |      |
| Critical T Value |      | Critical T Value |      |
| Pass or Fail     | PASS | Pass or Fail     | PASS |

DEP Whole Effluent Toxicity (WET) Analysis Spreadsheet

Type of Test: Chronic  
Species Tested: Pimephales  
Endpoint: Survival  
TIWC (decimal): 0.93  
No. Per Replicate: 10  
TST b value: 0.75  
TST alpha value: 0.25

Facility Name:  
Economy Borough MA - Big  
Sewickley Creek WWTP

Permit No.  
PA0218413

| Test Completion Date<br>11/18/2014 |         |      |
|------------------------------------|---------|------|
| Replicate No.                      | Control | TIWC |
| 1                                  | 1       | 0.7  |
| 2                                  | 1       | 1    |
| 3                                  | 1       | 0.8  |
| 4                                  | 1       | 1    |
| 5                                  |         |      |
| 6                                  |         |      |
| 7                                  |         |      |
| 8                                  |         |      |
| 9                                  |         |      |
| 10                                 |         |      |
| 11                                 |         |      |
| 12                                 |         |      |
| 13                                 |         |      |
| 14                                 |         |      |
| 15                                 |         |      |

Mean: 1.000 0.875  
Std Dev.: 0.000 0.150  
# Replicates: 4 4

T-Test Result: 4.3376  
Deg. of Freedom: 3  
Critical T Value: 0.7649  
Pass or Fail: **PASS**

| Test Completion Date<br>11/10/2015 |         |      |
|------------------------------------|---------|------|
| Replicate No.                      | Control | TIWC |
| 1                                  | 0.9     | 0.9  |
| 2                                  | 0.9     | 0.8  |
| 3                                  | 0.9     | 1    |
| 4                                  | 1       | 1    |
| 5                                  |         |      |
| 6                                  |         |      |
| 7                                  |         |      |
| 8                                  |         |      |
| 9                                  |         |      |
| 10                                 |         |      |
| 11                                 |         |      |
| 12                                 |         |      |
| 13                                 |         |      |
| 14                                 |         |      |
| 15                                 |         |      |

Mean: 0.925 0.925  
Std Dev.: 0.050 0.096  
# Replicates: 4 4

T-Test Result: 8.6068  
Deg. of Freedom: 4  
Critical T Value: 0.7407  
Pass or Fail: **PASS**

| Test Completion Date<br>11/22/2016 |         |      |
|------------------------------------|---------|------|
| Replicate No.                      | Control | TIWC |
| 1                                  | 1       | 1    |
| 2                                  | 1       | 1    |
| 3                                  | 1       | 1    |
| 4                                  | 1       | 1    |
| 5                                  |         |      |
| 6                                  |         |      |
| 7                                  |         |      |
| 8                                  |         |      |
| 9                                  |         |      |
| 10                                 |         |      |
| 11                                 |         |      |
| 12                                 |         |      |
| 13                                 |         |      |
| 14                                 |         |      |
| 15                                 |         |      |

Mean: 1.000 1.000  
Std Dev.: 0.000 0.000  
# Replicates: 4 4

T-Test Result:  
Deg. of Freedom:  
Critical T Value:  
Pass or Fail: **PASS**

| Test Completion Date<br>11/7/2017 |         |      |
|-----------------------------------|---------|------|
| Replicate No.                     | Control | TIWC |
| 1                                 | 1       | 1    |
| 2                                 | 1       | 1    |
| 3                                 | 1       | 1    |
| 4                                 | 1       | 1    |
| 5                                 |         |      |
| 6                                 |         |      |
| 7                                 |         |      |
| 8                                 |         |      |
| 9                                 |         |      |
| 10                                |         |      |
| 11                                |         |      |
| 12                                |         |      |
| 13                                |         |      |
| 14                                |         |      |
| 15                                |         |      |

Mean: 1.000 1.000  
Std Dev.: 0.000 0.000  
# Replicates: 4 4

T-Test Result:  
Deg. of Freedom:  
Critical T Value:  
Pass or Fail: **PASS**

DEP Whole Effluent Toxicity (WET) Analysis Spreadsheet

Type of Test Chronic  
Species Tested Pimephales  
Endpoint Growth  
TIWC (decimal) 0.93  
No. Per Replicate 10  
TST b value 0.75  
TST alpha value 0.25

Facility Name  
Economy Borough MA - Big  
Sewickley Creek WWTP

Permit No.  
PA0218413

| Test Completion Date<br>11/16/2014 |         |       |
|------------------------------------|---------|-------|
| Replicate No.                      | Control | TIWC  |
| 1                                  | 0.346   | 0.313 |
| 2                                  | 0.357   | 0.435 |
| 3                                  | 0.294   | 0.288 |
| 4                                  | 0.289   | 0.359 |
| 5                                  |         |       |
| 6                                  |         |       |
| 7                                  |         |       |
| 8                                  |         |       |
| 9                                  |         |       |
| 10                                 |         |       |
| 11                                 |         |       |
| 12                                 |         |       |
| 13                                 |         |       |
| 14                                 |         |       |
| 15                                 |         |       |

Mean 0.322 0.349  
Std Dev. 0.035 0.065  
# Replicates 4 4

T-Test Result 3.0878  
Deg. of Freedom 4  
Critical T Value 0.7407  
Pass or Fail **PASS**

| Test Completion Date<br>11/10/2015 |         |       |
|------------------------------------|---------|-------|
| Replicate No.                      | Control | TIWC  |
| 1                                  | 0.359   | 0.375 |
| 2                                  | 0.393   | 0.259 |
| 3                                  | 0.342   | 0.313 |
| 4                                  | 0.422   | 0.354 |
| 5                                  |         |       |
| 6                                  |         |       |
| 7                                  |         |       |
| 8                                  |         |       |
| 9                                  |         |       |
| 10                                 |         |       |
| 11                                 |         |       |
| 12                                 |         |       |
| 13                                 |         |       |
| 14                                 |         |       |
| 15                                 |         |       |

Mean 0.379 0.325  
Std Dev. 0.036 0.051  
# Replicates 4 4

T-Test Result 1.4213  
Deg. of Freedom 5  
Critical T Value 0.7267  
Pass or Fail **PASS**

| Test Completion Date<br>11/22/2016 |         |       |
|------------------------------------|---------|-------|
| Replicate No.                      | Control | TIWC  |
| 1                                  | 0.331   | 0.38  |
| 2                                  | 0.383   | 0.375 |
| 3                                  | 0.376   | 0.431 |
| 4                                  | 0.37    | 0.415 |
| 5                                  |         |       |
| 6                                  |         |       |
| 7                                  |         |       |
| 8                                  |         |       |
| 9                                  |         |       |
| 10                                 |         |       |
| 11                                 |         |       |
| 12                                 |         |       |
| 13                                 |         |       |
| 14                                 |         |       |
| 15                                 |         |       |

Mean 0.365 0.400  
Std Dev. 0.023 0.027  
# Replicates 4 4

T-Test Result 7.8384  
Deg. of Freedom 5  
Critical T Value 0.7267  
Pass or Fail **PASS**

| Test Completion Date<br>11/7/2017 |         |       |
|-----------------------------------|---------|-------|
| Replicate No.                     | Control | TIWC  |
| 1                                 | 0.453   | 0.442 |
| 2                                 | 0.5056  | 0.44  |
| 3                                 | 0.411   | 0.416 |
| 4                                 | 0.299   | 0.433 |
| 5                                 |         |       |
| 6                                 |         |       |
| 7                                 |         |       |
| 8                                 |         |       |
| 9                                 |         |       |
| 10                                |         |       |
| 11                                |         |       |
| 12                                |         |       |
| 13                                |         |       |
| 14                                |         |       |
| 15                                |         |       |

Mean 0.417 0.433  
Std Dev. 0.088 0.012  
# Replicates 4 4

T-Test Result 3.5856  
Deg. of Freedom 4  
Critical T Value 0.7407  
Pass or Fail **PASS**

### WET Summary and Evaluation

|                              |                          |
|------------------------------|--------------------------|
| Facility Name                | Big Sewickley Creek WWTP |
| Permit No.                   | PA0218413                |
| Design Flow (MGD)            | 1.25                     |
| Q <sub>7-10</sub> Flow (cfs) | 0.153                    |
| PMF <sub>a</sub>             | 1                        |
| PMF <sub>c</sub>             | 1                        |

| Species      | Endpoint     | Test Results (Pass/Fail) |           |           |           |
|--------------|--------------|--------------------------|-----------|-----------|-----------|
|              |              | Test Date                | Test Date | Test Date | Test Date |
|              |              | 11/18/14                 | 11/10/15  | 11/22/16  | 11/7/17   |
| Ceriodaphnia | Reproduction | PASS                     | PASS      | PASS      | PASS      |

| Species      | Endpoint | Test Results (Pass/Fail) |           |           |           |
|--------------|----------|--------------------------|-----------|-----------|-----------|
|              |          | Test Date                | Test Date | Test Date | Test Date |
|              |          | 11/18/14                 | 11/10/15  | 11/22/16  | 11/7/17   |
| Ceriodaphnia | Survival | PASS                     | PASS      | PASS      | PASS      |

| Species    | Endpoint | Test Results (Pass/Fail) |           |           |           |
|------------|----------|--------------------------|-----------|-----------|-----------|
|            |          | Test Date                | Test Date | Test Date | Test Date |
|            |          | 11/18/14                 | 11/10/15  | 11/22/16  | 11/7/17   |
| Pimephales | Survival | PASS                     | PASS      | PASS      | PASS      |

| Species    | Endpoint | Test Results (Pass/Fail) |           |           |           |
|------------|----------|--------------------------|-----------|-----------|-----------|
|            |          | Test Date                | Test Date | Test Date | Test Date |
|            |          | 11/16/14                 | 11/10/15  | 11/22/16  | 11/7/17   |
| Pimephales | Growth   | PASS                     | PASS      | PASS      | PASS      |

Reasonable Potential? NO

#### Permit Recommendations

Test Type Chronic  
TIWC 93 % Effluent  
Dilution Series 23, 47, 93, 97, 100 % Effluent  
Permit Limit None  
Permit Limit Species