pennsylvania
DEPARTMENT OF ENVIRONMENTAL PROTECTION

Southwest Regional Office
CLEAN WATER PROGRAM

Application Type	**New**	Application No.	**PA0219088**
Facility Type	**Industrial**	APS ID	**356519**
Major / Minor	**Minor**	Authorization ID	**367236**

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

Applicant and Facility Information

Applicant Name	**AK Steel Corporation**	Facility Name	**AK Steel Corp Bridgeville Plant**
Applicant Address	PO Box 823	Facility Address	Vanadium Road
	Butler, PA 16003		Bridgeville, PA 15017
Applicant Contact	Carl Batliner	Facility Contact	Russell Dudek
Applicant Phone	(513) 985-9121	Facility Phone	(724) 284-2267
Client ID	160114	Site ID	552072
SIC Code	4953	Municipality	Collier Township
SIC Description	Trans. & Utilities - Refuse Systems	County	Allegheny
Date Application Received	October 11, 2001	EPA Waived?	Yes
Date Application Accepted	October 12, 2001	If No, Reason	

Purpose of Application: A new Individual NPDES permit to discharge treated waste.

Summary of Review

1. Introduction

The Department received a new NPDES permit application from AK Steel Corporation on October 11, 2001 to discharge stormwater associated with industrial activities and contaminated hillside seepage from AK Steel Corporation's Bridgeville Plant site. The site is a gated vacant lot containing various forms of slag. Permitting was postponed/delayed per the applicant's request to explore mining possibilities of vanadium slag. AK Steel determined that the mining of vanadium slag was uneconomical and decided not to pursue the operation. The facility is still liable for environmental impacts from the historical slag site.

2. Project Overview

The AK Steel Bridgeville site is an approximately nine-acre parcel located in Collier Township, Allegheny County, Pennsylvania (Appendix A). The site includes historically placed slag, slag aggregate, pitchblende and vanadium processing residues from previous owners of the site. Vanadium processing operations by the Vanadium Corporation of America (VCA) stopped in the early 1950s. During that time, VCA placed vanadium processing residual materials on the site. Prior to AK Steel's acquisition of the Bridgeville site, Universal Cyclops owned the property. During the 1980s and 1990s, Cyclops, with the approval from the PA-DEP, used steelmaking slag to fill a railroad track cut on the property in a north-south direction along its eastern edge of the property (Appendix B). AK Steel acquired the Bridgeville site in 1999 and has retained ownership of the site. The site retains the vanadium processing residue piles from the first half of the previous century and the steel slag placed in piles and in the railroad cut from 1980s and 1990s.

Currently the site is bounded by a railroad to the north, a railroad and Universal Stainless property to the east and south, and Universal Stainless and Carpenter Powder Products (CPP) industrial properties to the west. The western and central

Approve	Deny	Signatures	Date
X		Mahbuba Iasmin Mahbuba Iasmin, Ph.D., P.E. / Environmental Engineering Specialist	05/14/2020
X		Michael E. Fifth Michael E. Fifth, P.E. / Environmental Engineer Manager	6/5/2020

Summary of Review

portions of the site are generally at an elevation of approximately 855 feet above mean sea level. The property elevation drops sharply on the east and southern property edge to an elevation of approximately 800 feet above mean sea level. Access to the site is limited by the adjacent properties, railroads, and terrain, with the only entrance to the property being through the CPP property entrance along Mayer Street.

Stormwater surface runoff from the site occurs from multiple natural erosion channels plus stormwater infiltration through the slag, which causes seep areas along the east and southern portion of the site along the property line. Drainage from the erosion channels and seeps ultimately collect at the toe of the slope and follows a surface water channel that flows south along the toe of the eastern and southern side slopes. The runoff and seepage are routed to a drainage pipe under the railroad tracks to the Universal Stainless property and then flow north via an open channel and culverts to Chartiers Creek through the Universal Stainless property. The location at the drainage pipe under the railroad tracks on the AK Steel side of the property is identified as Internal Monitoring Point (IMP 101) for permitting purposes (Appendix C). The final discharge location into Chartiers Creek is identified as Outfall 001 and shown in Appendix C. Effluent limits and monitoring requirements will be applied at IMP 101 per the receiving stream properties at Outfall 001. The receiving stream at Outfall 001 is a diversion channel (oxbow) of Chartiers Creek that was strategically created in the 1960s to alleviate flooding (Appendix D) and the name of the stream section per Geographic Names Information System (GNIS) is Painters Run. The diversion channel ends and enters the main channel of Chartiers Creek after the oxbow at approximately 0.86 miles downstream from Outfall 001. Chartiers Creek enters the Ohio River, approximately 7 miles from the site.

On July 10, 2019, AK Steel submitted a Remedial Plan (RP) to address the current site conditions contributing to the runoff and seeps observed on the east slopes of the site that are impacting the discharge to the creek. The key elements of the RP include: a) Grade and contour the site to provide positive surface water drainage; b) Cap the site with an impermeable multilayer cover system; c) Collect and control stormwater runoff; d) Provide site security and long-term care; and e) Execute an environmental covenant with appropriate use restrictions. The proposed cap system will entail re-grading the site and include a multilayer cover system. The outer slopes are proposed to be regraded to a minimum slope of 3H:1V to meet the minimum requirements for interface shear strength and veneer stability of the cap system. An engineered cap is proposed to prevent surface water infiltration, stabilize the residual waste materials, and prevent erosion and ponding water. The cap system proposed in concept consists of the following components listed from top to bottom of the entire cap: a) 6-inch thick vegetative cover; b) 18-inch thick protective cover; c) double sided geo-composite drainage layer; d) 40-mil textured Linear Low Density Polyethylene (LLDPE) or High Density Polyethylene (HDPE) geomembrane; and e) 6-inch thick intermediate cover soil as needed. The geomembrane will provide a low-permeable barrier exceeding 1.0×10^{-9} cm/sec. The surface water controls proposed in the RP include channels, letdowns, a detention pond, and the outlet structure. The detention pond is proposed to handle flow from a 25-year, 24-hour storm event. Once the construction of treatment technologies (i.e., detention pond) are complete, the controlled discharge from the detention pond will be identified as the new internal monitoring point (IMP), if applicable, for compliance in permitting purposes.

3. Site Specific Conditions

A Consent Order and Agreement (COA) will be issued with the current Draft Permit that outlines the specific path to compliance for the AK Steel site. A three-year compliance schedule is provided in the current permit to allow the permittee to complete necessary constructions and comply with the final permit limits.

4. Public Notifications and Zoning Approval

AK steel has submitted Act 14 notifications to the Scott Township and the Allegheny County on October 01, 2001. A newspaper notification was published in the local newspaper on October 04, 2001.

5. Conclusion

There are currently no open violations by Client ID. Permit issuance is recommended.

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

Summary of Review

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.

Following is the explanation of how discharge monitoring requirements/limitations were developed for the AK Steel site located in Bridgeville, PA. The discharge monitoring requirements/limitations will be applied at Internal Monitoring Point (IMP) 101 only since the majority of Outfall 001 discharges consists of offsite runoff.

Discharge, Receiving Waters and Water Supply Information

Outfall No.	001 and IMP 101	Design Flow (MGD)	0.074
Latitude	40º 22' 14.36"	Longitude	-80º 05' 47.63"
Quad Name	Bridgeville	Quad Code	1605
Wastewater Description:	Stormwater; IW process effluent with ELG		

Receiving Waters	Painters Run (WWF)	Stream Code	36777
NHD Com ID	99689314	RMI	12.56
Drainage Area	4.93	Yield (cfs/mi^2)	
Q_{7-10} Flow (cfs)	0.0552	Q_{7-10} Basis	USGS StreamStats
Elevation (ft)	1074	Slope (ft/ft)	0.0001
Watershed No.	20-F	Chapter 93 Class.	WWF
Existing Use		Existing Use Qualifier	
Exceptions to Use		Exceptions to Criteria	
Assessment Status	Impaired		
Cause(s) of Impairment	CHLORDANE, METALS, POLYCHLORINATED BIPHENYLS (PCBS), SILTATION, TOTAL DISSOLVED SOLIDS (TDS), TOTAL SUSPENDED SOLIDS (TSS)		
Source(s) of Impairment	ACID MINE DRAINAGE, SOURCE UNKNOWN		
TMDL Status	Final	Name	Chartiers Creek – PCB and Chlordane

Background/Ambient Data		Data Source
pH (SU)	7	25 § 93.7
Temperature (°F)		
Hardness (mg/L)	100	25 § 93.8c
Other:		

Nearest Downstream Public Water Supply Intake		West View Water Authority	
PWS Waters	Ohio River	Flow at Intake (cfs)	4,730
PWS RMI	35.27	Distance from Outfall (mi)	15.01

Changes Since Last Permit Issuance: Not Applicable; New permit.

Other Comments: None.

Development of Effluent Limitations

Outfall No.	IMP 101	**Design Flow (MGD)**	0.074
Latitude	40º 22' 02.25"	**Longitude**	-80º 05' 49.09"

Wastewater Description: Stormwater and groundwater seepage/leachate

Overview

IMP 101 discharge consists of stormwater discharges and groundwater seeps from the AK Steel site. The figure presented in Appendix E provides a comparison of the precipitation at the site to the flow of the seeps as submitted in the RP by AK Steel. The precipitation rates were calculated based on the site's 8.8-acre size and the average precipitation over the preceding week (7 days). Based upon the observations, nearly all precipitation entering the unconsolidated residual material at the site flows across the top of the natural shale ground surface beneath the residual materials and then discharges as seeps along the hill slope rather than infiltrating into the underlying shale. Under normal circumstances, a 7-day runoff study would provide an inadequate data set. A presumption of 100% runoff from a precipitation event however adequately confirms the total potential runoff volume from a site.

Technology-Based Effluent Limitations (TBELs)

Outfall 001 (IMP 101) effluent consists of stormwater runoff and groundwater seeps from AK Steel property. The Standard Industrial Classification (SIC) code for the facility is listed as 4953 – Refuse Systems. This section discusses the applicable federal regulations based on the waste deposited at the AK Steel site.

- Per Title 40 §257.2, AK Steel has *solid waste* stored at the site atop shale bedrock to a maximum thickness of about 25 feet. The definition states, "*Solid waste means any … refuse … from a waste treatment plant, water supply treatment plant, or air pollution control facility and other discarded material, including solid, liquid, semisolid, or contained gaseous material resulting from industrial … operations … but does not include solid or dissolved materials in domestic sewage … or industrial discharges which are point sources subject to permits under section 402 of the Federal Water Pollution Control Act…*". The AK Steel site can be categorized as *landfill* since refuse from steel making operations was received for permanent disposal. Per Title 40 §257.2, "*Landfill means an area of land or an excavation in which wastes are placed for permanent disposal, and that is not a land application unit, surface impoundment, injection well, or waste pile*". It is important to mention that materials stored at AK Steel is not considered as waste pile per Title 40 §257.2, "*Waste pile or pile means any noncontainerized accumulation of solid, nonflowing waste that is used for treatment or storage*". Therefore, the wastewater (i.e., seep) discharged from AK Steel site is categorized as leachate from landfill.

  40 CFR Part 445 applies to discharges of wastewater from landfills subject to the provisions of 40 CFR Part 264, *Standards for Owners and Operators of Hazardous Waste Treatment, Storage, and Disposal Facilities, Subpart N-(Landfills);* and 40 CFR Part 265, *Interim Status Standards for Owners and Operators of Hazardous Waste Treatment, Storage, and Disposal Facilities, Subpart N-(Landfills).* It is imperative to determine whether the materials disposed of at AK Steel site is hazardous or non-hazardous.

  Within AK Steel property, residual materials from vanadium and steel operations were placed at the site. The operations included high temperature smelting to create high strength steel alloys; slags and/or residues from the steel-making operations were also disposed of at the AK Steel site. Per §261.3(c)(2)(ii)(C)(1), "*non-wastewater residues, such as slag, resulting from high temperature metals recovery (HTMR) processing of K061, … waste, in units identified as … electric furnaces, plasma arc furnaces, slag reactors, rotary hearth furnace/electric furnace combinations or industrial furnaces (as defined in paragraphs (6), (7), and (13) of the definition for "Industrial furnace" in 40 CFR 260.10), that are disposed in subtitle D units, provided that these residues meet the generic exclusion levels identified in the tables in this paragraph for all constituents, exhibit no characteristics of hazardous waste. Testing requirements must be incorporated in a facility's waste analysis plan or a generator's self-implementing waste analysis plan; at a minimum, composite samples of residues must be collected and analyzed quarterly and/or when the process or operation generating the waste changes. Persons claiming this exclusion in an enforcement action will have the burden of proving by clear and convincing evidence that the material meets all of the exclusion requirements*."

The AK Steel discharge concentrations were compared with the generic exclusion levels for hazardous waste as presented in 40 CFR §261.3(c)(2)(ii)(C)(1) and are shown in Table 1. The permit writer believes that this comparison is acceptable and necessary to understand whether the leachate from the slag is contributing the constituent concentrations similar to hazardous waste upon Toxicity Characteristic Leaching Procedure (TCLP). Upon comparison, total chromium in AK Steel's discharges exceeds the generic exclusion level. Therefore, the refuse deposited at the AK Steel site should be considered as "Hazardous Waste" and the effluent limitation requirements presented in 40 CFR Part 445 apply.

Table 1. Analysis of AK Steel Discharge Concentrations: Hazardous vs. Non-hazardous

Constituent	Maximum for any single composite sample—TCLP (mg/l)	Maximum concentration reported by AK Steel (mg/l)
Generic exclusion levels for K061 and K062 non-wastewater HTMR residues		
Antimony	0.10	0.017
Arsenic	0.50	0.089
Barium	7.6	0.018
Beryllium	0.010	0.00014
Cadmium	0.050	0.00085
Chromium (total)	0.33	1.30
Lead	0.15	0.0052
Mercury	0.009	0.0001
Nickel	1.0	0.028
Selenium	0.16	0.011
Silver	0.30	0.00022
Thallium	0.020	0.00012
Zinc	70	0.016

The discharges from various locations at the AK Steel site combine at the toe of the eastern and southern side slopes opposite to Universal Stainless property and are routed to a drainage pipe under and across the rail road leading towards the Universal Stainless property. Therefore, the discharge is a *point source* as defined in 40 CFR §260.10:

"Point source means any discernible, confined, and discrete conveyance, including, but not limited to any pipe, ditch, channel, tunnel, conduit, well, discrete fissure, container, rolling stock, concentrated animal feeding operation, or vessel or other floating craft, from which pollutants are or may be discharged. This term does not include return flows from irrigated agriculture."

Per 40 CFR §445.11, the effluent limitations attainable by the application of the best practicable control technology currently available (BPT) for landfill point source category are presented in Table 2.

Table 2. Effluent Limitations for Landfill Point Source Category – Hazardous Waste

Regulated parameter	Maximum daily[1]	Maximum monthly avg.[1]
BOD_5	220	56
TSS	88	27
Ammonia (as N)	10	4.9

α-Terpineol	0.042	0.019
Aniline	0.024	0.015
Benzoic acid	0.119	0.073
Naphthalene	0.059	0.022
p-Cresol	0.024	0.015
Phenol	0.048	0.029
Pyridine	0.072	0.025
Arsenic	1.1	0.54
Chromium	1.1	0.46
Zinc	0.535	0.296
pH	([2])	([2])

[1]Milligrams per liter (mg/L, ppm).
[2]Within the range 6 to 9.

- The AK Steel Bridgeville Site was originally operated by the Vanadium Corporation of America (VCA). VCA processed pitchblende (uraninite) and vanadium ores from 1940 to 1955. Residual pitchblende ores and vanadium tailings were disposed of at the facility during this time period. There are two more relevant federal ELGs which apply to mines related to vanadium and uranium ores. Per Federal Register, Volume 47, No. 114, Page 25718 (Monday, June 14, 1982) Proposed Rules, *"Mine" is an active mining area including all land and property placed under, or above the surface of such land, used in or resulting from the work of extracting metal ore from its natural deposits by any means or method, including secondary recovery of metal ore from refuse or other storage piles derived from the mining, cleaning, or concentration of metal ores"*. In current case, the AK Steel Bridgeville site is not an active mine, however, presents a significant potential of discharge of toxic constituents to the waters of Commonwealth due to in-situ leaching conditions. Per EPA's Proposed Rules, a large quantity of water may enter a mine by percolation, interception of an aquifer, and runoff. This water, though usually unwanted, must be managed by the mine operator and discharged as mine process wastewater of mine drainage. The concentration limits in the following federal ELGs do not apply to in-situ leach methods, however, the ELG presents a snapshot of the parameters of concern from such sites.

  40 CFR Part 440 Subpart C applies to Uranium, Radium, and Vanadium Ores subcategory. The provisions of this Subpart C are applicable to discharges from (a) mines either open-pit or underground, from which uranium, radium and vanadium ores are produced; and (b) mills using the acid leach, alkaline leach, or combined acid and alkaline leach process for the extraction of uranium, radium and vanadium. Only vanadium byproduct production from uranium ores is covered under this part. This Subpart has ELGs listed for mines in 40 CFR §440.32 for the following pollutants: TSS, COD, Zinc, Radium 226 (dissolved), Radium 226 (total), Uranium, and pH.

  40 CFR Part 440 Subpart H applies to discharges from (a) mines that produce vanadium ore (recovered alone and not as a by-product of uranium mining and mills) and (b) mills that process vanadium ore (recovered alone, not as a byproduct of uranium mining and mills). This Subpart has ELGs listed for mines in 40 CFR §440.82 for the following pollutants: TSS, Cadmium, Copper, Zinc, Lead, Arsenic, and pH.

  The parameters listed in these two ELGs are addressed in IMP 101 through other TBELs and WQBELs assessment except Radium 226 (dissolved) and Radium 226 (total). Currently, only Radium 226 (total) is regulated by DEP's Clean Water Program, and therefore, will be applied at IMP 101.

- In addition, Section III of DEP's IW Effluent Limit SOP recommends that permit writers consider the following when evaluating the need for effluent limits and monitoring requirements for industrial stormwater discharges:

A. Effluent limits and monitoring requirements for industrial stormwater discharges may be important for ensuring that Best Management Practices (BMPs) are adequately implemented.

B. Application managers will consider, where appropriate, applying treatment standards contained in Chapter 95.

C. The PAG-03 General Permit should be considered when evaluating the minimum standards for limits and monitoring requirements for industrial stormwater discharges. The application manager may include other limits and monitoring requirements as justified in the fact sheet.

D. In general, if actual stormwater concentrations exceed 100 times the most stringent Chapter 93 criterion (or a lesser amount for large industrial areas that drain to small streams), or exceed 100 mg/L for pollutants without criteria, the application manager should consider applying effluent limits for the applicable parameters and/or the implementation of BMPs with compliance schedules as necessary to achieve the limits or otherwise reduce stormwater concentrations.

Consistent with the recommendations in Section III.C of the IW Effluent Limit SOP cited above, minimum standards described in the PAG-03 General Permit for "Discharges of Stormwater Associated with Industrial Activity" will be applied to AK Steel's stormwater discharges. Based on AK Steel's SIC Code, the facility would be classified under Appendix A – Hazardous Waste Treatment, Storage, and Disposal Facilities and Appendix C – Landfills and Land Application Sites of the PAG-03 Permit.[1] The potential pollutants of concern in Appendices A and C of the PAG-03 are displayed in Tables 3 and 4, respectively.

Table 3. PAG-03 – Appendix A Minimum Monitoring Requirements

Discharge Parameter	Units	Sample Type	Benchmark Values
pH	S.U.	Grab	XXX
Total Suspended Solids	mg/L	Grab	100
Chemical Oxygen Demand	mg/L	Grab	120
Ammonia-Nitrogen	mg/L	Grab	XXX
Total Arsenic	mg/L	Grab	XXX
Total Cadmium	mg/L	Grab	XXX
Total Cyanide	mg/L	Grab	XXX
Total Lead	mg/L	Grab	XXX
Total Mercury	mg/L	Grab	XXX
Total Selenium	mg/L	Grab	XXX
Total Silver	mg/L	Grab	XXX

Table 4. PAG-03 – Appendix C Minimum Monitoring Requirements

Discharge Parameter	Units	Sample Type	Benchmark Values
pH	S.U.	Grab	XXX
Total Suspended Solids	mg/L	Grab	100
Chemical Oxygen Demand	mg/L	Grab	120
Ammonia-Nitrogen	mg/L	Grab	XXX
Total Iron	mg/L	Grab	XXX

- *Oil and Grease*

AK Steel's discharge contains a maximum concentration of 1.5 mg/L of total oil and grease (i.e., 4 mg/L) as reported in the submitted data in Appendix F. Therefore, no limits or monitoring requirement will be applied, per *Standard Operating Procedure (SOP) for Clean Water Program - Establishing Effluent Limitations for Individual Industrial Permits* (*SOP No. BPNPSM-PMT-032*).

[1] The determination of which of the PAG-03 General Permit's appendices applies to a facility is based on a facility's SIC Code.

Water Quality-Based Effluent Limitations (WQBELs)

Total Maximum Daily Load (TMDL) Considerations

The discharges from AK Steel are located in Chartiers Creek River Watershed for which the Department has developed a TMDL in 2001. The Chartiers and Little Chartiers Creek watersheds were determined to be impaired because excessive levels of PCB and Chlordane were found in fish tissue, resulting in a fish consumption ban. In 1998, DEP listed Chartiers and Little Chartiers Creeks under Section 303(d) of the federal Clean Water Act as impaired due to elevated PCB and Chlordane levels in fish tissue. The first fish consumption advisory was issued on December 12, 1979 due to PCB contamination. This advisory applied to carp from Canonsburg to the mouth of Chartiers Creek watershed. The statewide release on June 26, 1986 added largemouth bass to the advisory because of Chlordane contamination. The inclusion of Little Chartiers Creek was completed in August 1992 when the advisory was re-issued for Chartiers Creek. Therefore, the 1998 303(d) list reflected an additional impaired segment, on Little Chartiers Creek from Canonsburg Lake to mouth.

A TMDL establishes the amount of a pollutant that a water body can assimilate without exceeding the water quality criteria for that pollutant. TMDLs provide the scientific basis for a state to establish water quality-based controls to reduce pollution from both point and non-point sources in order to restore and maintain the quality of the state's water resources (USEPA, 1991a).

The production and use of PCB in the United States was banned in 1979. PCB was introduced into the environment while its use was unrestricted. Once in a waterbody, PCB becomes associated with solids particles and enters the sediments. PCB is very resistant to breakdown and can remain in sediments for many years. One known source of PCB in the Chartiers Creek watershed is the Cooper Power Systems site, located in Cecil Township, Washington County (NPDES PA0001937). During the manufacturing process of electrical transformers, oils containing PCB were used. Improper maintenance practices at the site resulted in PCB soil contamination which, over time, leached from the site into area streams.

Chlordane is a man-made organochlorine compound that was widely used as a broad-spectrum agricultural pesticide before its use was restricted to termite control around building foundations. All uses of chlordane have been banned since April 1988. Chlordane may be introduced to surface waters through contaminated ground water or surface runoff, and therefore a non-point source contaminant. Once in a waterbody, chlordane becomes associated with solids particles and enters the sediments.

In addition to the remedial actions at the Cooper Power Systems site in Chartiers Creek watershed, PCB and Chlordane levels are expected to decline in the watershed due to bans on use and natural attenuation, such as the covering of contaminated sediments with newer, less contaminated materials and the flushing of sediments during the periods of high stream flow. Therefore, TMDL limits are not applicable at IMP 101.

Evaluation of Reasonable Potential and PENTOXSD Modeling

Toxics Screening Analysis identifies toxic pollutants of concern whose maximum concentrations, as reported in the permit application or on DMRs, are greater than the most stringent applicable water quality criterion. This includes pollutants reported as "Not Detectable" or as "<MDL" where the method detection limit for the analytical method used is greater than the most stringent water quality criterion.

PENTOXSD Version 2.0d for Windows is a single discharge, mass-balance water quality modeling program that includes consideration for mixing, first-order decay and other factors to determine recommended WQBELs for toxic substances and several non-toxic substances. PENTOXSD evaluates each pollutant by computing a Waste Load Allocation for each applicable criterion, determining a recommended maximum WQBEL, and comparing that recommended WQBEL with the input discharge concentration to determine which is more stringent. Based on this evaluation, PENTOXSD recommends average monthly and maximum daily WQBELs.

The identified toxic pollutants of concern are selected for analysis through PENTOXSD 2.0. The most stringent WQBELs are determined using PENTOXSD Version 2.0d for very high values of the identified pollutants. The most stringent WQBELs are then added back to the Toxics Screening spreadsheet and screening recommendations are determined.

The Department has received updated analytical data from AK Steel on March 25, 2019. AK Steel collected samples from two rain events and two non-rain events (i.e., wet but no active rain) during January 2019 – March 2019. The analytical

data is presented in Appendix F. The maximum reported values were chosen to perform PENTOXSD analysis. The PENTOXSD input parameters are summarized in Table 5.

Table 5. PENTOXSD Input Parameters

Parameter	Value
Design Discharge Flow	0.115 cubic feet per second (51.6 gallons per minute)
Elevation	1,074 ft
Upstream River Mile Index (RMI)	12.56
Drainage Area	4.93 Sq. miles
Q_{7-10} (Streamstats)	0.0552 cfs

Rationale Behind the PENTOXSD Input Parameters-

Design Flow

The discharge from the site consists of waste pile seeps and precipitation. As presented in July 2019 RP by AK Steel, from January to May 2019, Aurora Environmental Inc. measured three seeps along the railroad tracks on the eastern side of the site. Flow measurements were made with a bucket and a stopwatch and ranged from 0.65 gpm to 51.6 gpm. The larger number was measured during a precipitation event and included surface runoff with the seep flow. The maximum seep in presence of precipitation (i.e., 51.6 gpm) was utilized to determine the discharge monitoring requirements.

Stream Flow (Q_{7-10})

The 7-day, 10-year low flow of the stream found using USGS Streamstats is 0.0552 cfs. The details are presented in Appendix G.

The PENTOXSD analysis results and recommended limits are presented in Appendix H. The water quality modeling recommended establishing limits for total aluminum, total antimony, total arsenic, total cadmium, hexavalent chromium, total copper, total iron, total lead, total mercury, total selenium, total vanadium, acrolein, acrylonitrile, carbon tetrachloride, 1,1,2,2-tetrachloroethane, trichloroethylene, and vinyl chloride. Monitor and report was recommended for total nickel, total thallium, chlorodibromomethane, and 1,3-dichloropropylene.

Zero Assimilative Capacity

Per *Standard Operating Procedure (SOP) for Clean Water Program – Establishing Water Quality-Based Effluent Limitations (WQBELs) and Permit Conditions for Toxic Pollutants in NPDES Permits for Existing Dischargers (SOP No. BCW-PMT-037)*, there is zero assimilative capacity for the pollutants of concern if a) discharges that are assigned a WLA in a TMDL that is based on water quality criteria; b) new discharges to waters where a TMDL has been established and does not include a WLA for the discharge; c) discharges to waters that are impaired for the pollutant of concern and where a TMDL has not been established; and b) discharges where water quality modeling recommends limits at or below criteria.

Water quality modeling recommended effluent limits below water quality criteria for total aluminum and acrolein. For total aluminum, the most stringent water quality criterion is the acute fish criterion (AFC). Per *Standard Operating Procedure (SOP) for Clean Water Program – Establishing Water Quality-Based Effluent Limitations (WQBELs) and Permit Conditions for Toxic Pollutants in NPDES Permits for Existing Dischargers (SOP No. BCW-PMT-037)*, the average monthly limit (AML) will be set equal to the most stringent water quality criterion (i.e., 750 µg/L). For AFC, the maximum daily limit (MDL) will also be set to the criterion.

For acrolein, the most stringent water quality criterion is the chronic fish criterion (CFC). Per *Standard Operating Procedure (SOP) for Clean Water Program – Establishing Water Quality-Based Effluent Limitations (WQBELs) and Permit Conditions for Toxic Pollutants in NPDES Permits for Existing Dischargers (SOP No. BCW-PMT-037)*, the average monthly limit (AML) will be set equal to the most stringent water quality criterion. For CFC, the maximum daily limit (MDL) will be set to the MDL produced by PENTOXSD. However, in case of Acrolein, since the MDL (i.e., 2.31 µg/L) developed by PENTOXSD is also below the criterion, the MDL will also be set equal to the most stringent water quality criterion (i.e., 3.0 µg/L).

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

The maximum total dissolved solids (TDS) concentration reported in IMP 001 is 920 mg/L. Per *Policy and Procedure for NPDES Permitting of Discharges of Total Dissolved Solids (TDS) – 25 Pa. Code §95.10 (DEP-ID: 385-2100-002)*, a monitoring requirement for TDS for any discharge that exceeds 1,000 mg/L TDS should be applied at minimum. Therefore, no monitoring/limit requirements should be applied. However, the receiving reach of Chartiers Creek is impaired for TDS due to acid mine drainage (AMD), per eMapPA. A zero assimilative capacity of the receiving stream for TDS should be considered per *Standard Operating Procedure (SOP) for Clean Water Program – Establishing Water Quality-Based Effluent Limitations (WQBELs) and Permit Conditions for Toxic Pollutants in NPDES Permits for Existing Dischargers (SOP No. BCW-PMT-037).* Since the closest public water supply (PWS) intake (i.e., West View Authority) is about 15 miles away, only monitor and report requirements for TDS, sulfate, chloride, bromide, and 1,4-dioxane will be imposed to collect data in the current permitting cycle. Limits may become warranted in the renewal of the permit based on the data evaluation.

Summary of Effluent Limitations for IMP 101

Effluent limits imposed at the outfalls are the most stringent of TBELs, WQBELs, regulatory effluent standards and monitoring requirements as described in the sections above. The applicable final requirements for IMP 101 are summarized in Table 6.

Based on the data submitted by AK Steel and the data presented in RP, it is apparent that the discharge from AK Steel is highly variable in nature due to the contribution of precipitation-based discharge. However, a fraction of the maximum discharge (i.e., seep) is always present. The sampling frequency (i.e., twice per month) is chosen based on Table 6-4 of *Technical Guidance for the Development and Specification of Effluent Limitations and Other Permit Conditions in NPDES Permits (Document No. 362-0400-001, 10/97)*, the nature of variability of the discharge, and best professional judgement of the permit writer.

Table 6. Monitoring Requirements for IMP 101

Parameter	Minimum	Average Monthly	Daily Maximum	Instantaneous Maximum	Sample Frequency	Sample Type
Flow (MGD)	-	Report	Report	-	2/month	Measured
pH	6.0	-	-	9.0	2/month	Grab
5-Day Biochemical Oxygen Demand (BOD_5)	-	56	220	-	2/month	Grab
Total Suspended Solids (mg/L)	-	27	88	-	2/month	Grab
Total Dissolved Solids (mg/L)	-	Report	Report	-	2/month	Grab
Sulfate (mg/L)	-	Report	Report	-	2/month	Grab
Chloride (mg/L)	-	Report	Report	-	2/month	Grab
Bromide (mg/L)	-	Report	Report	-	2/month	Grab
1,4-Dioxane	-	Report	Report	-	2/month	Grab
Chemical Oxygen Demand (mg/L)	-	Report	Report	-	2/month	Grab
Ammonia-Nitrogen (mg/L)	-	4.9	10.0	-	2/month	Grab

Total Aluminum (µg/L)	-	750.0	750.0	-	2/month	Grab
Total Antimony (µg/L)	-	8.30	12.95	-	2/month	Grab
Total Arsenic (µg/L)	-	14.82	23.13	-	2/month	Grab
Total Cadmium (µg/L)	-	0.40	0.63	-	2/month	Grab
Hexavalent Chromium (µg/L)	-	15.41	24.04	-	2/month	Grab
Total Copper (µg/L)	-	13.30	20.75	-	2/month	Grab
Total Cyanide (µg/L)	-	Report	Report	-	2/month	Grab
Total Iron (µg/L)	-	1600.0	2496.3	-	2/month	Grab
Total Lead (µg/L)	-	4.72	7.36	-	2/month	Grab
Total Mercury (µg/L)	-	0.07	0.12	-	2/month	Grab
Total Nickel (µg/L)	-	Report	Report	-	2/month	Grab
Total Selenium (µg/L)	-	7.40	11.54	-	2/month	Grab
Total Silver (µg/L)	-	Report	Report	-	2/month	Grab
Total Thallium (µg/L)	-	Report	Report	-	2/month	Grab
Total Vanadium (µg/L)	-	148.2	231.2	-	2/month	Grab
Total Zinc (µg/L)	-	Report	Report	-	2/month	Grab
Acrolein (µg/L)	-	3.0	3.0	-	2/month	Grab
Acrylonitrile (µg/L)	-	0.31	0.49	-	2/month	Grab
Carbon Tetrachloride (µg/L)	-	0.88	1.37	-	2/month	Grab
Chlorodibromomethane (µg/L)	-	Report	Report	-	2/month	Grab
1,3-Dichloropropylene (µg/L)	-	Report	Report	-	2/month	Grab
1,1,2,2-Tetrachloroethane (µg/L)	-	0.60	0.94	-	2/month	Grab
Trichloroethylene (µg/L)	-	13.0	20.28	-	2/month	Grab
Vinyl Chloride (µg/L)	-	0.15	0.24	-	2/month	Grab
α-Terpineol (mg/L)	-	0.019	0.042	-	2/month	Grab
Aniline (mg/L)	-	0.015	0.024	-	2/month	Grab
Benzoic Acid (mg/L)	-	0.073	0.119	-	2/month	Grab
Naphthalene (mg/L)	-	0.022	0.059	-	2/month	Grab
p-Cresol (mg/L)	-	0.015	0.024	-	2/month	Grab
Phenol (mg/L)	-	0.029	0.048	-	2/month	Grab
Pyridine (mg/L)	-	0.025	0.072	-	2/month	Grab
Radium-226 (pCi/L)	-	Report	Report	-	2/month	Grab

Effluent Limitation Compliance Schedule

Whenever the Department proposes the imposition of water quality based effluent limitations on existing sources, the NPDES permit may include a schedule of compliance to achieve the WQBELs. Any compliance schedule contained in an NPDES permit must be an enforceable sequence of actions or operations leading to compliance with the water quality-based effluent limitations (WQBELs). In accordance with 40 CFR 122.47(a)(3) and PA Code Chapter 92a.51, compliance schedules that are longer than one year in duration must set forth interim requirements and dates for their achievement. In order to grant a compliance schedule in an NPDES Permit, the permitting authority has to make a reasonable finding, adequately supported by the administrative record and described in the Fact Sheet, that a compliance schedule is "appropriate" and that compliance with the final WQBEL is required "as soon as possible".

In current case, AK Steel will be allowed a compliance schedule of three years to meet the proposed effluent limitations at IMP 101 for the parameters listed in Table 6. The facility is required to install the necessary treatment technologies within the first three years from the permit effective date. Therefore, only monitor and report requirements will be applied for the parameters listed in Table 6 for the first three years. After three years following the permit effective date, the final permit limits will take effect. AK Steel will be required to comply with the "Corrective Action" benchmarks set forth in the Consent Order and Agreement (COA) and the necessary construction of treatment facilities within the three years of permit effective date. AK Steel may apply for a General Permit (PAG-03) upon confirmation of eligibility based on the quality of discharge from the AK Steel Bridgeville site. The Part C.I.F condition of the Draft NPDES Permit states:

"The final effluent limitations from Part A for discharges via IMP 101 (and Outfall 001) to Chartiers Creek are effective upon completion of construction activities, but no later than three years following the Permit Effective Date. If the permittee fails to complete construction activities within three years following the Permit Effective Date, a written notice of non-compliance, i.e., failure to complete construction of treatment technologies necessary to achieve compliance with the Part A effluent limits, shall be submitted to the Department no later than 14 calendar days following three years from the Permit Effective Date. The notice of non-compliance shall include the following information:

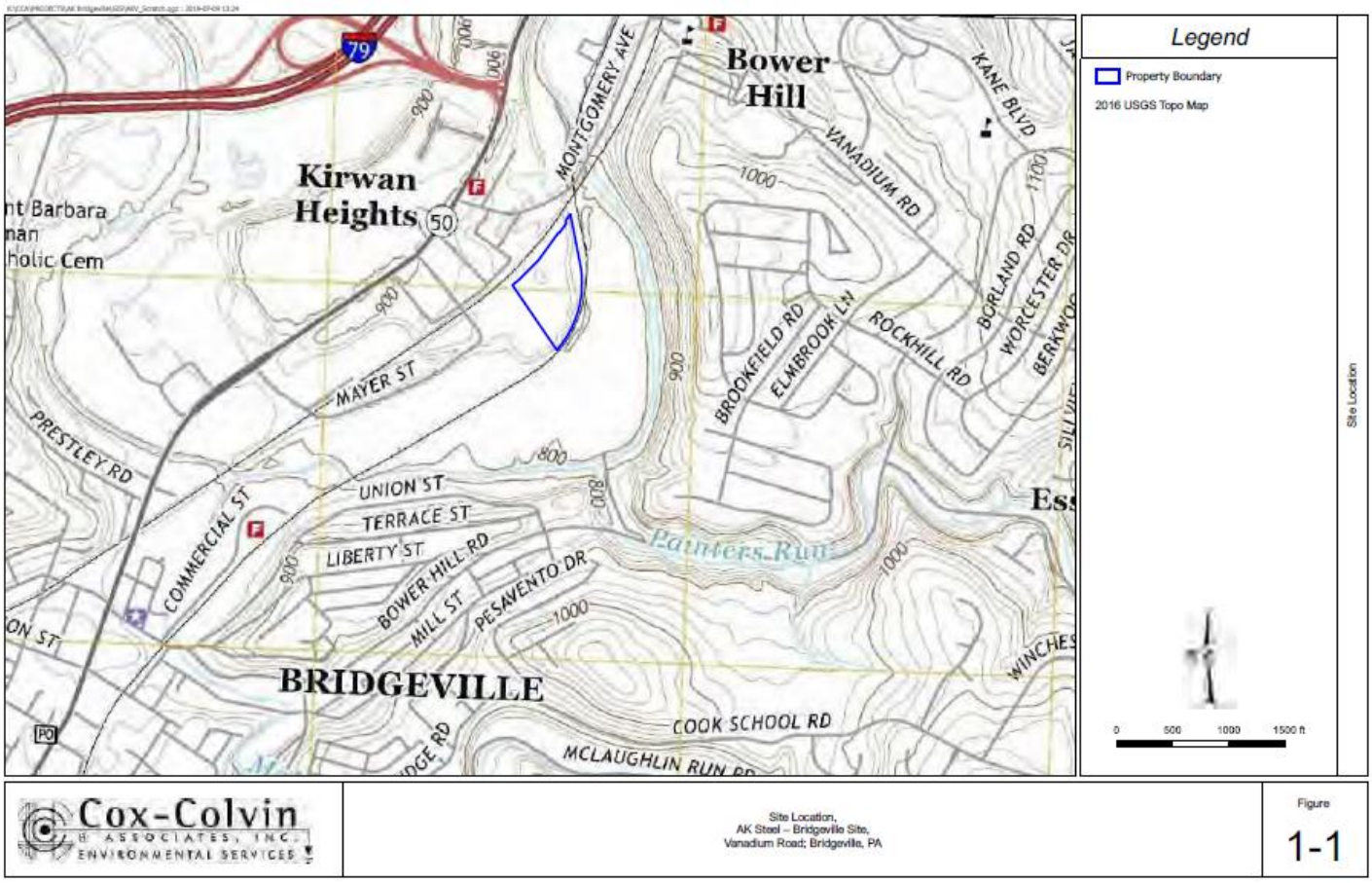
1. A short description of the non-compliance.

2. A description of any actions taken or proposed by the permittee to comply with the requirement.

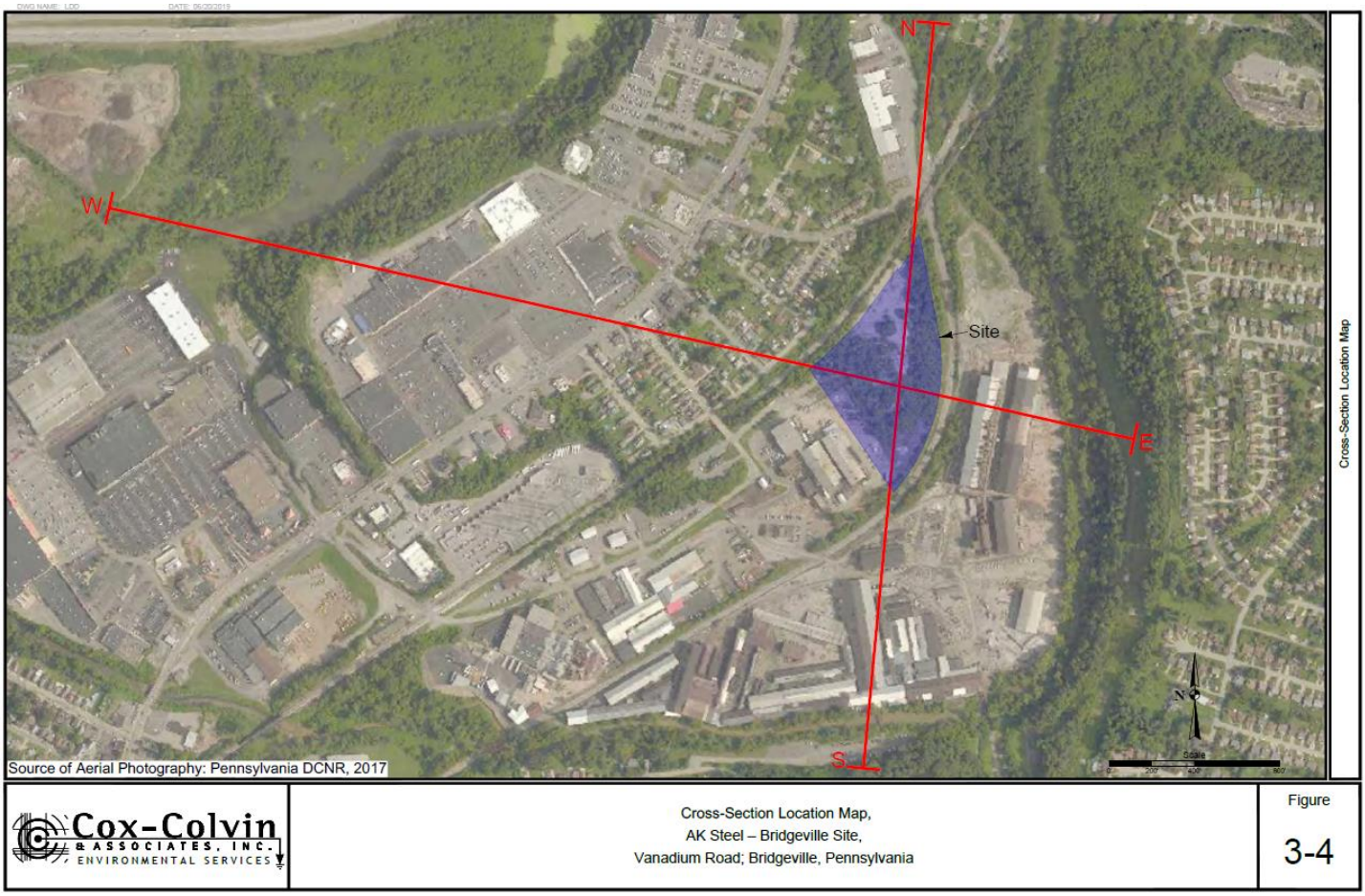
3. A description of any factors which tend to explain or mitigate the non-compliance.

4. An estimate of the date that compliance with the requirement will be achieved."

Appendix A


Legend
Property Boundary
2016 USGS Topo Map
Site Location
0 500 1000 1500 ft
Bower Hill
Kirwan Heights
BRIDGEVILLE
Painters Run
MONTGOMERY AVE
KANE BLVD
VANADIUM RD
BORLAND RD
WORCESTER DR
BROOKFIELD RD
ELMBROOK LN
ROCKHILL RD
MAYER ST
PRESTLEY RD
COMMERCIAL ST
UNION ST
TERRACE ST
LIBERTY ST
BOWER HILL RD
MILL ST
PESAVENTO DR
COOK SCHOOL RD
MCLAUGHLIN RUN RD
79
50
PO
Cox-Colvin & ASSOCIATES, INC. ENVIRONMENTAL SERVICES
Site Location,
AK Steel – Bridgeville Site,
Vanadium Road; Bridgeville, PA
Figure
1-1

Appendix B



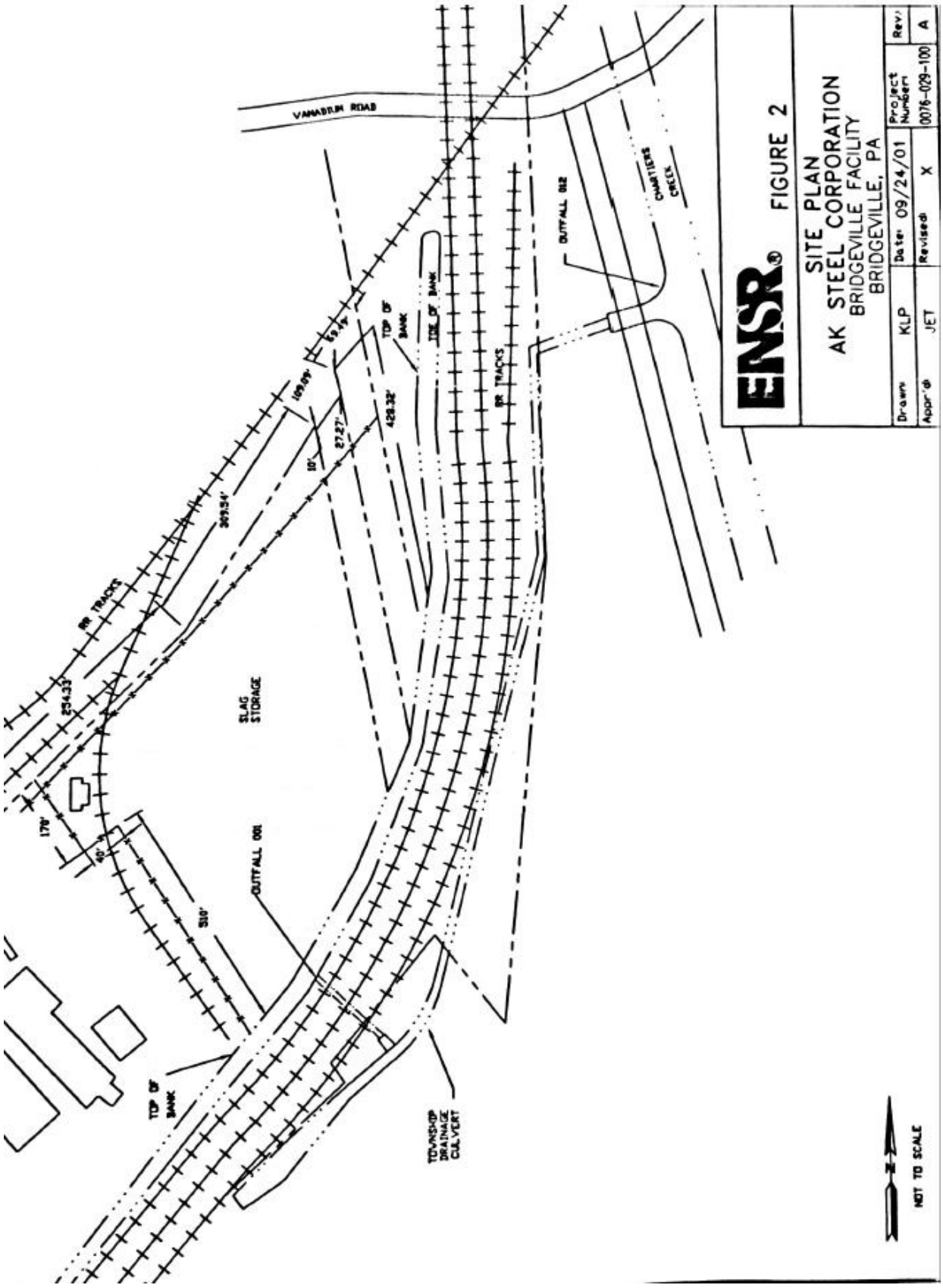
Cox-Colvin & ASSOCIATES, INC. ENVIRONMENTAL SERVICES

Cross-Section Location Map,
AK Steel – Bridgeville Site,
Vanadium Road; Bridgeville, Pennsylvania

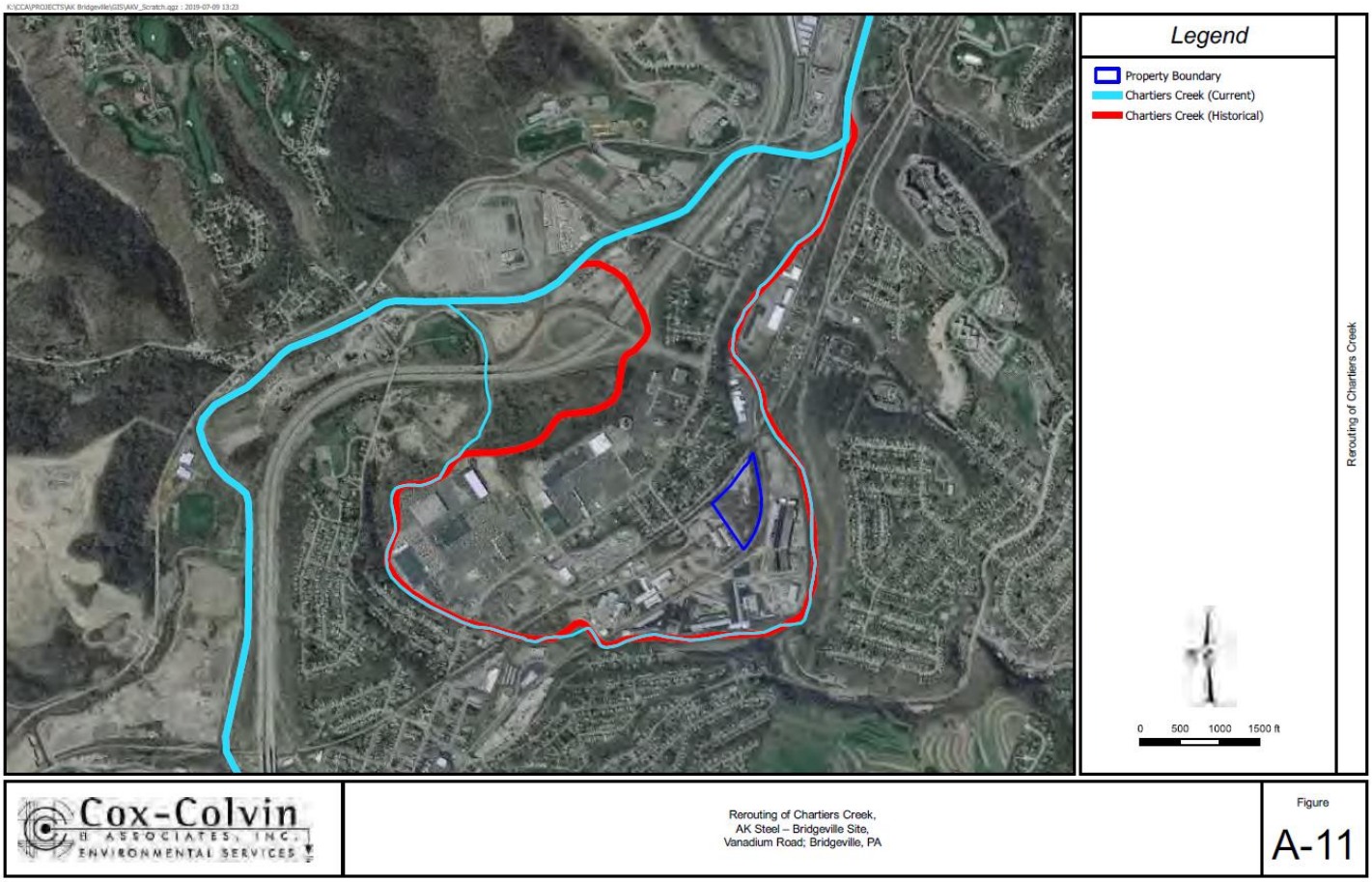
Figure
3-4

Appendix C

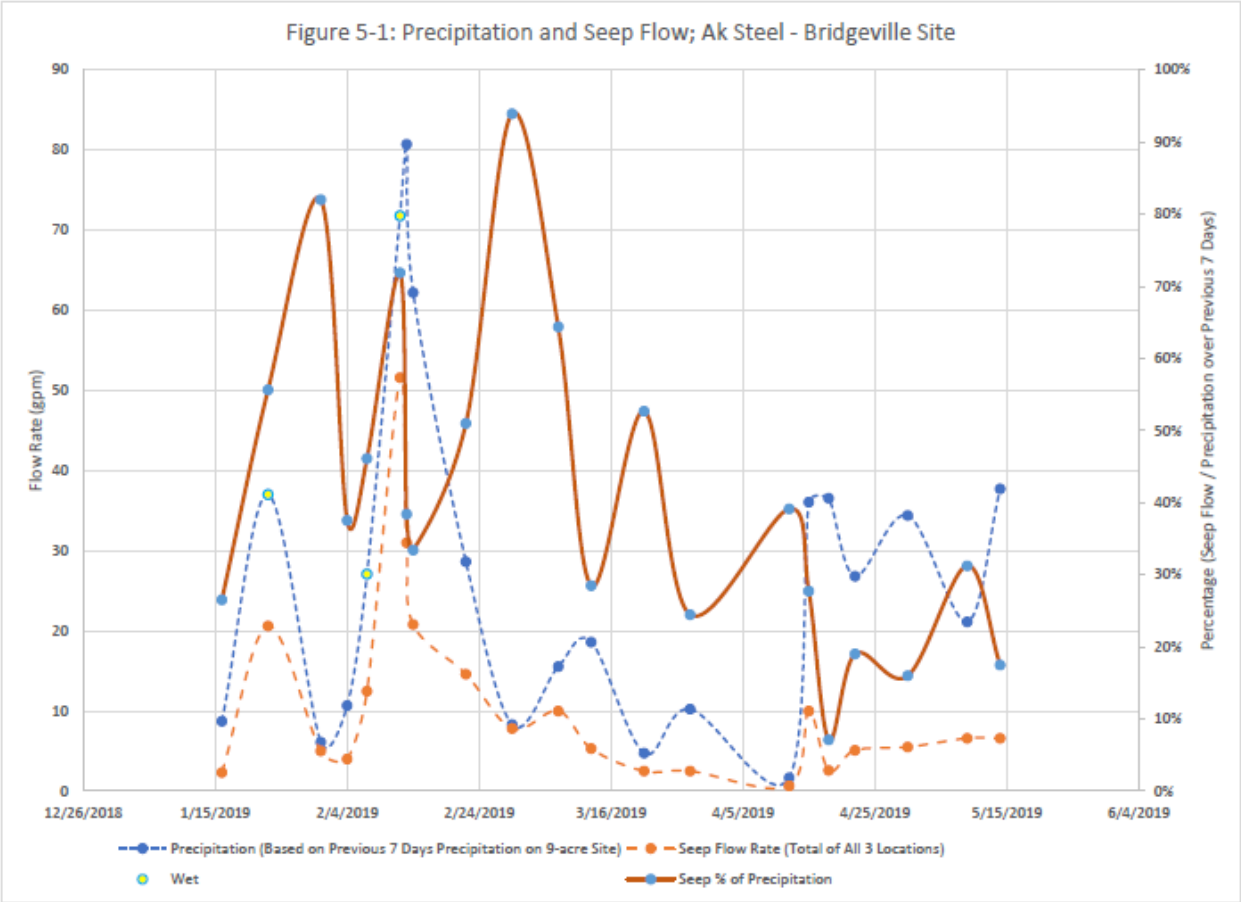
(Outfall 001 renamed as IMP 101, Outfall 012 renamed as Outfall 001 in current Fact Sheet)



Appendix D


K:\CCA\PROJECTS\AK Bridgeville\GIS\AKV_Scratch.qgz : 2019-07-09 13:23
Legend
Property Boundary
Chartiers Creek (Current)
Chartiers Creek (Historical)
0 500 1000 1500 ft
Rerouting of Chartiers Creek
Cox-Colvin & ASSOCIATES, INC. ENVIRONMENTAL SERVICES
Rerouting of Chartiers Creek,
AK Steel – Bridgeville Site,
Vanadium Road; Bridgeville, PA
Figure
A-11

Appendix E



Cox-Colvin & Associates, Inc.

Appendix F

AK Steel Bridgeville Site
Sampling Data 2019

OUTFALL -->		RR-1			
			Rain Event		
Sample Date:		01/16/19	01/23/19	02/22/19	03/01/19
Flowrate at time of Sampling (gpm):		2.31	20.6	14.6	7.8
GROUP 1	Units				
Biochemical Oxygen Demand (BOD)	mg/L	< 2.0	< 2.0	< 2.0	< 2.0
Chemical Oxygen Demand (COD)	mg/L	< 9.1	26	16	< 9.1
Hardness (as CaCO3)	mg/L	170	190	130	150
Total Suspended Solids (TSS)	mg/L	7.8	18	0.9	< 0.5
Total Dissolved Solids (TDS)	mg/L	790	920	600	830
Ammonia as N	mg/L	0.057	0.096	< 0.046	< 0.046
Nitrate + Nitrite as N	mg/L	0.86	0.97	0.58	0.69
Total Kjeldahl Nitrogen (TKN)	mg/L	< 1.6	1.7 J	< 1.6	1.7 J
Phosphorus (as P), Total	mg/L	0.95	1.9	1.4	1.3
Temperature (field)	°C	3.6	6.3	8.7	5.7
pH (field)	s.u.	8.33	7.48	7.59	8.53
Color (true)	CU	80	350	250	130
Fluoride	mg/L	3.6	3.2	3.4	3.6
Oil and Grease (hexane)	mg/L	< 1.4	< 1.4	< 1.5	< 1.4
Chlorine, Total Residual (field)	mg/L	0.33	0.21	0.17	0.31
Bromide	mg/L	< 0.087	< 0.087	< 0.087	< 0.087
Chloride	mg/L	50	28	14	14
Sulfate	mg/L	140	140	140	140
Sulfide	mg/L	< 1.4	< 1.4	< 1.4	< 1.4
Sulfite	mg/L	no result	no result	no result	no result
Surfactants	mg/L	0.049 J	< 0.072	< 0.072	0.045 J
Aluminum, Total	ug/l	< 6.6	1400	1200	350
Barium, Total	ug/l	< 0.2	18	13	12
Boron, Total	ug/l	15 JB	400	450	530
Cobalt, Total	ug/l	< 0.046	1.9	0.7	0.4 J
Iron, Total	ug/l	< 13 *	1600	940	290
Iron, Dissolved	ug/l	< 13 *	100	140	57
Magnesium, Total	ug/l	no result	no result	no result	no result
Molybdenum, Total	ug/l	15	2900	3400	4100
Manganese, Total	ug/l	< 0.79	96	21	30
Tin, Total	ug/l	no result	no result	no result	no result
Titanium, Total	ug/l	no result	no result	no result	no result
Vanadium	ug/l	22000	24000	24000	52000
Total Organic Carbon	mg/L	6.8	8.8	8.2	8.6

GROUP 2	Units								
Antimony, Total	ug/l	<	0.2		8.5		13		17	
Arsenic, Total	ug/l		0.27		89		86		86	
Beryllium, Total	ug/l	<	0.087		0.14	J	< 0.087		< 0.087	
Cadmium, Total	ug/l	<	0.088		0.65	J	0.8	J	0.85	J
Chromium, Total	ug/l		5.7		740		1100		1300	
Chromium, (VI) Hexavalent	ug/l		1100		570		700		970	
Copper, Total	ug/l	<	0.99		29		12		8.8	
Lead, Total	ug/l	<	0.16		5.2		2		0.95	J
Mercury, Total	ug/l	<	0.065		0.1	J	< 0.1		< 0.1	
Nickel, Total	ug/l	<	0.46		28		11		7.9	
Selenium, Total	ug/l	<	0.81		8		8.8		11	
Silver, Total	ug/l	<	0.09		0.14	J	< 0.22		< 0.22	
Zinc, Total	ug/l	<	1.8		16	B	6.2		6.2	
Cyanide, Total	mg/l	<	0.002		< 0.002		< 0.002		< 0.002	
Cyanide, Free	mg/l		no result		no result		no result		no result	
Phenols, Total	mg/l	<	0.02		< 0.02		< 0.02		< 0.02	
GROUP 3	**Units**								
Acrolein	ug/L	<	16		< 16		< 16		< 16	
Acrylonitrile	ug/L	<	7.8		< 7.8		< 7.8		< 7.8	
Benzene	ug/L	<	0.6		< 0.6		< 0.6		< 0.6	
Bromoform	ug/L	<	0.98		< 0.98		< 0.98		< 0.98	
Carbon Tetrachloride	ug/L	<	0.88		< 0.88	*	< 0.88		< 0.88	
Chlorobenzene	ug/L	<	0.5		< 0.5		< 0.5		< 0.5	
Chlorodibromomethane	ug/L	<	0.84		< 0.84		< 0.84		< 0.84	
Chloroethane	ug/L	<	0.9		< 0.9		< 0.9		< 0.9	
2-Chloroethylvinyl Ether	ug/L	<	1.7		< 1.7		< 1.7		< 1.7	
Chloroform	ug/L	<	0.6		< 0.6		< 0.6		< 0.6	
Dichlorobromomethane	ug/L	<	0.64		< 0.64		< 0.64		< 0.64	
Dichlorodifluoromethane	ug/L		no result		no result		no result		no result	
1,1-Dichloroethane	ug/L	<	0.63		< 0.63		< 0.63		< 0.63	
1,2-Dichloroethane	ug/L	<	0.57		< 0.57		< 0.57		< 0.57	
1,1-Dichloroethylene	ug/L	<	0.55		< 0.55		< 0.55		< 0.55	
1,2-Dichloropropane	ug/L	<	0.66		< 0.66		< 0.66		< 0.66	
1,3-Dichloropropylene	ug/L	<	0.59		< 0.59		< 0.59		< 0.59	
Ethylbenzene	ug/L	<	0.51		< 0.51		< 0.51		< 0.51	
Methyl Bromide	ug/L	<	0.89		< 0.89		< 0.89		< 0.89	
Methyl Chloride	ug/L	<	0.9		< 0.9		< 0.9		< 0.9	
Methylene Chloride	ug/L	<	0.89		< 0.89		< 0.89		< 0.89	
1,1,2,2-Tetrachloroethane	ug/L	<	0.6		< 0.6		< 0.6		< 0.6	
Tetrachloroethylene	ug/L	<	0.47		< 0.47		< 0.47		< 0.47	
Toluene	ug/L	<	0.46		< 0.46		< 0.46		< 0.46	
1,2-trans-Dichloroethylene	ug/L	<	0.67		< 0.67		< 0.67		< 0.67	
1,1,1-Trichloroethane	ug/L	<	0.6		< 0.6		< 0.6		< 0.6	
1,1,2-Trichloroethane	ug/L	<	0.45		< 0.45		< 0.45		< 0.45	
Trichloroethylene	ug/L		13		1.6		1.5		1.5	
Trichlorofluoromethane	ug/L		no result		no result		no result		no result	
Vinyl Chloride	ug/L	<	0.88		< 0.88		< 0.88		< 0.88	

GROUP 4	Units				
2-Chlorophenol	ug/L	< 0.059	< 0.059	< 0.059	< 0.059
2,4-Dichlorophenol	ug/L	< 0.047	< 0.047	< 0.047	< 0.047
2,4-Dimethylphenol	ug/L	< 0.038	< 0.038	< 0.038	< 0.038
4,6-Dinitro-o-cresol	ug/L	< 1.4	< 1.4	< 1.4	< 1.4
2,4-Dinitrophenol	ug/L	< 1.4	< 1.4	< 1.4	< 1.4
2-Nitrophenol	ug/L	< 0.056	< 0.056	< 0.056	< 0.056
4-Nitrophenol	ug/L	< 0.13	< 0.13	< 0.13	< 0.13
p-Chloro-m-cresol	ug/L	< 0.056	< 0.056	< 0.056	< 0.056
Pentachlorophenol	ug/L	< 0.22	< 0.22	< 0.22	< 0.22
Phenol	ug/L	< 0.091	< 0.091	< 0.091	< 0.091
2,4,6-Trichlorophenol	ug/L	< 0.063	< 0.063	< 0.063	< 0.063

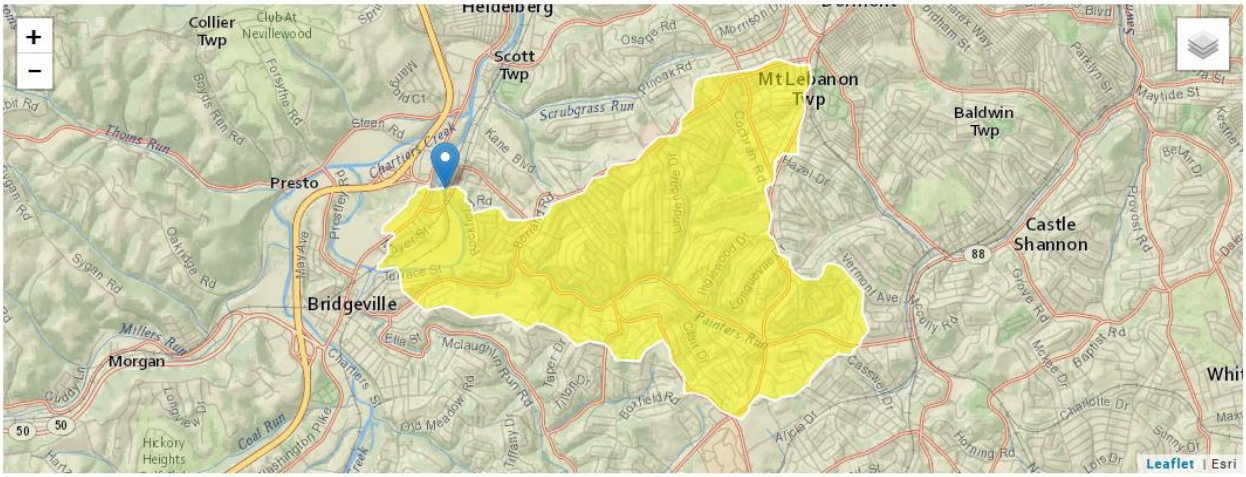
GROUP 5	Units				
Acenaphthene	ug/L	< 0.06	< 0.06	< 0.06	< 0.06
Acenaphtylene	ug/L	< 0.06	< 0.06	< 0.06	< 0.06
Anthracene	ug/L	< 0.045	< 0.045	< 0.045	< 0.045
Benzidine	ug/L	< 4.1 F1	< 4.1 F1	< 4.1 F1	< 4.1 F1
Benzo (a) anthracene	ug/L	< 0.069	< 0.069	< 0.069	< 0.069
Benzo (a) pyrene	ug/L	< 0.049	< 0.049	< 0.049	< 0.049
3,4, Benzofluoranthene	ug/L	< 0.09	< 0.09	< 0.09	< 0.09
Benzo (ghi) perylene	ug/L	< 0.064	< 0.064	< 0.064	< 0.064
Benzo (k) fluoranthene	ug/L	< 0.081	< 0.081	< 0.081	< 0.081
Bis (2-Chloroethyl) Ether	ug/L	< 0.037	< 0.037	< 0.037	< 0.037
Bis (2-Chloroisopropyl) Ether	ug/L	< 0.054	< 0.054	< 0.054	< 0.054
Bis (2-Ethylhexyl) Phthalate	ug/L	< 4.3	< 4.3	< 4.3	< 4.3
4-Bromophenyl Phenyl Ether	ug/L	< 0.058	< 0.058	< 0.058	< 0.058
Butyl Benzyl Phthalate	ug/L	< 0.43	< 0.43	< 0.43	< 0.43
2-Chloronaphthalene	ug/L	< 0.055 F1	< 0.055	< 0.055	< 0.055
4-Chlorophenyl Phenyl Ether	ug/L	< 0.056	< 0.056	< 0.056	< 0.056
Chrysene	ug/L	< 0.075	< 0.075	< 0.075	< 0.075
Dibenzo (a,h) anthracene	ug/L	< 0.067	< 0.067	< 0.067	< 0.067
1,2-Dichlorobenzene	ug/L	< 0.047 F1	< 0.047	< 0.047	< 0.047
1,3-Dichlorobenzene	ug/L	< 0.045 F1	< 0.045	< 0.045	< 0.045
1,4-Dichlorobenzene	ug/L	< 0.056 F1	< 0.056	< 0.056	< 0.056
3,3'-Dichlorobenzidine	ug/L	< 0.54	< 0.54	< 0.54	< 0.54
Diethyl Phthalate	ug/L	< 0.53	< 0.53	< 0.53	< 0.53
Dimethyl Phthalate	ug/L	< 0.052	< 0.052	< 0.052	< 0.052
Di-N-Butyl Phthalate	ug/L	< 0.69	< 0.69	< 0.69	< 0.69
2,4-Dinitrotoluene	ug/L	< 0.047	< 0.047	< 0.047	< 0.047
2,6-Dinitrotoluene	ug/L	< 0.056	< 0.056	< 0.056	< 0.056
Di-N-Octyl Phthalate	ug/L	< 0.63	< 0.63	< 0.63	< 0.63
1,2-Diphenyl hydrazine (as Azobenzene)	ug/L	< 0.045	< 0.045	< 0.045	< 0.045
Fluoranthene	ug/L	< 0.056	< 0.056	< 0.056	< 0.056
Fluorene	ug/L	< 0.064 F1	< 0.064	< 0.064	< 0.064
Hexachlorobenzene	ug/L	< 0.052	< 0.052	< 0.052	< 0.052
Hexachlorobutadiene	ug/L	< 0.064	< 0.064	< 0.064	< 0.064
Hexachlorocyclopentadiene	ug/L	< 0.46	< 0.46	< 0.46	< 0.46
Hexachloroethane	ug/L	< 0.057	< 0.057	< 0.057	< 0.057
Indeno(1,2,3-cd) pyrene	ug/L	< 0.079	< 0.079	< 0.079	< 0.079
Isophorone	ug/L	< 0.05	< 0.05	< 0.05	< 0.05
Naphthalene	ug/L	< 0.055	< 0.055	< 0.055	< 0.055
Nitrobenzene	ug/L	< 0.15	< 0.15	< 0.15	< 0.15
N-Nitrosodimethylamine	ug/L	< 0.062	< 0.062 *	< 0.062	< 0.062
N-Nitrosodi-N-propylamine	ug/L	< 0.066	< 0.066	< 0.066	< 0.066
N-Nitrosodiphenylamine	ug/L	< 0.11	< 0.11	< 0.11	< 0.11
Phenanthrene	ug/L	< 0.051 *	< 0.051	< 0.051	< 0.051
Pyrene	ug/L	< 0.05	< 0.05	< 0.05	< 0.05
1,2,4-Trichlorobenzene	ug/L	< 0.048	< 0.048	< 0.048	< 0.048

Appendix G

StreamStats:

StreamStats Report

Region ID:	PA
Workspace ID:	PA20190508130606935000
Clicked Point (Latitude, Longitude):	40.37236, -80.09726
Time:	2019-05-08 09:06:24 -0400



Basin Characteristics

Parameter Code	Parameter Description	Value	Unit
DRNAREA	Area that drains to a point on a stream	4.93	square miles
ELEV	Mean Basin Elevation	1074	feet

Low-Flow Statistics Flow Report [Low Flow Region 4]

PII: Prediction Interval-Lower, PIu: Prediction Interval-Upper, SEp: Standard Error of Prediction, SE: Standard Error (other -- see report)

Statistic	Value	Unit	SE	SEp
7 Day 2 Year Low Flow	0.158	ft^3/s	43	43
30 Day 2 Year Low Flow	0.28	ft^3/s	38	38
7 Day 10 Year Low Flow	0.0552	ft^3/s	66	66
30 Day 10 Year Low Flow	0.104	ft^3/s	54	54
90 Day 10 Year Low Flow	0.192	ft^3/s	41	41

Low-Flow Statistics Citations

Stuckey, M.H.,2006, Low-flow, base-flow, and mean-flow regression equations for Pennsylvania streams: U.S. Geological Survey Scientific Investigations Report 2006-5130, 84 p.

Appendix H

TOXICS SCREENING ANALYSIS
WATER QUALITY POLLUTANTS OF CONCERN
VERSION 2.7

CLEAR FORM

Facility: **AK Steel Corporation Bridgeville**
NPDES Permit No.: **PA0219088**
Outfall: **001**
Analysis Hardness (mg/L): **100**
Discharge Flow (MGD): **0.074**
Analysis pH (SU): **7**
Stream Flow, Q_{7-10} (cfs): **0.0552**

	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		920000	500000	Yes		
	Chloride		50000	250000	No		
	Bromide		87	N/A	No		
	Sulfate		140000	250000	Yes		
	Fluoride		3600	2000	Yes		
Group 2	Total Aluminum		1400	750	Yes	750	Establish Limits
	Total Antimony		17	5.6	Yes	8.3	Establish Limits
	Total Arsenic		89	10	Yes	14.82	Establish Limits
	Total Barium		18	2400	No		
	Total Beryllium		0.14	N/A	No		
	Total Boron		530	1600	No		
	Total Cadmium		0.85	0.271	Yes	0.401	Establish Limits
	Total Chromium		1300	N/A	No		
	Hexavalent Chromium		1100	10.4	Yes	15.407	Establish Limits
	Total Cobalt		1.9	19	No		
	Total Copper		29	9.3	Yes	13.299	Establish Limits
	Total Cyanide		0.002	N/A	No		
	Total Iron		1600	1500	Yes	2223.283	Establish Limits
	Dissolved Iron		140	300	No		
	Total Lead		5.2	3.2	Yes	4.716	Establish Limits
	Total Manganese		96	1000	No		
	Total Mercury		0.1	0.05	Yes	0.074	Establish Limits
	Total Molybdenum		4100	N/A	No		
	Total Nickel		28	52.2	Yes	77.315	Monitor
	Total Phenols (Phenolics)		0.091	5	No		
	Total Selenium		11	5.0	Yes	7.395	Establish Limits
	Total Silver		0.22	3.8	No		
	Total Thallium		0.12	0.24	Yes	0.356	Monitor
	Total Zinc		16	119.8	No		

Group 3	Acrolein	<	16	3	Yes	3	Establish Limits
	Acrylamide	<		0.07			
	Acrylonitrile	<	7.8	0.051	Yes	0.314	Establish Limits
	Benzene	<	0.6	1.2	No		
	Bromoform	<	0.98	4.3	No		
	Carbon Tetrachloride	<	0.88	0.23	Yes	1.417	Establish Limits
	Chlorobenzene	<	0.5	130	No (Value < QL)		
	Chlorodibromomethane	<	0.84	0.4	Yes	2.464	Monitor
	Chloroethane	<	0.9	N/A	No		
	2-Chloroethyl Vinyl Ether	<	1.7	3500	No (Value < QL)		
	Chloroform	<	0.6	5.7	No		
	Dichlorobromomethane	<	0.64	0.55	Yes	3.388	No Limits/Monitoring
	1,1-Dichloroethane	<	0.63	N/A	No		
	1,2-Dichloroethane	<	0.57	0.38	Yes	2.341	No Limits/Monitoring
	1,1-Dichloroethylene	<	0.55	33	No		
	1,2-Dichloropropane	<	0.66	2200	No		
	1,3-Dichloropropylene	<	0.59	0.34	Yes	2.095	Monitor
	Ethylbenzene	<	0.51	530	No		
	Methyl Bromide	<	0.89	47	No		
	Methyl Chloride	<	0.9	5500	No		
	Methylene Chloride	<	0.89	4.6	No		
	1,1,2,2-Tetrachloroethane	<	0.6	0.17	Yes	1.047	Establish Limits
	Tetrachloroethylene	<	0.47	0.69	No (Value < QL)		
	Toluene	<	0.46	330	No (Value < QL)		
	1,2-trans-Dichloroethylene	<	0.67	140	No		
	1,1,1-Trichloroethane	<	0.6	610	No		
	1,1,2-Trichloroethane	<	0.45	0.59	No (Value < QL)		
	Trichloroethylene	<	13	2.5	Yes	15.402	Establish Limits
	Vinyl Chloride	<	0.88	0.025	Yes	0.154	Establish Limits
Group 4	2-Chlorophenol	<	0.059	81	No (Value < QL)		
	2,4-Dichlorophenol	<	0.047	77	No (Value < QL)		
	2,4-Dimethylphenol	<	0.038	130	No (Value < QL)		
	4,6-Dinitro-o-Cresol	<	1.4	13	No (Value < QL)		
	2,4-Dinitrophenol	<	1.4	69	No (Value < QL)		
	2-Nitrophenol	<	0.056	1600	No (Value < QL)		
	4-Nitrophenol	<	0.13	470	No (Value < QL)		
	p-Chloro-m-Cresol	<	0.056	30	No (Value < QL)		
	Pentachlorophenol	<	0.22	0.27	No (Value < QL)		
	Phenol	<	0.091	10400	No (Value < QL)		
	2,4,6-Trichlorophenol	<	0.063	1.4	No (Value < QL)		

Group 5	Acenaphthene	<	0.06	17	No (Value < QL)		
	Acenaphthylene	<	0.06	N/A	No		
	Anthracene	<	0.045	8300	No (Value < QL)		
	Benzidine	<	4.1	0.000086	No (Value < QL)		
	Benzo(a)Anthracene	<	0.069	0.0038	No (Value < QL)		
	Benzo(a)Pyrene	<	0.049	0.0038	No (Value < QL)		
	3,4-Benzofluoranthene	<	0.09	0.0038	No (Value < QL)		
	Benzo(ghi)Perylene	<	0.064	N/A	No		
	Benzo(k)Fluoranthene	<	0.081	0.0038	No (Value < QL)		
	Bis(2-Chloroethoxy)Methane	<		N/A			
	Bis(2-Chloroethyl)Ether	<	0.037	0.03	No (Value < QL)		
	Bis(2-Chloroisopropyl)Ether	<	0.054	1400	No (Value < QL)		
	Bis(2-Ethylhexyl)Phthalate	<	4.3	1.2	No (Value < QL)		
	4-Bromophenyl Phenyl Ether	<	0.058	54	No (Value < QL)		
	Butyl Benzyl Phthalate	<	0.43	35	No (Value < QL)		
	2-Chloronaphthalene	<	0.055	1000	No (Value < QL)		
	4-Chlorophenyl Phenyl Ether	<	0.056	N/A	No		
	Chrysene	<	0.075	0.0038	No (Value < QL)		
	Dibenzo(a,h)Anthrancene	<	0.067	0.0038	No (Value < QL)		
	1,2-Dichlorobenzene	<	0.047	160	No (Value < QL)		
	1,3-Dichlorobenzene	<	0.045	69	No (Value < QL)		
	1,4-Dichlorobenzene	<	0.056	150	No (Value < QL)		
	3,3-Dichlorobenzidine	<	0.54	0.021	No (Value < QL)		
	Diethyl Phthalate	<	0.53	800	No (Value < QL)		
	Dimethyl Phthalate	<	0.052	500	No (Value < QL)		
	Di-n-Butyl Phthalate	<	0.69	21	No (Value < QL)		
	2,4-Dinitrotoluene	<	0.047	0.05	No (Value < QL)		
	2,6-Dinitrotoluene	<	0.056	0.05	No (Value < QL)		
	1,4-Dioxane	<		N/A			
	Di-n-Octyl Phthalate	<	0.63	N/A	No		
	1,2-Diphenylhydrazine	<	0.045	0.036	No (Value < QL)		
	Fluoranthene	<	0.056	40	No (Value < QL)		
	Fluorene	<	0.064	1100	No (Value < QL)		
	Hexachlorobenzene	<	0.052	0.00028	No (Value < QL)		
	Hexachlorobutadiene	<	0.064	0.44	No (Value < QL)		
	Hexachlorocyclopentadiene	<	0.46	1	No (Value < QL)		
	Hexachloroethane	<	0.057	1.4	No (Value < QL)		
	Indeno(1,2,3-cd)Pyrene	<	0.079	0.0038	No (Value < QL)		
	Isophorone	<	0.05	35	No (Value < QL)		
	Naphthalene	<	0.055	43	No (Value < QL)		
	Nitrobenzene	<	0.15	17	No (Value < QL)		
	n-Nitrosodimethylamine	<	0.062	0.00069	No (Value < QL)		
	n-Nitrosodi-n-Propylamine	<	0.066	0.005	No (Value < QL)		
	n-Nitrosodiphenylamine	<	0.11	3.3	No (Value < QL)		
	Phenanthrene	<	0.051	1	No (Value < QL)		

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-DDE	<		0.00022			
	4,4-DDD	<		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			
	PCB-1242	<		N/A			
	PCB-1254	<		N/A			
	PCB-1221	<		N/A			
	PCB-1232	<		N/A			
	PCB-1248	<		N/A			
	PCB-1260	<		N/A			
	PCB-1016	<		N/A			
	Toxaphene	<		0.0002			
	2,3,7,8-TCDD	<		0.000000005			
Group 7	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			
	Total Vanadium		52000	100	Yes	148.219	Establish Limits

PENTOXSD

Modeling Input Data

Stream Code	RMI	Elevation (ft)	Drainage Area (sq mi)	Slope	PWS With (mgd)	Apply FC
36777	12.56	1074.00	4.93	0.00010	0.00	☑

Stream Data

	LFY (cfsm)	Trib Flow (cfs)	Stream Flow (cfs)	WD Ratio	Rch Width (ft)	Rch Depth (ft)	Rch Velocity (fps)	Rch Trav Time (days)	Tributary Hard (mg/L)	Tributary pH	Stream Hard (mg/L)	Stream pH	Analysis Hard (mg/L)	Analysis pH
Q7-10	0.1	0	0.0552	0	0	0	0	0	100	7	0	0	0	0
Qh		0	0	0	0	0	0	0	100	7	0	0	0	0

Discharge Data

Name	Permit Number	Existing Disc Flow (mgd)	Permitted Disc Flow (mgd)	Design Disc Flow (mgd)	Reserve Factor	AFC PMF	CFC PMF	THH PMF	CRL PMF	Disc Hard (mg/L)	Disc pH
AK Steel Bridge	PA0219088	0	0	0.074	0	0	0	0	0	100	7

Parameter Data

Parameter Name	Disc Conc (µg/L)	Trib Conc (µg/L)	Disc Daily CV	Disc Hourly CV	Stream Conc (µg/L)	Stream CV	Fate Coef	FOS	Crit Mod	Max Disc Conc (µg/L)
1,1,2,2-TETRACHLOROETHANE	0.6	0	0.5	0.5	0	0	0	0	1	0
1,2-DICHLOROETHANE	0.57	0	0.5	0.5	0	0	0	0	1	0
1,3-DICHLOROPROPYLENE	0.59	0	0.5	0.5	0	0	0	0	1	0
ACROLEIN	16	0	0.5	0.5	0	0	0	0	1	0
ACRYLONITRILE	7.8	0	0.5	0.5	0	0	0	0	1	0
ALUMINUM	1400	0	0.5	0.5	0	0	0	0	1	0
ANTIMONY	17	0	0.5	0.5	0	0	0	0	1	0
ARSENIC	89	0	0.5	0.5	0	0	0	0	1	0
CADMIUM	0.85	0	0.5	0.5	0	0	0	0	1	0
CARBON TETRACHLORIDE	0.88	0	0.5	0.5	0	0	0	0	1	0
CHLORODIBROMOMETHANE	0.84	0	0.5	0.5	0	0	0	0	1	0
CHROMIUM, VI	1100	0	0.5	0.5	0	0	0	0	1	0
COPPER	29	0	0.5	0.5	0	0	0	0	1	0
DICHLOROBROMOMETHANE	0.64	0	0.5	0.5	0	0	0	0	1	0
LEAD	5.2	0	0.5	0.5	0	0	0	0	1	0
MERCURY	0.1	0	0.5	0.5	0	0	0	0	1	0
NICKEL	28	0	0.5	0.5	0	0	0	0	1	0
SELENIUM	11	0	0.5	0.5	0	0	0	0	1	0
THALLIUM	0.12	0	0.5	0.5	0	0	0	0	1	0
TOTAL IRON	1600	0	0.5	0.5	0	0	0	0	1	0
TRICHLOROETHYLENE	13	0	0.5	0.5	0	0	0	0	1	0
VANADIUM	52000	0	0.5	0.5	0	0	0	0	1	0
VINYL CHLORIDE	0.88	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
36777	12.06	1073.00	4.95	0.00010	0.00	☑

Stream Data

	LFY (cfsm)	Trib Flow (cfs)	Stream Flow (cfs)	WD Ratio	Rch Width (ft)	Rch Depth (ft)	Rch Velocity (fps)	Rch Trav Time (days)	Tributary Hard (mg/L)	Tributary pH	Stream Hard (mg/L)	Stream pH	Analysis Hard (mg/L)	Analysis pH
Q7-10	0.1	0	0.0552	0	0	0	0	0	100	7	0	0	0	0
Qh		0	0	0	0	0	0	0	100	7	0	0	0	0

Discharge Data

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

Parameter Data

Parameter Name	Disc Conc (µg/L)	Trib Conc (µg/L)	Disc Daily CV	Disc Hourly CV	Stream Conc (µg/L)	Stream CV	Fate Coef	FOS	Crit Mod	Max Disc Conc (µg/L)
1,1,2,2-TETRACHLOROETHANE	0	0	0.5	0.5	0	0	0	0	1	0
1,2-DICHLOROETHANE	0	0	0.5	0.5	0	0	0	0	1	0
1,3-DICHLOROPROPYLENE	0	0	0.5	0.5	0	0	0	0	1	0
ACROLEIN	0	0	0.5	0.5	0	0	0	0	1	0
ACRYLONITRILE	0	0	0.5	0.5	0	0	0	0	1	0
ALUMINUM	0	0	0.5	0.5	0	0	0	0	1	0
ANTIMONY	0	0	0.5	0.5	0	0	0	0	1	0
ARSENIC	0	0	0.5	0.5	0	0	0	0	1	0
CADMIUM	0	0	0.5	0.5	0	0	0	0	1	0
CARBON TETRACHLORIDE	0	0	0.5	0.5	0	0	0	0	1	0
CHLORODIBROMOMETHANE	0	0	0.5	0.5	0	0	0	0	1	0
CHROMIUM, VI	0	0	0.5	0.5	0	0	0	0	1	0
COPPER	0	0	0.5	0.5	0	0	0	0	1	0
DICHLOROBROMOMETHANE	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
NICKEL	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
THALLIUM	0	0	0.5	0.5	0	0	0	0	1	0
TOTAL IRON	0	0	0.5	0.5	0	0	0	0	1	0
TRICHLOROETHYLENE	0	0	0.5	0.5	0	0	0	0	1	0
VANADIUM	0	0	0.5	0.5	0	0	0	0	1	0
VINYL CHLORIDE	0	0	0.5	0.5	0	0	0	0	1	0

PENTOXSD Analysis Results

Hydrodynamics

SWP Basin	Stream Code:	Stream Name:
20F	36777	CHARTIERS CREEK

RMI	Stream Flow (cfs)	PWS With (cfs)	Net Stream Flow (cfs)	Disc Analysis Flow (cfs)	Reach Slope	Depth (ft)	Width (ft)	WD Ratio	Velocity (fps)	Reach Trav Time (days)	CMT (min)
Q7-10 Hydrodynamics											
12.560	0.0552	0	0.0552	0.11447	0.0001	0.4502	9.5209	21.149	0.0396	0.7718	4.353
12.060	0.0552	0	0.0552	NA	0	0	0	0	0	0	NA
Qh Hydrodynamics											
12.560	0.5908	0	0.5908	0.11447	0.0001	0.8426	9.5209	11.299	0.0879	0.3476	11.272
12.060	0.5908	0	0.5908	NA	0	0	0	0	0	0	NA

PENTOXSD Analysis Results

Wasteload Allocations

RMI	Name	Permit Number
12.56	AK Steel Bridge	PA0219088

AFC

Q7-10: CCT (min) 4.353 PMF 1 Analysis pH 7 Analysis Hardness 100

Parameter	Stream Conc (µg/L)	Stream CV	Trib Conc (µg/L)	Fate Coef	WQC (µg/L)	WQ Obj (µg/L)	WLA (µg/L)
ALUMINUM	0	0	0	0	750	750	1111.642
ANTIMONY	0	0	0	0	1100	1100	1630.408
ARSENIC	0	0	0	0	340	340	503.944
	Dissolved WQC. Chemical translator of 1 applied.						
CADMIUM	0	0	0	0	2.014	2.133	3.162
	Dissolved WQC. Chemical translator of 0.944 applied.						
CHROMIUM, VI	0	0	0	0	16	16.293	24.15
	Dissolved WQC. Chemical translator of 0.982 applied.						
COPPER	0	0	0	0	13.439	13.999	20.749
	Dissolved WQC. Chemical translator of 0.96 applied.						
TOTAL IRON	0	0	0	0	NA	NA	NA
LEAD	0	0	0	0	64.581	81.645	121.013
	Dissolved WQC. Chemical translator of 0.791 applied.						
MERCURY	0	0	0	0	1.4	1.647	2.441
	Dissolved WQC. Chemical translator of 0.85 applied.						
NICKEL	0	0	0	0	468.236	469.174	695.405
	Dissolved WQC. Chemical translator of 0.998 applied.						
SELENIUM	0	0	0	0	NA	NA	NA
THALLIUM	0	0	0	0	65	65	96.342
ACROLEIN	0	0	0	0	5	5	7.411
ACRYLONITRILE	0	0	0	0	650	650	963.423
CARBON TETRACHLORIDE	0	0	0	0	2800	2800	4150.128
CHLORODIBROMOMETHANE	0	0	0	0	NA	NA	NA
DICHLOROBROMOMETHANE	0	0	0	0	NA	NA	NA
1,2-DICHLOROETHANE	0	0	0	0	15000	15000	22232.83
1,3-DICHLOROPROPYLENE	0	0	0	0	310	310	459.479
1,1,2,2-TETRACHLOROETHANE	0	0	0	0	1000	1000	1482.189

PENTOXSD Analysis Results

Wasteload Allocations

RMI	Name	Permit Number						
12.56	AK Steel Bridge	PA0219088						
	TRICHLOROETHYLENE	0	0	0	0	2300	2300	3409.034
	VINYL CHLORIDE	0	0	0	0	NA	NA	NA
	VANADIUM	0	0	0	0	510	510	755.916

CFC

Q7-10: CCT (min) 4.353 PMF 1 Analysis pH 7 Analysis Hardness 100

Parameter	Stream Conc. (µg/L)	Stream CV	Trib Conc. (µg/L)	Fate Coef	WQC (µg/L)	WQ Obj (µg/L)	WLA (µg/L)
ALUMINUM	0	0	0	0	NA	NA	NA
ANTIMONY	0	0	0	0	220	220	326.082
ARSENIC	0	0	0	0	150	150	222.328
	Dissolved WQC. Chemical translator of 1 applied.						
CADMIUM	0	0	0	0	0.246	0.271	0.401
	Dissolved WQC. Chemical translator of 0.909 applied.						
CHROMIUM, VI	0	0	0	0	10	10.395	15.407
	Dissolved WQC. Chemical translator of 0.962 applied.						
COPPER	0	0	0	0	8.956	9.329	13.827
	Dissolved WQC. Chemical translator of 0.96 applied.						
TOTAL IRON	0	0	0	0	1500	1500	2223.283
	WQC = 30 day average. PMF = 1.						
LEAD	0	0	0	0	2.517	3.182	4.716
	Dissolved WQC. Chemical translator of 0.791 applied.						
MERCURY	0	0	0	0	0.77	0.906	1.343
	Dissolved WQC. Chemical translator of 0.85 applied.						
NICKEL	0	0	0	0	52.007	52.163	77.315
	Dissolved WQC. Chemical translator of 0.997 applied.						
SELENIUM	0	0	0	0	4.6	4.989	7.395
	Dissolved WQC. Chemical translator of 0.922 applied.						
THALLIUM	0	0	0	0	13	13	19.268
ACROLEIN	0	0	0	0	1	1	1.482
ACRYLONITRILE	0	0	0	0	130	130	192.685
CARBON TETRACHLORIDE	0	0	0	0	560	560	830.026
CHLORODIBROMOMETHANE	0	0	0	0	NA	NA	NA
DICHLOROBROMOMETHANE	0	0	0	0	NA	NA	NA

PENTOXSD Analysis Results

Wasteload Allocations

RMI	Name	Permit Number						
12.56	AK Steel Bridge	PA0219088						
	1,2-DICHLOROETHANE	0	0	0	0	3100	3100	4594.785
	1,3-DICHLOROPROPYLENE	0	0	0	0	61	61	90.414
	1,1,2,2-TETRACHLOROETHANE	0	0	0	0	210	210	311.26
	TRICHLOROETHYLENE	0	0	0	0	450	450	666.985
	VINYL CHLORIDE	0	0	0	0	NA	NA	NA
	VANADIUM	0	0	0	0	100	100	148.219

THH

Q7-10: CCT (min) 4.353 PMF 1 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)
ALUMINUM	0	0	0	0	NA	NA	NA
ANTIMONY	0	0	0	0	5.6	5.6	8.3
ARSENIC	0	0	0	0	10	10	14.822
CADMIUM	0	0	0	0	NA	NA	NA
CHROMIUM, VI	0	0	0	0	NA	NA	NA
COPPER	0	0	0	0	NA	NA	NA
TOTAL IRON	0	0	0	0	NA	NA	NA
LEAD	0	0	0	0	NA	NA	NA
MERCURY	0	0	0	0	0.05	0.05	0.074
NICKEL	0	0	0	0	610	610	904.135
SELENIUM	0	0	0	0	NA	NA	NA
THALLIUM	0	0	0	0	0.24	0.24	0.356
ACROLEIN	0	0	0	0	190	190	281.616
ACRYLONITRILE	0	0	0	0	NA	NA	NA

PENTOXSD Analysis Results

Wasteload Allocations

RMI	Name	Permit Number						
12.56	AK Steel Bridge	PA0219088						
CARBON TETRACHLORIDE			0	0	0	0	NA	NA	NA
CHLORODIBROMOMETHANE			0	0	0	0	NA	NA	NA
DICHLOROBROMOMETHANE			0	0	0	0	NA	NA	NA
1,2-DICHLOROETHANE			0	0	0	0	NA	NA	NA
1,3-DICHLOROPROPYLENE			0	0	0	0	NA	NA	NA
1,1,2,2-TETRACHLOROETHANE			0	0	0	0	NA	NA	NA
TRICHLOROETHYLENE			0	0	0	0	NA	NA	NA
VINYL CHLORIDE			0	0	0	0	NA	NA	NA
VANADIUM			0	0	0	0	NA	NA	NA

CRL

Qh: CCT (min) 11.272 PMF 1

Parameter	Stream Conc (µg/L)	Stream CV	Trib Conc (µg/L)	Fate Coef	WQC (µg/L)	WQ Obj (µg/L)	WLA (µg/L)
ALUMINUM	0	0	0	0	NA	NA	NA
ANTIMONY	0	0	0	0	NA	NA	NA
ARSENIC	0	0	0	0	NA	NA	NA
CADMIUM	0	0	0	0	NA	NA	NA
CHROMIUM, VI	0	0	0	0	NA	NA	NA
COPPER	0	0	0	0	NA	NA	NA
TOTAL IRON	0	0	0	0	NA	NA	NA
LEAD	0	0	0	0	NA	NA	NA
MERCURY	0	0	0	0	NA	NA	NA
NICKEL	0	0	0	0	NA	NA	NA

PENTOXSD Analysis Results

Wasteload Allocations

RMI	Name	Permit Number						
12.56	AK Steel Bridge	PA0219088						
	SELENIUM	0	0	0	0	NA	NA	NA
	THALLIUM	0	0	0	0	NA	NA	NA
	ACROLEIN	0	0	0	0	NA	NA	NA
	ACRYLONITRILE	0	0	0	0	0.051	0.051	0.314
	CARBON TETRACHLORIDE	0	0	0	0	0.23	0.23	1.417
	CHLORODIBROMOMETHANE	0	0	0	0	0.4	0.4	2.464
	DICHLOROBROMOMETHANE	0	0	0	0	0.55	0.55	3.388
	1,2-DICHLOROETHANE	0	0	0	0	0.38	0.38	2.341
	1,3-DICHLOROPROPYLENE	0	0	0	0	0.34	0.34	2.095
	1,1,2,2-TETRACHLOROETHANE	0	0	0	0	0.17	0.17	1.047
	TRICHLOROETHYLENE	0	0	0	0	2.5	2.5	15.402
	VINYL CHLORIDE	0	0	0	0	0.025	0.025	0.154
	VANADIUM	0	0	0	0	NA	NA	NA

PENTOXSD Analysis Results

Recommended Effluent Limitations

SWP Basin	Stream Code:	Stream Name:
20F	36777	CHARTIERS CREEK

RMI	Name	Permit Number	Disc Flow (mgd)
12.56	AK Steel Bridge	PA0219088	0.0740

Parameter	Effluent Limit (µg/L)	Governing Criterion	Max. Daily Limit (µg/L)	Most Stringent WQBEL (µg/L)	Most Stringent WQBEL Criterion
1,1,2,2-TETRACHLOROETHANE	0.6	INPUT	0.936	1.047	CRL
1,2-DICHLOROETHANE	0.57	INPUT	0.889	2.341	CRL
1,3-DICHLOROPROPYLENE	0.59	INPUT	0.92	2.095	CRL
ACROLEIN	1.482	CFC	2.312	1.482	CFC
ACRYLONITRILE	0.314	CRL	0.49	0.314	CRL
ALUMINUM	712.517	AFC	1111.642	712.517	AFC
ANTIMONY	8.3	THH	12.95	8.3	THH
ARSENIC	14.822	THH	23.125	14.822	THH
CADMIUM	0.401	CFC	0.626	0.401	CFC
CARBON TETRACHLORIDE	0.88	INPUT	1.373	1.417	CRL
CHLORODIBROMOMETHANE	0.84	INPUT	1.311	2.464	CRL
CHROMIUM, VI	15.407	CFC	24.038	15.407	CFC
COPPER	13.299	AFC	20.749	13.299	AFC
DICHLOROBROMOMETHANE	0.64	INPUT	0.999	3.388	CRL
LEAD	4.716	CFC	7.357	4.716	CFC
MERCURY	0.074	THH	0.116	0.074	THH
NICKEL	28	INPUT	43.685	77.315	CFC
SELENIUM	7.395	CFC	11.537	7.395	CFC
THALLIUM	0.12	INPUT	0.187	0.356	THH
TOTAL IRON	1600	INPUT	2496.257	2223.283	CFC
TRICHLOROETHYLENE	13	INPUT	20.282	15.402	CRL
VANADIUM	148.219	CFC	231.245	148.219	CFC
VINYL CHLORIDE	0.154	CRL	0.24	0.154	CRL