June 4, 2021

Ms. Erin Brittian
West Virginia Department of Environmental Protection
2031 Pleasant Valley Road
Fairmont, West Virginia 26554

Dear Erin:

Subject: Human Health and Ecological Risk Assessment Report
Mingo Junction Steel Works – Corrective Action Areas VIM and VIIM
Weirton, Hancock County, West Virginia
VRP Site Number 20015
CEC Project 174-529.2H2Z

Civil & Environmental Consultants, Inc. (CEC) is submitting one copy of the Human Health and Ecological Risk Assessment Report for the Mingo Junction Steel Works – Corrective Action Areas VIM and VIIM for your review. If you have any questions or require additional information, please call us at (724) 327-5200.

Very truly yours,

CIVIL & ENVIRONMENTAL CONSULTANTS, INC.

Elizabeth A. Stas

Elizabeth A. Stas, L.R.S. #296
Project Manager

David N. Olson

David N. Olson, L.R.S. #49
Principal

EAS:DNO/jg
Enclosure

cc: WVDEP OER File – depoerfilecopy@wv.gov
Kenan Cetin – WVDEP
Yogesh Patel – WVDEP
John Hopkins – USEPA
Joe Nowak – USEPA
Marvin Six – BDC
Craig Slater – MJSW
Public Repository – Office of Business Development of the Northern Panhandle

L-174529.2H2Z.Jun4/P

HUMAN HEALTH AND ECOLOGICAL RISK ASSESSMENT REPORT

MINGO JUNCTION STEEL WORKS –
CORRECTIVE ACTION AREAS VIM AND VIIM
WEIRTON, HANCOCK COUNTY, WEST VIRGINIA
VRP PROJECT #20015

Prepared For:

BUSINESS DEVELOPMENT CORPORATION
OF THE NORTHERN PANHANDLE
AND
MINGO JUNCTION STEEL WORKS, LLC

Prepared By:

LICENSED REMEDIATION SPECIALIST:
DAVID N. OLSON (LRS NO. 49)
Civil & Environmental Consultants, Inc.
4350 Northern Pike, Suite 141
Monroeville, Pennsylvania 15146
Phone: (724) 327-5200
Fax: (724) 327-5280
Email: dolson@cecinc.com

CEC Project 174-529.2H2Z

June 2021

TABLE OF CONTENTS

Page

1.0 Introduction 1
- 1.1 Site Location 2
- 1.2 Site History and Operational 3
- 1.3 Current and Future Land Use 4
  - 1.3.1 Weirton Area Reuse Plan 4

2.0 Data Evaluation and Identification of COCs 6
- 2.1 Soil Direct Contact 6
- 2.2 Groundwater Direct Contact 7
- 2.3 Vapor Intrusion 8
- 2.4 Groundwater Migration to Surface Water 9
- 2.5 De Minimis Ecological Screening 10

3.0 Exposure Assessment 11
- 3.1 Characterization of the Exposure Setting 11
- 3.2 Potential Transport Mechanisms 13
- 3.3 Identification of Potential Receptors and Exposure Pathways 14
- 3.4 Quantification of Exposure 17
  - 3.4.1 Intake Equations and Receptor Specific Intake Assumptions 17
  - 3.4.2 Receptor-Specific Intake Assumptions 20
  - 3.4.3 Exposure Point Concentrations 21

4.0 Toxicity Assessment 25
- 4.1 Potential Carcinogenic Toxicity Values 26
  - 4.1.1 Assessing the Mutagenic Mode of Action for Potential Carcinogens 28
- 4.2 Noncarcinogenic Toxicity Values 29

5.0 Risk Characterization 31
- 5.1 Risk Estimation Methods 31
  - 5.1.1 Cancer Risk Estimation Methods 31
  - 5.1.2 Noncarcinogenic Risk Estimation Methods 32
- 5.2 Risk Assessment Results 33

6.0 Uncertainties 35

7.0 Summary and Conclusions 37

8.0 References 39

TABLES

Table 1 – Identification of Contaminants of Concern in Surface Soil – Developed Areas
Table 2 – Identification of Contaminants of Concern in Surface Soil – Wooded Hillside
Table 3 – Identification of Contaminants of Concern in Subsurface Soil
Table 4 – Identification of Contaminants of Concern in Groundwater
Table 5 – Identification of Contaminants of Concern in Groundwater –Vapor Intrusion
Table 6 – Summary of Contaminants of Concern

Table 7 – Dermal Absorption Factors for Contaminants of Concern in Soil
Table 8 – Intake Equations and Exposure Factors – Future Outdoor Worker
Table 9 – Intake Equations and Exposure Factors – Future Construction Worker
Table 10 – Intake Equations and Exposure Factors – Current/Future Youth Trespasser
Table 11 – Exposure Point Concentrations for Surface Soil (Developed Areas)
Table 12 – Exposure Point Concentrations for Surface Soil (Wooded Hillside)
Table 13 – Exposure Point Concentrations for Shallow Soil (0 to 10 feet bgs)
Table 14 – Exposure Point Concentrations for Shallow Perched Groundwater
Table 15 – Calculation of Chronic Soil Volatilization Factors for Ambient (Outdoor) Air
Table 16 – Calculation of Subchronic Soil Volatilization Factors for Ambient (Outdoor) Air - Construction Worker
Table 17 – Calculation of a Particulate Emission Factor – Emissions from Unpaved Road Construction Traffic
Table 18 – Cancer Toxicity Values
Table 19 – Noncancer Toxicity Values – Chronic
Table 20 – Noncancer Toxicity Values – Subchronic
Table 21 – Summary of Risk Characterization

FIGURES

Figure 1 – CAAs VIM and VIIM Site Location Map
Figure 2 – CAA VIM Site Layout
Figure 3 – CAA VIIM Site Layout
Figure 4 – CAA VIM Sample Locations
Figure 5 – CAA VIIM Sample Locations
Figure 6 – CAA VIIM Sample Locations – Former 400,000-Gallon Fuel Oil Tank
Figure 7 – CAA VIIM Sample Locations - Former BOP Baghouse and Caster Sed. Basins
Figure 8 – CAA VIIM Sample Locations - Former BOP Scrubber WWTP
Figure 9 – CAA VIIM Sample Locations – Former Detinning Plant
Figure 10 – CAA VIIM Sample Locations – Former Hot Mill WWTP
Figure 11 – CAA VIIM Sample Locations – Former PORI and HARP Plants
Figure 12 – CAA VIIM Sample Locations – Wooded Hillside
Figure 13 – Conceptual Site Model

APPENDICES

Appendix A – Data Summary Tables
Appendix B – Approved De Minimis Ecological Screening Checklist
Appendix C – ProUCL Statistical Output
Appendix D – Volatilization Factors for a Trench Scenario
Appendix E – Risk Spreadsheets

1.0 INTRODUCTION

Civil & Environmental Consultants, Inc. (CEC) prepared this Human Health and Ecological Risk Assessment Report (RAR) for Corrective Action Areas (CAAs) VIM and VIIM of the Mingo Junction Steel Works site (Site) located along Main Street in the City of Weirton, Hancock County, West Virginia. This RAR was prepared on behalf of the Mingo Junction Steel Works, LLC (MJSW), who owns 272.7 acres of the 282-acre Site and the Business Development Corporation of the Northern Panhandle (BDC), who owns 9.3-acre portion of the Site. The BDC and its coalition partner, the Brooke-Hancock Regional Planning & Development Council have been awarded several United States Environmental Protection Agency (USEPA) Brownfields Assessment Grants that will be used to finance the assessment and remedial planning of the Site along with other properties in Brooke and Hancock counties.

The Site and surrounding property is subject to a Resource Conservation and Recovery Act (RCRA) Corrective Action Administrative Order issued to the Weirton Steel Corporation (former property owner) by the USEPA in September 1996 to perform investigation and remediation activities at WSC's steel manufacturing facility. WSC filed for Chapter 11 bankruptcy in 2004. Over the subsequent years the facility ownership changed several times, culminating with ArcelorMittal Weirton LLC (ArcelorMittal) taking ownership in December 2012. MJSW purchased approximately 1,300 acres of the former steel manufacturing facility from ArcelorMittal in January 2017 and the 1996 Administrative Order applicable to those areas was subsequently reassigned to MJSW in September 2018. MJSW initiated discussions with the West Virginia Department of Environmental Protection (WVDEP) and USEPA regarding entering the Site into the West Virginia Voluntary Remediation Program (VRP) in October 2019 and executed a Voluntary Remediation Agreement (VRA) with WVDEP on May 1, 2020. The Site has been assigned VRP Project #20015.

A Site Assessment Report (SAR) was submitted for the Site on June 30, 2020. The WVDEP provided comments based on their review of the SAR in a letter dated July 27, 2020. Representatives from the WVDEP, BDC, MJSW and CEC met at the Site on October 6, 2020 to discuss and agree on an approach to resolving several of the comments raised in the July 27th letter.

CEC submitted a letter to WVDEP dated November 10, 2020 with responses to the comments provided in the July 27th letter, which included a plan for collecting four additional soil samples. A revised SAR incorporating those sampling results and other information/revisions requested in the July 27th letter was submitted on January 28, 2021. WVDEP provided additional comments on the revised SAR via letter dated March 4, 2021. A revised report responding to these additional comments was submitted on March 17, 2021. WVDEP approved the March 17, 2021 revised SAR via letter dated April 16, 2021. Sections 1.1 and 1.2 of the approved SAR provide a detailed history of the RCRA Corrective Action Program activities conducted at the site, a detailed history of the activities conducted within CAAs VI and VII, and the process that was followed to enter the Site into the VRP. As recommended in the approved SAR, the purpose of this RAR is to evaluate potential human health risks associated with Contaminants of Concern (COCs) identified in site soils and groundwater under current and future land use scenarios.

This RAR was prepared in accordance with the procedures described in the WVDEP Voluntary Remediation and Redevelopment Act (VRRA) Guidance Manual (WVDEP, 2020), applicable federal guidance, such as the USEPA Risk Assessment Guidance for Superfund (RAGS) Part A (USEPA, 1989), Part E (USEPA, 2004), and Part F (USEPA, 2009), and other resources as referenced throughout this report.

1.1 SITE LOCATION

The 1,300-acre property owned by MJSW, which includes the Site, is located in the City of Weirton, Hancock County, West Virginia predominantly within a relatively flat, wide valley bottom that was a former channel of the Ohio River. CAAs VIM and VIIM occupy approximately 282 acres within the central portion of the overall property. The land surface across CAAs VIM and VIIM is relatively flat-lying with land surface elevations ranging from approximately 740 to 760 feet above mean sea level (famsl). The land surface rises to approximately 780 to 800 famsl along the eastern boundary towards Weir Avenue in CAA VIIM and Main Street in CAA VIM. Surface drainage is captured in a series of drop inlets and conveyed via underground sewers to the A-Outfall or B-Outfall wastewater treatment facilities (that are owned and operated by ArcelorMittal) where it is discharged to the Ohio River under WVDEP National Pollutant

Discharge Elimination System (NPDES) Permit # WV0003336. The site location is shown on the United States Geological Survey (USGS) topographic map attached as Figure 1. The detailed topography and layout of CAAs VIM and VIIM are shown on Figures 2 and 3, respectively.

1.2 SITE HISTORY AND OPERATION

Steel processing operations began by previous owners in 1909 and the steel-making facility continuously expanded after that time. CAA VIM was the Former Iron-Making Area. The primary activities in CAA VIM have included iron-making and related support operations, power and steam generation, the central facility machine shop, and trucking (fueling and maintenance) operations. Figure 2 presents the CAA VIM site layout, including existing, inactive, and demolished structures. Specific features that were located within CAA VIM included:

- Four blast furnaces that were used to produce molten iron for steelmaking. All four have been permanently shut down, and they are currently being demolished by MJSW in preparation for Site redevelopment;
- A Sinter Plant that was used to agglomerate iron ore fines and steel mill iron oxide byproducts into a suitable raw material for the production of iron in a blast furnace. The Sinter Plant was demolished in 2006 and 2007;
- A large steam and power generation complex that included five boilers fueled with natural gas. This plant has been shut down and is not scheduled to be restarted;
- A machine shop that was used to manufacture components used in the steel-making process at the Facility. This area and the adjacent trucking department was sold by MJSW to the BDC. The former Machine Shop has subsequently been occupied by Bidell Gas Compression, a manufacturer of equipment for the natural gas industry; and
- A Trucking Department Maintenance Building that was used to fuel and maintenance Facility trucks. This area was also sold to the BDC and the building has been demolished.

CAA VIIM was the Former Steel-Making Area. The primary activities in CAA VIIM included steel making and related support operations. Each of these is discussed in more detail below.

Figure 3 presents the CAA VIIM site layout, including existing, inactive, and demolished structures. Specific features that were located within CAA VIIM included:

- Two Basic Oxygen Furnaces (BOF) that were used to produce molten steel from molten iron, scrap metal, and other additives [also referred to as the Basic Oxygen Process (BOP), as shown on Figure 3]. The BOP building has been demolished;
- A Continuous Caster which received molten steel and produced a continuous steel slab which was then cut to the desired length. The Continuous Caster has been demolished;
- A Detinning Plant, which was shut down in 1996, that reclaimed tin from tin-bearing sludges generated at the Tin Mill;
- A Hot Strip Mill Wastewater Treatment Plant which was permanently shut down in 2007;
- The Veolia (formerly P.O.R.I.) Chemical Treatment and Oil Treatment Plants which were both permanently shut down in December 2011; and
- The HCL Plant which was permanently shut down in August 2009.

1.3 CURRENT AND FUTURE LAND USE

The land that comprises CAAs VIM and VIIM has been used for industrial purposes for nearly 100 years and will likely be used for industrial/commercial purposes in the future. CAA VIM is zoned as "Planned Development District" (commercial/industrial and restricted residential use) by the City of Weirton. The central portion of CAA VIIM is zoned "Heavy Industrial" while the eastern (along Weir Avenue) and western (wooded hillside) portions are zoned "Residential".

Activities performed in CAAs VIM and VIIM by MJSW since taking ownership in 2017 have primarily included dismantling existing buildings/structures in preparation for Site redevelopment.

1.3.1 Weirton Area Reuse Plan

In December 2017, the BDC, in partnership with the City of Weirton, was awarded a $400,000 grant from the United States Economic Development Agency (USEDA) to develop a "Weirton Area Reuse Plan" (WARP). The focus of the WARP is to upgrade infrastructure and repurpose

the 1,300-acre MJSW property (aka "Frontier Crossings") and integrate the development into the overall City of Weirton master plan. To accomplish this goal, the BDC teamed with MJSW and the City, and retained Thrasher Engineering (Thrasher) to develop the WARP.

In October 2018, the BDC hosted the Regional Economic Development Summit in the City of Weirton, which assembled local/state/federal government officials, developers and investors, and other stakeholders to share ideas about completing and implementing the WARP. A number of project initiatives have been kicked off since this summit. The City and County have initiated steps to create a Tax Incremental Financing Area to assist in funding area infrastructure improvements and will seek West Virginia Department of Transportation (WVDOT) road access, State and USEDA funds to construct a "signature" Frontier Crossings entry, a roundabout, and an arterial road into the industrial park. The City has also initiated the grant process with USEDA to fund and upgrade its public wastewater treatment works. A Work Force Training Center has been purchased by the BDC with expansion of the MJSW site envisioned. Finally, the City, BDC, and MJSW are working towards funding to improve the bridges to/from Browns Island to allow for travel from West Virginia to Ohio through the MJSW site.

The WARP master plan was completed in July 2019 and includes 337 acres of redevelopment for industrial, manufacturing, and commercial uses, with up to 10 new industrial buildings and 25 new commercial/retail buildings that could form a new regional hub for the emerging shale-manufacturing sector. The plan also includes a $42 million, 40-megawatt solar photovoltaic facility. The building construction and industrial equipment investment in this initial phase of the project is expected to reach $350 million, and as many as 1,137 direct jobs will be created.

2.0 DATA EVALUATION AND IDENTIFICATION OF COCS

The investigation of the Site included sampling and analysis of surface soil, subsurface soil, and groundwater to evaluate the potential for releases of hazardous constituents to the environment. A complete discussion of the previous site investigation and cleanup activities was presented in Section 2.3 of the approved SAR (CEC, 2021). The validity and usability of the data were determined during the data validation process, which was described in Section 6.4 of the approved SAR (CEC, 2021). In general, the overall quality of data generated during the Site characterization was acceptable for its intended purpose.

The primary objective of the data evaluation process is to develop a media-specific list of COCs that will be retained for further evaluation in the quantitative risk evaluation.

2.1 SOIL DIRECT CONTACT

A total of 83 surface soil samples (including six duplicate samples) were collected across the developed areas of the Site during the implementation of the CAAs VI and VII Work Plan from October through December 2013 and supplemental investigation from November 2017 to October 2018. It should be noted that sample VI-SS-09(0-0.3) was excavated during the former Fuel Oil/Tar Pumping Station excavation and has accordingly been excluded from the screening analysis presented in this section. In addition, five surface soil samples were collected from the wooded hillside comprising the western portion of CAA VIIM (refer to Figure 12) in December 2020 in response to WVDEP comments. Finally, a total of 91 subsurface soil samples (including four duplicate samples) were collected across the developed area of the Site during the following events:

- 2007 Interim Measure – Yard Office Interim Measure (SWMU W-700);
- October through December 2013 – Implementation of CAAs VI and VII RFI Work Plan; and
- November through December 2017 – Implementation of the subsurface soil sampling portion of the supplemental investigation.

The locations of the surface and subsurface soil samples are presented on Figures 4 through 12.

As presented in the approved SAR (CEC, 2021), the screening process used to identify soil COCs for the risk assessment consisted of comparing detected constituent concentrations to the lower of the USEPA Regional Screening Levels (RSLs), most recently updated in May 2021, or the WVDEP soil De Minimis values, most recently updated in June 2020 (WVDEP, 2020b). A comparison to both the residential and industrial screening values was conducted. The results of the initial direct contact screening for inorganic constituents were then compared to the default background values presented in Section 3.8.2 of the VRRA Guidance Manual. Constituents that were not detected, and constituents that were detected at concentrations below the De Minimis or background values, were not retained as COCs. The results of the direct contact screening evaluation for surface soil across the developed areas of the Site are presented in Table 1, for surface soil across the wooded hillside are presented in Table 2, and for subsurface soil are presented in Table 3. These tables present the number of samples analyzed for each constituent, the number of detections for each constituent, the range of detection limits, the range of detected concentrations, the sample with the maximum detection, and the soil De Minimis or background values, as appropriate.

A sample-by-sample summary of the analytical results is provided in Appendix A, Table A-1 for surface soil (developed areas), Table A-2 for surface soil (wooded hillside), and Table A-4 for subsurface soil. A summary of the identified COCs is provided on Table 6.

2.2 GROUNDWATER DIRECT CONTACT

The groundwater screening evaluation included a total of 49 groundwater samples (including four duplicate samples). Specifically, groundwater samples were collected from each of the 15 groundwater monitoring wells installed as part of the CAA VIM and VIIM RFI and two existing monitoring wells. The locations of the groundwater monitoring wells are shown on Figures 2 and 3 for CAA VIM and VIIM, respectively.

For groundwater, the screening process used to identify COCs consisted of comparing detected constituent concentrations to the lower of the USEPA Tapwater RSLs or WVDEP Groundwater De Minimis values. Additionally, the USEPA Federal MCLs were included in the screening evaluation. Constituents that were not detected, and constituents that were detected at concentrations below the De Minimis values, were not retained as COCs. The results of the direct contact screening evaluation for groundwater are presented in Table 4. This table presents the number of samples analyzed for each constituent, the number of detections for each constituent, the range of detection limits, the range of detected concentrations, the sample with the maximum detection, and the groundwater De Minimis values. A sample-by-sample comparison of the groundwater analytical results to the De Minimis values is provided in Appendix A, Table A-5. A summary of the identified COCs is provided on Table 6.

2.3 VAPOR INTRUSION

WVDEP does not provide De Minimis values for vapor intrusion from soil or groundwater. Therefore, to identify COCs for the vapor intrusion pathway, groundwater concentrations were compared to the USEPA Vapor Intrusion Screening Levels (VISL) for residential and commercial scenarios. The VISLs were obtained from the USEPA on-line VISL calculator (USEPA, 2021a) and are based on a 1E-06 risk level for a residential scenario, a 1E-05 risk level for a commercial scenario, and a default West Virginia groundwater temperature of 13 °C.

Table 5 provides a summary of the constituents that were detected in one or more of the groundwater samples and a comparison of these detected concentrations to the USEPA residential and commercial VISLs. As shown in Table 5, while chloroform, ethylbenzene, naphthalene, trichloroethene, vinyl chloride, and cyanide exceed a the USEPA residential VISLs, none of these constituents are detected at concentrations that exceed the USEPA commercial VISLs. A summary of the identified COCs is provided on Table 6.

2.4 GROUNDWATER MIGRATION TO SURFACE WATER

The nearest surface water bodies to the Site include the Ohio River, which is located between 600 and 5,000 feet to the west of the Site (depending on which CAA you are in) and Harmon Creek, which is located approximately 800 feet to the south of the southern limits of CAA VIIM (see Figure 1 which shows the location of these surface water features). A quantitative evaluation of the potential for Site-related constituents to migrate to the surface water of Harmon Creek was conducted as part of the De Miminis Ecological Screening presented in Section 3.2.8.2 of the approved SAR (CEC, 2021). Specifically, the concentrations detected in downgradient groundwater monitoring well VII-MW-03A were compared to the West Virginia's surface water quality standards (WQS) provided in Appendix E, Table 1 of WVDEP Title 47: Requirements Governing Water Quality Standard (WVDEP, 2016). For potential human receptors, WQS are provided for Category C (protection of human health from toxic effects through fish consumption) and Category A (protection of human health from toxic and/or organoleptic effects through drinking water and fish consumption). For potential ecological receptors, acute and chronic aquatic life WQS are provided for Category B1 and B4 (warm waters). The comparison is provided in Table A-7 in Appendix A. As shown on Table A-7, cadmium and iron were detected in the downgradient well VII-MW-03A at concentrations that exceed the ecological WQS and iron and manganese were detected at concentrations that exceed the human health WQS. Harmon Creek is not located immediately downgradient of the Site. Property owned by Cleveland-Cliffs, Inc. (formerly ArcelorMittal) is located downgradient of the Site, with Harmon Creek beyond. There are two groundwater monitoring wells located on Cleveland Cliffs property, adjacent to Harmon Creek. These wells include CA-MW-04AR and CA-MW-02A, which are wells that are monitored on an annual basis as part of the facility's RCRA Environmental Indicators monitoring program. Analytical results for CA-MW-04AR and CA-MW-02A for 2018, 2019, and 2020 are provided on Table A-7 in Appendix A. The locations of these wells are shown on Figure 5. As shown on Table A-7, cadmium, iron, and manganese were either non-detect, or detected below WQS in these downgradient wells during all three monitoring events. Therefore, it can be concluded that site COC in groundwater are not migrating to the surface water of Harmon Creek at concentrations that would result in a WQS exceedance.

2.5 DE MINIMIS ECOLOGICAL SCREENING

A De Minimis ecological screening evaluation was presented in Section 3.2.8.2 of the approved SAR (CEC, 2021). Specifically, WVDEP provides a "Checklist to Determine Applicable Remediation Standards, Part 1: Ecological Standards" to aid in completion of the ecological screening. The completed checklist previously presented in the approved SAR (CEC, 2021) is included as Appendix B of this report. Based on the responses in the completed checklist, Site constituents do not pose a significant ecological risk and no further ecological evaluation was warranted. Therefore, no further evaluation of ecological receptors is presented in this report.

3.0 EXPOSURE ASSESSMENT

Potential exposure to chemicals in environmental media depends on a number of factors related to the physical characteristics of a facility and its surroundings, including its location, surrounding land use, surface topography, drainage patterns, hydrogeology, geology, meteorology, and vegetation. Other factors include the current and possible future uses of the property, which determine the types of activities that might occur at the facility, the degree to which the facility is accessible to the general public, the amount and types of soil cover, and the mechanisms that might result in migration of chemicals to onsite populations.

This section summarizes various aspects of the exposure assessment for the Site, including the exposure setting (Section 3.1), potential transport mechanisms (Section 3.2), identification of potential receptors and exposure pathways (Section 3.3), and intake estimation methods and determination of Exposure Point Concentrations (EPCs; Section 3.4).

3.1 CHARACTERIZATION OF THE EXPOSURE SETTING

The Site is located in the City of Weirton, Hancock County, West Virginia predominantly within a relatively flat, wide valley bottom that was a former channel of the Ohio River. The Site was used for steel processing operations since 1909. CAA VIM was the Former Iron- Making Area while CAA VIIM was the Former Steel-Making Area. CAAs VIM and VIIM occupy approximately 282 acres within the central portion of the overall property. The land surface across CAAs VIM and VIIM is relatively flat-lying with land surface elevations ranging from approximately 740 to 760 famsl. The land surface rises to approximately 780 to 800 famsl along the eastern boundary towards Weir Avenue in CAA VIIM and Main Street in CAA VIM. Surface drainage is captured in a series of drop inlets and conveyed via underground sewers to the A-Outfall or B-Outfall wastewater treatment facilities (that are owned and operated by ArcelorMittal) where it is discharged to the Ohio River under WVDEP NPDES Permit # WV0003336.

In localized areas, discontinuous groundwater exists at the base of the fill materials perched on top of the original ground surface (fine-grained alluvial deposits). In general, however, the groundwater table lies deeper within the alluvial deposits. Groundwater at CAAs VIM and VIIM is not currently a potable water supply and is unlikely to be used for such purposes in the future given that these areas are connected to the City of Weirton public water supply system. Further, the City of Weirton recently enacted an ordinance that restricts the use of groundwater on the MJSW property and surrounding properties where groundwater could potentially be impacted by the Site. Therefore, groundwater is not considered to be a potential potable water source.

The nearest surface water bodies to the Site include the Ohio River, which is located between 600 and 5,000 feet to the west of the Site (depending on which CAA you are in) and Harmon Creek, which is located approximately 800 feet to the south of the southern limits of CAA VIIM (see Figure 1 which shows the location of these surface water features).

The majority of CAA VIM and VIIM consist of developed areas that were related to the production, processing, and storage of materials previously used in the iron and steel-making process, paved or gravel access roads, and railroad tracks. Mature forest areas occupy 77 acres in the western portion of CAA VIIM. This area is not associated with former industrial operations and consists of a steeply sloping hillside with heavy vegetation. Given the steep topography of this wooded hillside, redevelopment or construction in this area is not considered likely.

Iron and steel-making operations ceased at the Facility in the early 2000s. Currently, the Site is not used. Activities performed in CAAs VIM and VIIM by MJSW since taking ownership in 2017 have primarily included dismantling existing buildings/structures in preparation for site redevelopment. With the exception of the 77 acres of forest area of CAA VIIM (which has not been developed), the land that comprises CAAs VIM and VIIM has been used for industrial purposes for nearly 100 years and will likely be used for industrial/commercial purposes in the future. CAA VIM is zoned as "Planned Development District" (commercial/industrial and restricted residential use) by the City of Weirton. The central portion of CAA VIIM is zoned "Heavy Industrial" while the eastern (along Weir Avenue) and western (wooded hillside) portions are zoned "Residential". As described in Section 1.3.1, planning for the redevelopment of the

1,300-acre MJSW property is being conducted under a USEDA grant funded WARP. The focus of the WARP is to upgrade infrastructure and repurpose the property for industrial or commercial use. Accordingly, the expected future land use is industrial or commercial. MJSW will formally restrict future residential use of the property. Additionally, as described in Section 2.5, no complete pathways were identified for ecological receptors based on the results of the De Minims Ecological Screening Evaluation; therefore, no further evaluation of ecological receptors is warranted for this report.

3.2 POTENTIAL TRANSPORT MECHANISMS

Once media of interest and COCs have been identified, it is important to evaluate the environmental fate and potential transport of the COCs from the contaminant source to the receiving media. Physical and chemical properties of COCs along with environmental fate parameters were reviewed to perform the transport evaluation. In addition to physical and chemical properties, the topography of the site, local climate, characteristics of native soil and fill material, and potential subsurface conduits (e.g., preferential pathways for COCs transport) were also considered.

Based on this analysis, the potential transport mechanisms that are complete for the Site include:

- Direct releases to the ground surface and subsequent migration to subsurface soil based on the COCs identified in soil as described in Section 2.1;
- Emission of constituents in the form of volatile emissions and fugitive dust (wind erosion, vehicle traffic, or excavation) based on the COCs identified in soil as described in Section 2.1;
- Leaching of constituents from soil to groundwater based on the COCs identified in groundwater as described in Section 2.2; and
- Volatilization from groundwater into a subsurface construction trench based on the volatile COCs identified in groundwater as described in Section 2.2.

The following potential transport mechanisms were determined to be incomplete or *de minimis*:

- Volatilization from soil and groundwater and subsequent vapor intrusion to indoor air under a commercial scenario is considered an incomplete transport mechanism based on the screening presented in Section 2.3 which did not identify COCs for vapor intrusion in groundwater or soil for a commercial scenario; and
- Downgradient migration of groundwater to the surface water of Harmon Creek is considered an incomplete pathway based on an evaluation of groundwater monitoring wells located along Harmon Creek, as described in Section 2.4.

3.3 IDENTIFICATION OF POTENTIAL RECEPTORS AND EXPOSURE PATHWAYS

An exposure pathway is the mechanism by which an individual may come into contact with chemicals in environmental media. In accordance with USEPA (1989), an exposure pathway consists of the following four elements:

- A source and mechanism of chemical release to the environment;
- An environmental receiving or transport medium (e.g., air, soil) for the released chemical;
- A point of potential contact with the environmental medium of concern; and
- An exposure route (e.g., ingestion) at the receptor contact point.

For a pathway to be considered "complete," all four elements must be present. If any one of these elements does not exist, the exposure pathway is considered incomplete and further evaluation of the health risks associated with the incomplete pathway is not required.

This section identifies potential receptors and their associated exposure pathways. Potential receptors were selected to represent individuals who are most likely to come into contact with COCs during current and future land use at the Site. As described previously, the expected future land use is industrial/commercial. Accordingly, the following potential receptors were considered:

- Future Outdoor Worker;
- Future Indoor Worker;
- Future Construction Worker;
- Current/Future Adult Trespasser.

An outdoor worker is assumed to be a full-time employee who would be present at the Site daily during a typical, five-day workweek. This receptor is assumed to spend the majority of the workday outdoors, and intrusive activities, if any, conducted by this receptor are not expected to occur below 2 feet. Based on these activities, the outdoor worker was evaluated for direct contact exposure to surface soil (i.e., soil from the ground surface to 2 feet bgs) via the following pathways: incidental ingestion, dermal contact, and inhalation of volatile and particulate emissions in ambient air. Although potable use of groundwater is also a potential exposure pathway for an outdoor worker, as described above, the City of Weirton recently enacted an ordinance that restricts the use of groundwater on the MJSW property and surrounding properties where groundwater could potentially be impacted by the Site. A future outdoor worker was evaluated for the developed areas of the Site. A future outdoor worker on the wooded hillside is not considered a likely future receptor given the steep topography and location of the hillside which would make redevelopment difficult and unlikely.

An indoor worker is assumed to be an individual who would be a full-time employee, present at the Site daily during a typical five-day work week. This receptor is expected to spend the entire work day indoors. However, as described in Section 2.3, no COCs were identified for the vapor intrusion pathway under a commercial scenario making this pathway incomplete for the Site. Accordingly, no quantitative evaluation of an indoor worker was conducted.

A construction worker is assumed to be an employee or subcontractor who would be involved in a year-long (i.e., 250-day) construction or excavation project at the Site. This includes underground utility or equipment repair, installation of building footers and foundations, grading, and general construction on the Site. This receptor could potentially be directly exposed to constituents in surface and subsurface soil up to depths of 10 feet bgs. Therefore, the construction worker was evaluated for direct contact exposure to surface and shallow subsurface soil (i.e., soil

from the ground surface to 10 feet bgs) via the following pathways: incidental ingestion, dermal contact, and inhalation of volatile and particulate emissions in ambient air. A construction worker also has the potential to contact shallow groundwater during subsurface activities. Shallow perched groundwater was encountered during the investigation, particularly in the vicinity of the former HCL plant where six perched groundwater monitoring wells were installed (i.e., VII-MW-01P and VII-MW-03P through VII-MW-07P). Therefore, the construction worker was evaluated for direct contact exposure to shallow perched groundwater via the following pathways: incidental ingestion, dermal contact, and inhalation of volatile constituents in a trench during construction. A future construction worker was evaluated for the developed areas of the Site. A future construction worker on the wooded hillside is not considered a likely future receptor given the steep topography and location of the hillside which would make redevelopment difficult and unlikely.

Visitors to the Site are potential receptors that could be exposed to constituents via the same exposure routes as the outdoor worker. However, the magnitude of exposure of visitors would be significantly less than an outdoor worker. Therefore, risk characterization and subsequent mitigation (if warranted) measures for the outdoor workers would be protective of visitors. Accordingly, the outdoor worker receptors will be retained for the quantitative evaluation as a surrogate for current/future site visitors.

A youth trespasser is an individual who trespasses on the Site without permission (unauthorized access) under the current or a future land use scenario. The youth trespasser is assumed to be a resident of the area, age 11 to <16 years, who trespasses on the Site one day/week during the warmest months of the year (April through October). Intrusive activities, if any, conducted by this receptor are not expected to occur below 12 inches. Additionally, this receptor is expected to remain entirely outdoors. Based on these activities, the youth trespasser was evaluated for direct contact exposure to surface soil (i.e., incidental ingestion, dermal contact, and inhalation of volatile and particulate emissions in ambient air). Two separate youth trespasser scenarios were evaluated, including one scenario where trespassing occurs on the developed portions of the Site and a separate scenario where trespassing occurs on the undeveloped wooded hillside.

The CSM is depicted graphically on Figure 13.

3.4 QUANTIFICATION OF EXPOSURE

This section addresses the two primary aspects of exposure estimation: 1) constituent intakes; and 2) EPCs. Section 3.4.1 presents the equations used to calculate intake, or dose, and Section 3.4.2 presents the receptor specific intake assumptions used in these equations. Derivation of EPCs is discussed in Section 3.4.3.

3.4.1 Intake Equations and Receptor Specific Intake Assumptions

Equations used to calculate intake (or dose) are discussed in this section for incidental ingestion of soil, dermal contact with soil, and inhalation of volatiles or particulates. Standard USEPA equations were used to estimate intakes via these exposure routes.

Incidental Ingestion of Soil or Groundwater

Exposure to soil can result in a minor amount of incidental ingestion after hand to mouth contact. Similarly, incidental ingestion of groundwater can occur through splashing or hand-to-mouth contact during construction activities which expose groundwater. The estimated intake (or dose) through this exposure route is calculated as follows, in accordance with USEPA (1989):

$$\text{Ingestion Intake (mg/kg - day)} = \frac{C_S \times IR \times CF \times F_i \times EF \times ED}{BW \times AT}$$

Where:

C_S	=	constituent concentration in soil (mg/kg) or water (mg/L)
IR	=	ingestion rate of soil (mg/day) or water (L/day)
CF	=	conversion factor for soil exposure only (10^{-6} kg/mg)
F_i	=	fraction ingested from contaminated source (dimensionless)
EF	=	exposure frequency (days/year)
ED	=	exposure duration (years)

BW	=	body weight (kg)
AT	=	averaging time (period over which exposure is averaged in days)

Direct Dermal Contact with Soil

Direct physical contact with soil can result in the dermal absorption of constituents through the skin. The estimated intake (or absorbed dose) through this exposure route is calculated as follows, in accordance with USEPA (2004):

$$\text{Dermally Absorbed Dose (mg/kg - day)} = \frac{C_s \times CF \times AF \times ABS \times EF \times ED \times SA}{BW \times AT}$$

Where:

C_S	=	constituent concentration in soil (mg/kg)
CF	=	conversion factor (10^{-6} kg/mg)
AF	=	soil to skin adherence factor (mg/cm^2-event)
ABS	=	dermal absorption fraction (dimensionless)
EF	=	exposure frequency (days/year)
ED	=	exposure duration (years)
SA	=	skin surface area available for contact (cm^2)
EV	=	event frequency (events/day)
BW	=	body weight (kg)
AT	=	averaging time (period over which exposure is averaged in days)

Values for ABS are constituent-specific and were obtained from the Exhibit 3-4 of USEPA (2004). The soil ABS values used in this risk assessment are presented in Table 7.

Direct Dermal Contact with Groundwater

Direct physical contact with groundwater can result in the dermal absorption of constituents in groundwater through the skin. The estimated intake (or absorbed dose) through this exposure route is calculated as follows, in accordance with USEPA (2004):

$$\text{Dermally Absorbed Dose (mg/kg - day)} = \frac{DA_{event} \times EV \times ED \times EF \times SA}{BW \times AT}$$

Where DA_{event} is calculated for organic constituents as follows:

If $t_{event} \leq t^*$, then:

$$DA_{event}\ (mg/cm^2\text{ - event}) = 2FA \times K_p \times C_W \times \sqrt{\frac{6 \times \tau \times t_{event}}{\Pi}}$$

If $t_{event} > t^*$, then:

$$DA_{event}(mg/cm^2 - event) = FA \times K_p \times C_W \times \left[\frac{t_{event}}{1+B} + 2 \times \tau \times \left(\frac{1+3B+3B^2}{(1+B)^2}\right)\right]$$

And DA_{event} event is calculated for inorganics constituents as follows:

$$DA_{event}\ (mg/cm^2\text{ - event}) = K_p \times C_W \times t_{event}$$

Where:

EV	=	event frequency (events/day)
ED	=	exposure duration (years)
EF	=	exposure frequency (days/year)
SA	=	skin surface area available for contact (cm^2)
BW	=	body weight (kg)
AT	=	averaging time (period over which exposure is averaged in days)
FA	=	fraction adsorbed water (unitless)
Kp	=	constituent-specific dermal permeability coefficient (cm/hr)
Cw	=	constituent concentration in water (mg/cm^3)
τ	=	lag time per event (hours/event)
t_{event}	=	event duration (hours/event)
t^*	=	Time to reach steady-state (hr) $= 2.4 \times \tau$
π	=	3.14159265

B = dimensionless ratio of the permeability coefficient of a compound through the stratum corneum relative to its permeability coefficient across the viable epidermis (ve; dimensionless)

Inhalation of Volatiles and Particulates

In accordance with the USEPA (2009) Supplemental Guidance for Inhalation Risk Assessment, calculating an intake (or dose) is not recommended for evaluating exposure via the inhalation pathway. Instead, USEPA recommends when estimating risk via inhalation, risk assessors should use the concentration of the constituent in air as the exposure metric [e.g., milligrams per cubic meter ($mg/m^{3)}$)], rather than inhalation intake of a contaminant in air based on inhalation rates and body weight (e.g., mg/kg-day). Thus, instead of an intake calculation, an exposure concentration (EC) is calculated as follows:

$$EC\,(mg/m^3) = \frac{Ca \times ET \times EF \times ED}{AT}$$

Where:

Ca = constituent concentration in air (mg/m^3)

ET = exposure time (hours/day)

EF = exposure frequency (days/year)

ED = exposure duration (years)

AT = averaging time (period over which exposure is averaged in hours)

3.4.2 Receptor-Specific Intake Assumptions

Receptor specific intake assumptions quantify activity patterns and body characteristics for each of the receptors, such as the amount of time a receptor may spend at a site, the frequency the receptor visits the site, body weight of the receptor, and soil ingestion rates. The receptor specific intake assumptions presented in WVDEP (2020) and USEPA (2002, 2009, and 2011) along with values developed using professional judgement were used. These intake assumptions are provided

on Table 8 for a future outdoor worker, Table 9 for a future construction worker, and Table 10 for a current/future youth trespasser.

3.4.3 Exposure Point Concentrations

Potential exposure to constituents in the environment is directly proportional to the concentrations of constituents in environmental media and characteristics of exposure (e.g., frequency and duration). The concentrations at exposure points generally are referred to as EPCs. The analytical results for samples from a given medium were combined to derive a single EPC for each constituent that conservatively represents the level of that constituent to which potential receptors may be exposed. EPCs generally are estimated using measured concentrations in environmental media or estimated based on fate and transport models.

Depending on the distribution of the data, the proportion of the samples reported as nondetect, and the total number of samples, there are several statistical parameters that may be used to estimate EPCs. USEPA supplemental risk assessment guidance (USEPA, 1992) stipulates that EPC estimates should be based on the 95% upper confidence limit (95% UCL) of the arithmetic mean to estimate a reasonable maximum exposure (RME) scenario. RME conditions are defined by USEPA as the "highest exposure that is reasonably expected to occur at the site." The 95% UCL is used to evaluate all COCs except for lead. Additional discussion of EPCs is provided below.

EPCs for Soil Direct Contact

For constituents in surface and subsurface soil, EPCs were statistically calculated from sampling data. Sampling at the Site was biased toward potential source characterization. Accordingly, the data are expected to be representative of the maximum concentrations that could be encountered in any one portion of the Site and statistical analysis of the data are expected to yield reasonable upper confidence limits on mean concentrations across larger areas. The USEPA (2016) software package, ProUCL Version 5.1.00, was used to calculate 95% UCLs. Specifically, the following scenarios were evaluated:

- Data from the 83 surface soil samples (0 to 2 feet bgs) collected across the developed portions of the Site were combined to calculate EPCs for the future outdoor worker and current/future youth trespasser on the developed portion of the Site. The final EPC was selected as the lower of the 95% UCL or the maximum detected concentration (see Table 11). The calculated 95% UCL for arsenic in surface soil is 4.72 mg/Kg which is below the below WV background value of 13.1 mg/Kg. Therefore, arsenic was eliminated as a COC for surface soil. Similarly, the 95% UCL concentration for lead in surface soil is 156 mg/kg, which is below the residential De Minimis value of 400 mg/Kg. Therefore, lead was also eliminated as a COC for surface soil. It is noted that due to the numerous COCs that exceeded the residential De Minimis values in surface soil, and the potential that they may collectively contribute to unacceptable cumulative risks, EPCs were calculated for all COCs that exceeded the residential De Minimis value in surface soil and used to evaluate the nonresidential outdoor worker receptor;
- Data from the five surface soil samples (0 to 2 feet bgs) collected from the wooded hillside were combined to calculate EPCs for the current/future youth trespasser on the undeveloped wooded hillside. The final EPC was selected as the lower of the 95% UCL or the maximum detected concentration (see Table 12);
- Data from the 174 shallow subsurface soil samples (0 to 10 feet bgs) collected across the developed portions of the Site were combined to calculate EPCs for the future construction worker. The final EPC was selected as the lower of the 95% UCL or the maximum detected concentration (see Table 13). The calculated 95% UCL for arsenic in shallow subsurface soil is 5.02 mg/Kg which is below the below WV background value of 13.1 mg/Kg. The maximum arsenic concentration in subsurface soil is 13 mg/Kg, which is also below the WV background value of 13.1 mg/Kg. Therefore, arsenic was eliminated as a COC for shallow subsurface soil. Similarly, the 95% UCL concentration for lead in shallow subsurface soil is 160 mg/kg, which is below the residential De Minimis value of 400 mg/Kg. Therefore, lead was also eliminated as a COC for shallow subsurface soil. It is noted that due to the numerous COCs that exceeded the residential De Minimis values in shallow subsurface soil, and the potential that they may collectively contribute to unacceptable cumulative risks, EPCs were calculated for all COCs that exceeded the

residential De Minimis value in shallow soil and used to evaluate the nonresidential construction worker receptor; and

- Data from the six shallow perched groundwater monitoring wells located near the HCL Plant (i.e., VII-MW-01P and VII-MW-03P through VII-MW-07P) were combined to calculate EPCs for the future construction worker. The final EPCs were selected as the lower of the 95% UCL or the maximum detected concentration (see Table 14). The maximum lead concentration for lead in groundwater is 1 ug/L and the 95% UCL concentration for lead in groundwater is 0.94 ug/L, both of which are below the groundwater De Minimis value of 15 ug/L. Therefore, lead was eliminated as a COC for groundwater.

Where field duplicate samples were collected, the analytical results for the parent and duplicate sample were maintained as two distinct samples to calculate EPCs. The ProUCL statistical output is provided in Appendix C.

EPCs for Volatiles in Ambient Air

Air concentrations for constituents resulting from volatile emissions were estimated using a volatilization factor (VF). The VF relates the concentration of a constituent in soil to the estimated concentration in ambient air. For this assessment, site-specific VFs were calculated using Equations 4-8 of USEPA (2002) for an outdoor worker and trespasser and Equation 5-14 of USEPA (2002) for a construction worker. The VF calculations and site-specific inputs are provided in Table 15 for and outdoor worker and trespassers and Table 16 for a construction worker. Soil EPCs are converted to air concentrations by dividing the EPC by the VF to obtain an air concentration in units of mg/m^3.

EPCs for Particulates in Ambient Air

For receptors not involved in intrusive subsurface soil activities at the Site, ambient air concentrations of constituents resulting from fugitive dust emissions were calculated using USEPA's default particulate emission factor (PEF) of 1.316×10^9 m^3/kg (USEPA, 2021a). The PEF relates the concentration of a constituent in soil to the estimated concentration in respirable

airborne particulates. Specifically, soil EPCs are converted to a respirable airborne particulate concentration by dividing the EPC by the default PEF.

For the construction worker, who would be involved in intrusive subsurface soil activities at the Site, a PEF was calculated using Equation 5-5 of USEPA (2002), which calculates emissions from unpaved road construction traffic. This calculation and the resulting construction worker PEF of 6.9E+06 m^3/kg are presented in Table 17.

4.0 TOXICITY ASSESSMENT

The objective of this section is to identify the potential health hazards associated with exposure to each COC and to identify appropriate "dose-response" parameters (or toxicity values) to be used to quantify such health hazards. A dose-response relationship correlates the magnitude of the intake of a chemical (the amount that is absorbed by, or administered to, a receptor) with the increased likelihood or severity of adverse effects resulting from that intake.

Contaminant dose-response relationships have been investigated by means of epidemiological and clinical studies. Data from human and animal studies are weighed in an effort to derive toxicity values which are quantitative estimates of the incidence of adverse effects. The toxicity values used to evaluate carcinogenic effects include Cancer Slope Factors (CSFs) for the oral and dermal pathways and Inhalation Unit Risks (IURs) for the inhalation pathway. Toxicity values used to evaluate non-carcinogenic health effects include Reference Doses (RfD) for the oral and dermal pathways, and inhalation Reference Concentrations (RfCs) for the inhalation pathway.

Toxicity values found in literature are most often expressed as administered doses; therefore, these values are considered to be inappropriate for estimating the risks associated with dermal routes of exposure (expressed as an absorbed dose). Oral toxicity values based on administered doses must be adjusted to absorbed doses to accommodate dermal risk assessment. The adjustment to an absorbed dose is made using chemical-specific absorption efficiencies available in USEPA (2004).

Toxicity values used in the risk assessment were obtained from USEPA's Integrated Risk Information System (IRIS; USEPA, 2021c) where available. In the absence of a value from IRIS, the toxicity values presented in the USEPA (2021a) RSL tables were used, since the USEPA's hierarchy of toxicity values is consistent with the hierarchy specified by the WVDEP VRP, with the exception of vanadium and mercury. In accordance with WVDEP policy, toxicity values for vanadium pentoxide have been used as proxy values for vanadium. Additionally, in accordance with WVDEP policy, the California EPA RfD for mercury was used.

Toxicity values and the source of the values used in this assessment are summarized in Tables 18 (cancer values), 19 (chronic noncancer values), and 20 (subchronic noncancer values). The remainder of this section discusses the various dose-response parameters used for the purposes of this assessment. Cancer toxicity values are discussed further in Section 4.1 and noncancer toxicity values are discussed further in Section 4.2.

4.1 POTENTIAL CARCINOGENIC TOXICITY VALUES

Oral CSFs are used to evaluate potential carcinogenic risks from exposure via the ingestion pathway. CSFs are plausible upper-bound estimates of the probability of a human receptor developing cancer over their lifetime (assuming a 70-year lifetime) as a result of exposure to a known or potential carcinogen. A CSF is usually accompanied by a provisional weight-of-evidence classification, which indicates the strength of the evidence that the agent is a human carcinogen. Based on data collected from animal and human studies, USEPA (1986) developed the following weight-of-evidence classifications:

- Group A constituents (known human carcinogens) are agents for which there is sufficient evidence to support a causal association between exposure to the agents in humans and cancer;
- Group B1 constituents (probable human carcinogens) are agents for which there is limited evidence of carcinogenicity in humans;
- Group B2 constituents (probable human carcinogens) are agents for which there is sufficient evidence of carcinogenicity in animals but inadequate or no evidence in humans;
- Group C constituents (possible human carcinogens) are agents for which there is limited evidence of carcinogenicity in animals and inadequate or no human data;
- Group D constituents (not classifiable as to human carcinogenicity) are agents with inadequate human and animal evidence of carcinogenicity or for which no data are available; and
- Group E constituents (evidence of noncarcinogenicity in humans) are agents for which there is no evidence of carcinogenicity from human or animal studies, or both.

CSFs are expressed in units of $(mg/kg/day)^{-1}$ and are derived through an assumed low dosage linear relationship and an extrapolation from high to low dose responses determined from animal studies. In general, the value used in reporting the CSF is the upper 95% confidence limit of the slope of the dose-response curve. The estimation of CSFs is usually performed for Class A, B1, and B2 carcinogens. A Class C carcinogen may or may not have a published CSF.

In March 2005, USEPA published the Final Guidelines for Carcinogen Risk Assessment (USEPA, 2005a). Under these guidelines, the "Groups A, B1…" will no longer be recognized. Instead, new descriptors have been developed and will be assigned by the agency. These descriptors include:

Carcinogenic to Humans: This descriptor is appropriate when there is convincing epidemiologic evidence demonstrating causality between human exposure and cancer, or exceptionally when there is strong epidemiological evidence, extensive animal evidence, knowledge of the mode of action and information that the mode of action is anticipated to occur in humans and progress to tumors.

Likely to be Carcinogenic to Humans: This descriptor is appropriate when the available tumor effects and other key data are adequate to demonstrate carcinogenic potential to humans, but does not reach the weight-of-evidence for the descriptor "carcinogenic to humans".

Suggestive Evidence of Carcinogenic Potential: This descriptor is appropriate when the evidence from human or animal data is suggestive of carcinogenicity, which raises a concern for carcinogenic effects but is judged not sufficient for a stronger conclusion.

Inadequate Information to Assess Carcinogenic Potential: This descriptor is used when available data are judged inadequate to perform an assessment.

Not Likely to be Carcinogenic to Humans: This descriptor is used when the available data are considered robust for deciding that there is no basis for human hazard concern.

This human health risk assessment (HHRA) recognizes the re-classification of carcinogens; however, USEPA has only reviewed and updated a very limited number of constituents under these

updated guidelines. Therefore, both the USEPA (1986) and (2005a) approaches for classification of carcinogens are recognized in this HHRA.

IURs are used to evaluate potential carcinogenic risks from exposure via the inhalation pathway. The IUR is defined as the upper-bound excess lifetime cancer risk estimated to result from continuous exposure to an agent at a concentration of 1 $\mu g/m^3$ in air. Inhalation unit risk toxicity values are expressed in units of $(\mu g/m^3)^{-1}$.

Finally, oral toxicity values based on administered doses must be adjusted to absorbed doses to evaluate the dermal exposure pathway. Therefore, dermal CSFs are derived from the oral CSFs using gastrointestinal absorption efficiencies. Specifically, an oral CSF is converted to a dermal CSF using the following equation from USEPA (2004):

$$CSF_{dermal} = \frac{CSF_{oral}}{GIABS}$$

Where:

CSF_{dermal}	=	Dermal CSF $(mg/kg/day)^{-1}$
CSF_{oral}	=	Oral CSF $(mg/kg/day)^{-1}$
GIABS	=	Gastrointestinal absorption efficiency (dimensionless)

Constituent-specific GIABS are provided in Exhibit 4-1 of USEPA (2004). Cancer Slope Factors, weight-of-evidence classifications, IURs, and constituent-specific GIABS values are provided in Table 18.

4.1.1 Assessing the Mutagenic Mode of Action for Potential Carcinogens

The Guidelines for Carcinogen Risk Assessment (USEPA, 2005a) and Supplemental Guidance for Assessing Susceptibility from Early-Life Exposure to Carcinogens (USEPA, 2005b) address a number of issues pertaining to cancer risks associated with early-life exposures. Specifically, USEPA (2005b) provides guidance on potency adjustment for carcinogens acting through a mutagenic mode of action. For such substances, this guidance recommends a default approach

using estimates from chronic studies with appropriate modifications to address the potential for differential risk of early-life stage exposure. Default adjustment factors are recommended for use in the absence of constituent-specific data to assess cancer susceptibility from early-life exposure to a carcinogen acting through a mutagenic mode of action.

Accordingly, the CSFs and IURs for benzo[a]anthracene, benzo[a]pyrene, benzo[b]fluoranthene, benzo[k]fluoranthene, chrysene, dibenz(a,h)anthracene, and indeno[1,2,3-cd]pyrene were increased by a factor of 3 to account for mutagenic modes of action for the youth trespasser age 11 to <16.

4.2 NONCARCINOGENIC TOXICITY VALUES

Noncarcinogenic RfDs and RfCs are an estimate (with uncertainty spanning perhaps an order of magnitude) of a daily exposure to the human population (including sensitive subgroups) that is likely to be without an appreciable risk of deleterious effects during a lifetime. Noncarcinogenic toxicity values are usually derived from a Point-of-Departure (POD) and/or Benchmark Dose (BMD) value determination between the no observed adverse effect level (NOAEL) and the lowest observed adverse effect level (LOAEL), as determined from laboratory animal studies or human data. The NOAEL is the highest dose at which no adverse effects occur, while the LOAEL is the lowest dose at which adverse effects are discernable. USEPA has developed both chronic (long-term) and subchronic (short-term) noncancer toxicity values. For the purposes of this risk assessment, chronic values were used to estimate potential risk to identified receptors, except for the construction worker. Due to the subchronic exposure duration for the construction worker, subchronic noncancer toxicity values were used, when available, for this receptor. In the absence of a subchronic value, the chronic value was used.

RfDs (used to evaluate the oral exposure route) are expressed in units of dose (mg/kg-day), while RfCs (used to evaluate the inhalation exposure route) are expressed as concentrations (mg/m^3). Both types of toxicity values incorporate uncertainty factors to account for limitations in the quality or quantity of available data. Specifically, an uncertainty factor of 10 is used to account for variations in the general population (to protect sensitive sub-populations), when extrapolating

test results from animals to human (to account for interspecies variability), when a NOAEL derived from a subchronic study (instead of a chronic study) is used to develop the RfD, and when a LOAEL is used instead of a NOAEL. In addition, the USEPA reserves the use of a modifying factor of up to 10 based on professional judgment regarding data uncertainties not already considered.

The RfD incorporates the surety of the evidence for chronic human health effects. Even if applicable human data exist, the RfD (as diminished by the uncertainty factor) still maintains a margin of safety so that chronic human health effects are not underestimated. Thus, the RfD is an acceptable guideline for evaluation of non-carcinogenic risk, although the associated uncertainties preclude its use for precise risk quantitation.

Finally, oral toxicity values based on administered doses must be adjusted to absorbed doses to evaluate the dermal exposure pathway. Therefore, dermal RfDs are derived from the oral RfDs using gastrointestinal absorption efficiencies. Specifically, an oral RfD is converted to a dermal RfD using the following equation from USEPA (2004):

$$RfD_{dermal} = RfD_{oral} \times GIABS$$

Where:

RfD_{dermal}	=	Dermal Reference Dose (mg/kg/day)
RfD_{oral}	=	Oral Reference Dose (mg/kg/day)
GIABS	=	Gastrointestinal absorption efficiency (dimensionless)

Constituent-specific GIABS are provided in Exhibit 4-1 of USEPA (2004). RfDs, RfCs, and GIABS are provided in Tables 19 (chronic) and 20 (subchronic).

5.0 RISK CHARACTERIZATION

"Risk characterization" is the description of the nature and magnitude of potential human health risk, including uncertainty. Risk characterization integrates the results of the Exposure Assessment and Toxicity Assessment to estimate theoretical excess lifetime cancer risks (ELCRs) and noncarcinogenic health effects associated with exposure to chemicals. This integration provides quantitative estimates of either cancer risk or noncancer hazard indices (HIs), which are compared to standards of acceptable risk.

For every complete exposure pathway identified in the Exposure Assessment, the noncarcinogenic HI and the theoretical ELCRs were estimated according to a reasonable maximum exposure (RME) scenario. Risk quantification methods are discussed for carcinogenic and noncarcinogenic effects in this section.

5.1 RISK ESTIMATION METHODS

Quantitative estimates of risk are calculated according to risk assessment methods outlined in current guidance (USEPA, 1989, 2002, 2004, and 2009). ELCR are expressed in the form of dimensionless probabilities based on CSFs and IURs and carcinogenic intake estimates. Non-carcinogenic risk estimates are presented in the form of Hazard Quotients (or HIs) that are determined through a comparison of intakes with published (or derived) RfDs and RfCs.

5.1.1 Cancer Risk Estimation Methods

Carcinogenic risk is a dimensionless expression of an individual's increased likelihood of developing cancer over a lifetime due to exposure to Site-associated constituents. For the oral and dermal exposure pathways, the ELCR for each COC is calculated by multiplying the estimated intake by the CSF as follows:

$$\text{Intake} \times \text{CSF} = \text{ELCR}$$

For the inhalation exposure pathway, the ELCR for each COC is calculated by multiplying the EC by the IUR as follows:

$$EC \times IUR = ELCR$$

The equations for calculating intake for the oral and dermal pathways and for calculating the EC for the inhalation pathway were presented in Section 3.4.1.

The ELCRs for each COC associated with a given exposure pathway are summed to calculate a total ELCR for the pathway. Additionally, if a receptor is subject to exposure through more than one pathway, the ELCR for all pathways are summed to generate the overall ELCR for a given receptor. This approach assumes that the critical effect is the same for all of the carcinogenic COCs (i.e., cancer).

Calculated cancer risks should be recognized as an upper-limit estimate of potential risk. CSFs are the upper 95% confidence limit of a dose-response curve, which is generally derived from animal studies. Actual human risk, while not identifiable, is not expected to exceed the upper limit based on the CSFs and, in fact, may be lower. WVDEP (2020) has identified 1×10^{-5} as the acceptable risk benchmark for nonresidential scenarios and 1×10^{-6} as the acceptable risk benchmark for trespasser scenarios.

5.1.2 Noncarcinogenic Risk Estimation Methods

Noncarcinogenic responses are evaluated numerically using parameters known as the hazard quotient (HQ) and hazard index (HI). For oral and dermal exposure pathways, the HQ is calculated by dividing the estimated intake by the RfD as follows:

$$Intake \div RfD = HQ$$

For the inhalation exposure pathway, the HQ is calculated by dividing the EC by the RfC as follows:

$$EC \div RfC = HQ$$

The equations for calculating intake for the oral and dermal pathways and for calculating the EC for the inhalation pathway were presented in Section 3.4.1.

HQs for each COC associated with a given exposure pathway are summed to yield the HI. Additionally, if a receptor is subject to exposure through more than one pathway, the HIs for all pathways are summed to generate the total HI for a given receptor. If the value of the HI exceeds unity (1), there is a potential for noncarcinogenic health risk associated with the estimated exposure. However, HIs are most appropriately derived for constituents that act on the same target organ or have similar critical effect. Therefore, if the total HI across all COCs and all pathways exceeds 1, it is appropriate to segregate the COCs by the potential toxic endpoints and/or target organs and derive separate HIs for each group having similar effects (i.e., not all non-carcinogenic health effects are additive).

The HI is not a mathematical prediction of the severity of toxic effects and, therefore, is not a true "risk"; it is simply a numerical indicator of the possibility of the occurrence of non-carcinogenic (threshold) effects.

5.2 RISK ASSESSMENT RESULTS

The complete risk calculations, which combine the exposure assessment (Section 3.0), toxicity assessment (Section 4.0), and risk characterization (Section 5.0), are presented in the risk calculation spreadsheets included in Appendix E. Table 21 presents a summary of the risk assessment results, including the potential ELCRs and noncancer HIs for the complete exposure pathways and receptors identified for the Site. The potential cancer risks were compared to the WVDEP benchmark of 1×10^{-5} for nonresidential scenarios and the WVDEP benchmark of

1×10^{-6} for the trespasser scenarios. Noncancer HIs were compared to the USEPA benchmark of 1.0. As shown in Table 21, results of this comparison indicate the following:

- For a future outdoor worker potentially exposed to surface soil across the developed areas of the Site, the noncancer HI is $8x10^{1}$, which is below the WVDEP benchmark of 1 and the potential ELCR is $4x10^{-6}$, which is below the WVDEP benchmark of $1x10^{-5}$;
- For a current/future youth trespasser (age 11 up to 16 years) on the developed areas of the Site potentially exposed to surface soil, the noncancer HI is $1x10^{-1}$, which is below the WVDEP benchmark of 1 and the potential ELCR is $3x10^{-7}$, which is below the WVDEP benchmark of $1x10^{-6}$;
- For a future construction worker potentially exposed to shallow soil from 0 to 10 feet bgs across the developed portions of the Site, the noncancer HI is $1x10^{1}$, which exceeds the WVDEP benchmark of 1 and the potential ELCR is $3x10^{-6}$, which is below the WVDEP benchmark of $1x10^{-5}$. The noncancer HI is driven by inhalation of manganese particulates in ambient air during construction and inhalation of naphthalene volatiles (in the former HCL Plant area) from groundwater while working in a trench; and
- For a current/future youth trespasser (age 11 up to 16 years) on the undeveloped wooded hillside potentially exposed to surface soil, the noncancer HI is $3x10^{-2}$, which is below the WVDEP benchmark of 1 and the potential ELCR is $4x10^{-7}$, which is below the WVDEP benchmark of $1x10^{-6}$.

Based on the results presented above, further evaluation is warranted for a future construction worker potentially exposed via inhalation of manganese particulates in ambient air during construction and inhalation of naphthalene volatiles from groundwater while working in a trench.

6.0 UNCERTAINTIES

Uncertainties are inherent in every quantitative risk assessment. USEPA (1989) guidance stresses the importance of providing a complete analysis of uncertainties so that risk management decisions take these uncertainties into account when evaluating risk assessment conclusions. The uncertainty analysis provides a context for better understanding the assessment conclusions by identifying the uncertainties that have most significantly affected the assessment results. Therefore, sources of uncertainty in the hazard identification, exposure assessment, and toxicity assessment were identified and qualitatively evaluated. In summary, multiple sources of uncertainty exist with respect to the HHRA such that the assessment is likely to be overly conservative. The following provides a discussion of these uncertainties.

Analytical Data and EPCs: Sampling and analysis conducted at the Site was focused on potential source areas. In some cases, the resulting dataset was insufficient to calculate 95% UCLs, resulting in EPCs based on maximum detected concentrations. Actual exposures are more likely to occur at lower concentrations since the exposure areas are likely to be much larger than the individual sources considered. The use of maximum observed concentrations most likely results in overestimates of human health risks.

Toxicity Values: Toxicity information is seldom based on actual human data. Extrapolation of animal data to humans and the extrapolation of effects observed at high doses to low doses results in substantial uncertainty. Uncertainties in toxicity information are routinely addressed by the USEPA via the use of 95th percentile estimates for cancer slope factors and through the use of uncertainty factors and modifying factors for References Doses. USEPA toxicity values are designed to err on the conservative side. Hence, carcinogenic and noncarcinogenic risks are likely overestimated based on the toxicity information alone.

Chemical Interactions: The interactions between chemicals may change the dose-response relationships observed for chemicals tested in isolation, leading to adverse effects at lower than expected doses or additional toxic effects that would not be predicted based on the toxicity of individual components. These potential synergistic or antagonistic interactions among COCs are

unknown and have not been quantified in this risk assessment. Therefore, the calculated risks may be over or under estimated.

Exposure Factors: Uncertainty exists with respect to the selection of receptor characteristics (e.g., body weight) and exposure input parameters (ingestion rates, exposed skin surface area, etc.). Such input parameters are generally based on population data that encompasses a broad range of values. Input parameters used for the exposure assessment are typically at least the 50th percentile and are more routinely the 90th percentile or greater. These exposure factors may result in an overestimation or an underestimation of actual risks.

7.0 SUMMARY AND CONCLUSIONS

This human health and ecological risk assessment has been prepared for CAA VIM and VIIM of the MJSW Site located along Main Street in the City of Weirton, Hancock County, West Virginia. The Site was used for steel processing operations since 1909. CAA VIM was the Former Iron--Making Area while CAA VIIM was the Former Steel-Making Area. CAAs VIM and VIIM occupy approximately 282 acres within the central portion of the overall property. The Site and surrounding property is subject to a Resource Conservation and Recovery Act (RCRA) Corrective Action Administrative Order issued to the Weirton Steel Corporation (former property owner) by the USEPA in September 1996 to perform investigation and remediation activities at WSC's steel manufacturing facility. CAAs VIM and VIIM were entered into the VRP in May 2020.

Iron and steel-making operations ceased at the Facility in the early 2000s. Currently, the Site is not used. Activities performed in CAAs VIM and VIIM by MJSW since taking ownership in 2017 have primarily included dismantling existing buildings/structures in preparation for site redevelopment. The expected future land use is industrial or commercial. Future residential use of the Site will be prohibited for the Site via a land use covenant.

The VRP assessment of the Site included sampling and analysis of surface soil, subsurface soil, and groundwater to evaluate the potential for releases of hazardous constituents to the environment. COCs identified for soil generally included several PAHs, PCB-1254, PCB-1260, and several inorganics and for groundwater included VOCs, PAHs, and several inorganics. No COCs were identified for an industrial/commercial vapor intrusion to indoor air pathway or the downgradient groundwater migration to surface water pathway. The ecological screening evaluation consisted of an assessment of the physical and ecological characteristics of the Site and the nature and extent of contamination to determine if there are complete exposure pathways to ecological receptors of concern. The screening evaluation indicated that there are no potentially complete exposure pathways for ecological receptors to contact impacted media at the Site. Additionally, future residential use of the Site will be prohibited for the Site via a land use covenant and future potable use of groundwater is prohibited via a city ordinance making these potential exposure pathways incomplete.

Based on the COCs and the complete exposure pathways identified, a quantitative risk assessment was conducted for future outdoor workers, current/future trespassers, and future construction workers potentially exposed to soil and groundwater. Calculated ELCRs and noncancer HIs were acceptable for all receptors evaluated except for the future construction worker. Unacceptable risks were identified for a future construction worker potentially exposed via inhalation of manganese particulates in ambient air during construction and inhalation of naphthalene volatiles from groundwater while working in a trench.

Based on the results of the risk assessment, further evaluation is warranted for a future construction worker to reduce or eliminate potential unacceptable exposure. Accordingly, a Remedial Action Work Plan (RAWP) will be prepared for the Site.

8.0 REFERENCES

Voluntary Remediation Program Application submitted by the Business Development Corporation of the Northern Panhandle to the West Virginia Department of Environmental Protection (WVDEP) on February 18, 2020, revised and resubmitted on April 10, 2020.

Voluntary Remediation Agreement, VRP Site Number 20015, executed between the Business Development Corporation of the Northern Panhandle, Mingo Junction Steel Works, LLC, and the WVDEP on May 1, 2020.

Civil & Environmental Consultants, Inc. (CEC, 2021). Site Assessment Report. Mingo Junction Steel Works – Corrective Action Areas VIM and VIIM, Weirton, Hancock County, West Virginia, VRP Project # 20015. June 29, 2020, Revised January 28, 2021, Revised March 17, 2021.

United States Environmental Protection Agency (USEPA; 1986) Guidelines for Carcinogen Risk Assessment. Federal Register 16 51(185):33992-34003.

United States Environmental Protection Agency (USEPA, 1989) Risk Assessment Guidance for Superfund. Volume I, Part A. Human Health Evaluation Manual. EPA/540/1-89/002.

United States Environmental Protection Agency (USEPA, 1991) Human Health Evaluation Manual, Supplemental Guidance: "Standard default exposure factors (PDF)". OSWER Directive 9285.6-03.

United States Environmental Protection Agency (USEPA, 1992) Supplemental Guidance to RAGS: Calculating the Concentration Term (Office of Solid Waste and Emergency Response, USEPA, Washington, DC).

United States Environmental Protection Agency (USEPA, 2002) Supplemental Guidance for Calculating Soil Screening Levels for Superfund Sites. Office of Solid Waste and Emergency Response. December.

United States Environmental Protection Agency (USEPA, 2004) Risk Assessment Guidance for Superfund. Volume I - Human Health Evaluation Manual, Part E (Supplemental Guidance for Dermal Risk Assessment). Office of Superfund Remediation and Technology Innovation. EPA/540/R/99/005. July 2004.

United States Environmental Protection Agency (USEPA; 2005a) Guidelines for Carcinogen Risk Assessment. EPA/630/P-03/--1F. March 2005.

United States Environmental Protection Agency (USEPA, 2005b) Supplemental Guidance for Assessing Cancer Susceptibility from Early-life Exposure to Carcinogens. Risk Assessment Forum, Washington, DC.

United States Environmental Protection Agency (USEPA, 2009) Risk Assessment Guidance for Superfund. Volume I, Part F. Supplemental Guidance for Inhalation Risk Assessment. EPA/540/R-070/002. January 2009.

United States Environmental Protection Agency (USEPA, 2011) Exposure Factors Handbook: 2011 Edition. EPA/600/R-090/052F. September 2011.

United States Environmental Protection Agency (USEPA, 2016) ProUCL Version 5.1.00 Software Package and Guidance Manual developed by Lockheed Martin Environmental Services, and distributed by USEPA, Office of Research and Development.

United States Environmental Protection Agency (USEPA, 2021a) Regional Screening Levels Calculator for Chemical Contaminants at Superfund Sites. https://www.epa.gov/risk/regional-screening-levels-rsls-generic-tables. May 2021.

United States Environmental Protection Agency (USEPA, 2021b) Vapor Intrusion Screening Level (VISL) Calculator. https://www.epa.gov/vaporintrusion/vapor-intrusion-screening-level-calculator. May 2021.

United States Environmental Protection Agency (USEPA, 2021c) Integrated Risk Information System (IRIS). www.epa.gov/iris. June 2021.

West Virginia Department of Environmental Protection (WVDEP, 2016). Title 47, Series 2: Requirements Governing Water Quality Standards. Effective July 8, 2016.

West Virginia Department of Environmental Protection (WVDEP, 2020a). West Virginia Voluntary Remediation and Redevelopment Act Guidance Manual. June 2020.

West Virginia Department of Environmental Protection (WVDEP, 2020b). Table 60-3B De Minimis Table (http://www.dep.wv.gov/dlr/oer/voluntarymain/Pages/default.aspx). Effective June 1, 2020.

West Virginia Department of Environmental Protection (WVDEP, 2020c). Letter from Ms. Erin Brittain, CHMM, WVDEP Project Manager to Mr. Marvin Six, Business Development Corporation of the Northern Panhandle and Mr. Craig Slater, Mingo Junction Steel Works, LLC, Site Assessment Report Comments, VRP Project #20015. July 27, 2020.

West Virginia Department of Environmental Protection (WVDEP, 2021a). Letter from Ms. Erin Brittain, CHMM, WVDEP Project Manager to Mr. Marvin Six, Business Development Corporation of the Northern Panhandle and Mr. Craig Slater, Mingo Junction Steel Works, LLC, Revised Site Assessment Report Comments, VRP Project #20015. March 4, 2021.

West Virginia Department of Environmental Protection (WVDEP, 2021b). Letter from Ms. Erin Brittain, CHMM, WVDEP Project Manager to Mr. Marvin Six, Business Development Corporation of the Northern Panhandle and Mr. Craig Slater, Mingo Junction Steel Works, LLC, Revised Site Assessment Report Approval, VRP Project #20015. April 16, 2021.

TABLES

TABLE 1
IDENTIFICATION OF CONTAMINANTS OF CONCERN IN SURFACE SOIL - DEVELOPED AREAS[1]
CAA VIM AND VIIM
MINGO JUNCTION STEEL WORKS LLC - WEIRTON FACILITY

Constituent	Units	Number of Samples[2]	Number of Detections	Detection Limit Range		Detected Concentration Range[3]		Sample with Max Detect	Screening Results[4]			
				Min	Max	Min	Max		Residential Direct Contact	Does Max Exceed?	Industrial Direct Contact	Does Max Exceed?
Volatile Organic Compounds												
Benzene	mg/kg	70	0	0.0007	0.057	ND	ND	NA	1.2	NO	5.1	NO
Toluene	mg/kg	70	16	0.00076	0.048	0.00084	0.65	VI-SS-07(0-0.5)	490	NO	820	NO
Ethylbenzene	mg/kg	70	4	0.00067	0.035	0.0035	1.4	VI-SS-07(0-0.5)	5.8	NO	25	NO
Xylenes, Total	mg/kg	70	5	0.0023	0.11	0.0038	6.9	VI-SS-07(0-0.5)	58	NO	250	NO
1,1,1-Trichloroethane	mg/kg	66	0	0.0005	0.059	ND	ND	NA	640	NO	640	NO
1,1,2,2-Tetrachloroethane	mg/kg	66	0	0.00074	0.054	ND	ND	NA	0.6	NO	2.7	NO
1,1,2-Trichloro-1,2,2-trifluoroethane	mg/kg	66	0	0.0011	0.019	ND	ND	NA	670	NO	910	NO
1,1,2-Trichloroethane	mg/kg	66	0	0.00086	0.067	ND	ND	NA	0.15	NO	0.63	NO
1,1-Dichloroethane	mg/kg	66	0	0.0006	0.058	ND	ND	NA	3.6	NO	16	NO
1,1-Dichloroethene	mg/kg	66	0	0.00088	0.061	ND	ND	NA	23	NO	100	NO
1,2,4-Trichlorobenzene	mg/kg	66	2	0.00091	0.022	0.47	1.9	VII-SS-49(0-0.6)	5.8	NO	26	NO
1,2-Dibromo-3-Chloropropane	mg/kg	66	0	0.00078	***0.02***	ND	ND	NA	0.0053	NO	0.064	NO
1,2-Dibromoethane (EDB)	mg/kg	66	0	0.00089	0.035	ND	ND	NA	0.036	NO	0.16	NO
1,2-Dichlorobenzene	mg/kg	66	1	0.00083	0.039	0.0013	0.0013	VII-SS-28(0-2)	180	NO	380	NO
1,2-Dichloroethane	mg/kg	66	0	0.00064	0.055	ND	ND	NA	0.46	NO	2	NO
1,2-Dichloroethene, Total	mg/kg	65	16	0.0013	0.055	0.0014	0.0049	VII-SS-40(0-0.5)	- -		- -	
cis-1,2-Dichloroethene	mg/kg	66	0	0.00073	0.038	ND	ND	NA	16	NO	81	NO
trans-1,2-Dichloroethene	mg/kg	66	24	0.00062	0.043	0.00075	0.0049	VII-SS-40(0-0.5)	7	NO	30	NO
1,2-Dichloropropane	mg/kg	66	0	0.00056	0.073	ND	ND	NA	1.1	NO	6.6	NO
cis-1,3-Dichloropropene [4]	mg/kg	66	0	0.0007	0.042	ND	ND	NA	1.8	NO	8.2	NO
trans-1,3-Dichloropropene [4]	mg/kg	66	0	0.00062	0.034	ND	ND	NA	1.8	NO	8.2	NO
1,3-Dichlorobenzene [4]	mg/kg	66	0	0.00068	0.029	ND	ND	NA	2.6	NO	11	NO
1,4-Dichlorobenzene	mg/kg	66	0	0.00066	0.03	ND	ND	NA	2.6	NO	11	NO
2-Butanone (MEK)	mg/kg	66	1	0.00091	0.062	0.01	0.01	VII-SS-30(0-0.5)	2700	NO	19000	NO
2-Hexanone	mg/kg	66	0	0.00072	0.033	ND	ND	NA	20	NO	130	NO
4-Methyl-2-pentanone (MIBK)	mg/kg	66	0	0.00068	0.034	ND	ND	NA	3300	NO	3400	NO
Acetone	mg/kg	65	17	0.0052	0.29	0.006	0.062	VII-SS-30(0-0.5)	6100	NO	67000	NO
Bromoform	mg/kg	66	0	0.00046	0.061	ND	ND	NA	19	NO	86	NO
Bromomethane	mg/kg	20	0	0.00077	0.09	ND	ND	NA	0.68	NO	3	NO
Carbon disulfide	mg/kg	66	6	0.00053	0.062	0.00068	0.016	VII-SS-30(0-0.5)	77	NO	350	NO
Carbon tetrachloride	mg/kg	66	0	0.00046	0.062	ND	ND	NA	0.65	NO	2.9	NO
Chlorobenzene	mg/kg	66	1	0.00078	0.03	0.033	0.033	VI-SS-07(0-0.5)	28	NO	130	NO
Chlorodibromomethane	mg/kg	66	0	0.00074	0.037	ND	ND	NA	8.3	NO	39	NO
Chloroethane	mg/kg	59	0	0.0016	0.043	ND	ND	NA	1400	NO	2100	NO
Chloroform	mg/kg	66	30	0.00061	0.058	0.00067	0.00098	VII-SS-28(0-2)	0.32	NO	1.4	NO
Chloromethane	mg/kg	66	0	0.00088	0.08	ND	ND	NA	11	NO	46	NO
Cyclohexane	mg/kg	66	0	0.00038	0.034	ND	ND	NA	120	NO	120	NO
Dichlorobromomethane	mg/kg	66	0	0.00058	0.054	ND	ND	NA	0.29	NO	1.3	NO

TABLE 1
IDENTIFICATION OF CONTAMINANTS OF CONCERN IN SURFACE SOIL - DEVELOPED AREAS[1]
CAA VIM AND VIIM
MINGO JUNCTION STEEL WORKS LLC - WEIRTON FACILITY

Constituent	Units	Number of Samples[2]	Number of Detections	Detection Limit Range		Detected Concentration Range[3]		Sample with Max Detect	Screening Results[4]			
				Min	Max	Min	Max		Residential Direct Contact	Does Max Exceed?	Industrial Direct Contact	Does Max Exceed?
Dichlorodifluoromethane	mg/kg	66	0	0.00069	0.037	ND	ND	NA	8.7	NO	37	NO
Isopropylbenzene	mg/kg	66	2	0.0007	0.031	0.0018	0.33	VI-SS-07(0-0.5)	190	NO	270	NO
Methyl acetate	mg/kg	66	0	0.00093	0.071	ND	ND	NA	7800	NO	29000	NO
Methyl tert-butyl ether	mg/kg	66	0	0.00077	0.059	ND	ND	NA	47	NO	210	NO
Methylcyclohexane [4]	mg/kg	66	2	0.00075	0.032	0.06	0.12	VI-SS-07(0-0.5)	120	NO	120	NO
Methylene Chloride	mg/kg	66	54	0.00077	0.063	0.00079	0.0054	VII-SS-31(0-0.6)	35	NO	320	NO
Styrene	mg/kg	66	0	0.00073	0.037	ND	ND	NA	600	NO	870	NO
Tetrachloroethene	mg/kg	66	0	0.0007	0.047	ND	ND	NA	8.1	NO	39	NO
Trichloroethene	mg/kg	66	0	0.00068	0.046	ND	ND	NA	0.41	NO	1.9	NO
Trichlorofluoromethane	mg/kg	66	0	0.00095	0.064	ND	ND	NA	790	NO	1200	NO
Vinyl chloride	mg/kg	66	0	0.00049	***0.074***	ND	ND	NA	0.057	NO	1.7	NO
Semi-Volatile Organic Compounds												
Acenaphthene	mg/kg	78	25	0.0053	0.73	0.0079	20	VI-SS-07(0-0.5)	360	NO	4500	NO
Acenaphthylene [4]	mg/kg	78	27	0.0054	0.87	0.0095	5.8	VII-SS-41(0-1)	360	NO	4500	NO
Anthracene	mg/kg	78	49	0.0058	0.74	0.0087	16	VI-SS-07(0-0.5)	1800	NO	23000	NO
Benzo[a]anthracene	mg/kg	78	66	0.0088	***0.95***	0.009	48	VI-SS-07(0-0.5)	0.21	**YES**	21	**YES**
Benzo[a]pyrene	mg/kg	78	55	0.0071	***0.76***	0.01	28	VI-SS-07(0-0.5)	0.016	**YES**	2.1	**YES**
Benzo[b]fluoranthene	mg/kg	78	58	0.011	***1.2***	0.021	31	VII-SS-41(0-1)	0.16	**YES**	21	**YES**
Benzo[g,h,i]perylene [4]	mg/kg	78	56	0.0069	0.75	0.022	20	VII-SS-41(0-1)	180	NO	2300	NO
Benzo[k]fluoranthene	mg/kg	78	45	0.014	1.5	0.0061	14	VII-SS-41(0-1)	1.6	**YES**	210	NO
Chrysene	mg/kg	78	66	0.0084	0.9	0.019	87	VI-SS-07(0-0.5)	16	**YES**	2100	NO
Dibenz(a,h)anthracene	mg/kg	78	40	0.0066	***0.84***	0.0099	5.9	VI-SS-07(0-0.5)	0.016	**YES**	2.1	**YES**
Fluoranthene	mg/kg	78	69	0.0075	0.81	0.015	59	VI-SS-07(0-0.5)	240	NO	3000	NO
Fluorene	mg/kg	78	24	0.0056	1	0.0079	22	VI-SS-07(0-0.5)	240	NO	3000	NO
Indeno[1,2,3-cd]pyrene	mg/kg	78	55	0.0072	***0.78***	0.014	18	VII-SS-41(0-1)	0.16	**YES**	21	NO
Naphthalene	mg/kg	78	28	0.0057	0.65	0.0076	32	VI-SS-07(0-0.5)	2	**YES**	8.6	**YES**
Phenanthrene [4]	mg/kg	78	64	0.011	1.2	0.011	90	VI-SS-07(0-0.5)	1800	NO	23000	NO
Pyrene	mg/kg	78	69	0.0071	0.77	0.012	100	VI-SS-07(0-0.5)	180	NO	2300	NO
1,1'-Biphenyl	mg/kg	71	9	0.03	3.4	0.013	6.3	VI-SS-07(0-0.5)	4.7	**YES**	20	NO
2,4,5-Trichlorophenol	mg/kg	71	0	0.013	4	ND	ND	NA	630	NO	8200	NO
2,4,6-Trichlorophenol	mg/kg	71	0	0.01	5.7	ND	ND	NA	6.3	NO	82	NO
2,4-Dichlorophenol	mg/kg	71	0	0.0068	0.76	ND	ND	NA	19	NO	250	NO
2,4-Dimethylphenol	mg/kg	71	0	0.012	5.9	ND	ND	NA	130	NO	1600	NO
2,4-Dinitrophenol	mg/kg	71	0	0.41	***45***	ND	ND	NA	13	NO	160	NO
2,4-Dinitrotoluene	mg/kg	71	0	0.0092	***3.1***	ND	ND	NA	1.7	NO	7.4	NO
2,6-Dinitrotoluene	mg/kg	71	0	0.011	***3.9***	ND	ND	NA	0.36	NO	1.5	NO
2-Chloronaphthalene	mg/kg	71	0	0.0071	0.79	ND	ND	NA	480	NO	6000	NO
2-Chlorophenol	mg/kg	71	0	0.0086	3.1	ND	ND	NA	39	NO	580	NO
2-Methylnaphthalene	mg/kg	71	47	0.0061	0.68	0.0081	76	VI-SS-07(0-0.5)	24	**YES**	300	NO

TABLE 1
IDENTIFICATION OF CONTAMINANTS OF CONCERN IN SURFACE SOIL - DEVELOPED AREAS[1]
CAA VIM AND VIIM
MINGO JUNCTION STEEL WORKS LLC - WEIRTON FACILITY

Constituent	Units	Number of Samples[2]	Number of Detections	Detection Limit Range		Detected Concentration Range[3]		Sample with Max Detect	Screening Results[4]			
				Min	Max	Min	Max		Residential Direct Contact	Does Max Exceed?	Industrial Direct Contact	Does Max Exceed?
2-Methylphenol	mg/kg	71	0	0.024	2.6	ND	ND	NA	320	NO	4100	NO
2-Nitroaniline	mg/kg	71	0	0.084	17	ND	ND	NA	63	NO	800	NO
2-Nitrophenol	mg/kg	71	0	0.011	4.2	ND	ND	NA	- -		- -	
3,3'-Dichlorobenzidine	mg/kg	71	0	0.036	***4***	ND	ND	NA	1.2	NO	5.1	NO
Methylphenol, 3 & 4 [4]	mg/kg	71	2	0.033	3.7	0.037	0.11	VII-SS-28(0-2)	320	NO	4100	NO
3-Nitroaniline	mg/kg	71	0	0.047	16	ND	ND	NA	- -		- -	
4,6-Dinitro-2-methylphenol	mg/kg	70	0	0.14	***15***	ND	ND	NA	0.51	NO	6.6	NO
4-Bromophenyl phenyl ether	mg/kg	71	0	0.013	3.3	ND	ND	NA	- -		- -	
4-Chloro-3-methylphenol	mg/kg	71	0	0.0087	3.5	ND	ND	NA	630	NO	8200	NO
4-Chloroaniline	mg/kg	71	0	0.0062	***3***	ND	ND	NA	2.7	NO	11	NO
4-Chlorophenyl phenyl ether	mg/kg	71	0	0.011	4.2	ND	ND	NA	- -		- -	
4-Nitroaniline	mg/kg	71	0	0.009	15	ND	ND	NA	25	NO	110	NO
4-Nitrophenol	mg/kg	71	0	0.12	14	ND	ND	NA	- -		- -	
Acetophenone	mg/kg	71	7	0.01	3.1	0.038	0.17	VII-SS-41(0-1)	780	NO	2500	NO
Atrazine	mg/kg	71	0	0.033	***3.7***	ND	ND	NA	2.4	NO	10	NO
Benzaldehyde	mg/kg	71	3	0.023	5.7	0.26	0.43	VII-SS-37(0-1)	170	NO	820	NO
Bis(2-chloroisopropyl)ether	mg/kg	71	0	0.0074	0.82	ND	ND	NA	5.1	NO	310	NO
Bis(2-chloroethoxy)methane	mg/kg	71	0	0.0088	2.5	ND	ND	NA	19	NO	250	NO
Bis(2-chloroethyl)ether	mg/kg	71	0	0.0067	***1***	ND	ND	NA	0.23	NO	1	NO
Bis(2-ethylhexyl) phthalate	mg/kg	71	16	0.056	6.1	0.062	4.6	VII-SS-05(0-0.3)	39	NO	160	NO
Butyl benzyl phthalate	mg/kg	71	2	0.047	5.2	0.23	3.2	VII-SS-49(0-0.6)	290	NO	1200	NO
Caprolactam	mg/kg	71	0	0.12	29	ND	ND	NA	3100	NO	40000	NO
Carbazole [4]	mg/kg	71	26	0.0063	0.7	0.0072	7.1	VI-SS-07(0-0.5)	1800	NO	23000	NO
Dibenzofuran	mg/kg	71	11	0.034	3.7	0.055	13	VI-SS-07(0-0.5)	7.8	**YES**	120	NO
Diethyl phthalate	mg/kg	71	40	0.037	0.45	0.043	14	VII-SS-06(0-0.4)	5100	NO	66000	NO
Dimethyl phthalate	mg/kg	71	4	0.0067	4.1	0.076	0.83	VII-SS-37(0-1)	- -		- -	
Di-n-butyl phthalate	mg/kg	71	0	0.043	4.8	ND	ND	NA	630	NO	8200	NO
Di-n-octyl phthalate	mg/kg	71	0	0.036	4	ND	ND	NA	63	NO	820	NO
Hexachlorobenzene	mg/kg	71	0	0.0073	***0.81***	ND	ND	NA	0.21	NO	0.96	NO
Hexachlorobutadiene	mg/kg	71	0	0.0076	0.85	ND	ND	NA	1.2	NO	5.3	NO
Hexachlorocyclopentadiene	mg/kg	71	0	0.0094	***4.1***	ND	ND	NA	0.18	NO	0.75	NO
Hexachloroethane	mg/kg	71	0	0.0096	***2.7***	ND	ND	NA	1.8	NO	8	NO
Isophorone	mg/kg	71	0	0.0094	2.9	ND	ND	NA	570	NO	2400	NO
Nitrobenzene	mg/kg	71	0	0.028	3.2	ND	ND	NA	5.1	NO	22	NO
N-Nitrosodi-n-propylamine	mg/kg	71	0	0.008	***0.89***	ND	ND	NA	0.078	NO	0.33	NO
N-Nitrosodiphenylamine	mg/kg	71	0	0.032	3.5	ND	ND	NA	110	NO	470	NO
Pentachlorophenol	mg/kg	71	0	0.031	***3.4***	ND	ND	NA	1	NO	4	NO
Phenol	mg/kg	71	3	0.0081	0.9	0.13	0.25	VII-SS-28(0-2)	1900	NO	25000	NO

TABLE 1
IDENTIFICATION OF CONTAMINANTS OF CONCERN IN SURFACE SOIL - DEVELOPED AREAS[1]
CAA VIM AND VIIM
MINGO JUNCTION STEEL WORKS LLC - WEIRTON FACILITY

Constituent	Units	Number of Samples[2]	Number of Detections	Detection Limit Range		Detected Concentration Range[3]		Sample with Max Detect	Screening Results[4]			
				Min	Max	Min	Max		Residential Direct Contact	Does Max Exceed?	Industrial Direct Contact	Does Max Exceed?
Polychlorinated Biphenyls												
PCB-1016	mg/kg	69	0	0.00031	0.031	ND	ND	NA	0.41	NO	5.1	NO
PCB-1221	mg/kg	69	0	0.00062	0.061	ND	ND	NA	0.2	NO	0.83	NO
PCB-1232	mg/kg	69	0	0.00056	0.056	ND	ND	NA	0.17	NO	0.72	NO
PCB-1242	mg/kg	69	0	0.00057	0.056	ND	ND	NA	0.23	NO	0.95	NO
PCB-1248	mg/kg	69	0	0.00075	0.074	ND	ND	NA	0.23	NO	0.94	NO
PCB-1254	mg/kg	69	11	0.00065	0.064	0.011	0.58	VII-SS-07(0-0.7)	0.12	**YES**	0.97	NO
PCB-1260	mg/kg	69	33	0.0024	0.0035	0.0031	4.3	DUP-1-11-30-17	0.24	**YES**	0.99	**YES**
Inorganics												
Aluminum [4]	mg/kg	65	65	NA	NA	3100	72000	VII-SS-05(0-0.3)	77,120	NO	110000	NO
Antimony	mg/kg	65	62	0.027	0.028	0.055	6.9	VII-SS-24(0-1)	3.1	**YES**	47	NO
Arsenic	mg/kg	65	62	0.2	0.22	0.35	17	VI-SS-06(0-0.5)	0.43	**YES**	3	**YES**
Barium	mg/kg	65	65	NA	NA	29	420	VII-SS-23(0-2)	1500	NO	22000	NO
Beryllium	mg/kg	65	65	NA	NA	0.23	5.9	VII-SS-33(0-0.4)	16	NO	230	NO
Cadmium	mg/kg	65	65	NA	NA	0.13	8	VI-SS-06(0-0.5)DUP	7.1	**YES**	98	NO
Calcium	mg/kg	65	65	NA	NA	3500	270000	VII-SS-35(1-2)	- -		- -	
Chromium [4]	mg/kg	65	65	NA	NA	11	7300	VII-SS-30(0-0.5)	12000	NO	180000	NO
Cobalt	mg/kg	65	65	NA	NA	0.53	100	VII-SS-27(1.5-2)	2.3	**YES**	35	**YES**
Copper	mg/kg	65	65	NA	NA	6.1	490	VII-SS-30(0-0.5)	310	**YES**	4700	NO
Iron	mg/kg	65	65	NA	NA	8200	430000	VII-SS-22(0-2)	5500	**YES**	82000	**YES**
Lead	mg/kg	65	65	NA	NA	2.8	830	VI-SS-06(0-0.5)	400	**YES**	800	**YES**
Magnesium	mg/kg	65	65	NA	NA	1800	57000	VII-SS-13(0-0.7)	- -		- -	
Manganese [4]	mg/kg	65	65	NA	NA	520	36000	VII-SS-35(1-2)	180	**YES**	2600	**YES**
Mercury	mg/kg	65	53	0.011	0.013	0.011	2.8	VII-SS-09(0-0.5)	1.1	**YES**	3.1	NO
Nickel	mg/kg	65	65	NA	NA	2.9	4600	VII-SS-30(0-0.5)	150	**YES**	2200	**YES**
Potassium	mg/kg	65	65	NA	NA	28	2000	VI-SS-01(0-1)	- -		- -	
Selenium	mg/kg	65	46	0.047	0.75	0.064	3	VII-SS-41(0-1)	39	NO	580	NO
Silver	mg/kg	65	60	0.041	0.047	0.0095	2	VII-SS-17(0-2)	39	NO	580	NO
Sodium	mg/kg	65	65	NA	NA	53	14000	VII-SS-24(0-1)	- -		- -	
Thallium	mg/kg	65	56	0.021	0.025	0.0064	0.81	VII-SS-50(0-2)	0.078	**YES**	1.2	NO
Vanadium	mg/kg	65	65	NA	NA	1.3	620	VII-SS-49(0-0.6)	5.5	**YES**	160	**YES**
Zinc	mg/kg	65	65	NA	NA	15	5100	VII-SS-17(0-2)	2300	**YES**	35000	NO
Other Parameters												
Cyanide, Total	mg/kg	65	53	0.095	0.12	0.11	26	VI-SS-01(0-1)	2.3	**YES**	15	**YES**

TABLE 1
IDENTIFICATION OF CONTAMINANTS OF CONCERN IN SURFACE SOIL - DEVELOPED AREAS[4)]
CAA VIM AND VIIM
MINGO JUNCTION STEEL WORKS LLC - WEIRTON FACILITY

1 - Complete analytical results (detections and detection limits) for each sample and constituent are provided in Appendix A, Table A-1.

2 - Number of samples is the total number of valid discrete samples obtained, including duplicate samples (i.e., a duplicate sample is counted as a discrete sample).
This excludes sample location VI-SS-09(0-0.3), which was excavated as part of the former Tar Pumping Station excavation.

3 - The range of detected concentrations is presented. ND indicates that the constituent was not detected in any of the samples analyzed.

4 - Screening criteria based on the May 2021 USEPA Regional Screening Table and the June 2020 WVDEP De Minimis Table. Direct contact screening criteria are the lower of the USEPA Regional Screening Levels (RSLs) or the WVDEP De Minimis values. RSLs for noncarcinogenic chemicals are divided by 10 to account for potential cumulative effects. Notes regarding specific values for various chemicals (e.g., surrogates used, effects basis, etc.) are as follows:

RSLs for cis-1,3-dichloropropene and trans-1,3-dichloropropene are based on the RSLs for total 1,3-dichloropropene.
RSLs for 1,3-dichlorobenzene are based on the RSLs for 1,4-dichlorobenzene.
RSLs for methylcyclohexane are based on the RSLs for cyclohexane.
RSLs for acenaphthylene are based on the RSLs for acenaphthene.
RSLs for benzo(g,h,i)perylene are based on the RSLs for pyrene.
RSLs for phenanthrene and carbazole are based on the RSLs for anthracene.
RSLs for 3&4-methylphenol are conservatively based on the RSLs for 3-methylphenol.
The residential direct contact screening value for aluminum is based on the 90th percentile background concentrations in West Virginia soils published by USGS (2013).
Direct contact RSL for chromium is for the trivalent valence state; protection of groundwater RSL is based on total chromium.
RSLs for manganese are based on the non-diet values.

NA Constituent detected in every sample; detection limit not presented.

Bold italic values indicate that a detection limit exceeds a screening criterion.

TABLE 2
IDENTIFICATION OF CONTAMINANTS OF CONCERN IN SURFACE SOIL - WOODED HILLSIDE[1]
CAA VIM AND VIIM
MINGO JUNCTION STEEL WORKS LLC - WEIRTON FACILITY

Constituent	Units	Number of Samples[2]	Number of Detections	Detection Limit Range		Detected Concentration Range[3]		Sample with Max Detect	Screening Results[4]			
				Min	Max	Min	Max		Residential Direct Contact	Does Max Exceed?	Industrial Direct Contact	Does Max Exceed?
Inorganics												
Aluminum [4]	mg/kg	5	5	NA	NA	8300	12000	VII-SS-57 (0-1)	77,120	NO	110000	NO
Antimony	mg/kg	5	5	NA	NA	0.28	0.67	VII-SS-57 (0-1)	3.1	NO	47	NO
Arsenic	mg/kg	5	5	NA	NA	9.5	32	VII-SS-57 (0-1)	0.43	**YES**	3	**YES**
Barium	mg/kg	5	5	NA	NA	62	130	VII-SS-55 (0-1)	1500	NO	22000	NO
Beryllium	mg/kg	5	5	NA	NA	0.44	1.3	VII-SS-57 (0-1)	16	NO	230	NO
Cadmium	mg/kg	5	5	NA	NA	0.44	1.4	VII-SS-55 (0-1)	7.1	NO	98	NO
Calcium	mg/kg	5	5	NA	NA	470	2200	VII-SS-55 (0-1)	- -		- -	
Chromium [4]	mg/kg	5	5	NA	NA	17	44	VII-SS-57 (0-1)	12000	NO	180000	NO
Cobalt [4]	mg/kg	5	5	NA	NA	7.5	15	VII-SS-57 (0-1)	23.8	NO	35	NO
Copper	mg/kg	5	5	NA	NA	12	35	VII-SS-57 (0-1)	310	NO	4700	NO
Iron	mg/kg	5	5	NA	NA	19000	64000	VII-SS-57 (0-1)	5500	**YES**	82000	NO
Lead	mg/kg	5	5	NA	NA	48	130	VII-SS-57 (0-1)	400	NO	800	NO
Magnesium	mg/kg	5	5	NA	NA	1000	2300	VII-SS-55 (0-1)	- -		- -	
Manganese [4]	mg/kg	5	5	NA	NA	590	2100	DEP01 (VIISS56) (3)	180	**YES**	2600	NO
Mercury	mg/kg	5	5	NA	NA	0.061	0.22	VII-SS-57 (0-1)	1.1	NO	3.1	NO
Nickel	mg/kg	5	5	NA	NA	11	23	VII-SS-57 (0-1)	150	NO	2200	NO
Potassium	mg/kg	5	5	NA	NA	500	1300	VII-SS-57 (0-1)	- -		- -	
Selenium	mg/kg	5	5	NA	NA	0.56	3.1	DEP01 (VIISS56) (3)	39	NO	580	NO
Silver	mg/kg	5	4	0.22	0.22	0.085	0.22	VII-SS-57 (0-1)	39	NO	580	NO
Sodium	mg/kg	5	1	53	62	19	19	DEP01 (VIISS56) (3)	- -		- -	
Thallium [4]	mg/kg	5	4	0.28	0.28	0.23	0.51	VII-SS-57 (0-1)	0.8	NO	1.2	NO
Vanadium [4]	mg/kg	5	5	NA	NA	19	47	VII-SS-57 (0-1)	98.8	NO	160	NO
Zinc	mg/kg	5	5	NA	NA	100	280	VII-SS-55 (0-1)	2300	NO	35000	NO

TABLE 2
IDENTIFICATION OF CONTAMINANTS OF CONCERN IN SURFACE SOIL - WOODED HILLSIDE[1)]
CAA VIM AND VIIM
MINGO JUNCTION STEEL WORKS LLC - WEIRTON FACILITY

1 - Complete analytical results (detections and detection limits) for each sample and constituent are provided in Appendix A, Table A-2.

2 - Number of samples is the total number of valid discrete samples obtained, including duplicate samples (i.e., a duplicate sample is counted as a discrete sample).

3 - The range of detected concentrations is presented. ND indicates that the constituent was not detected in any of the samples analyzed.

4 - Screening criteria based on the May 2021 USEPA Regional Screening Table and the June 2020 WVDEP De Minimis Table. Direct contact screening criteria are the lower of the USEPA Regional Screening Levels (RSLs) or the WVDEP De Minimis values. RSLs for noncarcinogenic chemicals are divided by 10 to account for potential cumulative effects. Notes regarding specific values for various chemicals (e.g., surrogates used, effects basis, etc.) are as follows:

The residential direct contact screening values for aluminum, cobalt, thallium, and vanadium are based on the 90th percentile background concentrations in West Virginia soils published by USG

Direct contact RSL for chromium is for the trivalent valence state.

RSLs for manganese are based on the non-diet values.

NA Constituent detected in every sample; detection limit not presented.

Bold italic values indicate that a detection limit exceeds a screening criterion.

TABLE 3
IDENTIFICATION OF CONTAMINANTS OF CONCERN IN SUBSURFACE SOIL[1]
CAA VIM AND VIIM
MINGO JUNCTION STEEL WORKS LLC - WEIRTON FACILITY

Constituent	Units	Number of Samples[2]	Number of Detections	Detection Limit Range		Detected Concentration Range[3]		Sample with Max Detect	Screening Results[4]			
				Min	Max	Min	Max		Residential Direct Contact	Does Max Exceed?	Industrial Direct Contact	Does Max Exceed?
Volatile Organic Compounds												
Benzene	mg/kg	89	3	0.00074	0.061	0.00095	0.0033	VII-SB-110(6-8)	1.2	NO	5.1	NO
Toluene	mg/kg	89	6	0.00079	0.052	0.0011	0.034	VII-SB-110(6-8)	490	NO	820	NO
Ethylbenzene	mg/kg	89	8	0.0007	0.038	0.0013	0.037	VII-SB-110(6-8)	5.8	NO	25	NO
Xylenes, Total	mg/kg	89	7	0.0024	0.12	0.0058	0.22	VII-SB-110(6-8)	58	NO	250	NO
1,1,1-Trichloroethane	mg/kg	27	1	0.00053	0.063	0.00095	0.00095	VII-MW-02A(40-42)	640	NO	640	NO
1,1,2,2-Tetrachloroethane	mg/kg	27	0	0.00078	0.057	ND	ND	NA	0.6	NO	2.7	NO
1,1,2-Trichloro-1,2,2-trifluoroethane	mg/kg	27	0	0.0012	0.02	ND	ND	NA	670	NO	910	NO
1,1,2-Trichloroethane	mg/kg	27	0	0.00091	0.071	ND	ND	NA	0.15	NO	0.63	NO
1,1-Dichloroethane	mg/kg	27	0	0.00063	0.062	ND	ND	NA	3.6	NO	16	NO
1,1-Dichloroethene	mg/kg	27	0	0.00092	0.065	ND	ND	NA	23	NO	100	NO
1,2,4-Trichlorobenzene	mg/kg	27	0	0.00096	0.023	ND	ND	NA	5.8	NO	26	NO
1,2-Dibromo-3-Chloropropane	mg/kg	27	0	0.00082	***0.022***	ND	ND	NA	0.0053	NO	0.064	NO
1,2-Dibromoethane (EDB)	mg/kg	27	0	0.00094	***0.038***	ND	ND	NA	0.036	NO	0.16	NO
1,2-Dichlorobenzene	mg/kg	27	1	0.00087	0.042	0.097	0.097	VII-MW-03P(10-12)	180	NO	380	NO
1,2-Dichloroethane	mg/kg	27	0	0.00067	0.059	ND	ND	NA	0.46	NO	2	NO
1,2-Dichloroethene, Total	mg/kg	26	0	0.0014	0.058	ND	ND	NA	- -		- -	
cis-1,2-Dichloroethene	mg/kg	27	0	0.00077	0.041	ND	ND	NA	16	NO	81	NO
trans-1,2-Dichloroethene	mg/kg	27	0	0.00065	0.046	ND	ND	NA	7	NO	30	NO
1,2-Dichloropropane	mg/kg	27	0	0.00059	0.078	ND	ND	NA	1.1	NO	6.6	NO
cis-1,3-Dichloropropene [4]	mg/kg	27	0	0.00074	0.045	ND	ND	NA	1.8	NO	8.2	NO
trans-1,3-Dichloropropene [4]	mg/kg	27	0	0.00065	0.036	ND	ND	NA	1.8	NO	8.2	NO
1,3-Dichlorobenzene [4]	mg/kg	27	0	0.00071	0.031	ND	ND	NA	2.6	NO	11	NO
1,4-Dichlorobenzene	mg/kg	27	0	0.00069	0.032	ND	ND	NA	2.6	NO	11	NO
2-Butanone (MEK)	mg/kg	27	0	0.00096	0.067	ND	ND	NA	2700	NO	19000	NO
2-Hexanone	mg/kg	27	0	0.00075	0.035	ND	ND	NA	20	NO	130	NO
4-Methyl-2-pentanone (MIBK)	mg/kg	27	0	0.00071	0.036	ND	ND	NA	3300	NO	3400	NO
Acetone	mg/kg	26	0	0.0054	0.31	ND	ND	NA	6100	NO	67000	NO
Bromoform	mg/kg	27	0	0.00048	0.066	ND	ND	NA	19	NO	86	NO
Bromomethane	mg/kg	27	0	0.0008	0.097	ND	ND	NA	0.68	NO	3	NO
Carbon disulfide	mg/kg	27	2	0.00056	0.066	0.0011	0.0019	VII-MW-03P(10-12)	77	NO	350	NO
Carbon tetrachloride	mg/kg	27	0	0.00049	0.066	ND	ND	NA	0.65	NO	2.9	NO
Chlorobenzene	mg/kg	27	0	0.00082	0.032	ND	ND	NA	28	NO	130	NO
Chlorodibromomethane	mg/kg	27	0	0.00077	0.04	ND	ND	NA	8.3	NO	39	NO
Chloroethane	mg/kg	27	0	0.0017	0.046	ND	ND	NA	1400	NO	2100	NO
Chloroform	mg/kg	27	4	0.00064	0.062	0.00079	0.00088	VII-MW-02P(12-14)	0.32	NO	1.4	NO
Chloromethane	mg/kg	27	0	0.00093	0.085	ND	ND	NA	11	NO	46	NO
Cyclohexane	mg/kg	27	0	0.0004	0.037	ND	ND	NA	120	NO	120	NO
Dichlorobromomethane	mg/kg	27	0	0.00061	0.057	ND	ND	NA	0.29	NO	1.3	NO

TABLE 3
IDENTIFICATION OF CONTAMINANTS OF CONCERN IN SUBSURFACE SOIL[1]
CAA VIM AND VIIM
MINGO JUNCTION STEEL WORKS LLC - WEIRTON FACILITY

Constituent	Units	Number of Samples[2]	Number of Detections	Detection Limit Range		Detected Concentration Range[3]		Sample with Max Detect	Screening Results[4]			
				Min	Max	Min	Max		Residential Direct Contact	Does Max Exceed?	Industrial Direct Contact	Does Max Exceed?
Dichlorodifluoromethane	mg/kg	27	0	0.00073	0.039	ND	ND	NA	8.7	NO	37	NO
Isopropylbenzene	mg/kg	27	2	0.00074	0.033	0.0017	0.012	VII-MW-03P(10-12)	190	NO	270	NO
Methyl acetate	mg/kg	27	0	0.00098	0.075	ND	ND	NA	7800	NO	29000	NO
Methyl tert-butyl ether	mg/kg	27	0	0.00081	0.063	ND	ND	NA	47	NO	210	NO
Methylcyclohexane [4]	mg/kg	27	2	0.00079	0.034	0.0014	0.0046	VII-MW-03P(10-12)	120	NO	120	NO
Methylene Chloride	mg/kg	27	22	0.014	0.067	0.0014	0.089	VII-SB-104(38-40)	35	NO	320	NO
Naphthalene	mg/kg	1	0	0.019	0.019	ND	ND	NA	2	NO	8.6	NO
Styrene	mg/kg	27	0	0.00077	0.039	ND	ND	NA	600	NO	870	NO
Tetrachloroethene	mg/kg	27	4	0.00074	0.051	0.0011	0.051	VII-MW-03P(8-10)	8.1	NO	39	NO
Trichloroethene	mg/kg	27	2	0.00072	0.049	0.0011	0.0012	VII-MW-02A(40-42)	0.41	NO	1.9	NO
Trichlorofluoromethane	mg/kg	27	0	0.001	0.069	ND	ND	NA	790	NO	1200	NO
Vinyl chloride	mg/kg	27	0	0.00051	***0.079***	ND	ND	NA	0.057	NO	1.7	NO
Semi-Volatile Organic Compounds												
Acenaphthene	mg/kg	89	25	0.00077	0.78	0.0089	5.4	VII-SB-112(2-4)	360	NO	4500	NO
Acenaphthylene [4]	mg/kg	89	53	0.00092	0.6	0.012	35	IM-W700-S-20	360	NO	4500	NO
Anthracene	mg/kg	89	64	0.00079	0.0089	0.0012	4.3	IM-W700-S-39D	1800	NO	23000	NO
Benzo[a]anthracene	mg/kg	89	65	0.001	0.011	0.0012	8.7	IM-W700-S-41	0.21	**YES**	21	NO
Benzo[a]pyrene	mg/kg	89	64	0.00081	0.0091	0.0017	4.6	IM-W700-S-41	0.016	**YES**	2.1	**YES**
Benzo[b]fluoranthene	mg/kg	89	65	0.0013	0.014	0.0044	8.7	IM-W700-S-41	0.16	**YES**	21	NO
Benzo[g,h,i]perylene [4]	mg/kg	89	61	0.0008	0.034	0.0015	2.4	IM-W700-S-41	180	NO	2300	NO
Benzo[k]fluoranthene	mg/kg	89	41	0.00098	0.089	0.0015	3.7	IM-W700-S-41	1.6	**YES**	210	NO
Chrysene	mg/kg	89	61	0.00096	0.035	0.0018	7.2	IM-W700-S-41	16	NO	2100	NO
Dibenz(a,h)anthracene	mg/kg	89	9	0.0009	***0.14***	0.0094	0.26	VII-SB-101(18-20)	0.016	**YES**	2.1	NO
Fluoranthene	mg/kg	89	43	0.00086	0.095	0.0014	21	IM-W700-S-39D	240	NO	3000	NO
Fluorene	mg/kg	89	65	0.0011	0.012	0.0027	8.8	VII-SB-112(2-4)	240	NO	3000	NO
Indeno[1,2,3-cd]pyrene	mg/kg	89	61	0.00083	0.022	0.0021	4.6	IM-W700-S-41	0.16	**YES**	21	NO
Naphthalene	mg/kg	89	63	0.00069	0.36	0.0072	11	IM-W700-S-20	2	**YES**	8.6	**YES**
Phenanthrene [4]	mg/kg	89	69	0.0013	0.013	0.0048	18	IM-W700-S-20	1800	NO	23000	NO
Pyrene	mg/kg	89	64	0.00081	0.038	0.0018	15	IM-W700-S-39D	180	NO	2300	NO
1,1'-Biphenyl	mg/kg	26	1	0.033	0.18	0.065	0.065	VII-MW-01P(11-12)	4.7	NO	20	NO
2,4,5-Trichlorophenol	mg/kg	26	0	0.039	0.21	ND	ND	NA	630	NO	8200	NO
2,4,6-Trichlorophenol	mg/kg	26	0	0.055	0.3	ND	ND	NA	6.3	NO	82	NO
2,4-Dichlorophenol	mg/kg	26	0	0.0073	0.04	ND	ND	NA	19	NO	250	NO
2,4-Dimethylphenol	mg/kg	26	0	0.057	0.31	ND	ND	NA	130	NO	1600	NO
2,4-Dinitrophenol	mg/kg	26	0	0.44	2.4	ND	ND	NA	13	NO	160	NO
2,4-Dinitrotoluene	mg/kg	26	0	0.03	0.16	ND	ND	NA	1.7	NO	7.4	NO
2,6-Dinitrotoluene	mg/kg	26	0	0.038	0.2	ND	ND	NA	0.36	NO	1.5	NO
2-Chloronaphthalene	mg/kg	26	0	0.0076	0.041	ND	ND	NA	480	NO	6000	NO
2-Chlorophenol	mg/kg	26	0	0.03	0.16	ND	ND	NA	39	NO	580	NO
2-Methylnaphthalene	mg/kg	26	9	0.0066	0.0075	0.0089	11	VII-MW-03P(10-12)	24	NO	300	NO

TABLE 3
IDENTIFICATION OF CONTAMINANTS OF CONCERN IN SUBSURFACE SOIL[1]
CAA VIM AND VIIM
MINGO JUNCTION STEEL WORKS LLC - WEIRTON FACILITY

Constituent	Units	Number of Samples[2]	Number of Detections	Detection Limit Range		Detected Concentration Range[3]		Sample with Max Detect	Screening Results[4]			
				Min	Max	Min	Max		Residential Direct Contact	Does Max Exceed?	Industrial Direct Contact	Does Max Exceed?
2-Methylphenol	mg/kg	26	0	0.026	0.14	ND	ND	NA	320	NO	4100	NO
2-Nitroaniline	mg/kg	26	0	0.16	0.88	ND	ND	NA	63	NO	800	NO
2-Nitrophenol	mg/kg	26	0	0.04	0.22	ND	ND	NA	- -		- -	
3,3'-Dichlorobenzidine	mg/kg	26	0	0.039	0.21	ND	ND	NA	1.2	NO	5.1	NO
Methylphenol, 3 & 4 [4]	mg/kg	26	0	0.036	0.19	ND	ND	NA	320	NO	4100	NO
3-Nitroaniline	mg/kg	26	0	0.15	0.81	ND	ND	NA	- -		- -	
4,6-Dinitro-2-methylphenol	mg/kg	26	0	0.15	***0.79***	ND	ND	NA	0.51	NO	6.6	NO
4-Bromophenyl phenyl ether	mg/kg	26	0	0.032	0.17	ND	ND	NA	- -		- -	
4-Chloro-3-methylphenol	mg/kg	26	0	0.034	0.18	ND	ND	NA	630	NO	8200	NO
4-Chloroaniline	mg/kg	26	0	0.029	0.16	ND	ND	NA	2.7	NO	11	NO
4-Chlorophenyl phenyl ether	mg/kg	26	0	0.041	0.22	ND	ND	NA	- -		- -	
4-Nitroaniline	mg/kg	26	0	0.15	0.8	ND	ND	NA	25	NO	110	NO
4-Nitrophenol	mg/kg	26	0	0.13	0.72	ND	ND	NA	- -		- -	
Acetophenone	mg/kg	26	0	0.03	0.16	ND	ND	NA	780	NO	2500	NO
Atrazine	mg/kg	26	0	0.036	0.19	ND	ND	NA	2.4	NO	10	NO
Benzaldehyde	mg/kg	26	0	0.055	0.3	ND	ND	NA	170	NO	820	NO
Bis(2-chloroisopropyl)ether	mg/kg	26	0	0.0079	0.043	ND	ND	NA	5.1	NO	310	NO
Bis(2-chloroethoxy)methane	mg/kg	26	0	0.024	0.13	ND	ND	NA	19	NO	250	NO
Bis(2-chloroethyl)ether	mg/kg	26	0	0.0098	0.053	ND	ND	NA	0.23	NO	1	NO
Bis(2-ethylhexyl) phthalate	mg/kg	26	3	0.059	0.32	0.1	0.26	VII-MW-01A(6-8)	39	NO	160	NO
Butyl benzyl phthalate	mg/kg	26	0	0.05	0.27	ND	ND	NA	290	NO	1200	NO
Caprolactam	mg/kg	26	0	0.06	1.5	ND	ND	NA	3100	NO	40000	NO
Carbazole [4]	mg/kg	26	1	0.0067	0.06	0.054	0.054	VII-SB-107(4-6)	1800	NO	23000	NO
Dibenzofuran	mg/kg	26	2	0.036	0.19	0.054	0.06	VII-SB-107(4-6)	7.8	NO	120	NO
Diethyl phthalate	mg/kg	26	1	0.04	0.22	0.058	0.058	VII-SB-105(36-38)	5100	NO	66000	NO
Dimethyl phthalate	mg/kg	26	0	0.04	0.22	ND	ND	NA	- -		- -	
Di-n-butyl phthalate	mg/kg	26	0	0.046	0.25	ND	ND	NA	630	NO	8200	NO
Di-n-octyl phthalate	mg/kg	26	0	0.039	0.21	ND	ND	NA	63	NO	820	NO
Hexachlorobenzene	mg/kg	26	0	0.0078	0.06	ND	ND	NA	0.21	NO	0.96	NO
Hexachlorobutadiene	mg/kg	26	0	0.0082	0.06	ND	ND	NA	1.2	NO	5.3	NO
Hexachlorocyclopentadiene	mg/kg	26	0	0.039	***0.21***	ND	ND	NA	0.18	NO	0.75	NO
Hexachloroethane	mg/kg	25	0	0.026	0.14	ND	ND	NA	1.8	NO	8	NO
Isophorone	mg/kg	26	0	0.028	0.15	ND	ND	NA	570	NO	2400	NO
Nitrobenzene	mg/kg	25	0	0.03	0.16	ND	ND	NA	5.1	NO	22	NO
N-Nitrosodi-n-propylamine	mg/kg	26	0	0.0086	0.06	ND	ND	NA	0.078	NO	0.33	NO
N-Nitrosodiphenylamine	mg/kg	26	0	0.034	0.18	ND	ND	NA	110	NO	470	NO
Pentachlorophenol	mg/kg	26	0	0.033	0.18	ND	ND	NA	1	NO	4	NO
Phenol	mg/kg	26	0	0.0086	0.047	ND	ND	NA	1900	NO	25000	NO

TABLE 3
IDENTIFICATION OF CONTAMINANTS OF CONCERN IN SUBSURFACE SOIL[1]
CAA VIM AND VIIM
MINGO JUNCTION STEEL WORKS LLC - WEIRTON FACILITY

Constituent	Units	Number of Samples[2]	Number of Detections	Detection Limit Range		Detected Concentration Range[3]		Sample with Max Detect	Screening Results[4]			
				Min	Max	Min	Max		Residential Direct Contact	Does Max Exceed?	Industrial Direct Contact	Does Max Exceed?
Polychlorinated Biphenyls												
PCB-1016	mg/kg	75	0	0.0016	0.0038	ND	ND	NA	0.41	NO	5.1	NO
PCB-1221	mg/kg	75	0	0.0031	0.0049	ND	ND	NA	0.2	NO	0.83	NO
PCB-1232	mg/kg	75	0	0.0028	0.0044	ND	ND	NA	0.17	NO	0.72	NO
PCB-1242	mg/kg	75	0	0.0029	0.0042	ND	ND	NA	0.23	NO	0.95	NO
PCB-1248	mg/kg	75	8	0.0017	0.0038	0.0083	0.039	IM-W700-S-13	0.23	NO	0.94	NO
PCB-1254	mg/kg	75	2	0.0025	0.0037	0.023	0.038	IM-W700-S-03B(3)	0.12	NO	0.97	NO
PCB-1260	mg/kg	75	2	0.0025	0.0036	0.015	0.13	VI-SB-103 (4-5')	0.24	NO	0.99	NO
Inorganics												
Aluminum [4]	mg/kg	26	26	NA	NA	3100	32000	VII-MW-03P(8-10)	77,120	NO	110000	NO
Antimony	mg/kg	26	25	0.0029	0.0029	0.016	0.46	VII-SB-107(4-6)	3.1	NO	47	NO
Arsenic [4]	mg/kg	26	26	NA	NA	0.32	13	VII-SB-105(6-8)	13.1	NO	13.1	NO
Barium	mg/kg	26	26	NA	NA	32	320	VII-MW-03P(8-10)	1500	NO	22000	NO
Beryllium	mg/kg	26	26	NA	NA	0.27	7.5	VII-MW-03P(8-10)	16	NO	230	NO
Cadmium	mg/kg	26	26	NA	NA	0.12	1.3	VII-SB-105(6-8)	7.1	NO	98	NO
Calcium	mg/kg	26	26	NA	NA	590	190000	VII-MW-03P(8-10)	- -		- -	
Chromium [4]	mg/kg	26	26	NA	NA	5.4	450	VII-SB-107(4-6)	12000	NO	180000	NO
Cobalt [4]	mg/kg	26	26	NA	NA	1.1	19	VI-MW-02A(42.1-43	23.8	NO	35	NO
Copper	mg/kg	26	26	NA	NA	2.4	150	VII-SB-105(6-8)	310	NO	4700	NO
Iron	mg/kg	26	26	NA	NA	14000	86000	VII-SB-107(4-6)	5500	**YES**	82000	**YES**
Lead	mg/kg	26	26	NA	NA	0.35	78	VII-SB-102(6-8)	400	NO	800	NO
Magnesium	mg/kg	26	26	NA	NA	740	60000	VII-MW-03P(10-12)	- -		- -	
Manganese [4]	mg/kg	26	26	NA	NA	230	9000	VII-MW-03A(11-12)	180	**YES**	2600	**YES**
Mercury	mg/kg	26	24	0.012	0.012	0.012	0.33	VII-SB-102(6-8)	1.1	NO	3.1	NO
Nickel	mg/kg	26	26	NA	NA	0.87	55	VII-SB-105(6-8)	150	NO	2200	NO
Potassium	mg/kg	26	26	NA	NA	440	1700	VII-MW-03P(8-10)	- -		- -	
Selenium	mg/kg	26	24	0.055	0.058	0.11	2.3	VII-MW-03P(8-10)	39	NO	580	NO
Silver	mg/kg	26	25	0.0047	0.0047	0.0056	0.24	VII-MW-01P(11-12)	39	NO	580	NO
Sodium	mg/kg	26	26	NA	NA	35	1100	VII-MW-03P(8-10)	- -		- -	
Thallium	mg/kg	26	26	NA	NA	0.0023	0.24	VII-SB-105(6-8)	0.078	**YES**	1.2	NO
Vanadium	mg/kg	26	26	NA	NA	3	110	VII-MW-03A(11-12)	5.5	**YES**	160	NO
Zinc	mg/kg	26	26	NA	NA	1.9	260	VII-SB-107(4-6)	2300	NO	35000	NO
Other Parameters												
Cyanide, Total	mg/kg	26	5	0.1	0.13	0.22	3.7	VII-MW-03P(8-10)	2.3	**YES**	15	NO

TABLE 3
IDENTIFICATION OF CONTAMINANTS OF CONCERN IN SUBSURFACE SOIL[1]
CAA VIM AND VIIM
MINGO JUNCTION STEEL WORKS LLC - WEIRTON FACILITY

1 - Complete analytical results (detections and detection limits) for each sample and constituent are provided in Appendix A, Table A-4.

2 - Number of samples is the total number of valid discrete samples obtained, including duplicate samples (i.e., a duplicate sample is counted as a discrete sample).

3 - The range of detected concentrations is presented. ND indicates that the constituent was not detected in any of the samples analyzed.

4 - Screening criteria based on the May 2021 USEPA Regional Screening Table and the June 2020 WVDEP De Minimis Table. Direct contact screening criteria are the lower of the USEPA Regional Screening Levels (RSLs) or the WVDEP De Minimis values. RSLs for noncarcinogenic chemicals are divided by 10 to account for potential cumulative effects. Notes regarding specific values for various chemicals (e.g., surrogates used, effects basis, etc.) are as follows:

RSLs for cis-1,3-dichloropropene and trans-1,3-dichloropropene are based on the RSLs for total 1,3-dichloropropene.
RSLs for 1,3-dichlorobenzene are based on the RSLs for 1,4-dichlorobenzene.
RSLs for methylcyclohexane are based on the RSLs for cyclohexane.
RSLs for acenaphthylene are based on the RSLs for acenaphthene.
RSLs for benzo(g,h,i)perylene are based on the RSLs for pyrene.
RSLs for phenanthrene and carbazole are based on the RSLs for anthracene.
RSLs for 3&4-methylphenol are conservatively based on the RSLs for 3-methylphenol.
The direct contact screening values for aluminum (residential only), arsenic, and cobalt (residential only) are based on the 90th percentile background concentrations in West Virginia soils publisl
Direct contact RSL for chromium is for the trivalent valence state.
RSLs for manganese are based on the non-diet values.

NA Constituent detected in every sample; detection limit not presented.

Bold italic values indicate that a detection limit exceeds a screening criterion.

TABLE 4
IDENTIFICATION OF CONTAMINANTS OF CONCERN IN GROUNDWATER[1]
CAA VIM AND VIIM
MINGO JUNCTION STEEL WORKS LLC - WEIRTON FACILITY

Constituent	Number of Samples[2]	Number of Detections	Detection Limit Range		Detected Concentration Range[3]		Sample with Max Detect	Screening Results[4]			
			Min	Max	Min	Max		Groundwater	Does Max Exceed?	MCL	Does Max Exceed?
Volatile Organic Compounds											
1,1,1-Trichloroethane	43	0	0.29	0.6	ND	ND	NA	200	NO	200	NO
1,1,2,2-Tetrachloroethane	43	0	***0.2***	***0.6***	ND	ND	NA	0.076	NO	- -	
1,1,2-Trichloro-1,2,2-trifluoroethane	24	0	0.32	0.32	ND	ND	NA	1000	NO	- -	
1,1,2-Trichloroethane	43	0	***0.2***	***0.45***	ND	ND	NA	0.041	NO	5	NO
1,1-Dichloroethane	43	13	0.12	0.63	0.19	7	VII-MW-01A	2.8	**YES**	- -	
1,1-Dichloroethene	43	7	0.3	0.55	0.34	1.2	MA-MW-07D	7	NO	7	NO
1,2,4-Trichlorobenzene	24	0	0.27	0.27	ND	ND	NA	0.4	NO	70	NO
1,2-Dibromo-3-Chloropropane	24	0	***0.14***	***0.14***	ND	ND	NA	0.00033	NO	0.2	NO
1,2-Dibromoethane (EDB)	24	0	***0.18***	***0.18***	ND	ND	NA	0.0075	NO	0.05	NO
1,2-Dichlorobenzene	24	4	0.15	0.15	0.2	37	VII-MW-03P	30	**YES**	600	NO
1,2-Dichloroethane	43	0	***0.21***	***0.57***	ND	ND	NA	0.17	NO	5	NO
1,2-Dichloroethene, Total	43	17	0.51	1.3	0.55	10	VII-MW-01A	- -		- -	
cis-1,2-Dichloroethene	43	20	0.24	0.71	0.54	10	VII-MW-01A	3.6	**YES**	70	NO
trans-1,2-Dichloroethene	43	3	0.17	0.67	0.68	2.2	VII-MW-03P	6.8	NO	100	NO
1,2-Dichloropropane	43	0	0.095	0.66	ND	ND	NA	0.82	NO	5	NO
cis-1,3-Dichloropropene [1]	43	0	0.19	***0.59***	ND	ND	NA	0.47	NO	- -	
trans-1,3-Dichloropropene [1]	43	0	0.15	***0.58***	ND	ND	NA	0.47	NO	- -	
1,3-Dichlorobenzene [1]	24	0	0.11	0.11	ND	ND	NA	0.48	NO	75	NO
1,4-Dichlorobenzene	24	2	0.21	0.21	0.54	0.59	VII-MW-03P	0.48	**YES**	75	NO
2-Butanone (MEK)	43	2	0.55	2.6	3.9	4.7	VII-MW-03P	560	NO	- -	
2-Hexanone	43	1	0.16	3.3	0.66	0.66	VII-MW-03P	3.8	NO	- -	
4-Methyl-2-pentanone (MIBK)	43	1	0.53	3.1	0.53	0.53	VII-MW-03P	630	NO	- -	
Acetone	43	18	2.5	3.4	3.1	8.8	VII-MW-02P	1400	NO	- -	
Benzene	43	4	0.11	***0.6***	0.13	0.54	VII-MW-03P	0.46	**YES**	5	NO
Bromoform	43	0	0.19	0.98	ND	ND	NA	3.3	NO	80	NO
Bromomethane	43	0	0.31	***0.89***	ND	ND	NA	0.75	NO	- -	
Carbon disulfide	43	1	0.21	0.88	0.58	0.58	VII-MW-01P	81	NO	- -	
Carbon tetrachloride	43	0	0.14	***0.88***	ND	ND	NA	0.46	NO	5	NO
Chlorobenzene	43	3	0.14	0.5	0.54	0.96	VII-MW-03P	7.8	NO	100	NO
Chlorodibromomethane	43	1	0.14	0.84	0.19	0.19	VI-MW-01A	0.87	NO	80	NO
Chloroethane	43	0	0.21	0.9	ND	ND	NA	2100	NO	- -	
Chloroform	43	16	0.17	***0.6***	0.19	4.3	VII-MW-02A	0.22	**YES**	80	NO
Chloromethane	43	0	0.28	0.9	ND	ND	NA	19	NO	- -	
Cyclohexane	24	4	0.25	0.25	0.4	1	VII-MW-01P	1300	NO	- -	
Dichlorobromomethane	43	3	0.13	***0.64***	1.1	1.4	VI-MW-01A	0.13	**YES**	80	NO
Dichlorodifluoromethane	24	0	0.19	0.19	ND	ND	NA	20	NO	- -	
Ethylbenzene	43	9	0.23	0.51	0.23	16	VII-MW-03P	1.5	**YES**	700	NO
Isopropylbenzene	24	4	0.16	0.16	1.8	4.8	VII-MW-03P	45	NO	- -	

TABLE 4
IDENTIFICATION OF CONTAMINANTS OF CONCERN IN GROUNDWATER[1]
CAA VIM AND VIIM
MINGO JUNCTION STEEL WORKS LLC - WEIRTON FACILITY

Constituent	Number of Samples[2]	Number of Detections	Detection Limit Range		Detected Concentration Range[3]		Sample with Max Detect	Screening Results[4]			
			Min	Max	Min	Max		Groundwater	Does Max Exceed?	MCL	Does Max Exceed?
Methyl acetate	24	0	0.14	0.14	ND	ND	NA	2000	NO	- -	
Methyl tert-butyl ether	43	0	0.18	0.59	ND	ND	NA	14	NO	- -	
Methylcyclohexane [1]	24	4	0.26	0.26	1	2.2	VII-MW-01P	1300	NO	- -	
Methylene Chloride	43	0	0.13	0.89	ND	ND	NA	5	NO	5	NO
Naphthalene	19	4	***0.79***	***0.79***	2.4	24	VII-MW-01P	0.12	**YES**	- -	
Styrene	43	1	0.097	0.47	1.1	1.1	VII-MW-03P	100	NO	100	NO
Tetrachloroethene	43	29	0.15	0.47	0.17	10	VII-MW-03P	4.1	**YES**	5	**YES**
Toluene	43	5	0.15	0.46	0.96	5	VII-MW-03P	110	NO	1000	NO
Trichloroethene	43	26	0.14	***0.69***	0.15	1.8	VII-MW-03P	0.28	**YES**	5	NO
Trichlorofluoromethane	24	0	0.2	0.2	ND	ND	NA	520	NO	- -	
Vinyl chloride	43	3	***0.23***	***0.88***	0.24	0.49	VII-MW-03P	0.019	**YES**	2	NO
Xylenes, Total	43	10	0.49	0.89	0.78	61	VII-MW-03P	19	**YES**	10000	NO
Semi-Volatile Organics											
1,1'-Biphenyl	38	5	0.055	***0.28***	0.78	2.6	VII-MW-03P	0.083	**YES**	- -	
2,4,5-Trichlorophenol	38	0	0.056	0.31	ND	ND	NA	120	NO	- -	
2,4,6-Trichlorophenol	38	0	0.063	0.36	ND	ND	NA	1.2	NO	- -	
2,4-Dichlorophenol	38	0	0.047	0.26	ND	ND	NA	4.6	NO	- -	
2,4-Dimethylphenol	38	0	0.038	0.21	ND	ND	NA	36	NO	- -	
2,4-Dinitrophenol	38	0	1.4	***7.7***	ND	ND	NA	3.9	NO	- -	
2,4-Dinitrotoluene	38	0	0.047	***0.26***	ND	ND	NA	0.24	NO	- -	
2,6-Dinitrotoluene	38	0	***0.056***	***0.3***	ND	ND	NA	0.049	NO	- -	
2-Chloronaphthalene	38	0	0.028	0.3	ND	ND	NA	75	NO	- -	
2-Chlorophenol	38	0	0.059	0.32	ND	ND	NA	9.1	NO	- -	
2-Methylnaphthalene	38	8	0.018	0.3	0.024	30	VII-MW-03P	3.6	**YES**	- -	
2-Methylphenol	38	1	0.1	1.5	0.23	0.23	VII-MW-03P	93	NO	- -	
2-Nitroaniline	38	0	0.2	2.7	ND	ND	NA	19	NO	- -	
2-Nitrophenol	38	0	0.056	0.31	ND	ND	NA	- -		- -	
3,3'-Dichlorobenzidine	38	0	***0.14***	***2.9***	ND	ND	NA	0.13	NO	- -	
3-Nitroaniline	38	0	0.062	0.96	ND	ND	NA	- -		- -	
4,6-Dinitro-2-methylphenol	38	0	***1.4***	***7.4***	ND	ND	NA	0.15	NO	- -	
4-Bromophenyl phenyl ether	38	0	0.058	0.32	ND	ND	NA	- -		- -	
4-Chloro-3-methylphenol	38	0	0.056	0.31	ND	ND	NA	140	NO	- -	
4-Chloroaniline	38	1	0.041	0.35	0.31	0.31	VI-MW-01A	0.37	NO	- -	
4-Chlorophenyl phenyl ether	38	0	0.056	0.31	ND	ND	NA	- -		- -	
4-Nitroaniline	38	0	0.054	0.92	ND	ND	NA	3.8	NO	- -	
4-Nitrophenol [1]	38	1	0.13	0.96	0.85	0.85	VII-MW-01A	3.9	NO	- -	
Acenaphthene	41	8	0.027	0.31	0.073	2.1	VII-MW-03P	53	NO	- -	
Acenaphthylene [1]	41	0	0.02	0.33	ND	ND	NA	53	NO	- -	
Acetophenone	38	1	0.057	0.31	0.13	0.13	VII-MW-02P	190	NO	- -	
Anthracene	41	10	0.018	0.25	0.025	0.29	VII-MW-03P	180	NO	- -	

TABLE 4
IDENTIFICATION OF CONTAMINANTS OF CONCERN IN GROUNDWATER[1]
CAA VIM AND VIIM
MINGO JUNCTION STEEL WORKS LLC - WEIRTON FACILITY

Constituent	Number of Samples[2]	Number of Detections	Detection Limit Range		Detected Concentration Range[3]		Sample with Max Detect	Screening Results[4]			
			Min	Max	Min	Max		Groundwater	Does Max Exceed?	MCL	Does Max Exceed?
Atrazine	38	0	0.18	***3.2***	ND	ND	NA	0.3	NO	3	NO
Benzaldehyde	38	0	0.098	0.56	ND	ND	NA	19	NO	- -	
Benzo[a]anthracene	41	3	***0.034***	***0.38***	0.1	0.24	VII-MW-02A	0.012	**YES**	- -	
Benzo[a]pyrene	41	3	***0.026***	***0.27***	0.07	0.21	VII-MW-02A	0.025	**YES**	0.2	**YES**
Benzo[b]fluoranthene	41	3	***0.045***	***0.49***	0.11	0.34	VII-MW-02A	0.034	**YES**	- -	
Benzo[g,h,i]perylene [1]	41	3	0.027	0.35	0.12	0.37	VII-MW-02A	12	NO	- -	
Benzo[k]fluoranthene	41	3	0.028	***0.44***	0.14	0.36	VII-MW-02A	0.34	**YES**	- -	
Bis(2-chloroisopropyl)ether	38	0	0.022	0.29	ND	ND	NA	0.36	NO	- -	
Bis(2-chloroethoxy)methane	38	0	0.062	0.34	ND	ND	NA	5.9	NO	- -	
Bis(2-chloroethyl)ether	38	0	***0.029***	***0.2***	ND	ND	NA	0.014	NO	- -	
Bis(2-ethylhexyl) phthalate	38	21	0.41	***31***	0.51	13	VII-MW-03A	5.6	**YES**	6	**YES**
Butyl benzyl phthalate	38	25	0.21	2.3	0.21	4.1	VI-MW-01A	16	NO	- -	
Caprolactam	38	7	0.44	2.4	0.46	36	VI-MW-02AR	990	NO	- -	
Carbazole [1]	38	5	0.025	0.25	0.036	2	VII-MW-03P	180	NO	- -	
Chrysene	41	4	0.03	0.41	0.034	0.35	VII-MW-02A	3.4	NO	- -	
Dibenz(a,h)anthracene	41	3	***0.025***	***0.36***	0.12	0.41	VII-MW-02A	0.0034	**YES**	- -	
Dibenzofuran	38	5	0.068	0.35	0.6	1.5	VII-MW-03P	0.79	**YES**	- -	
Diethyl phthalate	38	5	0.27	2.8	0.34	0.75	VII-MW-02P	1500	NO	- -	
Dimethyl phthalate	38	0	0.052	0.28	ND	ND	NA	- -		- -	
Di-n-butyl phthalate	38	2	0.22	3.7	0.23	0.72	MA-MW-07D	90	NO	- -	
Di-n-octyl phthalate	38	2	0.19	3.4	0.23	0.3	VI-MW-01A	20	NO	- -	
Fluoranthene	41	15	0.02	0.3	0.021	0.44	VI-MW-01P	80	NO	- -	
Fluorene	41	9	0.022	0.33	0.04	2.6	VII-MW-01P	29	NO	- -	
Hexachlorobenzene	38	0	***0.052***	***0.28***	ND	ND	NA	0.0098	NO	1	NO
Hexachlorobutadiene	38	0	0.064	***0.35***	ND	ND	NA	0.14	NO	- -	
Hexachlorocyclopentadiene	38	0	***0.13***	***2.5***	ND	ND	NA	0.041	NO	50	NO
Hexachloroethane	38	0	0.057	0.31	ND	ND	NA	0.33	NO	- -	
Indeno[1,2,3-cd]pyrene	41	3	***0.04***	***0.43***	0.11	0.37	VII-MW-02A	0.034	**YES**	- -	
Isophorone	38	0	0.05	0.27	ND	ND	NA	78	NO	- -	
Methylphenol, 3 & 4 [1]	38	1	0.19	1.9	0.35	0.35	VII-MW-03P	93	NO	- -	
Naphthalene	41	10	0.021	***0.28***	0.044	23	VII-MW-03P	0.12	**YES**	- -	
Nitrobenzene	38	0	0.14	***2.5***	ND	ND	NA	0.14	NO	- -	
N-Nitrosodi-n-propylamine	38	0	***0.046***	***0.36***	ND	ND	NA	0.011	NO	- -	
N-Nitrosodiphenylamine	38	0	0.11	0.6	ND	ND	NA	12	NO	- -	
Pentachlorophenol	38	0	***0.23***	***4.2***	ND	ND	NA	0.041	NO	1	NO
Phenanthrene [1]	41	26	0.04	0.26	0.039	3	VII-MW-01P	180	NO	- -	
Phenol	38	3	0.051	2.4	0.2	0.42	VII-MW-03P	580	NO	- -	
Pyrene	41	9	0.021	0.27	0.024	0.28	VI-MW-01P	12	NO	- -	

TABLE 4
IDENTIFICATION OF CONTAMINANTS OF CONCERN IN GROUNDWATER[1]
CAA VIM AND VIIM
MINGO JUNCTION STEEL WORKS LLC - WEIRTON FACILITY

Constituent	Number of Samples[2]	Number of Detections	Detection Limit Range		Detected Concentration Range[3]		Sample with Max Detect	Screening Results[4]			
			Min	Max	Min	Max		Groundwater	Does Max Exceed?	MCL	Does Max Exceed?
Inorganics [5]											
Aluminum	35	22	2.6	13	3.6	7000	VII-MW-03A	2000	**YES**	*200*	**YES**
Antimony	35	20	0.019	0.38	0.047	0.94	VII-MW-02P	0.78	**YES**	6	NO
Arsenic	35	20	***0.29***	***0.32***	0.34	2.4	VII-MW-02P	0.052	**YES**	10	NO
Barium	35	35	NA	NA	13	110	VII-MW-03A	380	NO	2000	NO
Beryllium	35	8	0.037	0.16	0.048	1.6	VII-MW-03A	2.5	NO	4	NO
Cadmium	35	8	0.11	0.13	0.12	1.4	VII-MW-03A	0.92	**YES**	5	NO
Calcium	35	35	NA	NA	25000	1000000	VII-MW-01P	- -		- -	
Chromium [1]	35	32	1.5	1.5	0.75	14	VII-MW-03A	2200	NO	100	NO
Cobalt	35	34	0.075	0.075	0.077	98	VII-MW-01P	0.6	**YES**	- -	
Copper	35	34	0.63	0.63	0.39	26	VII-MW-03A	80	NO	1300	NO
Iron	35	29	6.1	14	7.4	74000	VII-MW-03A	1400	**YES**	*300*	**YES**
Lead	35	25	0.019	0.13	0.029	31	VII-MW-03A	15	**YES**	15	**YES**
Magnesium	35	34	83	83	690	62000	VI-MW-02AR	- -		- -	
Manganese [1]	35	32	1.4	1.4	0.65	30000	VII-MW-01P	43	**YES**	*50*	**YES**
Mercury	35	4	0.038	***0.1***	0.043	0.067	VI-MW-02AR	0.063	**YES**	2	NO
Nickel	35	32	0.17	1.7	0.21	110	VII-MW-01P	39	**YES**	- -	
Potassium	35	35	NA	NA	1500	49000	VII-MW-01P	- -		- -	
Selenium	35	22	0.42	2.6	0.45	15	VII-MW-01P	10	**YES**	50	NO
Silver	35	2	0.036	0.12	0.092	0.7	VII-MW-03A	9.4	NO	*100*	NO
Sodium	35	35	NA	NA	5600	170000	VI-MW-01A	- -		- -	
Thallium	35	14	0.015	***0.13***	0.017	0.15	VII-MW-03A	0.02	**YES**	2	NO
Vanadium	35	32	0.082	0.082	0.11	10	VII-MW-02P	1.2	**YES**	- -	
Zinc	35	29	3.2	3.2	2.3	160	VII-MW-01P	600	NO	*5000*	NO
Other Parameters											
Cyanide, Total	35	13	***1.5***	***4.4***	1.5	60	MA-MW-07A	0.15	**YES**	200	NO

TABLE 4
IDENTIFICATION OF CONTAMINANTS OF CONCERN IN GROUNDWATER[1)]
CAA VIM AND VIIM
MINGO JUNCTION STEEL WORKS LLC - WEIRTON FACILITY

1 - Complete analytical results (detections and detection limits) for each sample and constituent are provided in Appendix A, Table A-5.

2 - Number of samples is the total number of valid discrete samples obtained, including duplicate samples (i.e., a duplicate sample is counted as a discrete sample).

3 - The range of detected concentrations is presented. ND indicates that the constituent was not detected in any of the samples analyzed.

4 - Screening criteria based on the May 2021 USEPA Regional Screening Table, the June 2020 WVDEP De Minimis Table, and federal Maximum Contaminant Levels (MCLs). Secondary MCLs are shown in italics. Groundwater criteria shown are the lower of the USEPA Tapwater Regional Screening Levels (RSLs) or the WVDEP Groundwater De Minimis values. Tapwater RSLs for noncarcinogenic chemicals are divided by 10 to account for potential cumulative effects. Only those chemicals for which at least one positive detection was encountered are included in the screening evaluation. Double dashes indicate that an RSL is not available for a given constituent. Notes regarding specific values for various chemicals (e.g., surrogates used, effects basis, etc.) are as follows:

RSLs for cis-1,3-dichloropropene and trans-1,3-dichloropropene are based on the RSLs for total 1,3-dichloropropene.
RSLs for 1,3-dichlorobenzene are based on the RSLs for 1,4-dichlorobenzene.
RSLs for methylcyclohexane are based on the RSLs for cyclohexane.
RSLs for acenaphthylene are based on the RSLs for acenaphthene.
RSLs for benzo(g,h,i)perylene are based on the RSLs for pyrene.
RSLs for phenanthrene and carbazole are based on the RSLs for anthracene.
RSLs for 3&4-methylphenol are conservatively based on the RSLs for 3-methylphenol.
Direct contact RSL for chromium is for the trivalent valence state; protection of groundwater RSL is based on total chromium.
RSLs for manganese are based on the non-diet values.

5 - Groundwater samples were collected for total inorganic analysis during the November 2013 event and dissolved inorganic analysis during the February 2014 and March/April 2019 events.

NA Constituent detected in every sample; detection limit not presented.

Bold italic values indicate that a detection limit exceeds a screening criterion.

TABLE 5
IDENTIFICATION OF CONTAMINANTS OF CONCERN IN GROUNDWATER - VAPOR INTRUSION[1]
CAA VIM AND VIIM
MINGO JUNCTION STEEL WORKS LLC - WEIRTON FACILITY

Constituent	Number of Samples[2]	Number of Detections	Detection Limit Range		Detected Concentration Range[3]		Sample with Max Detect	Screening Results[4]			
			Min	Max	Min	Max		Residential	Does Max Exceed?	Commercial	Does Max Exceed?
Volatile Organic Compounds											
1,1,1-Trichloroethane	43	0	0.29	0.6	ND	ND	NA	1240	NO	5210	NO
1,1,2,2-Tetrachloroethane	43	0	0.2	0.6	ND	ND	NA	6.59	NO	288	NO
1,1,2-Trichloro-1,2,2-trifluoroethane	24	0	0.32	0.32	ND	ND	NA	38	NO	160	NO
1,1,2-Trichloroethane	43	0	0.2	0.45	ND	ND	NA	1.17	NO	4.91	NO
1,1-Dichloroethane	43	13	0.12	0.63	0.19	7	VII-MW-01A	12.4	NO	541	NO
1,1-Dichloroethene	43	7	0.3	0.55	0.34	1.2	MA-MW-07D	29.7	NO	125	NO
1,2,4-Trichlorobenzene	24	0	0.27	0.27	ND	ND	NA	8.78	NO	36.9	NO
1,2-Dibromo-3-Chloropropane	24	0	***0.14***	***0.14***	ND	ND	NA	0.0648	NO	7.84	NO
1,2-Dibromoethane (EDB)	24	0	0.18	0.18	ND	ND	NA	0.332	NO	14.5	NO
1,2-Dichlorobenzene	24	4	0.15	0.15	0.2	37	VII-MW-03P	571	NO	2400	NO
1,2-Dichloroethane	43	0	0.21	0.57	ND	ND	NA	3.92	NO	111	NO
1,2-Dichloroethene, Total	43	17	0.51	1.3	0.55	10	VII-MW-01A	- -		- -	
cis-1,2-Dichloroethene	43	20	0.24	0.71	0.54	10	VII-MW-01A	- -		- -	
trans-1,2-Dichloroethene	43	3	0.17	0.67	0.68	2.2	VII-MW-03P	- -		- -	
1,2-Dichloropropane	43	0	0.095	0.66	ND	ND	NA	6.38	NO	26.8	NO
cis-1,3-Dichloropropene [1]	43	0	0.19	0.59	ND	ND	NA	8.93	NO	111	NO
trans-1,3-Dichloropropene [1]	43	0	0.15	0.58	ND	ND	NA	8.93	NO	111	NO
1,3-Dichlorobenzene [1]	24	0	0.11	0.11	ND	ND	NA	5.57	NO	243	NO
1,4-Dichlorobenzene	24	2	0.21	0.21	0.54	0.59	VII-MW-03P	5.57	NO	243	NO
2-Butanone (MEK)	43	2	0.55	2.6	3.9	4.7	VII-MW-03P	389000	NO	1640000	NO
2-Hexanone	43	1	0.16	3.3	0.66	0.66	VII-MW-03P	1650	NO	6950	NO
4-Methyl-2-pentanone (MIBK)	43	1	0.53	3.1	0.53	0.53	VII-MW-03P	106000	NO	447000	NO
Acetone	43	18	2.5	3.4	3.1	8.8	VII-MW-02P	3680000	NO	15500000	NO
Benzene	43	4	0.11	0.6	0.13	0.54	VII-MW-03P	2.7	NO	98.6	NO
Bromoform	43	0	0.19	0.98	ND	ND	NA	243	NO	10600	NO
Bromomethane	43	0	0.31	0.89	ND	ND	NA	2.48	NO	10.4	NO
Carbon disulfide	43	1	0.21	0.88	0.58	0.58	VII-MW-01P	191	NO	801	NO
Carbon tetrachloride	43	0	0.14	***0.88***	ND	ND	NA	0.693	NO	30.3	NO
Chlorobenzene	43	3	0.14	0.5	0.54	0.96	VII-MW-03P	78.6	NO	330	NO
Chlorodibromomethane	43	1	0.14	0.84	0.19	0.19	VI-MW-01A	- -		- -	
Chloroethane	43	0	0.21	0.9	ND	ND	NA	3350	NO	14000	NO
Chloroform	43	16	0.17	0.6	0.19	4.3	VII-MW-02A	1.33	**YES**	58.1	NO
Chloromethane	43	0	0.28	0.9	ND	ND	NA	34.9	NO	146	NO
Cyclohexane	24	4	0.25	0.25	0.4	1	VII-MW-01P	172	NO	722	NO
Dichlorobromomethane	43	3	0.13	0.64	1.1	1.4	VI-MW-01A	1.55	NO	67.6	NO
Dichlorodifluoromethane	24	0	0.19	0.19	ND	ND	NA	0.963	NO	4.05	NO
Ethylbenzene	43	9	0.23	0.51	0.23	16	VII-MW-03P	6.85	**YES**	299	NO
Isopropylbenzene	24	4	0.16	0.16	1.8	4.8	VII-MW-03P	208	NO	873	NO

TABLE 5
IDENTIFICATION OF CONTAMINANTS OF CONCERN IN GROUNDWATER - VAPOR INTRUSION[1]
CAA VIM AND VIIM
MINGO JUNCTION STEEL WORKS LLC - WEIRTON FACILITY

Constituent	Number of Samples[2]	Number of Detections	Detection Limit Range		Detected Concentration Range[3]		Sample with Max Detect	Screening Results[4]			
			Min	Max	Min	Max		Residential	Does Max Exceed?	Commercial	Does Max Exceed?
Methyl acetate	24	0	0.14	0.14	ND	ND	NA	- -		- -	
Methyl tert-butyl ether	43	0	0.18	0.59	ND	ND	NA	722	NO	31500	NO
Methylcyclohexane [1]	24	4	0.26	0.26	1	2.2	VII-MW-01P	172	NO	722	NO
Methylene Chloride	43	0	0.13	0.89	ND	ND	NA	742	NO	3120	NO
Naphthalene	19	4	0.79	0.79	2.4	24	VII-MW-01P	11	**YES**	174	NO
Styrene	43	1	0.097	0.47	1.1	1.1	VII-MW-03P	1860	NO	7820	NO
Tetrachloroethene	43	29	0.15	0.47	0.17	10	VII-MW-03P	10.9	NO	45.6	NO
Toluene	43	5	0.15	0.46	0.96	5	VII-MW-03P	3520	NO	14800	NO
Trichloroethene	43	26	0.14	0.69	0.15	1.8	VII-MW-03P	0.897	**YES**	3.77	NO
Trichlorofluoromethane	24	0	0.2	0.2	ND	ND	NA	- -		- -	
Vinyl chloride	43	3	***0.23***	***0.88***	0.24	0.49	VII-MW-03P	0.197	**YES**	32.8	NO
Xylenes, Total	43	10	0.49	0.89	0.78	61	VII-MW-03P	75.9	NO	319	NO
Semi-Volatile Organics											
1,1'-Biphenyl	38	5	0.055	0.28	0.78	2.6	VII-MW-03P	8.73	NO	36.7	NO
2,4,5-Trichlorophenol	38	0	0.056	0.31	ND	ND	NA	- -		- -	
2,4,6-Trichlorophenol	38	0	0.063	0.36	ND	ND	NA	- -		- -	
2,4-Dichlorophenol	38	0	0.047	0.26	ND	ND	NA	- -		- -	
2,4-Dimethylphenol	38	0	0.038	0.21	ND	ND	NA	- -		- -	
2,4-Dinitrophenol	38	0	1.4	7.7	ND	ND	NA	- -		- -	
2,4-Dinitrotoluene	38	0	0.047	0.26	ND	ND	NA	- -		- -	
2,6-Dinitrotoluene	38	0	0.056	0.3	ND	ND	NA	- -		- -	
2-Chloronaphthalene	38	0	0.028	0.3	ND	ND	NA	- -		- -	
2-Chlorophenol	38	0	0.059	0.32	ND	ND	NA	- -		- -	
2-Methylnaphthalene	38	8	0.018	0.3	0.024	30	VII-MW-03P	- -		- -	
2-Methylphenol	38	1	0.1	1.5	0.23	0.23	VII-MW-03P	- -		- -	
2-Nitroaniline	38	0	0.2	2.7	ND	ND	NA	- -		- -	
2-Nitrophenol	38	0	0.056	0.31	ND	ND	NA	- -		- -	
3,3'-Dichlorobenzidine	38	0	0.14	2.9	ND	ND	NA	- -		- -	
3-Nitroaniline	38	0	0.062	0.96	ND	ND	NA	- -		- -	
4,6-Dinitro-2-methylphenol	38	0	1.4	7.4	ND	ND	NA	- -		- -	
4-Bromophenyl phenyl ether	38	0	0.058	0.32	ND	ND	NA	- -		- -	
4-Chloro-3-methylphenol	38	0	0.056	0.31	ND	ND	NA	- -		- -	
4-Chloroaniline	38	1	0.041	0.35	0.31	0.31	VI-MW-01A	- -		- -	
4-Chlorophenyl phenyl ether	38	0	0.056	0.31	ND	ND	NA	- -		- -	
4-Nitroaniline	38	0	0.054	0.92	ND	ND	NA	- -		- -	
4-Nitrophenol [1]	38	1	0.13	0.96	0.85	0.85	VII-MW-01A	- -		- -	
Acenaphthene	41	8	0.027	0.31	0.073	2.1	VII-MW-03P	- -		- -	
Acenaphthylene [1]	41	0	0.02	0.33	ND	ND	NA	- -		- -	
Acetophenone	38	1	0.057	0.31	0.13	0.13	VII-MW-02P	- -		- -	
Anthracene	41	10	0.018	0.25	0.025	0.29	VII-MW-03P	- -		- -	

TABLE 5
IDENTIFICATION OF CONTAMINANTS OF CONCERN IN GROUNDWATER - VAPOR INTRUSION[1]
CAA VIM AND VIIM
MINGO JUNCTION STEEL WORKS LLC - WEIRTON FACILITY

Constituent	Number of Samples[2]	Number of Detections	Detection Limit Range		Detected Concentration Range[3]		Sample with Max Detect	Screening Results[4]			
			Min	Max	Min	Max		Residential	Does Max Exceed?	Commercial	Does Max Exceed?
Atrazine	38	0	0.18	3.2	ND	ND	NA	- -		- -	
Benzaldehyde	38	0	0.098	0.56	ND	ND	NA	- -		- -	
Benzo[a]anthracene	41	3	0.034	0.38	0.1	0.24	VII-MW-02A	176	NO	- -	
Benzo[a]pyrene	41	3	0.026	0.27	0.07	0.21	VII-MW-02A	- -		- -	
Benzo[b]fluoranthene	41	3	0.045	0.49	0.11	0.34	VII-MW-02A	- -		- -	
Benzo[g,h,i]perylene [1]	41	3	0.027	0.35	0.12	0.37	VII-MW-02A	- -		- -	
Benzo[k]fluoranthene	41	3	0.028	0.44	0.14	0.36	VII-MW-02A	- -		- -	
Bis(2-chloroisopropyl)ether	38	0	0.022	0.29	ND	ND	NA	- -		- -	
Bis(2-chloroethoxy)methane	38	0	0.062	0.34	ND	ND	NA	- -		- -	
Bis(2-chloroethyl)ether	38	0	0.029	0.2	ND	ND	NA	30.5	NO	1330	NO
Bis(2-ethylhexyl) phthalate	38	21	0.41	31	0.51	13	VII-MW-03A	- -		- -	
Butyl benzyl phthalate	38	25	0.21	2.3	0.21	4.1	VI-MW-01A	- -		- -	
Caprolactam	38	7	0.44	2.4	0.46	36	VI-MW-02AR	- -		- -	
Carbazole [1]	38	5	0.025	0.25	0.036	2	VII-MW-03P	- -		- -	
Chrysene	41	4	0.03	0.41	0.034	0.35	VII-MW-02A	- -		- -	
Dibenz(a,h)anthracene	41	3	0.025	0.36	0.12	0.41	VII-MW-02A	- -		- -	
Dibenzofuran	38	5	0.068	0.35	0.6	1.5	VII-MW-03P	- -		- -	
Diethyl phthalate	38	5	0.27	2.8	0.34	0.75	VII-MW-02P	- -		- -	
Dimethyl phthalate	38	0	0.052	0.28	ND	ND	NA	- -		- -	
Di-n-butyl phthalate	38	2	0.22	3.7	0.23	0.72	MA-MW-07D	- -		- -	
Di-n-octyl phthalate	38	2	0.19	3.4	0.23	0.3	VI-MW-01A	- -		- -	
Fluoranthene	41	15	0.02	0.3	0.021	0.44	VI-MW-01P	- -		- -	
Fluorene	41	9	0.022	0.33	0.04	2.6	VII-MW-01P	- -		- -	
Hexachlorobenzene	38	0	0.052	***0.28***	ND	ND	NA	0.275	NO	12	NO
Hexachlorobutadiene	38	0	0.064	0.35	ND	ND	NA	0.716	NO	31.3	NO
Hexachlorocyclopentadiene	38	0	0.13	***2.5***	ND	ND	NA	0.958	NO	4.02	NO
Hexachloroethane	38	0	0.057	0.31	ND	ND	NA	4.26	NO	186	NO
Indeno[1,2,3-cd]pyrene	41	3	0.04	0.43	0.11	0.37	VII-MW-02A	- -		- -	
Isophorone	38	0	0.05	0.27	ND	ND	NA	- -		- -	
Methylphenol, 3 & 4 [1]	38	1	0.19	1.9	0.35	0.35	VII-MW-03P	- -		- -	
Naphthalene	41	10	0.021	0.28	0.044	23	VII-MW-03P	11	**YES**	174	NO
Nitrobenzene	38	0	0.14	2.5	ND	ND	NA	177	NO	7710	NO
N-Nitrosodi-n-propylamine	38	0	0.046	0.36	ND	ND	NA	- -		- -	
N-Nitrosodiphenylamine	38	0	0.11	0.6	ND	ND	NA	- -		- -	
Pentachlorophenol	38	0	0.23	4.2	ND	ND	NA	- -		- -	
Phenanthrene [1]	41	26	0.04	0.26	0.039	3	VII-MW-01P	- -		- -	
Phenol	38	3	0.051	2.4	0.2	0.42	VII-MW-03P	- -		- -	
Pyrene	41	9	0.021	0.27	0.024	0.28	VI-MW-01P	- -		- -	

TABLE 5
IDENTIFICATION OF CONTAMINANTS OF CONCERN IN GROUNDWATER - VAPOR INTRUSION[1]
CAA VIM AND VIIM
MINGO JUNCTION STEEL WORKS LLC - WEIRTON FACILITY

Constituent	Number of Samples[2]	Number of Detections	Detection Limit Range		Detected Concentration Range[3]		Sample with Max Detect	Screening Results[4]			
			Min	Max	Min	Max		Residential	Does Max Exceed?	Commercial	Does Max Exceed?
Inorganics [5]											
Aluminum	35	22	2.6	13	3.6	7000	VII-MW-03A	- -		- -	
Antimony	35	20	0.019	0.38	0.047	0.94	VII-MW-02P	- -		- -	
Arsenic	35	20	0.29	0.32	0.34	2.4	VII-MW-02P	- -		- -	
Barium	35	35	NA	NA	13	110	VII-MW-03A	- -		- -	
Beryllium	35	8	0.037	0.16	0.048	1.6	VII-MW-03A	- -		- -	
Cadmium	35	8	0.11	0.13	0.12	1.4	VII-MW-03A	- -		- -	
Calcium	35	35	NA	NA	25000	1000000	VII-MW-01P	- -		- -	
Chromium [1]	35	32	1.5	1.5	0.75	14	VII-MW-03A	- -		- -	
Cobalt	35	34	0.075	0.075	0.077	98	VII-MW-01P	- -		- -	
Copper	35	34	0.63	0.63	0.39	26	VII-MW-03A	- -		- -	
Iron	35	29	6.1	14	7.4	74000	VII-MW-03A	- -		- -	
Lead	35	25	0.019	0.13	0.029	31	VII-MW-03A	- -		- -	
Magnesium	35	34	83	83	690	62000	VI-MW-02AR	- -		- -	
Manganese [1]	35	32	1.4	1.4	0.65	30000	VII-MW-01P	- -		- -	
Mercury	35	4	0.038	0.1	0.043	0.067	VI-MW-02AR	0.252	NO	1.06	NO
Nickel	35	32	0.17	1.7	0.21	110	VII-MW-01P	- -		- -	
Potassium	35	35	NA	NA	1500	49000	VII-MW-01P	- -		- -	
Selenium	35	22	0.42	2.6	0.45	15	VII-MW-01P	- -		- -	
Silver	35	2	0.036	0.12	0.092	0.7	VII-MW-03A	- -		- -	
Sodium	35	35	NA	NA	5600	170000	VI-MW-01A	- -		- -	
Thallium	35	14	0.015	0.13	0.017	0.15	VII-MW-03A	- -		- -	
Vanadium	35	32	0.082	0.082	0.11	10	VII-MW-02P	- -		- -	
Zinc	35	29	3.2	3.2	2.3	160	VII-MW-01P	- -		- -	
Other Parameters											
Cyanide, Total	35	13	1.5	4.4	1.5	60	MA-MW-07A	20.1	**YES**	84.4	NO

TABLE 5
IDENTIFICATION OF CONTAMINANTS OF CONCERN IN GROUNDWATER - VAPOR INTRUSION[1)]
CAA VIM AND VIIM
MINGO JUNCTION STEEL WORKS LLC - WEIRTON FACILITY

1 - Complete analytical results (detections and detection limits) for each sample and constituent are provided in Appendix A, Table A-6.

2 - Number of samples is the total number of valid discrete samples obtained, including duplicate samples (i.e., a duplicate sample is counted as a discrete sample).

3 - The range of detected concentrations is presented. ND indicates that the constituent was not detected in any of the samples analyzed.

4 - Screening criteria based on the May 2021 USEPA Vapor Intrusion Screening Levels (VISL) for residential and commercial scenarios. The residential scenario is based on a Target Risk Level of 1E-6, a Hazard Quotient of 0.1, and the default West Virginia groundwater temperature of 13°C. The commercial scenario is based on a Target Risk Level of 1E-5, a Hazard Quotient of 0.1, and the default West Virginia groundwater temperature of 13°C. Double dashes indicate that an RSL is not available for a given constituent. Notes regarding specific values for various chemicals (e.g., surrogates used, effects basis, etc.) are as follows:

Criteria for cis-1,3-dichloropropene and trans-1,3-dichloropropene are based on the criteria for total 1,3-dichloropropene.
Criteria for 1,3-dichlorobenzene is based on the criteria for 1,4-dichlorobenzene.
Criteria for methylcyclohexane is based on the criteria for cyclohexane.

5 - Groundwater samples were collected for total inorganic analysis during the November 2013 event and dissolved inorganic analysis during the February 2014 and March/April 2019 events.

NA Constituent detected in every sample; detection limit not presented.

Bold italic values indicate that a detection limit exceeds a screening criterion.

TABLE 6
SUMMARY OF CONTAMINANTS OF CONCERN
CAA VIM AND VIIM
MINGO JUNCTION STEEL WORKS LLC - WEIRTON FACILITY VRP#20015

Medium	Pathway	Contaminants of Concern	
Surface Soil (Developed Areas)	**Direct Contact**	**Residential**	**Industrial**
		Benzo[a]anthracene Benzo[a]pyrene Benzo[b]fluoranthene Benzo[k]fluoranthene Chrysene Dibenz(a,h)anthracene Indeno[1,2,3-cd]pyrene Naphthalene 1,1'-Biphenyl 2-Methylnaphthalene Dibenzofuran PCB-1254 PCB-1260 Antimony Arsenic Cadmium Cobalt Copper Iron Lead Manganese Mercury Nickel Thallium Vanadium Zinc Cyanide, Total	Benzo[a]anthracene Benzo[a]pyrene Benzo[b]fluoranthene Dibenz(a,h)anthracene Naphthalene PCB-1260 Arsenic Cobalt Iron Lead Manganese Nickel Vanadium Cyanide, Total
Surface Soil (Wooded Hillside)	**Direct Contact**	**Residential**	**Industrial**
		Arsenic Iron Manganese	Arsenic
Subsurface Soil	**Direct Contact**	**Residential**	**Industrial**
		Benzo[a]anthracene Benzo[a]pyrene Benzo[b]fluoranthene Benzo[k]fluoranthene Dibenz(a,h)anthracene Indeno[1,2,3-cd]pyrene Naphthalene Iron Manganese Thallium Vanadium Cyanide, Total	Benzo[a]pyrene Naphthalene Iron Manganese

TABLE 6
SUMMARY OF CONTAMINANTS OF CONCERN
CAA VIM AND VIIM
MINGO JUNCTION STEEL WORKS LLC - WEIRTON FACILITY VRP#20015

Medium	Pathway	Contaminants of Concern	
Groundwater	**Direct Contact**	1,1-Dichloroethane	Bis(2-ethylhexyl) phthalate
		1,2-Dichlorobenzene	Dibenz(a,h)anthracene
		cis-1,2-Dichloroethene	Dibenzofuran
		1,4-Dichlorobenzene	Indeno[1,2,3-cd]pyrene
		Benzene	Aluminum
		Chloroform	Antimony
		Dichlorobromomethane	Arsenic
		Ethylbenzene	Cadmium
		Naphthalene	Cobalt
		Tetrachloroethene	Iron
		Trichloroethene	Lead
		Vinyl chloride	Manganese
		Xylenes, Total	Mercury
		1,1'-Biphenyl	Nickel
		2-Methylnaphthalene	Selenium
		Benzo[a]anthracene	Thallium
		Benzo[a]pyrene	Vanadium
		Benzo[b]fluoranthene	Cyanide, Total
		Benzo[k]fluoranthene	
Groundwater	**Vapor Intrusion**	**Residential**	**Commercial**
		Chloroform Ethylbenzene Naphthalene Trichloroethene Vinyl chloride Cyanide	none
Groundwater	**Migration to Surface Water (human and ecological)**	none	

TABLE 7
DERMAL ABSORPTION FACTORS FOR CONTAMINANTS OF CONCERN IN SOIL
CAA VIM AND VIIM
MINGO JUNCTION STEEL WORKS LLC - WEIRTON FACILITY VRP#20015

Contaminant of Concern	Dermal Absorption Factor (unitless)	Source
Benzo[a]anthracene	0.13	Exhibit 3-4 (USEPA, 2004)
Benzo[a]pyrene	0.13	Exhibit 3-4 (USEPA, 2004)
Benzo[b]fluoranthene	0.13	Exhibit 3-4 (USEPA, 2004)
Benzo[k]fluoranthene	0.13	Exhibit 3-4 (USEPA, 2004)
Chrysene	0.13	Exhibit 3-4 (USEPA, 2004)
Dibenz(a,h)anthracene	0.13	Exhibit 3-4 (USEPA, 2004)
Indeno[1,2,3-cd]pyrene	0.13	Exhibit 3-4 (USEPA, 2004)
Naphthalene	0.13	Exhibit 3-4 (USEPA, 2004)
1,1'-Biphenyl	- -	
2-Methylnaphthalene	0.13	
Dibenzofuran	- -	
PCB-1254	0.14	Exhibit 3-4 (USEPA, 2004)
PCB-1260	0.14	Exhibit 3-4 (USEPA, 2004)
Antimony	- -	
Arsenic	0.03	Exhibit 3-4 (USEPA, 2004)
Cadmium	0.001	Exhibit 3-4 (USEPA, 2004)
Cobalt	- -	
Copper	- -	
Iron	- -	
Lead	- -	
Manganese	- -	
Mercury	- -	
Nickel	- -	
Thallium	- -	
Vanadium	- -	
Zinc	- -	
Cyanide, Total	- -	

TABLE 8
INTAKE EQUATIONS AND EXPOSURE FACTORS - FUTURE OUTDOOR WORKER
CAA VIM AND VIIM
MINGO JUNCTION STEEL WORKS LLC - WEIRTON FACILITY VRP#20015

Exposure Route	Parameter Code	Parameter Definition	Value	Units	Rationale/ Reference	Intake Equation
All Pathways						
	EF	Exposure Frequency	250	days/year	USEPA (2002)	
	ED	Exposure Duration	25	years	USEPA (2002)	
	BW	Body Weight	80	kg	USEPA (2011)	
	AT	Averaging Time (noncancer)	9,125	days	ED * 365 days/yr	
		Averaging Time (cancer)	25,550	days	70 yrs * 365 days/yr	
Incidental Ingestion (soil)						
	C_S	Soil EPC	Constituent-Specific	mg/kg	Calculated (see Section 3.4.3)	Ingestion Intake (mg/kg-day)=
	IR	Soil Ingestion Rate	100	mg/day	USEPA (1991)	$\frac{C_S \times IR \times CF \times Fi \times EF \times ED}{BW \times AT}$
	CF	Conversion Factor	1.00E-06	kg/mg	- -	
	Fi	Fraction Soil Ingested at Site	100	%	- -	
Dermal Contact (soil)						
	C_S	Soil EPC	Constituent-Specific	mg/kg	Calculated (see Section 3.4.3)	Dermally Absorbed Dose (mg/kg-day)=
	CF	Conversion Factor	1.00E-06	kg/mg	- -	$\frac{C_S \times CF \times AF \times ABS \times EF \times ED \times SA \times EV}{BW \times AT}$
	AF	Soil to Skin Adherence Factor	0.12	mg/cm^2-event	USEPA (2011). Table 7-20 and Section 7.2.2; arithmetic mean of weighted average of body part- specific (hands, forearms, and face) mean adherence factors for adult commercial/industrial activities	
	ABS	Dermal Absorption Fraction	Constituent-Specific	unitless	Constituent specific - see Table 7	
	EV	Event frequency	1	events/day	- -	
	SA	Skin Surface Area	3,527	cm^2	Considers head, hands, and forearms USEPA (2011)	
Inhalation						
	Ca	Air EPC	Constituent-Specific	mg/m^3	Calculated (see Section 3.4.3)	Exposure Concentration (mg/m^3)=
	ET	Exposure Time	8	hours/day	USEPA (2009)	$\frac{C_a \times ET \times EF \times ED}{AT}$
	AT	Averaging Time (noncancer)	219,000	hours	ED * 365 days/yr * 24 hours/day	
		Averaging Time (cancer)	613,200	hours	70 yrs * 365 days/yr * 24 hours/day	

Notes:
EPC - Exposure Point Concentration

TABLE 9
INTAKE EQUATIONS AND EXPOSURE FACTORS - FUTURE CONSTRUCTION WORKER
CAA VIM AND VIIM
MINGO JUNCTION STEEL WORKS LLC - WEIRTON FACILITY VRP#20015

Exposure Route	Parameter Code	Parameter Definition	Value	Units	Rationale/ Reference	Intake Equation
All Pathways	EF_{soil}	Exposure Frequency	250	days/year	The estimated construction duration where shallow soil is exposed is a one year large construction project or several smaller projects conducted in sequence over a year (i.e., 50 weeks at 5 days/week).	
	EF_{water}	Exposure Frequency	30	days/year	Estimated duration for subsurface work in a trench, where groundwater exposure could occur.	
	ED	Exposure Duration	1	years	one-time construction project	
	BW	Body Weight	80	kg	USEPA (2011)	
	AT	Averaging Time (noncancer)	365	days	ED * 365 days/yr	
		Averaging Time (cancer)	25,550	days	70 yrs * 365 days/yr	
Incidental Ingestion (soil)	C_S	Soil EPC	Constituent-Specific	mg/kg	Calculated (see Section 3.4.3)	Ingestion Intake (mg/kg-day)= $\frac{C_S \times IR \times CF \times Fi \times EF \times ED}{BW \times AT}$
	IR	Soil Ingestion Rate	330	mg/day	USEPA (2002)	
	CF	Conversion Factor	1.00E-06	kg/mg	- -	
	Fi	Fraction Soil Ingested at Site	100	%	- -	
Dermal Contact (soil)	C_S	Soil EPC	Constituent-Specific	mg/kg	Calculated (see Section 3.4.3)	Dermally Absorbed Dose (mg/kg-day)= $\frac{C_S \times CF \times AF \times ABS \times EF \times ED \times SA \times EV}{BW \times AT}$
	CF	Conversion Factor	1.00E-06	kg/mg	- -	
	AF	Soil to Skin Adherence Factor	0.3	mg/cm^2-event	USEPA (2002)	
	ABS	Dermal Absorption Fraction	Constituent-Specific	unitless	Constituent specific - see Table 7	
	EV	Event frequency	1	events/day	- -	
	SA	Skin Surface Area	3,527	cm^2	Considers head, hands, and forearms USEPA (2011)	
Incidental Ingestion (water)	C_W	Water EPC	Constituent-Specific	mg/L	Calculated (see Section 3.4.3)	Ingestion Intake (mg/kg-day)= $\frac{C_S \times IR \times EF \times ED}{BW \times AT}$
	IR	Water Ingestion Rate	0.025	L/day	Conservative estimate of incidental ingestion of groundwater during construction.	
Dermal Contact (water)	DA_{event}	Absorbed Dose per Event	Constituent-Specific	mg/cm^2-event	Constituent-specific in accordance with USEPA (2004). Calculation provided in Appendix E.	Dermally Absorbed Dose (mg/kg-day)= $\frac{DA_{event} \times EV \times ED \times EF \times SA}{BW \times AT}$
	EV	Event Frequency	1	event/day	- -	
	EV	Event frequency	1	events/day	- -	
	SA	Skin Surface Area	6,032	cm^2	Considers head, hands, forearms, lower legs, and feet USEPA (2011)	
Inhalation	Ca	Air EPC	Constituent-Specific	mg/m^3	Calculated (see Section 3.4.3)	Exposure Concentration (mg/m^3)= $\frac{C_a \times ET \times EF \times ED}{AT}$
	ET	Exposure Time	8	hours/day	USEPA (2009)	
	AT	Averaging Time (noncancer)	8,760	hours	ED * 365 days/yr * 24 hours/day	
		Averaging Time (cancer)	613,200	hours	70 yrs * 365 days/yr * 24 hours/day	

Notes:
EPC - Exposure Point Concentration

TABLE 10
INTAKE EQUATIONS AND EXPOSURE FACTORS - CURRENT/FUTURE YOUTH TRESPASSER
CAA VIM AND VIIM
MINGO JUNCTION STEEL WORKS LLC - WEIRTON FACILITY VRP#20015

Exposure Route	Parameter Code	Parameter Definition	Value	Units	Rationale/ Reference	Intake Equation
All Pathways						
	EF	Exposure Frequency	30	days/year	Assumes exposure 1 day/week during warmest months of the year (April through October). Based on professional judgement.	
	ED	Exposure Duration	5	years	Assumes typical adolescent trespasser, ages 11 to <16. Based on professional judgement.	
	BW	Body Weight	56.8	kg	Table 8-1 of USEPA (2011)	
	AT	Averaging Time (noncancer)	1,825	days	ED * 365 days/yr	
		Averaging Time (cancer)	25,550	days	70 yrs * 365 days/yr	
Incidental Ingestion (soil)	C_S	Soil EPC	Constituent-Specific	mg/kg	Calculated (see Section 3.4.3)	Ingestion Intake (mg/kg-day)=
	IR	Soil Ingestion Rate	100	mg/day	USEPA default value for an outdoor worker, conservatively applied to a trespasser.	$\frac{C_S \times IR \times CF \times Fi \times EF \times ED}{BW \times AT}$
	CF	Conversion Factor	1.00E-06	kg/mg	- -	
	Fi	Fraction Soil Ingested at Site	100	%	- -	
Dermal Contact (soil)	C_S	Soil EPC	Constituent-Specific	mg/kg	Calculated (see Section 3.4.3)	Dermally Absorbed Dose (mg/kg-day)=
	CF	Conversion Factor	1.00E-06	kg/mg	- -	$\frac{C_S \times CF \times AF \times ABS \times EF \times ED \times SA \times EV}{BW \times AT}$
	AF	Soil to Skin Adherence Factor	0.04	mg/cm^2-event	geometric mean for child (age 8 to 12) playing in dry soil; corresponds to face, forearms, hands, lower legs, and feet, Exhibit C-3 of USEPA (2004). Conservatively applied to a trespasser.	
	ABS	Dermal Absorption Fraction	Constituent-Specific	unitless	Constituent specific - see Table 7	
	EV	Event frequency	1	events/day	- -	
	TBS	Total Body Surface Area	20600	cm^2	Recommended 95th percentile value for total body surface area, males and females combined, age 11 to <16 years, Table 7-1 of USEPA (2011).	
	FBE	Fraction of Body Exposed	0.54	unitless	Mean percent of total body surface area corresponding to head, arms, hands, and legs for age range 11 to <16 years, Table 7-2 of USEPA (2011).	
	SA	Skin Surface Area	11,083	cm^2	calculated as TBS * FBE	
Inhalation	Ca	Air EPC	Constituent-Specific	mg/m^3	Calculated (see Section 3.4.3)	Exposure Concentration (mg/m^3)=
	ET	Exposure Time	2	hours/day	Average time expected to trespass on site. Based on professional judgement.	$\frac{C_a \times ET \times EF \times ED}{AT}$
	AT	Averaging Time (noncancer)	43,800	hours	ED * 365 days/yr * 24 hours/day	
		Averaging Time (cancer)	613,200	hours	70 yrs * 365 days/yr * 24 hours/day	

Notes:
EPC - Exposure Point Concentration

TABLE 11
EXPOSURE POINT CONCENTRATIONS FOR SURFACE SOIL (DEVELOPED AREAS)
CAA VIM AND VIIM
MINGO JUNCTION STEEL WORKS LLC - WEIRTON FACILITY VRP#20015

Contaminants of Concern	Number of Samples [1]	Number of Detected Results	Maximum Detected Concentration (mg/Kg)	Upper Confidence Limit [2] (mg/Kg)	Exposure Point Concentration [3] (mg/Kg)
Benzo[a]anthracene	78	66	48	5.18	5.18
Benzo[a]pyrene	78	55	28	4.01	4.01
Benzo[b]fluoranthene	78	58	31	3.79	3.79
Benzo[k]fluoranthene	78	45	14	1.36	1.36
Chrysene	78	66	87	9.45	9.45
Dibenz(a,h)anthracene	78	40	5.9	0.53	0.53
Indeno[1,2,3-cd]pyrene	78	55	18	1.93	1.93
Naphthalene	78	28	32	2.32	2.32
1,1'-Biphenyl	71	9	6.3	0.036	0.036
2-Methylnaphthalene	71	47	76	6.38	6.38
Dibenzofuran	71	11	13	1.09	1.09
PCB-1254	69	11	0.58	0.011	0.011
PCB-1260	69	33	4.3	0.80	0.80
Antimony	65	62	6.9	1.25	1.25
Arsenic	65	62	17	4.72	Arsenic is eliminated as a COC since the UCL is below WV background value of 13.1 mg/Kg
Cadmium	65	65	8	2.52	2.52
Cobalt	65	65	100	16.6	16.6
Copper	65	65	490	61.2	61.2
Iron	65	65	430000	122924	122924
Lead	65	65	830	156	Lead is eliminated as a COC since the UCL is below the residential De Minimis value of 400 mg/Kg.
Manganese	65	65	36000	12518	12518
Mercury	65	53	2.8	0.32	0.32
Nickel	65	65	4600	399	399
Thallium	65	56	0.81	0.11	0.11
Vanadium	65	65	620.00	217	217
Zinc	65	65	5100.00	950	950
Cyanide, Total	65	53	26.00	2.30	2.30

Notes:

[1] The surface soil dataset includes samples collected from 0 to 2 feet bgs from the developed areas within CAA VIM and VIIM.

Duplicate and parent samples are maintained as two distinct samples.

[2] Upper Confidence Limits (UCLs) were calculated using the USEPA ProUCL software. The ProUCL statistical output is provided in Appendix C.

[3] The Exposure Point Concentration (EPC) is the lower of the maximum detected concentration or the UCL.

TABLE 12
EXPOSURE POINT CONCENTRATIONS FOR SURFACE SOIL (WOODED HILLSIDE)
CAA VIM AND VIIM
MINGO JUNCTION STEEL WORKS LLC - WEIRTON FACILITY VRP#20015

Contaminants of Concern	Number of Samples [1]	Number of Detected Results	Maximum Detected Concentration (mg/Kg)	Upper Confidence Limit [2] (mg/Kg)	Exposure Point Concentration [3] (mg/Kg)
Arsenic	5	5	32	33.6	32
Iron	5	5	64000	51553	51553
Manganese	5	5	2100	1955	1955

Notes:

[1] The surface soil dataset includes samples collected from 0 to 2 feet bgs from the undeveloped wooded hillside.

Duplicate and parent samples are maintained as two distinct samples.

[2] Upper Confidence Limits (UCLs) were calculated using the USEPA ProUCL software. The ProUCL statistical output is provided in Appendix C.

[3] The Exposure Point Concentration (EPC) is the lower of the maximum detected concentration or the UCL.

TABLE 13
EXPOSURE POINT CONCENTRATIONS FOR SHALLOW SOIL (0 TO 10 FEET BGS)
CAA VIM AND VIIM
MINGO JUNCTION STEEL WORKS LLC - WEIRTON FACILITY VRP#20015

Contaminants of Concern	Number of Samples [1]	Number of Detected Results	Maximum Detected Concentration (mg/Kg)	Upper Confidence Limit [2] (mg/Kg)	Exposure Point Concentration [3] (mg/Kg)
Benzo[a]anthracene	147	129	48	3.00	3.00
Benzo[a]pyrene	147	117	28	2.32	2.32
Benzo[b]fluoranthene	147	121	31	3.09	3.09
Benzo[k]fluoranthene	147	84	14	1.63	1.63
Chrysene	147	125	87	5.28	5.28
Dibenz(a,h)anthracene	147	48	5.9	0.49	0.49
Indeno[1,2,3-cd]pyrene	147	114	18	1.94	1.94
Naphthalene	147	88	32	5.91	5.91
1,1'-Biphenyl	80	9	6.3	0.033	0.033
2-Methylnaphthalene	80	51	76	5.67	5.67
Dibenzofuran	80	13	13	0.97	0.97
PCB-1254	127	13	0.58	0.043	0.043
PCB-1260	127	35	4.3	0.44	0.44
Antimony	74	71	6.9	1.22	1.22
Arsenic	74	71	17	5.02	Arsenic is eliminated as a COC since the UCL is below WV background value of 13.1 mg/Kg
Cadmium	74	74	8	2.26	2.26
Cobalt	74	74	100	9.47	9.47
Copper	74	74	490	60.7	60.7
Iron	74	74	430000	114702	114702
Lead	74	74	830	160	Lead is eliminated as a COC since the UCL is below the residential De Minimis value of 400 mg/Kg.
Manganese	74	74	36000	11422	11422
Mercury	74	61	2.8	0.29	0.29
Nickel	74	74	4600	353	353
Thallium	74	65	0.81	0.13	0.13
Vanadium	74	74	620.00	195	195
Zinc	74	74	5100.00	852	852
Cyanide, Total	74	74	26.00	2.21	2.21

Notes:

[1] The shallow soil dataset includes samples collected from 0 to 10 feet bgs from the developed areas within CAA VIM and VIIM.

Duplicate and parent samples are maintained as two distinct samples.

[2] Upper Confidence Limits (UCLs) were calculated using the USEPA ProUCL software. The ProUCL statistical output is provided in Appendix C.

[3] The Exposure Point Concentration (EPC) is the lower of the maximum detected concentration or the UCL.

TABLE 14
EXPOSURE POINT CONCENTRATIONS FOR SHALLOW PERCHED GROUNDWATER
CAA VIM AND VIIM
MINGO JUNCTION STEEL WORKS LLC - WEIRTON FACILITY VRP#20015

Contaminants of Concern	Number of Samples (1)	Number of Detected Results	Maximum Detected Concentration (ug/L)	Upper Confidence Limit (2) (ug/L)	Exposure Point Concentration (3) (ug/L)
1,1-Dichloroethane	14	2	0.25	too few to detects to calculate	0.25
1,2-Dichlorobenzene	4	2	37	too few to detects to calculate	37
cis-1,2-Dichloroethene	14	6	4.3	1.75	1.75
1,4-Dichlorobenzene	4	2	0.59	too few to detects to calculate	0.59
Benzene	14	4	0.54	0.47	0.47
Chloroform	14	1	3.50	too few to detects to calculate	3.50
Dichlorobromomethane	14	1	1.30	too few to detects to calculate	1.30
Ethylbenzene	14	8	16	5.79	5.79
Tetrachloroethene	14	10	10	4.62	4.62
Trichloroethene	14	5	1.80	0.89	0.89
Vinyl chloride	14	1	0.49	too few to detects to calculate	0.49
Xylenes, Total	14	8	61	23.1	23.1
1,1'-Biphenyl	6	5	2.60	2.13	2.13
2-Methylnaphthalene	6	5	30	28.6	28.6
Benzo[a]anthracene	6	0	ND	ND	ND
Benzo(a)pyrene	6	0	ND	ND	ND
Benzo[b]fluoranthene	6	0	ND	ND	ND
Benzo[k]fluoranthene	6	0	ND	ND	ND
Chrysene	6	0	ND	ND	ND
Dibenz(a,h)anthracene	6	0	ND	ND	ND
Indeno[1,2,3-cd]pyrene	6	0	ND	ND	ND
Naphthalene	6	5	23	17.2	17.2
Bis(2-ethylhexyl) phthalate	6	4	1.60	1.69	1.60
Dibenzofuran	6	5	1.50	1.52	1.50
PCB-1254	NA	NA	NA	NA	NA
PCB-1260	NA	NA	NA	NA	NA
Aluminum	6	4	920	3197	920
Antimony	6	2	0.12	too few to detects to calculate	0.12
Arsenic	6	5	1.90	1.63	1.63
Cadmium	6	1	0.84	too few to detects to calculate	0.84
Cobalt	6	6	98	2656.00	98
Copper	6	6	2.60	1.98	1.98

TABLE 14
EXPOSURE POINT CONCENTRATIONS FOR SHALLOW PERCHED GROUNDWATER
CAA VIM AND VIIM
MINGO JUNCTION STEEL WORKS LLC - WEIRTON FACILITY VRP#20015

Contaminants of Concern	Number of Samples [1]	Number of Detected Results	Maximum Detected Concentration (ug/L)	Upper Confidence Limit [2] (ug/L)	Exposure Point Concentration [3] (ug/L)
Iron	6	5	60000	30013	30013
Lead	6	4	1.00	0.94	Lead is eliminated as a COC since the UCL is below the Tapwater RSL and groundwater De Minimis value of 15 ug/L.
Manganese	6	5	30000	15010	15010
Mercury	6	1	0.050	too few to detects to calculate	0.050
Nickel	6	3	110	59.8	59.8
Selenium	6	5	15.0	9.62	9.62
Thallium	6	2	0.11	0.17	0.11
Vanadium	6	5	5.70	3.57	3.57
Zinc	6	4	160	557	160
Cyanide, Total	6	0	ND	ND	ND

Notes:

[1] The shallow groundwater dataset includes samples collected from shallow perched wells located within the HCL Plant Area (i.e., wells VII-MW-01P, 03P, 04P, 05P, 06P, 07P). Duplicate and parent samples are maintained as two distinct samples.

[2] Upper Confidence Limits (UCLs) were calculated using the USEPA ProUCL software. The ProUCL statistical output is provided in Appendix C.

[3] The Exposure Point Concentration (EPC) is the lower of the maximum detected concentration or the UCL.

TABLE 15
CALCULATION OF CHRONIC SOIL VOLATILIZATION FACTORS FOR AMBIENT (OUTDOOR) AIR
CAA VIM AND VIIM
MINGO JUNCTION STEEL WORKS LLC - WEIRTON FACILITY VRP#20015

USEPA (2002) Equation 4-8:

$$VF\ (m^3/kg) = Q/C_{vol} \times \frac{(3.14 \times Da \times T)^{1/2}}{(2 \times Pb \times Da)} \times 10^{-4}\ (m^2/cm^2)$$

where:

$$Da\ (cm^2/s) = \frac{(Ea^{10/3} \times DiH'_{TS} + Ew^{10/3}\ Dw)\ /\ n^2}{Pb\ Kd + Ew + Ea\ H'_{TS}}$$

Parameter	Value	Variable	Units	Source
inverse of the mean concentration at the center of a 0.5-acre-square site	58.17	Q/C_{vol}	$\frac{(g/m^2\text{-}s)}{(kg/m^3)}$	Value for Huntington, WV for a 0.5-acre site (Exhibit D-3; USEPA, 2002)
air-filled soil porosity	0.284	Ea	L_{air}/L_{soil}	USEPA (2021a) On-Line RSL Calculator
total soil porosity	0.434	n	L_{pore}/L_{soil}	USEPA (2021a) On-Line RSL Calculator
water-filled soil porosity	0.150	Ew	L_{water}/L_{soil}	USEPA (2021a) On-Line RSL Calculator
dry soil bulk density	1.5	Pb	g/cm^3	USEPA (2021a) On-Line RSL Calculator
diffusivity in air	--	Di	cm^2/sec	chemical-specific
Henry's Law Constant at system temperature	--	H'_{TS}	unitless	chemical-specific
diffusivity in water	--	Dw	cm^2/sec	chemical-specific
soil-water partition coefficient	--	Kd	cm^3/g	Koc x foc
soil-organic carbon partition coefficient	--	Koc	cm^3/g	chemical-specific
exposure interval	788400000	T	sec	based on an exposure duration of 25 yrs
fraction organic carbon	0.006	foc	g/g	USEPA (2021a) On-Line RSL Calculator

Constituent-Specific Factors

Constituent	H'_{TS} (unitless)	Di (cm^2/sec)	Dw (cm^2/sec)	Koc (cm^3/g)	Da (cm^2/s)	VF (m^3/kg)
Benzo[a]anthracene	4.9E-04	2.6E-02	6.7E-06	1.8E+05	6.8E-10	3.7E+06
Naphthalene	1.8E-02	6.0E-02	8.4E-06	1.5E+03	6.2E-06	3.9E+04
1,1'-Biphenyl	1.3E-02	4.7E-02	7.6E-06	5.1E+03	1.0E-06	9.5E+04
2-Methylnaphthalene	2.1E-02	5.2E-02	7.8E-06	2.5E+03	4.0E-06	4.9E+04
Dibenzofuran	8.7E-03	6.5E-02	7.4E-06	9.2E+03	5.5E-07	1.3E+05
PCB-1254	1.2E-02	2.4E-02	6.1E-06	1.3E+05	1.9E-08	7.1E+05
PCB-1260	1.4E-02	2.2E-02	5.6E-06	3.5E+05	7.7E-09	1.1E+06
Mercury	3.5E-01	3.1E-02	6.3E-06	8.7E+03	1.1E-05	2.9E+04
Cyanide	4.2E-03	2.1E-01	2.5E-05	1.7E+03	4.7E-06	4.5E+04

Constituent specific factors obtained from USEPA On-Line RSL Calculator (USEPA, 2021a).

TABLE 16

CALCULATION OF SUBCHRONIC SOIL VOLATILIZATION FACTORS FOR AMBIENT (OUTDOOR) AIR
CONSTRUCTION WORKER
CAA VIM AND VIIM
MINGO JUNCTION STEEL WORKS LLC - WEIRTON FACILITY VRP#20015

USEPA (2002) Equation 5-14:

$$VF_{sc}\ (m^3/kg) = Q/C_{sa} \times \frac{(3.14 \times Da \times T)^{1/2}}{(2 \times Pb \times Da)} \times 10^{-4}\ (m^2/cm^2) \times (1 / F_D)$$

where:

$$Da\ (cm^2/s) = \frac{(Ea^{10/3} \times DiH'_{TS} + Ew^{10/3}\ Dw)\ /\ n^2}{Pb\ Kd + Ew + Ea\ H'_{TS}}$$

Parameter	Value	Variable	Units	Source
inverse of 1-hr average air concentration at the center of a 0.5-acre-square site	14.31	Q/C_{sa}	$\frac{(g/m^2\text{-}s)}{(kg/m^3)}$	Value for a 0.5-acre site calculated using Equation 5-15 from USEPA (2002)
air-filled soil porosity	0.284	Ea	L_{air}/L_{soil}	USEPA (2021a) On-Line RSL Calculator
total soil porosity	0.434	n	L_{pore}/L_{soil}	USEPA (2021a) On-Line RSL Calculator
water-filled soil porosity	0.150	Ew	L_{water}/L_{soil}	USEPA (2021a) On-Line RSL Calculator
dry soil bulk density	1.5	Pb	g/cm^3	USEPA (2021a) On-Line RSL Calculator
diffusivity in air	--	Di	cm^2/sec	chemical-specific
Henry's Law Constant at system temperature	--	H'_{TS}	unitless	chemical-specific
diffusivity in water	--	Dw	cm^2/sec	chemical-specific
soil-water partition coefficient	--	Kd	cm^3/g	Koc x foc
soil-organic carbon partition coefficient	--	Koc	cm^3/g	chemical-specific
exposure interval	3.02E+07	T	sec	Site-specific: 50 weeks, 7 day/week for 24 hour/day
fraction organic carbon	0.006	foc	g/g	USEPA (2021a) On-Line RSL Calculator
dispersion correction factor	0.186	F_D	unitless	calculated assuming a construction duration of 8400 hours (24 hrs/day, 7 days/week for 50 weeks) using Equation E-16 (USEPA, 2002)

Constituent-Specific Factors

Constituent	H'_{TS} (unitless)	Di (cm^2/sec)	Dw (cm^2/sec)	Koc (cm^3/g)	Da (cm^2/s)	VF (m^3/kg)
Benzo[a]anthracene	4.9E-04	2.6E-02	6.7E-06	1.8E+05	6.8E-10	9.6E+05
Naphthalene	1.8E-02	6.0E-02	8.4E-06	1.5E+03	6.2E-06	1.0E+04
1,1'-Biphenyl	1.3E-02	4.7E-02	7.6E-06	5.1E+03	1.0E-06	2.5E+04
2-Methylnaphthalene	2.1E-02	5.2E-02	7.8E-06	2.5E+03	4.0E-06	1.3E+04
Dibenzofuran	8.7E-03	6.5E-02	7.4E-06	9.2E+03	5.5E-07	3.4E+04
PCB-1254	1.2E-02	2.4E-02	6.1E-06	1.3E+05	1.9E-08	1.8E+05
PCB-1260	1.4E-02	2.2E-02	5.6E-06	3.5E+05	7.7E-09	2.9E+05
Mercury	3.5E-01	3.1E-02	6.3E-06	8.7E+03	1.1E-05	7.5E+03
Cyanide	4.2E-03	2.1E-01	2.5E-05	1.7E+03	4.7E-06	1.2E+04

Constituent specific factors obtained from USEPA On-Line RSL Calculator (USEPA, 2021a).

TABLE 17
CALCULATION OF A PARTICULATE EMISSION FACTOR - EMISSIONS FROM UNPAVED ROAD CONSTRUCTION TRAFFIC
CAA VIM AND VIIM
MINGO JUNCTION STEEL WORKS LLC - WEIRTON FACILITY VRP#20015

USEPA (2002) Equation 5-5:

$$PEF_{sc} = Q/C_{sr} \times \frac{1}{F_D} \times \left[\frac{T \times A_R}{556 \times \left(\frac{W}{3}\right)^{0.4} \times \frac{(365d/yr - p)}{365d/yr} \times \sum VKT} \right]$$

Symbol	Factor	Value	Source
PEF_{sc}	Subchronic particulate emission factor (m^3/kg)	6.9E+06	Calculated
Q/C_{sr}	Inverse of 1-hr average air concentration along a straight road segment bisecting a 0.5-acre-square site (g/m^2-s per kg/m^3)	23.0	Value for a 0.5-acre site calculated using Equation 5-6 from USEPA (2002)
F_D	Dispersion correction factor (unitless)	0.186	Calculated assuming a construction duration (i.e., averaging time) of 8,400 hours (50 weeks of construction; 24 hrs/day) using Equation E-16 (USEPA, 2002)
T	Total time over which construction occurs (s)	3.02E+07	Site-specific: 50 weeks, 7 day/week for 24 hour/day
A_R	Surface area of contaminated road segment (m^2)	390	Assumes 210 feet of unpaved roads may be constructed (i.e., assumes disturbance of a one acre source area). A construction road width of 20 feet is assumed.
W	Mean vehicle weight (tons)	8	Assumes traffic consists of twenty 2-ton cars and ten 20-ton trucks
p	Number of days with at least 0.01 inches of precipitation (days/yr)	170	Estimated from Exhibit 5-2 (USEPA, 2002)
ΣVTK	Sum of fleet vehicle kilometers traveled during the exposure duration (km)	480	Assumes each vehicle travels the length of the road once per day for 120 days/yr

TABLE 18
CANCER TOXICITY VALUES
CAA VIM AND VIIM
MINGO JUNCTION STEEL WORKS LLC - WEIRTON FACILITY VRP#20015

Contaminants of Concern	Mutagen	Weight of Evidence Classification	Oral Exposure			Inhalation Exposure			Dermal Exposure	
			Cancer Slope Factor [1] $(mg/kg\text{-}day)^{-1}$		Tumor Sites and Types	Inhalation Unit Risk [1] $(ug/m^3)^{-1}$		Tumor Sites and Types	Gastrointestinal Absorption Efficiency	Cancer Slope Factor [1] $(mg/kg\text{-}day)^{-1}$
VOCs										
1,1-Dichloroethane		C*	5.7E-03	C	Reproductive, Hematologic, Hepatic	1.6E-06	C	Reproductive, Hematologic, Hepatic	1	5.7E-03
1,2-Dichlorobenzene		D	NA		- -	NA		- -	1	NA
cis-1,2-Dichloroethene		- -	NA		- -	NA		- -	1	NA
1,4-Dichlorobenzene		- -	5.4E-03	C	Hepatocellular adenomas or carcinomas	1.1E-05	C	Hepatocellular adenomas or carcinomas	1	5.4E-03
Benzene		Known/likely human carcinogen	5.5E-02	I	Hematologic (Leukemia)	7.8E-06	I	Hematologic (Leukemia)	1	5.5E-02
Chloroform		Not likely to be carcinogenic to humans	3.1E-02	C	renal tumors	2.3E-05	I	Hepatocellular carcinoma	1	3.1E-02
Dichlorobromomethane		B2	6.2E-02	I	Urinary (Kidney)	3.7E-05	C	Kidney	1	6.2E-02
Ethylbenzene		D	1.1E-02	C	renal tumor	2.5E-06	C	renal tumor	1	1.1E-02
Tetrachloroethene		Likely to be carcinogenic to humans	2.1E-03	I	Hepatocellular adenomas or carcinomas	2.6E-07	I	Hepatocellular adenomas or carcinomas	1	2.1E-03
Trichloroethene	M	Carcinogenic to humans	4.6E-02	I	Hematologic, Hepatic, Urinary	4.1E-06	I	Hematologic, Hepatic, Urinary	1	4.6E-02
Vinyl chloride	M	Known/likely human carcinogen	7.2E-01	I	hepatic	4.4E-06	I	hepatic	1	7.2E-01
Xylenes, Total		- -	NA		- -	NA		- -	1	NA

TABLE 18
CANCER TOXICITY VALUES
CAA VIM AND VIIM
MINGO JUNCTION STEEL WORKS LLC - WEIRTON FACILITY VRP#20015

Contaminants of Concern	Mutagen	Weight of Evidence Classification	Oral Exposure			Inhalation Exposure			Dermal Exposure	
			Cancer Slope Factor [1] $(mg/kg\text{-}day)^{-1}$		Tumor Sites and Types	Inhalation Unit Risk [1] $(ug/m^3)^{-1}$		Tumor Sites and Types	Gastrointestinal Absorption Efficiency	Cancer Slope Factor [1] $(mg/kg\text{-}day)^{-1}$
SVOCs										
1,1'-Biphenyl		Suggestive evidence of carcinogenic potential	8.0E-03	I	hepatic	NA		- -	1	8.0E-03
2-Methylnaphthalene		- -	NA		- -	NA		- -	1	NA
Benzo[a]anthracene	M	B2	1.0E-01	E	- -	6.0E-05	E	- -	1	1.0E-01
Benzo(a)pyrene	M	Carcinogenic to humans	1.0E+00	I	Gastrointestinal	6.0E-04	I	Gastrointestinal, respiratory	1	1.0E+00
Benzo[b]fluoranthene	M	B2	1.0E-01	E	- -	6.0E-05	E	- -	1	1.0E-01
Benzo[k]fluoranthene	M	B2	1.0E-02	E	- -	6.0E-06	E	- -	1	1.0E-02
Chrysene	M	B2	1.0E-03	E	- -	6.0E-07	E	- -	1	1.0E-03
Dibenz(a,h)anthracene	M	B2	1.0E+00	E	- -	6.0E-04	E	- -	1	1.0E+00
Indeno[1,2,3-cd]pyrene	M	B2	1.0E-01	E	- -	6.0E-05	E	- -	1	1.0E-01
SVOCs Cont.										
Naphthalene		C*	1.2E-01	C	nasal respiratory epithelial adenoma	3.4E-05	C	nasal respiratory epithelial adenoma	1	1.2E-01
Bis(2-ethylhexyl) phthalate		B2	1.4E-02	I	Hepatocellular adenomas or carcinomas	2.4E-06	C	hepatocellular carcinoma	1	1.4E-02
Dibenzofuran		D	NA		- -	NA		- -	1	NA
PCBs										
PCB-1254		B2	2.0E+00	I	hepatic	5.7E-04	I	hepatic	1	2.0E+00
PCB-1260		B2	2.0E+00	I	hepatic	5.7E-04	I	hepatic	1	2.0E+00

TABLE 18
CANCER TOXICITY VALUES
CAA VIM AND VIIM
MINGO JUNCTION STEEL WORKS LLC - WEIRTON FACILITY VRP#20015

Contaminants of Concern	Mutagen	Weight of Evidence Classification	Oral Exposure			Inhalation Exposure			Dermal Exposure	
			Cancer Slope Factor [1] $(mg/kg\text{-}day)^{-1}$		Tumor Sites and Types	Inhalation Unit Risk [1] $(ug/m^3)^{-1}$		Tumor Sites and Types	Gastrointestinal Absorption Efficiency	Cancer Slope Factor [1] $(mg/kg\text{-}day)^{-1}$
Inorganics										
Aluminum		- -	NA		- -	NA		- -	1	NA
Antimony		- -	NA		- -	NA		- -	0.15	NA
Arsenic		A	1.5E+00	I	Dermal (skin cancer)	4.3E-03	I	Respiratory (lung cancer)	1	1.5E+00
Cadmium		B1	NA		- -	1.8E-03	I	Respiratory	0.025	NA
Cobalt		- -	NA		- -	9.0E-03	P	Respiratory	1	NA
Copper		D	NA		- -	NA		- -	1	NA
Iron		- -	NA		- -	NA		- -	1	NA
Lead		- -	NA		- -	NA		- -	1	NA
Manganese		D	NA		- -	NA		- -	0.04	NA
Mercury		D	NA		- -	NA		- -	1	NA
Nickel		- -	NA		- -	2.6E-04	C	Respiratory (lung cancer)	0.04	NA
Selenium		D	NA		- -	NA		- -	1	NA
Thallium		- -	NA		- -	NA		- -	1	NA
Vanadium*		- -	NA		- -	8.3E-03	P	Respiratory	0.026	NA
Zinc		D	NA		- -	NA		- -	1	NA
Cyanide, Total		D	NA		- -	NA		- -	1	NA

TABLE 18
CANCER TOXICITY VALUES
CAA VIM AND VIIM
MINGO JUNCTION STEEL WORKS LLC - WEIRTON FACILITY VRP#20015

Contaminants of Concern	Mutagen	Weight of Evidence Classification	Oral Exposure		Inhalation Exposure		Dermal Exposure	
			Cancer Slope Factor [1] $(mg/kg\text{-}day)^{-1}$	Tumor Sites and Types	Inhalation Unit Risk [1] $(ug/m^3)^{-1}$	Tumor Sites and Types	Gastrointestinal Absorption Efficiency	Cancer Slope Factor [1] $(mg/kg\text{-}day)^{-1}$

Notes:

1 - Oral and inhalation toxicity values obtained from the sources noted above and defined below. Dermal Cancer Slope Factors (SFd) were calculated using the oral Cancer Slope Factor (SFo) and the Gastrointestinal Absorption Efficiency (GIABS) in accordance with USEPA (2004) using the following equation: SFd = SFo/GIABS.

A - Known human carcinogen

B1 - Probable human carcinogen (based on limited evidence of carcinogenicity in humans)

B2 - Probable human carcinogen

C* - Possible Human Carcinogen

D - Not classifiable as to human carcinogenicity

I - Integrated Risk Information System (IRIS; USEPA, 2021c)

C - California EPA toxicity values Chronic Reference Exposure Levels (RELS) and the Cancer Potency Values, as presented in USEPA (2021a).

E - Values calculated using a Relative Potency Factor (RPF) which is based on the potency of the constituent relative to benzo(a)pyrene, as presented in USEPA (2021a).

P - Provisional Peer Reviewed Toxicity Values (PPRTV) as presented in USEPA (2021a)

* - Based on the values for Vanadium Pentoxide, as presented in USEPA (2021a).

NA - USEPA-derived toxicity values are not available for this particular exposure route or endpoint.

TABLE 19
NONCANCER TOXICITY VALUES - CHRONIC
CAA VIM AND VIIM
MINGO JUNCTION STEEL WORKS LLC - WEIRTON FACILITY VRP#20015

	Oral Exposure			Inhalation Exposure			Dermal Exposure	
Contaminants of Concern	**Chronic Reference Dose [1] (mg/kg-day)**		**Target Organ or Critical Effect**	**Chronic Reference Concentration [1] (mg/m^3)**		**Target Organ or Critical Effect**	**Gastrointestinal Absorption Efficiency**	**Chronic Reference Dose [1] (mg/kg-day)**
VOCs								
1,1-Dichloroethane	2.0E-01	P	kidney	NA		- -	1	2.0E-01
1,2-Dichlorobenzene	9.0E-02	I	hepatocellular necrosis	2.0E-01	H	hepatic	1	9.0E-02
cis-1,2-Dichloroethene	2.0E-03	I	urinary	NA		- -	1	2.0E-03
1,4-Dichlorobenzene	7.0E-02	A	hepatic	8.0E-01	I	hepatic	1	7.0E-02
Benzene	4.0E-03	I	immune	3.0E-02	I	immune	1	4.0E-03
Chloroform	1.0E-02	I	hepatic	9.8E-02	A	hepatic	1	1.0E-02
Dichlorobromomethane	2.0E-02	I	urinary	NA		- -	1	2.0E-02
Ethylbenzene	1.0E-01	I	hepatic, urinary	1.0E+00	I	developmental	1	1.0E-01
Tetrachloroethene	6.0E-03	I	nervous, ocular	4.0E-02	I	nervous, ocular	1	6.0E-03
Trichloroethene	5.0E-04	I	developmental, immune	2.0E-03	I	developmental, immune	1	5.0E-04
Vinyl chloride	3.0E-03	I	hepatic	1.0E-01	I	hepatic	1	3.0E-03
Xylenes, Total	2.0E-01	I	decreased body weight; increased mortality	1.0E-01	I	nervous	1	2.0E-01
SVOCs								
1,1'-Biphenyl	5.0E-01	I	urinary	4.0E-04	P	developmental	1	5.0E-01
2-Methylnaphthalene	4.0E-03	I	respiratory	NA		- -	1	4.0E-03
Benzo[a]anthracene	NA		- -	NA		- -	1	NA
Benzo(a)pyrene	3.0E-04	I	Developmental, immune, reproductive	2.0E-06	I	Developmental, reproductive	1	3.0E-04
Benzo[b]fluoranthene	NA		- -	NA		- -	1	NA
Benzo[k]fluoranthene	NA		- -	NA		- -	1	NA
Chrysene	NA		- -	NA		- -	1	NA
Dibenz(a,h)anthracene	NA		- -	NA		- -	1	NA
Indeno[1,2,3-cd]pyrene	NA		- -	NA		- -	1	NA

TABLE 19
NONCANCER TOXICITY VALUES - CHRONIC
CAA VIM AND VIIM
MINGO JUNCTION STEEL WORKS LLC - WEIRTON FACILITY VRP#20015

	Oral Exposure			Inhalation Exposure			Dermal Exposure	
Contaminants of Concern	**Chronic Reference Dose [1] (mg/kg-day)**		**Target Organ or Critical Effect**	**Chronic Reference Concentration [1] (mg/m^3)**		**Target Organ or Critical Effect**	**Gastrointestinal Absorption Efficiency**	**Chronic Reference Dose [1] (mg/kg-day)**
SVOCs Cont.								
Naphthalene	2.0E-02	I	decreased body weight	3.0E-03	I	nervous, respiratory	1	2.0E-02
Bis(2-ethylhexyl) phthalate	2.0E-02	I	hepatic	NA		- -	1	2.0E-02
Dibenzofuran	1.0E-03	P	whole body	NA		- -	1	1.0E-03
PCBs								
PCB-1254	2.0E-05	I	immune, dermal, ocular	NA		- -	1	2.0E-05
PCB-1260	NA		- -	NA		- -	1	NA
Inorganics								
Aluminum	1.0E+00	P	Neurological	5.0E-03	P	Neurological	1	1.0E+00
Antimony	4.0E-04	I	Hematologic	3.0E-04	A	Respiratory	0.15	6.0E-05
Arsenic	3.0E-04	I	Cardiovascular, dermal	1.5E-05	C	Reproductive, cardiovascular, CNS, respiratory, integumentary	1	3.0E-04
Cadmium	1.0E-03	I	Urinary	1.0E-05	A	Respiratory, hepatic, renal, endocrine, gastrointestinal, hematologic, cardiovascular	0.025	2.5E-05
Cobalt	3.0E-04	P	Hematologic, endocrine, reproductive, cardiovascular	6.0E-06	P	Respiratory	1	3.0E-04
Copper	4.0E-02	H	Gastrointestinal	NA		- -	1	4.0E-02
Iron	7.0E-01	P	Hematopoietic, hepatic, gastrointestinal	NA		- -	1	7.0E-01
Lead	NA		- -	NA		- -	1	NA
Manganese	2.4E-02	I	nervous system	5.0E-05	I	nervous system	0.04	9.6E-04
Mercury	1.6E-04	C	Nervous system, development, kidney	3.0E-04	I	nervous system	1	1.6E-04

TABLE 19
NONCANCER TOXICITY VALUES - CHRONIC
CAA VIM AND VIIM
MINGO JUNCTION STEEL WORKS LLC - WEIRTON FACILITY VRP#20015

	Oral Exposure			Inhalation Exposure			Dermal Exposure	
Contaminants of Concern	**Chronic Reference Dose (1) (mg/kg-day)**		**Target Organ or Critical Effect**	**Chronic Reference Concentration (1) (mg/m^3)**		**Target Organ or Critical Effect**	**Gastrointestinal Absorption Efficiency**	**Chronic Reference Dose (1) (mg/kg-day)**
Nickel	2.0E-02	I	decreased body and organ weight	9.0E-05	A	respiratory	0.04	8.0E-04
Selenium	5.0E-03	I	nervous, hematologic, dermal	2.0E-02	C	liver, cardiovascular system, nervous system	1	5.0E-03
Thallium	1.0E-05	P	Integumentary	NA		- -	1	1.0E-05
Vanadium*	9.0E-03	I	dermal (decreased hair cystine)	7.0E-06	P	Upper and lower respiratory tract	0.026	2.3E-04
Zinc	3.0E-01	I	immune, hematologic	NA		- -	1	3.0E-01
Cyanide, Total	6.0E-04	I	reproductive	8.0E-04	**	endocrine	1	6.0E-04

Notes:

1 - Oral and inhalation toxicity values obtained from the sources noted above and defined below. Dermal Reference Doses (RfDd) were calculated using the oral Reference Dose (RfDo) and the Gastrointestinal Absorption Efficiency (GIABS) in accordance with USEPA (2004) using the following equation: RfDd = GIABS x RfDo.

A - ATSDR Chronic Minimal Risk Levels, as presented in WVDEP (2021a).

C - California EPA toxicity values Chronic Reference Exposure Levels (RELS) and the Cancer Potency Values, as presented in USEPA (2021a)

H - Health Effects Assessment Summary Table.

I - Integrated Risk Information System (IRIS; USEPA, 2021c)

P - Provisional Peer Reviewed Toxicity Values (PPRTV) as presented in USEPA (2021a)

* - Based on the values for Vanadium Pentoxide, as presented in USEPA (2021a).

** The RfC for hydrogen cyanide is used as a surrogate for cyanide.

NA - USEPA-derived toxicity values are not available for this particular exposure route or endpoint.

TABLE 20
NONCANCER TOXICITY VALUES - SUBCHRONIC
CAA VIM AND VIIM
MINGO JUNCTION STEEL WORKS LLC - WEIRTON FACILITY VRP#20015

Contaminants of Concern	Oral Exposure			Inhalation Exposure			Dermal Exposure	
	Subchronic Reference Dose [1] (mg/kg-day)		Target Organ or Critical Effect	Subchronic Reference Concentration [1] (mg/m^3)		Target Organ or Critical Effect	Gastrointestinal Absorption Efficiency	Subchronic Reference Dose [1] (mg/kg-day)
VOCs								
1,1-Dichloroethane	2.0E+00	P	kidney	NA		- -	1	2.0E+00
1,2-Dichlorobenzene	6.0E-01	A	hepatocellular necrosis	2.0E+00	H	hepatic	1	6.0E-01
cis-1,2-Dichloroethene	2.0E-02	P	urinary	NA		- -	1	2.0E-02
1,4-Dichlorobenzene	7.0E-02	A	hepatic	1.2E+00	A	hepatic	1	7.0E-02
Benzene	1.0E-02	P	immune	8.0E-02	P	immune	1	1.0E-02
Chloroform	1.0E-01	A	hepatic	2.4E-01	A	hepatic	1	1.0E-01
Dichlorobromomethane	8.0E-03	P	urinary	NA		- -	1	8.0E-03
Ethylbenzene	5.0E-02	P	hepatic, urinary	9.0E+00	P	developmental	1	5.0E-02
Tetrachloroethene	8.0E-03	A	nervous, ocular	4.1E-02	A	nervous, ocular	1	8.0E-03
Trichloroethene	5.0E-04	A	developmental, immune	2.2E-03	A	developmental, immune	1	5.0E-04
Vinyl chloride	3.0E-03	I	hepatic	7.7E-02	A	hepatic	1	3.0E-03
Xylenes, Total	4.0E-01	P	decreased body weight; increased mortality	4.0E-01	P	nervous	1	4.0E-01
SVOCs								
1,1'-Biphenyl	1.0E-01	P	urinary	4.0E-03	P	developmental	1	1.0E-01
2-Methylnaphthalene	4.0E-03	P	respiratory	NA		- -	1	4.0E-03
Benzo[a]anthracene	NA		- -	NA		- -	1	NA
Benzo(a)pyrene	3.0E-04	I	Developmental, immune, reproductive	2.0E-06	I	Developmental, reproductive	1	3.0E-04
Benzo[b]fluoranthene	NA		- -	NA		- -	1	NA
Benzo[k]fluoranthene	NA		- -	NA		- -	1	NA
Chrysene	NA		- -	NA		- -	1	NA
Dibenz(a,h)anthracene	NA		- -	NA		- -	1	NA
Indeno[1,2,3-cd]pyrene	NA		- -	NA		- -	1	NA

TABLE 20
NONCANCER TOXICITY VALUES - SUBCHRONIC
CAA VIM AND VIIM
MINGO JUNCTION STEEL WORKS LLC - WEIRTON FACILITY VRP#20015

	Oral Exposure			Inhalation Exposure			Dermal Exposure	
Contaminants of Concern	**Subchronic Reference Dose [1] (mg/kg-day)**		**Target Organ or Critical Effect**	**Subchronic Reference Concentration [1] (mg/m^3)**		**Target Organ or Critical Effect**	**Gastrointestinal Absorption Efficiency**	**Subchronic Reference Dose [1] (mg/kg-day)**
SVOCs Cont.								
Naphthalene	6.0E-01	A	decreased body weight	3.0E-03	I	nervous, respiratory	1	6.0E-01
Bis(2-ethylhexyl) phthalate	2.0E-02	I	hepatic	NA		- -	1	2.0E-02
Dibenzofuran	4.0E-03	P	whole body	NA		- -	1	4.0E-03
PCBs								
PCB-1254	3.0E-05	A	immune, dermal, ocular	NA		- -	1	3.0E-05
PCB-1260	NA		- -	NA		- -	1	NA
Inorganics								
Aluminum	1.0E+00	A	Neurological	5.0E-03	P	Neurological	1	1.0E+00
Antimony	4.0E-04	P	Hematologic	1.0E-03	A	Respiratory	0.15	6.0E-05
Arsenic	3.0E-04	I	Cardiovascular, dermal	1.5E-05	C	Reproductive, cardiovascular, CNS, respiratory, integumentary	1	3.0E-04
Cadmium	5.0E-04	A	Urinary	1.0E-05	A	Respiratory, hepatic, renal, endocrine, gastrointestinal, hematologic, cardiovascular	0.025	1.3E-05
Cobalt	3.0E-03	P	Hematologic, endocrine, reproductive, cardiovascular	2.0E-05	P	Respiratory	1	3.0E-03
Copper	1.0E-02	A	Gastrointestinal	NA		- -	1	1.0E-02
Iron	7.0E-01	P	Hematopoietic, hepatic, gastrointestinal	NA		- -	1	7.0E-01
Lead	NA		- -	NA		- -	1	NA
Manganese	2.4E-02	I	nervous system	5.0E-05	I	nervous system	0.04	9.6E-04
Mercury	1.6E-04	C	Nervous system, development, kidney	3.0E-04	H	nervous system	1	1.6E-04

TABLE 20
NONCANCER TOXICITY VALUES - SUBCHRONIC
CAA VIM AND VIIM
MINGO JUNCTION STEEL WORKS LLC - WEIRTON FACILITY VRP#20015

Contaminants of Concern	Oral Exposure			Inhalation Exposure			Dermal Exposure	
	Subchronic Reference Dose [1] (mg/kg-day)		Target Organ or Critical Effect	Subchronic Reference Concentration [1] (mg/m^3)		Target Organ or Critical Effect	Gastrointestinal Absorption Efficiency	Subchronic Reference Dose [1] (mg/kg-day)
Nickel	2.0E-02	H	decreased body and organ weight	2.0E-04	A	respiratory	0.04	8.0E-04
Selenium	5.0E-03	H	nervous, hematologic, dermal	2.0E-02	C	liver, cardiovascular system, nervous system	1	5.0E-03
Thallium	4.0E-05	P	Integumentary	NA		- -	1	4.0E-05
Vanadium*	7.0E-04	P	dermal (decreased hair cystine)	1.0E-04	A	Upper and lower respiratory tract	0.026	1.8E-05
Zinc	3.0E-01	A	immune, hematologic	NA		- -	1	3.0E-01
Cyanide, Total	2.0E-02	H	reproductive	8.0E-04	**	endocrine	1	2.0E-02

Notes:

1 - Oral and inhalation toxicity values obtained from the sources noted above and defined below. Dermal Reference Doses (RfDd) were calculated using the oral Reference Dose (RfDo) and the Gastrointestinal Absorption Efficiency (GIABS) in accordance with USEPA (2004) using the following equation: RfDd = GIABS x RfDo.

A - ATSDR Chronic Minimal Risk Levels, as presented in USEPA (2021a).

C - California EPA toxicity values Chronic Reference Exposure Levels (RELS) and the Cancer Potency Values, as presented in USEPA (2021a).

H - Health Effects Assessment Summary Table.

I - Integrated Risk Information System (IRIS; USEPA, 2021c).

P - Provisional Peer Reviewed Toxicity Values (PPRTV) as presented in USEPA (2021a)

* - Based on the values for Vanadium Pentoxide, as presented in USEPA (2021a).

** The RfC for hydrogen cyanide is used as a surrogate for cyanide.

NA - USEPA-derived toxicity values are not available for this particular exposure route or endpoint.

TABLE 21
SUMMARY OF RISK CHARACTERIZATION
CAA VIM AND VIIM
MINGO JUNCTION STEEL WORKS LLC - WEIRTON FACILITY VRP#20015

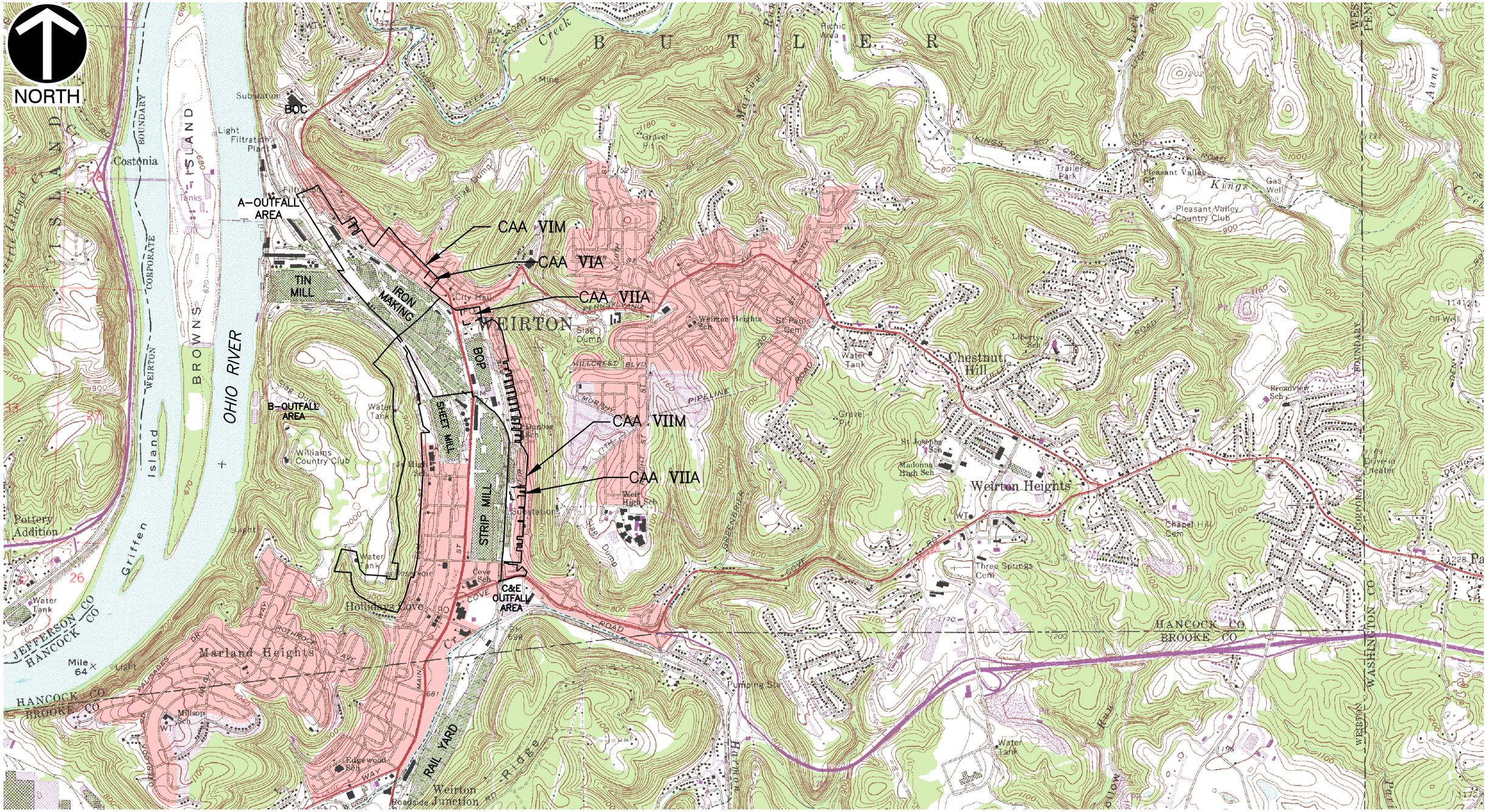
Receptor	Exposure Pathways	Noncancer Hazard Index	Theoretical Excess Lifetime Cancer Risk	Primary Risk Drivers
Future Outdoor Worker	Incidental Ingestion of Surface Soil			
	Dermal Contact with Surface Soil			
	Inhalation of Volatile and Particulate Emissions from Surface Soil	8E-01	4E-06	- -
Current/Future Adolescent (Age 11 to <16)	Incidental Ingestion of Surface Soil			
Trespasser - Developed Areas	Dermal Contact with Surface Soil			
	Inhalation of Volatile and Particulate Emissions from Surface Soil	1E-01	3E-07	- -
Future Construction Worker	Incidental Ingestion of Shallow Soil			
	Dermal Contact with Shallow Soil			
	Inhalation of Volatile and Particulate Emissions from Shallow Soil			Inhalation of manganese particulates in ambient air
	Incidental Ingestion of Shallow Groundwater			
	Dermal Contact with Shallow Groundwater			Inhalation of naphthalene vapors in a trench
	Inhalation of Volatile Emissions from Groundwater in a Trench	**1E+01**	3E-06	
Current/Future Adolescent (Age 11 to <16)	Incidental Ingestion of Surface Soil			
Trespasser - Wooded Hillside	Dermal Contact with Surface Soil			
	Inhalation of Volatile and Particulate Emissions from Surface Soil	3E-02	4E-07	- -

Notes:

Appendix E presents a detailed breakdown of the risk calculations by pathway and constituent.

Shaded values exceed the WVDEP excess lifetime cancer risk of 1×10^{-5} for nonresidential receptors or 1×10^{-6} for a trespasser.

FIGURES



REFERENCE

1. U.S.G.S. 7.5' TOPOGRAPHIC MAP, WEIRTON QUADRANGLE, WV–PA–OH DATED: 1968, PHOTOREVISED: 1990.

* HAND SIGNATURE ON FILE

SCALE IN FEET

0 2000 4000

Civil & Environmental Consultants, Inc.
4350 Northern Pike · Suite 141 · Monroeville, PA 15146
724-327-5200 · 800-899-3610
www.cecinc.com

MJSW - WEIRTON FACILITY
RCRA CORRECTIVE ACTION - CAAs VIM AND VIIM
WEIRTON, WEST VIRGINIA

CAAs VIM AND VIIM SITE LOCATION MAP

DRAWN BY:	ZLD	CHECKED BY:	TEA	APPROVED BY:	*DNO	FIGURE NO.:	1
DATE:	JUNE 18, 2019	DWG SCALE:	1"=2000'	PROJECT NO:	174-529		

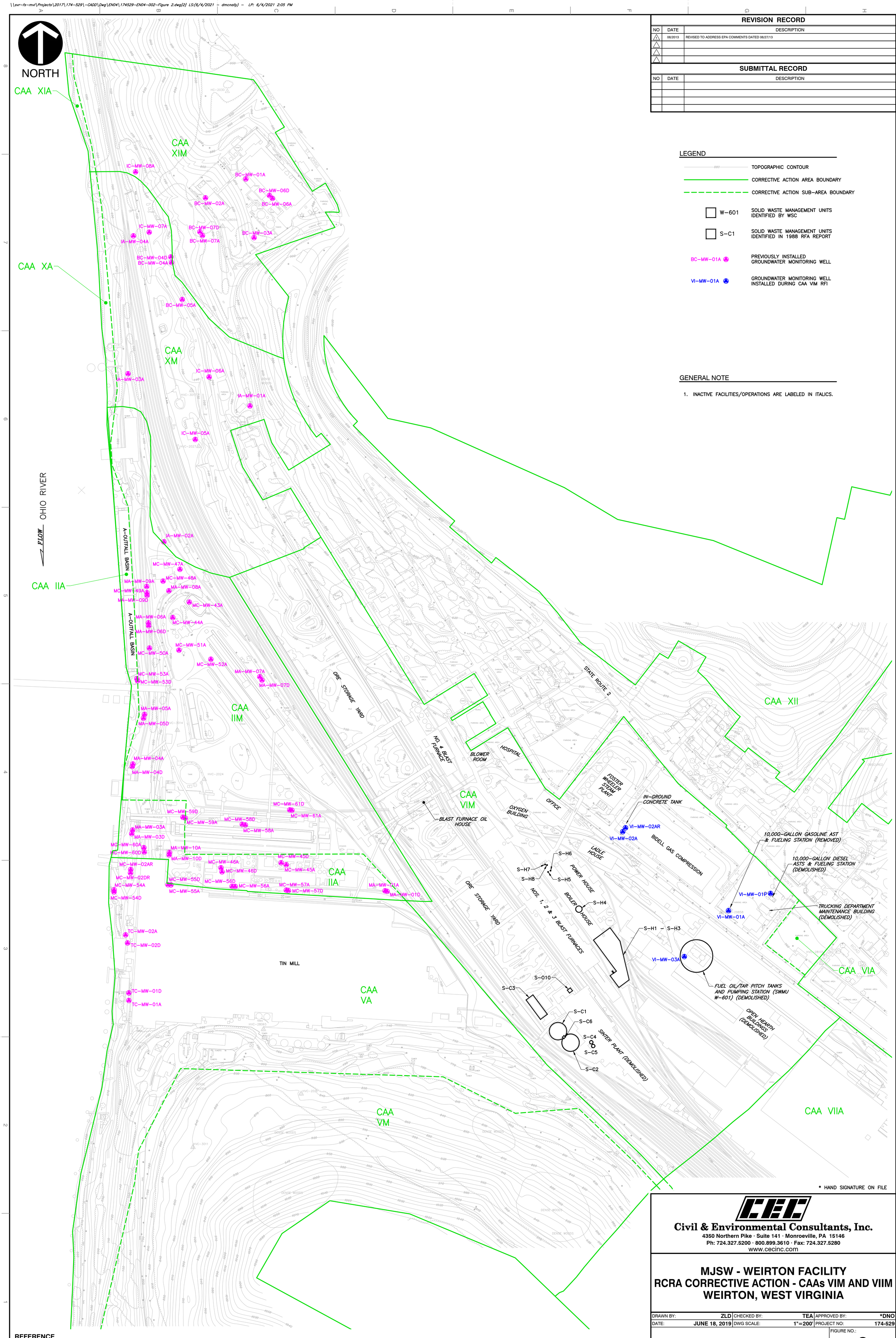
P:\2017\174-529\-CADD\Dwg\EN04\174529-EN04-001-Figure 1.dwg\{2-1} LS:(6/4/2021 - dmcnally) - LP: 6/4/2021 12:06 PM

REVISION RECORD

NO	DATE	DESCRIPTION
1	08/2013	REVISED TO ADDRESS EPA COMMENTS DATED 08/27/13

SUBMITTAL RECORD

NO	DATE	DESCRIPTION



LEGEND

880	TOPOGRAPHIC CONTOUR
	CORRECTIVE ACTION AREA BOUNDARY
	CORRECTIVE ACTION SUB-AREA BOUNDARY
W-601	SOLID WASTE MANAGEMENT UNITS IDENTIFIED BY WSC
S-C1	SOLID WASTE MANAGEMENT UNITS IDENTIFIED IN 1988 RFA REPORT
BC-MW-01A	PREVIOUSLY INSTALLED GROUNDWATER MONITORING WELL
VI-MW-01A	GROUNDWATER MONITORING WELL INSTALLED DURING CAA VIM RFI

GENERAL NOTE

1. INACTIVE FACILITIES/OPERATIONS ARE LABELED IN ITALICS.

REFERENCE

1. TOPOGRAPHIC MAPPING PREPARED BY ADR EASTERN MAPPING DATED APRIL 9, 1990.

SCALE IN FEET
0 200 400

* HAND SIGNATURE ON FILE

Civil & Environmental Consultants, Inc.
4350 Northern Pike · Suite 141 · Monroeville, PA 15146
Ph: 724.327.5200 · 800.899.3610 · Fax: 724.327.5280
www.cecinc.com

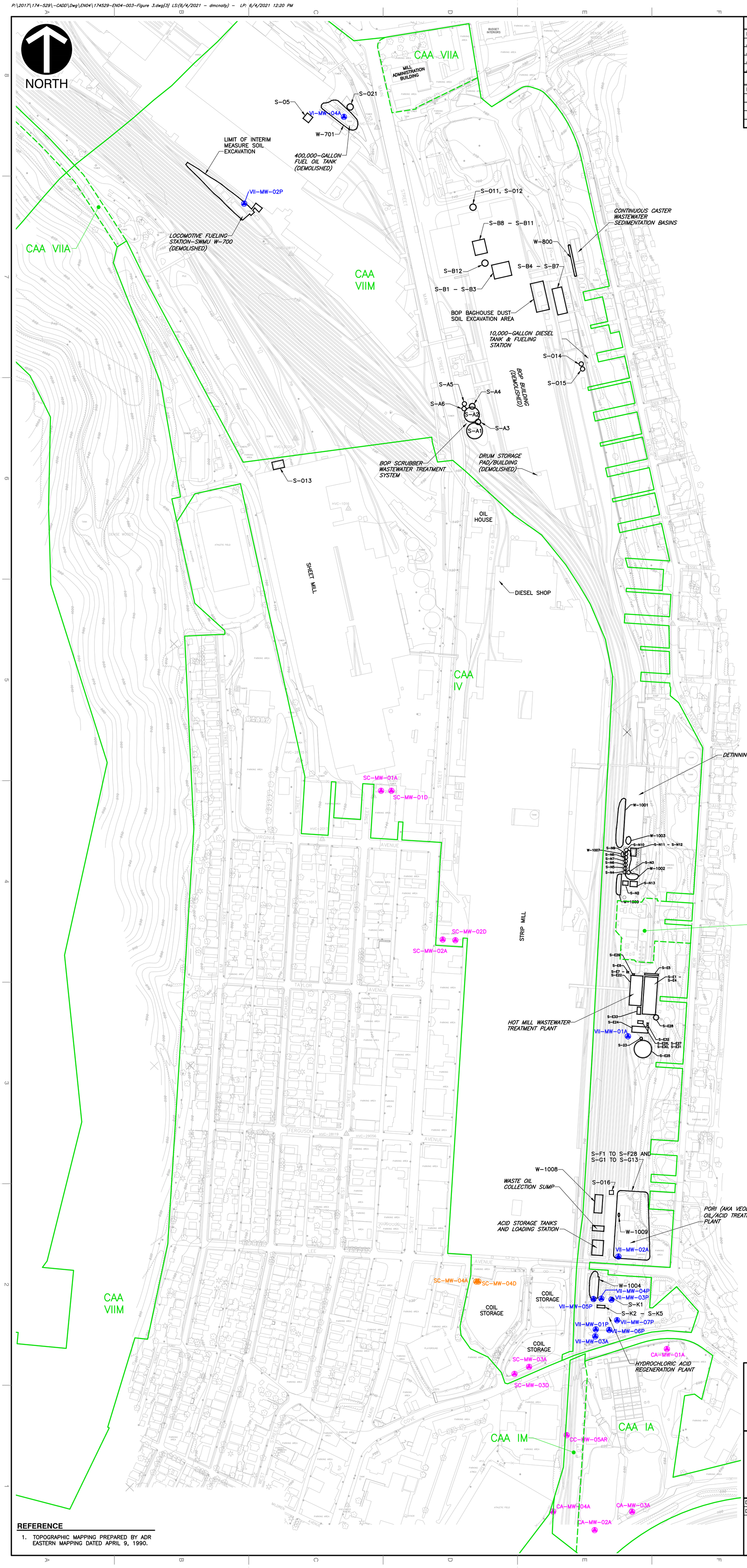
MJSW - WEIRTON FACILITY
RCRA CORRECTIVE ACTION - CAAs VIM AND VIIM
WEIRTON, WEST VIRGINIA

DRAWN BY:	ZLD	CHECKED BY:	TEA	APPROVED BY:	*DNO
DATE:	JUNE 18, 2019	DWG SCALE:	1"=200'	PROJECT NO:	174-529

CAA VIM SITE LAYOUT

FIGURE NO.: 2

P:\2017\174-529\-CADD\Dwg\EN04\174529-EN04-003-Figure 3.dwg[3] LS:(6/4/2021 - dmcnally) - LP: 6/4/2021 12:20 PM



REVISION RECORD

NO	DATE	DESCRIPTION
△		
△		
△		
△		

SUBMITTAL RECORD

NO	DATE	DESCRIPTION

LEGEND

- TOPOGRAPHIC CONTOUR
- CORRECTIVE ACTION AREA BOUNDARY
- CORRECTIVE ACTION SUB-AREA BOUNDARY
- W-701 — SOLID WASTE MANAGEMENT UNITS IDENTIFIED BY WSC
- S-A1 — SOLID WASTE MANAGEMENT UNITS IDENTIFIED IN 1988 RFA REPORT
- SC-MW-01A — PREVIOUSLY INSTALLED GROUNDWATER MONITORING WELL
- VII-MW-01A — GROUNDWATER MONITORING WELL INSTALLED DURING CAA VIIM RFI
- SC-MW-04A — GROUNDWATER MONITORING WELL INSTALLED DURING CAA VIIM TO MONITOR ARCELORMITTAL PROPERTY

GENERAL NOTE

1. INACTIVE FACILITIES/OPERATIONS ARE LABELED IN ITALICS.

REFERENCE

1. TOPOGRAPHIC MAPPING PREPARED BY ADR EASTERN MAPPING DATED APRIL 9, 1990.

SCALE IN FEET
0 200 400

* HAND SIGNATURE ON FILE

Civil & Environmental Consultants, Inc.
4350 Northern Pike · Suite 141 · Monroeville, PA 15146
Ph: 724.327.5200 · 800.899.3610 · Fax: 724.327.5280
www.cecinc.com

MJSW - WEIRTON FACILITY
RCRA CORRECTIVE ACTION - CAAs VIM AND VIIM
WEIRTON, WEST VIRGINIA

DRAWN BY:	ZLD	CHECKED BY:	TEA	APPROVED BY:	*DNO
DATE:	JUNE 18, 2019	DWG SCALE:	1"=200'	PROJECT NO:	174-529

CAA VIIM SITE LAYOUT

FIGURE NO.: 3

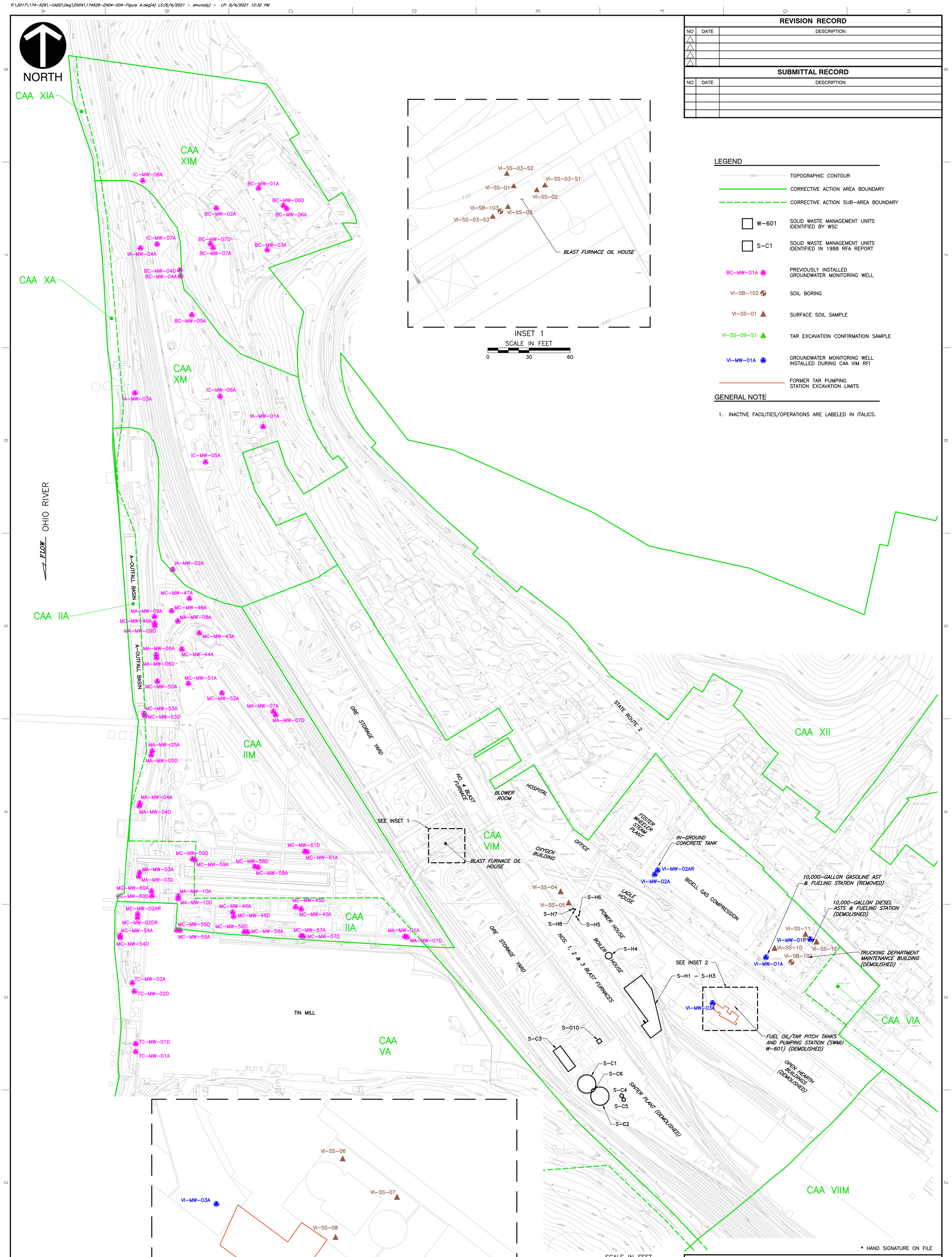
P:\2017\174-529\-CADD\Dwg\EN04\174529-EN04-004-Figure 4.dwg[4] LS:(6/4/2021 - dmcnally) - LP: 6/4/2021 12:32 PM

REVISION RECORD

NO	DATE	DESCRIPTION
△		
△		
△		
△		

SUBMITTAL RECORD

NO	DATE	DESCRIPTION



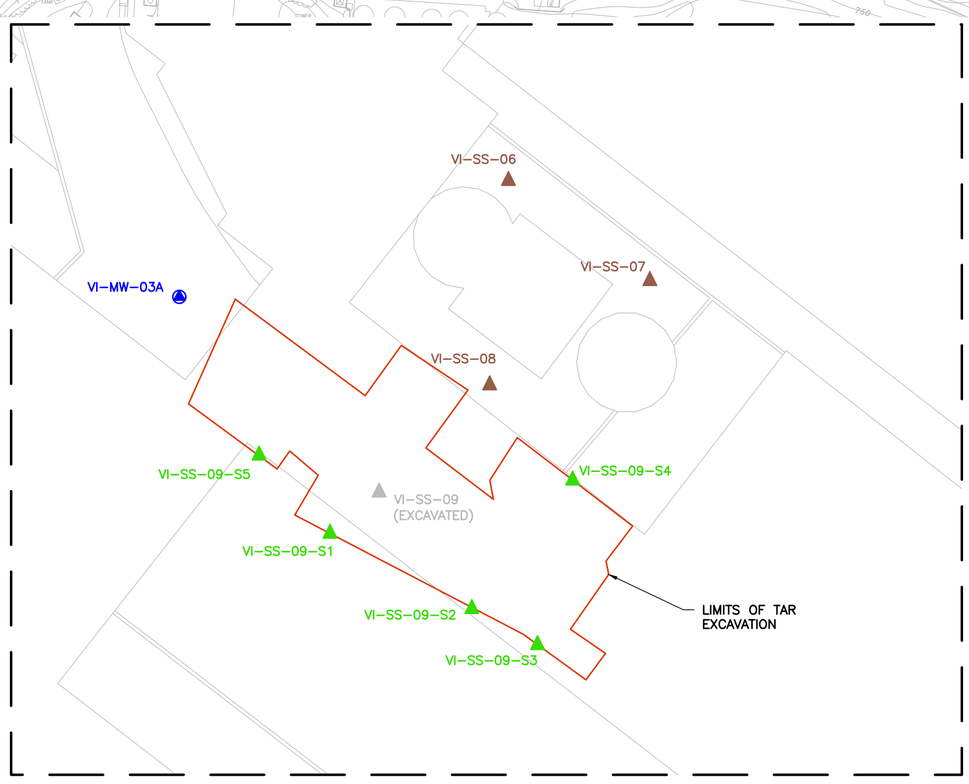
INSET 1
SCALE IN FEET
0 30 60

LEGEND

- TOPOGRAPHIC CONTOUR
- CORRECTIVE ACTION AREA BOUNDARY
- CORRECTIVE ACTION SUB-AREA BOUNDARY
- W-601 — SOLID WASTE MANAGEMENT UNITS IDENTIFIED BY WSC
- S-C1 — SOLID WASTE MANAGEMENT UNITS IDENTIFIED IN 1988 RFA REPORT
- BC-MW-01A — PREVIOUSLY INSTALLED GROUNDWATER MONITORING WELL
- VI-SB-102 — SOIL BORING
- VI-SS-01 — SURFACE SOIL SAMPLE
- VI-SS-09-S1 — TAR EXCAVATION CONFIRMATION SAMPLE
- VI-MW-01A — GROUNDWATER MONITORING WELL INSTALLED DURING CAA VIM RFI
- FORMER TAR PUMPING STATION EXCAVATION LIMITS

GENERAL NOTE

1. INACTIVE FACILITIES/OPERATIONS ARE LABELED IN ITALICS.



INSET 2
SCALE IN FEET
0 30 60

REFERENCE

1. TOPOGRAPHIC MAPPING PREPARED BY ADR EASTERN MAPPING DATED APRIL 9, 1990.

* HAND SIGNATURE ON FILE

Civil & Environmental Consultants, Inc.
4350 Northern Pike · Suite 141 · Monroeville, PA 15146
Ph: 724.327.5200 · 800.899.3610 · Fax: 724.327.5280
www.cecinc.com

MJSW - WEIRTON FACILITY
RCRA CORRECTIVE ACTION - CAAs VIM AND VIIM
WEIRTON, WEST VIRGINIA

DRAWN BY:	ZLD	CHECKED BY:	TEA	APPROVED BY:	*DNO
DATE:	JUNE 18, 2019	DWG SCALE:	1"=200'	PROJECT NO:	174-529

CAA VIM SAMPLE LOCATIONS

FIGURE NO.: 4

P:\2017\174-529\-CADD\Dwg\EN04\174529-EN04-005-Figure 5.dwg{3-5} LS:(6/4/2021 - dmcnally) - LP: 6/4/2021 1:11 PM

NORTH

SEE FIGURE NO. 6 FOR EXPANDED VIEW AND SAMPLE LOCATIONS

S-05 · S-021 · VI-MW-04A · W-701

400,000-GALLON FUEL OIL TANK (DEMOLISHED)

LIMIT OF INTERIM MEASURE SOIL EXCAVATION

VII-SB-112 · VII-SB-111 · VII-SB-113 · VII-SB-110 · VII-SB-114 · VII-MW-02P · VII-SB-109 · VII-SB-115 · VII-SB-116 · VII-SB-117

LOCOMOTIVE FUELING STATION-SWMU W-700 (DEMOLISHED)

CAA VIIA · CAA VIIA · CAA VIIM · CAA IV · CAA VIIA · CAA VIIM · CAA IM · CAA IA

MILL ADMINISTRATION BUILDING

S-011, S-012

S-B8 - S-B11 · S-B12 · S-B1 - S-B3 · S-B4 - S-B7 · W-800

CONTINUOUS CASTER WASTEWATER SEDIMENTATION BASINS

SEE FIGURE NO. 7 FOR EXPANDED VIEW AND SAMPLE LOCATIONS

BOP BAGHOUSE DUST SOIL EXCAVATION AREA

10,000-GALLON DIESEL TANK & FUELING STATION

S-014 · S-015 · VII-SB-101/VII-SS-18

SEE FIGURE NO. 8 FOR EXPANDED VIEW AND SAMPLE LOCATIONS

BOP BUILDING (DEMOLISHED)

S-A5 · S-A4 · S-A6 · S-A2 · S-A1 · S-A3

BOP SCRUBBER WASTEWATER TREATMENT SYSTEM

DRUM STORAGE PAD/BUILDING (DEMOLISHED) · VII-SS-19 · VII-SS-20 · VII-SS-21

S-013

OIL HOUSE

SHEET MILL

DIESEL SHOP

SC-MW-01A · SC-MW-01D

DETINNING PLANT

W-1001 · W-1003 · W-1007 · S-N9 · S-N8 · S-N7 · S-N6 · S-N5 · S-N4 · S-N10 · S-N11 - S-N12 · S-N3 · W-1002 · S-N13 · S-N2 · W-1000

SEE FIGURE NO. 9 FOR EXPANDED VIEW AND SAMPLE LOCATIONS

STRIP MILL

SC-MW-02D · SC-MW-02A

VII-SB-102/VII-SS-28

HOT MILL WASTEWATER TREATMENT PLANT

VII-MW-01A

SEE FIGURE NO. 10 FOR EXPANDED VIEW AND SAMPLE LOCATIONS

S-F1 TO S-F28 AND S-G1 TO S-G13

SEE FIGURE NO. 11 FOR EXPANDED VIEW AND SAMPLE LOCATIONS

W-1008 · WASTE OIL COLLECTION SUMP · S-016 · VII-SB-103/VII-SS-35 · VII-SB-118 · VII-SB-107 · VII-SB-104/VII-SS-36 · W-1009 · ACID STORAGE TANKS AND LOADING STATION · PORI (AKA VEOLIA) OIL/ACID TREATMENT PLANT · VII-SB-106/VII-SS-46 · VII-SB-105 · VII-MW-02A

SC-MW-04A · SC-MW-04D

COIL STORAGE · COIL STORAGE · COIL STORAGE

W-1004 · VII-MW-04P · VII-MW-03P/VII-SS-50 · VII-MW-05P · S-K1 · S-K2 - S-K5 · VII-MW-07P · VII-MW-01P · VII-MW-06P · VII-SB-119 · VII-MW-03A

SC-MW-03A · SC-MW-03D

CA-MW-01A

HYDROCHLORIC ACID REGENERATION PLANT

CC-MW-05AR

CA-MW-04A · CA-MW-03A · CA-MW-02A

REVISION RECORD

NO	DATE	DESCRIPTION

SUBMITTAL RECORD

NO	DATE	DESCRIPTION

LEGEND

880	TOPOGRAPHIC CONTOUR
	CORRECTIVE ACTION AREA BOUNDARY
	CORRECTIVE ACTION SUB-AREA BOUNDARY
W-701	SOLID WASTE MANAGEMENT UNITS IDENTIFIED BY WSC
S-A1	SOLID WASTE MANAGEMENT UNITS IDENTIFIED IN 1988 RFA REPORT
SC-MW-01A	PREVIOUSLY INSTALLED GROUNDWATER MONITORING WELL
VII-SB-101	SOIL BORING
VI-SS-19	SURFACE SOIL SAMPLE
VII-MW-01A	GROUNDWATER MONITORING WELL INSTALLED DURING CAA VIIM RFI
SC-MW-04A	GROUNDWATER MONITORING WELL INSTALLED DURING CAA VIIM RFI TO MONITOR ARCELORMITTAL PROPERTY

GENERAL NOTE

1. INACTIVE FACILITIES/OPERATIONS ARE LABELED IN ITALICS.

REFERENCE

1. TOPOGRAPHIC MAPPING PREPARED BY ADR EASTERN MAPPING DATED APRIL 9, 1990.

SCALE IN FEET 0 200 400

* HAND SIGNATURE ON FILE

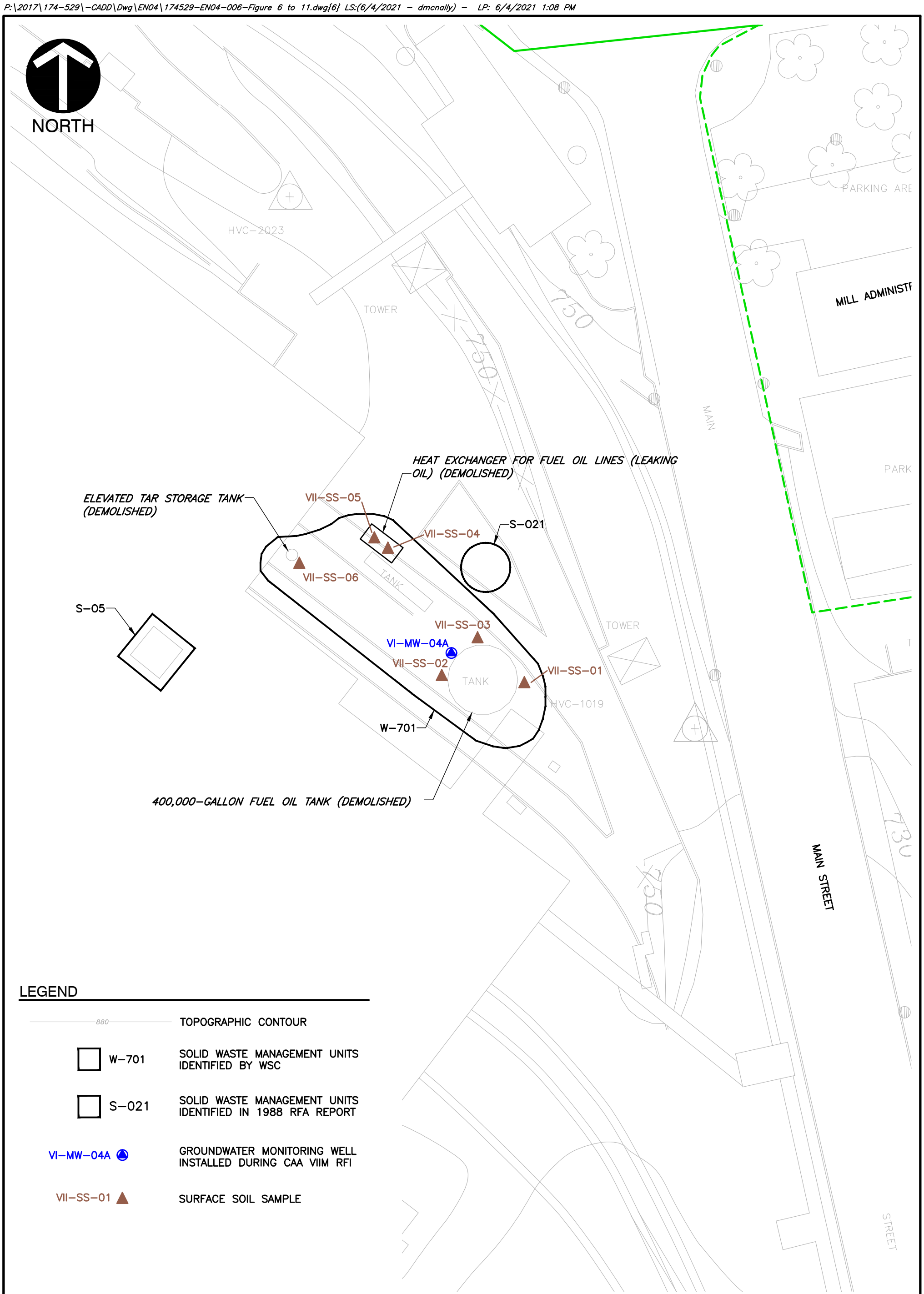
Civil & Environmental Consultants, Inc.
4350 Northern Pike · Suite 141 · Monroeville, PA 15146
Ph: 724.327.5200 · 800.899.3610 · Fax: 724.327.5280
www.cecinc.com

MJSW - WEIRTON FACILITY
RCRA CORRECTIVE ACTION - CAAs VIM AND VIIM
WEIRTON, WEST VIRGINIA

DRAWN BY:	ZLD	CHECKED BY:	TEA	APPROVED BY:	*DNO
DATE:	JUNE 18, 2019	DWG SCALE:	1"=200'	PROJECT NO:	174-529

CAA VIIM SAMPLE LOCATIONS

FIGURE NO.: 5



LEGEND

880	TOPOGRAPHIC CONTOUR
W-701	SOLID WASTE MANAGEMENT UNITS IDENTIFIED BY WSC
S-021	SOLID WASTE MANAGEMENT UNITS IDENTIFIED IN 1988 RFA REPORT
VI-MW-04A	GROUNDWATER MONITORING WELL INSTALLED DURING CAA VIIM RFI
VII-SS-01	SURFACE SOIL SAMPLE

* HAND SIGNATURE ON FILE

SCALE IN FEET

0 50 100

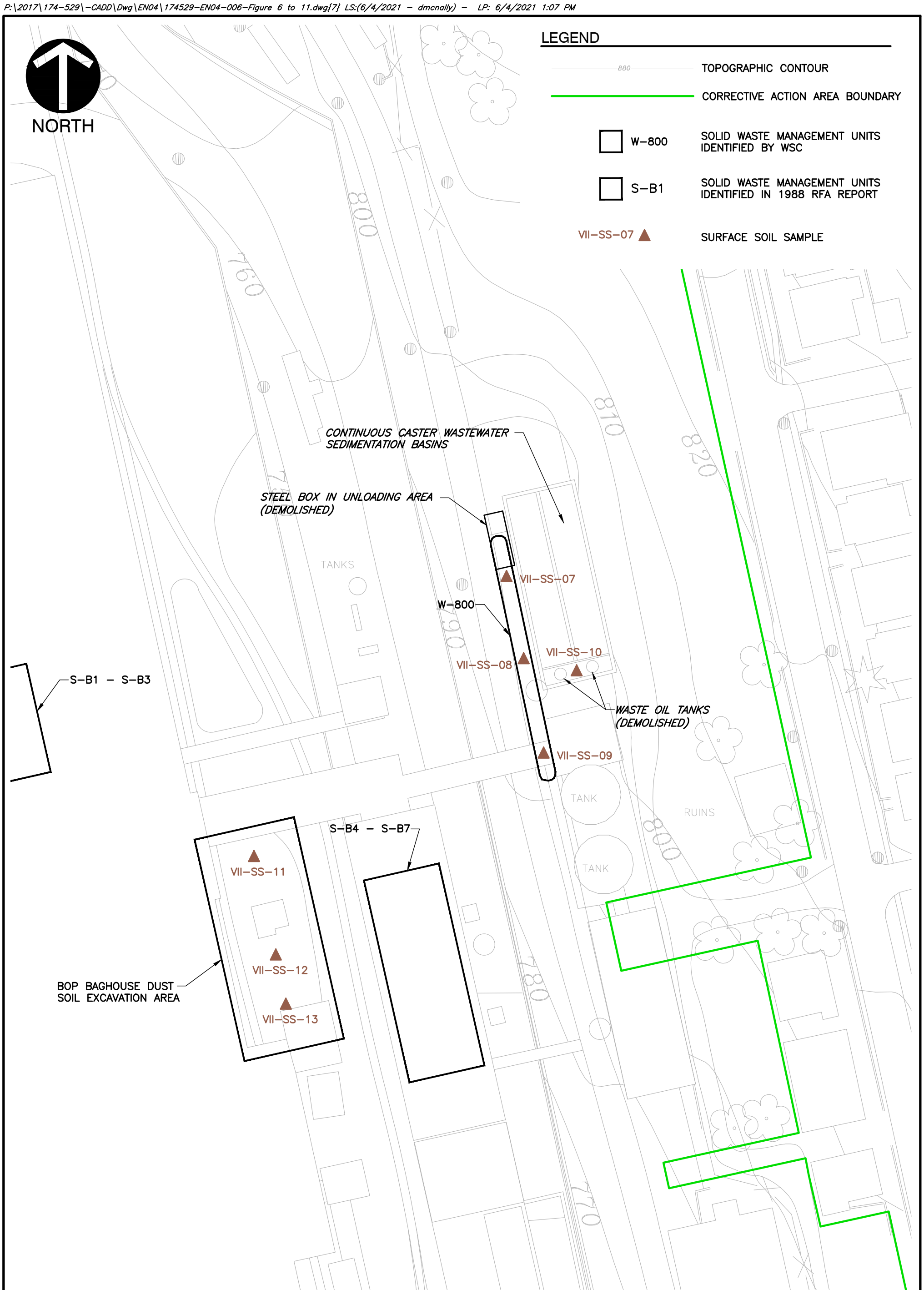
Civil & Environmental Consultants, Inc.

4350 Northern Pike · Suite 141 · Monroeville, PA 15146
724-327-5200 · 800-899-3610
www.cecinc.com

MJSW - WEIRTON FACILITY
RCRA CORRECTIVE ACTION - CAAs VIM AND VIIM
WEIRTON, WEST VIRGINIA

CAA VIIM SAMPLE LOCATIONS
FORMER 400,000-GALLON FUEL OIL TANK

DRAWN BY:	ZLD	CHECKED BY:	TEA	APPROVED BY:	*DNO	DRAWING NO.:
DATE:	JUNE 18, 2019	DWG SCALE:	1"=50'	PROJECT NO:	174-529	6



* HAND SIGNATURE ON FILE

SCALE IN FEET

0 50 100

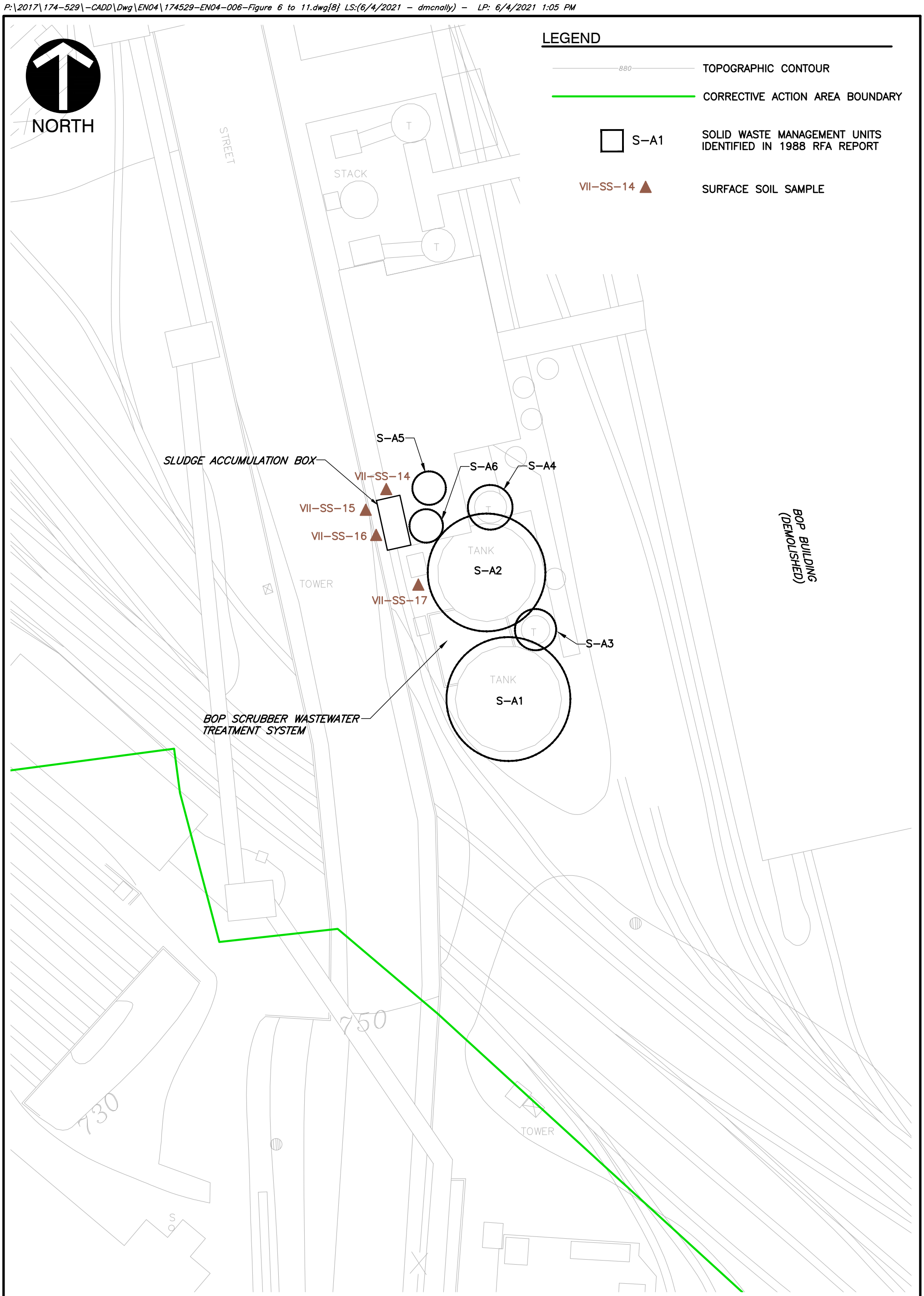
Civil & Environmental Consultants, Inc.

4350 Northern Pike · Suite 141 · Monroeville, PA 15146
724-327-5200 · 800-899-3610
www.cecinc.com

MJSW - WEIRTON FACILITY
RCRA CORRECTIVE ACTION - CAAs VIM AND VIIM
WEIRTON, WEST VIRGINIA

CAA VIIM SAMPLE LOCATIONS
FORMER BOP BAGHOUSE AND CASTER SED. BASINS

DRAWN BY:	ZLD	CHECKED BY:	TEA	APPROVED BY:	*DNO	DRAWING NO.:	7
DATE:	JUNE 18, 2019	DWG SCALE:	1"=50'	PROJECT NO:	174-529		



* HAND SIGNATURE ON FILE

SCALE IN FEET

0 50 100

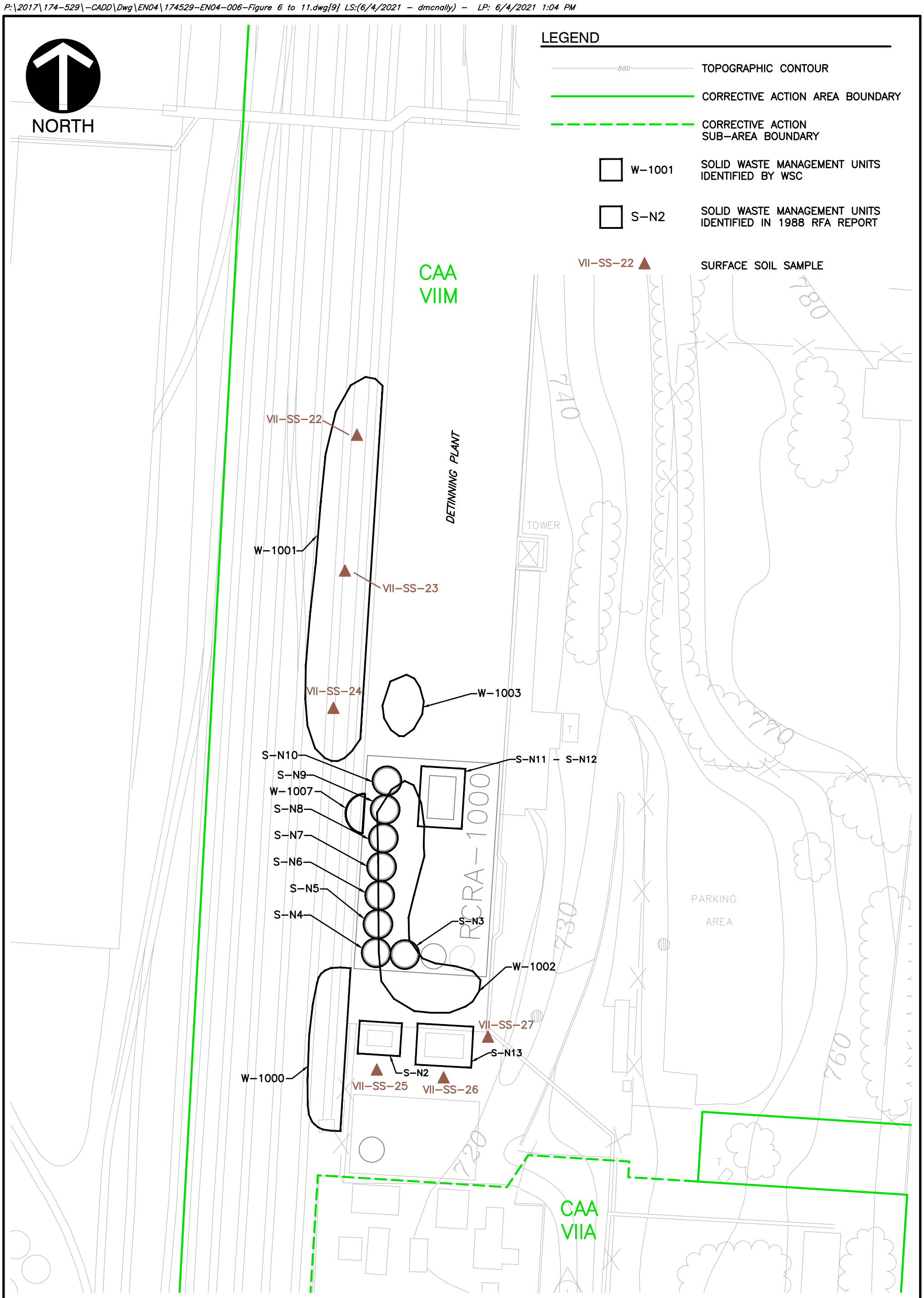
Civil & Environmental Consultants, Inc.

4350 Northern Pike · Suite 141 · Monroeville, PA 15146
724-327-5200 · 800-899-3610
www.cecinc.com

MJSW - WEIRTON FACILITY
RCRA CORRECTIVE ACTION - CAAs VIM AND VIIM
WEIRTON, WEST VIRGINIA

CAA VIIM SAMPLE LOCATIONS
FORMER BOP SCRUBBER WWTP

DRAWN BY:	ZLD	CHECKED BY:	TEA	APPROVED BY:	*DNO	DRAWING NO.:	8
DATE:	JUNE 18, 2019	DWG SCALE:	1"=50'	PROJECT NO:	174-529		



* HAND SIGNATURE ON FILE

SCALE IN FEET

0 50 100

Civil & Environmental Consultants, Inc.

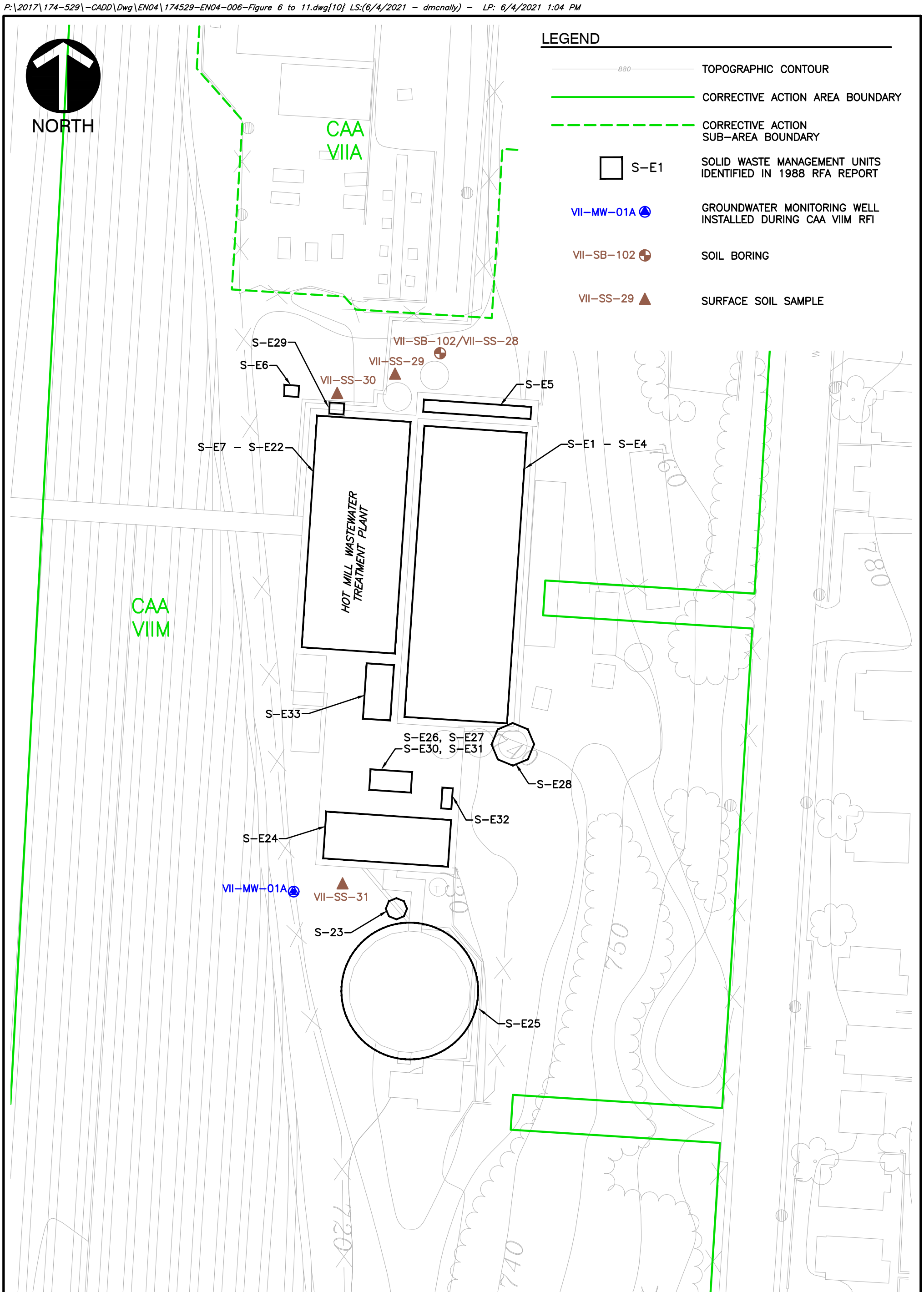
4350 Northern Pike · Suite 141 · Monroeville, PA 15146
724-327-5200 · 800-899-3610
www.cecinc.com

MJSW - WEIRTON FACILITY
RCRA CORRECTIVE ACTION - CAAs VIM AND VIIM
WEIRTON, WEST VIRGINIA

CAA VIIM SAMPLE LOCATIONS
FORMER DETTINING PLANT

DRAWN BY:	ZLD	CHECKED BY:	TEA	APPROVED BY:	*DNO	DRAWING NO.:	9
DATE:	JUNE 18, 2019	DWG SCALE:	1"=50'	PROJECT NO:	174-529		

P:\2017\174-529\-CADD\Dwg\EN04\174529-EN04-006-Figure 6 to 11.dwg{10} LS:(6/4/2021 - dmcnally) - LP: 6/4/2021 1:04 PM



* HAND SIGNATURE ON FILE

SCALE IN FEET

0 50 100

Civil & Environmental Consultants, Inc.

4350 Northern Pike · Suite 141 · Monroeville, PA 15146
724-327-5200 · 800-899-3610
www.cecinc.com

MJSW - WEIRTON FACILITY
RCRA CORRECTIVE ACTION - CAAs VIM AND VIIM
WEIRTON, WEST VIRGINIA

CAA VIIM SAMPLE LOCATIONS
FORMER HOT MILL WWTP

DRAWN BY:	ZLD	CHECKED BY:	TEA	APPROVED BY:	*DNO	DRAWING NO.:	10
DATE:	JUNE 18, 2019	DWG SCALE:	1"=50'	PROJECT NO:	174-529		

P:\2017\174-529\-CADD\Dwg\EN04\174529-EN04-006-Figure 6 to 11.dwg{11} LS:(6/4/2021 - dmcnally) - LP: 6/4/2021 1:03 PM

NORTH

S-016

CONCRETE CONTAINMENT WALL

CONCRETE SECONDARY CONTAINMENT FOR OUTDOOR TANKS (SHADED AREA)

S-F22

FORMER WASTE OIL DRUM STORAGE AREA (W-1008)

LIMIT OF RELEASE FROM SECONDARY CONTAINMENT AREA

PAVED UNLOADING AREA

VII-SS-37
VII-SS-38
VII-SS-39
VII-SS-41-S3
VII-SS-41
VII-SS-40
VII-SB-118
VII-SS-41-S2
VII-SS-41-S1
VII-SB-107
VII-SS-32
VII-SS-33
VII-SS-34
VII-SS-42
VII-SS-45
VII-SS-44
VII-SS-43
VII-SB-103/VII-SS-35
VII-SB-104/VII-SS-36

FLOTATION SKIMMERS (SWMUS S-G5 AND S-G6)

W-1009

WASTE OIL COLLECTION SUMP

LIMIT OF PREVIOUS RELEASE FROM FLOTATION SKIMMERS

SWMUS S-F1 TO S-F28 AND S-G1 TO S-G13

ACID STORAGE TANKS AND LOADING STATION

PORI (AKA VEOLIA) OIL/ACID TREATMENT PLANT

VII-SB-106/VII-SS-46

VII-SB-105

S-F27 WOOD-LINED SUMP

PARKING AREA

VII-MW-02A

HVC-1011

FORMER HARP PICKLE LIQUOR TANKS (SWMU W-1004)

VII-SS-47

W-1004

VII-SS-48

FORMER 5,000 GALLON DIESEL AST AND FUELING STATION

VII-SS-49

IN-GROUND SUMPS (SWMU S-K1) FORMERLY OVERLAIN BY DRUM STORAGE RACKS

VII-MW-05P

VII-MW-04P

VII-MW-03P/VII-SS-50

FORMER HARP REACTORS (SWMU S-K2 - S-K5)

VII-SS-51

IRON STAINED SOIL AREA

HYDROCHLORIC ACID REGENERATION PLANT

FORMER 2,000 GALLON DIESEL AST AND FUELING AREA

FORMER MECHANICAL MAINTENANCE BUILDING

VII-MW-07P

VII-SS-52

VII-SS-54

IRON STAINED SOIL AREA

FORMER KEROSENE DRUM STORAGE AREA

MAN DOOR

VII-SS-53

VII-SB-119

VII-MW-01P

VII-MW-06P

VII-MW-03A

WEIR AVE.

REVISION RECORD

NO	DATE	DESCRIPTION

SUBMITTAL RECORD

NO	DATE	DESCRIPTION

LEGEND

880	TOPOGRAPHIC CONTOUR
	CORRECTIVE ACTION AREA BOUNDARY
W-1008	SOLID WASTE MANAGEMENT UNITS IDENTIFIED BY WSC
S-F1	SOLID WASTE MANAGEMENT UNITS IDENTIFIED IN 1988 RFA REPORT
VII-MW-02A	GROUNDWATER MONITORING WELL INSTALLED DURING CAA VIIM RFI
VII-SB-107	SOIL BORING
VII-SS-32	SURFACE SOIL SAMPLE

* HAND SIGNATURE ON FILE

REFERENCE

1. TOPOGRAPHIC MAPPING PREPARED BY ADR EASTERN MAPPING DATED APRIL 9, 1990.

SCALE IN FEET
0 20 40

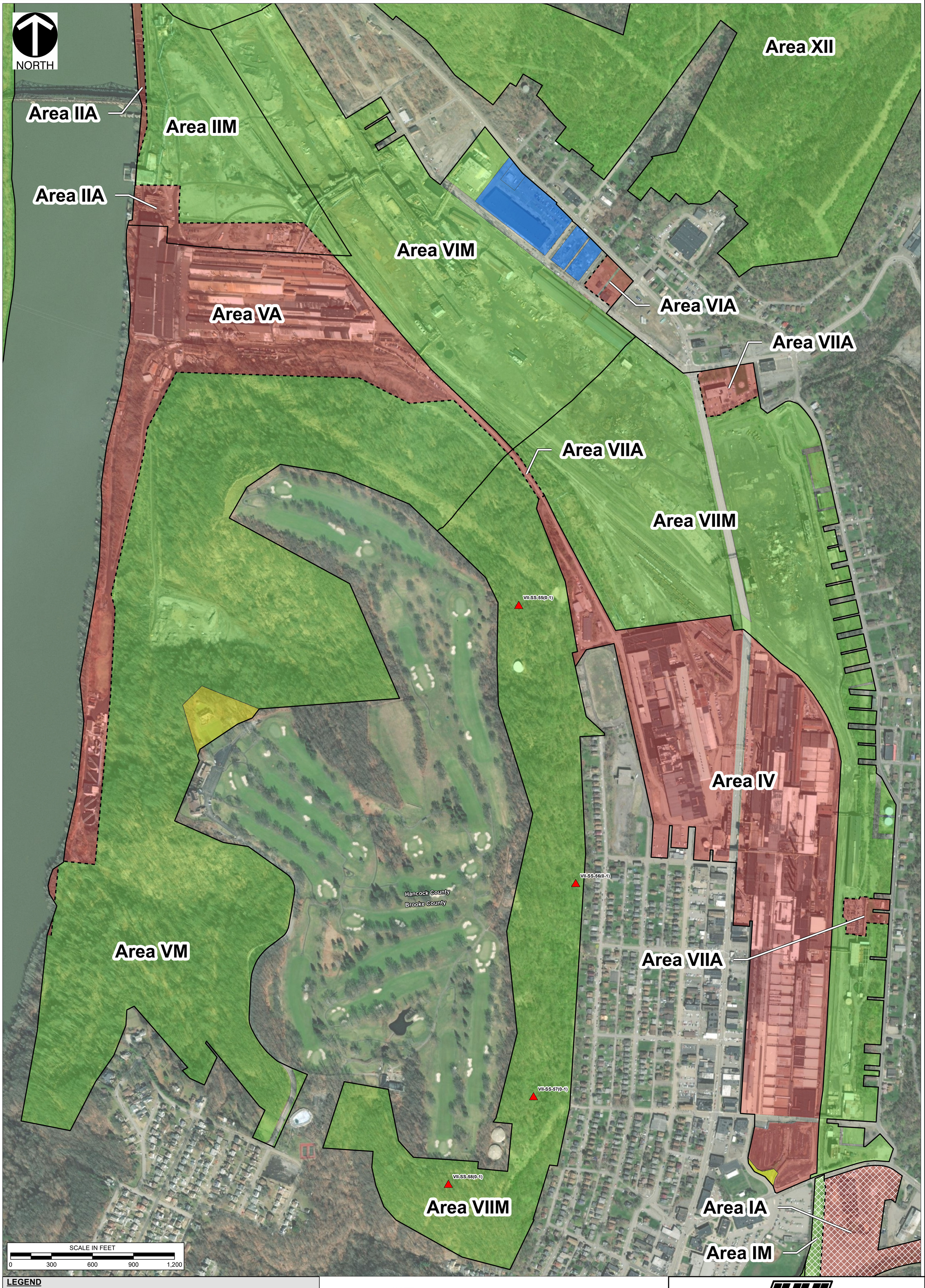
Civil & Environmental Consultants, Inc.
4350 Northern Pike · Suite 141 · Monroeville, PA 15146
Ph: 724.327.5200 · 800.899.3610 · Fax: 724.327.5280
www.cecinc.com

MJSW - WEIRTON FACILITY
RCRA CORRECTIVE ACTION - CAAs VIM AND VIIM
WEIRTON, WEST VIRGINIA

DRAWN BY:	ZLD	CHECKED BY:	TEA	APPROVED BY:	*DNO
DATE:	JUNE 18, 2019	DWG SCALE:	1"=20'	PROJECT NO:	174-529

CAA VIIM SAMPLE LOCATIONS
FORMER PORI AND HARP PLANTS

FIGURE NO.: 11



LEGEND

- SOIL SAMPLE LOCATION
- RCRA CORRECTIVE ACTION AREA (CAA) BOUNDARY
- CAA SUBDIVISION BOUNDARY*
- RFI AND CMS COMPLETED
- RFI COMPLETED AND NO CMS REQUIRED
- PROPERTY SOLD IN 2004/2005
- PROPERY OWNED BY ARCELORMITTAL
- PROPERTY OWNED BY MINGO JUNCTION STEEL WORKS, LLC (MJSW)
- PROPERTY OWNED BY BUSINESS DEVELOPMENT CORPORATION OF THE NORTHERN PANHANDLE
- COUNTY/STATE BOUNDARY

NOTE*

BECAUSE THE BOUNDARIES OF THE PROPERTIES ACQUIRED BY MJSW DID NOT ALIGN WITH THE CORRECTIVE ACTION AREA (CAA) BOUNDARIES, SEVERAL OF THE CAAS ARE NOW PARTIALLY OWNED BY ARCELORMITTAL AND PARTIALLY OWNED BY MJSW. FOR THOSE AREAS, AN "A" SUFFIX HAS BEEN ADDED TO THE CAA DESIGNATIONS FOR PROPERTY OWNED BY ARCELORMITTAL AND A "M" SUFFIX HAS BEEN ADDED TO THE CAA DESIGNATIONS FOR PROPERTY OWNED BY MJSW. ALL CAAS OWNED ENTIRELY BY ONE ENTITY RETAIN THEIR PRIOR CAA DESIGNATION.

REFERENCE

ESRI WORLD IMAGERY / ARCGIS MAP SERVICE:
HTTP://GOTO.ARCGISONLINE.COM/MAPS/WORLD_IMAGERY,
ACCESSED 6/4/2021, IMAGERY DATE: 2016.

Civil & Environmental Consultants, Inc.
4000 Triangle Lane, Suite 200 - Export, PA 15632
Ph: 724-327-5200 - 800-899-3610
www.cecinc.com

MJSW - WEIRTON FACILITY
RCRA CORRECTIVE ACTION - CAAs VIM AND VIIM
WEIRTON, WEST VIRGINIA

DRAWN BY:	JDM	CHECKED BY:	TAW	APPROVED BY: * Hand signature on file	DNO*
DATE:	JANUARY 8, 2021	SCALE:	1 " = 300 '	PROJECT NO:	174-529
SAMPLE LOCATIONS – WOODED HILLSIDE				FIGURE NO.:	12

P:\2017\174-529\-GIS\Maps\EN20_Task_2H2Z\174529_2H2Z_FIG_12_SAMPLE_LOCATIONS_WOODED_HILLSIDE.mxd 1/11/2021 12:28 PM (jmendicino)

FIGURE 13
CONCEPTUAL SITE EXPOSURE MODEL
CAA VIM AND VIIM
MINGO JUNCTION STEEL WORKS LLC - WEIRTON FACILITY

SOURCE	TRANSPORT MECHANISM	EXPOSURE MEDIUM	POTENTIAL EXPOSURE ROUTES	POTENTIAL RECEPTORS: Future Outdoor Worker (Commercial or Industrial) Developed Areas	Future Indoor Worker Developed Areas	Future Construction Worker Developed Areas	Future Residents	Future Site Visitor Developed Areas	Current/Future Youth Trespasser Developed Areas and Wooded Hillside	Current/Future Terrestrial and Aquatic Ecological Receptors
HISTORICAL OPERATIONS	SPILLS/RELEASES TO GROUND SURFACE	SURFACE SOIL	INCIDENTAL INGESTION	X		X	IP	X	X	
			DERMAL CONTACT	X		X	IP	X	X	
			INHALATION OF VOLATILES AND PARTICULATES (I.E., DUST)	X		X	IP	X	X	
	MIGRATION TO SUBSURFACE SOIL	SUBSURFACE SOIL	INCIDENTAL INGESTION			X				
			DERMAL CONTACT			X				
			INHALATION OF VOLATILES AND PARTICULATES (I.E., DUST)			X				
	LEACHING FROM SOIL TO GROUNDWATER	ONSITE GROUNDWATER	POTABLE USE	IP			IP	IP		
			INCIDENTAL INGESTION			X				
			DERMAL CONTACT			X				
			INHALATION OF VOLATILE EMISSIONS (AMBIENT AIR IN A TRENCH)			X				
	VOLATILIZATION FROM GROUNDWATER AND SUBSEQUENT VAPOR INTRUSION	INDOOR AIR	INHALATION OF VOLATILE EMISSIONS (INDOOR AIR)		0		IP			
	DOWNGRADIENT MIGRATION OF GROUNDWATER	SURFACE WATER OF THE OHIO RIVER AND HARMON CREEK	INCIDENTAL INGESTION							
			DERMAL CONTACT							

Notes:
X - Indicates pathway is complete and was evaluated in the risk assessment.
0 - Indicates an incomplete pathway based on the data evaluation in which no COC were identified.
Blanks indicate exposure pathway/media are not relevant for a given receptor.
IP (Incomplete Pathway) - Indicates an potentially complete exposure pathway that has been eliminated through engineered and/or institutional controls.

APPENDIX A

DATA SUMMARY TABLES

TABLE A-1
ANALYTICAL AND SCREENING RESULTS
SURFACE SOIL
CAA VIM AND VIIM
MINGO JUNCTION STEEL WORKS LLC - WEIRTON FACILITY

Constituent	Units	Analytical Method	Screening Criteria [1]			Sample Information [2]						
			Residential Soil RSL	Residential Soil De Minimis	*Protection of Groundwater RSL*	VI-SS-01(0-1) 12/2/2013	VI-SS-02(0-0.5) 12/2/2013	VI-SS-03(0-1) 12/2/2013	VI-SS-03(0-1)DUP 12/2/2013 Duplicate	VI-SS-03-S1 11/30/2017	VI-SS-03-S2 11/30/2017	VI-SS-03-S3 11/30/2017
Volatile Organic Compounds												
Benzene	mg/kg	8260	1.2	1.2	0.052	< 0.00077	< 0.00077	< 0.00075	< 0.00075	NA	NA	NA
Toluene	mg/kg	8260	490	820	13.8	< 0.00084	< 0.00083	< 0.00081	< 0.00081	NA	NA	NA
Ethylbenzene	mg/kg	8260	5.8	6.2	15.6	< 0.00074	< 0.00073	< 0.00071	< 0.00072	NA	NA	NA
Xylenes, Total	mg/kg	8260	58	260	198	< 0.0026	< 0.0025	< 0.0025	< 0.0025	NA	NA	NA
1,1,1-Trichloroethane	mg/kg	8260	810	640	5.6	< 0.00056	< 0.00055	< 0.00054	< 0.00054	NA	NA	NA
1,1,2,2-Tetrachloroethane	mg/kg	8260	0.6	0.64	0.0006	< 0.00082	< 0.00082	< 0.0008	< 0.0008	NA	NA	NA
1,1,2-Trichloro-1,2,2-trifluoroethane	mg/kg	8260	670	910	52	< 0.0012	< 0.0012	< 0.0012	< 0.0012	NA	NA	NA
1,1,2-Trichloroethane	mg/kg	8260	0.15	1.2	0.032	< 0.00095	< 0.00095	< 0.00092	< 0.00093	NA	NA	NA
1,1-Dichloroethane	mg/kg	8260	3.6	3.8	0.0156	< 0.00066	< 0.00065	< 0.00064	< 0.00064	NA	NA	NA
1,1-Dichloroethene	mg/kg	8260	23	240	0.2	< 0.00097	< 0.00096	< 0.00094	< 0.00095	NA	NA	NA
1,2,4-Trichlorobenzene	mg/kg	8260	5.8	24	4	< 0.001	< 0.001	< 0.00098	< 0.00098	NA	NA	NA
1,2-Dibromo-3-Chloropropane	mg/kg	8260	0.0053	0.0057	0.00172	< 0.00086	< 0.00085	< 0.00083	< 0.00083	NA	NA	NA
1,2-Dibromoethane (EDB)	mg/kg	8260	0.036	0.039	0.00028	< 0.00099	< 0.00098	< 0.00096	< 0.00096	NA	NA	NA
1,2-Dichlorobenzene	mg/kg	8260	180	380	11.6	< 0.00092	< 0.00091	< 0.00088	< 0.00089	NA	NA	NA
1,2-Dichloroethane	mg/kg	8260	0.46	0.5	0.028	< 0.0007	< 0.0007	< 0.00068	< 0.00068	NA	NA	NA
1,2-Dichloroethene, Total	mg/kg	8260	- -	- -	- -	< 0.0015	< 0.0015	< 0.0014	< 0.0014	NA	NA	NA
cis-1,2-Dichloroethene	mg/kg	8260	16	17	0.42	< 0.00081	< 0.0008	< 0.00078	< 0.00078	NA	NA	NA
trans-1,2-Dichloroethene	mg/kg	8260	7	130	0.62	< 0.00068	< 0.00068	< 0.00066	< 0.00066	NA	NA	NA
1,2-Dichloropropane	mg/kg	8260	1.6	1.1	0.034	< 0.00062	< 0.00062	< 0.0006	< 0.00061	NA	NA	NA
cis-1,3-Dichloropropene [1]	mg/kg	8260	1.8	1.9	0.0034	< 0.00078	< 0.00077	< 0.00075	< 0.00076	NA	NA	NA
trans-1,3-Dichloropropene [1]	mg/kg	8260	1.8	1.9	0.0034	< 0.00069	< 0.00068	< 0.00066	< 0.00067	NA	NA	NA
1,3-Dichlorobenzene [1]	mg/kg	8260	2.6	2.8	1.44	< 0.00075	< 0.00075	< 0.00073	< 0.00073	NA	NA	NA
1,4-Dichlorobenzene	mg/kg	8260	2.6	2.8	1.44	< 0.00073	< 0.00072	< 0.00071	< 0.00071	NA	NA	NA
2-Butanone (MEK)	mg/kg	8260	2700	28000	2.4	< 0.001	< 0.001	< 0.00098	< 0.00098	NA	NA	NA
2-Hexanone	mg/kg	8260	20	- -	0.0176	< 0.00079	< 0.00079	< 0.00077	< 0.00077	NA	NA	NA
4-Methyl-2-pentanone (MIBK)	mg/kg	8260	3300	3400	2.8	< 0.00075	< 0.00074	< 0.00072	< 0.00073	NA	NA	NA
Acetone	mg/kg	8260	6100	61000	5.8	< 0.0057	< 0.0057	< 0.0055	< 0.0056	NA	NA	NA
Bromoform	mg/kg	8260	19	20	0.42	< 0.00051	< 0.0005	< 0.00049	< 0.00049	NA	NA	NA
Bromomethane	mg/kg	8260	0.68	7.3	0.0038	< 0.00085 R	< 0.00084	< 0.00082 R	< 0.00082 R	NA	NA	NA
Carbon disulfide	mg/kg	8260	77	740	0.48	< 0.00059	< 0.00058	< 0.00057	< 0.00057	NA	NA	NA
Carbon tetrachloride	mg/kg	8260	0.65	0.7	0.038	< 0.00051	< 0.00051	< 0.0005	< 0.0005	NA	NA	NA
Chlorobenzene	mg/kg	8260	28	290	1.36	< 0.00087	< 0.00086	< 0.00084	< 0.00084	NA	NA	NA
Chlorodibromomethane	mg/kg	8260	8.3	8.3	0.42	< 0.00081	< 0.00081	< 0.00079	< 0.00079	NA	NA	NA
Chloroethane	mg/kg	8260	1400	2100	11.8	< 0.0018	< 0.0018	< 0.0017	< 0.0017	NA	NA	NA
Chloroform	mg/kg	8260	0.32	0.34	0.44	0.00076 B	0.0007 B	0.00068 B	0.00073 B	NA	NA	NA
Chloromethane	mg/kg	8260	11	120	0.098	< 0.00098	< 0.00097	< 0.00095	< 0.00095	NA	NA	NA
Cyclohexane	mg/kg	8260	650	120	26	< 0.00043	< 0.00042	< 0.00041	< 0.00041	NA	NA	NA
Dichlorobromomethane	mg/kg	8260	0.29	0.31	0.44	< 0.00064	< 0.00064	< 0.00062	< 0.00063	NA	NA	NA
Dichlorodifluoromethane	mg/kg	8260	8.7	94	0.6	< 0.00076	< 0.00076	< 0.00074	< 0.00074	NA	NA	NA
Isopropylbenzene	mg/kg	8260	190	270	1.48	< 0.00078	< 0.00077	< 0.00075	< 0.00076	NA	NA	NA
Methyl acetate	mg/kg	8260	7800	23000	8.2	< 0.001	< 0.001	< 0.001	< 0.001	NA	NA	NA
Methyl tert-butyl ether	mg/kg	8260	47	50	0.064	< 0.00086	< 0.00085	< 0.00083	< 0.00083	NA	NA	NA
Methylcyclohexane [1]	mg/kg	8260	650	120	26	< 0.00083	< 0.00082	< 0.0008	< 0.00081	NA	NA	NA
Methylene Chloride	mg/kg	8260	35	58	0.054	0.003 B	0.003 B	0.0031 B	0.0032 B	NA	NA	NA
Styrene	mg/kg	8260	600	870	2.6	< 0.00081	< 0.0008	< 0.00078	< 0.00079	NA	NA	NA
Tetrachloroethene	mg/kg	8260	8.1	25	0.046	< 0.00078	< 0.00077	< 0.00076	< 0.00076	NA	NA	NA
Trichloroethene	mg/kg	8260	0.41	0.5	0.036	< 0.00075	< 0.00075	< 0.00073	< 0.00073	NA	NA	NA
Trichlorofluoromethane	mg/kg	8260	2300	790	6.6	< 0.0011	< 0.001	< 0.001	< 0.001	NA	NA	NA
Vinyl chloride	mg/kg	8260	0.059	0.057	0.0138	< 0.00054	< 0.00053	< 0.00052	< 0.00052	NA	NA	NA

TABLE A-1
ANALYTICAL AND SCREENING RESULTS
SURFACE SOIL
CAA VIM AND VIIM
MINGO JUNCTION STEEL WORKS LLC - WEIRTON FACILITY

Constituent	Units	Analytical Method	Screening Criteria [1]			Sample Information [2]						
			Residential Soil RSL	Residential Soil De Minimis	*Protection of Groundwater RSL*	VI-SS-01(0-1) 12/2/2013	VI-SS-02(0-0.5) 12/2/2013	VI-SS-03(0-1) 12/2/2013	VI-SS-03(0-1)DUP 12/2/2013 Duplicate	VI-SS-03-S1 11/30/2017	VI-SS-03-S2 11/30/2017	VI-SS-03-S3 11/30/2017
Semi-Volatile Organic Compounds												
Acenaphthene	mg/kg	8270	360	4100	11	< 0.037	< 0.0073	0.022 J	0.043 J	NA	NA	NA
Acenaphthylene [1]	mg/kg	8270	360	4200	11	< 0.044	< 0.0087	0.027 J	0.051 J	NA	NA	NA
Anthracene	mg/kg	8270	1800	23000	116	0.048 J	0.0087 J	0.027 J	0.047 J	NA	NA	NA
Benzo[a]anthracene	mg/kg	8270	1.1	0.21	0.22	< 0.048	0.029 J	0.067 J	0.099	NA	NA	NA
Benzo[a]pyrene	mg/kg	8270	0.11	0.016	4.8	< 0.038	0.024 J	0.052 J	0.095	NA	NA	NA
Benzo[b]fluoranthene	mg/kg	8270	1.1	0.16	6	< 0.06	0.049 J	0.069 J	0.13	NA	NA	NA
Benzo[g,h,i]perylene [1]	mg/kg	8270	180	1800	26	< 0.038	0.046 J	0.065 J	0.084	NA	NA	NA
Benzo[k]fluoranthene	mg/kg	8270	11	1.6	58	< 0.077	0.021 J	0.031 J	0.049 J	NA	NA	NA
Chrysene	mg/kg	8270	110	16	180	< 0.045	0.039 J	0.069 J	0.12	NA	NA	NA
Dibenz(a,h)anthracene	mg/kg	8270	0.11	0.016	1.92	< 0.042	0.0099 J	0.016 J	0.027 J	NA	NA	NA
Fluoranthene	mg/kg	8270	240	2400	178	0.15 J	0.037 J	0.15	0.29	NA	NA	NA
Fluorene	mg/kg	8270	240	2900	10.8	< 0.05	< 0.01	0.032 J	0.067 J	NA	NA	NA
Indeno[1,2,3-cd]pyrene	mg/kg	8270	1.1	0.16	19.6	< 0.039	0.031 J	0.044 J	0.081	NA	NA	NA
Naphthalene	mg/kg	8270	2	4.1	0.0076	< 0.033	***0.02*** J	***0.013*** J	< 0.0064	NA	NA	NA
Phenanthrene [1]	mg/kg	8270	1800	23000	116	0.13 J	0.032 J	0.13	0.24	NA	NA	NA
Pyrene	mg/kg	8270	180	2300	26	0.13 J	0.034 J	0.1	0.18	NA	NA	NA
1,1'-Biphenyl	mg/kg	8270	4.7	51	0.0174	< 0.17	< 0.034	< 0.033	< 0.033	NA	NA	NA
2,4,5-Trichlorophenol	mg/kg	8270	630	6300	8	< 0.2	< 0.041 UL	< 0.039	< 0.039	NA	NA	NA
2,4,6-Trichlorophenol	mg/kg	8270	6.3	49	0.024	< 0.28	< 0.057 UL	< 0.055	< 0.055	NA	NA	NA
2,4-Dichlorophenol	mg/kg	8270	19	190	0.046	< 0.038	< 0.0076 UL	< 0.0074	< 0.0074	NA	NA	NA
2,4-Dimethylphenol	mg/kg	8270	130	1300	0.84	< 0.3	< 0.059 UL	< 0.058	< 0.058	NA	NA	NA
2,4-Dinitrophenol	mg/kg	8270	13	130	0.088	< 2.3	< 0.45 UL	< 0.44	< 0.44	NA	NA	NA
2,4-Dinitrotoluene	mg/kg	8270	1.7	1.7	0.0064	< 0.15	< 0.031	< 0.03	< 0.03	NA	NA	NA
2,6-Dinitrotoluene	mg/kg	8270	0.36	0.36	0.00134	< 0.2	< 0.039	< 0.038	< 0.038	NA	NA	NA
2-Chloronaphthalene	mg/kg	8270	480	5000	7.8	< 0.04	< 0.0079	< 0.0077	< 0.0077	NA	NA	NA
2-Chlorophenol	mg/kg	8270	39	340	0.178	< 0.16	< 0.031 UL	< 0.03	< 0.03	NA	NA	NA
2-Methylnaphthalene	mg/kg	8270	24	310	0.38	0.042 J	0.034 J	0.019 J	0.022 J	NA	NA	NA
2-Methylphenol	mg/kg	8270	320	3200	1.5	< 0.13	< 0.027 UL	< 0.026	< 0.026	NA	NA	NA
2-Nitroaniline	mg/kg	8270	63	630	0.16	< 0.85	< 0.17	< 0.16	< 0.17	NA	NA	NA
2-Nitrophenol	mg/kg	8270	- -	- -	- -	< 0.21	< 0.042 UL	< 0.041	< 0.041	NA	NA	NA
3,3'-Dichlorobenzidine	mg/kg	8270	1.2	1.2	0.0164	< 0.2	< 0.04	< 0.039	< 0.039	NA	NA	NA
Methylphenol, 3 & 4 [1]	mg/kg	8270	320	3200	1.48	< 0.19	0.037 L	< 0.036	< 0.036	NA	NA	NA
3-Nitroaniline	mg/kg	8270	- -	- -	- -	< 0.78	< 0.16	< 0.15	< 0.15	NA	NA	NA
4,6-Dinitro-2-methylphenol	mg/kg	8270	0.51	- -	0.0052	< 0.76 R	< 0.15 UL	< 0.15	< 0.15	NA	NA	NA
4-Bromophenyl phenyl ether	mg/kg	8270	- -	- -	- -	< 0.17	< 0.033	< 0.032	< 0.032	NA	NA	NA
4-Chloro-3-methylphenol	mg/kg	8270	630	- -	3.4	< 0.18	< 0.035 UL	< 0.034	< 0.034	NA	NA	NA
4-Chloroaniline	mg/kg	8270	2.7	2.7	0.0032	< 0.15	< 0.03	< 0.029	< 0.03	NA	NA	NA
4-Chlorophenyl phenyl ether	mg/kg	8270	- -	- -	- -	< 0.21	< 0.042	< 0.041	< 0.041	NA	NA	NA
4-Nitroaniline	mg/kg	8270	25	- -	0.032	< 0.77	< 0.15	< 0.15	< 0.15	NA	NA	NA
4-Nitrophenol	mg/kg	8270	- -	- -	- -	< 0.69	< 0.14 UL	< 0.13	< 0.13	NA	NA	NA
Acetophenone	mg/kg	8270	780	2500	1.16	< 0.16	< 0.031	< 0.03	< 0.03	NA	NA	NA
Atrazine	mg/kg	8270	2.4	2.4	0.038	< 0.19	< 0.037	< 0.036	< 0.036	NA	NA	NA
Benzaldehyde	mg/kg	8270	170	1200	0.082	< 0.29	< 0.057	< 0.055	< 0.055	NA	NA	NA
Bis(2-chloroisopropyl)ether	mg/kg	8270	310	5.1	0.52	< 0.041	< 0.0082	< 0.0079	< 0.008	NA	NA	NA
Bis(2-chloroethoxy)methane	mg/kg	8270	19	- -	0.026	< 0.13	< 0.025	< 0.024	< 0.024	NA	NA	NA
Bis(2-chloroethyl)ether	mg/kg	8270	0.23	0.24	0.000072	< 0.051	< 0.01	< 0.0099	< 0.0099	NA	NA	NA
Bis(2-ethylhexyl) phthalate	mg/kg	8270	39	39	28	< 0.31	< 0.061	< 0.059	< 0.06	NA	NA	NA
Butyl benzyl phthalate	mg/kg	8270	290	290	4.8	< 0.26	< 0.052	< 0.05	< 0.05	NA	NA	NA
Caprolactam	mg/kg	8270	3100	31000	5	< 1.4	< 0.29	< 0.28	< 0.28	NA	NA	NA
Carbazole [1]	mg/kg	8270	1800	23000	116	< 0.035	< 0.007	0.014 J	0.018 J	NA	NA	NA

TABLE A-1
ANALYTICAL AND SCREENING RESULTS
SURFACE SOIL
CAA VIM AND VIIM
MINGO JUNCTION STEEL WORKS LLC - WEIRTON FACILITY

			Screening Criteria [1]			Sample Information [2]						
Constituent	Units	Analytical Method	Residential Soil RSL	Residential Soil De Minimis	*Protection of Groundwater RSL*	VI-SS-01(0-1) 12/2/2013	VI-SS-02(0-0.5) 12/2/2013	VI-SS-03(0-1) 12/2/2013	VI-SS-03(0-1)DUP 12/2/2013 Duplicate	VI-SS-03-S1 11/30/2017	VI-SS-03-S2 11/30/2017	VI-SS-03-S3 11/30/2017
Dibenzofuran	mg/kg	8270	7.8	78	0.3	< 0.19	< 0.037	< 0.036	< 0.036	NA	NA	NA
Diethyl phthalate	mg/kg	8270	5100	51000	12.2	0.47 B	0.054 B	0.13 B	0.067 B	NA	NA	NA
Dimethyl phthalate	mg/kg	8270	- -	- -	- -	< 0.21	< 0.041	< 0.04	< 0.04	NA	NA	NA
Di-n-butyl phthalate	mg/kg	8270	630	6300	4.6	< 0.24	< 0.048	< 0.046	< 0.046	NA	NA	NA
Di-n-octyl phthalate	mg/kg	8270	63	- -	114	< 0.2	< 0.04	< 0.039	< 0.039	NA	NA	NA
Hexachlorobenzene	mg/kg	8270	0.21	0.22	0.26	< 0.041	< 0.0081	< 0.0078	< 0.0079	NA	NA	NA
Hexachlorobutadiene	mg/kg	8270	1.2	1.3	0.0054	< 0.043	< 0.0085	< 0.0082	< 0.0083	NA	NA	NA
Hexachlorocyclopentadiene	mg/kg	8270	0.18	1.9	3.2	< 0.21	< 0.041	< 0.04	< 0.04	NA	NA	NA
Hexachloroethane	mg/kg	8270	1.8	2	0.004	< 0.14	< 0.027	< 0.026	< 0.027	NA	NA	NA
Isophorone	mg/kg	8270	570	570	0.52	< 0.14	< 0.029	< 0.028	< 0.028	NA	NA	NA
Nitrobenzene	mg/kg	8270	5.1	5.5	0.00184	< 0.16	< 0.032	< 0.031	< 0.031	NA	NA	NA
N-Nitrosodi-n-propylamine	mg/kg	8270	0.078	0.078	0.000162	< 0.045	< 0.0089	< 0.0086	< 0.0087	NA	NA	NA
N-Nitrosodiphenylamine	mg/kg	8270	110	110	1.34	< 0.18	< 0.035	< 0.034	< 0.034	NA	NA	NA
Pentachlorophenol	mg/kg	8270	1	1	0.028	< 0.17	< 0.034 UL	< 0.033	< 0.033	NA	NA	NA
Phenol	mg/kg	8270	1900	19000	6.6	< 0.045	< 0.009 UL	< 0.0087	0.13	NA	NA	NA
Polychlorinated Biphenyls												
PCB-1016	mg/kg	8082	0.41	5.5	0.26	< 0.0028	< 0.0028	< 0.0028	< 0.0028	< 0.031	< 0.00031	< 0.0061
PCB-1221	mg/kg	8082	0.2	0.26	0.0016	< 0.0036	< 0.0036	< 0.0035	< 0.0035	< 0.061	< 0.00062	< 0.012
PCB-1232	mg/kg	8082	0.17	0.22	0.0016	< 0.0033	< 0.0032	< 0.0032	< 0.0032	< 0.056	< 0.00056	< 0.011
PCB-1242	mg/kg	8082	0.23	0.31	0.024	< 0.0031	< 0.0031	< 0.003	< 0.003	< 0.056	< 0.00057	< 0.011
PCB-1248	mg/kg	8082	0.23	0.31	0.024	< 0.0018	< 0.0018	< 0.0018	< 0.0018	< 0.074	< 0.00075	< 0.015
PCB-1254	mg/kg	8082	0.12	0.32	0.04	< 0.0027	< 0.0027	< 0.0026	< 0.0026	< 0.064	< 0.00065	< 0.013
PCB-1260	mg/kg	8082	0.24	0.33	0.11	***2.2***	***1.3***	***2.6***	***3.4***	***3***	***0.2***	***3.3***
Inorganics												
Aluminum	mg/kg	6020	7700	77000	60000	30000 K	20000 K	14000 K	8100 K	NA	NA	NA
Antimony	mg/kg	6020	3.1	31	5.4	0.45 L	0.36 L	0.55 J	0.91 J	NA	NA	NA
Arsenic	mg/kg	6020	0.68	0.43	5.8	2.8 L	3 L	1.6 L	1.8 L	NA	NA	NA
Barium	mg/kg	6020	1500	15000	1640	340 L	160	140	100	NA	NA	NA
Beryllium	mg/kg	6020	16	160	64	5.7 L	3.8	1.9	1.3	NA	NA	NA
Cadmium	mg/kg	6020	7.1	37	7.6	1.6	0.85 J	0.99 J	0.67 J	NA	NA	NA
Calcium	mg/kg	6020	- -	- -	- -	140000	120000	120000	65000	NA	NA	NA
Chromium [1]	mg/kg	6020	12000	120000	3600000	140	280	470	310	NA	NA	NA
Cobalt	mg/kg	6020	2.3	23	0.54	***3.5***	***2.2***	***2.9***	***12***	NA	NA	NA
Copper	mg/kg	6020	310	3100	920	28	39	32	56	NA	NA	NA
Iron	mg/kg	6020	5500	55000	700	***51000***	***64000***	***110000***	***300000***	NA	NA	NA
Lead	mg/kg	6020	400	400	280	46	72	47	30	NA	NA	NA
Magnesium	mg/kg	6020	- -	- -	- -	40000	31000	27000	15000	NA	NA	NA
Manganese [1]	mg/kg	6020	180	3500	56	***6000***	***7300***	***13000***	***7500***	NA	NA	NA
Mercury	mg/kg	7471	1.1	3.1	2	0.032	0.055 L	0.036 L	0.048 L	NA	NA	NA
Nickel	mg/kg	6020	150	1500	52	10 K	12 K	14 K	37 K	NA	NA	NA
Potassium	mg/kg	6020	- -	- -	- -	2000	790	610	370	NA	NA	NA
Selenium	mg/kg	6020	39	390	5.2	< 0.55	< 0.54 UL	< 0.54	< 0.54	NA	NA	NA
Silver	mg/kg	6020	39	390	1.6	0.19 J	< 0.042	0.068 J	0.059 J	NA	NA	NA
Sodium	mg/kg	6020	- -	- -	- -	850 J	460 L	390	230	NA	NA	NA
Thallium	mg/kg	6020	0.078	0.78	2.8	0.064 J	0.04 L	0.05 J	0.031 J	NA	NA	NA
Vanadium	mg/kg	6020	39	5.5	172	52 L	160 L	***260*** L	***200*** L	NA	NA	NA
Zinc	mg/kg	6020	2300	23000	740	110 J	110 L	91	57	NA	NA	NA
Other Parameters												
Cyanide, Total	mg/kg	9012	2.3	23	40	26	1.8	10	5.2	NA	NA	NA
Percent Moisture	%	- -	- -	- -	- -	13	12	10	10	NA	NA	NA

TABLE A-1
ANALYTICAL AND SCREENING RESULTS
SURFACE SOIL
CAA VIM AND VIIM
MINGO JUNCTION STEEL WORKS LLC - WEIRTON FACILITY

Constituent	Units	Analytical Method	Screening Criteria [1]			Sample Information [2]						
			Residential Soil RSL	Residential Soil De Minimis	*Protection of Groundwater RSL*	DUP-1-11-30-17 11/30/2017 Duplicate	VI-SS-04(1-2) 12/9/2013	VI-SS-05(1-2) 12/9/2013	VI-SS-06(0-0.5) 12/2/2013	VI-SS-06(0-0.5)DUP 12/2/2013 Duplicate	VI-SS-07(0-0.5) 12/2/2013	VI-SS-08(0-1) 12/2/2013
Volatile Organic Compounds												
Benzene	mg/kg	8260	1.2	1.2	0.052	NA	< 0.0008	< 0.00071	< 0.00099	< 0.001	< 0.055	< 0.00078
Toluene	mg/kg	8260	490	820	13.8	NA	< 0.00087	< 0.00077	< 0.0011	< 0.0011	0.65	< 0.00084
Ethylbenzene	mg/kg	8260	5.8	6.2	15.6	NA	< 0.00076	< 0.00068	< 0.00095	< 0.00096	1.4	< 0.00074
Xylenes, Total	mg/kg	8260	58	260	198	NA	< 0.0027	< 0.0024	< 0.0033	< 0.0033	6.9	< 0.0026
1,1,1-Trichloroethane	mg/kg	8260	810	640	5.6	NA	< 0.00058	< 0.00051	< 0.00072	< 0.00073	< 0.057	< 0.00056
1,1,2,2-Tetrachloroethane	mg/kg	8260	0.6	0.64	0.0006	NA	< 0.00085	< 0.00076	< 0.0011	< 0.0011	< 0.052	< 0.00083
1,1,2-Trichloro-1,2,2-trifluoroethane	mg/kg	8260	670	910	52	NA	< 0.0013	< 0.0011	< 0.0016	< 0.0016	< 0.018	< 0.0012
1,1,2-Trichloroethane	mg/kg	8260	0.15	1.2	0.032	NA	< 0.00099	< 0.00088	< 0.0012	< 0.0012	< 0.064	< 0.00096
1,1-Dichloroethane	mg/kg	8260	3.6	3.8	0.0156	NA	< 0.00068	< 0.00061	< 0.00085	< 0.00086	< 0.056	< 0.00066
1,1-Dichloroethene	mg/kg	8260	23	240	0.2	NA	< 0.001	< 0.00089	< 0.0012	< 0.0013	< 0.059	< 0.00098
1,2,4-Trichlorobenzene	mg/kg	8260	5.8	24	4	NA	< 0.001	< 0.00093	< 0.0013	< 0.0013	< 0.021	< 0.001
1,2-Dibromo-3-Chloropropane	mg/kg	8260	0.0053	0.0057	0.00172	NA	< 0.00089	< 0.00079	< 0.0011	< 0.0011	< 0.02	< 0.00086
1,2-Dibromoethane (EDB)	mg/kg	8260	0.036	0.039	0.00028	NA	< 0.001	< 0.00091	< 0.0013	< 0.0013	< 0.034	< 0.00099
1,2-Dichlorobenzene	mg/kg	8260	180	380	11.6	NA	< 0.00095	< 0.00084	< 0.0012	< 0.0012	< 0.038	< 0.00092
1,2-Dichloroethane	mg/kg	8260	0.46	0.5	0.028	NA	< 0.00073	< 0.00065	< 0.0009	< 0.00091	< 0.053	< 0.00071
1,2-Dichloroethene, Total	mg/kg	8260	- -	- -	- -	NA	< 0.0015	< 0.0014	< 0.0019	< 0.0019	< 0.053	< 0.0015
cis-1,2-Dichloroethene	mg/kg	8260	16	17	0.42	NA	< 0.00084	< 0.00074	< 0.001	< 0.001	< 0.037	< 0.00081
trans-1,2-Dichloroethene	mg/kg	8260	7	130	0.62	NA	< 0.00071	< 0.00063	< 0.00088	< 0.00089	< 0.042	< 0.00069
1,2-Dichloropropane	mg/kg	8260	1.6	1.1	0.034	NA	< 0.00065	< 0.00057	< 0.0008	< 0.00081	< 0.071	< 0.00063
cis-1,3-Dichloropropene [1]	mg/kg	8260	1.8	1.9	0.0034	NA	< 0.00081	< 0.00072	< 0.001	< 0.001	< 0.04	< 0.00078
trans-1,3-Dichloropropene [1]	mg/kg	8260	1.8	1.9	0.0034	NA	< 0.00071	< 0.00063	< 0.00088	< 0.00089	< 0.032	< 0.00069
1,3-Dichlorobenzene [1]	mg/kg	8260	2.6	2.8	1.44	NA	< 0.00078	< 0.00069	< 0.00097	< 0.00098	< 0.028	< 0.00076
1,4-Dichlorobenzene	mg/kg	8260	2.6	2.8	1.44	NA	< 0.00076	< 0.00067	< 0.00094	< 0.00095	< 0.029	< 0.00073
2-Butanone (MEK)	mg/kg	8260	2700	28000	2.4	NA	< 0.001	< 0.00093	< 0.0013	< 0.0013	< 0.06	< 0.001
2-Hexanone	mg/kg	8260	20	- -	0.0176	NA	< 0.00082	< 0.00073	< 0.001	< 0.001	< 0.032	< 0.00079
4-Methyl-2-pentanone (MIBK)	mg/kg	8260	3300	3400	2.8	NA	< 0.00078	< 0.00069	< 0.00096	< 0.00097	< 0.033	< 0.00075
Acetone	mg/kg	8260	6100	61000	5.8	NA	< 0.0059	< 0.0053	< 0.0074	< 0.0075	< 0.28	< 0.0058
Bromoform	mg/kg	8260	19	20	0.42	NA	< 0.00053	< 0.00047	< 0.00065	< 0.00066	< 0.059	< 0.00051
Bromomethane	mg/kg	8260	0.68	7.3	0.0038	NA	< 0.00088 R	< 0.00078 R	< 0.0011 R	< 0.0011 R	< 0.087	< 0.00085 R
Carbon disulfide	mg/kg	8260	77	740	0.48	NA	0.0019 J	< 0.00054	< 0.00075	< 0.00076	< 0.059	< 0.00059
Carbon tetrachloride	mg/kg	8260	0.65	0.7	0.038	NA	< 0.00053	< 0.00047	< 0.00066	< 0.00067	< 0.06	< 0.00051
Chlorobenzene	mg/kg	8260	28	290	1.36	NA	< 0.0009	< 0.0008	< 0.0011	< 0.0011	0.033 J	< 0.00087
Chlorodibromomethane	mg/kg	8260	8.3	8.3	0.42	NA	< 0.00084	< 0.00075	< 0.001	< 0.0011	< 0.036	< 0.00082
Chloroethane	mg/kg	8260	1400	2100	11.8	NA	< 0.0018 R	< 0.0016	< 0.0023	< 0.0023	< 0.041	< 0.0018
Chloroform	mg/kg	8260	0.32	0.34	0.44	NA	0.00075 B	0.0007 B	0.00091 B	0.00089 B	< 0.056	0.0007 B
Chloromethane	mg/kg	8260	11	120	0.098	NA	< 0.001	< 0.0009	< 0.0013	< 0.0013	< 0.077	< 0.00098
Cyclohexane	mg/kg	8260	650	120	26	NA	< 0.00044	< 0.00039	< 0.00055	< 0.00055	< 0.033	< 0.00043
Dichlorobromomethane	mg/kg	8260	0.29	0.31	0.44	NA	< 0.00067	< 0.00059	< 0.00083	< 0.00084	< 0.052	< 0.00065
Dichlorodifluoromethane	mg/kg	8260	8.7	94	0.6	NA	< 0.00079	< 0.0007	< 0.00098	< 0.00099	< 0.035	< 0.00077
Isopropylbenzene	mg/kg	8260	190	270	1.48	NA	< 0.00081	< 0.00072	< 0.001	< 0.001	0.33	< 0.00078
Methyl acetate	mg/kg	8260	7800	23000	8.2	NA	< 0.0011	< 0.00095	< 0.0013	< 0.0013	< 0.068	< 0.001
Methyl tert-butyl ether	mg/kg	8260	47	50	0.064	NA	< 0.00089	< 0.00079	< 0.0011	< 0.0011	< 0.057	< 0.00086
Methylcyclohexane [1]	mg/kg	8260	650	120	26	NA	< 0.00086	< 0.00076	< 0.0011	< 0.0011	0.12 J	< 0.00084
Methylene Chloride	mg/kg	8260	35	58	0.054	NA	0.0025 B	0.00084 B	0.0039 B	0.0043 B	< 0.06	0.0039 B
Styrene	mg/kg	8260	600	870	2.6	NA	< 0.00084	< 0.00074	< 0.001	< 0.0011	< 0.035	< 0.00081
Tetrachloroethene	mg/kg	8260	8.1	25	0.046	NA	< 0.00081	< 0.00072	< 0.001	< 0.001	< 0.046	< 0.00078
Trichloroethene	mg/kg	8260	0.41	0.5	0.036	NA	< 0.00078	< 0.00069	< 0.00097	< 0.00098	< 0.044	< 0.00076
Trichlorofluoromethane	mg/kg	8260	2300	790	6.6	NA	< 0.0011	< 0.00097	< 0.0014	< 0.0014	< 0.062	< 0.0011
Vinyl chloride	mg/kg	8260	0.059	0.057	0.0138	NA	< 0.00056	< 0.0005	< 0.00069	< 0.0007	< 0.071	< 0.00054

TABLE A-1
ANALYTICAL AND SCREENING RESULTS
SURFACE SOIL
CAA VIM AND VIIM
MINGO JUNCTION STEEL WORKS LLC - WEIRTON FACILITY

Constituent	Units	Analytical Method	Screening Criteria [1]			Sample Information [2]																							
			Residential Soil RSL	Residential Soil De Minimis	*Protection of Groundwater RSL*	DUP-1-11-30-17 11/30/2017 Duplicate				VI-SS-04(1-2) 12/9/2013				VI-SS-05(1-2) 12/9/2013				VI-SS-06(0-0.5) 12/2/2013				VI-SS-06(0-0.5)DUP 12/2/2013 Duplicate				VI-SS-07(0-0.5) 12/2/2013				VI-SS-08(0-1) 12/2/2013			
Semi-Volatile Organic Compounds																													
Acenaphthene	mg/kg	8270	360	4100	11	NA				<	0.0076	UJ		0.028	J		0.15	J		0.22	J		***20***			<	0.0073		
Acenaphthylene [1]	mg/kg	8270	360	4200	11	NA				<	0.0091	UJ	<	0.008			0.82	J		2.3			5.3				0.019		J
Anthracene	mg/kg	8270	1800	23000	116	NA				<	0.0078	UJ		0.035	J		1.2			1.9			16				0.017		J
Benzo[a]anthracene	mg/kg	8270	1.1	0.21	0.22	NA				<	0.0099	UJ		0.038	J		***2.1***			***6.2***			***48***				0.11		
Benzo[a]pyrene	mg/kg	8270	0.11	0.016	4.8	NA				<	0.0079	UJ		0.016	J		2.6			***9***			***28***				0.14		
Benzo[b]fluoranthene	mg/kg	8270	1.1	0.16	6	NA				<	0.012	UJ		0.025	J		3.5			***11***			***21***				0.15		
Benzo[g,h,i]perylene [1]	mg/kg	8270	180	1800	26	NA				<	0.0079	UJ	<	0.0069			3.4			9.3			13				0.18		
Benzo[k]fluoranthene	mg/kg	8270	11	1.6	58	NA				<	0.016	UJ	<	0.014			1.7			4			5.8				0.047		J
Chrysene	mg/kg	8270	110	16	180	NA				<	0.0095	UJ		0.033	J		2.7			7			87				0.28		
Dibenz(a,h)anthracene	mg/kg	8270	0.11	0.016	1.92	NA				<	0.0088	UJ	<	0.0077	UJ		0.56	J		1.6			***5.9***				0.042		J
Fluoranthene	mg/kg	8270	240	2400	178	NA				<	0.0085	UJ		0.16	J		4.2			12			59				0.091		
Fluorene	mg/kg	8270	240	2900	10.8	NA				<	0.01	UJ		0.023	J	<	0.13			0.3	J		***22***			<	0.01		
Indeno[1,2,3-cd]pyrene	mg/kg	8270	1.1	0.16	19.6	NA				<	0.0082	UJ	<	0.0072	UJ		2.2			6.6			7.6				0.082		
Naphthalene	mg/kg	8270	2	4.1	0.0076	NA				<	0.0068	UJ		***0.032***	J	<	0.084		<	0.086			***32***			<	0.0066		
Phenanthrene [1]	mg/kg	8270	1800	23000	116	NA				<	0.013	UJ		0.34	J		1.7			2.8			90				0.035		J
Pyrene	mg/kg	8270	180	2300	26	NA				<	0.008	UJ		0.11	J		3.5			9.8			***100***				0.24		
1,1'-Biphenyl	mg/kg	8270	4.7	51	0.0174	NA				<	0.035	UJ	<	0.031	UJ	<	0.44		<	0.44			***6.3***		J	<	0.034		
2,4,5-Trichlorophenol	mg/kg	8270	630	6300	8	NA				<	0.042	UJ	<	0.037	UJ	<	0.52		<	0.53		<	1.6			<	0.041		
2,4,6-Trichlorophenol	mg/kg	8270	6.3	49	0.024	NA				<	0.059	UJ	<	0.052	UJ	<	0.73		<	0.74		<	2.2			<	0.057		
2,4-Dichlorophenol	mg/kg	8270	19	190	0.046	NA				<	0.008	UJ	<	0.007	UJ	<	0.098		<	0.1		<	0.3			<	0.0077		
2,4-Dimethylphenol	mg/kg	8270	130	1300	0.84	NA				<	0.062	UJ	<	0.054	UJ	<	0.76		<	0.78		<	2.3			<	0.06		
2,4-Dinitrophenol	mg/kg	8270	13	130	0.088	NA				<	0.47	UJ	<	0.41	UJ	<	5.8		<	5.9		<	18			<	0.45		
2,4-Dinitrotoluene	mg/kg	8270	1.7	1.7	0.0064	NA				<	0.032	UJ	<	0.028	UJ	<	0.39		<	0.4		<	1.2			<	0.031		
2,6-Dinitrotoluene	mg/kg	8270	0.36	0.36	0.00134	NA				<	0.041	UJ	<	0.036	UJ	<	0.5		<	0.51		<	1.5			<	0.039		
2-Chloronaphthalene	mg/kg	8270	480	5000	7.8	NA				<	0.0083	UJ	<	0.0072	UJ	<	0.1		<	0.1		<	0.31			<	0.008		
2-Chlorophenol	mg/kg	8270	39	340	0.178	NA				<	0.032	UJ	<	0.028	UJ	<	0.4		<	0.41		<	1.2			<	0.031		
2-Methylnaphthalene	mg/kg	8270	24	310	0.38	NA				<	0.0071	UJ		0.017	J		0.18	J		0.2	J		***76***				0.016		J
2-Methylphenol	mg/kg	8270	320	3200	1.5	NA				<	0.028	UJ	<	0.024	UJ	<	0.34		<	0.35		<	1			<	0.027		
2-Nitroaniline	mg/kg	8270	63	630	0.16	NA				<	0.18	UJ	<	0.16	UJ	<	2.2		<	2.2		<	6.6			<	0.17		
2-Nitrophenol	mg/kg	8270	- -	- -	- -	NA				<	0.044	UJ	<	0.038	UJ	<	0.54		<	0.55		<	1.6			<	0.042		
3,3'-Dichlorobenzidine	mg/kg	8270	1.2	1.2	0.0164	NA				<	0.042	UJ	<	0.037	UJ	<	0.52		<	0.53		<	1.6			<	0.04		
Methylphenol, 3 & 4 [1]	mg/kg	8270	320	3200	1.48	NA				<	0.039	UJ	<	0.034	UJ	<	0.48		<	0.49		<	1.4			<	0.037		
3-Nitroaniline	mg/kg	8270	- -	- -	- -	NA				<	0.16	UJ	<	0.14	UJ	<	2		<	2		<	6.1			<	0.16		
4,6-Dinitro-2-methylphenol	mg/kg	8270	0.51	- -	0.0052	NA				<	0.16	UJ	<	0.14	UJ	<	2		<	2		<	6			<	0.15		
4-Bromophenyl phenyl ether	mg/kg	8270	- -	- -	- -	NA				<	0.035	UJ	<	0.03	UJ	<	0.42		<	0.43		<	1.3			<	0.033		
4-Chloro-3-methylphenol	mg/kg	8270	630	- -	3.4	NA				<	0.037	UJ	<	0.032	UJ	<	0.45		<	0.46		<	1.4			<	0.035		
4-Chloroaniline	mg/kg	8270	2.7	2.7	0.0032	NA				<	0.032	UJ	<	0.028	UJ	<	0.39		<	0.4		<	1.2			<	0.031		
4-Chlorophenyl phenyl ether	mg/kg	8270	- -	- -	- -	NA				<	0.044	UJ	<	0.039	UJ	<	0.54		<	0.55		<	1.6			<	0.042		
4-Nitroaniline	mg/kg	8270	25	- -	0.032	NA				<	0.16	UJ	<	0.14	UJ	<	2		<	2		<	6			<	0.15		
4-Nitrophenol	mg/kg	8270	- -	- -	- -	NA				<	0.14	UJ	<	0.13	UJ	<	1.8		<	1.8		<	5.4			<	0.14		
Acetophenone	mg/kg	8270	780	2500	1.16	NA				<	0.033	UJ	<	0.029	UJ	<	0.4		<	0.41		<	1.2			<	0.031		
Atrazine	mg/kg	8270	2.4	2.4	0.038	NA				<	0.039	UJ	<	0.034	UJ	<	0.48		<	0.48		<	1.4			<	0.037		
Benzaldehyde	mg/kg	8270	170	1200	0.082	NA				<	0.06	UJ	<	0.052	UJ	<	0.73		<	0.75		<	2.2			<	0.057		
Bis(2-chloroisopropyl)ether	mg/kg	8270	310	5.1	0.52	NA				<	0.0086	UJ	<	0.0075	UJ	<	0.11		<	0.11		<	0.32			<	0.0082		
Bis(2-chloroethoxy)methane	mg/kg	8270	19	- -	0.026	NA				<	0.026	UJ	<	0.023	UJ	<	0.32		<	0.33		<	0.98			<	0.025		
Bis(2-chloroethyl)ether	mg/kg	8270	0.23	0.24	0.000072	NA				<	0.011	UJ	<	0.0093	UJ	<	0.13		<	0.13		<	0.4			<	0.01		
Bis(2-ethylhexyl) phthalate	mg/kg	8270	39	39	28	NA				<	0.064	UJ	<	0.056	UJ	<	0.79		<	0.8		<	2.4			<	0.062		
Butyl benzyl phthalate	mg/kg	8270	290	290	4.8	NA				<	0.054	UJ	<	0.047	UJ	<	0.67		<	0.68		<	2			<	0.052		
Caprolactam	mg/kg	8270	3100	31000	5	NA				<	0.3	UJ	<	0.26	UJ	<	3.7		<	3.8		<	11			<	0.29		
Carbazole [1]	mg/kg	8270	1800	23000	116	NA				<	0.0073	UJ		0.044	J		0.37	J		0.4	J		7.1				0.0072		J

TABLE A-1
ANALYTICAL AND SCREENING RESULTS
SURFACE SOIL
CAA VIM AND VIIM
MINGO JUNCTION STEEL WORKS LLC - WEIRTON FACILITY

Constituent	Units	Analytical Method	Screening Criteria [(1)] Residential Soil RSL	Residential Soil De Minimis	Protection of Groundwater RSL	Sample Information [(2)] DUP-1-11-30-17 11/30/2017 Duplicate	VI-SS-04(1-2) 12/9/2013	VI-SS-05(1-2) 12/9/2013	VI-SS-06(0-0.5) 12/2/2013	VI-SS-06(0-0.5)DUP 12/2/2013 Duplicate	VI-SS-07(0-0.5) 12/2/2013	VI-SS-08(0-1) 12/2/2013
Dibenzofuran	mg/kg	8270	7.8	78	0.3	NA	< 0.039 UJ	0.055 J	< 0.48	< 0.49	13 J	< 0.038
Diethyl phthalate	mg/kg	8270	5100	51000	12.2	NA	0.048 J	0.049 J	1 B	3.6 B	1.9 B	0.3 B
Dimethyl phthalate	mg/kg	8270	- -	- -	- -	NA	< 0.043 UJ	< 0.038 UJ	< 0.53	< 0.54	< 1.6	< 0.042
Di-n-butyl phthalate	mg/kg	8270	630	6300	4.6	NA	< 0.05 UJ	< 0.044 UJ	< 0.61	< 0.62	< 1.9	< 0.048
Di-n-octyl phthalate	mg/kg	8270	63	- -	114	NA	< 0.042 UJ	< 0.037 UJ	< 0.51	< 0.52	< 1.6	< 0.04
Hexachlorobenzene	mg/kg	8270	0.21	0.22	0.26	NA	< 0.0085 UJ	< 0.0074 UJ	< 0.1	< 0.11	< 0.32	< 0.0081
Hexachlorobutadiene	mg/kg	8270	1.2	1.3	0.0054	NA	< 0.0089 UJ	< 0.0078 UJ	< 0.11	< 0.11	< 0.33	< 0.0085
Hexachlorocyclopentadiene	mg/kg	8270	0.18	1.9	3.2	NA	< 0.043 UJ	< 0.037 UJ	< 0.53	< 0.54	< 1.6	< 0.041
Hexachloroethane	mg/kg	8270	1.8	2	0.004	NA	< 0.029 UJ	< 0.025 UJ	< 0.35	< 0.36	< 1.1	< 0.027
Isophorone	mg/kg	8270	570	570	0.52	NA	< 0.03 UJ	< 0.026 UJ	< 0.37	< 0.38	< 1.1	< 0.029
Nitrobenzene	mg/kg	8270	5.1	5.5	0.00184	NA	< 0.033 UJ	< 0.029 UJ	< 0.41	< 0.41	< 1.2	< 0.032
N-Nitrosodi-n-propylamine	mg/kg	8270	0.078	0.078	0.000162	NA	< 0.0093 UJ	< 0.0081 UJ	< 0.11	< 0.12	< 0.35	< 0.009
N-Nitrosodiphenylamine	mg/kg	8270	110	110	1.34	NA	< 0.037 UJ	< 0.032 UJ	< 0.45	< 0.46	< 1.4	< 0.035
Pentachlorophenol	mg/kg	8270	1	1	0.028	NA	< 0.036 UJ	< 0.031 UJ	< 0.44	< 0.44	< 1.3	< 0.034
Phenol	mg/kg	8270	1900	19000	6.6	NA	< 0.0094 UJ	< 0.0082 UJ	< 0.12	< 0.12	< 0.35	< 0.009
Polychlorinated Biphenyls												
PCB-1016	mg/kg	8082	0.41	5.5	0.26	< 0.0061	< 0.003	< 0.0026	< 0.0036	< 0.0037	< 0.0028	< 0.0029
PCB-1221	mg/kg	8082	0.2	0.26	0.0016	< 0.012	< 0.0038	< 0.0033	< 0.0047	< 0.0047	< 0.0035	< 0.0037
PCB-1232	mg/kg	8082	0.17	0.22	0.0016	< 0.011	< 0.0034	< 0.003	< 0.0042	< 0.0042	< 0.0032	< 0.0033
PCB-1242	mg/kg	8082	0.23	0.31	0.024	< 0.011	< 0.0032	< 0.0028	< 0.004	< 0.004	< 0.003	< 0.0031
PCB-1248	mg/kg	8082	0.23	0.31	0.024	< 0.015	< 0.0019	< 0.0017	< 0.0023	< 0.0023	< 0.0017	< 0.0018
PCB-1254	mg/kg	8082	0.12	0.32	0.04	< 0.013	< 0.0028	< 0.0025	< 0.0035	< 0.0035	< 0.0026	< 0.0027
PCB-1260	mg/kg	8082	0.24	0.33	0.11	4.3 J+	< 0.0028	0.0033 J	< 0.0035	0.63	< 0.0026	0.027
Inorganics												
Aluminum	mg/kg	6020	7700	77000	60000	NA	6400 J	5000 J	9300 K	13000 K	27000 K	11000 K
Antimony	mg/kg	6020	3.1	31	5.4	NA	0.17 J	< 0.027 UJ	3.5	3.4	0.13 J	0.28 J
Arsenic	mg/kg	6020	0.68	0.43	5.8	NA	2.1 K	1 K	17 L	15 L	1.6 L	2.6 L
Barium	mg/kg	6020	1500	15000	1640	NA	74 J	47 J	120	130	240	68
Beryllium	mg/kg	6020	16	160	64	NA	0.61 J	0.4 J	1.2 J	2.1	5.4	0.87 J
Cadmium	mg/kg	6020	7.1	37	7.6	NA	0.13 J	0.6 J	7.4	8	0.98 J	2.1
Calcium	mg/kg	6020	- -	- -	- -	NA	3500 J	190000 J	48000	63000	160000	160000
Chromium [(1)]	mg/kg	6020	12000	120000	3600000	NA	11 J	480 J	240	210	36	760
Cobalt	mg/kg	6020	2.3	23	0.54	NA	55 J	50 J	8.7	11	1.2	2.2
Copper	mg/kg	6020	310	3100	920	NA	16 J	16 J	160	180	13	20
Iron	mg/kg	6020	5500	55000	700	NA	24000 J	170000 J	180000	230000	22000	160000
Lead	mg/kg	6020	400	400	280	NA	12 J	7 J	830	680	64	17
Magnesium	mg/kg	6020	- -	- -	- -	NA	1800 J	22000 J	9600	14000	46000	41000
Manganese [(1)]	mg/kg	6020	180	3500	56	NA	520 J	28000 J	5200	5000	2200	21000
Mercury	mg/kg	7471	1.1	3.1	2	NA	0.07 J	0.029 B	0.58 L	0.81 L	0.023 L	0.03 L
Nickel	mg/kg	6020	150	1500	52	NA	14 K	3.4 K	59 K	64 K	6 K	11 K
Potassium	mg/kg	6020	- -	- -	- -	NA	710 J	120 J	580	660	1100	260
Selenium	mg/kg	6020	39	390	5.2	NA	0.36 J	< 0.53 UJ	< 0.74	< 0.75	< 0.54	< 0.58
Silver	mg/kg	6020	39	390	1.6	NA	0.0095 B	< 0.041 UJ	0.85 J	0.94 J	0.09 J	0.3 J
Sodium	mg/kg	6020	- -	- -	- -	NA	53 J	150 J	240	270	740	210
Thallium	mg/kg	6020	0.078	0.78	2.8	NA	0.1 B	0.088 B	0.55 J	0.73 J	0.045 J	0.025 J
Vanadium	mg/kg	6020	39	5.5	172	NA	6.6 J	300 J	71 L	92 L	11 L	390 L
Zinc	mg/kg	6020	2300	23000	740	NA	44 L	62 L	1600	1800	97	89
Other Parameters												
Cyanide, Total	mg/kg	9012	2.3	23	40	NA	< 0.11	0.51 J	2.4	2.4	0.89	5.6
Percent Moisture	%	- -	- -	- -	- -	NA	16	5.2	32	33	9.9	13

TABLE A-1
ANALYTICAL AND SCREENING RESULTS
SURFACE SOIL
CAA VIM AND VIIM
MINGO JUNCTION STEEL WORKS LLC - WEIRTON FACILITY

Constituent	Units	Analytical Method	Screening Criteria [1]			Sample Information [2]						
			Residential Soil RSL	Residential Soil De Minimis	*Protection of Groundwater RSL*	VI-SS-09(0-0.3) 12/2/2013 Excavated [3]	VI-SS-09-S1 10/15/2018	VI-SS-09-S2 10/15/2018	VI-SS-09-S3 10/15/2018	VI-SS-09-S4 10/15/2018	VI-SS-09-S4 DUP 10/15/2018 Duplicate	VI-SS-09-S5 10/15/2018
Volatile Organic Compounds												
Benzene	mg/kg	8260	1.2	1.2	0.052	< 0.055	NA	NA	NA	NA	NA	NA
Toluene	mg/kg	8260	490	820	13.8	0.34	NA	NA	NA	NA	NA	NA
Ethylbenzene	mg/kg	8260	5.8	6.2	15.6	0.54	NA	NA	NA	NA	NA	NA
Xylenes, Total	mg/kg	8260	58	260	198	2.6	NA	NA	NA	NA	NA	NA
1,1,1-Trichloroethane	mg/kg	8260	810	640	5.6	< 0.057	NA	NA	NA	NA	NA	NA
1,1,2,2-Tetrachloroethane	mg/kg	8260	0.6	0.64	0.0006	< 0.052	NA	NA	NA	NA	NA	NA
1,1,2-Trichloro-1,2,2-trifluoroethane	mg/kg	8260	670	910	52	< 0.018	NA	NA	NA	NA	NA	NA
1,1,2-Trichloroethane	mg/kg	8260	0.15	1.2	0.032	< 0.064	NA	NA	NA	NA	NA	NA
1,1-Dichloroethane	mg/kg	8260	3.6	3.8	0.0156	< 0.056	NA	NA	NA	NA	NA	NA
1,1-Dichloroethene	mg/kg	8260	23	240	0.2	< 0.059	NA	NA	NA	NA	NA	NA
1,2,4-Trichlorobenzene	mg/kg	8260	5.8	24	4	< 0.021	NA	NA	NA	NA	NA	NA
1,2-Dibromo-3-Chloropropane	mg/kg	8260	0.0053	0.0057	0.00172	< 0.02	NA	NA	NA	NA	NA	NA
1,2-Dibromoethane (EDB)	mg/kg	8260	0.036	0.039	0.00028	< 0.034	NA	NA	NA	NA	NA	NA
1,2-Dichlorobenzene	mg/kg	8260	180	380	11.6	< 0.038	NA	NA	NA	NA	NA	NA
1,2-Dichloroethane	mg/kg	8260	0.46	0.5	0.028	< 0.053	NA	NA	NA	NA	NA	NA
1,2-Dichloroethene, Total	mg/kg	8260	- -	- -	- -	< 0.053	NA	NA	NA	NA	NA	NA
cis-1,2-Dichloroethene	mg/kg	8260	16	17	0.42	< 0.037	NA	NA	NA	NA	NA	NA
trans-1,2-Dichloroethene	mg/kg	8260	7	130	0.62	< 0.042	NA	NA	NA	NA	NA	NA
1,2-Dichloropropane	mg/kg	8260	1.6	1.1	0.034	< 0.071	NA	NA	NA	NA	NA	NA
cis-1,3-Dichloropropene [1]	mg/kg	8260	1.8	1.9	0.0034	< 0.04	NA	NA	NA	NA	NA	NA
trans-1,3-Dichloropropene [1]	mg/kg	8260	1.8	1.9	0.0034	< 0.032	NA	NA	NA	NA	NA	NA
1,3-Dichlorobenzene [1]	mg/kg	8260	2.6	2.8	1.44	< 0.028	NA	NA	NA	NA	NA	NA
1,4-Dichlorobenzene	mg/kg	8260	2.6	2.8	1.44	< 0.029	NA	NA	NA	NA	NA	NA
2-Butanone (MEK)	mg/kg	8260	2700	28000	2.4	< 0.06	NA	NA	NA	NA	NA	NA
2-Hexanone	mg/kg	8260	20	- -	0.0176	< 0.032	NA	NA	NA	NA	NA	NA
4-Methyl-2-pentanone (MIBK)	mg/kg	8260	3300	3400	2.8	< 0.033	NA	NA	NA	NA	NA	NA
Acetone	mg/kg	8260	6100	61000	5.8	< 0.28	NA	NA	NA	NA	NA	NA
Bromoform	mg/kg	8260	19	20	0.42	< 0.059	NA	NA	NA	NA	NA	NA
Bromomethane	mg/kg	8260	0.68	7.3	0.0038	< 0.087	NA	NA	NA	NA	NA	NA
Carbon disulfide	mg/kg	8260	77	740	0.48	< 0.06	NA	NA	NA	NA	NA	NA
Carbon tetrachloride	mg/kg	8260	0.65	0.7	0.038	< 0.06	NA	NA	NA	NA	NA	NA
Chlorobenzene	mg/kg	8260	28	290	1.36	< 0.029	NA	NA	NA	NA	NA	NA
Chlorodibromomethane	mg/kg	8260	8.3	8.3	0.42	< 0.036	NA	NA	NA	NA	NA	NA
Chloroethane	mg/kg	8260	1400	2100	11.8	< 0.041	NA	NA	NA	NA	NA	NA
Chloroform	mg/kg	8260	0.32	0.34	0.44	< 0.056	NA	NA	NA	NA	NA	NA
Chloromethane	mg/kg	8260	11	120	0.098	< 0.077	NA	NA	NA	NA	NA	NA
Cyclohexane	mg/kg	8260	650	120	26	< 0.033	NA	NA	NA	NA	NA	NA
Dichlorobromomethane	mg/kg	8260	0.29	0.31	0.44	< 0.052	NA	NA	NA	NA	NA	NA
Dichlorodifluoromethane	mg/kg	8260	8.7	94	0.6	< 0.035	NA	NA	NA	NA	NA	NA
Isopropylbenzene	mg/kg	8260	190	270	1.48	0.18 J	NA	NA	NA	NA	NA	NA
Methyl acetate	mg/kg	8260	7800	23000	8.2	< 0.068	NA	NA	NA	NA	NA	NA
Methyl tert-butyl ether	mg/kg	8260	47	50	0.064	< 0.057	NA	NA	NA	NA	NA	NA
Methylcyclohexane [1]	mg/kg	8260	650	120	26	0.046 J	NA	NA	NA	NA	NA	NA
Methylene Chloride	mg/kg	8260	35	58	0.054	< 0.06	NA	NA	NA	NA	NA	NA
Styrene	mg/kg	8260	600	870	2.6	< 0.035	NA	NA	NA	NA	NA	NA
Tetrachloroethene	mg/kg	8260	8.1	25	0.046	< 0.046	NA	NA	NA	NA	NA	NA
Trichloroethene	mg/kg	8260	0.41	0.5	0.036	< 0.044	NA	NA	NA	NA	NA	NA
Trichlorofluoromethane	mg/kg	8260	2300	790	6.6	< 0.062	NA	NA	NA	NA	NA	NA
Vinyl chloride	mg/kg	8260	0.059	0.057	0.0138	< 0.072	NA	NA	NA	NA	NA	NA

TABLE A-1
ANALYTICAL AND SCREENING RESULTS
SURFACE SOIL
CAA VIM AND VIIM
MINGO JUNCTION STEEL WORKS LLC - WEIRTON FACILITY

Constituent	Units	Analytical Method	Screening Criteria [1]			Sample Information [2]						
			Residential Soil RSL	Residential Soil De Minimis	*Protection of Groundwater RSL*	VI-SS-09(0-0.3) 12/2/2013 Excavated [3]	VI-SS-09-S1 10/15/2018	VI-SS-09-S2 10/15/2018	VI-SS-09-S3 10/15/2018	VI-SS-09-S4 10/15/2018	VI-SS-09-S4 DUP 10/15/2018 Duplicate	VI-SS-09-S5 10/15/2018
Semi-Volatile Organic Compounds												
Acenaphthene	mg/kg	8270	360	4100	11	***3300***	0.18	0.18	0.074	0.17	0.46	0.24
Acenaphthylene [1]	mg/kg	8270	360	4200	11	***150***	0.35	0.11	0.2	0.21	0.13	0.89
Anthracene	mg/kg	8270	1800	23000	116	***7100***	0.87	0.41	0.48	1.3	0.66	1.3
Benzo[a]anthracene	mg/kg	8270	1.1	0.21	0.22	***1300***	***2.4***	***0.82***	***0.89***	***1.5***	***0.97***	***5.2***
Benzo[a]pyrene	mg/kg	8270	0.11	0.016	4.8	***730***	2.8	0.73	0.99	1.5	0.75	***6.4***
Benzo[b]fluoranthene	mg/kg	8270	1.1	0.16	6	***880***	3.7	1.1	1.3	2	0.87	***7.5***
Benzo[g,h,i]perylene [1]	mg/kg	8270	180	1800	26	***420***	3	0.88	1.2	1.5	0.75	5.6
Benzo[k]fluoranthene	mg/kg	8270	11	1.6	58	***370***	1.3	0.51	0.64	0.55	0.47	3
Chrysene	mg/kg	8270	110	16	180	***1300***	2.9	0.86	1.1	1.6	0.96	5.5
Dibenz(a,h)anthracene	mg/kg	8270	0.11	0.016	1.92	***110***	0.7	0.19	0.24	0.3	0.14	1.1 J
Fluoranthene	mg/kg	8270	240	2400	178	***5400***	4.9	2	1.9	4	3.9	13
Fluorene	mg/kg	8270	240	2900	10.8	***4500***	0.21	0.13	0.073	0.21	0.47	0.19
Indeno[1,2,3-cd]pyrene	mg/kg	8270	1.1	0.16	19.6	***380***	2.3	0.69	0.88	1.1	0.57	4.3
Naphthalene	mg/kg	8270	2	4.1	0.0076	***1100***	***0.11*** J	***0.029*** J	***0.057***	***0.069*** J	***0.032*** J	***0.077***
Phenanthrene [1]	mg/kg	8270	1800	23000	116	***12000***	1.9	1.1	0.82	2.5	3.8	2.7 J
Pyrene	mg/kg	8270	180	2300	26	***3200***	4.2	1.4	1.4	3	2.5	10
1,1'-Biphenyl	mg/kg	8270	4.7	51	0.0174	***610***	< 0.032	0.013 J	0.014 J	< 0.032	***0.018*** J	***0.02*** J
2,4,5-Trichlorophenol	mg/kg	8270	630	6300	8	< 4	< 0.054	< 0.013	< 0.014	< 0.055	< 0.027	< 0.027
2,4,6-Trichlorophenol	mg/kg	8270	6.3	49	0.024	< 5.5	< 0.041	< 0.01	< 0.01	< 0.042	< 0.021	< 0.021
2,4-Dichlorophenol	mg/kg	8270	19	190	0.046	< 0.74	< 0.058	< 0.014	< 0.015	< 0.059	< 0.029	< 0.029
2,4-Dimethylphenol	mg/kg	8270	130	1300	0.84	***22*** J	< 0.047	< 0.012	< 0.012	< 0.048	< 0.023	< 0.023
2,4-Dinitrophenol	mg/kg	8270	13	130	0.088	< 44	< 2	< 0.5	< 0.51	< 2.1	< 1	< 1 UR
2,4-Dinitrotoluene	mg/kg	8270	1.7	1.7	0.0064	< 3	< 0.038	< 0.0092	< 0.0095	< 0.038	< 0.019	< 0.019
2,6-Dinitrotoluene	mg/kg	8270	0.36	0.36	0.00134	< 3.8	< 0.047	< 0.011	< 0.012	< 0.047	< 0.023	< 0.023
2-Chloronaphthalene	mg/kg	8270	480	5000	7.8	< 0.77	< 0.035	< 0.0085	< 0.0087	< 0.035	< 0.017	< 0.017
2-Chlorophenol	mg/kg	8270	39	340	0.178	< 3	< 0.035	< 0.0086	< 0.0088	< 0.036	< 0.018	< 0.017
2-Methylnaphthalene	mg/kg	8270	24	310	0.38	***1600***	0.13 J	0.036 J	0.065	0.098 J	0.06 J	0.096
2-Methylphenol	mg/kg	8270	320	3200	1.5	***17*** J	< 0.22	< 0.053	< 0.055	< 0.22	< 0.11	< 0.11
2-Nitroaniline	mg/kg	8270	63	630	0.16	< 17	< 0.34	< 0.084	< 0.087	< 0.35	< 0.17	< 0.17
2-Nitrophenol	mg/kg	8270	- -	- -	- -	< 4.1	< 0.043	< 0.011	< 0.011	< 0.044	< 0.022	< 0.021
3,3'-Dichlorobenzidine	mg/kg	8270	1.2	1.2	0.0164	< 3.9	< 0.7	< 0.17	< 0.18	< 0.71	< 0.35	< 0.35 UR
Methylphenol, 3 & 4 [1]	mg/kg	8270	320	3200	1.48	***29*** J	< 0.22	< 0.054	< 0.056	< 0.22	< 0.11	< 0.11
3-Nitroaniline	mg/kg	8270	- -	- -	- -	< 15	< 0.19	< 0.047	< 0.048	< 0.19	< 0.096	< 0.095
4,6-Dinitro-2-methylphenol	mg/kg	8270	0.51	- -	0.0052	< 15	< 1.3	< 0.32	< 0.33	< 1.3	< 0.65	< 0.65
4-Bromophenyl phenyl ether	mg/kg	8270	- -	- -	- -	< 3.2	< 0.053	< 0.013	< 0.013	< 0.053	< 0.026	< 0.026
4-Chloro-3-methylphenol	mg/kg	8270	630	- -	3.4	< 3.4	< 0.036	< 0.0087	< 0.009	< 0.036	< 0.018	< 0.018
4-Chloroaniline	mg/kg	8270	2.7	2.7	0.0032	< 3	< 0.025	< 0.0062	< 0.0063	< 0.025	< 0.013	< 0.012 UJ
4-Chlorophenyl phenyl ether	mg/kg	8270	- -	- -	- -	< 4.1	< 0.046	< 0.011	< 0.012	< 0.046	< 0.023	< 0.023
4-Nitroaniline	mg/kg	8270	25	- -	0.032	< 15	< 0.037	< 0.009	< 0.0092	< 0.037	< 0.018	< 0.018
4-Nitrophenol	mg/kg	8270	- -	- -	- -	< 13	< 0.53	< 0.13	< 0.13	< 0.54	< 0.26	< 0.26
Acetophenone	mg/kg	8270	780	2500	1.16	< 3	< 0.041	< 0.01	< 0.01	< 0.042	< 0.02	< 0.02
Atrazine	mg/kg	8270	2.4	2.4	0.038	< 3.6	< 0.33 UJ	< 0.081 UJ	< 0.083 UJ	< 0.34 UJ	< 0.17 UJ	< 0.16 UJ
Benzaldehyde	mg/kg	8270	170	1200	0.082	< 5.5	< 0.094 UR	< 0.023 UR	< 0.024 UR	< 0.095 UR	< 0.047 UR	< 0.047 UR
Bis(2-chloroisopropyl)ether	mg/kg	8270	310	5.1	0.52	< 0.8	< 0.056 UJ	< 0.014 UJ	< 0.014 UJ	< 0.057 UJ	< 0.028 UJ	< 0.028
Bis(2-chloroethoxy)methane	mg/kg	8270	19	- -	0.026	< 2.4	< 0.036	< 0.0088	< 0.0091	< 0.037	< 0.018	< 0.018
Bis(2-chloroethyl)ether	mg/kg	8270	0.23	0.24	0.000072	< 0.99	< 0.027	< 0.0067	< 0.0069	< 0.028	< 0.014	< 0.014
Bis(2-ethylhexyl) phthalate	mg/kg	8270	39	39	28	< 6	2.1 J	< 0.2	< 0.2	< 0.82	< 0.4	< 0.4
Butyl benzyl phthalate	mg/kg	8270	290	290	4.8	< 5.1	< 0.52	< 0.13	< 0.13	< 0.53	< 0.26	< 0.26
Caprolactam	mg/kg	8270	3100	31000	5	< 28	< 0.49	< 0.12	< 0.12	< 0.5	< 0.25	< 0.24 UR
Carbazole [1]	mg/kg	8270	1800	23000	116	***2800***	0.31	0.14	0.15	0.21	0.12	0.47 J

TABLE A-1
ANALYTICAL AND SCREENING RESULTS
SURFACE SOIL
CAA VIM AND VIIM
MINGO JUNCTION STEEL WORKS LLC - WEIRTON FACILITY

			Screening Criteria [1]			Sample Information [2]						
Constituent	Units	Analytical Method	Residential Soil RSL	Residential Soil De Minimis	*Protection of Groundwater RSL*	VI-SS-09(0-0.3) 12/2/2013 Excavated [3]	VI-SS-09-S1 10/15/2018	VI-SS-09-S2 10/15/2018	VI-SS-09-S3 10/15/2018	VI-SS-09-S4 10/15/2018	VI-SS-09-S4 DUP 10/15/2018 Duplicate	VI-SS-09-S5 10/15/2018
Dibenzofuran	mg/kg	8270	7.8	78	0.3	***2900***	0.13 J	0.12 J	0.07 J	0.11 J	0.29 J	0.12 J
Diethyl phthalate	mg/kg	8270	5100	51000	12.2	***16*** B	< 0.23	< 0.056	< 0.057	< 0.23	< 0.11	< 0.11
Dimethyl phthalate	mg/kg	8270	- -	- -	- -	< 4	< 0.027	< 0.0067	< 0.0069	< 0.028	< 0.014	< 0.014
Di-n-butyl phthalate	mg/kg	8270	630	6300	4.6	< 4.6	< 0.33	< 0.081	< 0.083	< 0.34	< 0.17	< 0.16
Di-n-octyl phthalate	mg/kg	8270	63	- -	114	< 3.9	< 0.44	< 0.11	< 0.11	< 0.45	< 0.22	< 0.22
Hexachlorobenzene	mg/kg	8270	0.21	0.22	0.26	< 0.79	< 0.054	< 0.013	< 0.014	< 0.055	< 0.027	< 0.027
Hexachlorobutadiene	mg/kg	8270	1.2	1.3	0.0054	< 0.83	< 0.044	< 0.011	< 0.011	< 0.045	< 0.022	< 0.022
Hexachlorocyclopentadiene	mg/kg	8270	0.18	1.9	3.2	< 4	< 0.039	< 0.0094	< 0.0097	< 0.039	< 0.019	< 0.019
Hexachloroethane	mg/kg	8270	1.8	2	0.004	< 2.7	< 0.039	< 0.0096	< 0.0098	< 0.039	< 0.019	< 0.019
Isophorone	mg/kg	8270	570	570	0.52	< 2.8	< 0.039	< 0.0094	< 0.0097	< 0.039	< 0.019	< 0.019
Nitrobenzene	mg/kg	8270	5.1	5.5	0.00184	< 3.1	< 0.28	< 0.068	< 0.07	< 0.28	< 0.14	< 0.14
N-Nitrosodi-n-propylamine	mg/kg	8270	0.078	0.078	0.000162	< 0.87	< 0.051	< 0.013	< 0.013	< 0.052	< 0.026	< 0.025
N-Nitrosodiphenylamine	mg/kg	8270	110	110	1.34	< 3.4	< 0.25	< 0.062	< 0.063	< 0.25	< 0.13	< 0.12
Pentachlorophenol	mg/kg	8270	1	1	0.028	< 3.3	< 1.2	< 0.3	< 0.31	< 1.2	< 0.61	< 0.6
Phenol	mg/kg	8270	1900	19000	6.6	***15***	< 0.23	< 0.056	< 0.058	< 0.23	< 0.11	< 0.11
Polychlorinated Biphenyls												
PCB-1016	mg/kg	8082	0.41	5.5	0.26	< 0.0027	NA	NA	NA	NA	NA	NA
PCB-1221	mg/kg	8082	0.2	0.26	0.0016	< 0.0035	NA	NA	NA	NA	NA	NA
PCB-1232	mg/kg	8082	0.17	0.22	0.0016	< 0.0031	NA	NA	NA	NA	NA	NA
PCB-1242	mg/kg	8082	0.23	0.31	0.024	< 0.003	NA	NA	NA	NA	NA	NA
PCB-1248	mg/kg	8082	0.23	0.31	0.024	< 0.0017	NA	NA	NA	NA	NA	NA
PCB-1254	mg/kg	8082	0.12	0.32	0.04	< 0.0026	NA	NA	NA	NA	NA	NA
PCB-1260	mg/kg	8082	0.24	0.33	0.11	< 0.0026	NA	NA	NA	NA	NA	NA
Inorganics												
Aluminum	mg/kg	6020	7700	77000	60000	1200 K	NA	NA	NA	NA	NA	NA
Antimony	mg/kg	6020	3.1	31	5.4	0.76 J	NA	NA	NA	NA	NA	NA
Arsenic	mg/kg	6020	0.68	0.43	5.8	***6.9*** L	NA	NA	NA	NA	NA	NA
Barium	mg/kg	6020	1500	15000	1640	19	NA	NA	NA	NA	NA	NA
Beryllium	mg/kg	6020	16	160	64	0.15 J	NA	NA	NA	NA	NA	NA
Cadmium	mg/kg	6020	7.1	37	7.6	1.4	NA	NA	NA	NA	NA	NA
Calcium	mg/kg	6020	- -	- -	- -	15000	NA	NA	NA	NA	NA	NA
Chromium [1]	mg/kg	6020	12000	120000	3600000	44	NA	NA	NA	NA	NA	NA
Cobalt	mg/kg	6020	2.3	23	0.54	***4.5***	NA	NA	NA	NA	NA	NA
Copper	mg/kg	6020	310	3100	920	40	NA	NA	NA	NA	NA	NA
Iron	mg/kg	6020	5500	55000	700	***49000***	NA	NA	NA	NA	NA	NA
Lead	mg/kg	6020	400	400	280	72	NA	NA	NA	NA	NA	NA
Magnesium	mg/kg	6020	- -	- -	- -	1900	NA	NA	NA	NA	NA	NA
Manganese [1]	mg/kg	6020	180	3500	56	***710***	NA	NA	NA	NA	NA	NA
Mercury	mg/kg	7471	1.1	3.1	2	***2.8*** L	NA	NA	NA	NA	NA	NA
Nickel	mg/kg	6020	150	1500	52	22 K	NA	NA	NA	NA	NA	NA
Potassium	mg/kg	6020	- -	- -	- -	220	NA	NA	NA	NA	NA	NA
Selenium	mg/kg	6020	39	390	5.2	< 0.54	NA	NA	NA	NA	NA	NA
Silver	mg/kg	6020	39	390	1.6	< 0.042	NA	NA	NA	NA	NA	NA
Sodium	mg/kg	6020	- -	- -	- -	200	NA	NA	NA	NA	NA	NA
Thallium	mg/kg	6020	0.078	0.78	2.8	0.76 J	NA	NA	NA	NA	NA	NA
Vanadium	mg/kg	6020	39	5.5	172	7.4 L	NA	NA	NA	NA	NA	NA
Zinc	mg/kg	6020	2300	23000	740	180	NA	NA	NA	NA	NA	NA
Other Parameters												
Cyanide, Total	mg/kg	9012	2.3	23	40	2	NA	NA	NA	NA	NA	NA
Percent Moisture	%	- -	- -	- -	- -	9.9	NA	NA	NA	NA	NA	NA

TABLE A-1
ANALYTICAL AND SCREENING RESULTS
SURFACE SOIL
CAA VIM AND VIIM
MINGO JUNCTION STEEL WORKS LLC - WEIRTON FACILITY

Constituent	Units	Analytical Method	Screening Criteria [1]			Sample Information [2]						
			Residential Soil RSL	Residential Soil De Minimis	*Protection of Groundwater RSL*	VI-SS-10 10/07/2013	VI-SS-11 10/07/2013	VI-SS-12 10/07/2013	VII-SB-119 (1-2') 12/08/2017	VII-SS-01(0-0.6) 12/2/2013	VII-SS-02(0-0.5) 12/2/2013	VII-SS-03(0-0.5) 12/2/2013
Volatile Organic Compounds												
Benzene	mg/kg	8260	1.2	1.2	0.052	< 0.00078	< 0.00077	< 0.00077	< 0.012	< 0.00078	< 0.057	< 0.00076
Toluene	mg/kg	8260	490	820	13.8	< 0.00085	0.0033 J	< 0.00084	< 0.01	< 0.00084	0.2 J	< 0.00082
Ethylbenzene	mg/kg	8260	5.8	6.2	15.6	< 0.00075	0.0035 J	< 0.00074	< 0.013	< 0.00074	0.23 J	< 0.00072
Xylenes, Total	mg/kg	8260	58	260	198	< 0.0026	0.034	< 0.0026	< 0.026	< 0.0026	1.7	0.0038 J
1,1,1-Trichloroethane	mg/kg	8260	810	640	5.6	NA	NA	NA	< 0.015	< 0.00056	< 0.059	< 0.00055
1,1,2,2-Tetrachloroethane	mg/kg	8260	0.6	0.64	0.0006	NA	NA	NA	< 0.018	< 0.00083	< 0.054	< 0.00081
1,1,2-Trichloro-1,2,2-trifluoroethane	mg/kg	8260	670	910	52	NA	NA	NA	< 0.012	< 0.0012	< 0.019	< 0.0012
1,1,2-Trichloroethane	mg/kg	8260	0.15	1.2	0.032	NA	NA	NA	< 0.015	< 0.00096	< 0.067	< 0.00094
1,1-Dichloroethane	mg/kg	8260	3.6	3.8	0.0156	NA	NA	NA	< 0.011	< 0.00066	< 0.058	< 0.00065
1,1-Dichloroethene	mg/kg	8260	23	240	0.2	NA	NA	NA	< 0.017	< 0.00098	< 0.061	< 0.00096
1,2,4-Trichlorobenzene	mg/kg	8260	5.8	24	4	NA	NA	NA	< 0.0097	< 0.001	< 0.022	< 0.00099
1,2-Dibromo-3-Chloropropane	mg/kg	8260	0.0053	0.0057	0.00172	NA	NA	NA	< 0.019	< 0.00086	< 0.02	< 0.00084
1,2-Dibromoethane (EDB)	mg/kg	8260	0.036	0.039	0.00028	NA	NA	NA	< 0.016	< 0.001	< 0.035	< 0.00097
1,2-Dichlorobenzene	mg/kg	8260	180	380	11.6	NA	NA	NA	< 0.024	< 0.00092	< 0.039	< 0.0009
1,2-Dichloroethane	mg/kg	8260	0.46	0.5	0.028	NA	NA	NA	< 0.0088	< 0.00071	< 0.055	< 0.00069
1,2-Dichloroethene, Total	mg/kg	8260	- -	- -	- -	NA	NA	NA	NA	< 0.0015	< 0.055	< 0.0014
cis-1,2-Dichloroethene	mg/kg	8260	16	17	0.42	NA	NA	NA	< 0.0095	< 0.00081	< 0.038	< 0.00079
trans-1,2-Dichloroethene	mg/kg	8260	7	130	0.62	NA	NA	NA	< 0.015	< 0.00069	< 0.043	< 0.00067
1,2-Dichloropropane	mg/kg	8260	1.6	1.1	0.034	NA	NA	NA	< 0.015	< 0.00063	< 0.073	< 0.00061
cis-1,3-Dichloropropene [1]	mg/kg	8260	1.8	1.9	0.0034	NA	NA	NA	< 0.0096	< 0.00078	< 0.042	< 0.00076
trans-1,3-Dichloropropene [1]	mg/kg	8260	1.8	1.9	0.0034	NA	NA	NA	< 0.01	< 0.00069	< 0.034	< 0.00067
1,3-Dichlorobenzene [1]	mg/kg	8260	2.6	2.8	1.44	NA	NA	NA	< 0.0096	< 0.00076	< 0.029	< 0.00074
1,4-Dichlorobenzene	mg/kg	8260	2.6	2.8	1.44	NA	NA	NA	< 0.0062	< 0.00073	< 0.03	< 0.00072
2-Butanone (MEK)	mg/kg	8260	2700	28000	2.4	NA	NA	NA	< 0.017	< 0.001	< 0.062	< 0.00099
2-Hexanone	mg/kg	8260	20	- -	0.0176	NA	NA	NA	< 0.025	< 0.0008	< 0.033	< 0.00078
4-Methyl-2-pentanone (MIBK)	mg/kg	8260	3300	3400	2.8	NA	NA	NA	< 0.011	< 0.00075	< 0.034	< 0.00074
Acetone	mg/kg	8260	6100	61000	5.8	NA	NA	NA	< 0.019	< 0.0058	< 0.29	< 0.0056
Bromoform	mg/kg	8260	19	20	0.42	NA	NA	NA	< 0.016	< 0.00051	< 0.061	< 0.0005
Bromomethane	mg/kg	8260	0.68	7.3	0.0038	NA	NA	NA	< 0.027	< 0.00085 R	< 0.091 R	< 0.00083 R
Carbon disulfide	mg/kg	8260	77	740	0.48	NA	NA	NA	< 0.018	< 0.00059	< 0.062	< 0.00058
Carbon tetrachloride	mg/kg	8260	0.65	0.7	0.038	NA	NA	NA	< 0.02	< 0.00052	< 0.062	< 0.0005
Chlorobenzene	mg/kg	8260	28	290	1.36	NA	NA	NA	< 0.0095	< 0.00087	< 0.03	< 0.00085
Chlorodibromomethane	mg/kg	8260	8.3	8.3	0.42	NA	NA	NA	< 0.015	< 0.00082	< 0.037	< 0.0008
Chloroethane	mg/kg	8260	1400	2100	11.8	NA	NA	NA	< 0.016	< 0.0018	< 0.043	< 0.0017
Chloroform	mg/kg	8260	0.32	0.34	0.44	NA	NA	NA	< 0.013	0.00091 B	< 0.058	< 0.00066
Chloromethane	mg/kg	8260	11	120	0.098	NA	NA	NA	< 0.023	< 0.00098	< 0.08	< 0.00096
Cyclohexane	mg/kg	8260	650	120	26	NA	NA	NA	< 0.0074	< 0.00043	< 0.034	< 0.00042
Dichlorobromomethane	mg/kg	8260	0.29	0.31	0.44	NA	NA	NA	< 0.014	< 0.00065	< 0.054	< 0.00063
Dichlorodifluoromethane	mg/kg	8260	8.7	94	0.6	NA	NA	NA	< 0.018	< 0.00077	< 0.037	< 0.00075
Isopropylbenzene	mg/kg	8260	190	270	1.48	NA	NA	NA	< 0.014	< 0.00078	< 0.031	< 0.00077
Methyl acetate	mg/kg	8260	7800	23000	8.2	NA	NA	NA	< 0.036	< 0.001	< 0.071	< 0.001
Methyl tert-butyl ether	mg/kg	8260	47	50	0.064	NA	NA	NA	< 0.022	< 0.00086	< 0.059	< 0.00084
Methylcyclohexane [1]	mg/kg	8260	650	120	26	NA	NA	NA	< 0.013	< 0.00084	0.06 J	< 0.00082
Methylene Chloride	mg/kg	8260	35	58	0.054	NA	NA	NA	< 0.014	0.0043 B	< 0.063	0.0033 B
Styrene	mg/kg	8260	600	870	2.6	NA	NA	NA	< 0.008	< 0.00081	< 0.037	< 0.0008
Tetrachloroethene	mg/kg	8260	8.1	25	0.046	NA	NA	NA	< 0.012	< 0.00079	< 0.047	< 0.00077
Trichloroethene	mg/kg	8260	0.41	0.5	0.036	NA	NA	NA	< 0.0091	< 0.00076	< 0.046	< 0.00074
Trichlorofluoromethane	mg/kg	8260	2300	790	6.6	NA	NA	NA	< 0.0088	< 0.0011	< 0.064	< 0.001
Vinyl chloride	mg/kg	8260	0.059	0.057	0.0138	NA	NA	NA	< 0.022	< 0.00054	< 0.074	< 0.00053

TABLE A-1
ANALYTICAL AND SCREENING RESULTS
SURFACE SOIL
CAA VIM AND VIIM
MINGO JUNCTION STEEL WORKS LLC - WEIRTON FACILITY

			Screening Criteria [1]			Sample Information [2]						
						VI-SS-10	VI-SS-11	VI-SS-12	VII-SB-119 (1-2')	VII-SS-01(0-0.6)	VII-SS-02(0-0.5)	VII-SS-03(0-0.5)
						10/07/2013	10/07/2013	10/07/2013	12/08/2017	12/2/2013	12/2/2013	12/2/2013
Constituent	**Units**	**Analytical Method**	**Residential Soil RSL**	**Residential Soil De Minimis**	***Protection of Groundwater RSL***							
Semi-Volatile Organic Compounds												
Acenaphthene	mg/kg	8270	360	4100	11	0.0083 J	< 0.015 UJ	< 0.018 UJ	NA	< 0.073	2.6	< 0.29
Acenaphthylene [1]	mg/kg	8270	360	4200	11	0.021 J	< 0.017 UJ	< 0.022 UJ	NA	0.27 J	< 0.22	< 0.34
Anthracene	mg/kg	8270	1800	23000	116	0.033 J	0.2 J	0.2 J	NA	< 0.075	2.4	< 0.29
Benzo[a]anthracene	mg/kg	8270	1.1	0.21	0.22	0.099 J	***0.47*** J	***0.58*** J	NA	***2.3***	***19***	***16***
Benzo[a]pyrene	mg/kg	8270	0.11	0.016	4.8	0.13 J	0.59 J	0.62 J	NA	3.5	***14***	***15***
Benzo[b]fluoranthene	mg/kg	8270	1.1	0.16	6	0.16 J	1.1 J	0.78 J	NA	1.7	***8.1***	***8.1***
Benzo[g,h,i]perylene [1]	mg/kg	8270	180	1800	26	0.24 J	0.64 J	0.65 J	NA	2	6.5	7.5
Benzo[k]fluoranthene	mg/kg	8270	11	1.6	58	0.12 J	0.26 J	0.31 J	NA	< 0.15	< 0.39	1 J
Chrysene	mg/kg	8270	110	16	180	0.13 J	0.92 J	0.85 J	NA	5.7	37	38
Dibenz(a,h)anthracene	mg/kg	8270	0.11	0.016	1.92	0.036 J	0.13 J	0.16 J	NA	0.73 J	***3.1***	***3.6***
Fluoranthene	mg/kg	8270	240	2400	178	0.17 J	1.4 J	1.6 J	NA	0.46 J	4.8	2 J
Fluorene	mg/kg	8270	240	2900	10.8	0.0079 J	0.7 J	0.39 J	NA	0.24 J	3	< 0.39
Indeno[1,2,3-cd]pyrene	mg/kg	8270	1.1	0.16	19.6	0.15 J	0.54 J	0.54 J	NA	0.55 J	2.1	2.9 J
Naphthalene	mg/kg	8270	2	4.1	0.0076	***0.031*** J	< 0.013 UJ	< 0.016 UJ	NA	< 0.066	***3.2***	< 0.26
Phenanthrene [1]	mg/kg	8270	1800	23000	116	0.073 J	1 J	1.2 J	NA	0.29 J	19	1.9 J
Pyrene	mg/kg	8270	180	2300	26	0.14 J	1.4 J	1.4 J	NA	5.7	***33***	26
1,1'-Biphenyl	mg/kg	8270	4.7	51	0.0174	NA	NA	NA	NA	< 0.34	< 0.86	< 1.3
2,4,5-Trichlorophenol	mg/kg	8270	630	6300	8	NA	NA	NA	NA	< 0.41	< 1	< 1.6
2,4,6-Trichlorophenol	mg/kg	8270	6.3	49	0.024	NA	NA	NA	NA	< 0.57	< 1.4	< 2.2
2,4-Dichlorophenol	mg/kg	8270	19	190	0.046	NA	NA	NA	NA	< 0.077	< 0.19	< 0.3
2,4-Dimethylphenol	mg/kg	8270	130	1300	0.84	NA	NA	NA	NA	< 0.6	< 1.5	< 2.3
2,4-Dinitrophenol	mg/kg	8270	13	130	0.088	NA	NA	NA	NA	< 4.6	< 11	< 18
2,4-Dinitrotoluene	mg/kg	8270	1.7	1.7	0.0064	NA	NA	NA	NA	< 0.31	< 0.78	< 1.2
2,6-Dinitrotoluene	mg/kg	8270	0.36	0.36	0.00134	NA	NA	NA	NA	< 0.39	< 0.99	< 1.5
2-Chloronaphthalene	mg/kg	8270	480	5000	7.8	NA	NA	NA	NA	< 0.08	< 0.2	< 0.31
2-Chlorophenol	mg/kg	8270	39	340	0.178	NA	NA	NA	NA	< 0.31	< 0.79	< 1.2
2-Methylnaphthalene	mg/kg	8270	24	310	0.38	NA	NA	NA	NA	< 0.069	***21***	0.3 J
2-Methylphenol	mg/kg	8270	320	3200	1.5	NA	NA	NA	NA	< 0.27	< 0.67	< 1
2-Nitroaniline	mg/kg	8270	63	630	0.16	NA	NA	NA	NA	< 1.7	< 4.3	< 6.7
2-Nitrophenol	mg/kg	8270	- -	- -	- -	NA	NA	NA	NA	< 0.42	< 1.1	< 1.6
3,3'-Dichlorobenzidine	mg/kg	8270	1.2	1.2	0.0164	NA	NA	NA	NA	< 0.4	< 1	< 1.6
Methylphenol, 3 & 4 [1]	mg/kg	8270	320	3200	1.48	NA	NA	NA	NA	< 0.37	< 0.94	< 1.5
3-Nitroaniline	mg/kg	8270	- -	- -	- -	NA	NA	NA	NA	< 1.6	< 4	< 6.2
4,6-Dinitro-2-methylphenol	mg/kg	8270	0.51	- -	0.0052	NA	NA	NA	NA	< 1.5	< 3.9	< 6
4-Bromophenyl phenyl ether	mg/kg	8270	- -	- -	- -	NA	NA	NA	NA	< 0.33	< 0.84	< 1.3
4-Chloro-3-methylphenol	mg/kg	8270	630	- -	3.4	NA	NA	NA	NA	< 0.35	< 0.88	< 1.4
4-Chloroaniline	mg/kg	8270	2.7	2.7	0.0032	NA	NA	NA	NA	< 0.31	< 0.77	< 1.2
4-Chlorophenyl phenyl ether	mg/kg	8270	- -	- -	- -	NA	NA	NA	NA	< 0.43	< 1.1	< 1.7
4-Nitroaniline	mg/kg	8270	25	- -	0.032	NA	NA	NA	NA	< 1.5	< 3.9	< 6.1
4-Nitrophenol	mg/kg	8270	- -	- -	- -	NA	NA	NA	NA	< 1.4	< 3.5	< 5.5
Acetophenone	mg/kg	8270	780	2500	1.16	NA	NA	NA	NA	< 0.31	< 0.79	< 1.2
Atrazine	mg/kg	8270	2.4	2.4	0.038	NA	NA	NA	NA	< 0.37	< 0.93	< 1.5
Benzaldehyde	mg/kg	8270	170	1200	0.082	NA	NA	NA	NA	< 0.57	< 1.4	< 2.2
Bis(2-chloroisopropyl)ether	mg/kg	8270	310	5.1	0.52	NA	NA	NA	NA	< 0.083	< 0.21	< 0.32
Bis(2-chloroethoxy)methane	mg/kg	8270	19	- -	0.026	NA	NA	NA	NA	< 0.25	< 0.63	< 0.98
Bis(2-chloroethyl)ether	mg/kg	8270	0.23	0.24	0.000072	NA	NA	NA	NA	< 0.1	< 0.26	< 0.4
Bis(2-ethylhexyl) phthalate	mg/kg	8270	39	39	28	NA	NA	NA	NA	< 0.62	< 1.6	< 2.4
Butyl benzyl phthalate	mg/kg	8270	290	290	4.8	NA	NA	NA	NA	< 0.52	< 1.3	< 2
Caprolactam	mg/kg	8270	3100	31000	5	NA	NA	NA	NA	< 2.9	< 7.2	< 11
Carbazole [1]	mg/kg	8270	1800	23000	116	NA	NA	NA	NA	< 0.07	< 0.18	< 0.28

TABLE A-1
ANALYTICAL AND SCREENING RESULTS
SURFACE SOIL
CAA VIM AND VIIM
MINGO JUNCTION STEEL WORKS LLC - WEIRTON FACILITY

Constituent	Units	Analytical Method	Screening Criteria [1] Residential Soil RSL	Residential Soil De Minimis	*Protection of Groundwater RSL*	Sample Information [2] VI-SS-10 10/07/2013	VI-SS-11 10/07/2013	VI-SS-12 10/07/2013	VII-SB-119 (1-2') 12/08/2017	VII-SS-01(0-0.6) 12/2/2013	VII-SS-02(0-0.5) 12/2/2013	VII-SS-03(0-0.5) 12/2/2013
Dibenzofuran	mg/kg	8270	7.8	78	0.3	NA	NA	NA	NA	< 0.38	< 0.94	< 1.5
Diethyl phthalate	mg/kg	8270	5100	51000	12.2	NA	NA	NA	NA	0.78 B	1.2 B	1.8 B
Dimethyl phthalate	mg/kg	8270	- -	- -	- -	NA	NA	NA	NA	< 0.42	< 1	< 1.6
Di-n-butyl phthalate	mg/kg	8270	630	6300	4.6	NA	NA	NA	NA	< 0.48	< 1.2	< 1.9
Di-n-octyl phthalate	mg/kg	8270	63	- -	114	NA	NA	NA	NA	< 0.4	< 1	< 1.6
Hexachlorobenzene	mg/kg	8270	0.21	0.22	0.26	NA	NA	NA	NA	< 0.081	< 0.2	< 0.32
Hexachlorobutadiene	mg/kg	8270	1.2	1.3	0.0054	NA	NA	NA	NA	< 0.086	< 0.21	< 0.33
Hexachlorocyclopentadiene	mg/kg	8270	0.18	1.9	3.2	NA	NA	NA	NA	< 0.41	< 1	< 1.6
Hexachloroethane	mg/kg	8270	1.8	2	0.004	NA	NA	NA	NA	< 0.27	< 0.69	< 1.1
Isophorone	mg/kg	8270	570	570	0.52	NA	NA	NA	NA	< 0.29	< 0.72	< 1.1
Nitrobenzene	mg/kg	8270	5.1	5.5	0.00184	NA	NA	NA	NA	< 0.32	< 0.8	< 1.2
N-Nitrosodi-n-propylamine	mg/kg	8270	0.078	0.078	0.000162	NA	NA	NA	NA	< 0.09	< 0.23	< 0.35
N-Nitrosodiphenylamine	mg/kg	8270	110	110	1.34	NA	NA	NA	NA	< 0.35	< 0.89	< 1.4
Pentachlorophenol	mg/kg	8270	1	1	0.028	NA	NA	NA	NA	< 0.34	< 0.86	< 1.3
Phenol	mg/kg	8270	1900	19000	6.6	NA	NA	NA	NA	< 0.09	< 0.23	< 0.35
Polychlorinated Biphenyls												
PCB-1016	mg/kg	8082	0.41	5.5	0.26	NA	NA	NA	NA	< 0.0029	< 0.0029	< 0.0028
PCB-1221	mg/kg	8082	0.2	0.26	0.0016	NA	NA	NA	NA	< 0.0037	< 0.0037	< 0.0036
PCB-1232	mg/kg	8082	0.17	0.22	0.0016	NA	NA	NA	NA	< 0.0033	< 0.0033	< 0.0032
PCB-1242	mg/kg	8082	0.23	0.31	0.024	NA	NA	NA	NA	< 0.0031	< 0.0031	< 0.0031
PCB-1248	mg/kg	8082	0.23	0.31	0.024	NA	NA	NA	NA	< 0.0018	< 0.0018	< 0.0018
PCB-1254	mg/kg	8082	0.12	0.32	0.04	NA	NA	NA	NA	< 0.0027	< 0.0027	< 0.0027
PCB-1260	mg/kg	8082	0.24	0.33	0.11	NA	NA	NA	NA	0.0083 J	< 0.0027	< 0.0027
Inorganics												
Aluminum	mg/kg	6020	7700	77000	60000	NA	NA	NA	NA	19000 K	11000 K	13000 K
Antimony	mg/kg	6020	3.1	31	5.4	NA	NA	NA	NA	0.53 J	0.087 J	0.36 J
Arsenic	mg/kg	6020	0.68	0.43	5.8	NA	NA	NA	NA	1.1 L	1.1 L	1.3 L
Barium	mg/kg	6020	1500	15000	1640	NA	NA	NA	NA	100	65	60
Beryllium	mg/kg	6020	16	160	64	NA	NA	NA	NA	1.2	0.72 J	0.56 J
Cadmium	mg/kg	6020	7.1	37	7.6	NA	NA	NA	NA	0.47 J	1.1	0.71 J
Calcium	mg/kg	6020	- -	- -	- -	NA	NA	NA	NA	170000	180000	150000
Chromium [1]	mg/kg	6020	12000	120000	3600000	NA	NA	NA	NA	1000	1200	1100
Cobalt	mg/kg	6020	2.3	23	0.54	NA	NA	NA	NA	***3.3***	***1.1***	***2.6***
Copper	mg/kg	6020	310	3100	920	NA	NA	NA	NA	40	16	21 B
Iron	mg/kg	6020	5500	55000	700	NA	NA	NA	NA	***180000***	***150000***	***180000***
Lead	mg/kg	6020	400	400	280	NA	NA	NA	NA	56	32	130
Magnesium	mg/kg	6020	- -	- -	- -	NA	NA	NA	NA	47000	47000	43000
Manganese [1]	mg/kg	6020	180	3500	56	NA	NA	NA	NA	***22000***	***27000***	***22000***
Mercury	mg/kg	7471	1.1	3.1	2	NA	NA	NA	NA	< 0.011 UL	< 0.013 UL	0.019 L
Nickel	mg/kg	6020	150	1500	52	NA	NA	NA	NA	15 K	4.5 K	7.8 K
Potassium	mg/kg	6020	- -	- -	- -	NA	NA	NA	NA	350	160	150
Selenium	mg/kg	6020	39	390	5.2	NA	NA	NA	NA	< 0.58	< 0.56	< 0.56
Silver	mg/kg	6020	39	390	1.6	NA	NA	NA	NA	0.19 J	0.14 J	0.073 J
Sodium	mg/kg	6020	- -	- -	- -	NA	NA	NA	NA	310	190	180
Thallium	mg/kg	6020	0.078	0.78	2.8	NA	NA	NA	NA	< 0.023	< 0.022	< 0.022
Vanadium	mg/kg	6020	39	5.5	172	NA	NA	NA	NA	***570*** L	***560*** L	***390*** L
Zinc	mg/kg	6020	2300	23000	740	NA	NA	NA	NA	70	37	99
Other Parameters												
Cyanide, Total	mg/kg	9012	2.3	23	40	NA	NA	NA	NA	2.5	1.5	1.7
Percent Moisture	%	- -	- -	- -	- -	14	12	13	NA	13	13	11

TABLE A-1
ANALYTICAL AND SCREENING RESULTS
SURFACE SOIL
CAA VIM AND VIIM
MINGO JUNCTION STEEL WORKS LLC - WEIRTON FACILITY

Constituent	Units	Analytical Method	Screening Criteria [1]			Sample Information [2]																							
			Residential Soil RSL	Residential Soil De Minimis	*Protection of Groundwater RSL*	VII-SS-04(0-0.4) 12/2/2013			VII-SS-05(0-0.3) 12/2/2013			VII-SS-06(0-0.4) 12/2/2013			VII-SS-07(0-0.7) 11/25/2013			VII-SS-08(0-0.5) 11/26/2013			VII-SS-09(0-0.5) 11/26/2013			VII-SS-10(0-0.5) 11/26/2013		
Volatile Organic Compounds																													
Benzene	mg/kg	8260	1.2	1.2	0.052	<	0.00077		<	0.00083		<	0.00077		<	0.00076		<	0.00076		<	0.00077		<	0.00079	
Toluene	mg/kg	8260	490	820	13.8	<	0.00083			0.0015	J	<	0.00083		<	0.00082			0.00088	J		0.0011	J	<	0.00086	
Ethylbenzene	mg/kg	8260	5.8	6.2	15.6	<	0.00074		<	0.00079		<	0.00073		<	0.00072		<	0.00072		<	0.00074		<	0.00075	
Xylenes, Total	mg/kg	8260	58	260	198	<	0.0026		<	0.0028		<	0.0025		<	0.0025		<	0.0025		<	0.0026		<	0.0026	
1,1,1-Trichloroethane	mg/kg	8260	810	640	5.6	<	0.00056		<	0.0006		<	0.00055		<	0.00055		<	0.00054		<	0.00056		<	0.00057	
1,1,2,2-Tetrachloroethane	mg/kg	8260	0.6	0.64	0.0006	<	0.00082		<	0.00088		<	0.00082		<	0.00081		<	0.0008		<	0.00082		<	0.00084	
1,1,2-Trichloro-1,2,2-trifluoroethane	mg/kg	8260	670	910	52	<	0.0012		<	0.0013		<	0.0012		<	0.0012		<	0.0012		<	0.0012		<	0.0013	
1,1,2-Trichloroethane	mg/kg	8260	0.15	1.2	0.032	<	0.00095		<	0.001		<	0.00094		<	0.00093		<	0.00093		<	0.00095		<	0.00097	
1,1-Dichloroethane	mg/kg	8260	3.6	3.8	0.0156	<	0.00066		<	0.00071		<	0.00065		<	0.00065		<	0.00064		<	0.00066		<	0.00067	
1,1-Dichloroethene	mg/kg	8260	23	240	0.2	<	0.00097		<	0.001		<	0.00096		<	0.00095		<	0.00095		<	0.00097		<	0.00099	
1,2,4-Trichlorobenzene	mg/kg	8260	5.8	24	4	<	0.001		<	0.0011		<	0.001		<	0.00099		<	0.00099		<	0.001		<	0.001	
1,2-Dibromo-3-Chloropropane	mg/kg	8260	0.0053	0.0057	0.00172	<	0.00086		<	0.00092		<	0.00085		<	0.00084		<	0.00084		<	0.00086		<	0.00088	
1,2-Dibromoethane (EDB)	mg/kg	8260	0.036	0.039	0.00028	<	0.00099		<	0.0011		<	0.00098		<	0.00097		<	0.00097		<	0.00099		<	0.001	
1,2-Dichlorobenzene	mg/kg	8260	180	380	11.6	<	0.00091		<	0.00098		<	0.0009		<	0.0009		<	0.00089		<	0.00091		<	0.00093	
1,2-Dichloroethane	mg/kg	8260	0.46	0.5	0.028	<	0.0007		<	0.00075		<	0.0007		<	0.00069		<	0.00069		<	0.0007		<	0.00072	
1,2-Dichloroethene, Total	mg/kg	8260	- -	- -	- -	<	0.0015		<	0.0016		<	0.0015			0.0017	J		0.0022	J		0.0044	J	<	0.0015	
cis-1,2-Dichloroethene	mg/kg	8260	16	17	0.42	<	0.0008		<	0.00087		<	0.0008		<	0.00079		<	0.00079		<	0.00081		<	0.00082	
trans-1,2-Dichloroethene	mg/kg	8260	7	130	0.62	<	0.00068		<	0.00073		<	0.00068			0.0017	J		0.0022	J		0.0044	J		0.0014	J
1,2-Dichloropropane	mg/kg	8260	1.6	1.1	0.034	<	0.00062		<	0.00067		<	0.00062		<	0.00061		<	0.00061		<	0.00062		<	0.00064	
cis-1,3-Dichloropropene [1]	mg/kg	8260	1.8	1.9	0.0034	<	0.00078		<	0.00083		<	0.00077		<	0.00076		<	0.00076		<	0.00078		<	0.00079	
trans-1,3-Dichloropropene [1]	mg/kg	8260	1.8	1.9	0.0034	<	0.00068		<	0.00074		<	0.00068		<	0.00067		<	0.00067		<	0.00068		<	0.0007	
1,3-Dichlorobenzene [1]	mg/kg	8260	2.6	2.8	1.44	<	0.00075		<	0.00081		<	0.00074		<	0.00074		<	0.00073		<	0.00075		<	0.00077	
1,4-Dichlorobenzene	mg/kg	8260	2.6	2.8	1.44	<	0.00073		<	0.00078		<	0.00072		<	0.00072		<	0.00071		<	0.00073		<	0.00075	
2-Butanone (MEK)	mg/kg	8260	2700	28000	2.4	<	0.001		<	0.0011		<	0.001		<	0.00099		<	0.00099		<	0.001		<	0.001	
2-Hexanone	mg/kg	8260	20	- -	0.0176	<	0.00079		<	0.00085		<	0.00078		<	0.00078		<	0.00077		<	0.00079		<	0.00081	
4-Methyl-2-pentanone (MIBK)	mg/kg	8260	3300	3400	2.8	<	0.00075		<	0.0008		<	0.00074		<	0.00073		<	0.00073		<	0.00075		<	0.00076	
Acetone	mg/kg	8260	6100	61000	5.8	<	0.0057		<	0.0062		<	0.0057			0.0078	J		0.006	J		0.0095	J	<	0.0059	
Bromoform	mg/kg	8260	19	20	0.42	<	0.00051		<	0.00054		<	0.0005		<	0.0005		<	0.00049		<	0.00051		<	0.00052	
Bromomethane	mg/kg	8260	0.68	7.3	0.0038	<	0.00085	R	<	0.00091	R	<	0.00084	R	<	0.00083	R	<	0.00083	R	<	0.00085	R	<	0.00087	R
Carbon disulfide	mg/kg	8260	77	740	0.48	<	0.00059		<	0.00063		<	0.00058		<	0.00058		<	0.00057		<	0.00059		<	0.0006	
Carbon tetrachloride	mg/kg	8260	0.65	0.7	0.038	<	0.00051		<	0.00055		<	0.00051		<	0.0005		<	0.0005		<	0.00051		<	0.00052	
Chlorobenzene	mg/kg	8260	28	290	1.36	<	0.00087		<	0.00093		<	0.00086		<	0.00085		<	0.00085		<	0.00087		<	0.00089	
Chlorodibromomethane	mg/kg	8260	8.3	8.3	0.42	<	0.00081		<	0.00087		<	0.00081		<	0.0008		<	0.00079		<	0.00081		<	0.00083	
Chloroethane	mg/kg	8260	1400	2100	11.8	<	0.0018		<	0.0019		<	0.0018		<	0.0017		<	0.0017		<	0.0018		<	0.0018	
Chloroform	mg/kg	8260	0.32	0.34	0.44		0.00086	B	<	0.00072			0.00074	B	<	0.00066		<	0.00065			0.00071	B	<	0.00069	
Chloromethane	mg/kg	8260	11	120	0.098	<	0.00097		<	0.001		<	0.00097		<	0.00096		<	0.00095		<	0.00098		<	0.001	
Cyclohexane	mg/kg	8260	650	120	26	<	0.00042		<	0.00046		<	0.00042		<	0.00042		<	0.00042		<	0.00043		<	0.00044	
Dichlorobromomethane	mg/kg	8260	0.29	0.31	0.44	<	0.00064		<	0.00069		<	0.00064		<	0.00063		<	0.00063		<	0.00064		<	0.00066	
Dichlorodifluoromethane	mg/kg	8260	8.7	94	0.6	<	0.00076		<	0.00082		<	0.00076		<	0.00075		<	0.00074		<	0.00076		<	0.00078	
Isopropylbenzene	mg/kg	8260	190	270	1.48	<	0.00078		<	0.00084		<	0.00077		<	0.00076		<	0.00076		<	0.00078		<	0.0008	
Methyl acetate	mg/kg	8260	7800	23000	8.2	<	0.001		<	0.0011		<	0.001		<	0.001		<	0.001		<	0.001		<	0.0011	
Methyl tert-butyl ether	mg/kg	8260	47	50	0.064	<	0.00086		<	0.00092		<	0.00085		<	0.00084		<	0.00084		<	0.00086		<	0.00088	
Methylcyclohexane [1]	mg/kg	8260	650	120	26	<	0.00083		<	0.00089		<	0.00082		<	0.00081		<	0.00081		<	0.00083		<	0.00085	
Methylene Chloride	mg/kg	8260	35	58	0.054		0.0053	B		0.0048	B		0.0034	B		0.0031	B		0.0034	B		0.0053	B		0.0036	B
Styrene	mg/kg	8260	600	870	2.6	<	0.00081		<	0.00087		<	0.0008		<	0.00079		<	0.00079		<	0.00081		<	0.00083	
Tetrachloroethene	mg/kg	8260	8.1	25	0.046	<	0.00078		<	0.00084		<	0.00077		<	0.00076		<	0.00076		<	0.00078		<	0.0008	
Trichloroethene	mg/kg	8260	0.41	0.5	0.036	<	0.00075		<	0.00081		<	0.00075		<	0.00074		<	0.00074		<	0.00075		<	0.00077	
Trichlorofluoromethane	mg/kg	8260	2300	790	6.6	<	0.0011		<	0.0011		<	0.001		<	0.001		<	0.001		<	0.0011		<	0.0011	
Vinyl chloride	mg/kg	8260	0.059	0.057	0.0138	<	0.00054		<	0.00058		<	0.00053		<	0.00053		<	0.00053		<	0.00054		<	0.00055	

TABLE A-1
ANALYTICAL AND SCREENING RESULTS
SURFACE SOIL
CAA VIM AND VIIM
MINGO JUNCTION STEEL WORKS LLC - WEIRTON FACILITY

Constituent	Units	Analytical Method	Screening Criteria [1]			Sample Information [2]						
			Residential Soil RSL	Residential Soil De Minimis	*Protection of Groundwater RSL*	VII-SS-04(0-0.4) 12/2/2013	VII-SS-05(0-0.3) 12/2/2013	VII-SS-06(0-0.4) 12/2/2013	VII-SS-07(0-0.7) 11/25/2013	VII-SS-08(0-0.5) 11/26/2013	VII-SS-09(0-0.5) 11/26/2013	VII-SS-10(0-0.5) 11/26/2013
Semi-Volatile Organic Compounds												
Acenaphthene	mg/kg	8270	360	4100	11	< 0.73	1.7 J	< 0.73	< 0.0072 UJ	< 0.036 UJ	< 0.22 UJ	< 0.037 UJ
Acenaphthylene [1]	mg/kg	8270	360	4200	11	< 0.87	< 0.47	< 0.87	< 0.0086 UJ	< 0.043 UJ	< 0.26 UJ	< 0.045 UJ
Anthracene	mg/kg	8270	1800	23000	116	0.87 J	1.1 J	< 0.74	0.015 J	< 0.037 UJ	< 0.22 UJ	< 0.038 UJ
Benzo[a]anthracene	mg/kg	8270	1.1	0.21	0.22	***6.1*** J	***8.9***	< 0.95	0.052 J	0.12 J	***0.51*** J	0.13 J
Benzo[a]pyrene	mg/kg	8270	0.11	0.016	4.8	4.8 J	***5.8***	< 0.76	0.076 J	< 0.037 UJ	< 0.23 UJ	0.1 J
Benzo[b]fluoranthene	mg/kg	8270	1.1	0.16	6	4.3 J	3.5 J	< 1.2	0.1 J	< 0.059 UJ	< 0.36 UJ	0.12 J
Benzo[g,h,i]perylene [1]	mg/kg	8270	180	1800	26	4.6 J	3.3 J	< 0.75	0.089 J	< 0.037 UJ	< 0.23 UJ	< 0.039 UJ
Benzo[k]fluoranthene	mg/kg	8270	11	1.6	58	< 1.5	< 0.83	< 1.5	0.051 J	< 0.075 UJ	< 0.46 UJ	< 0.079 UJ
Chrysene	mg/kg	8270	110	16	180	22	23	< 0.9	0.091 J	0.17 J	0.42 J	0.1 J
Dibenz(a,h)anthracene	mg/kg	8270	0.11	0.016	1.92	***2.5*** J	1.6 J	< 0.84	0.02 J	< 0.042 UJ	< 0.25 UJ	< 0.043 UJ
Fluoranthene	mg/kg	8270	240	2400	178	4.7 J	2.6 J	< 0.81	0.084 J	0.16 J	< 0.25 UJ	0.15 J
Fluorene	mg/kg	8270	240	2900	10.8	1.1 J	2 J	< 1	< 0.0099 UJ	< 0.049 UJ	< 0.3 UJ	< 0.051 UJ
Indeno[1,2,3-cd]pyrene	mg/kg	8270	1.1	0.16	19.6	1.7 J	1.5 J	< 0.78	0.07 J	< 0.038 UJ	< 0.24 UJ	0.08 J
Naphthalene	mg/kg	8270	2	4.1	0.0076	< 0.65	< 0.35	< 0.65	< 0.0065 UJ	< 0.032 UJ	< 0.2 UJ	< 0.034 UJ
Phenanthrene [1]	mg/kg	8270	1800	23000	116	3.3 J	12	< 1.2	0.048 J	< 0.059 UJ	< 0.36 UJ	< 0.062 UJ
Pyrene	mg/kg	8270	180	2300	26	26	18	< 0.77	0.077 J	0.21 J	< 0.23 UJ	0.12 J
1,1'-Biphenyl	mg/kg	8270	4.7	51	0.0174	< 3.4	< 1.8	< 3.4	< 0.033 UJ	< 0.17 UJ	< 1 UJ	< 0.17 UJ
2,4,5-Trichlorophenol	mg/kg	8270	630	6300	8	< 4	< 2.2	< 4	< 0.04 UJ	< 0.2 UJ	< 1.2 UJ	< 0.21 UJ
2,4,6-Trichlorophenol	mg/kg	8270	6.3	49	0.024	< 5.7	< 3.1	< 5.7	< 0.056 UJ	< 0.28 UJ	< 1.7 UJ	< 0.29 UJ
2,4-Dichlorophenol	mg/kg	8270	19	190	0.046	< 0.76	< 0.41	< 0.76	< 0.0075 UJ	< 0.037 UJ	< 0.23 UJ	< 0.039 UJ
2,4-Dimethylphenol	mg/kg	8270	130	1300	0.84	< 5.9	< 3.2	< 5.9	< 0.059 UJ	< 0.29 UJ	< 1.8 UJ	< 0.3 UJ
2,4-Dinitrophenol	mg/kg	8270	13	130	0.088	< 45	< 24	< 45	< 0.45 UJ	< 2.2 UJ	< 14 UJ	< 2.3 UJ
2,4-Dinitrotoluene	mg/kg	8270	1.7	1.7	0.0064	< 3.1	< 1.7	< 3.1	< 0.03 UJ	< 0.15 UJ	< 0.93 UJ	< 0.16 UJ
2,6-Dinitrotoluene	mg/kg	8270	0.36	0.36	0.00134	< 3.9	< 2.1	< 3.9	< 0.039 UJ	< 0.19 UJ	< 1.2 UJ	< 0.2 UJ
2-Chloronaphthalene	mg/kg	8270	480	5000	7.8	< 0.79	< 0.43	< 0.79	< 0.0078 UJ	< 0.039 UJ	< 0.24 UJ	< 0.041 UJ
2-Chlorophenol	mg/kg	8270	39	340	0.178	< 3.1	< 1.7	< 3.1	< 0.031 UJ	< 0.15 UJ	< 0.94 UJ	< 0.16 UJ
2-Methylnaphthalene	mg/kg	8270	24	310	0.38	< 0.68	***6.2***	< 0.68	0.014 J	< 0.034 UJ	< 0.21 UJ	< 0.035 UJ
2-Methylphenol	mg/kg	8270	320	3200	1.5	< 2.6	< 1.4	< 2.6	< 0.026 UJ	< 0.13 UJ	< 0.8 UJ	< 0.14 UJ
2-Nitroaniline	mg/kg	8270	63	630	0.16	< 17	< 9.2	< 17	< 0.17 UJ	< 0.84 UJ	< 5.1 UJ	< 0.87 UJ
2-Nitrophenol	mg/kg	8270	- -	- -	- -	< 4.2	< 2.3	< 4.2	< 0.041 UJ	< 0.21 UJ	< 1.3 UJ	< 0.21 UJ
3,3'-Dichlorobenzidine	mg/kg	8270	1.2	1.2	0.0164	< 4	< 2.2	< 4	< 0.04 UJ	< 0.2 UJ	< 1.2 UJ	< 0.21 UJ
Methylphenol, 3 & 4 [1]	mg/kg	8270	320	3200	1.48	< 3.7	< 2	< 3.7	< 0.037 UJ	< 0.18 UJ	< 1.1 UJ	< 0.19 UJ
3-Nitroaniline	mg/kg	8270	- -	- -	- -	< 16	< 8.5	< 16	< 0.15 UJ	< 0.77 UJ	< 4.7 UJ	< 0.8 UJ
4,6-Dinitro-2-methylphenol	mg/kg	8270	0.51	- -	0.0052	< 15	< 8.3	< 15	< 0.15 UJ	< 0.75 UJ	< 4.6 UJ	< 0.78 UJ
4-Bromophenyl phenyl ether	mg/kg	8270	- -	- -	- -	< 3.3	< 1.8	< 3.3	< 0.033 UJ	< 0.16 UJ	< 1 UJ	< 0.17 UJ
4-Chloro-3-methylphenol	mg/kg	8270	630	- -	3.4	< 3.5	< 1.9	< 3.5	< 0.035 UJ	< 0.17 UJ	< 1.1 UJ	< 0.18 UJ
4-Chloroaniline	mg/kg	8270	2.7	2.7	0.0032	< 3	< 1.6	< 3	< 0.03 UJ	< 0.15 UJ	< 0.92 UJ	< 0.16 UJ
4-Chlorophenyl phenyl ether	mg/kg	8270	- -	- -	- -	< 4.2	< 2.3	< 4.2	< 0.042 UJ	< 0.21 UJ	< 1.3 UJ	< 0.22 UJ
4-Nitroaniline	mg/kg	8270	25	- -	0.032	< 15	< 8.3	< 15	< 0.15 UJ	< 0.76 UJ	< 4.6 UJ	< 0.79 UJ
4-Nitrophenol	mg/kg	8270	- -	- -	- -	< 14	< 7.5	< 14	< 0.14 UJ	< 0.68 UJ	< 4.2 UJ	< 0.71 UJ
Acetophenone	mg/kg	8270	780	2500	1.16	< 3.1	< 1.7	< 3.1	< 0.031 UJ	< 0.15 UJ	< 0.94 UJ	< 0.16 UJ
Atrazine	mg/kg	8270	2.4	2.4	0.038	< 3.7	< 2	< 3.7	< 0.037 UJ	< 0.18 UJ	< 1.1 UJ	< 0.19 UJ
Benzaldehyde	mg/kg	8270	170	1200	0.082	< 5.7	< 3.1	< 5.7	< 0.056 UJ	< 0.28 UJ	< 1.7 UJ	< 0.29 UJ
Bis(2-chloroisopropyl)ether	mg/kg	8270	310	5.1	0.52	< 0.82	< 0.44	< 0.82	< 0.0081 UJ	< 0.04 UJ	< 0.25 UJ	< 0.042 UJ
Bis(2-chloroethoxy)methane	mg/kg	8270	19	- -	0.026	< 2.5	< 1.4	< 2.5	< 0.025 UJ	< 0.12 UJ	< 0.75 UJ	< 0.13 UJ
Bis(2-chloroethyl)ether	mg/kg	8270	0.23	0.24	0.000072	< 1	< 0.55	< 1	< 0.01 UJ	< 0.05 UJ	< 0.31 UJ	< 0.052 UJ
Bis(2-ethylhexyl) phthalate	mg/kg	8270	39	39	28	< 6.1	4.6 J	< 6.1	< 0.061 UJ	< 0.3 UJ	< 1.9 UJ	< 0.31 UJ
Butyl benzyl phthalate	mg/kg	8270	290	290	4.8	< 5.2	< 2.8	< 5.2	< 0.051 UJ	< 0.26 UJ	< 1.6 UJ	< 0.27 UJ
Caprolactam	mg/kg	8270	3100	31000	5	< 29	< 15	< 29	< 0.28 UJ	< 1.4 UJ	< 8.7 UJ	< 1.5 UJ
Carbazole [1]	mg/kg	8270	1800	23000	116	< 0.7	< 0.38	< 0.7	< 0.0069 UJ	< 0.034 UJ	< 0.21 UJ	< 0.036 UJ

TABLE A-1
ANALYTICAL AND SCREENING RESULTS
SURFACE SOIL
CAA VIM AND VIIM
MINGO JUNCTION STEEL WORKS LLC - WEIRTON FACILITY

			Screening Criteria [1]			Sample Information [2]																					
						VII-SS-04(0-0.4) 12/2/2013			VII-SS-05(0-0.3) 12/2/2013			VII-SS-06(0-0.4) 12/2/2013			VII-SS-07(0-0.7) 11/25/2013			VII-SS-08(0-0.5) 11/26/2013			VII-SS-09(0-0.5) 11/26/2013			VII-SS-10(0-0.5) 11/26/2013		
Constituent	**Units**	**Analytical Method**	**Residential Soil RSL**	**Residential Soil De Minimis**	***Protection of Groundwater RSL***																						
Dibenzofuran	mg/kg	8270	7.8	78	0.3	<	3.7		<	2		<	3.7		<	0.037	UJ	<	0.18	UJ	<	1.1	UJ	<	0.19	UJ
Diethyl phthalate	mg/kg	8270	5100	51000	12.2		11	B		9.6	B		***14***	B		0.048	B	<	0.2	UJ		1.3	B		0.3	B
Dimethyl phthalate	mg/kg	8270	- -	- -	- -	<	4.1		<	2.2		<	4.1		<	0.041	UJ	<	0.2	UJ	<	1.2	UJ	<	0.21	UJ
Di-n-butyl phthalate	mg/kg	8270	630	6300	4.6	<	4.8		<	2.6		<	4.7		<	0.047	UJ	<	0.23	UJ	<	1.4	UJ	<	0.24	UJ
Di-n-octyl phthalate	mg/kg	8270	63	- -	114	<	4		<	2.2		<	4		<	0.04	UJ	<	0.2	UJ	<	1.2	UJ	<	0.2	UJ
Hexachlorobenzene	mg/kg	8270	0.21	0.22	0.26	<	0.81		<	0.44		<	0.81		<	0.008	UJ	<	0.04	UJ	<	0.24	UJ	<	0.041	UJ
Hexachlorobutadiene	mg/kg	8270	1.2	1.3	0.0054	<	0.85		<	0.46		<	0.85		<	0.0084	UJ	<	0.042	UJ	<	0.26	UJ	<	0.044	UJ
Hexachlorocyclopentadiene	mg/kg	8270	0.18	1.9	3.2	<	4.1		<	2.2		<	4.1		<	0.04	UJ	<	0.2	UJ	<	1.2	UJ	<	0.21	UJ
Hexachloroethane	mg/kg	8270	1.8	2	0.004	<	2.7		<	1.5		<	2.7		<	0.027	UJ	<	0.13	UJ	<	0.82	UJ	<	0.14	UJ
Isophorone	mg/kg	8270	570	570	0.52	<	2.9		<	1.5		<	2.9		<	0.028	UJ	<	0.14	UJ	<	0.86	UJ	<	0.15	UJ
Nitrobenzene	mg/kg	8270	5.1	5.5	0.00184	<	3.2		<	1.7		<	3.2		<	0.031	UJ	<	0.16	UJ	<	0.95	UJ	<	0.16	UJ
N-Nitrosodi-n-propylamine	mg/kg	8270	0.078	0.078	0.000162	<	0.89		<	0.48		<	0.89		<	0.0088	UJ	<	0.044	UJ	<	0.27	UJ	<	0.046	UJ
N-Nitrosodiphenylamine	mg/kg	8270	110	110	1.34	<	3.5		<	1.9		<	3.5		<	0.035	UJ	<	0.17	UJ	<	1.1	UJ	<	0.18	UJ
Pentachlorophenol	mg/kg	8270	1	1	0.028	<	3.4		<	1.8		<	3.4		<	0.034	UJ	<	0.17	UJ	<	1	UJ	<	0.17	UJ
Phenol	mg/kg	8270	1900	19000	6.6	<	0.9		<	0.49		<	0.89		<	0.0089	UJ	<	0.044	UJ	<	0.27	UJ	<	0.046	UJ
Polychlorinated Biphenyls																											
PCB-1016	mg/kg	8082	0.41	5.5	0.26	<	0.0028	UL	<	0.003	UL	<	0.0028	UL	<	0.0028	UJ	<	0.0028	UJ	<	0.0028	UJ	<	0.0029	UJ
PCB-1221	mg/kg	8082	0.2	0.26	0.0016	<	0.0036	UL	<	0.0039	UL	<	0.0036	UL	<	0.0036	UJ	<	0.0035	UJ	<	0.0036	UJ	<	0.0037	UJ
PCB-1232	mg/kg	8082	0.17	0.22	0.0016	<	0.0032	UL	<	0.0035	UL	<	0.0032	UL	<	0.0032	UJ	<	0.0032	UJ	<	0.0033	UJ	<	0.0033	UJ
PCB-1242	mg/kg	8082	0.23	0.31	0.024	<	0.0031	UL	<	0.0033	UL	<	0.0031	UL	<	0.0031	UJ	<	0.003	UJ	<	0.0031	UJ	<	0.0032	UJ
PCB-1248	mg/kg	8082	0.23	0.31	0.024	<	0.0018	UL	<	0.0019	UL	<	0.0018	UL	<	0.0018	UJ	<	0.0018	UJ	<	0.0018	UJ	<	0.0018	UJ
PCB-1254	mg/kg	8082	0.12	0.32	0.04	<	0.0027	UL	<	0.0029	UL	<	0.0027	UL		***0.58***	J		0.033	J	<	0.0027	UJ	<	0.0028	UJ
PCB-1260	mg/kg	8082	0.24	0.33	0.11	<	0.0027	UL	<	0.0029	UL	<	0.0027	UL	<	0.0027	UJ	<	0.0026	UJ		0.015	J	<	0.0028	UJ
Inorganics																											
Aluminum	mg/kg	6020	7700	77000	60000		17000	K		***72000***	K		33000	K		10000	K		10000	K		9900	K		13000	K
Antimony	mg/kg	6020	3.1	31	5.4		0.78	J		0.13	J		0.076	J		0.78	L		0.61	J		1.2	J		1.4	J
Arsenic	mg/kg	6020	0.68	0.43	5.8		4.8	L		2.4	L		1	L	<	0.2	UJ		3	K		3.7	K		4.7	K
Barium	mg/kg	6020	1500	15000	1640		130			38			310			160			100	J		110			100	
Beryllium	mg/kg	6020	16	160	64		1.4			0.25	J		4.9			1.5			0.86	J		2			1.6	
Cadmium	mg/kg	6020	7.1	37	7.6		3			5.1			0.85	J		1.5	J		2.3	J		***7.8***			1.7	
Calcium	mg/kg	6020	- -	- -	- -		120000			180000			150000			130000	J		110000	J		64000			97000	
Chromium [1]	mg/kg	6020	12000	120000	3600000		610			860			58			690	J		290	J		79			400	
Cobalt	mg/kg	6020	2.3	23	0.54		***3.4***			***1.8***			***1.5***			***3.1***			***2.8***	J		***8***			***7.4***	
Copper	mg/kg	6020	310	3100	920		43			19	B		10	B		40	K		36	K		66	K		34	K
Iron	mg/kg	6020	5500	55000	700		***120000***			***130000***			***25000***			***110000***	L		***110000***	L		***71000***	L		***69000***	L
Lead	mg/kg	6020	400	400	280		210			9.8			63			39			12	J		***290***			22	
Magnesium	mg/kg	6020	- -	- -	- -		27000			30000			32000			27000			18000	J		19000			22000	
Manganese [1]	mg/kg	6020	180	3500	56		***11000***			***30000***			***3600***			***16000***			***13000***	J		***1800***			***8400***	
Mercury	mg/kg	7471	1.1	3.1	2		0.092	L	<	0.012	UL		0.016	L		0.028	J		0.029	J		***2.8***	K		0.024	J
Nickel	mg/kg	6020	150	1500	52		16	K		7.6	K		4.3	K		15			13	J		29			26	
Potassium	mg/kg	6020	- -	- -	- -		530			100	J		1700			380	L		300	L		590	L		610	L
Selenium	mg/kg	6020	39	390	5.2	<	0.55		<	0.62			2.9	J		1	B		0.88	B		1.6	B		1.5	B
Silver	mg/kg	6020	39	390	1.6		0.27	J		0.75	J	<	0.043			0.22	J		0.36	J		0.069	J		0.29	J
Sodium	mg/kg	6020	- -	- -	- -		710			370			530			1300	J		3400	J		320			360	
Thallium	mg/kg	6020	0.078	0.78	2.8		0.032	J	<	0.025		<	0.022			0.029	J		0.029	J		0.12	J		0.077	J
Vanadium	mg/kg	6020	39	5.5	172		***300***	L		***320***	L		41	L		20	L		110	L		17	L		150	L
Zinc	mg/kg	6020	2300	23000	740		510			41			56			150	K		55	K		560	K		180	K
Other Parameters																											
Cyanide, Total	mg/kg	9012	2.3	23	40		1			0.81			3.3			0.64			0.69			0.47	J		0.57	J
Percent Moisture	%	- -	- -	- -	- -		13			19			12			11			11			13			15	

TABLE A-1
ANALYTICAL AND SCREENING RESULTS
SURFACE SOIL
CAA VIM AND VIIM
MINGO JUNCTION STEEL WORKS LLC - WEIRTON FACILITY

Constituent	Units	Analytical Method	Screening Criteria [1]			Sample Information [2]						
			Residential Soil RSL	Residential Soil De Minimis	*Protection of Groundwater RSL*	VII-SS-11(0-0.5) 12/2/2013	VII-SS-12(0-0.5) 11/25/2013	VII-SS-13(0-0.7) 12/2/2013	VII-SS-14(0-0.5) 11/25/2013	VII-SS-15(0-1) 12/9/2013	VII-SS-16(0-1) 11/25/2013	VII-SS-17(0-2) 11/25/2013
Volatile Organic Compounds												
Benzene	mg/kg	8260	1.2	1.2	0.052	< 0.00095	< 0.00079	< 0.00083	< 0.00072	< 0.00075	< 0.00073	< 0.00077
Toluene	mg/kg	8260	490	820	13.8	< 0.001	< 0.00085	< 0.0009	< 0.00078	< 0.00081	< 0.00079	0.0011 J
Ethylbenzene	mg/kg	8260	5.8	6.2	15.6	< 0.00091	< 0.00075	< 0.00079	< 0.00069	< 0.00072	< 0.00069	< 0.00074
Xylenes, Total	mg/kg	8260	58	260	198	< 0.0032	< 0.0026	< 0.0028	< 0.0024	< 0.0025	< 0.0024	< 0.0026
1,1,1-Trichloroethane	mg/kg	8260	810	640	5.6	< 0.00069	< 0.00057	< 0.0006	< 0.00052	< 0.00054	< 0.00053	< 0.00056
1,1,2,2-Tetrachloroethane	mg/kg	8260	0.6	0.64	0.0006	< 0.001	< 0.00084	< 0.00088	< 0.00077	< 0.0008	< 0.00078	< 0.00082
1,1,2-Trichloro-1,2,2-trifluoroethane	mg/kg	8260	670	910	52	< 0.0015	< 0.0013	< 0.0013	< 0.0011	< 0.0012	< 0.0012	< 0.0012
1,1,2-Trichloroethane	mg/kg	8260	0.15	1.2	0.032	< 0.0012	< 0.00097	< 0.001	< 0.00089	< 0.00093	< 0.0009	< 0.00095
1,1-Dichloroethane	mg/kg	8260	3.6	3.8	0.0156	< 0.00081	< 0.00067	< 0.00071	< 0.00062	< 0.00064	< 0.00062	< 0.00066
1,1-Dichloroethene	mg/kg	8260	23	240	0.2	< 0.0012	< 0.00099	< 0.001	< 0.00091	< 0.00094	< 0.00092	< 0.00097
1,2,4-Trichlorobenzene	mg/kg	8260	5.8	24	4	< 0.0012	< 0.001	< 0.0011	< 0.00094	< 0.00098	< 0.00095	< 0.001
1,2-Dibromo-3-Chloropropane	mg/kg	8260	0.0053	0.0057	0.00172	< 0.0011	< 0.00088	< 0.00092	< 0.0008	< 0.00083	< 0.00081	< 0.00086
1,2-Dibromoethane (EDB)	mg/kg	8260	0.036	0.039	0.00028	< 0.0012	< 0.001	< 0.0011	< 0.00092	< 0.00096	< 0.00093	< 0.00099
1,2-Dichlorobenzene	mg/kg	8260	180	380	11.6	< 0.0011	< 0.00093	< 0.00098	< 0.00085	< 0.00089	< 0.00086	< 0.00091
1,2-Dichloroethane	mg/kg	8260	0.46	0.5	0.028	< 0.00086	< 0.00072	< 0.00075	< 0.00066	< 0.00068	< 0.00066	< 0.0007
1,2-Dichloroethene, Total	mg/kg	8260	- -	- -	- -	< 0.0018	< 0.0015	< 0.0016	< 0.0014	< 0.0014	0.0014 J	0.0037 J
cis-1,2-Dichloroethene	mg/kg	8260	16	17	0.42	< 0.00099	< 0.00082	< 0.00086	< 0.00075	< 0.00078	< 0.00076	< 0.00081
trans-1,2-Dichloroethene	mg/kg	8260	7	130	0.62	< 0.00084	0.00084 J	< 0.00073	0.0008 J	< 0.00066	0.0014 J	0.0037 J
1,2-Dichloropropane	mg/kg	8260	1.6	1.1	0.034	< 0.00077	< 0.00064	< 0.00067	< 0.00058	< 0.0006	< 0.00059	< 0.00062
cis-1,3-Dichloropropene [1]	mg/kg	8260	1.8	1.9	0.0034	< 0.00096	< 0.00079	< 0.00083	< 0.00073	< 0.00075	< 0.00073	< 0.00078
trans-1,3-Dichloropropene [1]	mg/kg	8260	1.8	1.9	0.0034	< 0.00084	< 0.0007	< 0.00074	< 0.00064	< 0.00067	< 0.00065	< 0.00069
1,3-Dichlorobenzene [1]	mg/kg	8260	2.6	2.8	1.44	< 0.00092	< 0.00077	< 0.00081	< 0.0007	< 0.00073	< 0.00071	< 0.00075
1,4-Dichlorobenzene	mg/kg	8260	2.6	2.8	1.44	< 0.0009	< 0.00075	< 0.00078	< 0.00068	< 0.00071	< 0.00069	< 0.00073
2-Butanone (MEK)	mg/kg	8260	2700	28000	2.4	< 0.0012	< 0.001	< 0.0011	< 0.00094	< 0.00098	< 0.00095	< 0.001
2-Hexanone	mg/kg	8260	20	- -	0.0176	< 0.00097	< 0.00081	< 0.00085	< 0.00074	< 0.00077	< 0.00075	< 0.00079
4-Methyl-2-pentanone (MIBK)	mg/kg	8260	3300	3400	2.8	< 0.00092	< 0.00076	< 0.0008	< 0.0007	< 0.00073	< 0.0007	< 0.00075
Acetone	mg/kg	8260	6100	61000	5.8	< 0.007	< 0.0059	< 0.0061	< 0.0054	< 0.0056	0.0062 J	0.037
Bromoform	mg/kg	8260	19	20	0.42	< 0.00062	< 0.00052	< 0.00054	< 0.00047	< 0.00049	< 0.00048	< 0.00051
Bromomethane	mg/kg	8260	0.68	7.3	0.0038	< 0.001 R	< 0.00087 R	< 0.00091 R	< 0.00079 R	< 0.00082 R	< 0.0008 R	< 0.00085 R
Carbon disulfide	mg/kg	8260	77	740	0.48	< 0.00072	< 0.0006	< 0.00063	< 0.00055	< 0.00057	< 0.00055	< 0.00059
Carbon tetrachloride	mg/kg	8260	0.65	0.7	0.038	< 0.00063	< 0.00052	< 0.00055	< 0.00048	< 0.0005	< 0.00048	< 0.00051
Chlorobenzene	mg/kg	8260	28	290	1.36	< 0.0011	< 0.00089	< 0.00093	< 0.00081	< 0.00084	< 0.00082	< 0.00087
Chlorodibromomethane	mg/kg	8260	8.3	8.3	0.42	< 0.001	< 0.00083	< 0.00087	< 0.00076	< 0.00079	< 0.00077	< 0.00081
Chloroethane	mg/kg	8260	1400	2100	11.8	< 0.0022	< 0.0018	< 0.0019	< 0.0017	< 0.0017 R	< 0.0017	< 0.0018
Chloroform	mg/kg	8260	0.32	0.34	0.44	0.00086 B	< 0.00069	0.00072 B	< 0.00063	< 0.00065	< 0.00063	< 0.00067
Chloromethane	mg/kg	8260	11	120	0.098	< 0.0012	< 0.001	< 0.001	< 0.00091	< 0.00095	< 0.00092	< 0.00098
Cyclohexane	mg/kg	8260	650	120	26	< 0.00052	< 0.00043	< 0.00046	< 0.0004	< 0.00041	< 0.0004	< 0.00043
Dichlorobromomethane	mg/kg	8260	0.29	0.31	0.44	< 0.00079	< 0.00066	< 0.00069	< 0.0006	< 0.00062	< 0.00061	< 0.00064
Dichlorodifluoromethane	mg/kg	8260	8.7	94	0.6	< 0.00094	< 0.00078	< 0.00082	< 0.00071	< 0.00074	< 0.00072	< 0.00076
Isopropylbenzene	mg/kg	8260	190	270	1.48	< 0.00096	< 0.0008	< 0.00083	< 0.00073	< 0.00076	< 0.00073	< 0.00078
Methyl acetate	mg/kg	8260	7800	23000	8.2	< 0.0013	< 0.0011	< 0.0011	< 0.00097	< 0.001	< 0.00097	< 0.001
Methyl tert-butyl ether	mg/kg	8260	47	50	0.064	< 0.0011	< 0.00088	< 0.00092	< 0.0008	< 0.00083	< 0.00081	< 0.00086
Methylcyclohexane [1]	mg/kg	8260	650	120	26	< 0.001	< 0.00085	< 0.00089	< 0.00078	< 0.00081	< 0.00078	< 0.00083
Methylene Chloride	mg/kg	8260	35	58	0.054	0.0042 B	0.003 B	0.0033 B	0.0026 B	0.0029 B	0.0032 B	0.0042 B
Styrene	mg/kg	8260	600	870	2.6	< 0.00099	< 0.00083	< 0.00087	< 0.00076	< 0.00079	< 0.00076	< 0.00081
Tetrachloroethene	mg/kg	8260	8.1	25	0.046	< 0.00096	< 0.0008	< 0.00084	< 0.00073	< 0.00076	< 0.00073	< 0.00078
Trichloroethene	mg/kg	8260	0.41	0.5	0.036	< 0.00093	< 0.00077	< 0.00081	< 0.0007	< 0.00073	< 0.00071	< 0.00075
Trichlorofluoromethane	mg/kg	8260	2300	790	6.6	< 0.0013	< 0.0011	< 0.0011	< 0.00098	< 0.001	< 0.00099	< 0.0011
Vinyl chloride	mg/kg	8260	0.059	0.057	0.0138	< 0.00066	< 0.00055	< 0.00058	< 0.0005	< 0.00052	< 0.00051	< 0.00054

TABLE A-1
ANALYTICAL AND SCREENING RESULTS
SURFACE SOIL
CAA VIM AND VIIM
MINGO JUNCTION STEEL WORKS LLC - WEIRTON FACILITY

Constituent	Units	Analytical Method	Screening Criteria [1]			Sample Information [2]																							
			Residential Soil RSL	Residential Soil De Minimis	*Protection of Groundwater RSL*	VII-SS-11(0-0.5) 12/2/2013			VII-SS-12(0-0.5) 11/25/2013			VII-SS-13(0-0.7) 12/2/2013			VII-SS-14(0-0.5) 11/25/2013			VII-SS-15(0-1) 12/9/2013			VII-SS-16(0-1) 11/25/2013			VII-SS-17(0-2) 11/25/2013		
Semi-Volatile Organic Compounds																													
Acenaphthene	mg/kg	8270	360	4100	11		0.028	J	<	0.0075	UJ	<	0.0079		<	0.034	UJ	<	0.0071	UJ	<	0.0069	UJ	<	0.037	UJ
Acenaphthylene [1]	mg/kg	8270	360	4200	11	<	0.011		<	0.009	UJ	<	0.0094		<	0.041	UJ	<	0.0085	UJ	<	0.0083	UJ	<	0.044	UJ
Anthracene	mg/kg	8270	1800	23000	116		0.054	J		0.011	J	<	0.008		<	0.035	UJ	<	0.0072	UJ	<	0.0071	UJ	<	0.037	UJ
Benzo[a]anthracene	mg/kg	8270	1.1	0.21	0.22		0.057	J		0.048	J		0.013	J	<	0.045	UJ		0.028	J	<	0.009	UJ	<	0.048	UJ
Benzo[a]pyrene	mg/kg	8270	0.11	0.016	4.8		0.043	J		0.042	J	<	0.0082		<	0.036	UJ		0.019	J	<	0.0072	UJ	<	0.038	UJ
Benzo[b]fluoranthene	mg/kg	8270	1.1	0.16	6		0.086	J		0.09	J	<	0.013		<	0.056	UJ		0.033	J	<	0.011	UJ	<	0.06	UJ
Benzo[g,h,i]perylene [1]	mg/kg	8270	180	1800	26		0.062	J		0.067	J	<	0.0082		<	0.036	UJ		0.041	J	<	0.0072	UJ	<	0.038	UJ
Benzo[k]fluoranthene	mg/kg	8270	11	1.6	58		0.023	J		0.035	J	<	0.017		<	0.072	UJ	<	0.015	UJ	<	0.015	UJ	<	0.077	UJ
Chrysene	mg/kg	8270	110	16	180		0.079	J		0.086	J		0.019	J	<	0.043	UJ		0.054	J	<	0.0086	UJ	<	0.045	UJ
Dibenz(a,h)anthracene	mg/kg	8270	0.11	0.016	1.92	<	0.01		<	0.0087	UJ	<	0.0091		<	0.04	UJ		0.014	J	<	0.008	UJ	<	0.042	UJ
Fluoranthene	mg/kg	8270	240	2400	178		0.14			0.1	J		0.017	J	<	0.038	UJ		0.044	J	<	0.0077	UJ	<	0.041	UJ
Fluorene	mg/kg	8270	240	2900	10.8		0.038	J	<	0.01	UJ	<	0.011		<	0.047	UJ	<	0.0097	UJ	<	0.0095	UJ	<	0.05	UJ
Indeno[1,2,3-cd]pyrene	mg/kg	8270	1.1	0.16	19.6		0.049	J		0.056	J	<	0.0085		<	0.037	UJ		0.024	J	<	0.0074	UJ	<	0.039	UJ
Naphthalene	mg/kg	8270	2	4.1	0.0076		***0.032***	J	<	0.0067	UJ	<	0.0071		<	0.031	UJ	<	0.0064	UJ	<	0.0062	UJ	<	0.033	UJ
Phenanthrene [1]	mg/kg	8270	1800	23000	116		0.17			0.043	J	<	0.013		<	0.057	UJ		0.017	J	<	0.011	UJ	<	0.06	UJ
Pyrene	mg/kg	8270	180	2300	26		0.099			0.09	J		0.015	J	<	0.036	UJ		0.067	J	<	0.0073	UJ	<	0.038	UJ
1,1'-Biphenyl	mg/kg	8270	4.7	51	0.0174	<	0.042		<	0.035	UJ	<	0.037		<	0.16	UJ	<	0.033	UJ	<	0.032	UJ	<	0.17	UJ
2,4,5-Trichlorophenol	mg/kg	8270	630	6300	8	<	0.05		<	0.042	UJ	<	0.044		<	0.19	UJ	<	0.039	UJ	<	0.038	UJ	<	0.2	UJ
2,4,6-Trichlorophenol	mg/kg	8270	6.3	49	0.024	<	0.07		<	0.059	UJ	<	0.061		<	0.27	UJ	<	0.055	UJ	<	0.054	UJ	<	0.28	UJ
2,4-Dichlorophenol	mg/kg	8270	19	190	0.046	<	0.0094		<	0.0078	UJ	<	0.0082		<	0.036	UJ	<	0.0074	UJ	<	0.0072	UJ	<	0.038	UJ
2,4-Dimethylphenol	mg/kg	8270	130	1300	0.84	<	0.073		<	0.061	UJ	<	0.064		<	0.28	UJ	<	0.058	UJ	<	0.056	UJ	<	0.3	UJ
2,4-Dinitrophenol	mg/kg	8270	13	130	0.088	<	0.56		<	0.47	UJ	<	0.49		<	2.1	UJ	<	0.44	UJ	<	0.43	UJ	<	2.3	UJ
2,4-Dinitrotoluene	mg/kg	8270	1.7	1.7	0.0064	<	0.038		<	0.032	UJ	<	0.033		<	0.14	UJ	<	0.03	UJ	<	0.029	UJ	<	0.15	UJ
2,6-Dinitrotoluene	mg/kg	8270	0.36	0.36	0.00134	<	0.048		<	0.04	UJ	<	0.042		<	0.18	UJ	<	0.038	UJ	<	0.037	UJ	<	0.2	UJ
2-Chloronaphthalene	mg/kg	8270	480	5000	7.8	<	0.0097		<	0.0082	UJ	<	0.0086		<	0.037	UJ	<	0.0077	UJ	<	0.0075	UJ	<	0.04	UJ
2-Chlorophenol	mg/kg	8270	39	340	0.178	<	0.038		<	0.032	UJ	<	0.034		<	0.15	UJ	<	0.03	UJ	<	0.029	UJ	<	0.16	UJ
2-Methylnaphthalene	mg/kg	8270	24	310	0.38		0.025	J	<	0.007	UJ	<	0.0074		<	0.032	UJ	<	0.0066	UJ	<	0.0065	UJ	<	0.034	UJ
2-Methylphenol	mg/kg	8270	320	3200	1.5	<	0.033		<	0.027	UJ	<	0.029		<	0.12	UJ	<	0.026	UJ	<	0.025	UJ	<	0.13	UJ
2-Nitroaniline	mg/kg	8270	63	630	0.16	<	0.21		<	0.18	UJ	<	0.18		<	0.8	UJ	<	0.17	UJ	<	0.16	UJ	<	0.85	UJ
2-Nitrophenol	mg/kg	8270	- -	- -	- -	<	0.051		<	0.043	UJ	<	0.045		<	0.2	UJ	<	0.041	UJ	<	0.04	UJ	<	0.21	UJ
3,3'-Dichlorobenzidine	mg/kg	8270	1.2	1.2	0.0164	<	0.049		<	0.041	UJ	<	0.043		<	0.19	UJ	<	0.039	UJ	<	0.038	UJ	<	0.2	UJ
Methylphenol, 3 & 4 [1]	mg/kg	8270	320	3200	1.48	<	0.046		<	0.038	UJ	<	0.04		<	0.17	UJ	<	0.036	UJ	<	0.035	UJ	<	0.19	UJ
3-Nitroaniline	mg/kg	8270	- -	- -	- -	<	0.19		<	0.16	UJ	<	0.17		<	0.74	UJ	<	0.15	UJ	<	0.15	UJ	<	0.78	UJ
4,6-Dinitro-2-methylphenol	mg/kg	8270	0.51	- -	0.0052	<	0.19		<	0.16	UJ	<	0.16		<	0.72	UJ	<	0.15	UJ	<	0.14	UJ	<	0.76	UJ
4-Bromophenyl phenyl ether	mg/kg	8270	- -	- -	- -	<	0.041		<	0.034	UJ	<	0.036		<	0.16	UJ	<	0.032	UJ	<	0.031	UJ	<	0.17	UJ
4-Chloro-3-methylphenol	mg/kg	8270	630	- -	3.4	<	0.043		<	0.036	UJ	<	0.038		<	0.16	UJ	<	0.034	UJ	<	0.033	UJ	<	0.17	UJ
4-Chloroaniline	mg/kg	8270	2.7	2.7	0.0032	<	0.037		<	0.031	UJ	<	0.033		<	0.14	UJ	<	0.03	UJ	<	0.029	UJ	<	0.15	UJ
4-Chlorophenyl phenyl ether	mg/kg	8270	- -	- -	- -	<	0.052		<	0.043	UJ	<	0.046		<	0.2	UJ	<	0.041	UJ	<	0.04	UJ	<	0.21	UJ
4-Nitroaniline	mg/kg	8270	25	- -	0.032	<	0.19		<	0.16	UJ	<	0.17		<	0.72	UJ	<	0.15	UJ	<	0.15	UJ	<	0.77	UJ
4-Nitrophenol	mg/kg	8270	- -	- -	- -	<	0.17		<	0.14	UJ	<	0.15		<	0.65	UJ	<	0.13	UJ	<	0.13	UJ	<	0.69	UJ
Acetophenone	mg/kg	8270	780	2500	1.16	<	0.038		<	0.032	UJ	<	0.034		<	0.15	UJ	<	0.03	UJ	<	0.03	UJ	<	0.16	UJ
Atrazine	mg/kg	8270	2.4	2.4	0.038	<	0.045		<	0.038	UJ	<	0.04		<	0.17	UJ	<	0.036	UJ	<	0.035	UJ	<	0.19	UJ
Benzaldehyde	mg/kg	8270	170	1200	0.082	<	0.07		<	0.059	UJ	<	0.061		<	0.27	UJ	<	0.055	UJ	<	0.054	UJ	<	0.28	UJ
Bis(2-chloroisopropyl)ether	mg/kg	8270	310	5.1	0.52	<	0.01		<	0.0084	UJ	<	0.0089		<	0.039	UJ	<	0.008	UJ	<	0.0078	UJ	<	0.041	UJ
Bis(2-chloroethoxy)methane	mg/kg	8270	19	- -	0.026	<	0.031		<	0.026	UJ	<	0.027		<	0.12	UJ	<	0.024	UJ	<	0.024	UJ	<	0.13	UJ
Bis(2-chloroethyl)ether	mg/kg	8270	0.23	0.24	0.000072	<	0.013		<	0.01	UJ	<	0.011		<	0.048	UJ	<	0.0099	UJ	<	0.0097	UJ	<	0.051	UJ
Bis(2-ethylhexyl) phthalate	mg/kg	8270	39	39	28	<	0.075		<	0.063	UJ	<	0.066		<	0.29	UJ		0.2	J	<	0.058	UJ	<	0.31	UJ
Butyl benzyl phthalate	mg/kg	8270	290	290	4.8	<	0.064		<	0.053	UJ	<	0.056		<	0.24	UJ	<	0.05	UJ	<	0.049	UJ	<	0.26	UJ
Caprolactam	mg/kg	8270	3100	31000	5	<	0.35		<	0.3	UJ	<	0.31		<	1.3	UJ	<	0.28	UJ	<	0.27	UJ	<	1.4	UJ
Carbazole [1]	mg/kg	8270	1800	23000	116		0.02	J	<	0.0072	UJ	<	0.0076		<	0.033	UJ	<	0.0068	UJ	<	0.0066	UJ	<	0.035	UJ

TABLE A-1
ANALYTICAL AND SCREENING RESULTS
SURFACE SOIL
CAA VIM AND VIIM
MINGO JUNCTION STEEL WORKS LLC - WEIRTON FACILITY

Constituent	Units	Analytical Method	Screening Criteria [1] Residential Soil RSL	Residential Soil De Minimis	*Protection of Groundwater RSL*	Sample Information [2] VII-SS-11(0-0.5) 12/2/2013	VII-SS-12(0-0.5) 11/25/2013	VII-SS-13(0-0.7) 12/2/2013	VII-SS-14(0-0.5) 11/25/2013	VII-SS-15(0-1) 12/9/2013	VII-SS-16(0-1) 11/25/2013	VII-SS-17(0-2) 11/25/2013
Dibenzofuran	mg/kg	8270	7.8	78	0.3	< 0.046	< 0.038 UJ	< 0.04	< 0.18 UJ	< 0.036 UJ	< 0.035 UJ	< 0.19 UJ
Diethyl phthalate	mg/kg	8270	5100	51000	12.2	0.18 B	0.057 B	0.13 B	< 0.2 UJ	0.068 J	0.046 B	< 0.21 UJ
Dimethyl phthalate	mg/kg	8270	- -	- -	- -	< 0.051	< 0.043 UJ	< 0.045	< 0.19 UJ	< 0.04 UJ	< 0.039 UJ	< 0.21 UJ
Di-n-butyl phthalate	mg/kg	8270	630	6300	4.6	< 0.059	< 0.049 UJ	< 0.051	< 0.22 UJ	< 0.046 UJ	< 0.045 UJ	< 0.24 UJ
Di-n-octyl phthalate	mg/kg	8270	63	- -	114	< 0.049	< 0.041 UJ	< 0.043	< 0.19 UJ	< 0.039 UJ	< 0.038 UJ	< 0.2 UJ
Hexachlorobenzene	mg/kg	8270	0.21	0.22	0.26	< 0.0099	< 0.0083 UJ	< 0.0087	< 0.038 UJ	< 0.0079 UJ	< 0.0077 UJ	< 0.041 UJ
Hexachlorobutadiene	mg/kg	8270	1.2	1.3	0.0054	< 0.01	< 0.0087 UJ	< 0.0092	< 0.04 UJ	< 0.0083 UJ	< 0.0081 UJ	< 0.043 UJ
Hexachlorocyclopentadiene	mg/kg	8270	0.18	1.9	3.2	< 0.05	< 0.042 UJ	< 0.044	< 0.19 UJ	< 0.04 UJ	< 0.039 UJ	< 0.21 UJ
Hexachloroethane	mg/kg	8270	1.8	2	0.004	< 0.034	< 0.028 UJ	< 0.029	< 0.13 UJ	< 0.027 UJ	< 0.026 UJ	< 0.14 UJ
Isophorone	mg/kg	8270	570	570	0.52	< 0.035	< 0.029 UJ	< 0.031	< 0.13 UJ	< 0.028 UJ	< 0.027 UJ	< 0.14 UJ
Nitrobenzene	mg/kg	8270	5.1	5.5	0.00184	< 0.039	< 0.033 UJ	< 0.034	< 0.15 UJ	< 0.031 UJ	< 0.03 UJ	< 0.16 UJ
N-Nitrosodi-n-propylamine	mg/kg	8270	0.078	0.078	0.000162	< 0.011	< 0.0092 UJ	< 0.0096	< 0.042 UJ	< 0.0087 UJ	< 0.0085 UJ	< 0.045 UJ
N-Nitrosodiphenylamine	mg/kg	8270	110	110	1.34	< 0.043	< 0.036 UJ	< 0.038	< 0.17 UJ	< 0.034 UJ	< 0.033 UJ	< 0.18 UJ
Pentachlorophenol	mg/kg	8270	1	1	0.028	< 0.042	< 0.035 UJ	< 0.037	< 0.16 UJ	< 0.033 UJ	< 0.032 UJ	< 0.17 UJ
Phenol	mg/kg	8270	1900	19000	6.6	< 0.011	< 0.0092 UJ	< 0.0097	< 0.042 UJ	< 0.0087 UJ	< 0.0085 UJ	< 0.045 UJ
Polychlorinated Biphenyls												
PCB-1016	mg/kg	8082	0.41	5.5	0.26	< 0.0035	< 0.0029 UJ	< 0.003	< 0.0026 UJ	< 0.0028	< 0.0027 UJ	< 0.0028 UJ
PCB-1221	mg/kg	8082	0.2	0.26	0.0016	< 0.0045	< 0.0037 UJ	< 0.0039	< 0.0034 UJ	< 0.0035	< 0.0034 UJ	< 0.0036 UJ
PCB-1232	mg/kg	8082	0.17	0.22	0.0016	< 0.004	< 0.0033 UJ	< 0.0035	< 0.003 UJ	< 0.0032	< 0.0031 UJ	< 0.0033 UJ
PCB-1242	mg/kg	8082	0.23	0.31	0.024	< 0.0038	< 0.0032 UJ	< 0.0033	< 0.0029 UJ	< 0.003	< 0.0029 UJ	< 0.0031 UJ
PCB-1248	mg/kg	8082	0.23	0.31	0.024	< 0.0022	< 0.0018 UJ	< 0.0019	< 0.0017 UJ	< 0.0018	< 0.0017 UJ	< 0.0018 UJ
PCB-1254	mg/kg	8082	0.12	0.32	0.04	< 0.0033	0.011 J	< 0.0029	< 0.0025 UJ	< 0.0026	< 0.0026 UJ	< 0.0027 UJ
PCB-1260	mg/kg	8082	0.24	0.33	0.11	0.011 J	0.018 J	0.0082 J	0.0074 J	0.0036 J	0.0035 J	0.019 J
Inorganics												
Aluminum	mg/kg	6020	7700	77000	60000	5500 K	9300 K	26000 K	17000 K	16000 J	13000 K	21000 K
Antimony	mg/kg	6020	3.1	31	5.4	2.4 J	0.48 J	0.24 J	0.53 J	0.34 J	0.38 J	0.87 J
Arsenic	mg/kg	6020	0.68	0.43	5.8	5.1 L	3.3 K	1.8 L	4 K	1.7 K	2.8 K	***6.6*** K
Barium	mg/kg	6020	1500	15000	1640	110	150	160	260	220 J	190	160
Beryllium	mg/kg	6020	16	160	64	0.69 J	1.6	5.7	3.9	4 J	3.2	2.2
Cadmium	mg/kg	6020	7.1	37	7.6	5.1	2.1	1.3	6.6	4.5 J	5.7	6.8
Calcium	mg/kg	6020	- -	- -	- -	87000	120000	180000	110000	110000 J	110000	120000
Chromium [1]	mg/kg	6020	12000	120000	3600000	120	550	76	160	120 J	97	530
Cobalt	mg/kg	6020	2.3	23	0.54	***5.9***	***3.9***	***7.3***	***2.8***	***2.1*** J	***2.8***	***3.9***
Copper	mg/kg	6020	310	3100	920	58	58 K	18 B	41 K	30 J	43 K	56 K
Iron	mg/kg	6020	5500	55000	700	***140000***	***89000*** L	***31000***	***100000*** L	***92000*** J	***95000*** L	***160000*** L
Lead	mg/kg	6020	400	400	280	140	84	63	***440***	150 J	190	***500***
Magnesium	mg/kg	6020	- -	- -	- -	17000	31000	57000	27000	30000 J	27000	26000
Manganese [1]	mg/kg	6020	180	3500	56	***5800***	***11000***	***6600***	***6200***	***5000*** J	***3800***	***8900***
Mercury	mg/kg	7471	1.1	3.1	2	0.067 L	0.034 J	0.028 L	0.059	0.021 B	0.017 J	0.075
Nickel	mg/kg	6020	150	1500	52	23 K	14	8 K	16	15 K	14	19
Potassium	mg/kg	6020	- -	- -	- -	190	380 L	720	1500 L	1200 J	910 L	740 L
Selenium	mg/kg	6020	39	390	5.2	< 0.67	1.9 B	2.4 J	2.2 B	1.6 J	2.4 B	2.4 B
Silver	mg/kg	6020	39	390	1.6	0.41 J	0.23 J	< 0.047	***1.9***	0.89 J	1 J	***2***
Sodium	mg/kg	6020	- -	- -	- -	220	290	570	1200	1100 J	1100	860
Thallium	mg/kg	6020	0.078	0.78	2.8	0.071 J	0.045 J	< 0.024	0.066 J	0.034 B	0.027 J	0.058 J
Vanadium	mg/kg	6020	39	5.5	172	***180*** L	***230*** L	37 L	91 L	61 J	80 L	75 L
Zinc	mg/kg	6020	2300	23000	740	***890***	450 K	360 B	***2300*** K	***1200*** L	***1400*** K	***5100*** K
Other Parameters												
Cyanide, Total	mg/kg	9012	2.3	23	40	0.75	0.63	1.3	1.4	0.46 J	0.18 J	1.1
Percent Moisture	%	- -	- -	- -	- -	29	15	19	6.6	10	7.5	13

TABLE A-1
ANALYTICAL AND SCREENING RESULTS
SURFACE SOIL
CAA VIM AND VIIM
MINGO JUNCTION STEEL WORKS LLC - WEIRTON FACILITY

Constituent	Units	Analytical Method	Screening Criteria [1]			Sample Information [2]						
			Residential Soil RSL	Residential Soil De Minimis	*Protection of Groundwater RSL*	VII-SS-18(0-2) 10/22/2013	VII-SS-19(0-1) 11/25/2013	VII-SS-20(0-1) 11/25/2013	VII-SS-21(0-0.5) 11/25/2013	VII-SS-22(0-2) 11/25/2013	VII-SS-23(0-2) 11/25/2013	VII-SS-24(0-1) 11/25/2013
Volatile Organic Compounds												
Benzene	mg/kg	8260	1.2	1.2	0.052	< 0.00074 UJ	< 0.00073	< 0.00071	< 0.00074	< 0.00078	< 0.00083	< 0.00081
Toluene	mg/kg	8260	490	820	13.8	< 0.0008 UJ	< 0.00079	< 0.00076	< 0.0008	< 0.00084	< 0.0009	< 0.00088
Ethylbenzene	mg/kg	8260	5.8	6.2	15.6	< 0.00071 UJ	< 0.0007	< 0.00067	< 0.0007	< 0.00074	< 0.00079	< 0.00077
Xylenes, Total	mg/kg	8260	58	260	198	< 0.0025 UJ	< 0.0024	< 0.0023	< 0.0025	< 0.0026	< 0.0028	< 0.0027
1,1,1-Trichloroethane	mg/kg	8260	810	640	5.6	NA	< 0.00053	< 0.00051	< 0.00053	< 0.00056	< 0.0006	< 0.00059
1,1,2,2-Tetrachloroethane	mg/kg	8260	0.6	0.64	0.0006	NA	< 0.00078	< 0.00075	< 0.00079	< 0.00083	< 0.00089	< 0.00086
1,1,2-Trichloro-1,2,2-trifluoroethane	mg/kg	8260	670	910	52	NA	< 0.0012	< 0.0011	< 0.0012	< 0.0012	< 0.0013	< 0.0013
1,1,2-Trichloroethane	mg/kg	8260	0.15	1.2	0.032	NA	< 0.0009	< 0.00087	< 0.00091	< 0.00096	< 0.001	< 0.001
1,1-Dichloroethane	mg/kg	8260	3.6	3.8	0.0156	NA	< 0.00062	< 0.0006	< 0.00063	< 0.00066	< 0.00071	< 0.00069
1,1-Dichloroethene	mg/kg	8260	23	240	0.2	NA	< 0.00092	< 0.00089	< 0.00093	< 0.00098	< 0.001	< 0.001
1,2,4-Trichlorobenzene	mg/kg	8260	5.8	24	4	NA	< 0.00096	< 0.00092	< 0.00097	< 0.001	< 0.0011	< 0.0011
1,2-Dibromo-3-Chloropropane	mg/kg	8260	0.0053	0.0057	0.00172	NA	< 0.00081	< 0.00078	< 0.00082	< 0.00086	< 0.00093	< 0.0009
1,2-Dibromoethane (EDB)	mg/kg	8260	0.036	0.039	0.00028	NA	< 0.00093	< 0.0009	< 0.00095	< 0.00099	< 0.0011	< 0.001
1,2-Dichlorobenzene	mg/kg	8260	180	380	11.6	NA	< 0.00086	< 0.00083	< 0.00087	< 0.00092	< 0.00099	< 0.00096
1,2-Dichloroethane	mg/kg	8260	0.46	0.5	0.028	NA	< 0.00066	< 0.00064	< 0.00067	< 0.00071	< 0.00076	< 0.00074
1,2-Dichloroethene, Total	mg/kg	8260	- -	- -	- -	NA	< 0.0014	0.0018 J	< 0.0014	< 0.0015	0.0017 J	< 0.0015
cis-1,2-Dichloroethene	mg/kg	8260	16	17	0.42	NA	< 0.00076	< 0.00074	< 0.00077	< 0.00081	< 0.00087	< 0.00085
trans-1,2-Dichloroethene	mg/kg	8260	7	130	0.62	NA	0.0009 J	0.0018 J	< 0.00065	0.00076 J	0.0017 J	0.0014 J
1,2-Dichloropropane	mg/kg	8260	1.6	1.1	0.034	NA	< 0.00059	< 0.00057	< 0.0006	< 0.00062	< 0.00067	< 0.00065
cis-1,3-Dichloropropene [1]	mg/kg	8260	1.8	1.9	0.0034	NA	< 0.00073	< 0.00071	< 0.00074	< 0.00078	< 0.00084	< 0.00082
trans-1,3-Dichloropropene [1]	mg/kg	8260	1.8	1.9	0.0034	NA	< 0.00065	< 0.00063	< 0.00066	< 0.00069	< 0.00074	< 0.00072
1,3-Dichlorobenzene [1]	mg/kg	8260	2.6	2.8	1.44	NA	< 0.00071	< 0.00069	< 0.00072	< 0.00075	< 0.00081	< 0.00079
1,4-Dichlorobenzene	mg/kg	8260	2.6	2.8	1.44	NA	< 0.00069	< 0.00067	< 0.0007	< 0.00073	< 0.00079	< 0.00077
2-Butanone (MEK)	mg/kg	8260	2700	28000	2.4	NA	< 0.00096	< 0.00092	< 0.00097	< 0.001	< 0.0011	< 0.0011
2-Hexanone	mg/kg	8260	20	- -	0.0176	NA	< 0.00075	< 0.00072	< 0.00076	< 0.00079	< 0.00085	< 0.00083
4-Methyl-2-pentanone (MIBK)	mg/kg	8260	3300	3400	2.8	NA	< 0.00071	< 0.00068	< 0.00072	< 0.00075	< 0.00081	< 0.00078
Acetone	mg/kg	8260	6100	61000	5.8	NA	< 0.0054	0.0075 J	< 0.0055	0.01 J	< 0.0062	< 0.006
Bromoform	mg/kg	8260	19	20	0.42	NA	< 0.00048	< 0.00046	< 0.00048	< 0.00051	< 0.00055	< 0.00053
Bromomethane	mg/kg	8260	0.68	7.3	0.0038	NA	< 0.0008 R	< 0.00077 R	< 0.00081	< 0.00085 R	< 0.00091 R	< 0.00089 R
Carbon disulfide	mg/kg	8260	77	740	0.48	NA	< 0.00055	< 0.00054	< 0.00056	< 0.00059	< 0.00063	< 0.00062
Carbon tetrachloride	mg/kg	8260	0.65	0.7	0.038	NA	< 0.00048	< 0.00047	< 0.00049	< 0.00051	< 0.00055	< 0.00054
Chlorobenzene	mg/kg	8260	28	290	1.36	NA	< 0.00082	< 0.00079	< 0.00083	< 0.00087	< 0.00094	< 0.00091
Chlorodibromomethane	mg/kg	8260	8.3	8.3	0.42	NA	< 0.00077	< 0.00074	< 0.00078	< 0.00082	< 0.00088	< 0.00085
Chloroethane	mg/kg	8260	1400	2100	11.8	NA	< 0.0017	< 0.0016	< 0.0017	< 0.0018	< 0.0019	< 0.0019
Chloroform	mg/kg	8260	0.32	0.34	0.44	NA	< 0.00063	0.00074 B	0.0007 B	0.00067 B	0.00074 B	< 0.0007
Chloromethane	mg/kg	8260	11	120	0.098	NA	< 0.00092	< 0.00089	< 0.00093	< 0.00098	< 0.0011	< 0.001
Cyclohexane	mg/kg	8260	650	120	26	NA	< 0.0004	< 0.00039	< 0.00041	< 0.00043	< 0.00046	< 0.00045
Dichlorobromomethane	mg/kg	8260	0.29	0.31	0.44	NA	< 0.00061	< 0.00059	< 0.00062	< 0.00065	< 0.00069	< 0.00068
Dichlorodifluoromethane	mg/kg	8260	8.7	94	0.6	NA	< 0.00072	< 0.0007	< 0.00073	< 0.00077	< 0.00082	< 0.0008
Isopropylbenzene	mg/kg	8260	190	270	1.48	NA	< 0.00074	< 0.00071	< 0.00074	< 0.00078	< 0.00084	< 0.00082
Methyl acetate	mg/kg	8260	7800	23000	8.2	NA	< 0.00098	< 0.00094	< 0.00099	< 0.001	< 0.0011	< 0.0011
Methyl tert-butyl ether	mg/kg	8260	47	50	0.064	NA	< 0.00081	< 0.00078	< 0.00082	< 0.00086	< 0.00092	< 0.0009
Methylcyclohexane [1]	mg/kg	8260	650	120	26	NA	< 0.00079	< 0.00076	< 0.00079	< 0.00083	< 0.0009	< 0.00087
Methylene Chloride	mg/kg	8260	35	58	0.054	NA	0.0039 B	0.0034 B	0.0023 B	0.0039 B	0.0036 B	0.0035 B
Styrene	mg/kg	8260	600	870	2.6	NA	< 0.00076	< 0.00074	< 0.00077	< 0.00081	< 0.00087	< 0.00085
Tetrachloroethene	mg/kg	8260	8.1	25	0.046	NA	< 0.00074	< 0.00071	< 0.00075	< 0.00078	< 0.00084	< 0.00082
Trichloroethene	mg/kg	8260	0.41	0.5	0.036	NA	< 0.00071	< 0.00069	< 0.00072	< 0.00076	< 0.00081	< 0.00079
Trichlorofluoromethane	mg/kg	8260	2300	790	6.6	NA	< 0.001	< 0.00096	< 0.001	< 0.0011	< 0.0011	< 0.0011
Vinyl chloride	mg/kg	8260	0.059	0.057	0.0138	NA	< 0.00051	< 0.00049	< 0.00051	< 0.00054	< 0.00058	< 0.00056

TABLE A-1
ANALYTICAL AND SCREENING RESULTS
SURFACE SOIL
CAA VIM AND VIIM
MINGO JUNCTION STEEL WORKS LLC - WEIRTON FACILITY

Constituent	Units	Analytical Method	Screening Criteria [1]			Sample Information [2]						
			Residential Soil RSL	Residential Soil De Minimis	*Protection of Groundwater RSL*	VII-SS-18(0-2) 10/22/2013	VII-SS-19(0-1) 11/25/2013	VII-SS-20(0-1) 11/25/2013	VII-SS-21(0-0.5) 11/25/2013	VII-SS-22(0-2) 11/25/2013	VII-SS-23(0-2) 11/25/2013	VII-SS-24(0-1) 11/25/2013
Semi-Volatile Organic Compounds												
Acenaphthene	mg/kg	8270	360	4100	11	< 0.007	< 0.035 UJ	0.0095 J	< 0.007 UJ	0.016 J	0.035 J	0.22 J
Acenaphthylene [1]	mg/kg	8270	360	4200	11	0.0095 J	< 0.041 UJ	< 0.008 UJ	< 0.0084 UJ	0.062 J	0.19 J	0.18 J
Anthracene	mg/kg	8270	1800	23000	116	0.011 J	< 0.035 UJ	0.043 J	0.028 J	0.12 J	0.22 J	0.43 J
Benzo[a]anthracene	mg/kg	8270	1.1	0.21	0.22	0.084	< 0.045 UJ	0.17 J	0.15 J	***0.69*** J	***0.36*** J	***1.2*** J
Benzo[a]pyrene	mg/kg	8270	0.11	0.016	4.8	0.1	< 0.036 UJ	0.18 J	0.15 J	0.31 J	0.41 J	0.6 J
Benzo[b]fluoranthene	mg/kg	8270	1.1	0.16	6	0.13	< 0.057 UJ	0.19 J	0.2 J	0.87 J	0.69 J	1.4 J
Benzo[g,h,i]perylene [1]	mg/kg	8270	180	1800	26	0.093	< 0.036 UJ	0.18 J	0.2 J	0.24 J	0.53 J	0.69 J
Benzo[k]fluoranthene	mg/kg	8270	11	1.6	58	0.048 J	< 0.073 UJ	0.074 J	0.075 J	0.45 J	0.31 J	0.42 J
Chrysene	mg/kg	8270	110	16	180	0.083	< 0.043 UJ	0.25 J	0.2 J	1.1 J	0.54 J	1.4 J
Dibenz(a,h)anthracene	mg/kg	8270	0.11	0.016	1.92	< 0.0081	< 0.04 UJ	0.046 J	0.052 J	0.059 J	0.12 J	0.15 J
Fluoranthene	mg/kg	8270	240	2400	178	0.076	< 0.039 UJ	0.28 J	0.18 J	0.69 J	0.74 J	3.5 J
Fluorene	mg/kg	8270	240	2900	10.8	< 0.0097	< 0.048 UJ	< 0.0092 UJ	< 0.0096 UJ	< 0.01 UJ	0.016 J	0.093 J
Indeno[1,2,3-cd]pyrene	mg/kg	8270	1.1	0.16	19.6	0.071 J	< 0.037 UJ	0.12 J	0.12 J	0.25 J	0.45 J	0.58 J
Naphthalene	mg/kg	8270	2	4.1	0.0076	0.0076 J	< 0.031 UJ	< 0.006 UJ	< 0.0063 UJ	< 0.0066 UJ	< 0.0071 UJ	***0.51*** J
Phenanthrene [1]	mg/kg	8270	1800	23000	116	0.041 J	< 0.058 UJ	0.14 J	0.077 J	0.092 J	0.05 J	1.6 J
Pyrene	mg/kg	8270	180	2300	26	0.11 J	< 0.037 UJ	0.27 J	0.17 J	3.1 J	1.1 J	3.3 J
1,1'-Biphenyl	mg/kg	8270	4.7	51	0.0174	NA	< 0.16 UJ	< 0.031 UJ	< 0.033 UJ	< 0.034 UJ	< 0.037 UJ	***0.087*** J
2,4,5-Trichlorophenol	mg/kg	8270	630	6300	8	NA	< 0.19 UJ	< 0.037 UJ	< 0.039 UJ	< 0.041 UJ	< 0.044 UJ	< 0.043 UJ
2,4,6-Trichlorophenol	mg/kg	8270	6.3	49	0.024	NA	< 0.27 UJ	< 0.052 UJ	< 0.055 UJ	< 0.057 UJ	< 0.061 UJ	< 0.06 UJ
2,4-Dichlorophenol	mg/kg	8270	19	190	0.046	NA	< 0.036 UJ	< 0.007 UJ	< 0.0073 UJ	< 0.0077 UJ	< 0.0082 UJ	< 0.0081 UJ
2,4-Dimethylphenol	mg/kg	8270	130	1300	0.84	NA	< 0.28 UJ	< 0.055 UJ	< 0.057 UJ	< 0.06 UJ	< 0.064 UJ	< 0.063 UJ
2,4-Dinitrophenol	mg/kg	8270	13	130	0.088	NA	< 2.2 UJ	< 0.42 UJ	< 0.44 UJ	< 0.45 UJ	< 0.49 UJ	< 0.48 UJ
2,4-Dinitrotoluene	mg/kg	8270	1.7	1.7	0.0064	NA	< 0.15 UJ	< 0.028 UJ	< 0.03 UJ	< 0.031 UJ	< 0.033 UJ	< 0.032 UJ
2,6-Dinitrotoluene	mg/kg	8270	0.36	0.36	0.00134	NA	< 0.19 UJ	< 0.036 UJ	< 0.038 UJ	< 0.039 UJ	< 0.042 UJ	< 0.041 UJ
2-Chloronaphthalene	mg/kg	8270	480	5000	7.8	NA	< 0.038 UJ	< 0.0073 UJ	< 0.0076 UJ	< 0.008 UJ	< 0.0086 UJ	< 0.0084 UJ
2-Chlorophenol	mg/kg	8270	39	340	0.178	NA	< 0.15 UJ	< 0.029 UJ	< 0.03 UJ	< 0.031 UJ	< 0.034 UJ	< 0.033 UJ
2-Methylnaphthalene	mg/kg	8270	24	310	0.38	NA	< 0.033 UJ	0.049 J	0.026 J	< 0.0069 UJ	< 0.0074 UJ	0.21 J
2-Methylphenol	mg/kg	8270	320	3200	1.5	NA	< 0.13 UJ	< 0.024 UJ	< 0.026 UJ	< 0.027 UJ	< 0.029 UJ	< 0.028 UJ
2-Nitroaniline	mg/kg	8270	63	630	0.16	NA	< 0.81 UJ	< 0.16 UJ	< 0.16 UJ	< 0.17 UJ	< 0.18 UJ	< 0.18 UJ
2-Nitrophenol	mg/kg	8270	- -	- -	- -	NA	< 0.2 UJ	< 0.039 UJ	< 0.04 UJ	< 0.042 UJ	< 0.045 UJ	< 0.044 UJ
3,3'-Dichlorobenzidine	mg/kg	8270	1.2	1.2	0.0164	NA	< 0.19 UJ	< 0.037 UJ	< 0.039 UJ	< 0.04 UJ	< 0.043 UJ	< 0.042 UJ
Methylphenol, 3 & 4 [1]	mg/kg	8270	320	3200	1.48	NA	< 0.18 UJ	< 0.034 UJ	< 0.036 UJ	< 0.037 UJ	< 0.04 UJ	< 0.039 UJ
3-Nitroaniline	mg/kg	8270	- -	- -	- -	NA	< 0.74 UJ	< 0.14 UJ	< 0.15 UJ	< 0.16 UJ	< 0.17 UJ	< 0.17 UJ
4,6-Dinitro-2-methylphenol	mg/kg	8270	0.51	- -	0.0052	NA	< 0.73 UJ	< 0.14 UJ	< 0.15 UJ	< 0.15 UJ	< 0.16 UJ	< 0.16 UJ
4-Bromophenyl phenyl ether	mg/kg	8270	- -	- -	- -	NA	< 0.16 UJ	< 0.03 UJ	< 0.032 UJ	< 0.033 UJ	< 0.036 UJ	< 0.035 UJ
4-Chloro-3-methylphenol	mg/kg	8270	630	- -	3.4	NA	< 0.17 UJ	< 0.032 UJ	< 0.034 UJ	< 0.035 UJ	< 0.038 UJ	< 0.037 UJ
4-Chloroaniline	mg/kg	8270	2.7	2.7	0.0032	NA	< 0.14 UJ	< 0.028 UJ	< 0.029 UJ	< 0.031 UJ	< 0.033 UJ	< 0.032 UJ
4-Chlorophenyl phenyl ether	mg/kg	8270	- -	- -	- -	NA	< 0.2 UJ	< 0.039 UJ	< 0.041 UJ	< 0.042 UJ	< 0.046 UJ	< 0.045 UJ
4-Nitroaniline	mg/kg	8270	25	- -	0.032	NA	< 0.73 UJ	< 0.14 UJ	< 0.15 UJ	< 0.15 UJ	< 0.17 UJ	< 0.16 UJ
4-Nitrophenol	mg/kg	8270	- -	- -	- -	NA	< 0.66 UJ	< 0.13 UJ	< 0.13 UJ	< 0.14 UJ	< 0.15 UJ	< 0.15 UJ
Acetophenone	mg/kg	8270	780	2500	1.16	NA	< 0.15 UJ	< 0.029 UJ	< 0.03 UJ	< 0.031 UJ	< 0.034 UJ	< 0.033 UJ
Atrazine	mg/kg	8270	2.4	2.4	0.038	NA	< 0.18 UJ	< 0.034 UJ	< 0.036 UJ	< 0.037 UJ	< 0.04 UJ	< 0.039 UJ
Benzaldehyde	mg/kg	8270	170	1200	0.082	NA	< 0.27 UJ	< 0.052 UJ	< 0.055 UJ	< 0.057 UJ	< 0.061 UJ	< 0.06 UJ
Bis(2-chloroisopropyl)ether	mg/kg	8270	310	5.1	0.52	NA	< 0.039 UJ	< 0.0076 UJ	< 0.0079 UJ	< 0.0082 UJ	< 0.0088 UJ	< 0.0087 UJ
Bis(2-chloroethoxy)methane	mg/kg	8270	19	- -	0.026	NA	< 0.12 UJ	< 0.023 UJ	< 0.024 UJ	< 0.025 UJ	< 0.027 UJ	< 0.026 UJ
Bis(2-chloroethyl)ether	mg/kg	8270	0.23	0.24	0.000072	NA	< 0.049 UJ	< 0.0094 UJ	< 0.0098 UJ	< 0.01 UJ	< 0.011 UJ	< 0.011 UJ
Bis(2-ethylhexyl) phthalate	mg/kg	8270	39	39	28	NA	< 0.29 UJ	< 0.057 UJ	< 0.059 UJ	< 0.062 UJ	< 0.066 UJ	< 0.065 UJ
Butyl benzyl phthalate	mg/kg	8270	290	290	4.8	NA	< 0.25 UJ	< 0.048 UJ	< 0.05 UJ	< 0.052 UJ	< 0.056 UJ	< 0.055 UJ
Caprolactam	mg/kg	8270	3100	31000	5	NA	< 1.4 UJ	< 0.26 UJ	< 0.28 UJ	< 0.29 UJ	< 0.31 UJ	< 0.3 UJ
Carbazole [1]	mg/kg	8270	1800	23000	116	NA	< 0.033 UJ	< 0.0065 UJ	< 0.0067 UJ	0.03 J	0.034 J	0.098 J

TABLE A-1
ANALYTICAL AND SCREENING RESULTS
SURFACE SOIL
CAA VIM AND VIIM
MINGO JUNCTION STEEL WORKS LLC - WEIRTON FACILITY

Constituent	Units	Analytical Method	Screening Criteria [1] Residential Soil RSL	Residential Soil De Minimis	*Protection of Groundwater RSL*	Sample Information [2] VII-SS-18(0-2) 10/22/2013	VII-SS-19(0-1) 11/25/2013	VII-SS-20(0-1) 11/25/2013	VII-SS-21(0-0.5) 11/25/2013	VII-SS-22(0-2) 11/25/2013	VII-SS-23(0-2) 11/25/2013	VII-SS-24(0-1) 11/25/2013
Dibenzofuran	mg/kg	8270	7.8	78	0.3	NA	< 0.18 UJ	< 0.034 UJ	< 0.036 UJ	< 0.038 UJ	< 0.04 UJ	0.29 J
Diethyl phthalate	mg/kg	8270	5100	51000	12.2	NA	< 0.2 UJ	< 0.038 UJ	0.11 B	0.043 B	< 0.045 UJ	< 0.044 UJ
Dimethyl phthalate	mg/kg	8270	- -	- -	- -	NA	< 0.2 UJ	< 0.038 UJ	< 0.04 UJ	< 0.042 UJ	< 0.045 UJ	< 0.044 UJ
Di-n-butyl phthalate	mg/kg	8270	630	6300	4.6	NA	< 0.23 UJ	< 0.044 UJ	< 0.046 UJ	< 0.048 UJ	< 0.051 UJ	< 0.05 UJ
Di-n-octyl phthalate	mg/kg	8270	63	- -	114	NA	< 0.19 UJ	< 0.037 UJ	< 0.039 UJ	< 0.04 UJ	< 0.043 UJ	< 0.042 UJ
Hexachlorobenzene	mg/kg	8270	0.21	0.22	0.26	NA	< 0.039 UJ	< 0.0075 UJ	< 0.0078 UJ	< 0.0081 UJ	< 0.0087 UJ	< 0.0086 UJ
Hexachlorobutadiene	mg/kg	8270	1.2	1.3	0.0054	NA	< 0.04 UJ	< 0.0078 UJ	< 0.0082 UJ	< 0.0085 UJ	< 0.0092 UJ	< 0.009 UJ
Hexachlorocyclopentadiene	mg/kg	8270	0.18	1.9	3.2	NA	< 0.2 UJ	< 0.038 UJ	< 0.039 UJ	< 0.041 UJ	< 0.044 UJ	< 0.043 UJ
Hexachloroethane	mg/kg	8270	1.8	2	0.004	NA	< 0.13 UJ	< 0.025 UJ	< 0.026 UJ	< 0.027 UJ	< 0.029 UJ	< 0.029 UJ
Isophorone	mg/kg	8270	570	570	0.52	NA	< 0.14 UJ	< 0.026 UJ	< 0.028 UJ	< 0.029 UJ	< 0.031 UJ	< 0.03 UJ
Nitrobenzene	mg/kg	8270	5.1	5.5	0.00184	NA	< 0.15 UJ	< 0.029 UJ	< 0.03 UJ	< 0.032 UJ	< 0.034 UJ	< 0.033 UJ
N-Nitrosodi-n-propylamine	mg/kg	8270	0.078	0.078	0.000162	NA	< 0.042 UJ	< 0.0082 UJ	< 0.0086 UJ	< 0.009 UJ	< 0.0096 UJ	< 0.0094 UJ
N-Nitrosodiphenylamine	mg/kg	8270	110	110	1.34	NA	< 0.17 UJ	< 0.032 UJ	< 0.034 UJ	< 0.035 UJ	< 0.038 UJ	< 0.037 UJ
Pentachlorophenol	mg/kg	8270	1	1	0.028	NA	< 0.16 UJ	< 0.031 UJ	< 0.033 UJ	< 0.034 UJ	< 0.037 UJ	< 0.036 UJ
Phenol	mg/kg	8270	1900	19000	6.6	NA	< 0.043 UJ	< 0.0083 UJ	< 0.0086 UJ	< 0.009 UJ	< 0.0097 UJ	< 0.0095 UJ
Polychlorinated Biphenyls												
PCB-1016	mg/kg	8082	0.41	5.5	0.26	NA	< 0.0027 UJ	< 0.0026 UJ	< 0.0027 UJ	< 0.0029 UJ	< 0.003 UJ	< 0.003 UJ
PCB-1221	mg/kg	8082	0.2	0.26	0.0016	NA	< 0.0034 UJ	< 0.0033 UJ	< 0.0035 UJ	< 0.0037 UJ	< 0.0039 UJ	< 0.0038 UJ
PCB-1232	mg/kg	8082	0.17	0.22	0.0016	NA	< 0.0031 UJ	< 0.003 UJ	< 0.0031 UJ	< 0.0033 UJ	< 0.0035 UJ	< 0.0034 UJ
PCB-1242	mg/kg	8082	0.23	0.31	0.024	NA	< 0.0029 UJ	< 0.0028 UJ	< 0.003 UJ	< 0.0031 UJ	< 0.0033 UJ	< 0.0033 UJ
PCB-1248	mg/kg	8082	0.23	0.31	0.024	NA	< 0.0017 UJ	< 0.0017 UJ	< 0.0017 UJ	< 0.0018 UJ	< 0.0019 UJ	< 0.0019 UJ
PCB-1254	mg/kg	8082	0.12	0.32	0.04	NA	< 0.0026 UJ	***0.29*** J	***0.21*** J	0.016 J	***0.041*** J	***0.45*** J
PCB-1260	mg/kg	8082	0.24	0.33	0.11	NA	< 0.0026 UJ	< 0.0025 UJ	***0.12*** J	< 0.0027 UJ	0.076 J	***0.29*** J
Inorganics												
Aluminum	mg/kg	6020	7700	77000	60000	NA	27000 K	12000 K	18000 K	4400 K	28000 K	25000 K
Antimony	mg/kg	6020	3.1	31	5.4	NA	< 0.028	0.14 J	0.23 J	0.85 J	1.6 J	***6.9***
Arsenic	mg/kg	6020	0.68	0.43	5.8	NA	0.75 K	5.6 K	2.2 K	1.9 K	< 0.22	< 0.22
Barium	mg/kg	6020	1500	15000	1640	NA	280	64	150	30	420	240
Beryllium	mg/kg	6020	16	160	64	NA	5.7	1	2.7	0.42 J	5.2	4.2
Cadmium	mg/kg	6020	7.1	37	7.6	NA	0.88 J	1.3	1.6	0.71 J	2.7	4.3
Calcium	mg/kg	6020	- -	- -	- -	NA	160000	110000	140000	67000	140000	92000
Chromium [1]	mg/kg	6020	12000	120000	3600000	NA	36	400	420	390	29	150
Cobalt	mg/kg	6020	2.3	23	0.54	NA	0.53 J	***5.4***	***4.9***	***9.1***	***2.2***	***4.1***
Copper	mg/kg	6020	310	3100	920	NA	66	22 K	33 K	110 K	37 K	110 K
Iron	mg/kg	6020	5500	55000	700	NA	***8200*** L	***64000*** L	***78000*** L	***430000*** L	***18000*** L	***38000*** L
Lead	mg/kg	6020	400	400	280	NA	7.7	23	27	9.5	190	***610***
Magnesium	mg/kg	6020	- -	- -	- -	NA	39000	34000	37000	18000	19000	18000
Manganese [1]	mg/kg	6020	180	3500	56	NA	***2900***	***11000***	***10000***	***8900***	***2400***	***1400***
Mercury	mg/kg	7471	1.1	3.1	2	NA	< 0.011	0.023 J	0.033	< 0.013	0.12	0.35
Nickel	mg/kg	6020	150	1500	52	NA	2.9	***88***	***63***	***60***	8.6	25
Potassium	mg/kg	6020	- -	- -	- -	NA	1100 L	250 L	460 L	100 L	1400 L	460 L
Selenium	mg/kg	6020	39	390	5.2	NA	1.4 B	1.3 B	1.5 B	1.4 B	0.81 B	0.98 B
Silver	mg/kg	6020	39	390	1.6	NA	0.079 J	0.57 J	0.68 J	0.065 J	0.14 J	0.53 J
Sodium	mg/kg	6020	- -	- -	- -	NA	830	230	320	130	2000	14000
Thallium	mg/kg	6020	0.078	0.78	2.8	NA	< 0.021	0.028 J	0.024 J	< 0.022	0.03 J	0.072 J
Vanadium	mg/kg	6020	39	5.5	172	NA	37 L	***230*** L	170 L	***400*** L	7.2 L	1.3 L
Zinc	mg/kg	6020	2300	23000	740	NA	320 K	130 K	150 K	110 K	***2000*** K	***2800*** K
Other Parameters												
Cyanide, Total	mg/kg	9012	2.3	23	40	NA	0.4 J	0.37 J	0.95	0.67	0.91	1.9
Percent Moisture	%	- -	- -	- -	- -	8.9	7.8	4.7	8.8	13	19	17

TABLE A-1
ANALYTICAL AND SCREENING RESULTS
SURFACE SOIL
CAA VIM AND VIIM
MINGO JUNCTION STEEL WORKS LLC - WEIRTON FACILITY

Constituent	Units	Analytical Method	Screening Criteria [1]			Sample Information [2]						
			Residential Soil RSL	Residential Soil De Minimis	*Protection of Groundwater RSL*	VII-SS-25(0.5-2) 12/9/2013	VII-SS-26(1.5-2) 12/9/2013	VII-SS-27(1.5-2) 12/9/2013	VII-SS-28(0-2) 10/28/2013	VII-SS-29(0-2) 11/25/2013	VII-SS-30(0-0.5) 11/25/2013	VII-SS-31(0-0.6) 11/25/2013
Volatile Organic Compounds												
Benzene	mg/kg	8260	1.2	1.2	0.052	< 0.00071	< 0.00079	< 0.00085	< 0.00078 UJ	< 0.00075	< 0.00075	< 0.00078
Toluene	mg/kg	8260	490	820	13.8	< 0.00077	< 0.00085	< 0.00092	0.0011 J	< 0.00081	0.0011 J	< 0.00084
Ethylbenzene	mg/kg	8260	5.8	6.2	15.6	< 0.00068	< 0.00075	< 0.00081	< 0.00074 UJ	< 0.00071	< 0.00072	< 0.00074
Xylenes, Total	mg/kg	8260	58	260	198	< 0.0024	< 0.0026	< 0.0028	< 0.0026 UJ	< 0.0025	< 0.0025	< 0.0026
1,1,1-Trichloroethane	mg/kg	8260	810	640	5.6	< 0.00051	< 0.00057	< 0.00062	< 0.00056 UJ	< 0.00054	< 0.00054	< 0.00056
1,1,2,2-Tetrachloroethane	mg/kg	8260	0.6	0.64	0.0006	< 0.00076	< 0.00084	< 0.00091	< 0.00083 UJ	< 0.0008	< 0.0008	< 0.00082
1,1,2-Trichloro-1,2,2-trifluoroethane	mg/kg	8260	670	910	52	< 0.0011	< 0.0012	< 0.0014	< 0.0012 UJ	< 0.0012	< 0.0012	< 0.0012
1,1,2-Trichloroethane	mg/kg	8260	0.15	1.2	0.032	< 0.00088	< 0.00097	< 0.0011	< 0.00096 UJ	< 0.00092	< 0.00093	< 0.00095
1,1-Dichloroethane	mg/kg	8260	3.6	3.8	0.0156	< 0.00061	< 0.00067	< 0.00073	< 0.00066 UJ	< 0.00064	< 0.00064	< 0.00066
1,1-Dichloroethene	mg/kg	8260	23	240	0.2	< 0.00089	< 0.00099	< 0.0011	< 0.00098 UJ	< 0.00094	< 0.00095	< 0.00097
1,2,4-Trichlorobenzene	mg/kg	8260	5.8	24	4	< 0.00093	< 0.001	< 0.0011	< 0.001 UJ	< 0.00098	< 0.00098	< 0.001
1,2-Dibromo-3-Chloropropane	mg/kg	8260	0.0053	0.0057	0.00172	< 0.00079	< 0.00087	< 0.00095	< 0.00087 UJ	< 0.00083	< 0.00084	< 0.00086
1,2-Dibromoethane (EDB)	mg/kg	8260	0.036	0.039	0.00028	< 0.00091	< 0.001	< 0.0011	< 0.001 UJ	< 0.00096	< 0.00096	< 0.00099
1,2-Dichlorobenzene	mg/kg	8260	180	380	11.6	< 0.00084	< 0.00093	< 0.001	0.0013 J	< 0.00088	< 0.00089	< 0.00092
1,2-Dichloroethane	mg/kg	8260	0.46	0.5	0.028	< 0.00065	< 0.00072	< 0.00078	< 0.00071 UJ	< 0.00068	< 0.00068	< 0.0007
1,2-Dichloroethene, Total	mg/kg	8260	- -	- -	- -	< 0.0013	< 0.0015	< 0.0016	< 0.0015 UJ	< 0.0014	0.0016 J	< 0.0015
cis-1,2-Dichloroethene	mg/kg	8260	16	17	0.42	< 0.00074	< 0.00082	< 0.00089	< 0.00081 UJ	< 0.00078	< 0.00079	< 0.00081
trans-1,2-Dichloroethene	mg/kg	8260	7	130	0.62	< 0.00063	< 0.0007	< 0.00075	< 0.00069 UJ	< 0.00066	0.0016 J	0.0012 J
1,2-Dichloropropane	mg/kg	8260	1.6	1.1	0.034	< 0.00057	< 0.00063	< 0.00069	< 0.00063 UJ	< 0.0006	< 0.00061	< 0.00062
cis-1,3-Dichloropropene [1]	mg/kg	8260	1.8	1.9	0.0034	< 0.00071	< 0.00079	< 0.00086	< 0.00078 UJ	< 0.00075	< 0.00076	< 0.00078
trans-1,3-Dichloropropene [1]	mg/kg	8260	1.8	1.9	0.0034	< 0.00063	< 0.0007	< 0.00076	< 0.00069 UJ	< 0.00066	< 0.00067	< 0.00069
1,3-Dichlorobenzene [1]	mg/kg	8260	2.6	2.8	1.44	< 0.00069	< 0.00077	< 0.00083	< 0.00076 UJ	< 0.00073	< 0.00073	< 0.00075
1,4-Dichlorobenzene	mg/kg	8260	2.6	2.8	1.44	< 0.00067	< 0.00074	< 0.00081	< 0.00074 UJ	< 0.0007	< 0.00071	< 0.00073
2-Butanone (MEK)	mg/kg	8260	2700	28000	2.4	< 0.00093	< 0.001	< 0.0011	< 0.001 UJ	< 0.00098	0.01	< 0.001
2-Hexanone	mg/kg	8260	20	- -	0.0176	< 0.00073	< 0.00081	< 0.00087	< 0.0008 UJ	< 0.00076	< 0.00077	< 0.00079
4-Methyl-2-pentanone (MIBK)	mg/kg	8260	3300	3400	2.8	< 0.00069	< 0.00076	< 0.00083	< 0.00075 UJ	< 0.00072	< 0.00073	< 0.00075
Acetone	mg/kg	8260	6100	61000	5.8	< 0.0053	< 0.0058	< 0.0063	0.015 J	< 0.0055	0.062	< 0.0057
Bromoform	mg/kg	8260	19	20	0.42	< 0.00047	< 0.00052	< 0.00056	< 0.00051 UJ	< 0.00049	< 0.00049	< 0.00051
Bromomethane	mg/kg	8260	0.68	7.3	0.0038	< 0.00078 R	< 0.00086 R	< 0.00094 R	< 0.00085 UJ	< 0.00082 R	< 0.00083 R	< 0.00085 R
Carbon disulfide	mg/kg	8260	77	740	0.48	< 0.00054	< 0.0006	0.0013 J	< 0.00059 UJ	< 0.00057	0.016	< 0.00059
Carbon tetrachloride	mg/kg	8260	0.65	0.7	0.038	< 0.00047	< 0.00052	< 0.00057	< 0.00052 UJ	< 0.00049	< 0.0005	< 0.00051
Chlorobenzene	mg/kg	8260	28	290	1.36	< 0.0008	< 0.00088	< 0.00096	< 0.00088 UJ	< 0.00084	< 0.00085	< 0.00087
Chlorodibromomethane	mg/kg	8260	8.3	8.3	0.42	< 0.00075	< 0.00083	< 0.0009	< 0.00082 UJ	< 0.00079	< 0.00079	< 0.00081
Chloroethane	mg/kg	8260	1400	2100	11.8	< 0.0016	< 0.0018	< 0.002 R	< 0.0018 UJ	< 0.0017	< 0.0017	< 0.0018
Chloroform	mg/kg	8260	0.32	0.34	0.44	0.00086 B	0.00073 B	< 0.00074	0.00098 J	0.00082 B	0.00082 B	< 0.00067
Chloromethane	mg/kg	8260	11	120	0.098	< 0.0009	< 0.001	< 0.0011	< 0.00098 UJ	< 0.00094	< 0.00095	< 0.00098
Cyclohexane	mg/kg	8260	650	120	26	< 0.00039	< 0.00043	< 0.00047	< 0.00043 UJ	< 0.00041	< 0.00041	< 0.00043
Dichlorobromomethane	mg/kg	8260	0.29	0.31	0.44	< 0.00059	< 0.00066	< 0.00071	< 0.00065 UJ	< 0.00062	< 0.00063	< 0.00064
Dichlorodifluoromethane	mg/kg	8260	8.7	94	0.6	< 0.0007	< 0.00078	< 0.00084	< 0.00077 UJ	< 0.00074	< 0.00074	< 0.00076
Isopropylbenzene	mg/kg	8260	190	270	1.48	< 0.00071	< 0.00079	< 0.00086	< 0.00078 UJ	< 0.00075	< 0.00076	< 0.00078
Methyl acetate	mg/kg	8260	7800	23000	8.2	< 0.00095	< 0.0011	< 0.0011	< 0.001 UJ	< 0.001	< 0.001	< 0.001
Methyl tert-butyl ether	mg/kg	8260	47	50	0.064	< 0.00079	< 0.00087	< 0.00095	< 0.00086 UJ	< 0.00083	< 0.00084	< 0.00086
Methylcyclohexane [1]	mg/kg	8260	650	120	26	< 0.00076	< 0.00085	< 0.00092	< 0.00084 UJ	< 0.0008	< 0.00081	< 0.00083
Methylene Chloride	mg/kg	8260	35	58	0.054	0.00097 B	0.00087 B	0.0033 B	0.0053 B	0.0012 B	0.0046 B	0.0054 B
Styrene	mg/kg	8260	600	870	2.6	< 0.00074	< 0.00082	< 0.00089	< 0.00082 UJ	< 0.00078	< 0.00079	< 0.00081
Tetrachloroethene	mg/kg	8260	8.1	25	0.046	< 0.00072	< 0.0008	< 0.00086	< 0.00079 UJ	< 0.00075	< 0.00076	< 0.00078
Trichloroethene	mg/kg	8260	0.41	0.5	0.036	< 0.00069	< 0.00077	< 0.00083	< 0.00076 UJ	< 0.00073	< 0.00073	< 0.00076
Trichlorofluoromethane	mg/kg	8260	2300	790	6.6	< 0.00097	< 0.0011	< 0.0012	< 0.0011 UJ	< 0.001	< 0.001	< 0.0011
Vinyl chloride	mg/kg	8260	0.059	0.057	0.0138	< 0.00049	< 0.00055	< 0.00059	< 0.00054 UJ	< 0.00052	< 0.00052	< 0.00054

TABLE A-1
ANALYTICAL AND SCREENING RESULTS
SURFACE SOIL
CAA VIM AND VIIM
MINGO JUNCTION STEEL WORKS LLC - WEIRTON FACILITY

Constituent	Units	Analytical Method	Screening Criteria [1]			Sample Information [2]						
			Residential Soil RSL	Residential Soil De Minimis	*Protection of Groundwater RSL*	VII-SS-25(0.5-2) 12/9/2013	VII-SS-26(1.5-2) 12/9/2013	VII-SS-27(1.5-2) 12/9/2013	VII-SS-28(0-2) 10/28/2013	VII-SS-29(0-2) 11/25/2013	VII-SS-30(0-0.5) 11/25/2013	VII-SS-31(0-0.6) 11/25/2013
Semi-Volatile Organic Compounds												
Acenaphthene	mg/kg	8270	360	4100	11	< 0.0068 UJ	< 0.0075 UJ	< 0.0081 UJ	0.036 J	< 0.0071 UJ	< 0.0071 UJ	< 0.0074 UJ
Acenaphthylene [1]	mg/kg	8270	360	4200	11	< 0.0081 UJ	0.023 J	< 0.0096 UJ	0.017 J	< 0.0085 UJ	< 0.0085 UJ	0.028 J
Anthracene	mg/kg	8270	1800	23000	116	< 0.0069 UJ	< 0.0076 UJ	0.015 J	0.029 J	0.0091 J	< 0.0073 UJ	0.051 J
Benzo[a]anthracene	mg/kg	8270	1.1	0.21	0.22	< 0.0088 UJ	0.068 J	< 0.011 UJ	0.074 J	0.04 J	0.025 J	0.043 J
Benzo[a]pyrene	mg/kg	8270	0.11	0.016	4.8	< 0.0071 UJ	0.071 J	< 0.0084 UJ	0.094 J	< 0.0074 UJ	< 0.0074 UJ	< 0.0077 UJ
Benzo[b]fluoranthene	mg/kg	8270	1.1	0.16	6	< 0.011 UJ	0.11 J	0.022 J	0.073 J	< 0.012 UJ	< 0.012 UJ	< 0.012 UJ
Benzo[g,h,i]perylene [1]	mg/kg	8270	180	1800	26	< 0.007 UJ	0.086 J	< 0.0084 UJ	0.08 J	< 0.0074 UJ	< 0.0074 UJ	0.052 J
Benzo[k]fluoranthene	mg/kg	8270	11	1.6	58	< 0.014 UJ	0.06 J	< 0.017 UJ	0.11 J	< 0.015 UJ	< 0.015 UJ	< 0.015 UJ
Chrysene	mg/kg	8270	110	16	180	< 0.0084 UJ	0.077 J	< 0.01 UJ	0.14 J	0.027 J	0.043 J	0.052 J
Dibenz(a,h)anthracene	mg/kg	8270	0.11	0.016	1.92	< 0.0078 UJ	< 0.0087 UJ	< 0.0094 UJ	0.037 J	< 0.0082 UJ	< 0.0082 UJ	< 0.0085 UJ
Fluoranthene	mg/kg	8270	240	2400	178	< 0.0075 UJ	0.088 J	0.056 J	0.13 J	0.046 J	0.072 J	0.053 J
Fluorene	mg/kg	8270	240	2900	10.8	< 0.0093 UJ	< 0.01 UJ	< 0.011 UJ	0.044 J	< 0.0098 UJ	< 0.0098 UJ	< 0.01 UJ
Indeno[1,2,3-cd]pyrene	mg/kg	8270	1.1	0.16	19.6	< 0.0073 UJ	0.072 J	< 0.0087 UJ	0.068 J	< 0.0076 UJ	< 0.0076 UJ	< 0.0079 UJ
Naphthalene	mg/kg	8270	2	4.1	0.0076	< 0.0061 UJ	***0.11*** J	< 0.0073 UJ	***0.46*** J	***0.049*** J	< 0.0064 UJ	***0.043*** J
Phenanthrene [1]	mg/kg	8270	1800	23000	116	< 0.011 UJ	0.044 J	0.063 J	0.45 J	0.05 J	0.039 J	0.05 J
Pyrene	mg/kg	8270	180	2300	26	< 0.0071 UJ	0.089 J	0.048 J	0.14 J	0.037 J	0.078 J	0.036 J
1,1'-Biphenyl	mg/kg	8270	4.7	51	0.0174	< 0.031 UJ	< 0.035 UJ	< 0.038 UJ	***0.066*** J	< 0.033 UJ	< 0.033 UJ	< 0.034 UJ
2,4,5-Trichlorophenol	mg/kg	8270	630	6300	8	< 0.038 UJ	< 0.042 UJ	< 0.045 UJ	< 0.041 UJ	< 0.039 UJ	< 0.04 UJ	< 0.041 UJ
2,4,6-Trichlorophenol	mg/kg	8270	6.3	49	0.024	< 0.053 UJ	< 0.058 UJ	< 0.063 UJ	< 0.058 UJ	< 0.055 UJ	< 0.055 UJ	< 0.057 UJ
2,4-Dichlorophenol	mg/kg	8270	19	190	0.046	< 0.0071 UJ	< 0.0078 UJ	< 0.0084 UJ	< 0.0078 UJ	< 0.0074 UJ	< 0.0074 UJ	< 0.0077 UJ
2,4-Dimethylphenol	mg/kg	8270	130	1300	0.84	< 0.055 UJ	< 0.061 UJ	< 0.066 UJ	< 0.061 UJ	< 0.058 UJ	< 0.058 UJ	< 0.06 UJ
2,4-Dinitrophenol	mg/kg	8270	13	130	0.088	< 0.42 UJ	< 0.46 UJ	< 0.5 UJ	< 0.46 UJ	< 0.44 UJ	< 0.44 UJ	< 0.46 UJ
2,4-Dinitrotoluene	mg/kg	8270	1.7	1.7	0.0064	< 0.028 UJ	< 0.031 UJ	< 0.034 UJ	< 0.031 UJ	< 0.03 UJ	< 0.03 UJ	< 0.031 UJ
2,6-Dinitrotoluene	mg/kg	8270	0.36	0.36	0.00134	< 0.036 UJ	< 0.04 UJ	< 0.043 UJ	< 0.04 UJ	< 0.038 UJ	< 0.038 UJ	< 0.04 UJ
2-Chloronaphthalene	mg/kg	8270	480	5000	7.8	< 0.0074 UJ	< 0.0081 UJ	< 0.0088 UJ	< 0.0081 UJ	< 0.0077 UJ	< 0.0077 UJ	< 0.008 UJ
2-Chlorophenol	mg/kg	8270	39	340	0.178	< 0.029 UJ	< 0.032 UJ	< 0.034 UJ	< 0.032 UJ	< 0.03 UJ	< 0.03 UJ	< 0.031 UJ
2-Methylnaphthalene	mg/kg	8270	24	310	0.38	< 0.0063 UJ	0.11 J	0.016 J	***0.69*** J	0.064 J	0.0081 J	0.053 J
2-Methylphenol	mg/kg	8270	320	3200	1.5	< 0.025 UJ	< 0.027 UJ	< 0.029 UJ	< 0.027 UJ	< 0.026 UJ	< 0.026 UJ	< 0.027 UJ
2-Nitroaniline	mg/kg	8270	63	630	0.16	< 0.16 UJ	< 0.17 UJ	< 0.19 UJ	< 0.17 UJ	< 0.17 UJ	< 0.17 UJ	< 0.17 UJ
2-Nitrophenol	mg/kg	8270	- -	- -	- -	< 0.039 UJ	< 0.043 UJ	< 0.046 UJ	< 0.043 UJ	< 0.041 UJ	< 0.041 UJ	< 0.042 UJ
3,3'-Dichlorobenzidine	mg/kg	8270	1.2	1.2	0.0164	< 0.037 UJ	< 0.041 UJ	< 0.044 UJ	< 0.041 UJ	< 0.039 UJ	< 0.039 UJ	< 0.041 UJ
Methylphenol, 3 & 4 [1]	mg/kg	8270	320	3200	1.48	< 0.035 UJ	< 0.038 UJ	< 0.041 UJ	0.11 J	< 0.036 UJ	< 0.036 UJ	< 0.038 UJ
3-Nitroaniline	mg/kg	8270	- -	- -	- -	< 0.15 UJ	< 0.16 UJ	< 0.17 UJ	< 0.16 UJ	< 0.15 UJ	< 0.15 UJ	< 0.16 UJ
4,6-Dinitro-2-methylphenol	mg/kg	8270	0.51	- -	0.0052	< 0.14 UJ	< 0.16 UJ	< 0.17 UJ	< 0.16 UJ	< 0.15 UJ	< 0.15 UJ	< 0.15 UJ
4-Bromophenyl phenyl ether	mg/kg	8270	- -	- -	- -	< 0.031 UJ	< 0.034 UJ	< 0.037 UJ	< 0.034 UJ	< 0.032 UJ	< 0.032 UJ	< 0.033 UJ
4-Chloro-3-methylphenol	mg/kg	8270	630	- -	3.4	< 0.032 UJ	< 0.036 UJ	< 0.039 UJ	< 0.036 UJ	< 0.034 UJ	< 0.034 UJ	< 0.035 UJ
4-Chloroaniline	mg/kg	8270	2.7	2.7	0.0032	< 0.028 UJ	< 0.031 UJ	< 0.034 UJ	< 0.031 UJ	< 0.03 UJ	< 0.03 UJ	< 0.031 UJ
4-Chlorophenyl phenyl ether	mg/kg	8270	- -	- -	- -	< 0.039 UJ	< 0.043 UJ	< 0.047 UJ	< 0.043 UJ	< 0.041 UJ	< 0.041 UJ	< 0.043 UJ
4-Nitroaniline	mg/kg	8270	25	- -	0.032	< 0.14 UJ	< 0.16 UJ	< 0.17 UJ	< 0.16 UJ	< 0.15 UJ	< 0.15 UJ	< 0.16 UJ
4-Nitrophenol	mg/kg	8270	- -	- -	- -	< 0.13 UJ	< 0.14 UJ	< 0.15 UJ	< 0.14 UJ	< 0.13 UJ	< 0.14 UJ	< 0.14 UJ
Acetophenone	mg/kg	8270	780	2500	1.16	< 0.029 UJ	0.11 J	< 0.035 UJ	0.11 J	< 0.03 UJ	< 0.03 UJ	< 0.032 UJ
Atrazine	mg/kg	8270	2.4	2.4	0.038	< 0.034 UJ	< 0.038 UJ	< 0.041 UJ	< 0.038 UJ	< 0.036 UJ	< 0.036 UJ	< 0.037 UJ
Benzaldehyde	mg/kg	8270	170	1200	0.082	< 0.053 UJ	< 0.058 UJ	< 0.063 UJ	< 0.058 UJ	< 0.055 UJ	< 0.056 UJ	< 0.057 UJ
Bis(2-chloroisopropyl)ether	mg/kg	8270	310	5.1	0.52	< 0.0076 UJ	< 0.0084 UJ	< 0.0091 UJ	< 0.0084 UJ	< 0.008 UJ	< 0.008 UJ	< 0.0083 UJ
Bis(2-chloroethoxy)methane	mg/kg	8270	19	- -	0.026	< 0.023 UJ	< 0.026 UJ	< 0.028 UJ	< 0.026 UJ	< 0.024 UJ	< 0.024 UJ	< 0.025 UJ
Bis(2-chloroethyl)ether	mg/kg	8270	0.23	0.24	0.000072	< 0.0095 UJ	< 0.01 UJ	< 0.011 UJ	< 0.01 UJ	< 0.0099 UJ	< 0.0099 UJ	< 0.01 UJ
Bis(2-ethylhexyl) phthalate	mg/kg	8270	39	39	28	< 0.057 UJ	0.23 J	< 0.068 UJ	< 0.063 UJ	< 0.06 UJ	0.063 J	0.065 J
Butyl benzyl phthalate	mg/kg	8270	290	290	4.8	< 0.048 UJ	< 0.053 UJ	< 0.058 UJ	< 0.053 UJ	< 0.051 UJ	< 0.051 UJ	< 0.052 UJ
Caprolactam	mg/kg	8270	3100	31000	5	< 0.27 UJ	< 0.29 UJ	< 0.32 UJ	< 0.29 UJ	< 0.28 UJ	< 0.28 UJ	< 0.29 UJ
Carbazole [1]	mg/kg	8270	1800	23000	116	< 0.0065 UJ	< 0.0072 UJ	< 0.0078 UJ	0.041 J	0.011 J	< 0.0068 UJ	0.01 J

TABLE A-1
ANALYTICAL AND SCREENING RESULTS
SURFACE SOIL
CAA VIM AND VIIM
MINGO JUNCTION STEEL WORKS LLC - WEIRTON FACILITY

Constituent	Units	Analytical Method	Screening Criteria [1] Residential Soil RSL	Residential Soil De Minimis	*Protection of Groundwater RSL*	Sample Information [2] VII-SS-25(0.5-2) 12/9/2013	VII-SS-26(1.5-2) 12/9/2013	VII-SS-27(1.5-2) 12/9/2013	VII-SS-28(0-2) 10/28/2013	VII-SS-29(0-2) 11/25/2013	VII-SS-30(0-0.5) 11/25/2013	VII-SS-31(0-0.6) 11/25/2013
Dibenzofuran	mg/kg	8270	7.8	78	0.3	< 0.035 UJ	< 0.038 UJ	< 0.041 UJ	0.22 J	< 0.036 UJ	< 0.036 UJ	< 0.038 UJ
Diethyl phthalate	mg/kg	8270	5100	51000	12.2	0.067 J	0.053 J	0.14 J	< 0.042 UJ	0.048 B	0.076 B	0.048 B
Dimethyl phthalate	mg/kg	8270	- -	- -	- -	< 0.038 UJ	< 0.043 UJ	< 0.046 UJ	< 0.042 UJ	< 0.04 UJ	< 0.04 UJ	< 0.042 UJ
Di-n-butyl phthalate	mg/kg	8270	630	6300	4.6	< 0.044 UJ	< 0.049 UJ	< 0.053 UJ	< 0.049 UJ	< 0.046 UJ	< 0.046 UJ	< 0.048 UJ
Di-n-octyl phthalate	mg/kg	8270	63	- -	114	< 0.037 UJ	< 0.041 UJ	< 0.044 UJ	< 0.041 UJ	< 0.039 UJ	< 0.039 UJ	< 0.04 UJ
Hexachlorobenzene	mg/kg	8270	0.21	0.22	0.26	< 0.0075 UJ	< 0.0083 UJ	< 0.009 UJ	< 0.0083 UJ	< 0.0079 UJ	< 0.0079 UJ	< 0.0082 UJ
Hexachlorobutadiene	mg/kg	8270	1.2	1.3	0.0054	< 0.0079 UJ	< 0.0087 UJ	< 0.0094 UJ	< 0.0087 UJ	< 0.0083 UJ	< 0.0083 UJ	< 0.0086 UJ
Hexachlorocyclopentadiene	mg/kg	8270	0.18	1.9	3.2	< 0.038 UJ	< 0.042 UJ	< 0.045 UJ	< 0.042 UJ	< 0.04 UJ	< 0.04 UJ	< 0.041 UJ
Hexachloroethane	mg/kg	8270	1.8	2	0.004	< 0.025 UJ	< 0.028 UJ	< 0.03 UJ	< 0.028 UJ	< 0.027 UJ	< 0.027 UJ	< 0.028 UJ
Isophorone	mg/kg	8270	570	570	0.52	< 0.027 UJ	< 0.029 UJ	< 0.032 UJ	< 0.029 UJ	< 0.028 UJ	< 0.028 UJ	< 0.029 UJ
Nitrobenzene	mg/kg	8270	5.1	5.5	0.00184	< 0.029 UJ	< 0.032 UJ	< 0.035 UJ	< 0.032 UJ	< 0.031 UJ	< 0.031 UJ	< 0.032 UJ
N-Nitrosodi-n-propylamine	mg/kg	8270	0.078	0.078	0.000162	< 0.0083 UJ	< 0.0091 UJ	< 0.0099 UJ	< 0.0091 UJ	< 0.0087 UJ	< 0.0087 UJ	< 0.009 UJ
N-Nitrosodiphenylamine	mg/kg	8270	110	110	1.34	< 0.033 UJ	< 0.036 UJ	< 0.039 UJ	< 0.036 UJ	< 0.034 UJ	< 0.034 UJ	< 0.035 UJ
Pentachlorophenol	mg/kg	8270	1	1	0.028	< 0.032 UJ	< 0.035 UJ	< 0.038 UJ	< 0.035 UJ	< 0.033 UJ	< 0.033 UJ	< 0.034 UJ
Phenol	mg/kg	8270	1900	19000	6.6	< 0.0083 UJ	< 0.0092 UJ	< 0.0099 UJ	0.25 J	< 0.0087 UJ	0.13 J	< 0.0091 UJ
Polychlorinated Biphenyls												
PCB-1016	mg/kg	8082	0.41	5.5	0.26	< 0.0026	< 0.0029	< 0.0031	< 0.0029 UJ	< 0.0027 UJ	< 0.0028 UJ	< 0.0028 UJ
PCB-1221	mg/kg	8082	0.2	0.26	0.0016	< 0.0034	< 0.0037	< 0.004	< 0.0037 UJ	< 0.0035 UJ	< 0.0035 UJ	< 0.0037 UJ
PCB-1232	mg/kg	8082	0.17	0.22	0.0016	< 0.003	< 0.0033	< 0.0036	< 0.0033 UJ	< 0.0032 UJ	< 0.0032 UJ	< 0.0033 UJ
PCB-1242	mg/kg	8082	0.23	0.31	0.024	< 0.0029	< 0.0032	< 0.0034	< 0.0032 UJ	< 0.003 UJ	< 0.003 UJ	< 0.0031 UJ
PCB-1248	mg/kg	8082	0.23	0.31	0.024	< 0.0017	< 0.0018	< 0.002	< 0.0018 UJ	< 0.0017 UJ	< 0.0018 UJ	< 0.0018 UJ
PCB-1254	mg/kg	8082	0.12	0.32	0.04	< 0.0025	< 0.0028	0.015 J	< 0.0028 UJ	< 0.0026 UJ	0.019 J	< 0.0027 UJ
PCB-1260	mg/kg	8082	0.24	0.33	0.11	< 0.0025	< 0.0028	< 0.003	< 0.0028 UJ	< 0.0026 UJ	0.035 J	< 0.0027 UJ
Inorganics												
Aluminum	mg/kg	6020	7700	77000	60000	7400 J	27000 J	12000 J	16000 K	8900 K	11000 K	22000 K
Antimony	mg/kg	6020	3.1	31	5.4	< 0.027 UJ	0.31 J	0.17 J	0.44 J	1.3 J	1.2 J	0.31 J
Arsenic	mg/kg	6020	0.68	0.43	5.8	0.6 K	2.8 K	5.4 K	***13*** K	***14*** K	***7.3*** K	2.9 K
Barium	mg/kg	6020	1500	15000	1640	30 J	300 J	110 J	180 J	110	180	310
Beryllium	mg/kg	6020	16	160	64	0.35 J	5.2 J	1.9 J	2.7 J	2.3	2.4	4.7
Cadmium	mg/kg	6020	7.1	37	7.6	0.44 J	2 J	0.72 J	0.95 J	0.49 J	0.68 J	1.1
Calcium	mg/kg	6020	- -	- -	- -	180000 J	110000 J	34000 J	130000 J	59000	69000	140000
Chromium [1]	mg/kg	6020	12000	120000	3600000	1100 J	68 J	14 J	350 J	110	7300	260
Cobalt	mg/kg	6020	2.3	23	0.54	***29*** J	***12*** J	***100*** J	***3.3*** J	***8.5***	***30***	***3.5***
Copper	mg/kg	6020	310	3100	920	14 J	23 J	13 J	63 K	100 K	490 K	36 K
Iron	mg/kg	6020	5500	55000	700	***170000*** J	***19000*** J	***21000*** J	***57000*** K	***180000*** L	***170000*** L	***52000*** L
Lead	mg/kg	6020	400	400	280	2.8 J	59 J	20 J	28 J	18	9.8	74
Magnesium	mg/kg	6020	- -	- -	- -	40000 J	19000 J	5400 J	34000 J	14000	17000	29000
Manganese [1]	mg/kg	6020	180	3500	56	***28000*** J	***3300*** J	***1000*** J	***7800***	***2200***	***4000***	***6700***
Mercury	mg/kg	7471	1.1	3.1	2	< 0.011 UL	0.03 B	0.023 B	0.2	0.017 J	< 0.011	0.021
Nickel	mg/kg	6020	150	1500	52	3.2 K	5.1 K	9.9 K	17 J	***66***	***4600***	***74***
Potassium	mg/kg	6020	- -	- -	- -	28 B	1700 J	920 J	1100 L	440 L	630 L	1900 L
Selenium	mg/kg	6020	39	390	5.2	< 0.53 UJ	2.4 J	1 J	1.5 K	1.9 B	2.2 B	1.5 B
Silver	mg/kg	6020	39	390	1.6	< 0.041 UJ	0.16 J	0.061 B	0.1 K	0.13 J	0.21 J	0.15 J
Sodium	mg/kg	6020	- -	- -	- -	61 B	570 J	220 J	1800 L	310	430	940
Thallium	mg/kg	6020	0.078	0.78	2.8	< 0.021 UJ	0.04 B	0.093 B	0.036 J	0.04 J	0.043 J	0.037 J
Vanadium	mg/kg	6020	39	5.5	172	***450*** J	16 J	20 J	23 J	32 L	39 L	110 L
Zinc	mg/kg	6020	2300	23000	740	15 L	***2100*** L	***930*** L	120 K	51 K	50 K	110 K
Other Parameters												
Cyanide, Total	mg/kg	9012	2.3	23	40	< 0.095	0.97	< 0.12	< 0.11	< 0.1	9.9	5.4
Percent Moisture	%	- -	- -	- -	- -	5.4	14	21	14	9.8	11	13

TABLE A-1
ANALYTICAL AND SCREENING RESULTS
SURFACE SOIL
CAA VIM AND VIIM
MINGO JUNCTION STEEL WORKS LLC - WEIRTON FACILITY

Constituent	Units	Analytical Method	Screening Criteria [1]			Sample Information [2]						
			Residential Soil RSL	Residential Soil De Minimis	*Protection of Groundwater RSL*	VII-SS-32(0-0.6) 11/19/2013	VII-SS-33(0-0.4) 11/19/2013	VII-SS-34(0-0.5) 11/19/2013	VII-SS-35(1-2) 10/29/2013	VII-SS-36(0-2) 10/24/2013	VII-SS-37(0-1) 11/06/2013	VII-SS-38(0-1) 11/06/2013
Volatile Organic Compounds												
Benzene	mg/kg	8260	1.2	1.2	0.052	< 0.00073 UJ	< 0.00073	< 0.00076	< 0.00078 UJ	< 0.054	< 0.00077	< 0.00082
Toluene	mg/kg	8260	490	820	13.8	0.001 J	0.0016 J	0.00084 J	< 0.00084 UJ	< 0.046	< 0.00083	< 0.00089
Ethylbenzene	mg/kg	8260	5.8	6.2	15.6	< 0.0007 UJ	< 0.0007	< 0.00072	0.0035 J	< 0.034	< 0.00074	< 0.00078
Xylenes, Total	mg/kg	8260	58	260	198	< 0.0024 UJ	< 0.0024	< 0.0025	0.012 J	< 0.11	< 0.0026	< 0.0027
1,1,1-Trichloroethane	mg/kg	8260	810	640	5.6	< 0.00053 UJ	< 0.00053	< 0.00055	< 0.00056 UJ	< 0.056	< 0.00056	< 0.00059
1,1,2,2-Tetrachloroethane	mg/kg	8260	0.6	0.64	0.0006	< 0.00078 UJ	< 0.00078	< 0.00081	< 0.00083 UJ	< 0.051	< 0.00082	< 0.00087
1,1,2-Trichloro-1,2,2-trifluoroethane	mg/kg	8260	670	910	52	< 0.0012 UJ	< 0.0012	< 0.0012	< 0.0012 UJ	< 0.018	< 0.0012	< 0.0013
1,1,2-Trichloroethane	mg/kg	8260	0.15	1.2	0.032	< 0.0009 UJ	< 0.0009	< 0.00094	< 0.00096 UJ	< 0.064	< 0.00095	< 0.001
1,1-Dichloroethane	mg/kg	8260	3.6	3.8	0.0156	< 0.00063 UJ	< 0.00062	< 0.00065	< 0.00067 UJ	< 0.056	< 0.00066	< 0.0007
1,1-Dichloroethene	mg/kg	8260	23	240	0.2	< 0.00092 UJ	< 0.00092	< 0.00096	< 0.00098 UJ	< 0.058	< 0.00097	< 0.001
1,2,4-Trichlorobenzene	mg/kg	8260	5.8	24	4	< 0.00096 UJ	< 0.00096	< 0.00099	< 0.001 UJ	< 0.021	< 0.001	< 0.0011
1,2-Dibromo-3-Chloropropane	mg/kg	8260	0.0053	0.0057	0.00172	< 0.00081 UJ	< 0.00081	< 0.00084	< 0.00087 UJ	< 0.019	< 0.00086	< 0.00091
1,2-Dibromoethane (EDB)	mg/kg	8260	0.036	0.039	0.00028	< 0.00094 UJ	< 0.00094	< 0.00097	< 0.001 UJ	< 0.034	< 0.00099	< 0.001
1,2-Dichlorobenzene	mg/kg	8260	180	380	11.6	< 0.00087 UJ	< 0.00087	< 0.0009	< 0.00092 UJ	< 0.037	< 0.00091	< 0.00097
1,2-Dichloroethane	mg/kg	8260	0.46	0.5	0.028	< 0.00067 UJ	< 0.00067	< 0.00069	< 0.00071 UJ	< 0.053	< 0.0007	< 0.00074
1,2-Dichloroethene, Total	mg/kg	8260	- -	- -	- -	0.0016 J	0.004 J	0.0021 J	< 0.0015 UJ	< 0.052	< 0.0015	< 0.0016
cis-1,2-Dichloroethene	mg/kg	8260	16	17	0.42	< 0.00076 UJ	< 0.00076	< 0.00079	< 0.00081 UJ	< 0.036	< 0.0008	< 0.00085
trans-1,2-Dichloroethene	mg/kg	8260	7	130	0.62	0.0016 J	0.004 J	0.0021 J	< 0.00069 UJ	< 0.041	< 0.00068	< 0.00072
1,2-Dichloropropane	mg/kg	8260	1.6	1.1	0.034	< 0.00059 UJ	< 0.00059	< 0.00061	< 0.00063 UJ	< 0.07	< 0.00062	< 0.00066
cis-1,3-Dichloropropene [1]	mg/kg	8260	1.8	1.9	0.0034	< 0.00074 UJ	< 0.00074	< 0.00076	< 0.00078 UJ	< 0.04	< 0.00078	< 0.00082
trans-1,3-Dichloropropene [1]	mg/kg	8260	1.8	1.9	0.0034	< 0.00065 UJ	< 0.00065	< 0.00067	< 0.00069 UJ	< 0.032	< 0.00068	< 0.00073
1,3-Dichlorobenzene [1]	mg/kg	8260	2.6	2.8	1.44	< 0.00071 UJ	< 0.00071	< 0.00074	< 0.00076 UJ	< 0.028	< 0.00075	< 0.0008
1,4-Dichlorobenzene	mg/kg	8260	2.6	2.8	1.44	< 0.00069 UJ	< 0.00069	< 0.00072	< 0.00074 UJ	< 0.029	< 0.00073	< 0.00077
2-Butanone (MEK)	mg/kg	8260	2700	28000	2.4	< 0.00096 UJ	< 0.00096	< 0.00099	< 0.001 UJ	< 0.059	< 0.001	< 0.0011
2-Hexanone	mg/kg	8260	20	- -	0.0176	< 0.00075 UJ	< 0.00075	< 0.00078	< 0.0008 UJ	< 0.031	< 0.00079	< 0.00084
4-Methyl-2-pentanone (MIBK)	mg/kg	8260	3300	3400	2.8	< 0.00071 UJ	< 0.00071	< 0.00073	< 0.00076 UJ	< 0.032	< 0.00075	< 0.00079
Acetone	mg/kg	8260	6100	61000	5.8	0.0099 J	0.01 J	< 0.0056	< 0.0058 UJ	< 0.27	< 0.0057	< 0.0061
Bromoform	mg/kg	8260	19	20	0.42	< 0.00048 UJ	< 0.00048	< 0.0005	< 0.00051 UJ	< 0.059	< 0.00051	< 0.00054
Bromomethane	mg/kg	8260	0.68	7.3	0.0038	< 0.0008 R	< 0.0008 R	< 0.00083 R	< 0.00086 UJ	< 0.086	< 0.00084	< 0.0009
Carbon disulfide	mg/kg	8260	77	740	0.48	< 0.00056 UJ	< 0.00056	< 0.00058	0.002 J	< 0.059	< 0.00059	< 0.00062
Carbon tetrachloride	mg/kg	8260	0.65	0.7	0.038	< 0.00049 UJ	< 0.00048	< 0.0005	< 0.00052 UJ	< 0.059	< 0.00051	< 0.00054
Chlorobenzene	mg/kg	8260	28	290	1.36	< 0.00082 UJ	< 0.00082	< 0.00085	< 0.00088 UJ	< 0.029	< 0.00087	< 0.00092
Chlorodibromomethane	mg/kg	8260	8.3	8.3	0.42	< 0.00077 UJ	< 0.00077	< 0.0008	< 0.00082 UJ	< 0.036	< 0.00081	< 0.00086
Chloroethane	mg/kg	8260	1400	2100	11.8	< 0.0017 UJ	< 0.0017 UJ	< 0.0017 UJ	< 0.0018 UJ	< 0.041	< 0.0018 R	< 0.0019 R
Chloroform	mg/kg	8260	0.32	0.34	0.44	< 0.00064 UJ	< 0.00063	< 0.00066	< 0.00068 UJ	< 0.055	0.00078 B	0.00084 B
Chloromethane	mg/kg	8260	11	120	0.098	< 0.00093 UJ	< 0.00092	< 0.00096	< 0.00099 UJ	< 0.076	< 0.00097	< 0.001
Cyclohexane	mg/kg	8260	650	120	26	< 0.0004 UJ	< 0.0004	< 0.00042	< 0.00043 UJ	< 0.033	< 0.00042	< 0.00045
Dichlorobromomethane	mg/kg	8260	0.29	0.31	0.44	< 0.00061 UJ	< 0.00061	< 0.00063	< 0.00065 UJ	< 0.051	< 0.00064	< 0.00068
Dichlorodifluoromethane	mg/kg	8260	8.7	94	0.6	< 0.00072 UJ	< 0.00072	< 0.00075	< 0.00077 UJ	< 0.035	< 0.00076	< 0.00081
Isopropylbenzene	mg/kg	8260	190	270	1.48	< 0.00074 UJ	< 0.00074	< 0.00076	0.0018 J	< 0.029	< 0.00078	< 0.00082
Methyl acetate	mg/kg	8260	7800	23000	8.2	< 0.00098 UJ	< 0.00098	< 0.001	< 0.001 UJ	< 0.067	< 0.001	< 0.0011
Methyl tert-butyl ether	mg/kg	8260	47	50	0.064	< 0.00081 UJ	< 0.00081	< 0.00084	< 0.00087 UJ	< 0.056	< 0.00086	< 0.00091
Methylcyclohexane [1]	mg/kg	8260	650	120	26	< 0.00079 UJ	< 0.00079	< 0.00082	< 0.00084 UJ	< 0.031	< 0.00083	< 0.00088
Methylene Chloride	mg/kg	8260	35	58	0.054	0.0036 B	0.0043 B	0.0037 B	0.0043 B	< 0.06	< 0.00077	< 0.00082
Styrene	mg/kg	8260	600	870	2.6	< 0.00077 UJ	< 0.00077	< 0.00079	< 0.00082 UJ	< 0.035	< 0.00081	< 0.00086
Tetrachloroethene	mg/kg	8260	8.1	25	0.046	< 0.00074 UJ	< 0.00074	< 0.00077	< 0.00079 UJ	< 0.045	< 0.00078	< 0.00083
Trichloroethene	mg/kg	8260	0.41	0.5	0.036	< 0.00072 UJ	< 0.00071	< 0.00074	< 0.00076 UJ	< 0.044	< 0.00075	< 0.0008
Trichlorofluoromethane	mg/kg	8260	2300	790	6.6	< 0.001 UJ	< 0.001	< 0.001	< 0.0011 UJ	< 0.061	< 0.0011	< 0.0011
Vinyl chloride	mg/kg	8260	0.059	0.057	0.0138	< 0.00051 UJ	< 0.00051	< 0.00053	< 0.00054 UJ	< 0.071	< 0.00054	< 0.00057

TABLE A-1
ANALYTICAL AND SCREENING RESULTS
SURFACE SOIL
CAA VIM AND VIIM
MINGO JUNCTION STEEL WORKS LLC - WEIRTON FACILITY

Constituent	Units	Analytical Method	Screening Criteria [1]			Sample Information [2]																							
			Residential Soil RSL	Residential Soil De Minimis	*Protection of Groundwater RSL*	VII-SS-32(0-0.6) 11/19/2013			VII-SS-33(0-0.4) 11/19/2013			VII-SS-34(0-0.5) 11/19/2013			VII-SS-35(1-2) 10/29/2013			VII-SS-36(0-2) 10/24/2013			VII-SS-37(0-1) 11/06/2013			VII-SS-38(0-1) 11/06/2013		
Semi-Volatile Organic Compounds																													
Acenaphthene	mg/kg	8270	360	4100	11	<	0.035	UJ	<	0.014	UJ	<	0.0072	UJ		0.056	J	<	0.007	UJ	<	0.0073		<	0.0077	
Acenaphthylene [1]	mg/kg	8270	360	4200	11	<	0.042	UJ	<	0.017	UJ		0.02	J	<	0.0089	UJ	<	0.0083	UJ		0.022	J	<	0.0092	
Anthracene	mg/kg	8270	1800	23000	116	<	0.035	UJ		0.023	J		0.026	J		0.028	J	<	0.0071	UJ		0.03	J		0.015	J
Benzo[a]anthracene	mg/kg	8270	1.1	0.21	0.22		***0.45***	J		0.022	J		0.053	J		0.053	J	<	0.0091	UJ		0.12			0.049	J
Benzo[a]pyrene	mg/kg	8270	0.11	0.016	4.8		0.28	J	<	0.014	UJ		0.048	J	<	0.0077	UJ	<	0.0073	UJ		0.12			0.055	J
Benzo[b]fluoranthene	mg/kg	8270	1.1	0.16	6		0.47	J	<	0.023	UJ		0.11	J	<	0.012	UJ	<	0.011	UJ		0.17			0.067	J
Benzo[g,h,i]perylene [1]	mg/kg	8270	180	1800	26		0.44	J	<	0.014	UJ		0.09	J	<	0.0077	UJ	<	0.0072	UJ		0.11			0.066	J
Benzo[k]fluoranthene	mg/kg	8270	11	1.6	58	<	0.073	UJ	<	0.029	UJ		0.026	J	<	0.016	UJ	<	0.015	UJ		0.081			0.027	J
Chrysene	mg/kg	8270	110	16	180		1.4	J		0.048	J		0.09	J		0.096	J	<	0.0087	UJ		0.13			0.055	J
Dibenz(a,h)anthracene	mg/kg	8270	0.11	0.016	1.92		0.11	J	<	0.016	UJ		0.018	J	<	0.0086	UJ	<	0.0081	UJ		0.031	J	<	0.009	
Fluoranthene	mg/kg	8270	240	2400	178		0.43	J		0.04	J		0.085	J		0.076	J	<	0.0078	UJ		0.19			0.075	J
Fluorene	mg/kg	8270	240	2900	10.8	<	0.048	UJ	<	0.019	UJ	<	0.0099	UJ		0.057	J	<	0.0096	UJ	<	0.01		<	0.011	
Indeno[1,2,3-cd]pyrene	mg/kg	8270	1.1	0.16	19.6		0.16	J	<	0.015	UJ		0.055	J	<	0.008	UJ	<	0.0075	UJ		0.09			0.038	J
Naphthalene	mg/kg	8270	2	4.1	0.0076	<	0.031	UJ		***0.046***	J		***0.033***	J		***0.37***	J	<	0.0063	UJ		***0.033***	J		***0.026***	J
Phenanthrene [1]	mg/kg	8270	1800	23000	116		0.39	J		0.063	J		0.074	J		0.19	J	<	0.012	UJ		0.081			0.039	J
Pyrene	mg/kg	8270	180	2300	26		1.2	J		0.044	J		0.074	J		0.15	J	<	0.0073	UJ		0.19			0.081	
1,1'-Biphenyl	mg/kg	8270	4.7	51	0.0174	<	0.16	UJ	<	0.065	UJ	<	0.034	UJ		***0.094***	J	<	0.032	UJ	<	0.034		<	0.036	
2,4,5-Trichlorophenol	mg/kg	8270	630	6300	8	<	0.19	UJ	<	0.077	UJ	<	0.04	UJ	<	0.041	UJ	<	0.039	UJ	<	0.041		<	0.043	
2,4,6-Trichlorophenol	mg/kg	8270	6.3	49	0.024	<	0.27	UJ	<	0.11	UJ	<	0.056	UJ	<	0.058	UJ	<	0.054	UJ	<	0.057		<	0.06	
2,4-Dichlorophenol	mg/kg	8270	19	190	0.046	<	0.036	UJ	<	0.015	UJ	<	0.0075	UJ	<	0.0078	UJ	<	0.0073	UJ	<	0.0077		<	0.0081	
2,4-Dimethylphenol	mg/kg	8270	130	1300	0.84	<	0.28	UJ	<	0.11	UJ	<	0.059	UJ	<	0.061	UJ	<	0.057	UJ	<	0.06		<	0.063	
2,4-Dinitrophenol	mg/kg	8270	13	130	0.088	<	2.2	UJ	<	0.86	UJ	<	0.45	UJ	<	0.46	UJ	<	0.43	UJ	<	0.45		<	0.48	
2,4-Dinitrotoluene	mg/kg	8270	1.7	1.7	0.0064	<	0.15	UJ	<	0.058	UJ	<	0.03	UJ	<	0.031	UJ	<	0.029	UJ	<	0.031		<	0.032	
2,6-Dinitrotoluene	mg/kg	8270	0.36	0.36	0.00134	<	0.19	UJ	<	0.075	UJ	<	0.039	UJ	<	0.04	UJ	<	0.037	UJ	<	0.039		<	0.042	
2-Chloronaphthalene	mg/kg	8270	480	5000	7.8	<	0.038	UJ	<	0.015	UJ	<	0.0078	UJ	<	0.0081	UJ	<	0.0076	UJ	<	0.008		<	0.0084	
2-Chlorophenol	mg/kg	8270	39	340	0.178	<	0.15	UJ	<	0.059	UJ	<	0.031	UJ	<	0.032	UJ	<	0.03	UJ	<	0.031		<	0.033	
2-Methylnaphthalene	mg/kg	8270	24	310	0.38		0.083	J		0.074	J		0.042	J		***0.87***	J	<	0.0065	UJ		0.037	J		0.022	J
2-Methylphenol	mg/kg	8270	320	3200	1.5	<	0.13	UJ	<	0.051	UJ	<	0.026	UJ	<	0.027	UJ	<	0.025	UJ	<	0.027		<	0.028	
2-Nitroaniline	mg/kg	8270	63	630	0.16	<	0.81	UJ	<	0.32	UJ	<	0.17	UJ	<	0.17	UJ	<	0.16	UJ	<	0.17		<	0.18	
2-Nitrophenol	mg/kg	8270	- -	- -	- -	<	0.2	UJ	<	0.08	UJ	<	0.041	UJ	<	0.043	UJ	<	0.04	UJ	<	0.042		<	0.044	
3,3'-Dichlorobenzidine	mg/kg	8270	1.2	1.2	0.0164	<	0.19	UJ	<	0.077	UJ	<	0.04	UJ	<	0.041	UJ	<	0.038	UJ	<	0.04		<	0.043	
Methylphenol, 3 & 4 [1]	mg/kg	8270	320	3200	1.48	<	0.18	UJ	<	0.071	UJ	<	0.037	UJ	<	0.038	UJ	<	0.036	UJ	<	0.037		<	0.039	
3-Nitroaniline	mg/kg	8270	- -	- -	- -	<	0.75	UJ	<	0.3	UJ	<	0.15	UJ	<	0.16	UJ	<	0.15	UJ	<	0.16		<	0.17	
4,6-Dinitro-2-methylphenol	mg/kg	8270	0.51	- -	0.0052	<	0.73	UJ	<	0.29	UJ	<	0.15	UJ	<	0.16	UJ	<	0.15	UJ	<	0.15		<	0.16	
4-Bromophenyl phenyl ether	mg/kg	8270	- -	- -	- -	<	0.16	UJ	<	0.063	UJ	<	0.033	UJ	<	0.034	UJ	<	0.032	UJ	<	0.033		<	0.035	
4-Chloro-3-methylphenol	mg/kg	8270	630	- -	3.4	<	0.17	UJ	<	0.067	UJ	<	0.035	UJ	<	0.036	UJ	<	0.033	UJ	<	0.035		<	0.037	
4-Chloroaniline	mg/kg	8270	2.7	2.7	0.0032	<	0.15	UJ	<	0.058	UJ	<	0.03	UJ	<	0.031	UJ	<	0.029	UJ	<	0.031		<	0.032	
4-Chlorophenyl phenyl ether	mg/kg	8270	- -	- -	- -	<	0.2	UJ	<	0.081	UJ	<	0.042	UJ	<	0.043	UJ	<	0.04	UJ	<	0.042		<	0.045	
4-Nitroaniline	mg/kg	8270	25	- -	0.032	<	0.73	UJ	<	0.29	UJ	<	0.15	UJ	<	0.16	UJ	<	0.15	UJ	<	0.15		<	0.16	
4-Nitrophenol	mg/kg	8270	- -	- -	- -	<	0.66	UJ	<	0.26	UJ	<	0.14	UJ	<	0.14	UJ	<	0.13	UJ	<	0.14		<	0.15	
Acetophenone	mg/kg	8270	780	2500	1.16	<	0.15	UJ	<	0.06	UJ		0.038	J	<	0.032	UJ	<	0.03	UJ		0.1	J	<	0.033	
Atrazine	mg/kg	8270	2.4	2.4	0.038	<	0.18	UJ	<	0.071	UJ	<	0.037	UJ	<	0.038	UJ	<	0.035	UJ	<	0.037		<	0.039	
Benzaldehyde	mg/kg	8270	170	1200	0.082	<	0.27	UJ	<	0.11	UJ	<	0.056	UJ	<	0.058	UJ	<	0.054	UJ		***0.43***	J	<	0.06	
Bis(2-chloroisopropyl)ether	mg/kg	8270	310	5.1	0.52	<	0.039	UJ	<	0.016	UJ	<	0.0081	UJ	<	0.0084	UJ	<	0.0078	UJ	<	0.0082		<	0.0087	
Bis(2-chloroethoxy)methane	mg/kg	8270	19	- -	0.026	<	0.12	UJ	<	0.048	UJ	<	0.025	UJ	<	0.025	UJ	<	0.024	UJ	<	0.025		<	0.026	
Bis(2-chloroethyl)ether	mg/kg	8270	0.23	0.24	0.000072	<	0.049	UJ	<	0.019	UJ	<	0.01	UJ	<	0.01	UJ	<	0.0098	UJ	<	0.01		<	0.011	
Bis(2-ethylhexyl) phthalate	mg/kg	8270	39	39	28	<	0.29	UJ	<	0.12	UJ		0.068	J		0.074	J	<	0.059	UJ	<	0.062		<	0.065	
Butyl benzyl phthalate	mg/kg	8270	290	290	4.8	<	0.25	UJ	<	0.099	UJ	<	0.051	UJ	<	0.053	UJ	<	0.05	UJ	<	0.052		<	0.055	
Caprolactam	mg/kg	8270	3100	31000	5	<	1.4	UJ	<	0.55	UJ	<	0.28	UJ	<	0.29	UJ	<	0.27	UJ	<	0.29		<	0.3	
Carbazole [1]	mg/kg	8270	1800	23000	116	<	0.033	UJ	<	0.013	UJ		0.0097	J	<	0.0071	UJ	<	0.0067	UJ		0.011	J	<	0.0074	

TABLE A-1
ANALYTICAL AND SCREENING RESULTS
SURFACE SOIL
CAA VIM AND VIIM
MINGO JUNCTION STEEL WORKS LLC - WEIRTON FACILITY

Constituent	Units	Analytical Method	Screening Criteria [1]			Sample Information [2]						
			Residential Soil RSL	Residential Soil De Minimis	*Protection of Groundwater RSL*	VII-SS-32(0-0.6) 11/19/2013	VII-SS-33(0-0.4) 11/19/2013	VII-SS-34(0-0.5) 11/19/2013	VII-SS-35(1-2) 10/29/2013	VII-SS-36(0-2) 10/24/2013	VII-SS-37(0-1) 11/06/2013	VII-SS-38(0-1) 11/06/2013
Dibenzofuran	mg/kg	8270	7.8	78	0.3	< 0.18 UJ	< 0.071 UJ	< 0.037 UJ	< 0.038 UJ	< 0.036 UJ	< 0.038	< 0.04
Diethyl phthalate	mg/kg	8270	5100	51000	12.2	0.62 B	0.32 B	0.05 B	< 0.042 UJ	< 0.04 UJ	0.09 B	< 0.044
Dimethyl phthalate	mg/kg	8270	- -	- -	- -	< 0.2 UJ	< 0.079 UJ	< 0.041 UJ	< 0.042 UJ	< 0.04 UJ	0.83	< 0.044
Di-n-butyl phthalate	mg/kg	8270	630	6300	4.6	< 0.23 UJ	< 0.091 UJ	< 0.047 UJ	< 0.049 UJ	< 0.046 UJ	< 0.048	< 0.05
Di-n-octyl phthalate	mg/kg	8270	63	- -	114	< 0.19 UJ	< 0.076 UJ	< 0.04 UJ	< 0.041 UJ	< 0.038 UJ	< 0.04	< 0.042
Hexachlorobenzene	mg/kg	8270	0.21	0.22	0.26	< 0.039 UJ	< 0.015 UJ	< 0.008 UJ	< 0.0083 UJ	< 0.0077 UJ	< 0.0081	< 0.0086
Hexachlorobutadiene	mg/kg	8270	1.2	1.3	0.0054	< 0.041 UJ	< 0.016 UJ	< 0.0084 UJ	< 0.0087 UJ	< 0.0081 UJ	< 0.0085	< 0.009
Hexachlorocyclopentadiene	mg/kg	8270	0.18	1.9	3.2	< 0.2 UJ	< 0.078 UJ	< 0.041 UJ	< 0.042 UJ	< 0.039 UJ	< 0.041	< 0.043
Hexachloroethane	mg/kg	8270	1.8	2	0.004	< 0.13 UJ	< 0.052 UJ	< 0.027 UJ	< 0.028 UJ	< 0.026 UJ	< 0.027	< 0.029
Isophorone	mg/kg	8270	570	570	0.52	< 0.14 UJ	< 0.055 UJ	< 0.028 UJ	< 0.029 UJ	< 0.027 UJ	< 0.029	< 0.03
Nitrobenzene	mg/kg	8270	5.1	5.5	0.00184	< 0.15 UJ	< 0.06 UJ	< 0.031 UJ	< 0.032 UJ	< 0.03 UJ	< 0.032	< 0.034
N-Nitrosodi-n-propylamine	mg/kg	8270	0.078	0.078	0.000162	< 0.043 UJ	< 0.017 UJ	< 0.0088 UJ	< 0.0091 UJ	< 0.0085 UJ	< 0.0089	< 0.0094
N-Nitrosodiphenylamine	mg/kg	8270	110	110	1.34	< 0.17 UJ	< 0.067 UJ	< 0.035 UJ	< 0.036 UJ	< 0.034 UJ	< 0.035	< 0.037
Pentachlorophenol	mg/kg	8270	1	1	0.028	< 0.16 UJ	< 0.065 UJ	< 0.034 UJ	< 0.035 UJ	< 0.032 UJ	< 0.034	< 0.036
Phenol	mg/kg	8270	1900	19000	6.6	< 0.043 UJ	< 0.017 UJ	< 0.0089 UJ	< 0.0092 UJ	< 0.0086 UJ	< 0.009	< 0.0095
Polychlorinated Biphenyls												
PCB-1016	mg/kg	8082	0.41	5.5	0.26	< 0.0027 UJ	< 0.0027 UJ	< 0.0028 UJ	< 0.0029 UJ	< 0.0027 UJ	< 0.0028 UJ	< 0.003 UJ
PCB-1221	mg/kg	8082	0.2	0.26	0.0016	< 0.0035 UJ	< 0.0035 UJ	< 0.0036 UJ	< 0.0037 UJ	< 0.0035 UJ	< 0.0036 UJ	< 0.0039 UJ
PCB-1232	mg/kg	8082	0.17	0.22	0.0016	< 0.0031 UJ	< 0.0031 UJ	< 0.0032 UJ	< 0.0033 UJ	< 0.0031 UJ	< 0.0032 UJ	< 0.0035 UJ
PCB-1242	mg/kg	8082	0.23	0.31	0.024	< 0.003 UJ	< 0.0029 UJ	< 0.003 UJ	< 0.0031 UJ	< 0.003 UJ	< 0.0031 UJ	< 0.0033 UJ
PCB-1248	mg/kg	8082	0.23	0.31	0.024	< 0.0017 UJ	< 0.0017 UJ	< 0.0018 UJ	< 0.0018 UJ	< 0.0017 UJ	< 0.0018 UJ	< 0.0019 UJ
PCB-1254	mg/kg	8082	0.12	0.32	0.04	< 0.0026 UJ	< 0.0026 UJ	< 0.0027 UJ	< 0.0027 UJ	< 0.0026 UJ	< 0.0027 UJ	< 0.0029 UJ
PCB-1260	mg/kg	8082	0.24	0.33	0.11	0.012 J	< 0.0026 UJ	< 0.0027 UJ	< 0.0027 UJ	0.0084 J	0.011 J	< 0.0029 UJ
Inorganics												
Aluminum	mg/kg	6020	7700	77000	60000	17000 K	27000 K	25000 K	8000 K	10000 K	8900 K	12000 K
Antimony	mg/kg	6020	3.1	31	5.4	0.72 L	0.23	0.89	0.43 J	0.26	3.2 L	0.32 J
Arsenic	mg/kg	6020	0.68	0.43	5.8	1.5 J	3 J	***5.9*** J	4.4 K	***7.3***	***6*** K	***7.3*** K
Barium	mg/kg	6020	1500	15000	1640	150	320	380	130 J	81	100 J	150 J
Beryllium	mg/kg	6020	16	160	64	1.9 J	5.9	5.2	0.4 J	0.65 L	0.8 K	1.4 K
Cadmium	mg/kg	6020	7.1	37	7.6	1	0.85	1.4	0.41 J	0.57	0.79 J	0.68 J
Calcium	mg/kg	6020	- -	- -	- -	170000 L	160000 L	150000	270000	16000	64000 J	90000 J
Chromium [1]	mg/kg	6020	12000	120000	3600000	790	120	81	1400 J	140	360 J	380 J
Cobalt	mg/kg	6020	2.3	23	0.54	***2.5***	***2***	***2.6***	***3.9*** J	***12***	***11*** J	***6.9*** J
Copper	mg/kg	6020	310	3100	920	24 K	24 K	37 K	69 K	61 K	58 J	25 J
Iron	mg/kg	6020	5500	55000	700	***120000*** L	***33000***	***33000***	***220000*** K	***54000*** J	***69000***	***66000***
Lead	mg/kg	6020	400	400	280	15	19	100	12 J	35	270 J	65 J
Magnesium	mg/kg	6020	- -	- -	- -	46000	44000	32000	27000 J	7400	16000 J	21000 K
Manganese [1]	mg/kg	6020	180	3500	56	***22000*** L	***4800*** L	***4300*** L	***36000***	***3600*** J	***8300***	***9100***
Mercury	mg/kg	7471	1.1	3.1	2	0.011 J	0.016 J	0.22	0.071	0.042	0.087 L	0.044 L
Nickel	mg/kg	6020	150	1500	52	27 J	16	9.9	21 J	27 K	24 J	16 J
Potassium	mg/kg	6020	- -	- -	- -	750	1900	1500	180 L	1400 K	790 J	940 J
Selenium	mg/kg	6020	39	390	5.2	1.4	2.8	2.6	0.65 K	0.69	0.78 L	1.1 K
Silver	mg/kg	6020	39	390	1.6	0.28 K	0.14 K	0.32 K	0.08 K	0.069 K	0.26 J	0.13 J
Sodium	mg/kg	6020	- -	- -	- -	1900	1300	980	300 L	180	250 K	620 K
Thallium	mg/kg	6020	0.078	0.78	2.8	0.034 J	0.065 J	0.3	0.0069 J	0.12	0.25 J	0.17 J
Vanadium	mg/kg	6020	39	5.5	172	***400*** L	33 L	54 L	120 J	34	110 J	***230*** J
Zinc	mg/kg	6020	2300	23000	740	59 K	67 K	390 K	61 K	160 K	200 J	120 J
Other Parameters												
Cyanide, Total	mg/kg	9012	2.3	23	40	1.1	1.3	0.43 J	0.46 J	< 0.11	0.11 J	0.12 J
Percent Moisture	%	- -	- -	- -	- -	8	7.9	11	14	8.8	13	18

TABLE A-1
ANALYTICAL AND SCREENING RESULTS
SURFACE SOIL
CAA VIM AND VIIM
MINGO JUNCTION STEEL WORKS LLC - WEIRTON FACILITY

Constituent	Units	Analytical Method	Screening Criteria [1]			Sample Information [2]						
			Residential Soil RSL	Residential Soil De Minimis	*Protection of Groundwater RSL*	VII-SS-38(0-1)DUP 11/06/2013 Duplicate	VII-SS-39(0-0.5) 11/06/2013	VII-SS-40(0-0.5) 11/19/2013	VII-SS-41(0-1) 11/19/2013	VII-SS-41-S1 11/30/2017	VII-SS-41-S2 11/30/2017	VII-SS-41-S3 11/30/2017
Volatile Organic Compounds												
Benzene	mg/kg	8260	1.2	1.2	0.052	< 0.00079	< 0.00084	< 0.00075	< 0.00079	NA	NA	NA
Toluene	mg/kg	8260	490	820	13.8	< 0.00086	< 0.00091	0.0018 J	0.0013 J	NA	NA	NA
Ethylbenzene	mg/kg	8260	5.8	6.2	15.6	< 0.00076	< 0.0008	< 0.00071	< 0.00075	NA	NA	NA
Xylenes, Total	mg/kg	8260	58	260	198	< 0.0026	< 0.0028	< 0.0025	< 0.0026	NA	NA	NA
1,1,1-Trichloroethane	mg/kg	8260	810	640	5.6	< 0.00057	< 0.0006	< 0.00054	< 0.00057	NA	NA	NA
1,1,2,2-Tetrachloroethane	mg/kg	8260	0.6	0.64	0.0006	< 0.00085	< 0.00089	< 0.0008	< 0.00084	NA	NA	NA
1,1,2-Trichloro-1,2,2-trifluoroethane	mg/kg	8260	670	910	52	< 0.0013	< 0.0013	< 0.0012	< 0.0012	NA	NA	NA
1,1,2-Trichloroethane	mg/kg	8260	0.15	1.2	0.032	< 0.00098	< 0.001	< 0.00092	< 0.00097	NA	NA	NA
1,1-Dichloroethane	mg/kg	8260	3.6	3.8	0.0156	< 0.00068	< 0.00071	< 0.00064	< 0.00067	NA	NA	NA
1,1-Dichloroethene	mg/kg	8260	23	240	0.2	< 0.001	< 0.0011	< 0.00094	< 0.00099	NA	NA	NA
1,2,4-Trichlorobenzene	mg/kg	8260	5.8	24	4	< 0.001	< 0.0011	< 0.00098	< 0.001	NA	NA	NA
1,2-Dibromo-3-Chloropropane	mg/kg	8260	0.0053	0.0057	0.00172	< 0.00088	< 0.00093	< 0.00083	< 0.00087	NA	NA	NA
1,2-Dibromoethane (EDB)	mg/kg	8260	0.036	0.039	0.00028	< 0.001	< 0.0011	< 0.00096	< 0.001	NA	NA	NA
1,2-Dichlorobenzene	mg/kg	8260	180	380	11.6	< 0.00094	< 0.00099	< 0.00089	< 0.00093	NA	NA	NA
1,2-Dichloroethane	mg/kg	8260	0.46	0.5	0.028	< 0.00072	< 0.00076	< 0.00068	< 0.00072	NA	NA	NA
1,2-Dichloroethene, Total	mg/kg	8260	- -	- -	- -	< 0.0015	< 0.0016	0.0049 J	0.0027 J	NA	NA	NA
cis-1,2-Dichloroethene	mg/kg	8260	16	17	0.42	< 0.00083	< 0.00087	< 0.00078	< 0.00082	NA	NA	NA
trans-1,2-Dichloroethene	mg/kg	8260	7	130	0.62	< 0.0007	< 0.00074	0.0049 J	0.0027 J	NA	NA	NA
1,2-Dichloropropane	mg/kg	8260	1.6	1.1	0.034	< 0.00064	< 0.00067	< 0.0006	< 0.00063	NA	NA	NA
cis-1,3-Dichloropropene [1]	mg/kg	8260	1.8	1.9	0.0034	< 0.0008	< 0.00084	< 0.00075	< 0.00079	NA	NA	NA
trans-1,3-Dichloropropene [1]	mg/kg	8260	1.8	1.9	0.0034	< 0.0007	< 0.00074	< 0.00066	< 0.0007	NA	NA	NA
1,3-Dichlorobenzene [1]	mg/kg	8260	2.6	2.8	1.44	< 0.00077	< 0.00081	< 0.00073	< 0.00077	NA	NA	NA
1,4-Dichlorobenzene	mg/kg	8260	2.6	2.8	1.44	< 0.00075	< 0.00079	< 0.00071	< 0.00074	NA	NA	NA
2-Butanone (MEK)	mg/kg	8260	2700	28000	2.4	< 0.001	< 0.0011	< 0.00098	< 0.001	NA	NA	NA
2-Hexanone	mg/kg	8260	20	- -	0.0176	< 0.00081	< 0.00086	< 0.00077	< 0.00081	NA	NA	NA
4-Methyl-2-pentanone (MIBK)	mg/kg	8260	3300	3400	2.8	< 0.00077	< 0.00081	< 0.00072	< 0.00076	NA	NA	NA
Acetone	mg/kg	8260	6100	61000	5.8	< 0.0059	< 0.0062	0.018 J	0.0096 J	NA	NA	NA
Bromoform	mg/kg	8260	19	20	0.42	< 0.00052	< 0.00055	< 0.00049	< 0.00052	NA	NA	NA
Bromomethane	mg/kg	8260	0.68	7.3	0.0038	< 0.00087	< 0.00092	< 0.00082 R	< 0.00086 R	NA	NA	NA
Carbon disulfide	mg/kg	8260	77	740	0.48	< 0.0006	< 0.00064	< 0.00057	< 0.0006	NA	NA	NA
Carbon tetrachloride	mg/kg	8260	0.65	0.7	0.038	< 0.00053	< 0.00055	< 0.0005	< 0.00052	NA	NA	NA
Chlorobenzene	mg/kg	8260	28	290	1.36	< 0.00089	< 0.00094	< 0.00084	< 0.00088	NA	NA	NA
Chlorodibromomethane	mg/kg	8260	8.3	8.3	0.42	< 0.00084	< 0.00088	< 0.00079	< 0.00083	NA	NA	NA
Chloroethane	mg/kg	8260	1400	2100	11.8	< 0.0018 R	< 0.0019 R	< 0.0017 UJ	< 0.0018	NA	NA	NA
Chloroform	mg/kg	8260	0.32	0.34	0.44	0.00079 B	0.0008 B	< 0.00065	< 0.00068	NA	NA	NA
Chloromethane	mg/kg	8260	11	120	0.098	< 0.001	< 0.0011	< 0.00095	< 0.001	NA	NA	NA
Cyclohexane	mg/kg	8260	650	120	26	< 0.00044	< 0.00046	< 0.00041	< 0.00043	NA	NA	NA
Dichlorobromomethane	mg/kg	8260	0.29	0.31	0.44	< 0.00066	< 0.0007	< 0.00062	< 0.00066	NA	NA	NA
Dichlorodifluoromethane	mg/kg	8260	8.7	94	0.6	< 0.00078	< 0.00083	< 0.00074	< 0.00078	NA	NA	NA
Isopropylbenzene	mg/kg	8260	190	270	1.48	< 0.0008	< 0.00084	< 0.00075	< 0.00079	NA	NA	NA
Methyl acetate	mg/kg	8260	7800	23000	8.2	< 0.0011	< 0.0011	< 0.001	< 0.0011	NA	NA	NA
Methyl tert-butyl ether	mg/kg	8260	47	50	0.064	< 0.00088	< 0.00093	< 0.00083	< 0.00087	NA	NA	NA
Methylcyclohexane [1]	mg/kg	8260	650	120	26	< 0.00085	< 0.0009	< 0.00081	< 0.00085	NA	NA	NA
Methylene Chloride	mg/kg	8260	35	58	0.054	< 0.00079	< 0.00083	0.005 B	0.0037 B	NA	NA	NA
Styrene	mg/kg	8260	600	870	2.6	< 0.00083	< 0.00088	< 0.00078	< 0.00082	NA	NA	NA
Tetrachloroethene	mg/kg	8260	8.1	25	0.046	< 0.0008	< 0.00084	< 0.00076	< 0.00079	NA	NA	NA
Trichloroethene	mg/kg	8260	0.41	0.5	0.036	< 0.00077	< 0.00082	< 0.00073	< 0.00077	NA	NA	NA
Trichlorofluoromethane	mg/kg	8260	2300	790	6.6	< 0.0011	< 0.0011	< 0.001	< 0.0011	NA	NA	NA
Vinyl chloride	mg/kg	8260	0.059	0.057	0.0138	< 0.00055	< 0.00058	< 0.00052	< 0.00055	NA	NA	NA

TABLE A-1
ANALYTICAL AND SCREENING RESULTS
SURFACE SOIL
CAA VIM AND VIIM
MINGO JUNCTION STEEL WORKS LLC - WEIRTON FACILITY

Constituent	Units	Analytical Method	Screening Criteria [1]			Sample Information [2]						
			Residential Soil RSL	Residential Soil De Minimis	*Protection of Groundwater RSL*	VII-SS-38(0-1)DUP 11/06/2013 Duplicate	VII-SS-39(0-0.5) 11/06/2013	VII-SS-40(0-0.5) 11/19/2013	VII-SS-41(0-1) 11/19/2013	VII-SS-41-S1 11/30/2017	VII-SS-41-S2 11/30/2017	VII-SS-41-S3 11/30/2017
Semi-Volatile Organic Compounds												
Acenaphthene	mg/kg	8270	360	4100	11	< 0.0075	< 0.08	0.0079 J	2.5 J	< 0.0053	< 0.054	< 0.037
Acenaphthylene [1]	mg/kg	8270	360	4200	11	< 0.0089	< 0.095	0.016 J	5.8 J	< 0.0054	< 0.055	< 0.038
Anthracene	mg/kg	8270	1800	23000	116	0.022 J	0.12 J	0.021 J	10 J	< 0.0058	< 0.06	< 0.041
Benzo[a]anthracene	mg/kg	8270	1.1	0.21	0.22	0.061 J	< 0.1	0.055 J	***22*** J	0.009 J	0.16	0.08 J
Benzo[a]pyrene	mg/kg	8270	0.11	0.016	4.8	0.062 J	< 0.083	0.064 J	***24*** J	0.01 J	0.17	0.12
Benzo[b]fluoranthene	mg/kg	8270	1.1	0.16	6	0.078	< 0.13	0.09 J	***31*** J	0.022	0.24	0.17
Benzo[g,h,i]perylene [1]	mg/kg	8270	180	1800	26	0.097	< 0.083	0.094 J	20 J	0.027	0.28	0.21
Benzo[k]fluoranthene	mg/kg	8270	11	1.6	58	0.042 J	< 0.17	0.027 J	14 J	0.0061 J	0.1 J	0.063 J
Chrysene	mg/kg	8270	110	16	180	0.074 J	< 0.099	0.076 J	24 J	0.021	0.2	0.1 J
Dibenz(a,h)anthracene	mg/kg	8270	0.11	0.016	1.92	0.021 J	< 0.092	0.015 J	***5.3*** J	< 0.0066	< 0.067	< 0.046
Fluoranthene	mg/kg	8270	240	2400	178	0.092	0.12 J	0.087 J	49 J	0.015 J	0.32	0.1 J
Fluorene	mg/kg	8270	240	2900	10.8	< 0.01	< 0.11	< 0.0097 UJ	2.7 J	< 0.0056	< 0.058	< 0.04
Indeno[1,2,3-cd]pyrene	mg/kg	8270	1.1	0.16	19.6	0.057 J	< 0.086	0.051 J	18 J	0.014 J	0.14 J	0.12
Naphthalene	mg/kg	8270	2	4.1	0.0076	***0.03*** J	< 0.072	***0.093*** J	***1.2*** J	< 0.0057	< 0.058	< 0.04
Phenanthrene [1]	mg/kg	8270	1800	23000	116	0.049 J	0.14 J	0.087 J	30 J	0.011 J	0.13 J	< 0.047
Pyrene	mg/kg	8270	180	2300	26	0.09	0.19 J	0.075 J	***35*** J	0.012 J	0.24	0.097 J
1,1'-Biphenyl	mg/kg	8270	4.7	51	0.0174	< 0.035	< 0.37	< 0.033 UJ	***0.17*** J	NA	NA	NA
2,4,5-Trichlorophenol	mg/kg	8270	630	6300	8	< 0.042	< 0.44	< 0.039 UJ	< 0.21 UJ	NA	NA	NA
2,4,6-Trichlorophenol	mg/kg	8270	6.3	49	0.024	< 0.058	< 0.62	< 0.055 UJ	< 0.29 UJ	NA	NA	NA
2,4-Dichlorophenol	mg/kg	8270	19	190	0.046	< 0.0078	< 0.083	< 0.0074 UJ	< 0.039 UJ	NA	NA	NA
2,4-Dimethylphenol	mg/kg	8270	130	1300	0.84	< 0.061	< 0.65	< 0.058 UJ	< 0.3 UJ	NA	NA	NA
2,4-Dinitrophenol	mg/kg	8270	13	130	0.088	< 0.46	< 4.9	< 0.44 UJ	< 2.3 UJ	NA	NA	NA
2,4-Dinitrotoluene	mg/kg	8270	1.7	1.7	0.0064	< 0.031	< 0.34	< 0.03 UJ	< 0.16 UJ	NA	NA	NA
2,6-Dinitrotoluene	mg/kg	8270	0.36	0.36	0.00134	< 0.04	< 0.43	< 0.038 UJ	< 0.2 UJ	NA	NA	NA
2-Chloronaphthalene	mg/kg	8270	480	5000	7.8	< 0.0081	< 0.087	< 0.0077 UJ	< 0.041 UJ	NA	NA	NA
2-Chlorophenol	mg/kg	8270	39	340	0.178	< 0.032	< 0.34	< 0.03 UJ	< 0.16 UJ	NA	NA	NA
2-Methylnaphthalene	mg/kg	8270	24	310	0.38	0.03 J	< 0.075	0.12 J	***1*** J	NA	NA	NA
2-Methylphenol	mg/kg	8270	320	3200	1.5	< 0.027	< 0.29	< 0.026 UJ	< 0.14 UJ	NA	NA	NA
2-Nitroaniline	mg/kg	8270	63	630	0.16	< 0.17	< 1.9	< 0.16 UJ	< 0.87 UJ	NA	NA	NA
2-Nitrophenol	mg/kg	8270	- -	- -	- -	< 0.043	< 0.46	< 0.041 UJ	< 0.21 UJ	NA	NA	NA
3,3'-Dichlorobenzidine	mg/kg	8270	1.2	1.2	0.0164	< 0.041	< 0.44	< 0.039 UJ	< 0.21 UJ	NA	NA	NA
Methylphenol, 3 & 4 [1]	mg/kg	8270	320	3200	1.48	< 0.038	< 0.41	< 0.036 UJ	< 0.19 UJ	NA	NA	NA
3-Nitroaniline	mg/kg	8270	- -	- -	- -	< 0.16	< 1.7	< 0.15 UJ	< 0.8 UJ	NA	NA	NA
4,6-Dinitro-2-methylphenol	mg/kg	8270	0.51	- -	0.0052	< 0.16	< 1.7	< 0.15 UJ	< 0.78 UJ	NA	NA	NA
4-Bromophenyl phenyl ether	mg/kg	8270	- -	- -	- -	< 0.034	< 0.36	< 0.032 UJ	< 0.17 UJ	NA	NA	NA
4-Chloro-3-methylphenol	mg/kg	8270	630	- -	3.4	< 0.036	< 0.38	< 0.034 UJ	< 0.18 UJ	NA	NA	NA
4-Chloroaniline	mg/kg	8270	2.7	2.7	0.0032	< 0.031	< 0.33	< 0.029 UJ	< 0.16 UJ	NA	NA	NA
4-Chlorophenyl phenyl ether	mg/kg	8270	- -	- -	- -	< 0.043	< 0.46	< 0.041 UJ	< 0.22 UJ	NA	NA	NA
4-Nitroaniline	mg/kg	8270	25	- -	0.032	< 0.16	< 1.7	< 0.15 UJ	< 0.79 UJ	NA	NA	NA
4-Nitrophenol	mg/kg	8270	- -	- -	- -	< 0.14	< 1.5	< 0.13 UJ	< 0.71 UJ	NA	NA	NA
Acetophenone	mg/kg	8270	780	2500	1.16	< 0.032	< 0.34	0.044 J	0.17 J	NA	NA	NA
Atrazine	mg/kg	8270	2.4	2.4	0.038	< 0.038	< 0.4	< 0.036 UJ	< 0.19 UJ	NA	NA	NA
Benzaldehyde	mg/kg	8270	170	1200	0.082	< 0.058	< 0.62	***0.33*** J	< 0.29 UJ	NA	NA	NA
Bis(2-chloroisopropyl)ether	mg/kg	8270	310	5.1	0.52	< 0.0084	< 0.09	< 0.0079 UJ	< 0.042 UJ	NA	NA	NA
Bis(2-chloroethoxy)methane	mg/kg	8270	19	- -	0.026	< 0.026	< 0.27	< 0.024 UJ	< 0.13 UJ	NA	NA	NA
Bis(2-chloroethyl)ether	mg/kg	8270	0.23	0.24	0.000072	< 0.01	< 0.11	< 0.0099 UJ	< 0.052 UJ	NA	NA	NA
Bis(2-ethylhexyl) phthalate	mg/kg	8270	39	39	28	< 0.063	< 0.67	< 0.059 UJ	< 0.31 UJ	NA	NA	NA
Butyl benzyl phthalate	mg/kg	8270	290	290	4.8	< 0.053	< 0.57	< 0.05 UJ	< 0.27 UJ	NA	NA	NA
Caprolactam	mg/kg	8270	3100	31000	5	< 0.29	< 3.1	< 0.28 UJ	< 1.5 UJ	NA	NA	NA
Carbazole [1]	mg/kg	8270	1800	23000	116	< 0.0072	< 0.077	0.018 J	5.1 J	NA	NA	NA

TABLE A-1
ANALYTICAL AND SCREENING RESULTS
SURFACE SOIL
CAA VIM AND VIIM
MINGO JUNCTION STEEL WORKS LLC - WEIRTON FACILITY

			Screening Criteria [1]			Sample Information [2]					
						VII-SS-38(0-1)DUP 11/06/2013 Duplicate	VII-SS-39(0-0.5) 11/06/2013	VII-SS-40(0-0.5) 11/19/2013	VII-SS-41(0-1) 11/19/2013	VII-SS-41-S1 11/30/2017	VII-SS-41-S2 11/30/2017	VII-SS-41-S3 11/30/2017
Constituent	**Units**	**Analytical Method**	**Residential Soil RSL**	**Residential Soil De Minimis**	***Protection of Groundwater RSL***							
Dibenzofuran	mg/kg	8270	7.8	78	0.3	< 0.038	< 0.41	< 0.036 UJ	***1.6*** J	NA	NA	NA
Diethyl phthalate	mg/kg	8270	5100	51000	12.2	< 0.043	< 0.45	0.082 B	0.45 B	NA	NA	NA
Dimethyl phthalate	mg/kg	8270	- -	- -	- -	< 0.043	< 0.45	< 0.04 UJ	< 0.21 UJ	NA	NA	NA
Di-n-butyl phthalate	mg/kg	8270	630	6300	4.6	< 0.049	< 0.52	< 0.046 UJ	< 0.24 UJ	NA	NA	NA
Di-n-octyl phthalate	mg/kg	8270	63	- -	114	< 0.041	< 0.44	< 0.039 UJ	< 0.21 UJ	NA	NA	NA
Hexachlorobenzene	mg/kg	8270	0.21	0.22	0.26	< 0.0083	< 0.088	< 0.0078 UJ	< 0.042 UJ	NA	NA	NA
Hexachlorobutadiene	mg/kg	8270	1.2	1.3	0.0054	< 0.0087	< 0.093	< 0.0082 UJ	< 0.044 UJ	NA	NA	NA
Hexachlorocyclopentadiene	mg/kg	8270	0.18	1.9	3.2	< 0.042	< 0.45	< 0.04 UJ	< 0.21 UJ	NA	NA	NA
Hexachloroethane	mg/kg	8270	1.8	2	0.004	< 0.028	< 0.3	< 0.026 UJ	< 0.14 UJ	NA	NA	NA
Isophorone	mg/kg	8270	570	570	0.52	< 0.029	< 0.31	< 0.028 UJ	< 0.15 UJ	NA	NA	NA
Nitrobenzene	mg/kg	8270	5.1	5.5	0.00184	< 0.032	< 0.35	< 0.031 UJ	< 0.16 UJ	NA	NA	NA
N-Nitrosodi-n-propylamine	mg/kg	8270	0.078	0.078	0.000162	< 0.0092	< 0.097	< 0.0086 UJ	< 0.046 UJ	NA	NA	NA
N-Nitrosodiphenylamine	mg/kg	8270	110	110	1.34	< 0.036	< 0.38	< 0.034 UJ	< 0.18 UJ	NA	NA	NA
Pentachlorophenol	mg/kg	8270	1	1	0.028	< 0.035	< 0.37	< 0.033 UJ	< 0.17 UJ	NA	NA	NA
Phenol	mg/kg	8270	1900	19000	6.6	< 0.0092	< 0.098	< 0.0087 UJ	< 0.046 UJ	NA	NA	NA
Polychlorinated Biphenyls												
PCB-1016	mg/kg	8082	0.41	5.5	0.26	< 0.0029 UJ	< 0.0031 UJ	< 0.0028 UJ	< 0.0029 UJ	NA	NA	NA
PCB-1221	mg/kg	8082	0.2	0.26	0.0016	< 0.0037 UJ	< 0.0039 UJ	< 0.0035 UJ	< 0.0037 UJ	NA	NA	NA
PCB-1232	mg/kg	8082	0.17	0.22	0.0016	< 0.0034 UJ	< 0.0035 UJ	< 0.0032 UJ	< 0.0033 UJ	NA	NA	NA
PCB-1242	mg/kg	8082	0.23	0.31	0.024	< 0.0032 UJ	< 0.0034 UJ	< 0.003 UJ	< 0.0032 UJ	NA	NA	NA
PCB-1248	mg/kg	8082	0.23	0.31	0.024	< 0.0019 UJ	< 0.0019 UJ	< 0.0018 UJ	< 0.0018 UJ	NA	NA	NA
PCB-1254	mg/kg	8082	0.12	0.32	0.04	< 0.0028 UJ	< 0.0029 UJ	< 0.0026 UJ	< 0.0028 UJ	NA	NA	NA
PCB-1260	mg/kg	8082	0.24	0.33	0.11	< 0.0028 UJ	0.026 J	< 0.0026 UJ	***0.12*** J	NA	NA	NA
Inorganics												
Aluminum	mg/kg	6020	7700	77000	60000	12000 K	25000 K	25000 K	24000 K	NA	NA	NA
Antimony	mg/kg	6020	3.1	31	5.4	0.34 J	0.57 J	0.42	2.3	NA	NA	NA
Arsenic	mg/kg	6020	0.68	0.43	5.8	***7.1*** K	5 K	2.5 J	***14*** J	NA	NA	NA
Barium	mg/kg	6020	1500	15000	1640	130 J	290 J	230	270	NA	NA	NA
Beryllium	mg/kg	6020	16	160	64	0.9 K	4.5 K	4.9	5.9	NA	NA	NA
Cadmium	mg/kg	6020	7.1	37	7.6	0.64 J	1.1 J	0.88	3.9	NA	NA	NA
Calcium	mg/kg	6020	- -	- -	- -	120000 J	180000 J	170000 L	120000	NA	NA	NA
Chromium [1]	mg/kg	6020	12000	120000	3600000	1100 J	68 J	390	93	NA	NA	NA
Cobalt	mg/kg	6020	2.3	23	0.54	***5.7*** J	***3.4*** J	***1.9***	***10***	NA	NA	NA
Copper	mg/kg	6020	310	3100	920	30 J	28 J	20 K	120 K	NA	NA	NA
Iron	mg/kg	6020	5500	55000	700	***110000***	***30000*** J	***69000*** L	***88000*** L	NA	NA	NA
Lead	mg/kg	6020	400	400	280	47 J	41 J	25	***440***	NA	NA	NA
Magnesium	mg/kg	6020	- -	- -	- -	24000 K	41000 K	43000	29000	NA	NA	NA
Manganese [1]	mg/kg	6020	180	3500	56	***16000***	***2800*** J	***7200*** L	***2400***	NA	NA	NA
Mercury	mg/kg	7471	1.1	3.1	2	0.042 L	0.1 L	0.034 J	0.22	NA	NA	NA
Nickel	mg/kg	6020	150	1500	52	15 J	14 J	9.1	***59***	NA	NA	NA
Potassium	mg/kg	6020	- -	- -	- -	850 J	1400 J	1300	1100	NA	NA	NA
Selenium	mg/kg	6020	39	390	5.2	0.96 K	2.3 K	2.2	3	NA	NA	NA
Silver	mg/kg	6020	39	390	1.6	0.12 J	0.14 J	0.16 K	0.26 K	NA	NA	NA
Sodium	mg/kg	6020	- -	- -	- -	470 K	1000 K	1200	760	NA	NA	NA
Thallium	mg/kg	6020	0.078	0.78	2.8	0.14 J	0.072 J	0.044 J	0.22	NA	NA	NA
Vanadium	mg/kg	6020	39	5.5	172	150 J	34 J	170 L	14 L	NA	NA	NA
Zinc	mg/kg	6020	2300	23000	740	94 J	44 J	53 K	640 K	NA	NA	NA
Other Parameters												
Cyanide, Total	mg/kg	9012	2.3	23	40	< 0.12	1.3	0.8	1.5	NA	NA	NA
Percent Moisture	%	- -	- -	- -	- -	15	20	10	14	NA	NA	NA

TABLE A-1
ANALYTICAL AND SCREENING RESULTS
SURFACE SOIL
CAA VIM AND VIIM
MINGO JUNCTION STEEL WORKS LLC - WEIRTON FACILITY

Constituent	Units	Analytical Method	Screening Criteria [1]			Sample Information [2]						
			Residential Soil RSL	Residential Soil De Minimis	*Protection of Groundwater RSL*	VII-SS-42(0-0.6) 11/19/2013	VII-SS-43(0-0.5) 11/19/2013	VII-SS-44(0-0.6) 11/19/2013	VII-SS-45(0-0.6) 11/19/2013	VII-SS-46(1-2) 12/9/2013	VII-SS-47(0-2) 10/24/2013	VII-SS-48(0-1) 10/24/2013
Volatile Organic Compounds												
Benzene	mg/kg	8260	1.2	1.2	0.052	< 0.00073 UJ	< 0.00073 UJ	< 0.00073	< 0.00072 UJ	< 0.0008	< 0.056	< 0.056
Toluene	mg/kg	8260	490	820	13.8	< 0.00079 UJ	< 0.00078 UJ	0.001 J	0.00089 J	< 0.00086	< 0.048	< 0.048
Ethylbenzene	mg/kg	8260	5.8	6.2	15.6	< 0.0007 UJ	< 0.00069 UJ	< 0.0007	< 0.00069 UJ	< 0.00076	< 0.035	< 0.035
Xylenes, Total	mg/kg	8260	58	260	198	< 0.0024 UJ	< 0.0024 UJ	< 0.0024	< 0.0024 UJ	< 0.0026	< 0.11	< 0.11
1,1,1-Trichloroethane	mg/kg	8260	810	640	5.6	< 0.00053 UJ	< 0.00052 UJ	< 0.00053	< 0.00052 UJ	< 0.00057	< 0.058	< 0.059
1,1,2,2-Tetrachloroethane	mg/kg	8260	0.6	0.64	0.0006	< 0.00078 UJ	< 0.00077 UJ	< 0.00078	< 0.00077 UJ	< 0.00085	< 0.053	< 0.053
1,1,2-Trichloro-1,2,2-trifluoroethane	mg/kg	8260	670	910	52	< 0.0012 UJ	< 0.0011 UJ	< 0.0012	< 0.0011 UJ	< 0.0013	< 0.019	< 0.019
1,1,2-Trichloroethane	mg/kg	8260	0.15	1.2	0.032	< 0.0009 UJ	< 0.00089 UJ	< 0.0009	< 0.00089 UJ	< 0.00098	< 0.065	< 0.066
1,1-Dichloroethane	mg/kg	8260	3.6	3.8	0.0156	< 0.00062 UJ	< 0.00062 UJ	< 0.00062	< 0.00061 UJ	< 0.00068	< 0.057	< 0.058
1,1-Dichloroethene	mg/kg	8260	23	240	0.2	< 0.00092 UJ	< 0.00091 UJ	< 0.00092	< 0.00091 UJ	< 0.001	< 0.06	< 0.061
1,2,4-Trichlorobenzene	mg/kg	8260	5.8	24	4	< 0.00096 UJ	< 0.00095 UJ	< 0.00096	< 0.00094 UJ	< 0.001	< 0.021	< 0.021
1,2-Dibromo-3-Chloropropane	mg/kg	8260	0.0053	0.0057	0.00172	< 0.00081 UJ	< 0.0008 UJ	< 0.00081	< 0.0008 UJ	< 0.00088	< 0.02	< 0.02
1,2-Dibromoethane (EDB)	mg/kg	8260	0.036	0.039	0.00028	< 0.00094 UJ	< 0.00093 UJ	< 0.00094	< 0.00092 UJ	< 0.001	< 0.034	< 0.035
1,2-Dichlorobenzene	mg/kg	8260	180	380	11.6	< 0.00087 UJ	< 0.00086 UJ	< 0.00086	< 0.00085 UJ	< 0.00094	< 0.038	< 0.039
1,2-Dichloroethane	mg/kg	8260	0.46	0.5	0.028	< 0.00067 UJ	< 0.00066 UJ	< 0.00066	< 0.00066 UJ	< 0.00072	< 0.054	< 0.055
1,2-Dichloroethene, Total	mg/kg	8260	- -	- -	- -	0.0015 J	< 0.0014 UJ	0.0022 J	0.002 J	< 0.0015	< 0.054	< 0.054
cis-1,2-Dichloroethene	mg/kg	8260	16	17	0.42	< 0.00076 UJ	< 0.00076 UJ	< 0.00076	< 0.00075 UJ	< 0.00083	< 0.037	< 0.038
trans-1,2-Dichloroethene	mg/kg	8260	7	130	0.62	0.0015 J	0.00075 J	0.0022 J	0.002 J	< 0.0007	< 0.042	< 0.043
1,2-Dichloropropane	mg/kg	8260	1.6	1.1	0.034	< 0.00059 UJ	< 0.00058 UJ	< 0.00059	< 0.00058 UJ	< 0.00064	< 0.072	< 0.073
cis-1,3-Dichloropropene [1]	mg/kg	8260	1.8	1.9	0.0034	< 0.00074 UJ	< 0.00073 UJ	< 0.00073	< 0.00072 UJ	< 0.0008	< 0.041	< 0.041
trans-1,3-Dichloropropene [1]	mg/kg	8260	1.8	1.9	0.0034	< 0.00065 UJ	< 0.00064 UJ	< 0.00065	< 0.00064 UJ	< 0.0007	< 0.033	< 0.033
1,3-Dichlorobenzene [1]	mg/kg	8260	2.6	2.8	1.44	< 0.00071 UJ	< 0.00071 UJ	< 0.00071	< 0.0007 UJ	< 0.00077	< 0.028	< 0.029
1,4-Dichlorobenzene	mg/kg	8260	2.6	2.8	1.44	< 0.00069 UJ	< 0.00068 UJ	< 0.00069	< 0.00068 UJ	< 0.00075	< 0.03	< 0.03
2-Butanone (MEK)	mg/kg	8260	2700	28000	2.4	< 0.00096 UJ	< 0.00095 UJ	< 0.00096	< 0.00094 UJ	< 0.001	< 0.061	< 0.062
2-Hexanone	mg/kg	8260	20	- -	0.0176	< 0.00075 UJ	< 0.00074 UJ	< 0.00075	< 0.00074 UJ	< 0.00081	< 0.032	< 0.033
4-Methyl-2-pentanone (MIBK)	mg/kg	8260	3300	3400	2.8	< 0.00071 UJ	< 0.0007 UJ	< 0.00071	< 0.0007 UJ	< 0.00077	< 0.033	< 0.034
Acetone	mg/kg	8260	6100	61000	5.8	0.0099 J	0.013 J	0.014 J	0.0084 J	< 0.0059	< 0.28	< 0.29
Bromoform	mg/kg	8260	19	20	0.42	< 0.00048 UJ	< 0.00048 UJ	< 0.00048	< 0.00047 UJ	< 0.00052	< 0.06	< 0.061
Bromomethane	mg/kg	8260	0.68	7.3	0.0038	< 0.0008 R	< 0.00079 R	< 0.0008 R	< 0.00079 R	< 0.00087 R	< 0.089	< 0.09
Carbon disulfide	mg/kg	8260	77	740	0.48	0.0014 J	< 0.00055 UJ	< 0.00056	0.00068 J	< 0.0006	< 0.061	< 0.061
Carbon tetrachloride	mg/kg	8260	0.65	0.7	0.038	< 0.00048 UJ	< 0.00048 UJ	< 0.00048	< 0.00048 UJ	< 0.00053	< 0.061	< 0.062
Chlorobenzene	mg/kg	8260	28	290	1.36	< 0.00082 UJ	< 0.00081 UJ	< 0.00082	< 0.00081 UJ	< 0.00089	< 0.03	< 0.03
Chlorodibromomethane	mg/kg	8260	8.3	8.3	0.42	< 0.00077 UJ	< 0.00076 UJ	< 0.00077	< 0.00076 UJ	< 0.00084	< 0.037	< 0.037
Chloroethane	mg/kg	8260	1400	2100	11.8	< 0.0017 UJ	< 0.0017 UJ	< 0.0017	< 0.0017 UJ	< 0.0018	< 0.042	< 0.043
Chloroform	mg/kg	8260	0.32	0.34	0.44	< 0.00064 UJ	< 0.00063 UJ	< 0.00063	< 0.00063 UJ	0.00076 B	< 0.057	< 0.058
Chloromethane	mg/kg	8260	11	120	0.098	< 0.00093 UJ	< 0.00092 UJ	< 0.00092	< 0.00091 UJ	< 0.001	< 0.078	< 0.079
Cyclohexane	mg/kg	8260	650	120	26	< 0.0004 UJ	< 0.0004 UJ	< 0.0004	< 0.0004 UJ	< 0.00044	< 0.034	< 0.034
Dichlorobromomethane	mg/kg	8260	0.29	0.31	0.44	< 0.00061 UJ	< 0.0006 UJ	< 0.00061	< 0.0006 UJ	< 0.00066	< 0.052	< 0.053
Dichlorodifluoromethane	mg/kg	8260	8.7	94	0.6	< 0.00072 UJ	< 0.00072 UJ	< 0.00072	< 0.00071 UJ	< 0.00078	< 0.036	< 0.036
Isopropylbenzene	mg/kg	8260	190	270	1.48	< 0.00074 UJ	< 0.00073 UJ	< 0.00074	< 0.00073 UJ	< 0.0008	< 0.03	< 0.03
Methyl acetate	mg/kg	8260	7800	23000	8.2	< 0.00098 UJ	< 0.00097 UJ	< 0.00098	< 0.00096 UJ	< 0.0011	< 0.069	< 0.07
Methyl tert-butyl ether	mg/kg	8260	47	50	0.064	< 0.00081 UJ	< 0.0008 UJ	< 0.00081	< 0.0008 UJ	< 0.00088	< 0.058	< 0.059
Methylcyclohexane [1]	mg/kg	8260	650	120	26	< 0.00079 UJ	< 0.00078 UJ	< 0.00079	< 0.00078 UJ	< 0.00085	< 0.031	< 0.032
Methylene Chloride	mg/kg	8260	35	58	0.054	0.003 B	0.003 B	0.0036 B	0.0033 B	0.00079 B	< 0.061	< 0.062
Styrene	mg/kg	8260	600	870	2.6	< 0.00077 UJ	< 0.00076 UJ	< 0.00076	< 0.00075 UJ	< 0.00083	< 0.036	< 0.036
Tetrachloroethene	mg/kg	8260	8.1	25	0.046	< 0.00074 UJ	< 0.00073 UJ	< 0.00074	< 0.00073 UJ	< 0.0008	< 0.046	< 0.047
Trichloroethene	mg/kg	8260	0.41	0.5	0.036	< 0.00071 UJ	< 0.00071 UJ	< 0.00071	< 0.0007 UJ	< 0.00077	< 0.045	< 0.046
Trichlorofluoromethane	mg/kg	8260	2300	790	6.6	< 0.001 UJ	< 0.00099 UJ	< 0.001	< 0.00098 UJ	< 0.0011	< 0.063	< 0.064
Vinyl chloride	mg/kg	8260	0.059	0.057	0.0138	< 0.00051 UJ	< 0.0005 UJ	< 0.00051	< 0.0005 UJ	< 0.00055	< 0.073	< 0.074

TABLE A-1
ANALYTICAL AND SCREENING RESULTS
SURFACE SOIL
CAA VIM AND VIIM
MINGO JUNCTION STEEL WORKS LLC - WEIRTON FACILITY

Constituent	Units	Analytical Method	Screening Criteria [1]			Sample Information [2]						
			Residential Soil RSL	Residential Soil De Minimis	*Protection of Groundwater RSL*	VII-SS-42(0-0.6) 11/19/2013	VII-SS-43(0-0.5) 11/19/2013	VII-SS-44(0-0.6) 11/19/2013	VII-SS-45(0-0.6) 11/19/2013	VII-SS-46(1-2) 12/9/2013	VII-SS-47(0-2) 10/24/2013	VII-SS-48(0-1) 10/24/2013
Semi-Volatile Organic Compounds												
Acenaphthene	mg/kg	8270	360	4100	11	< 0.035 UJ	< 0.0069 UJ	< 0.069 UJ	< 0.068 UJ	< 0.0075 UJ	< 0.0072 UJ	0.012 J
Acenaphthylene [1]	mg/kg	8270	360	4200	11	0.081 J	< 0.0082 UJ	< 0.083 UJ	< 0.081 UJ	< 0.009 UJ	< 0.0086 UJ	0.022 J
Anthracene	mg/kg	8270	1800	23000	116	0.038 J	< 0.007 UJ	< 0.07 UJ	< 0.069 UJ	< 0.0077 UJ	0.024 J	0.031 J
Benzo[a]anthracene	mg/kg	8270	1.1	0.21	0.22	***0.33*** J	0.043 J	***0.29*** J	***0.26*** J	0.036 J	0.095 J	0.12 J
Benzo[a]pyrene	mg/kg	8270	0.11	0.016	4.8	0.23 J	0.023 J	0.15 J	< 0.071 UJ	0.029 J	0.099 J	0.12 J
Benzo[b]fluoranthene	mg/kg	8270	1.1	0.16	6	0.28 J	0.049 J	0.28 J	0.2 J	0.044 J	0.14 J	0.21 J
Benzo[g,h,i]perylene [1]	mg/kg	8270	180	1800	26	0.31 J	0.048 J	0.32 J	0.36 J	0.022 J	0.098 J	0.16 J
Benzo[k]fluoranthene	mg/kg	8270	11	1.6	58	< 0.073 UJ	0.02 J	< 0.15 UJ	0.19 J	< 0.016 UJ	0.065 J	0.06 J
Chrysene	mg/kg	8270	110	16	180	0.96 J	0.13 J	0.74 J	0.76 J	0.042 J	0.12 J	0.15 J
Dibenz(a,h)anthracene	mg/kg	8270	0.11	0.016	1.92	0.094 J	< 0.008 UJ	< 0.08 UJ	< 0.079 UJ	< 0.0087 UJ	< 0.0084 UJ	0.04 J
Fluoranthene	mg/kg	8270	240	2400	178	0.36 J	0.082 J	0.46 J	0.28 J	0.049 J	0.18 J	0.2 J
Fluorene	mg/kg	8270	240	2900	10.8	< 0.048 UJ	< 0.0095 UJ	< 0.095 UJ	< 0.093 UJ	< 0.01 UJ	< 0.0099 UJ	< 0.01 UJ
Indeno[1,2,3-cd]pyrene	mg/kg	8270	1.1	0.16	19.6	0.12 J	0.017 J	0.16 J	0.15 J	0.021 J	0.077 J	0.13 J
Naphthalene	mg/kg	8270	2	4.1	0.0076	< 0.031 UJ	< 0.0062 UJ	< 0.062 UJ	< 0.061 UJ	< 0.0068 UJ	***0.02*** J	< 0.0066 UJ
Phenanthrene [1]	mg/kg	8270	1800	23000	116	0.37 J	0.16 J	0.22 J	0.2 J	0.032 J	0.094 J	0.095 J
Pyrene	mg/kg	8270	180	2300	26	0.86 J	0.11 J	0.77 J	0.69 J	0.043 J	0.16 J	0.22 J
1,1'-Biphenyl	mg/kg	8270	4.7	51	0.0174	< 0.16 UJ	< 0.032 UJ	< 0.32 UJ	< 0.32 UJ	< 0.035 UJ	< 0.034 UJ	< 0.034 UJ
2,4,5-Trichlorophenol	mg/kg	8270	630	6300	8	< 0.19 UJ	< 0.038 UJ	< 0.38 UJ	< 0.38 UJ	< 0.042 UJ	< 0.04 UJ	< 0.041 UJ
2,4,6-Trichlorophenol	mg/kg	8270	6.3	49	0.024	< 0.27 UJ	< 0.054 UJ	< 0.54 UJ	< 0.53 UJ	< 0.059 UJ	< 0.056 UJ	< 0.057 UJ
2,4-Dichlorophenol	mg/kg	8270	19	190	0.046	< 0.036 UJ	< 0.0072 UJ	< 0.072 UJ	< 0.071 UJ	< 0.0079 UJ	< 0.0075 UJ	< 0.0076 UJ
2,4-Dimethylphenol	mg/kg	8270	130	1300	0.84	< 0.28 UJ	< 0.056 UJ	< 0.56 UJ	< 0.55 UJ	< 0.061 UJ	< 0.059 UJ	< 0.06 UJ
2,4-Dinitrophenol	mg/kg	8270	13	130	0.088	< 2.2 UJ	< 0.43 UJ	< 4.3 UJ	< 4.2 UJ	< 0.47 UJ	< 0.45 UJ	< 0.45 UJ
2,4-Dinitrotoluene	mg/kg	8270	1.7	1.7	0.0064	< 0.15 UJ	< 0.029 UJ	< 0.29 UJ	< 0.29 UJ	< 0.032 UJ	< 0.03 UJ	< 0.031 UJ
2,6-Dinitrotoluene	mg/kg	8270	0.36	0.36	0.00134	< 0.19 UJ	< 0.037 UJ	< 0.37 UJ	< 0.37 UJ	< 0.041 UJ	< 0.039 UJ	< 0.039 UJ
2-Chloronaphthalene	mg/kg	8270	480	5000	7.8	< 0.038 UJ	< 0.0075 UJ	< 0.075 UJ	< 0.074 UJ	< 0.0082 UJ	< 0.0079 UJ	< 0.008 UJ
2-Chlorophenol	mg/kg	8270	39	340	0.178	< 0.15 UJ	< 0.029 UJ	< 0.29 UJ	< 0.29 UJ	< 0.032 UJ	< 0.031 UJ	< 0.031 UJ
2-Methylnaphthalene	mg/kg	8270	24	310	0.38	0.042 J	0.036 J	< 0.065 UJ	< 0.064 UJ	0.02 J	0.017 J	0.021 J
2-Methylphenol	mg/kg	8270	320	3200	1.5	< 0.13 UJ	< 0.025 UJ	< 0.25 UJ	< 0.25 UJ	< 0.027 UJ	< 0.026 UJ	< 0.027 UJ
2-Nitroaniline	mg/kg	8270	63	630	0.16	< 0.81 UJ	< 0.16 UJ	< 1.6 UJ	< 1.6 UJ	< 0.18 UJ	< 0.17 UJ	< 0.17 UJ
2-Nitrophenol	mg/kg	8270	- -	- -	- -	< 0.2 UJ	< 0.04 UJ	< 0.4 UJ	< 0.39 UJ	< 0.043 UJ	< 0.041 UJ	< 0.042 UJ
3,3'-Dichlorobenzidine	mg/kg	8270	1.2	1.2	0.0164	< 0.19 UJ	< 0.038 UJ	< 0.38 UJ	< 0.37 UJ	< 0.042 UJ	< 0.04 UJ	< 0.04 UJ
Methylphenol, 3 & 4 [1]	mg/kg	8270	320	3200	1.48	< 0.18 UJ	< 0.035 UJ	< 0.35 UJ	< 0.35 UJ	< 0.038 UJ	< 0.037 UJ	< 0.037 UJ
3-Nitroaniline	mg/kg	8270	- -	- -	- -	< 0.75 UJ	< 0.15 UJ	< 1.5 UJ	< 1.5 UJ	< 0.16 UJ	< 0.15 UJ	< 0.16 UJ
4,6-Dinitro-2-methylphenol	mg/kg	8270	0.51	- -	0.0052	< 0.73 UJ	< 0.14 UJ	< 1.4 UJ	< 1.4 UJ	< 0.16 UJ	< 0.15 UJ	< 0.15 UJ
4-Bromophenyl phenyl ether	mg/kg	8270	- -	- -	- -	< 0.16 UJ	< 0.031 UJ	< 0.31 UJ	< 0.31 UJ	< 0.034 UJ	< 0.033 UJ	< 0.033 UJ
4-Chloro-3-methylphenol	mg/kg	8270	630	- -	3.4	< 0.17 UJ	< 0.033 UJ	< 0.33 UJ	< 0.33 UJ	< 0.036 UJ	< 0.035 UJ	< 0.035 UJ
4-Chloroaniline	mg/kg	8270	2.7	2.7	0.0032	< 0.15 UJ	< 0.029 UJ	< 0.29 UJ	< 0.28 UJ	< 0.031 UJ	< 0.03 UJ	< 0.03 UJ
4-Chlorophenyl phenyl ether	mg/kg	8270	- -	- -	- -	< 0.2 UJ	< 0.04 UJ	< 0.4 UJ	< 0.39 UJ	< 0.044 UJ	< 0.042 UJ	< 0.042 UJ
4-Nitroaniline	mg/kg	8270	25	- -	0.032	< 0.74 UJ	< 0.15 UJ	< 1.5 UJ	< 1.4 UJ	< 0.16 UJ	< 0.15 UJ	< 0.15 UJ
4-Nitrophenol	mg/kg	8270	- -	- -	- -	< 0.66 UJ	< 0.13 UJ	< 1.3 UJ	< 1.3 UJ	< 0.14 UJ	< 0.14 UJ	< 0.14 UJ
Acetophenone	mg/kg	8270	780	2500	1.16	< 0.15 UJ	< 0.03 UJ	< 0.3 UJ	< 0.29 UJ	< 0.032 UJ	< 0.031 UJ	< 0.031 UJ
Atrazine	mg/kg	8270	2.4	2.4	0.038	< 0.18 UJ	< 0.035 UJ	< 0.35 UJ	< 0.34 UJ	< 0.038 UJ	< 0.037 UJ	< 0.037 UJ
Benzaldehyde	mg/kg	8270	170	1200	0.082	< 0.27 UJ	< 0.054 UJ	< 0.54 UJ	< 0.53 UJ	< 0.059 UJ	< 0.056 UJ	< 0.057 UJ
Bis(2-chloroisopropyl)ether	mg/kg	8270	310	5.1	0.52	< 0.039 UJ	< 0.0077 UJ	< 0.078 UJ	< 0.076 UJ	< 0.0085 UJ	< 0.0081 UJ	< 0.0082 UJ
Bis(2-chloroethoxy)methane	mg/kg	8270	19	- -	0.026	< 0.12 UJ	< 0.024 UJ	< 0.24 UJ	< 0.23 UJ	< 0.026 UJ	< 0.025 UJ	< 0.025 UJ
Bis(2-chloroethyl)ether	mg/kg	8270	0.23	0.24	0.000072	< 0.049 UJ	< 0.0096 UJ	< 0.097 UJ	< 0.095 UJ	< 0.011 UJ	< 0.01 UJ	< 0.01 UJ
Bis(2-ethylhexyl) phthalate	mg/kg	8270	39	39	28	< 0.29 UJ	< 0.058 UJ	< 0.58 UJ	< 0.57 UJ	< 0.064 UJ	0.091 J	0.16 J
Butyl benzyl phthalate	mg/kg	8270	290	290	4.8	< 0.25 UJ	< 0.049 UJ	< 0.49 UJ	< 0.48 UJ	0.23 J	< 0.051 UJ	< 0.052 UJ
Caprolactam	mg/kg	8270	3100	31000	5	< 1.4 UJ	< 0.27 UJ	< 2.7 UJ	< 2.7 UJ	< 0.3 UJ	< 0.28 UJ	< 0.29 UJ
Carbazole [1]	mg/kg	8270	1800	23000	116	< 0.033 UJ	0.0078 J	< 0.066 UJ	< 0.065 UJ	< 0.0072 UJ	< 0.0069 UJ	0.011 J

TABLE A-1
ANALYTICAL AND SCREENING RESULTS
SURFACE SOIL
CAA VIM AND VIIM
MINGO JUNCTION STEEL WORKS LLC - WEIRTON FACILITY

Constituent	Units	Analytical Method	Screening Criteria [1] Residential Soil RSL	Residential Soil De Minimis	*Protection of Groundwater RSL*	Sample Information [2] VII-SS-42(0-0.6) 11/19/2013	VII-SS-43(0-0.5) 11/19/2013	VII-SS-44(0-0.6) 11/19/2013	VII-SS-45(0-0.6) 11/19/2013	VII-SS-46(1-2) 12/9/2013	VII-SS-47(0-2) 10/24/2013	VII-SS-48(0-1) 10/24/2013
Dibenzofuran	mg/kg	8270	7.8	78	0.3	< 0.18 UJ	< 0.035 UJ	< 0.35 UJ	< 0.35 UJ	< 0.039 UJ	< 0.037 UJ	< 0.037 UJ
Diethyl phthalate	mg/kg	8270	5100	51000	12.2	0.22 B	< 0.039 UJ	< 0.39 UJ	0.6 B	< 0.043 UJ	< 0.041 UJ	< 0.042 UJ
Dimethyl phthalate	mg/kg	8270	- -	- -	- -	< 0.2 UJ	< 0.039 UJ	< 0.39 UJ	< 0.39 UJ	< 0.043 UJ	< 0.041 UJ	0.076 J
Di-n-butyl phthalate	mg/kg	8270	630	6300	4.6	< 0.23 UJ	< 0.045 UJ	< 0.45 UJ	< 0.44 UJ	< 0.049 UJ	< 0.047 UJ	< 0.048 UJ
Di-n-octyl phthalate	mg/kg	8270	63	- -	114	< 0.19 UJ	< 0.038 UJ	< 0.38 UJ	< 0.37 UJ	< 0.041 UJ	< 0.04 UJ	< 0.04 UJ
Hexachlorobenzene	mg/kg	8270	0.21	0.22	0.26	< 0.039 UJ	< 0.0076 UJ	< 0.077 UJ	< 0.075 UJ	< 0.0084 UJ	< 0.008 UJ	< 0.0081 UJ
Hexachlorobutadiene	mg/kg	8270	1.2	1.3	0.0054	< 0.041 UJ	< 0.008 UJ	< 0.081 UJ	< 0.079 UJ	< 0.0088 UJ	< 0.0084 UJ	< 0.0085 UJ
Hexachlorocyclopentadiene	mg/kg	8270	0.18	1.9	3.2	< 0.2 UJ	< 0.039 UJ	< 0.39 UJ	< 0.38 UJ	< 0.042 UJ	< 0.041 UJ	< 0.041 UJ
Hexachloroethane	mg/kg	8270	1.8	2	0.004	< 0.13 UJ	< 0.026 UJ	< 0.26 UJ	< 0.25 UJ	< 0.028 UJ	< 0.027 UJ	< 0.027 UJ
Isophorone	mg/kg	8270	570	570	0.52	< 0.14 UJ	< 0.027 UJ	< 0.27 UJ	< 0.27 UJ	< 0.03 UJ	< 0.028 UJ	< 0.029 UJ
Nitrobenzene	mg/kg	8270	5.1	5.5	0.00184	< 0.15 UJ	< 0.03 UJ	< 0.3 UJ	< 0.29 UJ	< 0.033 UJ	< 0.031 UJ	< 0.032 UJ
N-Nitrosodi-n-propylamine	mg/kg	8270	0.078	0.078	0.000162	< 0.043 UJ	< 0.0084 UJ	< 0.084 UJ	< 0.083 UJ	< 0.0092 UJ	< 0.0088 UJ	< 0.0089 UJ
N-Nitrosodiphenylamine	mg/kg	8270	110	110	1.34	< 0.17 UJ	< 0.033 UJ	< 0.33 UJ	< 0.33 UJ	< 0.036 UJ	< 0.035 UJ	< 0.035 UJ
Pentachlorophenol	mg/kg	8270	1	1	0.028	< 0.16 UJ	< 0.032 UJ	< 0.32 UJ	< 0.32 UJ	< 0.035 UJ	< 0.034 UJ	< 0.034 UJ
Phenol	mg/kg	8270	1900	19000	6.6	< 0.043 UJ	< 0.0085 UJ	< 0.085 UJ	< 0.084 UJ	< 0.0093 UJ	< 0.0089 UJ	< 0.009 UJ
Polychlorinated Biphenyls												
PCB-1016	mg/kg	8082	0.41	5.5	0.26	< 0.0027 UJ	< 0.0027 UJ	< 0.0027 UJ	< 0.0026 UJ	< 0.0029	< 0.0028 UJ	< 0.0028 UJ
PCB-1221	mg/kg	8082	0.2	0.26	0.0016	< 0.0035 UJ	< 0.0034 UJ	< 0.0034 UJ	< 0.0034 UJ	< 0.0037	< 0.0036 UJ	< 0.0036 UJ
PCB-1232	mg/kg	8082	0.17	0.22	0.0016	< 0.0031 UJ	< 0.0031 UJ	< 0.0031 UJ	< 0.003 UJ	< 0.0034	< 0.0032 UJ	< 0.0032 UJ
PCB-1242	mg/kg	8082	0.23	0.31	0.024	< 0.003 UJ	< 0.0029 UJ	< 0.0029 UJ	< 0.0029 UJ	< 0.0032	< 0.0031 UJ	< 0.0031 UJ
PCB-1248	mg/kg	8082	0.23	0.31	0.024	< 0.0017 UJ	< 0.0017 UJ	< 0.0017 UJ	< 0.0017 UJ	< 0.0019	< 0.0018 UJ	< 0.0018 UJ
PCB-1254	mg/kg	8082	0.12	0.32	0.04	< 0.0026 UJ	< 0.0026 UJ	< 0.0026 UJ	< 0.0025 UJ	< 0.0028	< 0.0027 UJ	0.035 J
PCB-1260	mg/kg	8082	0.24	0.33	0.11	< 0.0026 UJ	< 0.0025 UJ	0.01 J	< 0.0025 UJ	0.0031 J	0.015 J	< 0.0027 UJ
Inorganics												
Aluminum	mg/kg	6020	7700	77000	60000	16000 K	13000 K	15000 K	16000 K	10000 J	13000 K	10000 K
Antimony	mg/kg	6020	3.1	31	5.4	0.19 J	0.23 J	0.18 J	0.15 J	0.22 J	0.99 J	3 J
Arsenic	mg/kg	6020	0.68	0.43	5.8	1.4 J	1 J	1.9 J	1.4 J	3.6 K	3.6 J	5 J
Barium	mg/kg	6020	1500	15000	1640	110	64 J	110	140	100 J	150 J	120 J
Beryllium	mg/kg	6020	16	160	64	1	0.43 J	1.2	1.8	0.86 J	1.5 L	1.1 L
Cadmium	mg/kg	6020	7.1	37	7.6	1	1.1 J	0.77	0.93	0.4 J	2.3 J	3.2 J
Calcium	mg/kg	6020	- -	- -	- -	160000 L	190000 L	160000 L	170000 L	32000 J	110000 J	100000 J
Chromium [1]	mg/kg	6020	12000	120000	3600000	960	940 J	1000	970	96 J	470 J	540 J
Cobalt	mg/kg	6020	2.3	23	0.54	***2.3***	***2.3*** J	***3.3***	***2.2***	***14*** J	***6.4*** J	***8.7*** J
Copper	mg/kg	6020	310	3100	920	21 K	22 K	19 K	19 K	24 J	55 K	160 K
Iron	mg/kg	6020	5500	55000	700	***150000*** L	***160000*** L	***160000*** L	***130000*** L	***52000*** J	***130000*** J	***220000*** J
Lead	mg/kg	6020	400	400	280	16	5.1 J	12	14	27 J	130 J	130 J
Magnesium	mg/kg	6020	- -	- -	- -	49000	44000 J	43000	49000	7400 J	32000 J	33000 J
Manganese [1]	mg/kg	6020	180	3500	56	***23000*** L	***6400*** J	***18000*** L	***21000*** L	***3600*** J	***14000*** J	***16000*** J
Mercury	mg/kg	7471	1.1	3.1	2	< 0.012	< 0.011	< 0.011	< 0.012	0.047 L	0.058	0.64
Nickel	mg/kg	6020	150	1500	52	16	9.6 J	15	14	16 K	24 K	45 K
Potassium	mg/kg	6020	- -	- -	- -	460	190 J	520	670	980 J	580 K	360 K
Selenium	mg/kg	6020	39	390	5.2	1.1	0.75 J	1.1	1.4	0.58 J	1.5 J	1 J
Silver	mg/kg	6020	39	390	1.6	0.23 K	0.33 K	0.26 K	0.19 K	0.057 B	0.15 K	0.27 K
Sodium	mg/kg	6020	- -	- -	- -	820	820 J	1600	1700	150 J	300 J	300 J
Thallium	mg/kg	6020	0.078	0.78	2.8	0.019 J	0.0091 J	0.026 J	0.028 J	0.16 J	0.038 J	0.068 J
Vanadium	mg/kg	6020	39	5.5	172	***370*** L	***510*** L	***350*** L	***390*** L	30 J	78 J	***300*** J
Zinc	mg/kg	6020	2300	23000	740	49 K	23 K	51 K	56 K	64 L	210 K	***910*** K
Other Parameters												
Cyanide, Total	mg/kg	9012	2.3	23	40	1.2	0.59	0.59	1.1	< 0.11	0.43 J	0.67
Percent Moisture	%	- -	- -	- -	- -	8.2	7.1	8	6.4	15	11	12

TABLE A-1
ANALYTICAL AND SCREENING RESULTS
SURFACE SOIL
CAA VIM AND VIIM
MINGO JUNCTION STEEL WORKS LLC - WEIRTON FACILITY

Constituent	Units	Analytical Method	Screening Criteria [1]			Sample Information [2]						
			Residential Soil RSL	Residential Soil De Minimis	*Protection of Groundwater RSL*	VII-SS-49(0-0.6) 10/24/2013	VII-SS-50(0-2) 10/30/2013	VII-SS-51(0-1) 10/24/2013	VII-SS-52(0-1) 10/17/2013	VII-SS-53(0-0.5) 10/17/2013	VII-SS-54(0-0.7) 10/17/2013	VII-SS-54(0-0.7)DUP 10/17/2013 Duplicate
Volatile Organic Compounds												
Benzene	mg/kg	8260	1.2	1.2	0.052	< 0.054	< 0.00072 UJ	< 0.052	< 0.00073	< 0.0007	< 0.00083	< 0.00072
Toluene	mg/kg	8260	490	820	13.8	< 0.046	< 0.00077 UJ	< 0.045	< 0.00079	< 0.00076	< 0.0009	< 0.00078
Ethylbenzene	mg/kg	8260	5.8	6.2	15.6	< 0.034	< 0.00068 UJ	< 0.033	< 0.0007	< 0.00067	< 0.00079	< 0.00069
Xylenes, Total	mg/kg	8260	58	260	198	< 0.11	< 0.0024 UJ	< 0.1	< 0.0024	< 0.0023	< 0.0028	< 0.0024
1,1,1-Trichloroethane	mg/kg	8260	810	640	5.6	< 0.056	< 0.00052 UJ	< 0.054	< 0.00053	< 0.0005	< 0.0006	< 0.00052
1,1,2,2-Tetrachloroethane	mg/kg	8260	0.6	0.64	0.0006	< 0.051	< 0.00076 UJ	< 0.049	< 0.00078	< 0.00074	< 0.00089	< 0.00077
1,1,2-Trichloro-1,2,2-trifluoroethane	mg/kg	8260	670	910	52	< 0.018	< 0.0011 UJ	< 0.017	< 0.0012	< 0.0011	< 0.0013	< 0.0011
1,1,2-Trichloroethane	mg/kg	8260	0.15	1.2	0.032	< 0.063	< 0.00088 UJ	< 0.061	< 0.0009	< 0.00086	< 0.001	< 0.00089
1,1-Dichloroethane	mg/kg	8260	3.6	3.8	0.0156	< 0.055	< 0.00061 UJ	< 0.053	< 0.00062	< 0.0006	< 0.00071	< 0.00061
1,1-Dichloroethene	mg/kg	8260	23	240	0.2	< 0.058	< 0.0009	< 0.056 UJ	< 0.00092	< 0.00088	< 0.001	< 0.00091
1,2,4-Trichlorobenzene	mg/kg	8260	5.8	24	4	1.9	< 0.00094 UJ	0.47	< 0.00096	< 0.00091	< 0.0011	< 0.00094
1,2-Dibromo-3-Chloropropane	mg/kg	8260	0.0053	0.0057	0.00172	< 0.019	< 0.00079 UJ	< 0.019	< 0.00081	< 0.00078	< 0.00093	< 0.0008
1,2-Dibromoethane (EDB)	mg/kg	8260	0.036	0.039	0.00028	< 0.033	< 0.00092 UJ	< 0.032	< 0.00094	< 0.00089	< 0.0011	< 0.00092
1,2-Dichlorobenzene	mg/kg	8260	180	380	11.6	< 0.037	< 0.00085 UJ	< 0.036	< 0.00086	< 0.00083	< 0.00099	< 0.00085
1,2-Dichloroethane	mg/kg	8260	0.46	0.5	0.028	< 0.052	< 0.00065 UJ	< 0.051	< 0.00066	< 0.00064	< 0.00076	< 0.00065
1,2-Dichloroethene, Total	mg/kg	8260	- -	- -	- -	< 0.052	< 0.0014 UJ	< 0.05	< 0.0014	< 0.0013	< 0.0016	< 0.0014
cis-1,2-Dichloroethene	mg/kg	8260	16	17	0.42	< 0.036	< 0.00075 UJ	< 0.035	< 0.00076	< 0.00073	< 0.00087	< 0.00075
trans-1,2-Dichloroethene	mg/kg	8260	7	130	0.62	< 0.041	< 0.00063 UJ	< 0.04	< 0.00065	< 0.00062	< 0.00074	< 0.00064
1,2-Dichloropropane	mg/kg	8260	1.6	1.1	0.034	< 0.069	< 0.00058 UJ	< 0.067	< 0.00059	< 0.00056	< 0.00067	< 0.00058
cis-1,3-Dichloropropene [1]	mg/kg	8260	1.8	1.9	0.0034	< 0.039	< 0.00072 UJ	< 0.038	< 0.00073	< 0.0007	< 0.00084	< 0.00072
trans-1,3-Dichloropropene [1]	mg/kg	8260	1.8	1.9	0.0034	< 0.032	< 0.00063 UJ	< 0.031	< 0.00065	< 0.00062	< 0.00074	< 0.00064
1,3-Dichlorobenzene [1]	mg/kg	8260	2.6	2.8	1.44	< 0.027	< 0.0007 UJ	< 0.027	< 0.00071	< 0.00068	< 0.00081	< 0.0007
1,4-Dichlorobenzene	mg/kg	8260	2.6	2.8	1.44	< 0.029	< 0.00068 UJ	< 0.028	< 0.00069	< 0.00066	< 0.00079	< 0.00068
2-Butanone (MEK)	mg/kg	8260	2700	28000	2.4	< 0.059	< 0.00094 UJ	< 0.057	< 0.00096	< 0.00091	< 0.0011	< 0.00094
2-Hexanone	mg/kg	8260	20	- -	0.0176	< 0.031	< 0.00073 UJ	< 0.03	< 0.00075	< 0.00072	< 0.00085	< 0.00074
4-Methyl-2-pentanone (MIBK)	mg/kg	8260	3300	3400	2.8	< 0.032	< 0.00069 UJ	< 0.031	< 0.00071	< 0.00068	< 0.00081	< 0.0007
Acetone	mg/kg	8260	6100	61000	5.8	< 0.27	< 0.0053 R	< 0.26	< 0.0054	< 0.0052	< 0.0062	< 0.0053
Bromoform	mg/kg	8260	19	20	0.42	< 0.058	< 0.00047 UJ	< 0.056	< 0.00048	< 0.00046	< 0.00055	< 0.00047
Bromomethane	mg/kg	8260	0.68	7.3	0.0038	< 0.086	< 0.00078 UJ	< 0.083	< 0.0008	< 0.00077	< 0.00091	< 0.00079
Carbon disulfide	mg/kg	8260	77	740	0.48	< 0.058	< 0.00054 UJ	< 0.057	< 0.00055	< 0.00053	< 0.00063	< 0.00055
Carbon tetrachloride	mg/kg	8260	0.65	0.7	0.038	< 0.059	< 0.00047 UJ	< 0.057	< 0.00048	< 0.00046	< 0.00055	< 0.00048
Chlorobenzene	mg/kg	8260	28	290	1.36	< 0.029	< 0.0008 UJ	< 0.028	< 0.00082	< 0.00078	< 0.00094	< 0.00081
Chlorodibromomethane	mg/kg	8260	8.3	8.3	0.42	< 0.035	< 0.00075 UJ	< 0.034	< 0.00077	< 0.00074	< 0.00088	< 0.00076
Chloroethane	mg/kg	8260	1400	2100	11.8	< 0.041	< 0.0016 UJ	< 0.039	< 0.0017	< 0.0016	< 0.0019	< 0.0017
Chloroform	mg/kg	8260	0.32	0.34	0.44	< 0.055	0.00069 J	< 0.053	< 0.00063	< 0.00061	< 0.00072	< 0.00062
Chloromethane	mg/kg	8260	11	120	0.098	< 0.076	< 0.0009 UJ	< 0.073	< 0.00092	< 0.00088	< 0.0011	< 0.00091
Cyclohexane	mg/kg	8260	650	120	26	< 0.032	< 0.00039 UJ	< 0.031	< 0.0004	< 0.00038	< 0.00046	< 0.0004
Dichlorobromomethane	mg/kg	8260	0.29	0.31	0.44	< 0.051	< 0.0006 UJ	< 0.049	< 0.00061	< 0.00058	< 0.00069	< 0.0006
Dichlorodifluoromethane	mg/kg	8260	8.7	94	0.6	< 0.034	< 0.00071 UJ	< 0.034	< 0.00072	< 0.00069	< 0.00082	< 0.00071
Isopropylbenzene	mg/kg	8260	190	270	1.48	< 0.029	< 0.00072 UJ	< 0.028	< 0.00074	< 0.0007	< 0.00084	< 0.00072
Methyl acetate	mg/kg	8260	7800	23000	8.2	< 0.067	< 0.00096 UJ	< 0.065	< 0.00098	< 0.00093	< 0.0011	< 0.00096
Methyl tert-butyl ether	mg/kg	8260	47	50	0.064	< 0.056	< 0.00079 UJ	< 0.054	< 0.00081	< 0.00077	< 0.00092	< 0.0008
Methylcyclohexane [1]	mg/kg	8260	650	120	26	< 0.03	< 0.00077 UJ	< 0.029	< 0.00079	< 0.00075	< 0.0009	< 0.00077
Methylene Chloride	mg/kg	8260	35	58	0.054	< 0.059	0.001 J	< 0.057	0.0028 B	0.0016 B	0.0028 B	0.002 B
Styrene	mg/kg	8260	600	870	2.6	< 0.035	< 0.00075 UJ	< 0.034	< 0.00076	< 0.00073	< 0.00087	< 0.00075
Tetrachloroethene	mg/kg	8260	8.1	25	0.046	< 0.045	< 0.00072 UJ	< 0.044	< 0.00074	< 0.0007	< 0.00084	< 0.00073
Trichloroethene	mg/kg	8260	0.41	0.5	0.036	< 0.044	< 0.0007 UJ	< 0.042	< 0.00071	< 0.00068	< 0.00081	< 0.0007
Trichlorofluoromethane	mg/kg	8260	2300	790	6.6	< 0.061	< 0.00097 UJ	< 0.059	< 0.001	< 0.00095	< 0.0011	< 0.00098
Vinyl chloride	mg/kg	8260	0.059	0.057	0.0138	< 0.07	< 0.0005 UJ	< 0.068	< 0.00051	< 0.00049	< 0.00058	< 0.0005

TABLE A-1
ANALYTICAL AND SCREENING RESULTS
SURFACE SOIL
CAA VIM AND VIIM
MINGO JUNCTION STEEL WORKS LLC - WEIRTON FACILITY

Constituent	Units	Analytical Method	Screening Criteria [1]			Sample Information [2]						
			Residential Soil RSL	Residential Soil De Minimis	*Protection of Groundwater RSL*	VII-SS-49(0-0.6) 10/24/2013	VII-SS-50(0-2) 10/30/2013	VII-SS-51(0-1) 10/24/2013	VII-SS-52(0-1) 10/17/2013	VII-SS-53(0-0.5) 10/17/2013	VII-SS-54(0-0.7) 10/17/2013	VII-SS-54(0-0.7)DUP 10/17/2013 Duplicate
Semi-Volatile Organic Compounds												
Acenaphthene	mg/kg	8270	360	4100	11	< 0.0069 UJ	< 0.0068 UJ	< 0.0067 UJ	< 0.0069	< 0.0066	< 0.024	< 0.034
Acenaphthylene [1]	mg/kg	8270	360	4200	11	< 0.0083 UJ	< 0.0081 UJ	< 0.008 UJ	< 0.0082	< 0.0078	< 0.028	< 0.041
Anthracene	mg/kg	8270	1800	23000	116	< 0.0071 UJ	< 0.0069 UJ	0.022 J	< 0.007	< 0.0067	0.047 J	0.071 J
Benzo[a]anthracene	mg/kg	8270	1.1	0.21	0.22	0.018 J	< 0.0088 UJ	0.098 J	0.013 J	0.033 J	0.11 J	***0.28*** J
Benzo[a]pyrene	mg/kg	8270	0.11	0.016	4.8	< 0.0072 UJ	< 0.0071 UJ	0.1 J	< 0.0072	0.036 J	0.2 J	0.37
Benzo[b]fluoranthene	mg/kg	8270	1.1	0.16	6	0.021 J	< 0.011 UJ	0.12 J	< 0.011	0.04 J	0.2 J	0.45
Benzo[g,h,i]perylene [1]	mg/kg	8270	180	1800	26	0.028 J	< 0.007 UJ	0.11 J	< 0.0071	0.046 J	0.48	0.68
Benzo[k]fluoranthene	mg/kg	8270	11	1.6	58	< 0.015 UJ	< 0.014 UJ	0.069 J	< 0.015	0.028 J	0.08 J	0.16 J
Chrysene	mg/kg	8270	110	16	180	0.021 J	< 0.0084 UJ	0.14 J	0.036 J	0.035 J	0.15 J	0.28 J
Dibenz(a,h)anthracene	mg/kg	8270	0.11	0.016	1.92	< 0.008 UJ	< 0.0078 UJ	0.031 J	< 0.008	< 0.0076	0.097 J	0.12 J
Fluoranthene	mg/kg	8270	240	2400	178	0.027 J	0.023 J	0.17 J	0.02 J	0.04 J	0.24 J	0.53
Fluorene	mg/kg	8270	240	2900	10.8	< 0.0095 UJ	< 0.0093 UJ	< 0.0092 UJ	< 0.0095	< 0.009	< 0.033	< 0.047
Indeno[1,2,3-cd]pyrene	mg/kg	8270	1.1	0.16	19.6	< 0.0074 UJ	< 0.0073 UJ	0.079 J	< 0.0074	0.031 J	0.18 J	0.34 J
Naphthalene	mg/kg	8270	2	4.1	0.0076	< 0.0062 UJ	< 0.0061 UJ	< 0.006 UJ	< 0.0062	< 0.0059	< 0.021	< 0.031
Phenanthrene [1]	mg/kg	8270	1800	23000	116	0.022 J	0.058 J	0.1 J	< 0.011	0.024 J	0.13 J	0.21 J
Pyrene	mg/kg	8270	180	2300	26	0.029 J	0.03 J	0.16 J	0.03 J	0.033 J	0.22 J	0.49
1,1'-Biphenyl	mg/kg	8270	4.7	51	0.0174	< 0.032 UJ	< 0.031 UJ	< 0.031 UJ	< 0.032	< 0.03	< 0.11	< 0.16
2,4,5-Trichlorophenol	mg/kg	8270	630	6300	8	< 0.038 UJ	< 0.038 UJ	< 0.037 UJ	< 0.038	< 0.036	< 0.13	< 0.19
2,4,6-Trichlorophenol	mg/kg	8270	6.3	49	0.024	< 0.054 UJ	< 0.053 UJ	< 0.052 UJ	< 0.054	< 0.051	< 0.19	< 0.27
2,4-Dichlorophenol	mg/kg	8270	19	190	0.046	< 0.0072 UJ	< 0.0071 UJ	< 0.007 UJ	< 0.0072	< 0.0068	< 0.025	< 0.036
2,4-Dimethylphenol	mg/kg	8270	130	1300	0.84	< 0.056 UJ	< 0.055 UJ	< 0.055 UJ	< 0.056	< 0.053	< 0.19	< 0.28
2,4-Dinitrophenol	mg/kg	8270	13	130	0.088	< 0.43 UJ	< 0.42 UJ	< 0.42 UJ	< 0.43	< 0.41	< 1.5	< 2.1
2,4-Dinitrotoluene	mg/kg	8270	1.7	1.7	0.0064	< 0.029 UJ	< 0.028 UJ	< 0.028 UJ	< 0.029	< 0.028	< 0.1	< 0.14
2,6-Dinitrotoluene	mg/kg	8270	0.36	0.36	0.00134	< 0.037 UJ	< 0.036 UJ	< 0.036 UJ	< 0.037	< 0.035	< 0.13	< 0.18
2-Chloronaphthalene	mg/kg	8270	480	5000	7.8	< 0.0075 UJ	< 0.0074 UJ	< 0.0073 UJ	< 0.0075	< 0.0071	< 0.026	< 0.037
2-Chlorophenol	mg/kg	8270	39	340	0.178	< 0.029 UJ	< 0.029 UJ	< 0.029 UJ	< 0.029	< 0.028	< 0.1	< 0.15
2-Methylnaphthalene	mg/kg	8270	24	310	0.38	< 0.0065 UJ	0.022 J	0.018 J	< 0.0065	< 0.0061	0.053 J	0.13 J
2-Methylphenol	mg/kg	8270	320	3200	1.5	< 0.025 UJ	< 0.025 UJ	< 0.024 UJ	< 0.025	< 0.024	< 0.086	< 0.12
2-Nitroaniline	mg/kg	8270	63	630	0.16	< 0.16 UJ	< 0.16 UJ	< 0.16 UJ	< 0.16	< 0.15	< 0.55	< 0.8
2-Nitrophenol	mg/kg	8270	- -	- -	- -	< 0.04 UJ	< 0.039 UJ	< 0.039 UJ	< 0.04	< 0.038	< 0.14	< 0.2
3,3'-Dichlorobenzidine	mg/kg	8270	1.2	1.2	0.0164	< 0.038 UJ	< 0.037 UJ	< 0.037 UJ	< 0.038	< 0.036	< 0.13	< 0.19
Methylphenol, 3 & 4 [1]	mg/kg	8270	320	3200	1.48	< 0.035 UJ	< 0.034 UJ	< 0.034 UJ	< 0.035	< 0.033	< 0.12	< 0.17
3-Nitroaniline	mg/kg	8270	- -	- -	- -	< 0.15 UJ	< 0.15 UJ	< 0.14 UJ	< 0.15	< 0.14	< 0.51	< 0.73
4,6-Dinitro-2-methylphenol	mg/kg	8270	0.51	- -	0.0052	< 0.14 UJ	< 0.14 UJ	< 0.14 UJ	< 0.14	< 0.14	< 0.5	< 0.72
4-Bromophenyl phenyl ether	mg/kg	8270	- -	- -	- -	< 0.031 UJ	< 0.031 UJ	< 0.03 UJ	< 0.031	< 0.03	< 0.11	< 0.16
4-Chloro-3-methylphenol	mg/kg	8270	630	- -	3.4	< 0.033 UJ	< 0.032 UJ	< 0.032 UJ	< 0.033	< 0.031	< 0.11	< 0.16
4-Chloroaniline	mg/kg	8270	2.7	2.7	0.0032	< 0.029 UJ	< 0.028 UJ	< 0.028 UJ	< 0.029	< 0.027	< 0.099	< 0.14
4-Chlorophenyl phenyl ether	mg/kg	8270	- -	- -	- -	< 0.04 UJ	< 0.039 UJ	< 0.039 UJ	< 0.04	< 0.038	< 0.14	< 0.2
4-Nitroaniline	mg/kg	8270	25	- -	0.032	< 0.15 UJ	< 0.14 UJ	< 0.14 UJ	< 0.15	< 0.14	< 0.5	< 0.72
4-Nitrophenol	mg/kg	8270	- -	- -	- -	< 0.13 UJ	< 0.13 UJ	< 0.13 UJ	< 0.13	< 0.12	< 0.45	< 0.65
Acetophenone	mg/kg	8270	780	2500	1.16	0.043 J	< 0.029 UJ	< 0.029 UJ	< 0.03	< 0.028	< 0.1	< 0.15
Atrazine	mg/kg	8270	2.4	2.4	0.038	< 0.035 UJ	< 0.034 UJ	< 0.034 UJ	< 0.035	< 0.033	< 0.12	< 0.17
Benzaldehyde	mg/kg	8270	170	1200	0.082	< 0.054 UJ	< 0.053 UJ	< 0.052 UJ	< 0.054 UL	***0.26*** L	< 0.19 UL	< 0.27 UL
Bis(2-chloroisopropyl)ether	mg/kg	8270	310	5.1	0.52	< 0.0078 UJ	< 0.0076 UJ	< 0.0075 UJ	< 0.0078	< 0.0074	< 0.027	< 0.038
Bis(2-chloroethoxy)methane	mg/kg	8270	19	- -	0.026	< 0.024 UJ	< 0.023 UJ	< 0.023 UJ	< 0.024	< 0.022	< 0.081	< 0.12
Bis(2-chloroethyl)ether	mg/kg	8270	0.23	0.24	0.000072	< 0.0097 UJ	< 0.0095 UJ	< 0.0094 UJ	< 0.0096	< 0.0092	< 0.033	< 0.048
Bis(2-ethylhexyl) phthalate	mg/kg	8270	39	39	28	1.4 J	< 0.057 UJ	0.11 J	0.062 J	0.076 J	0.24 J	0.37 J
Butyl benzyl phthalate	mg/kg	8270	290	290	4.8	3.2 J	< 0.048 UJ	< 0.048 UJ	< 0.049	< 0.047	< 0.17	< 0.24
Caprolactam	mg/kg	8270	3100	31000	5	< 0.27 UJ	< 0.27 UJ	< 0.26 UJ	< 0.27	< 0.26	< 0.93	< 1.3
Carbazole [1]	mg/kg	8270	1800	23000	116	< 0.0066 UJ	< 0.0065 UJ	< 0.0064 UJ	< 0.0066	< 0.0063	< 0.023	< 0.033

TABLE A-1
ANALYTICAL AND SCREENING RESULTS
SURFACE SOIL
CAA VIM AND VIIM
MINGO JUNCTION STEEL WORKS LLC - WEIRTON FACILITY

			Screening Criteria [1]			Sample Information [2]						
						VII-SS-49(0-0.6) 10/24/2013	VII-SS-50(0-2) 10/30/2013	VII-SS-51(0-1) 10/24/2013	VII-SS-52(0-1) 10/17/2013	VII-SS-53(0-0.5) 10/17/2013	VII-SS-54(0-0.7) 10/17/2013	VII-SS-54(0-0.7)DUP 10/17/2013 Duplicate
Constituent	**Units**	**Analytical Method**	**Residential Soil RSL**	**Residential Soil De Minimis**	***Protection of Groundwater RSL***							
Dibenzofuran	mg/kg	8270	7.8	78	0.3	< 0.035 UJ	< 0.035 UJ	< 0.034 UJ	< 0.035	< 0.034	< 0.12	< 0.18
Diethyl phthalate	mg/kg	8270	5100	51000	12.2	< 0.039 UJ	< 0.038 UJ	< 0.038 UJ	< 0.039	< 0.037	< 0.14	< 0.19
Dimethyl phthalate	mg/kg	8270	- -	- -	- -	0.13 J	< 0.038 UJ	< 0.038 UJ	< 0.039	< 0.037	0.49 J	< 0.19
Di-n-butyl phthalate	mg/kg	8270	630	6300	4.6	< 0.045 UJ	< 0.044 UJ	< 0.044 UJ	< 0.045	< 0.043	< 0.15	< 0.22
Di-n-octyl phthalate	mg/kg	8270	63	- -	114	< 0.038 UJ	< 0.037 UJ	< 0.037 UJ	< 0.038	< 0.036	< 0.13	< 0.19
Hexachlorobenzene	mg/kg	8270	0.21	0.22	0.26	< 0.0077 UJ	< 0.0075 UJ	< 0.0075 UJ	< 0.0077	< 0.0073	< 0.026	< 0.038
Hexachlorobutadiene	mg/kg	8270	1.2	1.3	0.0054	< 0.0081 UJ	< 0.0079 UJ	< 0.0078 UJ	< 0.008	< 0.0076	< 0.028	< 0.04
Hexachlorocyclopentadiene	mg/kg	8270	0.18	1.9	3.2	< 0.039 UJ	< 0.038 UJ	< 0.038 UJ	< 0.039	< 0.037	< 0.13	< 0.19
Hexachloroethane	mg/kg	8270	1.8	2	0.004	< 0.026 UJ	< 0.025 UJ	< 0.025 UJ	< 0.026	< 0.025	< 0.089	< 0.13
Isophorone	mg/kg	8270	570	570	0.52	< 0.027 UJ	< 0.027 UJ	< 0.026 UJ	< 0.027	< 0.026	< 0.093	< 0.13
Nitrobenzene	mg/kg	8270	5.1	5.5	0.00184	< 0.03 UJ	< 0.029 UJ	< 0.029 UJ	< 0.03	< 0.028	< 0.1	< 0.15
N-Nitrosodi-n-propylamine	mg/kg	8270	0.078	0.078	0.000162	< 0.0085 UJ	< 0.0083 UJ	< 0.0082 UJ	< 0.0084	< 0.008	< 0.029	< 0.042
N-Nitrosodiphenylamine	mg/kg	8270	110	110	1.34	< 0.033 UJ	< 0.033 UJ	< 0.032 UJ	< 0.033	< 0.032	< 0.11	< 0.16
Pentachlorophenol	mg/kg	8270	1	1	0.028	< 0.032 UJ	< 0.032 UJ	< 0.031 UJ	< 0.032	< 0.031	< 0.11	< 0.16
Phenol	mg/kg	8270	1900	19000	6.6	< 0.0085 UJ	< 0.0083 UJ	< 0.0083 UJ	< 0.0085	< 0.0081	< 0.029	< 0.042
Polychlorinated Biphenyls												
PCB-1016	mg/kg	8082	0.41	5.5	0.26	< 0.0027 UJ	< 0.0026 UJ	< 0.0026 UJ	< 0.0027	< 0.0026	< 0.003	< 0.0026
PCB-1221	mg/kg	8082	0.2	0.26	0.0016	< 0.0034 UJ	< 0.0034 UJ	< 0.0034 UJ	< 0.0034	< 0.0033	< 0.0039	< 0.0034
PCB-1232	mg/kg	8082	0.17	0.22	0.0016	< 0.0031 UJ	< 0.003 UJ	< 0.003 UJ	< 0.0031	< 0.0029	< 0.0035	< 0.003
PCB-1242	mg/kg	8082	0.23	0.31	0.024	< 0.0029 UJ	< 0.0029 UJ	< 0.0029 UJ	< 0.0029	< 0.0028	< 0.0033	< 0.0029
PCB-1248	mg/kg	8082	0.23	0.31	0.024	< 0.0017 UJ	< 0.0017 UJ	< 0.0017 UJ	< 0.0017	< 0.0016	< 0.0019	< 0.0017
PCB-1254	mg/kg	8082	0.12	0.32	0.04	< 0.0026 UJ	< 0.0025 UJ	< 0.0025 UJ	< 0.0026	< 0.0024	< 0.0029	< 0.0025
PCB-1260	mg/kg	8082	0.24	0.33	0.11	< 0.0026 UJ	< 0.0025 UJ	0.011 J	< 0.0026	< 0.0024	< 0.0029	< 0.0025
Inorganics												
Aluminum	mg/kg	6020	7700	77000	60000	21000 K	11000 K	20000 K	3100	5800	9800	8200
Antimony	mg/kg	6020	3.1	31	5.4	1.3 J	0.55 J	0.055 J	0.18 J	1.9 L	0.66	1.4
Arsenic	mg/kg	6020	0.68	0.43	5.8	1.1 J	1.1 K	0.43 J	0.35 J	1.5	2.4	5
Barium	mg/kg	6020	1500	15000	1640	150 J	97 J	250 J	29 L	44 L	110 L	93 L
Beryllium	mg/kg	6020	16	160	64	1.9 L	1.3 J	3 L	0.32	0.23	1.3	1
Cadmium	mg/kg	6020	7.1	37	7.6	0.64 J	0.48 J	0.66 J	0.18	1.9 L	2.3	2.5
Calcium	mg/kg	6020	- -	- -	- -	200000 J	31000 J	97000 J	45000 K	81000 K	120000 K	52000 K
Chromium [1]	mg/kg	6020	12000	120000	3600000	1200 J	88 J	62 J	440	430	790	270
Cobalt	mg/kg	6020	2.3	23	0.54	***1.8*** J	***7.7*** J	***0.85*** J	***1.4***	***1.7***	***2.7***	***4.8***
Copper	mg/kg	6020	310	3100	920	21 K	28 K	6.1 K	17	81 L	50	110
Iron	mg/kg	6020	5500	55000	700	***160000*** J	***54000***	***20000*** K	***66000*** K	***92000*** K	***130000*** K	***100000*** K
Lead	mg/kg	6020	400	400	280	9.7 J	160 J	4.9 J	6.3 L	13	22	28
Magnesium	mg/kg	6020	- -	- -	- -	53000 J	8600 J	28000 J	13000 L	15000 J	23000	11000
Manganese [1]	mg/kg	6020	180	3500	56	***23000*** J	***2000*** J	***4100*** J	***7600*** K	***16000*** K	***17000*** K	***7600*** K
Mercury	mg/kg	7471	1.1	3.1	2	0.012 J	0.011 J	0.014 J	< 0.012	0.061	0.034 J	0.049
Nickel	mg/kg	6020	150	1500	52	8.3 K	21 J	6.5 K	14	11 J	19	38
Potassium	mg/kg	6020	- -	- -	- -	680 K	1100 L	1200 K	64	110	1000	460
Selenium	mg/kg	6020	39	390	5.2	1.5 J	1.2 K	1.9 J	< 0.047 UL	< 0.049 UL	< 0.056 UL	0.064 L
Silver	mg/kg	6020	39	390	1.6	0.15 K	0.083 K	0.31 K	0.085 J	0.32	0.11	0.19
Sodium	mg/kg	6020	- -	- -	- -	520 J	300 L	760 J	80	130	750	330
Thallium	mg/kg	6020	0.078	0.78	2.8	0.0078 J	0.81 J	0.012 J	0.0064 J	0.018 J	0.033 J	0.061 J
Vanadium	mg/kg	6020	39	5.5	172	***620*** J	***390*** J	39 J	160 L	***180*** K	94	84
Zinc	mg/kg	6020	2300	23000	740	49 K	470 K	49 K	150	140 L	430	***780***
Other Parameters												
Cyanide, Total	mg/kg	9012	2.3	23	40	0.63	0.11 J	0.91	< 0.11	< 0.098	< 0.12	< 0.1
Percent Moisture	%	- -	- -	- -	- -	8.1	6	5.2	7.8	3.5	19	6.4

TABLE A-1
ANALYTICAL AND SCREENING RESULTS
SURFACE SOIL
CAA VIM AND VIIM
MINGO JUNCTION STEEL WORKS LLC - WEIRTON FACILITY

1 - Screening criteria based on the May 2021 USEPA Regional Screening Table and the June 2020 WVDEP De Minimis Table. Direct contact USEPA regional screening levels (RSLs) and WVDEP De Minimis values are based on residential land use. RSLs for the protection of groundwater are based on a dilution attenuation factor (DAF) of 20. For chemicals with both risk-based and MCL-based protection of groundwater RSLs, the higher of the two values was used. RSLs for noncarcinogenic chemicals are divided by 10 to account for potential cumulative effects. Notes regarding specific values for various chemicals (e.g., surrogates used, effects basis, etc.) are as follows:

RSLs for cis-1,3-dichloropropene and trans-1,3-dichloropropene are based on the RSLs for total 1,3-dichloropropene.
RSLs for 1,3-dichlorobenzene are based on the RSLs for 1,4-dichlorobenzene.
RSLs for methylcyclohexane are based on the RSLs for cyclohexane.
RSLs for acenaphthylene are based on the RSLs for acenaphthene.
RSLs for benzo(g,h,i)perylene are based on the RSLs for pyrene.
RSLs for phenanthrene and carbazole are based on the RSLs for anthracene.
RSLs for 3&4-methylphenol are conservatively based on the RSLs for 3-methylphenol.
Direct contact RSL for chromium is for the trivalent valence state; protection of groundwater RSL is based on total chromium.
RSLs for manganese are based on the non-diet values.

Shading indicates an exceedance of the lower of the residential soil RSL or De Minimis value.
Bold italics numbers indicate exceedance of the RSL for Protection of Groundwater

2 - General sample information provided in column headings includes sample identification number and sampling date. Table qualifier codes are consistent with Region 3 data qualifiers related to identification and quantitation and are as follows:

Data Qualifiers
- - - Screening Criterion not available for this chemical constituent.
NA - Not Analyzed
* - LCS or LCSD exceeds the control limits.
4 - MS, MSD: The analyte present in the original sample is greater than 4 times the matrix spike concentration; therefore, control limits are not applicable.
B - Compound was found in the blank and sample.
F1 - MS and/or MSD Recovery is outside acceptance limits.
F2 - MS/MSD RPD exceeds control limits.
J - Result is less than the reporting limit but greater than or equal to the method detection limit and the concentration is an approximate value.
J+ - The percent recovery was greater than the lab high control limit. Results are estimated biased high.
K - Analyte present. Reported value may be biased high. Actual value is expected to be lower.
L - Analyte present. Reported value may be biased low. Actual value is expected to be higher.
N - Consider Present. Tentative identification. Special methods may be needed to confirm its presence or absence in future sampling efforts.
R - Unusable result. Analyte may or may not be present in the sample.
UJ - Not Detected. Quantitation limit may be inaccurate or imprecise.

3 - Sample location VI-SS-09(0-0.3) was excavated as part of the former Tar Pumping Station excavation.

TABLE A-2
ANALYTICAL AND SCREENING RESULTS
SURFACE SOIL - WOODED HILLSIDE
CAA VIM AND VIIM
MINGO JUNCTION STEEL WORKS LLC - WEIRTON FACILITY

Constituent	Units	Analytical Method [3]	Screening Criteria [1]			Sample Information [2]											
			Residential Soil RSL	Residential Soil De Minimis	*Protection of Groundwater RSL*	VII-SS-55 (0-1) 12/15/2020		VII-SS-56 (0-1) 12/15/2020		DEP01 (VIISS56) [3] 12/15/2020 WVDEP Split Sample		VII-SS-57 (0-1) 12/15/2020		VII-SS-58 (0-1) 12/15/2020	
Inorganics															
Aluminum	mg/kg	6020	7700	77000	60000	10000		11000		8800		12000		8300	
Antimony	mg/kg	6020	3.1	31	5.4	0.33	J	0.35	J	0.38	J	0.67		0.28	J
Arsenic	mg/kg	6020	0.68	0.43	5.8	***9.5***		***12***		***11***		***32***		***10***	
Barium	mg/kg	6020	1500	15000	1640	130		130		130		130		62	
Beryllium	mg/kg	6020	16	160	64	0.94		0.92		0.78		1.3		0.44	
Cadmium	mg/kg	6020	7.1	37	7.6	1.4		0.64		0.49	J	0.74		0.44	
Calcium	mg/kg	6020	- -	- -	- -	2200		1100		1100		1000		470	
Chromium [1]	mg/kg	6020	12000	120000	3600000	27	^1+	26	^1+	22		44	^1+	17	^1+
Cobalt	mg/kg	6020	2.3	23	0.54	***7.5***		***12***		***9.9***		***15***		***9.2***	
Copper	mg/kg	6020	310	3100	920	18		22		21		35		12	
Iron	mg/kg	6020	5500	55000	700	***35000***		***31000***		***27000***		***64000***		***19000***	
Lead	mg/kg	6020	400	400	280	80		93		88		130		48	
Magnesium	mg/kg	6020	- -	- -	- -	2300		1800		1400		2000		1000	
Manganese [1]	mg/kg	6020	180	3500	56	***1100***		***1900***		***2100***		***1100***		***590***	
Mercury	mg/kg	7471	1.1	3.1	2	0.061	J	0.085	J	0.094		0.22		0.11	J
Nickel	mg/kg	6020	150	1500	52	19		21		11		23		12	
Potassium	mg/kg	6020	- -	- -	- -	710		1000		680		1300		500	
Selenium	mg/kg	6020	39	390	5.2	0.56	J	0.73	J	3.1	J	1.5		0.72	J
Silver	mg/kg	6020	39	390	1.6	0.15	J	0.13	J	< 0.22		0.22	J	0.085	J
Sodium	mg/kg	6020	- -	- -	- -	< 55		< 62		19		< 62		< 53	
Thallium	mg/kg	6020	0.078	0.78	2.8	0.23		0.27		< 0.28		0.51		0.27	
Vanadium	mg/kg	6020	39	5.5	172	22		24		22		47		19	
Zinc	mg/kg	6020	2300	23000	740	280		200		150		250		100	
Other Parameters															
Percent Moisture	%	- -	- -	- -	- -	20		20.5		21		28.6		22.5	

TABLE A-2
ANALYTICAL AND SCREENING RESULTS
SURFACE SOIL - WOODED HILLSIDE
CAA VIM AND VIIM
MINGO JUNCTION STEEL WORKS LLC - WEIRTON FACILITY

1 - Screening criteria based on the May 2021 USEPA Regional Screening Table and the June 2020 WVDEP De Minimis Table. Direct contact USEPA regional screening levels (RSLs) and WVDEP De Minimis values are based on residential land use. RSLs for the protection of groundwater are based on a dilution attenuation factor (DAF) of 20. For chemicals with both risk-based and MCL-based protection of groundwater RSLs, the higher of the two values was used. RSLs for noncarcinogenic chemicals are divided by 10 to account for potential cumulative effects. Notes regarding specific values for various chemicals (e.g., surrogates used, effects basis, etc.) are as follows:

Direct contact RSL for chromium is for the trivalent valence state; protection of groundwater RSL is based on total chromium.

RSLs for manganese are based on the non-diet values.

Shading indicates an exceedance of the lower of the residential soil RSL or De Minimis value.
Bold italics numbers indicate exceedance of the RSL for Protection of Groundwater

2 - General sample information provided in column headings includes sample identification number and sampling date. Table qualifier codes are consistent with Region 3 data qualifiers related to identification and quantitation and are as follows:
Data Qualifiers

- - - Screening Criterion not available for this chemical constituent.
^1+ - Initial Calibration Verification (ICV) is outside acceptance limits, high biased.
J - Result is less than the reporting limit but greater than or equal to the method detection limit and the concentration is an approximate value.

2 - Total metals (excluding mercury) were analyzed via Method 6010 for sample DEP01(VIISS56).

TABLE A-3
SPLP ANALYTICAL AND SCREENING RESULTS
SURFACE SOIL - WOODED HILLSIDE
CAA VIM AND VIIM
MINGO JUNCTION STEEL WORKS LLC - WEIRTON FACILITY

			Screening Criteria [1]	Sample Information [2]											
	Units	Analytical Method	Groundwater De Minimis	VII-SS-55 (0-1) 12/15/2020			VII-SS-56 (0-1) 12/15/2020			VII-SS-57 (0-1) 12/15/2020			VII-SS-58 (0-1) 12/15/2020		
Inorganics															
Aluminum	ug/L	6020	20000		4600	F1		11000			3700			9200	
Antimony	ug/L	6020	7.8	<	0.57		<	0.57		<	0.57		<	0.57	
Arsenic	ug/L	6020	10		5.6			7.2			7.5			6.7	
Barium	ug/L	6020	2000		33			66			26			34	
Beryllium	ug/L	6020	4		0.85	J		0.51	J	<	0.31			0.31	J
Cadmium	ug/L	6020	5		0.25	J	<	0.2		<	0.2		<	0.2	
Calcium	ug/L	6020	- -		1100			1600			1900			1600	
Chromium	ug/L	6020	22000		11	B		19	B		14	B		16	B
Cobalt	ug/L	6020	6		1.8			3.5			2.6			2.6	
Copper	ug/L	6020	800		3.7			9.8			11			7.1	
Iron	ug/L	6020	14000		5200			9100			5200			8300	
Lead	ug/L	6020	15		13			27			22			12	
Magnesium	ug/L	6020	- -		510	J		1000			500	J		730	J
Manganese	ug/L	6020	850		240			600			210			130	
Mercury	ug/L	7470	2	<	0.13	F1		0.14	J B		0.21	J B		0.2	J B
Nickel	ug/L	6020	390		4.5			10			4.3			7.6	
Potassium	ug/L	6020	- -		770	J B		1700	B		1000	B		980	J B
Selenium	ug/L	6020	50		0.89	J	<	0.89			0.99	J	<	0.89	
Silver	ug/L	6020	94		0.11	J		0.09	J		0.098	J		0.065	J
Sodium	ug/L	6020	- -		NA			NA			NA			NA	
Thallium	ug/L	6020	2		0.61	J		0.21	J	<	0.2		<	0.2	
Vanadium	ug/L	6020	1.2		9.2	J		18	J		8.8	J		16	J
Zinc	ug/L	6020	6000		36			47		<	15			27	

TABLE A-3
SPLP ANALYTICAL AND SCREENING RESULTS
SURFACE SOIL - WOODED HILLSIDE
CAA VIM AND VIIM
MINGO JUNCTION STEEL WORKS LLC - WEIRTON FACILITY

1 - Screening criteria include the June 2020 WVDEP groundwater De Minimis values. Only those chemicals for which at least one positive detection was encountered are included in the screening evaluation.

Shading indicates an exceedance of the Groundwater De Minimis value.

2 - General sample information provided in column headings includes sample identification number and sampling date. Table qualifier codes are consistent with Region 3 data qualifiers related to identification and quantitation and are as follows:

Data Qualifiers

NA - Not Analyzed
- - - Screening Criterion not available for this chemical constituent.
B - Compound was found in the blank and sample.
F1 - MS and/or MSD Recovery is outside acceptance limits.
J - Result is less than the reporting limit but greater than or equal to the method detection limit and the concentration is an approximate value.

TABLE A-4
ANALYTICAL AND SCREENING RESULTS
SUBSURFACE SOIL
CAA VIM AND VIIM
MINGO JUNCTION STEEL WORKS LLC - WEIRTON FACILITY

Constituent	Units	Analytical Method	Screening Criteria[1]			Sample Information [2]							
			Industrial Soil RSL	Industrial Soil De Minimis	*Protection of Groundwater RSL*	IM-W700-S-01 7/12/2007 Sidewall	IM-W700-S-02 7/12/2007 Sidewall	IM-W700-S-03A[3] 7/12/2007 Sidewall	IM-W700-S-03B[3] 7/12/2007 Sidewall	IM-W700-S-04 7/12/2007 Sidewall	IM-W700-S-05 7/12/2007 Sidewall	IM-W700-S-06 7/12/2007 Sidewall	IM-W700-S-07 7/12/2007 Sidewall
Volatile Organic Compounds													
Benzene	mg/kg	8260	5.1	57	0.052	< 0.0012	< 0.0012	< 0.0012	< 0.0012	< 0.0012	< 0.0012	< 0.0014	< 0.0013
Toluene	mg/kg	8260	4700	820	13.8	< 0.00093	< 0.00095	< 0.00088	< 0.00088	< 0.00091	< 0.00094	< 0.0011	< 0.00096
Ethylbenzene	mg/kg	8260	25	280	15.6	< 0.0014	< 0.0014	< 0.0013	< 0.0013	< 0.0014	< 0.0014	< 0.0016	< 0.0014
Xylenes, Total	mg/kg	8260	250	260	198	< 0.0041	< 0.0042	< 0.0039	< 0.0039	< 0.0041	< 0.0042	< 0.0047	< 0.0043
1,1,1-Trichloroethane	mg/kg	8260	3600	640	5.6	NA	NA	NA	NA	NA	NA	NA	NA
1,1,2,2-Tetrachloroethane	mg/kg	8260	2.7	31	0.0006	NA	NA	NA	NA	NA	NA	NA	NA
1,1,2-Trichloro-1,2,2-trifluoroethane	mg/kg	8260	2800	910	52	NA	NA	NA	NA	NA	NA	NA	NA
1,1,2-Trichloroethane	mg/kg	8260	0.63	6.8	0.032	NA	NA	NA	NA	NA	NA	NA	NA
1,1-Dichloroethane	mg/kg	8260	16	170	0.0156	NA	NA	NA	NA	NA	NA	NA	NA
1,1-Dichloroethene	mg/kg	8260	100	1100	0.2	NA	NA	NA	NA	NA	NA	NA	NA
1,2,4-Trichlorobenzene	mg/kg	8260	26	280	4	NA	NA	NA	NA	NA	NA	NA	NA
1,2-Dibromo-3-Chloropropane	mg/kg	8260	0.064	0.7	0.00172	NA	NA	NA	NA	NA	NA	NA	NA
1,2-Dibromoethane (EDB)	mg/kg	8260	0.16	1.8	0.00028	NA	NA	NA	NA	NA	NA	NA	NA
1,2-Dichlorobenzene	mg/kg	8260	930	380	11.6	NA	NA	NA	NA	NA	NA	NA	NA
1,2-Dichloroethane	mg/kg	8260	2	23	0.028	NA	NA	NA	NA	NA	NA	NA	NA
1,2-Dichloroethene, Total	mg/kg	8260	- -	- -	- -	NA	NA	NA	NA	NA	NA	NA	NA
cis-1,2-Dichloroethene	mg/kg	8260	230	81	0.42	NA	NA	NA	NA	NA	NA	NA	NA
trans-1,2-Dichloroethene	mg/kg	8260	30	570	0.62	NA	NA	NA	NA	NA	NA	NA	NA
1,2-Dichloropropane	mg/kg	8260	6.6	49	0.034	NA	NA	NA	NA	NA	NA	NA	NA
cis-1,3-Dichloropropene [1]	mg/kg	8260	8.2	99	0.0034	NA	NA	NA	NA	NA	NA	NA	NA
trans-1,3-Dichloropropene [1]	mg/kg	8260	8.2	99	0.0034	NA	NA	NA	NA	NA	NA	NA	NA
1,3-Dichlorobenzene [1]	mg/kg	8260	11	120	1.44	NA	NA	NA	NA	NA	NA	NA	NA
1,4-Dichlorobenzene	mg/kg	8260	11	120	1.44	NA	NA	NA	NA	NA	NA	NA	NA
2-Butanone (MEK)	mg/kg	8260	19000	28000	2.4	NA	NA	NA	NA	NA	NA	NA	NA
2-Hexanone	mg/kg	8260	130	- -	0.0176	NA	NA	NA	NA	NA	NA	NA	NA
4-Methyl-2-pentanone (MIBK)	mg/kg	8260	14000	3400	2.8	NA	NA	NA	NA	NA	NA	NA	NA
Acetone	mg/kg	8260	67000	110000	5.8	NA	NA	NA	NA	NA	NA	NA	NA
Bromoform	mg/kg	8260	86	910	0.42	NA	NA	NA	NA	NA	NA	NA	NA
Bromomethane	mg/kg	8260	3	33	0.0038	NA	NA	NA	NA	NA	NA	NA	NA
Carbon disulfide	mg/kg	8260	350	740	0.48	NA	NA	NA	NA	NA	NA	NA	NA
Carbon tetrachloride	mg/kg	8260	2.9	32	0.038	NA	NA	NA	NA	NA	NA	NA	NA
Chlorobenzene	mg/kg	8260	130	760	1.36	NA	NA	NA	NA	NA	NA	NA	NA
Chlorodibromomethane	mg/kg	8260	39	780	0.42	NA	NA	NA	NA	NA	NA	NA	NA
Chloroethane	mg/kg	8260	5700	2100	11.8	NA	NA	NA	NA	NA	NA	NA	NA
Chloroform	mg/kg	8260	1.4	15	0.44	NA	NA	NA	NA	NA	NA	NA	NA
Chloromethane	mg/kg	8260	46	500	0.098	NA	NA	NA	NA	NA	NA	NA	NA
Cyclohexane	mg/kg	8260	2700	120	26	NA	NA	NA	NA	NA	NA	NA	NA
Dichlorobromomethane	mg/kg	8260	1.3	14	0.44	NA	NA	NA	NA	NA	NA	NA	NA
Dichlorodifluoromethane	mg/kg	8260	37	400	0.6	NA	NA	NA	NA	NA	NA	NA	NA
Isopropylbenzene	mg/kg	8260	990	270	1.48	NA	NA	NA	NA	NA	NA	NA	NA
Methyl acetate	mg/kg	8260	120000	29000	8.2	NA	NA	NA	NA	NA	NA	NA	NA
Methyl tert-butyl ether	mg/kg	8260	210	2300	0.064	NA	NA	NA	NA	NA	NA	NA	NA
Methylcyclohexane [1]	mg/kg	8260	2700	120	26	NA	NA	NA	NA	NA	NA	NA	NA
Methylene Chloride	mg/kg	8260	320	3300	0.054	NA	NA	NA	NA	NA	NA	NA	NA
Naphthalene	mg/kg	8260	8.6	180	0.0076	NA	NA	NA	NA	NA	NA	NA	NA
Styrene	mg/kg	8260	3500	870	2.6	NA	NA	NA	NA	NA	NA	NA	NA
Tetrachloroethene	mg/kg	8260	39	170	0.046	NA	NA	NA	NA	NA	NA	NA	NA
Trichloroethene	mg/kg	8260	1.9	20	0.036	NA	NA	NA	NA	NA	NA	NA	NA
Trichlorofluoromethane	mg/kg	8260	35000	1200	6.6	NA	NA	NA	NA	NA	NA	NA	NA
Vinyl chloride	mg/kg	8260	1.7	22	0.0138	NA	NA	NA	NA	NA	NA	NA	NA
Semi-Volatile Organic Compounds													
Acenaphthene	mg/kg	8310	4500	70000	11	< 0.14	< 0.029	< 0.054	< 0.027	< 0.056	< 0.029	< 0.032	< 0.047
Acenaphthylene [1]	mg/kg	8310	4500	80000	11	2.4	1.5	6	0.95	3.8	3.2	0.17 J	0.35
Anthracene	mg/kg	8310	23000	700000	116	0.67	0.25	0.26	0.12	0.42	0.13	0.055 PG	0.14 PG
Benzo[a]anthracene	mg/kg	8310	21	88	0.22	***0.31*** PG	***0.29*** PG	***0.28*** PG	***0.3***	***0.65***	0.096 PG	0.13	0.15
Benzo[a]pyrene	mg/kg	8310	2.1	4.3	4.8	0.45 PG	0.43	0.52	0.5	0.66	0.19	0.12	0.17

TABLE A-4
ANALYTICAL AND SCREENING RESULTS
SUBSURFACE SOIL
CAA VIM AND VIIM
MINGO JUNCTION STEEL WORKS LLC - WEIRTON FACILITY

			Screening Criteria[1]			Sample Information [2]							
						IM-W700-S-01 7/12/2007 Sidewall	IM-W700-S-02 7/12/2007 Sidewall	IM-W700-S-03A[3] 7/12/2007 Sidewall	IM-W700-S-03B[3] 7/12/2007 Sidewall	IM-W700-S-04 7/12/2007 Sidewall	IM-W700-S-05 7/12/2007 Sidewall	IM-W700-S-06 7/12/2007 Sidewall	IM-W700-S-07 7/12/2007 Sidewall
Constituent	**Units**	**Analytical Method**	**Industrial Soil RSL**	**Industrial Soil De Minimis**	***Protection of Groundwater RSL***								
Benzo[b]fluoranthene	mg/kg	8310	21	43	6	1.5	0.8	1.3	0.73	1.4	0.68	0.23	0.35
Benzo[g,h,i]perylene [1]	mg/kg	8310	2300	33000	26	0.072 J, PG	0.24	0.33	0.48	0.34	0.12	0.064	0.083
Benzo[k]fluoranthene	mg/kg	8310	210	430	58	0.3	0.2 PG	0.28 PG	0.22 PG	0.37 PG	< 0.0051	0.096	0.088 PG
Chrysene	mg/kg	8310	2100	4300	180	0.73	0.42	0.52	0.25	0.91	0.17 PG	0.19	0.21
Dibenz(a,h)anthracene	mg/kg	8310	2.1	4.3	1.92	< 0.025	< 0.0051	< 0.0095	< 0.0047	< 0.0098	< 0.005	< 0.0057	< 0.0082
Fluoranthene	mg/kg	8310	3000	44000	178	< 0.027	0.84	< 0.01	0.51 PG	2.3	< 0.0054	< 0.0061	0.64
Fluorene	mg/kg	8310	3000	62000	10.8	0.62	0.22	0.22	0.049	0.3	0.16 PG	0.063	0.3
Indeno[1,2,3-cd]pyrene	mg/kg	8310	21	43	19.6	0.21 PG	0.38	0.64	0.74	0.63	0.16	0.063 PG	0.084 PG
Naphthalene	mg/kg	8310	8.6	180	0.0076	***0.72*** J, PG	***0.37***	***0.41*** PG	***0.19***	***0.56***	***0.54***	***0.035*** J, PG	***0.46***
Phenanthrene [1]	mg/kg	8310	23000	700000	116	2.1	0.67	0.71	0.29	1	0.6	0.22	0.89
Pyrene	mg/kg	8310	2300	66000	26	1.9 PG	0.9 PG	1.1 PG	0.47 PG	2.4 PG	< 0.0056	0.43 PG	0.62 PG
1,1'-Biphenyl	mg/kg	8270	20	210	0.0174	NA	NA	NA	NA	NA	NA	NA	NA
2,4,5-Trichlorophenol	mg/kg	8270	8200	130000	8	NA	NA	NA	NA	NA	NA	NA	NA
2,4,6-Trichlorophenol	mg/kg	8270	82	1300	0.024	NA	NA	NA	NA	NA	NA	NA	NA
2,4-Dichlorophenol	mg/kg	8270	250	3800	0.046	NA	NA	NA	NA	NA	NA	NA	NA
2,4-Dimethylphenol	mg/kg	8270	1600	25000	0.84	NA	NA	NA	NA	NA	NA	NA	NA
2,4-Dinitrophenol	mg/kg	8270	160	2500	0.088	NA	NA	NA	NA	NA	NA	NA	NA
2,4-Dinitrotoluene	mg/kg	8270	7.4	110	0.0064	NA	NA	NA	NA	NA	NA	NA	NA
2,6-Dinitrotoluene	mg/kg	8270	1.5	24	0.00134	NA	NA	NA	NA	NA	NA	NA	NA
2-Chloronaphthalene	mg/kg	8270	6000	67000	7.8	NA	NA	NA	NA	NA	NA	NA	NA
2-Chlorophenol	mg/kg	8270	580	5500	0.178	NA	NA	NA	NA	NA	NA	NA	NA
2-Methylnaphthalene	mg/kg	8270	300	9300	0.38	NA	NA	NA	NA	NA	NA	NA	NA
2-Methylphenol	mg/kg	8270	4100	63000	1.5	NA	NA	NA	NA	NA	NA	NA	NA
2-Nitroaniline	mg/kg	8270	800	12000	0.16	NA	NA	NA	NA	NA	NA	NA	NA
2-Nitrophenol	mg/kg	8270	- -	- -	- -	NA	NA	NA	NA	NA	NA	NA	NA
3,3'-Dichlorobenzidine	mg/kg	8270	5.1	79	0.0164	NA	NA	NA	NA	NA	NA	NA	NA
Methylphenol, 3 & 4 [1]	mg/kg	8270	4100	63000	1.48	NA	NA	NA	NA	NA	NA	NA	NA
3-Nitroaniline	mg/kg	8270	- -	- -	- -	NA	NA	NA	NA	NA	NA	NA	NA
4,6-Dinitro-2-methylphenol	mg/kg	8270	6.6	- -	0.0052	NA	NA	NA	NA	NA	NA	NA	NA
4-Bromophenyl phenyl ether	mg/kg	8270	- -	- -	- -	NA	NA	NA	NA	NA	NA	NA	NA
4-Chloro-3-methylphenol	mg/kg	8270	8200	- -	3.4	NA	NA	NA	NA	NA	NA	NA	NA
4-Chloroaniline	mg/kg	8270	11	180	0.0032	NA	NA	NA	NA	NA	NA	NA	NA
4-Chlorophenyl phenyl ether	mg/kg	8270	- -	- -	- -	NA	NA	NA	NA	NA	NA	NA	NA
4-Nitroaniline	mg/kg	8270	110	- -	0.032	NA	NA	NA	NA	NA	NA	NA	NA
4-Nitrophenol	mg/kg	8270	- -	- -	- -	NA	NA	NA	NA	NA	NA	NA	NA
Acetophenone	mg/kg	8270	12000	2500	1.16	NA	NA	NA	NA	NA	NA	NA	NA
Atrazine	mg/kg	8270	10	150	0.038	NA	NA	NA	NA	NA	NA	NA	NA
Benzaldehyde	mg/kg	8270	820	1200	0.082	NA	NA	NA	NA	NA	NA	NA	NA
Bis(2-chloroisopropyl)ether	mg/kg	8270	4700	310	0.52	NA	NA	NA	NA	NA	NA	NA	NA
Bis(2-chloroethoxy)methane	mg/kg	8270	250	- -	0.026	NA	NA	NA	NA	NA	NA	NA	NA
Bis(2-chloroethyl)ether	mg/kg	8270	1	13	0.000072	NA	NA	NA	NA	NA	NA	NA	NA
Bis(2-ethylhexyl) phthalate	mg/kg	8270	160	2500	28	NA	NA	NA	NA	NA	NA	NA	NA
Butyl benzyl phthalate	mg/kg	8270	1200	19000	4.8	NA	NA	NA	NA	NA	NA	NA	NA
Caprolactam	mg/kg	8270	40000	600000	5	NA	NA	NA	NA	NA	NA	NA	NA
Carbazole [1]	mg/kg	8270	23000	700000	116	NA	NA	NA	NA	NA	NA	NA	NA
Dibenzofuran	mg/kg	8270	120	2300	0.3	NA	NA	NA	NA	NA	NA	NA	NA
Diethyl phthalate	mg/kg	8270	66000	1000000	12.2	NA	NA	NA	NA	NA	NA	NA	NA
Dimethyl phthalate	mg/kg	8270	- -	- -	- -	NA	NA	NA	NA	NA	NA	NA	NA
Di-n-butyl phthalate	mg/kg	8270	8200	130000	4.6	NA	NA	NA	NA	NA	NA	NA	NA
Di-n-octyl phthalate	mg/kg	8270	820	- -	114	NA	NA	NA	NA	NA	NA	NA	NA
Hexachlorobenzene	mg/kg	8270	0.96	13	0.26	NA	NA	NA	NA	NA	NA	NA	NA
Hexachlorobutadiene	mg/kg	8270	5.3	17	0.0054	NA	NA	NA	NA	NA	NA	NA	NA
Hexachlorocyclopentadiene	mg/kg	8270	0.75	8	3.2	NA	NA	NA	NA	NA	NA	NA	NA
Hexachloroethane	mg/kg	8270	8	91	0.004	NA	NA	NA	NA	NA	NA	NA	NA
Isophorone	mg/kg	8270	2400	37000	0.52	NA	NA	NA	NA	NA	NA	NA	NA
Nitrobenzene	mg/kg	8270	22	240	0.00184	NA	NA	NA	NA	NA	NA	NA	NA

TABLE A-4
ANALYTICAL AND SCREENING RESULTS
SUBSURFACE SOIL
CAA VIM AND VIIM
MINGO JUNCTION STEEL WORKS LLC - WEIRTON FACILITY

			Screening Criteria[1]			Sample Information [2]							
Constituent	**Units**	**Analytical Method**	**Industrial Soil RSL**	**Industrial Soil De Minimis**	***Protection of Groundwater RSL***	**IM-W700-S-01 7/12/2007 Sidewall**	**IM-W700-S-02 7/12/2007 Sidewall**	**IM-W700-S-03A[3] 7/12/2007 Sidewall**	**IM-W700-S-03B[3] 7/12/2007 Sidewall**	**IM-W700-S-04 7/12/2007 Sidewall**	**IM-W700-S-05 7/12/2007 Sidewall**	**IM-W700-S-06 7/12/2007 Sidewall**	**IM-W700-S-07 7/12/2007 Sidewall**
N-Nitrosodi-n-propylamine	mg/kg	8270	0.33	5.1	0.000162	NA	NA	NA	NA	NA	NA	NA	NA
N-Nitrosodiphenylamine	mg/kg	8270	470	7200	1.34	NA	NA	NA	NA	NA	NA	NA	NA
Pentachlorophenol	mg/kg	8270	4	52	0.028	NA	NA	NA	NA	NA	NA	NA	NA
Phenol	mg/kg	8270	25000	380000	6.6	NA	NA	NA	NA	NA	NA	NA	NA
Polychlorinated Biphenyls													
PCB-1016	mg/kg	8082	5.1	160	0.26	< 0.0029	< 0.003	< 0.0028	< 0.0028	< 0.0028	< 0.0029	< 0.0033	< 0.003
PCB-1221	mg/kg	8082	0.83	19	0.0016	< 0.0037	< 0.0038	< 0.0035	< 0.0035	< 0.0036	< 0.0038	< 0.0042	< 0.0038
PCB-1232	mg/kg	8082	0.72	14	0.0016	< 0.0033	< 0.0034	< 0.0032	< 0.0032	< 0.0033	< 0.0034	< 0.0038	< 0.0034
PCB-1242	mg/kg	8082	0.95	26	0.024	< 0.0032	< 0.0032	< 0.003	< 0.003	< 0.0031	< 0.0032	< 0.0036	< 0.0033
PCB-1248	mg/kg	8082	0.94	27	0.024	< 0.0018	< 0.0019	< 0.0018	< 0.0017	< 0.0018	0.02	< 0.0021	< 0.0019
PCB-1254	mg/kg	8082	0.97	28	0.04	< 0.0028	< 0.0028	< 0.0026	0.038	< 0.0027	< 0.0028	< 0.0032	< 0.0029
PCB-1260	mg/kg	8082	0.99	30	0.11	< 0.0028	< 0.0028	< 0.0026	< 0.0026	< 0.0027	< 0.0028	< 0.0032	< 0.0029
Inorganics													
Aluminum	mg/kg	6020	110000	1000000	60000	NA	NA	NA	NA	NA	NA	NA	NA
Antimony	mg/kg	6020	47	930	5.4	NA	NA	NA	NA	NA	NA	NA	NA
Arsenic	mg/kg	6020	3	35	5.8	NA	NA	NA	NA	NA	NA	NA	NA
Barium	mg/kg	6020	22000	400000	1640	NA	NA	NA	NA	NA	NA	NA	NA
Beryllium	mg/kg	6020	230	4500	64	NA	NA	NA	NA	NA	NA	NA	NA
Cadmium	mg/kg	6020	98	980	7.6	NA	NA	NA	NA	NA	NA	NA	NA
Calcium	mg/kg	6020	- -	- -	- -	NA	NA	NA	NA	NA	NA	NA	NA
Chromium [1]	mg/kg	6020	180000	1000000	3600000	NA	NA	NA	NA	NA	NA	NA	NA
Cobalt	mg/kg	6020	35	690	0.54	NA	NA	NA	NA	NA	NA	NA	NA
Copper	mg/kg	6020	4700	93000	920	NA	NA	NA	NA	NA	NA	NA	NA
Iron	mg/kg	6020	82000	1000000	700	NA	NA	NA	NA	NA	NA	NA	NA
Lead	mg/kg	6020	800	1000	280	NA	NA	NA	NA	NA	NA	NA	NA
Magnesium	mg/kg	6020	- -	- -	- -	NA	NA	NA	NA	NA	NA	NA	NA
Manganese [1]	mg/kg	6020	2600	80000	56	NA	NA	NA	NA	NA	NA	NA	NA
Mercury	mg/kg	7471	4.6	3.1	2	NA	NA	NA	NA	NA	NA	NA	NA
Nickel	mg/kg	6020	2200	43000	52	NA	NA	NA	NA	NA	NA	NA	NA
Potassium	mg/kg	6020	- -	- -	- -	NA	NA	NA	NA	NA	NA	NA	NA
Selenium	mg/kg	6020	580	12000	5.2	NA	NA	NA	NA	NA	NA	NA	NA
Silver	mg/kg	6020	580	12000	1.6	NA	NA	NA	NA	NA	NA	NA	NA
Sodium	mg/kg	6020	- -	- -	- -	NA	NA	NA	NA	NA	NA	NA	NA
Thallium	mg/kg	6020	1.2	23	2.8	NA	NA	NA	NA	NA	NA	NA	NA
Vanadium	mg/kg	6020	580	160	172	NA	NA	NA	NA	NA	NA	NA	NA
Zinc	mg/kg	6020	35000	700000	740	NA	NA	NA	NA	NA	NA	NA	NA
Other Parameters													
Cyanide, Total	mg/kg	9012	15	170	40	NA	NA	NA	NA	NA	NA	NA	NA
Total Organic Carbon	mg/kg	WALKLEY	- -	- -	- -	NA	NA	NA	NA	NA	NA	NA	NA
Percent Moisture	%	- -	- -	- -	- -	NA	NA	NA	NA	NA	NA	NA	NA
Percent Solids	%	MCAWW 160	- -	- -	- -	84.9	83.6	89.9	90.1	86.9	84.6	75	82.8

TABLE A-4
ANALYTICAL AND SCREENING RESULTS
SUBSURFACE SOIL
CAA VIM AND VIIM
MINGO JUNCTION STEEL WORKS LLC - WEIRTON FACILITY

Constituent	Units	Analytical Method	Screening Criteria[1]			Sample Information [2]							
			Industrial Soil RSL	Industrial Soil De Minimis	*Protection of Groundwater RSL*	IM-W700-S-08 7/12/2007 Sidewall	IM-W700-S-09A[3] 7/12/2007 Sidewall	IM-W700-S-09B[3] 7/12/2007 Sidewall	IM-W700-S-10 7/12/2007 Sidewall	IM-W700-S-11 7/12/2007 Sidewall	IM-W700-S-12 7/12/2007 Sidewall	IM-W700-S-13 7/12/2007 Sidewall	IM-W700-S-14 7/12/2007 Sidewall
Volatile Organic Compounds													
Benzene	mg/kg	8260	5.1	57	0.052	< 0.0013	< 0.0014	< 0.0011	< 0.0014	< 0.0013	< 0.0014	< 0.0015	< 0.0014
Toluene	mg/kg	8260	4700	820	13.8	< 0.001	< 0.0011	< 0.00087	< 0.0011	< 0.00099	< 0.0011	< 0.0011	< 0.001
Ethylbenzene	mg/kg	8260	25	280	15.6	< 0.0015	< 0.0016	< 0.0013	< 0.0016	< 0.0015	< 0.0016	< 0.0017	< 0.0015
Xylenes, Total	mg/kg	8260	250	260	198	< 0.0045	< 0.0048	< 0.0039	< 0.0047	< 0.0044	< 0.0048	< 0.0051	< 0.0046
1,1,1-Trichloroethane	mg/kg	8260	3600	640	5.6	NA	NA	NA	NA	NA	NA	NA	NA
1,1,2,2-Tetrachloroethane	mg/kg	8260	2.7	31	0.0006	NA	NA	NA	NA	NA	NA	NA	NA
1,1,2-Trichloro-1,2,2-trifluoroethane	mg/kg	8260	2800	910	52	NA	NA	NA	NA	NA	NA	NA	NA
1,1,2-Trichloroethane	mg/kg	8260	0.63	6.8	0.032	NA	NA	NA	NA	NA	NA	NA	NA
1,1-Dichloroethane	mg/kg	8260	16	170	0.0156	NA	NA	NA	NA	NA	NA	NA	NA
1,1-Dichloroethene	mg/kg	8260	100	1100	0.2	NA	NA	NA	NA	NA	NA	NA	NA
1,2,4-Trichlorobenzene	mg/kg	8260	26	280	4	NA	NA	NA	NA	NA	NA	NA	NA
1,2-Dibromo-3-Chloropropane	mg/kg	8260	0.064	0.7	0.00172	NA	NA	NA	NA	NA	NA	NA	NA
1,2-Dibromoethane (EDB)	mg/kg	8260	0.16	1.8	0.00028	NA	NA	NA	NA	NA	NA	NA	NA
1,2-Dichlorobenzene	mg/kg	8260	930	380	11.6	NA	NA	NA	NA	NA	NA	NA	NA
1,2-Dichloroethane	mg/kg	8260	2	23	0.028	NA	NA	NA	NA	NA	NA	NA	NA
1,2-Dichloroethene, Total	mg/kg	8260	- -	- -	- -	NA	NA	NA	NA	NA	NA	NA	NA
cis-1,2-Dichloroethene	mg/kg	8260	230	81	0.42	NA	NA	NA	NA	NA	NA	NA	NA
trans-1,2-Dichloroethene	mg/kg	8260	30	570	0.62	NA	NA	NA	NA	NA	NA	NA	NA
1,2-Dichloropropane	mg/kg	8260	6.6	49	0.034	NA	NA	NA	NA	NA	NA	NA	NA
cis-1,3-Dichloropropene [1]	mg/kg	8260	8.2	99	0.0034	NA	NA	NA	NA	NA	NA	NA	NA
trans-1,3-Dichloropropene [1]	mg/kg	8260	8.2	99	0.0034	NA	NA	NA	NA	NA	NA	NA	NA
1,3-Dichlorobenzene [1]	mg/kg	8260	11	120	1.44	NA	NA	NA	NA	NA	NA	NA	NA
1,4-Dichlorobenzene	mg/kg	8260	11	120	1.44	NA	NA	NA	NA	NA	NA	NA	NA
2-Butanone (MEK)	mg/kg	8260	19000	28000	2.4	NA	NA	NA	NA	NA	NA	NA	NA
2-Hexanone	mg/kg	8260	130	- -	0.0176	NA	NA	NA	NA	NA	NA	NA	NA
4-Methyl-2-pentanone (MIBK)	mg/kg	8260	14000	3400	2.8	NA	NA	NA	NA	NA	NA	NA	NA
Acetone	mg/kg	8260	67000	110000	5.8	NA	NA	NA	NA	NA	NA	NA	NA
Bromoform	mg/kg	8260	86	910	0.42	NA	NA	NA	NA	NA	NA	NA	NA
Bromomethane	mg/kg	8260	3	33	0.0038	NA	NA	NA	NA	NA	NA	NA	NA
Carbon disulfide	mg/kg	8260	350	740	0.48	NA	NA	NA	NA	NA	NA	NA	NA
Carbon tetrachloride	mg/kg	8260	2.9	32	0.038	NA	NA	NA	NA	NA	NA	NA	NA
Chlorobenzene	mg/kg	8260	130	760	1.36	NA	NA	NA	NA	NA	NA	NA	NA
Chlorodibromomethane	mg/kg	8260	39	780	0.42	NA	NA	NA	NA	NA	NA	NA	NA
Chloroethane	mg/kg	8260	5700	2100	11.8	NA	NA	NA	NA	NA	NA	NA	NA
Chloroform	mg/kg	8260	1.4	15	0.44	NA	NA	NA	NA	NA	NA	NA	NA
Chloromethane	mg/kg	8260	46	500	0.098	NA	NA	NA	NA	NA	NA	NA	NA
Cyclohexane	mg/kg	8260	2700	120	26	NA	NA	NA	NA	NA	NA	NA	NA
Dichlorobromomethane	mg/kg	8260	1.3	14	0.44	NA	NA	NA	NA	NA	NA	NA	NA
Dichlorodifluoromethane	mg/kg	8260	37	400	0.6	NA	NA	NA	NA	NA	NA	NA	NA
Isopropylbenzene	mg/kg	8260	990	270	1.48	NA	NA	NA	NA	NA	NA	NA	NA
Methyl acetate	mg/kg	8260	120000	29000	8.2	NA	NA	NA	NA	NA	NA	NA	NA
Methyl tert-butyl ether	mg/kg	8260	210	2300	0.064	NA	NA	NA	NA	NA	NA	NA	NA
Methylcyclohexane [1]	mg/kg	8260	2700	120	26	NA	NA	NA	NA	NA	NA	NA	NA
Methylene Chloride	mg/kg	8260	320	3300	0.054	NA	NA	NA	NA	NA	NA	NA	NA
Naphthalene	mg/kg	8260	8.6	180	0.0076	NA	NA	NA	NA	NA	NA	NA	NA
Styrene	mg/kg	8260	3500	870	2.6	NA	NA	NA	NA	NA	NA	NA	NA
Tetrachloroethene	mg/kg	8260	39	170	0.046	NA	NA	NA	NA	NA	NA	NA	NA
Trichloroethene	mg/kg	8260	1.9	20	0.036	NA	NA	NA	NA	NA	NA	NA	NA
Trichlorofluoromethane	mg/kg	8260	35000	1200	6.6	NA	NA	NA	NA	NA	NA	NA	NA
Vinyl chloride	mg/kg	8260	1.7	22	0.0138	NA	NA	NA	NA	NA	NA	NA	NA
Semi-Volatile Organic Compounds													
Acenaphthene	mg/kg	8310	4500	70000	11	< 0.031	0.42 J, PG	< 0.027	< 0.032	< 0.03	0.33 J, PG	2	0.52 J, PG
Acenaphthylene [1]	mg/kg	8310	4500	80000	11	1.6	0.37 J	0.74	1.6	1.2	0.13 J	5.8	0.19 J
Anthracene	mg/kg	8310	23000	700000	116	0.27	0.34 PG	0.073	0.24 PG	0.12 PG	0.16 PG	0.65 PG	0.39 PG
Benzo[a]anthracene	mg/kg	8310	21	88	0.22	0.2	0.17 J, PG	0.22	0.15 PG	0.05 PG	0.042 J, PG	***0.32*** PG	0.11 J, PG
Benzo[a]pyrene	mg/kg	8310	2.1	4.3	4.8	0.18	0.22 J	0.24	0.24	0.08	0.036 J, PG	0.2 PG	0.06 J, PG

TABLE A-4
ANALYTICAL AND SCREENING RESULTS
SUBSURFACE SOIL
CAA VIM AND VIIM
MINGO JUNCTION STEEL WORKS LLC - WEIRTON FACILITY

			Screening Criteria[1]			Sample Information [2]																	
Constituent	Units	Analytical Method	Industrial Soil RSL	Industrial Soil De Minimis	*Protection of Groundwater RSL*	IM-W700-S-08 7/12/2007 Sidewall		IM-W700-S-09A[3] 7/12/2007 Sidewall		IM-W700-S-09B[3] 7/12/2007 Sidewall		IM-W700-S-10 7/12/2007 Sidewall		IM-W700-S-11 7/12/2007 Sidewall		IM-W700-S-12 7/12/2007 Sidewall		IM-W700-S-13 7/12/2007 Sidewall		IM-W700-S-14 7/12/2007 Sidewall	
Benzo[b]fluoranthene	mg/kg	8310	21	43	6	0.44		0.55		0.44		0.58		0.22		0.24		2.5		0.67	PG
Benzo[g,h,i]perylene [1]	mg/kg	8310	2300	33000	26	0.1		0.14	J	0.21		0.11		0.046		0.05	J	0.089	J, PG	< 0.034	
Benzo[k]fluoranthene	mg/kg	8310	210	430	58	0.099	PG	0.13	J, PG	0.16	PG	< 0.0057		< 0.0054		< 0.012		< 0.025		< 0.034	
Chrysene	mg/kg	8310	2100	4300	180	0.3		0.29		0.23		0.26		0.081		0.084	J	< 0.026		< 0.035	
Dibenz(a,h)anthracene	mg/kg	8310	2.1	4.3	1.92	< 0.0054		< 0.035		< 0.0047		< 0.0056		< 0.0053		< 0.012		< 0.024		< 0.033	
Fluoranthene	mg/kg	8310	3000	44000	178	0.95		< 0.038		0.4	PG	< 0.0061		< 0.0058		< 0.013		< 0.026		< 0.036	
Fluorene	mg/kg	8310	3000	62000	10.8	0.37		1.8		0.035	J	0.66		0.72		1.1	PG	4.1		2.5	PG
Indeno[1,2,3-cd]pyrene	mg/kg	8310	21	43	19.6	0.11	PG	0.14	J, PG	0.28		0.21		0.091		0.075	J	0.1	J, PG	0.048	J, PG
Naphthalene	mg/kg	8310	8.6	180	0.0076	***0.45***		***0.8***	J	***0.087***	J	***0.63***		***0.7***		***0.63***		***0.21***	J	***1.3***	
Phenanthrene [1]	mg/kg	8310	23000	700000	116	0.63		2.2		0.29		0.75		0.26	PG	1.1		6.1		4.5	
Pyrene	mg/kg	8310	2300	66000	26	0.85	PG	< 0.038		0.36	PG	< 0.0062		< 0.0059		< 0.013		< 0.027		1.6	PG
1,1'-Biphenyl	mg/kg	8270	20	210	0.0174	NA		NA		NA		NA		NA		NA		NA		NA	
2,4,5-Trichlorophenol	mg/kg	8270	8200	130000	8	NA		NA		NA		NA		NA		NA		NA		NA	
2,4,6-Trichlorophenol	mg/kg	8270	82	1300	0.024	NA		NA		NA		NA		NA		NA		NA		NA	
2,4-Dichlorophenol	mg/kg	8270	250	3800	0.046	NA		NA		NA		NA		NA		NA		NA		NA	
2,4-Dimethylphenol	mg/kg	8270	1600	25000	0.84	NA		NA		NA		NA		NA		NA		NA		NA	
2,4-Dinitrophenol	mg/kg	8270	160	2500	0.088	NA		NA		NA		NA		NA		NA		NA		NA	
2,4-Dinitrotoluene	mg/kg	8270	7.4	110	0.0064	NA		NA		NA		NA		NA		NA		NA		NA	
2,6-Dinitrotoluene	mg/kg	8270	1.5	24	0.00134	NA		NA		NA		NA		NA		NA		NA		NA	
2-Chloronaphthalene	mg/kg	8270	6000	67000	7.8	NA		NA		NA		NA		NA		NA		NA		NA	
2-Chlorophenol	mg/kg	8270	580	5500	0.178	NA		NA		NA		NA		NA		NA		NA		NA	
2-Methylnaphthalene	mg/kg	8270	300	9300	0.38	NA		NA		NA		NA		NA		NA		NA		NA	
2-Methylphenol	mg/kg	8270	4100	63000	1.5	NA		NA		NA		NA		NA		NA		NA		NA	
2-Nitroaniline	mg/kg	8270	800	12000	0.16	NA		NA		NA		NA		NA		NA		NA		NA	
2-Nitrophenol	mg/kg	8270	- -	- -	- -	NA		NA		NA		NA		NA		NA		NA		NA	
3,3'-Dichlorobenzidine	mg/kg	8270	5.1	79	0.0164	NA		NA		NA		NA		NA		NA		NA		NA	
Methylphenol, 3 & 4 [1]	mg/kg	8270	4100	63000	1.48	NA		NA		NA		NA		NA		NA		NA		NA	
3-Nitroaniline	mg/kg	8270	- -	- -	- -	NA		NA		NA		NA		NA		NA		NA		NA	
4,6-Dinitro-2-methylphenol	mg/kg	8270	6.6	- -	0.0052	NA		NA		NA		NA		NA		NA		NA		NA	
4-Bromophenyl phenyl ether	mg/kg	8270	- -	- -	- -	NA		NA		NA		NA		NA		NA		NA		NA	
4-Chloro-3-methylphenol	mg/kg	8270	8200	- -	3.4	NA		NA		NA		NA		NA		NA		NA		NA	
4-Chloroaniline	mg/kg	8270	11	180	0.0032	NA		NA		NA		NA		NA		NA		NA		NA	
4-Chlorophenyl phenyl ether	mg/kg	8270	- -	- -	- -	NA		NA		NA		NA		NA		NA		NA		NA	
4-Nitroaniline	mg/kg	8270	110	- -	0.032	NA		NA		NA		NA		NA		NA		NA		NA	
4-Nitrophenol	mg/kg	8270	- -	- -	- -	NA		NA		NA		NA		NA		NA		NA		NA	
Acetophenone	mg/kg	8270	12000	2500	1.16	NA		NA		NA		NA		NA		NA		NA		NA	
Atrazine	mg/kg	8270	10	150	0.038	NA		NA		NA		NA		NA		NA		NA		NA	
Benzaldehyde	mg/kg	8270	820	1200	0.082	NA		NA		NA		NA		NA		NA		NA		NA	
Bis(2-chloroisopropyl)ether	mg/kg	8270	4700	310	0.52	NA		NA		NA		NA		NA		NA		NA		NA	
Bis(2-chloroethoxy)methane	mg/kg	8270	250	- -	0.026	NA		NA		NA		NA		NA		NA		NA		NA	
Bis(2-chloroethyl)ether	mg/kg	8270	1	13	0.000072	NA		NA		NA		NA		NA		NA		NA		NA	
Bis(2-ethylhexyl) phthalate	mg/kg	8270	160	2500	28	NA		NA		NA		NA		NA		NA		NA		NA	
Butyl benzyl phthalate	mg/kg	8270	1200	19000	4.8	NA		NA		NA		NA		NA		NA		NA		NA	
Caprolactam	mg/kg	8270	40000	600000	5	NA		NA		NA		NA		NA		NA		NA		NA	
Carbazole [1]	mg/kg	8270	23000	700000	116	NA		NA		NA		NA		NA		NA		NA		NA	
Dibenzofuran	mg/kg	8270	120	2300	0.3	NA		NA		NA		NA		NA		NA		NA		NA	
Diethyl phthalate	mg/kg	8270	66000	1000000	12.2	NA		NA		NA		NA		NA		NA		NA		NA	
Dimethyl phthalate	mg/kg	8270	- -	- -	- -	NA		NA		NA		NA		NA		NA		NA		NA	
Di-n-butyl phthalate	mg/kg	8270	8200	130000	4.6	NA		NA		NA		NA		NA		NA		NA		NA	
Di-n-octyl phthalate	mg/kg	8270	820	- -	114	NA		NA		NA		NA		NA		NA		NA		NA	
Hexachlorobenzene	mg/kg	8270	0.96	13	0.26	NA		NA		NA		NA		NA		NA		NA		NA	
Hexachlorobutadiene	mg/kg	8270	5.3	17	0.0054	NA		NA		NA		NA		NA		NA		NA		NA	
Hexachlorocyclopentadiene	mg/kg	8270	0.75	8	3.2	NA		NA		NA		NA		NA		NA		NA		NA	
Hexachloroethane	mg/kg	8270	8	91	0.004	NA		NA		NA		NA		NA		NA		NA		NA	
Isophorone	mg/kg	8270	2400	37000	0.52	NA		NA		NA		NA		NA		NA		NA		NA	
Nitrobenzene	mg/kg	8270	22	240	0.00184	NA		NA		NA		NA		NA		NA		NA		NA	

TABLE A-4
ANALYTICAL AND SCREENING RESULTS
SUBSURFACE SOIL
CAA VIM AND VIIM
MINGO JUNCTION STEEL WORKS LLC - WEIRTON FACILITY

			Screening Criteria[1]			Sample Information [2]							
Constituent	**Units**	**Analytical Method**	**Industrial Soil RSL**	**Industrial Soil De Minimis**	***Protection of Groundwater RSL***	**IM-W700-S-08 7/12/2007 Sidewall**	**IM-W700-S-09A[3] 7/12/2007 Sidewall**	**IM-W700-S-09B[3] 7/12/2007 Sidewall**	**IM-W700-S-10 7/12/2007 Sidewall**	**IM-W700-S-11 7/12/2007 Sidewall**	**IM-W700-S-12 7/12/2007 Sidewall**	**IM-W700-S-13 7/12/2007 Sidewall**	**IM-W700-S-14 7/12/2007 Sidewall**
N-Nitrosodi-n-propylamine	mg/kg	8270	0.33	5.1	0.000162	NA	NA	NA	NA	NA	NA	NA	NA
N-Nitrosodiphenylamine	mg/kg	8270	470	7200	1.34	NA	NA	NA	NA	NA	NA	NA	NA
Pentachlorophenol	mg/kg	8270	4	52	0.028	NA	NA	NA	NA	NA	NA	NA	NA
Phenol	mg/kg	8270	25000	380000	6.6	NA	NA	NA	NA	NA	NA	NA	NA
Polychlorinated Biphenyls													
PCB-1016	mg/kg	8082	5.1	160	0.26	< 0.0032	< 0.0034	< 0.0027	< 0.0033	< 0.0031	< 0.0034	< 0.0036	< 0.0032
PCB-1221	mg/kg	8082	0.83	19	0.0016	< 0.0041	< 0.0043	< 0.0034	< 0.0042	< 0.004	< 0.0043	< 0.0046	< 0.0041
PCB-1232	mg/kg	8082	0.72	14	0.0016	< 0.0036	< 0.0039	< 0.0031	< 0.0038	< 0.0036	< 0.0039	< 0.0041	< 0.0037
PCB-1242	mg/kg	8082	0.95	26	0.024	< 0.0035	< 0.0037	< 0.0029	< 0.0036	< 0.0034	< 0.0037	< 0.0039	< 0.0035
PCB-1248	mg/kg	8082	0.94	27	0.024	< 0.002	< 0.0021	< 0.0017	0.02 J	< 0.002	< 0.0021	***0.039***	***0.031***
PCB-1254	mg/kg	8082	0.97	28	0.04	< 0.003	< 0.0032	< 0.0026	< 0.0032	< 0.003	< 0.0032	< 0.0034	< 0.0031
PCB-1260	mg/kg	8082	0.99	30	0.11	< 0.003	< 0.0032	< 0.0026	< 0.0031	< 0.003	< 0.0032	< 0.0034	< 0.0031
Inorganics													
Aluminum	mg/kg	6020	110000	1000000	60000	NA	NA	NA	NA	NA	NA	NA	NA
Antimony	mg/kg	6020	47	930	5.4	NA	NA	NA	NA	NA	NA	NA	NA
Arsenic	mg/kg	6020	3	35	5.8	NA	NA	NA	NA	NA	NA	NA	NA
Barium	mg/kg	6020	22000	400000	1640	NA	NA	NA	NA	NA	NA	NA	NA
Beryllium	mg/kg	6020	230	4500	64	NA	NA	NA	NA	NA	NA	NA	NA
Cadmium	mg/kg	6020	98	980	7.6	NA	NA	NA	NA	NA	NA	NA	NA
Calcium	mg/kg	6020	- -	- -	- -	NA	NA	NA	NA	NA	NA	NA	NA
Chromium [1]	mg/kg	6020	180000	1000000	3600000	NA	NA	NA	NA	NA	NA	NA	NA
Cobalt	mg/kg	6020	35	690	0.54	NA	NA	NA	NA	NA	NA	NA	NA
Copper	mg/kg	6020	4700	93000	920	NA	NA	NA	NA	NA	NA	NA	NA
Iron	mg/kg	6020	82000	1000000	700	NA	NA	NA	NA	NA	NA	NA	NA
Lead	mg/kg	6020	800	1000	280	NA	NA	NA	NA	NA	NA	NA	NA
Magnesium	mg/kg	6020	- -	- -	- -	NA	NA	NA	NA	NA	NA	NA	NA
Manganese [1]	mg/kg	6020	2600	80000	56	NA	NA	NA	NA	NA	NA	NA	NA
Mercury	mg/kg	7471	4.6	3.1	2	NA	NA	NA	NA	NA	NA	NA	NA
Nickel	mg/kg	6020	2200	43000	52	NA	NA	NA	NA	NA	NA	NA	NA
Potassium	mg/kg	6020	- -	- -	- -	NA	NA	NA	NA	NA	NA	NA	NA
Selenium	mg/kg	6020	580	12000	5.2	NA	NA	NA	NA	NA	NA	NA	NA
Silver	mg/kg	6020	580	12000	1.6	NA	NA	NA	NA	NA	NA	NA	NA
Sodium	mg/kg	6020	- -	- -	- -	NA	NA	NA	NA	NA	NA	NA	NA
Thallium	mg/kg	6020	1.2	23	2.8	NA	NA	NA	NA	NA	NA	NA	NA
Vanadium	mg/kg	6020	580	160	172	NA	NA	NA	NA	NA	NA	NA	NA
Zinc	mg/kg	6020	35000	700000	740	NA	NA	NA	NA	NA	NA	NA	NA
Other Parameters													
Cyanide, Total	mg/kg	9012	15	170	40	NA	NA	NA	NA	NA	NA	NA	NA
Total Organic Carbon	mg/kg	WALKLEY	- -	- -	- -	NA	NA	NA	NA	NA	NA	NA	NA
Percent Moisture	%	- -	- -	- -	- -	NA	NA	NA	NA	NA	NA	NA	NA
Percent Solids	%	MCAWW 160	- -	- -	- -	78.4	73.5	91.3	75.3	79.7	73.6	69.5	76.7

TABLE A-4
ANALYTICAL AND SCREENING RESULTS
SUBSURFACE SOIL
CAA VIM AND VIIM
MINGO JUNCTION STEEL WORKS LLC - WEIRTON FACILITY

Constituent	Units	Analytical Method	Screening Criteria[1]			Sample Information [2]							
			Industrial Soil RSL	Industrial Soil De Minimis	*Protection of Groundwater RSL*	IM-W700-S-15A[3] 7/12/2007 Sidewall	IM-W700-S-15B[3] 7/12/2007 Sidewall	IM-W700-S-16 7/12/2007 Sidewall	IM-W700-S-17 7/12/2007 Sidewall	IM-W700-S-18 7/12/2007 Sidewall	IM-W700-S-19 7/12/2007 Sidewall	IM-W700-S-19D[3] 7/12/2007 Sidewall	IM-W700-S-20 7/12/2007 Sidewall
Volatile Organic Compounds													
Benzene	mg/kg	8260	5.1	57	0.052	< 0.0015	< 0.0011	< 0.0016	< 0.0014	< 0.0065	< 0.0013	< 0.0013	< 0.0014
Toluene	mg/kg	8260	4700	820	13.8	< 0.0012	< 0.00088	< 0.0012	< 0.0011	< 0.005	< 0.001	< 0.00097	< 0.0011
Ethylbenzene	mg/kg	8260	25	280	15.6	< 0.0017	< 0.0013	< 0.0018	< 0.0016	< 0.0075	< 0.0015	< 0.0015	< 0.0016
Xylenes, Total	mg/kg	8260	250	260	198	< 0.0052	< 0.0039	< 0.0054	< 0.0047	< 0.022	< 0.0045	< 0.0043	< 0.0048
1,1,1-Trichloroethane	mg/kg	8260	3600	640	5.6	NA	NA	NA	NA	NA	NA	NA	NA
1,1,2,2-Tetrachloroethane	mg/kg	8260	2.7	31	0.0006	NA	NA	NA	NA	NA	NA	NA	NA
1,1,2-Trichloro-1,2,2-trifluoroethane	mg/kg	8260	2800	910	52	NA	NA	NA	NA	NA	NA	NA	NA
1,1,2-Trichloroethane	mg/kg	8260	0.63	6.8	0.032	NA	NA	NA	NA	NA	NA	NA	NA
1,1-Dichloroethane	mg/kg	8260	16	170	0.0156	NA	NA	NA	NA	NA	NA	NA	NA
1,1-Dichloroethene	mg/kg	8260	100	1100	0.2	NA	NA	NA	NA	NA	NA	NA	NA
1,2,4-Trichlorobenzene	mg/kg	8260	26	280	4	NA	NA	NA	NA	NA	NA	NA	NA
1,2-Dibromo-3-Chloropropane	mg/kg	8260	0.064	0.7	0.00172	NA	NA	NA	NA	NA	NA	NA	NA
1,2-Dibromoethane (EDB)	mg/kg	8260	0.16	1.8	0.00028	NA	NA	NA	NA	NA	NA	NA	NA
1,2-Dichlorobenzene	mg/kg	8260	930	380	11.6	NA	NA	NA	NA	NA	NA	NA	NA
1,2-Dichloroethane	mg/kg	8260	2	23	0.028	NA	NA	NA	NA	NA	NA	NA	NA
1,2-Dichloroethene, Total	mg/kg	8260	- -	- -	- -	NA	NA	NA	NA	NA	NA	NA	NA
cis-1,2-Dichloroethene	mg/kg	8260	230	81	0.42	NA	NA	NA	NA	NA	NA	NA	NA
trans-1,2-Dichloroethene	mg/kg	8260	30	570	0.62	NA	NA	NA	NA	NA	NA	NA	NA
1,2-Dichloropropane	mg/kg	8260	6.6	49	0.034	NA	NA	NA	NA	NA	NA	NA	NA
cis-1,3-Dichloropropene [1]	mg/kg	8260	8.2	99	0.0034	NA	NA	NA	NA	NA	NA	NA	NA
trans-1,3-Dichloropropene [1]	mg/kg	8260	8.2	99	0.0034	NA	NA	NA	NA	NA	NA	NA	NA
1,3-Dichlorobenzene [1]	mg/kg	8260	11	120	1.44	NA	NA	NA	NA	NA	NA	NA	NA
1,4-Dichlorobenzene	mg/kg	8260	11	120	1.44	NA	NA	NA	NA	NA	NA	NA	NA
2-Butanone (MEK)	mg/kg	8260	19000	28000	2.4	NA	NA	NA	NA	NA	NA	NA	NA
2-Hexanone	mg/kg	8260	130	- -	0.0176	NA	NA	NA	NA	NA	NA	NA	NA
4-Methyl-2-pentanone (MIBK)	mg/kg	8260	14000	3400	2.8	NA	NA	NA	NA	NA	NA	NA	NA
Acetone	mg/kg	8260	67000	110000	5.8	NA	NA	NA	NA	NA	NA	NA	NA
Bromoform	mg/kg	8260	86	910	0.42	NA	NA	NA	NA	NA	NA	NA	NA
Bromomethane	mg/kg	8260	3	33	0.0038	NA	NA	NA	NA	NA	NA	NA	NA
Carbon disulfide	mg/kg	8260	350	740	0.48	NA	NA	NA	NA	NA	NA	NA	NA
Carbon tetrachloride	mg/kg	8260	2.9	32	0.038	NA	NA	NA	NA	NA	NA	NA	NA
Chlorobenzene	mg/kg	8260	130	760	1.36	NA	NA	NA	NA	NA	NA	NA	NA
Chlorodibromomethane	mg/kg	8260	39	780	0.42	NA	NA	NA	NA	NA	NA	NA	NA
Chloroethane	mg/kg	8260	5700	2100	11.8	NA	NA	NA	NA	NA	NA	NA	NA
Chloroform	mg/kg	8260	1.4	15	0.44	NA	NA	NA	NA	NA	NA	NA	NA
Chloromethane	mg/kg	8260	46	500	0.098	NA	NA	NA	NA	NA	NA	NA	NA
Cyclohexane	mg/kg	8260	2700	120	26	NA	NA	NA	NA	NA	NA	NA	NA
Dichlorobromomethane	mg/kg	8260	1.3	14	0.44	NA	NA	NA	NA	NA	NA	NA	NA
Dichlorodifluoromethane	mg/kg	8260	37	400	0.6	NA	NA	NA	NA	NA	NA	NA	NA
Isopropylbenzene	mg/kg	8260	990	270	1.48	NA	NA	NA	NA	NA	NA	NA	NA
Methyl acetate	mg/kg	8260	120000	29000	8.2	NA	NA	NA	NA	NA	NA	NA	NA
Methyl tert-butyl ether	mg/kg	8260	210	2300	0.064	NA	NA	NA	NA	NA	NA	NA	NA
Methylcyclohexane [1]	mg/kg	8260	2700	120	26	NA	NA	NA	NA	NA	NA	NA	NA
Methylene Chloride	mg/kg	8260	320	3300	0.054	NA	NA	NA	NA	NA	NA	NA	NA
Naphthalene	mg/kg	8260	8.6	180	0.0076	NA	NA	NA	NA	NA	NA	NA	NA
Styrene	mg/kg	8260	3500	870	2.6	NA	NA	NA	NA	NA	NA	NA	NA
Tetrachloroethene	mg/kg	8260	39	170	0.046	NA	NA	NA	NA	NA	NA	NA	NA
Trichloroethene	mg/kg	8260	1.9	20	0.036	NA	NA	NA	NA	NA	NA	NA	NA
Trichlorofluoromethane	mg/kg	8260	35000	1200	6.6	NA	NA	NA	NA	NA	NA	NA	NA
Vinyl chloride	mg/kg	8260	1.7	22	0.0138	NA	NA	NA	NA	NA	NA	NA	NA
Semi-Volatile Organic Compounds													
Acenaphthene	mg/kg	8310	4500	70000	11	< 0.18	< 0.027	0.52 PG	0.14 J, PG	< 0.037	< 0.12	< 0.13	< 0.5
Acenaphthylene [1]	mg/kg	8310	4500	80000	11	4.3	< 0.005	5.1	4.5	2.4	***13***	11	***35***
Anthracene	mg/kg	8310	23000	700000	116	0.16 J, PG	0.097	0.32 PG	0.28 PG	0.22 PG	0.36 PG	0.29 PG	1.5 PG
Benzo[a]anthracene	mg/kg	8310	21	88	0.22	0.093 J, PG	***0.31***	0.12 PG	0.14 PG	0.11 PG	0.19 PG	0.15 J, PG	***0.56*** J, PG
Benzo[a]pyrene	mg/kg	8310	2.1	4.3	4.8	0.11 J	0.22	0.17	0.15	0.17	0.12 J, PG	0.17	0.53 J

TABLE A-4
ANALYTICAL AND SCREENING RESULTS
SUBSURFACE SOIL
CAA VIM AND VIIM
MINGO JUNCTION STEEL WORKS LLC - WEIRTON FACILITY

			Screening Criteria[1]			Sample Information [2]																	
Constituent	Units	Analytical Method	Industrial Soil RSL	Industrial Soil De Minimis	*Protection of Groundwater RSL*	IM-W700-S-15A[3] 7/12/2007 Sidewall		IM-W700-S-15B[3] 7/12/2007 Sidewall		IM-W700-S-16 7/12/2007 Sidewall		IM-W700-S-17 7/12/2007 Sidewall		IM-W700-S-18 7/12/2007 Sidewall		IM-W700-S-19 7/12/2007 Sidewall		IM-W700-S-19D[3] 7/12/2007 Sidewall		IM-W700-S-20 7/12/2007 Sidewall	
Benzo[b]fluoranthene	mg/kg	8310	21	43	6	0.43	PG	0.41		0.62		0.66		0.55		0.98		0.54	PG	2.1	PG
Benzo[g,h,i]perylene [1]	mg/kg	8310	2300	33000	26	< 0.032		0.19		0.081		0.025	J, PG	0.044	J PG	0.078	J	0.074	J	0.29	J
Benzo[k]fluoranthene	mg/kg	8310	210	430	58	< 0.032		0.2		< 0.0066		< 0.0057		< 0.0065		< 0.022		< 0.022		< 0.089	
Chrysene	mg/kg	8310	2100	4300	180	< 0.033		0.29		0.28		< 0.0059		0.23		0.33		0.31		0.92	PG
Dibenz(a,h)anthracene	mg/kg	8310	2.1	4.3	1.92	< 0.031		< 0.0047		< 0.0065		< 0.0057		< 0.0064		< 0.022		< 0.022		< 0.088	
Fluoranthene	mg/kg	8310	3000	44000	178	< 0.034		0.53	PG	< 0.0071		< 0.0061		< 0.007		< 0.024		< 0.024		< 0.095	
Fluorene	mg/kg	8310	3000	62000	10.8	0.86	PG	0.037		1.8		1.5		0.86		0.82	PG	0.75	PG	5.1	PG
Indeno[1,2,3-cd]pyrene	mg/kg	8310	21	43	19.6	0.086	J	0.29		0.16		0.059	PG	0.07	PG	< 0.022		0.086	J, PG	0.15	J, PG
Naphthalene	mg/kg	8310	8.6	180	0.0076	***0.59***	J	***0.11***	J	***0.45***		***0.95***		***1.1***		***2.4***		***2***		***11***	
Phenanthrene [1]	mg/kg	8310	23000	700000	116	2.5		0.18	PG	1.6		1.5		0.67		2.6		2.2		18	
Pyrene	mg/kg	8310	2300	66000	26	1.4	PG	0.51	PG	0.94	PG	0.72	PG	0.73	PG	1.5	PG	1.4	PG	6.7	PG
1,1'-Biphenyl	mg/kg	8270	20	210	0.0174	NA		NA		NA		NA		NA		NA		NA		NA	
2,4,5-Trichlorophenol	mg/kg	8270	8200	130000	8	NA		NA		NA		NA		NA		NA		NA		NA	
2,4,6-Trichlorophenol	mg/kg	8270	82	1300	0.024	NA		NA		NA		NA		NA		NA		NA		NA	
2,4-Dichlorophenol	mg/kg	8270	250	3800	0.046	NA		NA		NA		NA		NA		NA		NA		NA	
2,4-Dimethylphenol	mg/kg	8270	1600	25000	0.84	NA		NA		NA		NA		NA		NA		NA		NA	
2,4-Dinitrophenol	mg/kg	8270	160	2500	0.088	NA		NA		NA		NA		NA		NA		NA		NA	
2,4-Dinitrotoluene	mg/kg	8270	7.4	110	0.0064	NA		NA		NA		NA		NA		NA		NA		NA	
2,6-Dinitrotoluene	mg/kg	8270	1.5	24	0.00134	NA		NA		NA		NA		NA		NA		NA		NA	
2-Chloronaphthalene	mg/kg	8270	6000	67000	7.8	NA		NA		NA		NA		NA		NA		NA		NA	
2-Chlorophenol	mg/kg	8270	580	5500	0.178	NA		NA		NA		NA		NA		NA		NA		NA	
2-Methylnaphthalene	mg/kg	8270	300	9300	0.38	NA		NA		NA		NA		NA		NA		NA		NA	
2-Methylphenol	mg/kg	8270	4100	63000	1.5	NA		NA		NA		NA		NA		NA		NA		NA	
2-Nitroaniline	mg/kg	8270	800	12000	0.16	NA		NA		NA		NA		NA		NA		NA		NA	
2-Nitrophenol	mg/kg	8270	- -	- -	- -	NA		NA		NA		NA		NA		NA		NA		NA	
3,3'-Dichlorobenzidine	mg/kg	8270	5.1	79	0.0164	NA		NA		NA		NA		NA		NA		NA		NA	
Methylphenol, 3 & 4 [1]	mg/kg	8270	4100	63000	1.48	NA		NA		NA		NA		NA		NA		NA		NA	
3-Nitroaniline	mg/kg	8270	- -	- -	- -	NA		NA		NA		NA		NA		NA		NA		NA	
4,6-Dinitro-2-methylphenol	mg/kg	8270	6.6	- -	0.0052	NA		NA		NA		NA		NA		NA		NA		NA	
4-Bromophenyl phenyl ether	mg/kg	8270	- -	- -	- -	NA		NA		NA		NA		NA		NA		NA		NA	
4-Chloro-3-methylphenol	mg/kg	8270	8200	- -	3.4	NA		NA		NA		NA		NA		NA		NA		NA	
4-Chloroaniline	mg/kg	8270	11	180	0.0032	NA		NA		NA		NA		NA		NA		NA		NA	
4-Chlorophenyl phenyl ether	mg/kg	8270	- -	- -	- -	NA		NA		NA		NA		NA		NA		NA		NA	
4-Nitroaniline	mg/kg	8270	110	- -	0.032	NA		NA		NA		NA		NA		NA		NA		NA	
4-Nitrophenol	mg/kg	8270	- -	- -	- -	NA		NA		NA		NA		NA		NA		NA		NA	
Acetophenone	mg/kg	8270	12000	2500	1.16	NA		NA		NA		NA		NA		NA		NA		NA	
Atrazine	mg/kg	8270	10	150	0.038	NA		NA		NA		NA		NA		NA		NA		NA	
Benzaldehyde	mg/kg	8270	820	1200	0.082	NA		NA		NA		NA		NA		NA		NA		NA	
Bis(2-chloroisopropyl)ether	mg/kg	8270	4700	310	0.52	NA		NA		NA		NA		NA		NA		NA		NA	
Bis(2-chloroethoxy)methane	mg/kg	8270	250	- -	0.026	NA		NA		NA		NA		NA		NA		NA		NA	
Bis(2-chloroethyl)ether	mg/kg	8270	1	13	0.000072	NA		NA		NA		NA		NA		NA		NA		NA	
Bis(2-ethylhexyl) phthalate	mg/kg	8270	160	2500	28	NA		NA		NA		NA		NA		NA		NA		NA	
Butyl benzyl phthalate	mg/kg	8270	1200	19000	4.8	NA		NA		NA		NA		NA		NA		NA		NA	
Caprolactam	mg/kg	8270	40000	600000	5	NA		NA		NA		NA		NA		NA		NA		NA	
Carbazole [1]	mg/kg	8270	23000	700000	116	NA		NA		NA		NA		NA		NA		NA		NA	
Dibenzofuran	mg/kg	8270	120	2300	0.3	NA		NA		NA		NA		NA		NA		NA		NA	
Diethyl phthalate	mg/kg	8270	66000	1000000	12.2	NA		NA		NA		NA		NA		NA		NA		NA	
Dimethyl phthalate	mg/kg	8270	- -	- -	- -	NA		NA		NA		NA		NA		NA		NA		NA	
Di-n-butyl phthalate	mg/kg	8270	8200	130000	4.6	NA		NA		NA		NA		NA		NA		NA		NA	
Di-n-octyl phthalate	mg/kg	8270	820	- -	114	NA		NA		NA		NA		NA		NA		NA		NA	
Hexachlorobenzene	mg/kg	8270	0.96	13	0.26	NA		NA		NA		NA		NA		NA		NA		NA	
Hexachlorobutadiene	mg/kg	8270	5.3	17	0.0054	NA		NA		NA		NA		NA		NA		NA		NA	
Hexachlorocyclopentadiene	mg/kg	8270	0.75	8	3.2	NA		NA		NA		NA		NA		NA		NA		NA	
Hexachloroethane	mg/kg	8270	8	91	0.004	NA		NA		NA		NA		NA		NA		NA		NA	
Isophorone	mg/kg	8270	2400	37000	0.52	NA		NA		NA		NA		NA		NA		NA		NA	
Nitrobenzene	mg/kg	8270	22	240	0.00184	NA		NA		NA		NA		NA		NA		NA		NA	

TABLE A-4
ANALYTICAL AND SCREENING RESULTS
SUBSURFACE SOIL
CAA VIM AND VIIM
MINGO JUNCTION STEEL WORKS LLC - WEIRTON FACILITY

			Screening Criteria[1]			Sample Information [2]							
Constituent	**Units**	**Analytical Method**	**Industrial Soil RSL**	**Industrial Soil De Minimis**	***Protection of Groundwater RSL***	**IM-W700-S-15A[3] 7/12/2007 Sidewall**	**IM-W700-S-15B[3] 7/12/2007 Sidewall**	**IM-W700-S-16 7/12/2007 Sidewall**	**IM-W700-S-17 7/12/2007 Sidewall**	**IM-W700-S-18 7/12/2007 Sidewall**	**IM-W700-S-19 7/12/2007 Sidewall**	**IM-W700-S-19D[3] 7/12/2007 Sidewall**	**IM-W700-S-20 7/12/2007 Sidewall**
N-Nitrosodi-n-propylamine	mg/kg	8270	0.33	5.1	0.000162	NA	NA	NA	NA	NA	NA	NA	NA
N-Nitrosodiphenylamine	mg/kg	8270	470	7200	1.34	NA	NA	NA	NA	NA	NA	NA	NA
Pentachlorophenol	mg/kg	8270	4	52	0.028	NA	NA	NA	NA	NA	NA	NA	NA
Phenol	mg/kg	8270	25000	380000	6.6	NA	NA	NA	NA	NA	NA	NA	NA
Polychlorinated Biphenyls													
PCB-1016	mg/kg	8082	5.1	160	0.26	< 0.0037	< 0.0027	< 0.0038	< 0.0033	< 0.0031	< 0.0032	< 0.003	< 0.0034
PCB-1221	mg/kg	8082	0.83	19	0.0016	< 0.0047	< 0.0035	< 0.0049	< 0.0042	< 0.004	< 0.0041	< 0.0039	< 0.0044
PCB-1232	mg/kg	8082	0.72	14	0.0016	< 0.0042	< 0.0031	< 0.0044	< 0.0038	< 0.0036	< 0.0037	< 0.0035	< 0.0039
PCB-1242	mg/kg	8082	0.95	26	0.024	< 0.004	< 0.003	< 0.0042	< 0.0036	< 0.0034	< 0.0035	< 0.0033	< 0.0037
PCB-1248	mg/kg	8082	0.94	27	0.024	< 0.0023	< 0.0017	***0.036***	< 0.0021	< 0.002	< 0.002	***0.027***	< 0.0022
PCB-1254	mg/kg	8082	0.97	28	0.04	< 0.0035	< 0.0026	< 0.0037	< 0.0032	< 0.003	< 0.003	< 0.0029	< 0.0033
PCB-1260	mg/kg	8082	0.99	30	0.11	< 0.0035	< 0.0026	< 0.0036	< 0.0032	< 0.003	< 0.003	< 0.0029	< 0.0033
Inorganics													
Aluminum	mg/kg	6020	110000	1000000	60000	NA	NA	NA	NA	NA	NA	NA	NA
Antimony	mg/kg	6020	47	930	5.4	NA	NA	NA	NA	NA	NA	NA	NA
Arsenic	mg/kg	6020	3	35	5.8	NA	NA	NA	NA	NA	NA	NA	NA
Barium	mg/kg	6020	22000	400000	1640	NA	NA	NA	NA	NA	NA	NA	NA
Beryllium	mg/kg	6020	230	4500	64	NA	NA	NA	NA	NA	NA	NA	NA
Cadmium	mg/kg	6020	98	980	7.6	NA	NA	NA	NA	NA	NA	NA	NA
Calcium	mg/kg	6020	- -	- -	- -	NA	NA	NA	NA	NA	NA	NA	NA
Chromium [1]	mg/kg	6020	180000	1000000	3600000	NA	NA	NA	NA	NA	NA	NA	NA
Cobalt	mg/kg	6020	35	690	0.54	NA	NA	NA	NA	NA	NA	NA	NA
Copper	mg/kg	6020	4700	93000	920	NA	NA	NA	NA	NA	NA	NA	NA
Iron	mg/kg	6020	82000	1000000	700	NA	NA	NA	NA	NA	NA	NA	NA
Lead	mg/kg	6020	800	1000	280	NA	NA	NA	NA	NA	NA	NA	NA
Magnesium	mg/kg	6020	- -	- -	- -	NA	NA	NA	NA	NA	NA	NA	NA
Manganese [1]	mg/kg	6020	2600	80000	56	NA	NA	NA	NA	NA	NA	NA	NA
Mercury	mg/kg	7471	4.6	3.1	2	NA	NA	NA	NA	NA	NA	NA	NA
Nickel	mg/kg	6020	2200	43000	52	NA	NA	NA	NA	NA	NA	NA	NA
Potassium	mg/kg	6020	- -	- -	- -	NA	NA	NA	NA	NA	NA	NA	NA
Selenium	mg/kg	6020	580	12000	5.2	NA	NA	NA	NA	NA	NA	NA	NA
Silver	mg/kg	6020	580	12000	1.6	NA	NA	NA	NA	NA	NA	NA	NA
Sodium	mg/kg	6020	- -	- -	- -	NA	NA	NA	NA	NA	NA	NA	NA
Thallium	mg/kg	6020	1.2	23	2.8	NA	NA	NA	NA	NA	NA	NA	NA
Vanadium	mg/kg	6020	580	160	172	NA	NA	NA	NA	NA	NA	NA	NA
Zinc	mg/kg	6020	35000	700000	740	NA	NA	NA	NA	NA	NA	NA	NA
Other Parameters													
Cyanide, Total	mg/kg	9012	15	170	40	NA	NA	NA	NA	NA	NA	NA	NA
Total Organic Carbon	mg/kg	WALKLEY	- -	- -	- -	NA	NA	NA	NA	NA	NA	NA	NA
Percent Moisture	%	- -	- -	- -	- -	NA	NA	NA	NA	NA	NA	NA	NA
Percent Solids	%	MCAWW 160	- -	- -	- -	67.6	90.4	64.9	75.1	79.1	77.9	81.3	72.7

TABLE A-4
ANALYTICAL AND SCREENING RESULTS
SUBSURFACE SOIL
CAA VIM AND VIIM
MINGO JUNCTION STEEL WORKS LLC - WEIRTON FACILITY

Constituent	Units	Analytical Method	Screening Criteria[1]			Sample Information [2]							
			Industrial Soil RSL	Industrial Soil De Minimis	*Protection of Groundwater RSL*	IM-W700-S-21A[3] 7/12/2007 Sidewall	IM-W700-S-21B[3] 7/12/2007 Sidewall	IM-W700-S-22 7/13/2007 Sidewall	IM-W700-S-23 7/13/2007 Sidewall	IM-W700-S-24 7/13/2007 Sidewall	IM-W700-S-25 7/13/2007 Sidewall	IM-W700-S-26 7/13/2007 Sidewall	IM-W700-S-27 7/12/2007 Floor
Volatile Organic Compounds													
Benzene	mg/kg	8260	5.1	57	0.052	< 0.0013	< 0.0011	< 0.0011	< 0.0012	< 0.0012	< 0.0013	< 0.0012	< 0.0013
Toluene	mg/kg	8260	4700	820	13.8	< 0.00098	< 0.00085	< 0.00087	< 0.00088	< 0.00093	< 0.00099	< 0.00092	< 0.001
Ethylbenzene	mg/kg	8260	25	280	15.6	< 0.0015	< 0.0013	< 0.0013	< 0.0013	< 0.0014	< 0.0015	< 0.0014	< 0.0015
Xylenes, Total	mg/kg	8260	250	260	198	< 0.0044	< 0.0038	< 0.0039	< 0.0039	< 0.0041	< 0.0044	< 0.0041	< 0.0046
1,1,1-Trichloroethane	mg/kg	8260	3600	640	5.6	NA	NA	NA	NA	NA	NA	NA	NA
1,1,2,2-Tetrachloroethane	mg/kg	8260	2.7	31	0.0006	NA	NA	NA	NA	NA	NA	NA	NA
1,1,2-Trichloro-1,2,2-trifluoroethane	mg/kg	8260	2800	910	52	NA	NA	NA	NA	NA	NA	NA	NA
1,1,2-Trichloroethane	mg/kg	8260	0.63	6.8	0.032	NA	NA	NA	NA	NA	NA	NA	NA
1,1-Dichloroethane	mg/kg	8260	16	170	0.0156	NA	NA	NA	NA	NA	NA	NA	NA
1,1-Dichloroethene	mg/kg	8260	100	1100	0.2	NA	NA	NA	NA	NA	NA	NA	NA
1,2,4-Trichlorobenzene	mg/kg	8260	26	280	4	NA	NA	NA	NA	NA	NA	NA	NA
1,2-Dibromo-3-Chloropropane	mg/kg	8260	0.064	0.7	0.00172	NA	NA	NA	NA	NA	NA	NA	NA
1,2-Dibromoethane (EDB)	mg/kg	8260	0.16	1.8	0.00028	NA	NA	NA	NA	NA	NA	NA	NA
1,2-Dichlorobenzene	mg/kg	8260	930	380	11.6	NA	NA	NA	NA	NA	NA	NA	NA
1,2-Dichloroethane	mg/kg	8260	2	23	0.028	NA	NA	NA	NA	NA	NA	NA	NA
1,2-Dichloroethene, Total	mg/kg	8260	- -	- -	- -	NA	NA	NA	NA	NA	NA	NA	NA
cis-1,2-Dichloroethene	mg/kg	8260	230	81	0.42	NA	NA	NA	NA	NA	NA	NA	NA
trans-1,2-Dichloroethene	mg/kg	8260	30	570	0.62	NA	NA	NA	NA	NA	NA	NA	NA
1,2-Dichloropropane	mg/kg	8260	6.6	49	0.034	NA	NA	NA	NA	NA	NA	NA	NA
cis-1,3-Dichloropropene [1]	mg/kg	8260	8.2	99	0.0034	NA	NA	NA	NA	NA	NA	NA	NA
trans-1,3-Dichloropropene [1]	mg/kg	8260	8.2	99	0.0034	NA	NA	NA	NA	NA	NA	NA	NA
1,3-Dichlorobenzene [1]	mg/kg	8260	11	120	1.44	NA	NA	NA	NA	NA	NA	NA	NA
1,4-Dichlorobenzene	mg/kg	8260	11	120	1.44	NA	NA	NA	NA	NA	NA	NA	NA
2-Butanone (MEK)	mg/kg	8260	19000	28000	2.4	NA	NA	NA	NA	NA	NA	NA	NA
2-Hexanone	mg/kg	8260	130	- -	0.0176	NA	NA	NA	NA	NA	NA	NA	NA
4-Methyl-2-pentanone (MIBK)	mg/kg	8260	14000	3400	2.8	NA	NA	NA	NA	NA	NA	NA	NA
Acetone	mg/kg	8260	67000	110000	5.8	NA	NA	NA	NA	NA	NA	NA	NA
Bromoform	mg/kg	8260	86	910	0.42	NA	NA	NA	NA	NA	NA	NA	NA
Bromomethane	mg/kg	8260	3	33	0.0038	NA	NA	NA	NA	NA	NA	NA	NA
Carbon disulfide	mg/kg	8260	350	740	0.48	NA	NA	NA	NA	NA	NA	NA	NA
Carbon tetrachloride	mg/kg	8260	2.9	32	0.038	NA	NA	NA	NA	NA	NA	NA	NA
Chlorobenzene	mg/kg	8260	130	760	1.36	NA	NA	NA	NA	NA	NA	NA	NA
Chlorodibromomethane	mg/kg	8260	39	780	0.42	NA	NA	NA	NA	NA	NA	NA	NA
Chloroethane	mg/kg	8260	5700	2100	11.8	NA	NA	NA	NA	NA	NA	NA	NA
Chloroform	mg/kg	8260	1.4	15	0.44	NA	NA	NA	NA	NA	NA	NA	NA
Chloromethane	mg/kg	8260	46	500	0.098	NA	NA	NA	NA	NA	NA	NA	NA
Cyclohexane	mg/kg	8260	2700	120	26	NA	NA	NA	NA	NA	NA	NA	NA
Dichlorobromomethane	mg/kg	8260	1.3	14	0.44	NA	NA	NA	NA	NA	NA	NA	NA
Dichlorodifluoromethane	mg/kg	8260	37	400	0.6	NA	NA	NA	NA	NA	NA	NA	NA
Isopropylbenzene	mg/kg	8260	990	270	1.48	NA	NA	NA	NA	NA	NA	NA	NA
Methyl acetate	mg/kg	8260	120000	29000	8.2	NA	NA	NA	NA	NA	NA	NA	NA
Methyl tert-butyl ether	mg/kg	8260	210	2300	0.064	NA	NA	NA	NA	NA	NA	NA	NA
Methylcyclohexane [1]	mg/kg	8260	2700	120	26	NA	NA	NA	NA	NA	NA	NA	NA
Methylene Chloride	mg/kg	8260	320	3300	0.054	NA	NA	NA	NA	NA	NA	NA	NA
Naphthalene	mg/kg	8260	8.6	180	0.0076	NA	NA	NA	NA	NA	NA	NA	NA
Styrene	mg/kg	8260	3500	870	2.6	NA	NA	NA	NA	NA	NA	NA	NA
Tetrachloroethene	mg/kg	8260	39	170	0.046	NA	NA	NA	NA	NA	NA	NA	NA
Trichloroethene	mg/kg	8260	1.9	20	0.036	NA	NA	NA	NA	NA	NA	NA	NA
Trichlorofluoromethane	mg/kg	8260	35000	1200	6.6	NA	NA	NA	NA	NA	NA	NA	NA
Vinyl chloride	mg/kg	8260	1.7	22	0.0138	NA	NA	NA	NA	NA	NA	NA	NA
Semi-Volatile Organic Compounds													
Acenaphthene	mg/kg	8310	4500	70000	11	< 0.03	< 0.036	< 0.016	< 0.053	< 0.045	< 0.03	< 0.084	< 0.0062
Acenaphthylene [1]	mg/kg	8310	4500	80000	11	2.4	3.2	0.57	2.5	0.88	2.1	1.1	< 0.0058
Anthracene	mg/kg	8310	23000	700000	116	0.064 PG	0.24	0.023 PG	0.14 PG	0.21	0.071 PG	0.2	0.0012 J, PG
Benzo[a]anthracene	mg/kg	8310	21	88	0.22	0.042 PG	0.17 PG	0.08 PG	***0.3*** PG	***0.37***	0.049 PG	***0.31***	< 0.0011
Benzo[a]pyrene	mg/kg	8310	2.1	4.3	4.8	0.037 J, PG	0.24	0.11	0.4	0.7	0.077	0.37	0.0017 J

TABLE A-4
ANALYTICAL AND SCREENING RESULTS
SUBSURFACE SOIL
CAA VIM AND VIIM
MINGO JUNCTION STEEL WORKS LLC - WEIRTON FACILITY

			Screening Criteria[1]			Sample Information [2]															
Constituent	Units	Analytical Method	Industrial Soil RSL	Industrial Soil De Minimis	*Protection of Groundwater RSL*	IM-W700-S-21A[3] 7/12/2007 Sidewall		IM-W700-S-21B[3] 7/12/2007 Sidewall		IM-W700-S-22 7/13/2007 Sidewall		IM-W700-S-23 7/13/2007 Sidewall		IM-W700-S-24 7/13/2007 Sidewall		IM-W700-S-25 7/13/2007 Sidewall		IM-W700-S-26 7/13/2007 Sidewall		IM-W700-S-27 7/12/2007 Floor	
Benzo[b]fluoranthene	mg/kg	8310	21	43	6	0.32		0.4	PG	0.21	PG	0.62		1.1		0.23	PG	0.75		0.0044	J, PG
Benzo[g,h,i]perylene [1]	mg/kg	8310	2300	33000	26	0.035	J, PG	0.099	PG	0.082		0.22	PG	0.31	PG	0.033	J, PG	0.27		< 0.0011	
Benzo[k]fluoranthene	mg/kg	8310	210	430	58	< 0.0053		0.14	PG	0.067	PG	0.29		0.41		< 0.0054		0.23	PG	< 0.0011	
Chrysene	mg/kg	8310	2100	4300	180	0.12		0.26		0.15		0.41		0.43		0.14		0.4		0.0018	J, PG
Dibenz(a,h)anthracene	mg/kg	8310	2.1	4.3	1.92	< 0.0053		< 0.0063		< 0.0028		< 0.0094		< 0.008		< 0.0053		< 0.015		< 0.0011	
Fluoranthene	mg/kg	8310	3000	44000	178	< 0.0057		0.95	PG	0.46		0.74	PG	0.76	PG	< 0.0058		0.71	PG	< 0.0012	
Fluorene	mg/kg	8310	3000	62000	10.8	0.25	PG	0.14	PG	0.026		0.093	PG	0.13		0.41		0.075	J, PG	0.0027	J
Indeno[1,2,3-cd]pyrene	mg/kg	8310	21	43	19.6	0.13		0.22		0.11		0.45		0.72		0.044	PG	0.41		< 0.0011	
Naphthalene	mg/kg	8310	8.6	180	0.0076	***1.1***		***0.56***		***0.033***	J, PG	***0.4***	PG	***0.52***		***0.87***		***0.22***	J	***0.0078***	J
Phenanthrene [1]	mg/kg	8310	23000	700000	116	0.62		0.67		0.15		0.53		0.62		1		0.49		0.0082	J, PG
Pyrene	mg/kg	8310	2300	66000	26	< 0.0058		1	PG	0.57	PG	0.82	PG	0.94	PG	0.41	PG	0.77	PG	< 0.0012	
1,1'-Biphenyl	mg/kg	8270	20	210	0.0174	NA		NA		NA		NA		NA		NA		NA		NA	
2,4,5-Trichlorophenol	mg/kg	8270	8200	130000	8	NA		NA		NA		NA		NA		NA		NA		NA	
2,4,6-Trichlorophenol	mg/kg	8270	82	1300	0.024	NA		NA		NA		NA		NA		NA		NA		NA	
2,4-Dichlorophenol	mg/kg	8270	250	3800	0.046	NA		NA		NA		NA		NA		NA		NA		NA	
2,4-Dimethylphenol	mg/kg	8270	1600	25000	0.84	NA		NA		NA		NA		NA		NA		NA		NA	
2,4-Dinitrophenol	mg/kg	8270	160	2500	0.088	NA		NA		NA		NA		NA		NA		NA		NA	
2,4-Dinitrotoluene	mg/kg	8270	7.4	110	0.0064	NA		NA		NA		NA		NA		NA		NA		NA	
2,6-Dinitrotoluene	mg/kg	8270	1.5	24	0.00134	NA		NA		NA		NA		NA		NA		NA		NA	
2-Chloronaphthalene	mg/kg	8270	6000	67000	7.8	NA		NA		NA		NA		NA		NA		NA		NA	
2-Chlorophenol	mg/kg	8270	580	5500	0.178	NA		NA		NA		NA		NA		NA		NA		NA	
2-Methylnaphthalene	mg/kg	8270	300	9300	0.38	NA		NA		NA		NA		NA		NA		NA		NA	
2-Methylphenol	mg/kg	8270	4100	63000	1.5	NA		NA		NA		NA		NA		NA		NA		NA	
2-Nitroaniline	mg/kg	8270	800	12000	0.16	NA		NA		NA		NA		NA		NA		NA		NA	
2-Nitrophenol	mg/kg	8270	- -	- -	- -	NA		NA		NA		NA		NA		NA		NA		NA	
3,3'-Dichlorobenzidine	mg/kg	8270	5.1	79	0.0164	NA		NA		NA		NA		NA		NA		NA		NA	
Methylphenol, 3 & 4 [1]	mg/kg	8270	4100	63000	1.48	NA		NA		NA		NA		NA		NA		NA		NA	
3-Nitroaniline	mg/kg	8270	- -	- -	- -	NA		NA		NA		NA		NA		NA		NA		NA	
4,6-Dinitro-2-methylphenol	mg/kg	8270	6.6	- -	0.0052	NA		NA		NA		NA		NA		NA		NA		NA	
4-Bromophenyl phenyl ether	mg/kg	8270	- -	- -	- -	NA		NA		NA		NA		NA		NA		NA		NA	
4-Chloro-3-methylphenol	mg/kg	8270	8200	- -	3.4	NA		NA		NA		NA		NA		NA		NA		NA	
4-Chloroaniline	mg/kg	8270	11	180	0.0032	NA		NA		NA		NA		NA		NA		NA		NA	
4-Chlorophenyl phenyl ether	mg/kg	8270	- -	- -	- -	NA		NA		NA		NA		NA		NA		NA		NA	
4-Nitroaniline	mg/kg	8270	110	- -	0.032	NA		NA		NA		NA		NA		NA		NA		NA	
4-Nitrophenol	mg/kg	8270	- -	- -	- -	NA		NA		NA		NA		NA		NA		NA		NA	
Acetophenone	mg/kg	8270	12000	2500	1.16	NA		NA		NA		NA		NA		NA		NA		NA	
Atrazine	mg/kg	8270	10	150	0.038	NA		NA		NA		NA		NA		NA		NA		NA	
Benzaldehyde	mg/kg	8270	820	1200	0.082	NA		NA		NA		NA		NA		NA		NA		NA	
Bis(2-chloroisopropyl)ether	mg/kg	8270	4700	310	0.52	NA		NA		NA		NA		NA		NA		NA		NA	
Bis(2-chloroethoxy)methane	mg/kg	8270	250	- -	0.026	NA		NA		NA		NA		NA		NA		NA		NA	
Bis(2-chloroethyl)ether	mg/kg	8270	1	13	0.000072	NA		NA		NA		NA		NA		NA		NA		NA	
Bis(2-ethylhexyl) phthalate	mg/kg	8270	160	2500	28	NA		NA		NA		NA		NA		NA		NA		NA	
Butyl benzyl phthalate	mg/kg	8270	1200	19000	4.8	NA		NA		NA		NA		NA		NA		NA		NA	
Caprolactam	mg/kg	8270	40000	600000	5	NA		NA		NA		NA		NA		NA		NA		NA	
Carbazole [1]	mg/kg	8270	23000	700000	116	NA		NA		NA		NA		NA		NA		NA		NA	
Dibenzofuran	mg/kg	8270	120	2300	0.3	NA		NA		NA		NA		NA		NA		NA		NA	
Diethyl phthalate	mg/kg	8270	66000	1000000	12.2	NA		NA		NA		NA		NA		NA		NA		NA	
Dimethyl phthalate	mg/kg	8270	- -	- -	- -	NA		NA		NA		NA		NA		NA		NA		NA	
Di-n-butyl phthalate	mg/kg	8270	8200	130000	4.6	NA		NA		NA		NA		NA		NA		NA		NA	
Di-n-octyl phthalate	mg/kg	8270	820	- -	114	NA		NA		NA		NA		NA		NA		NA		NA	
Hexachlorobenzene	mg/kg	8270	0.96	13	0.26	NA		NA		NA		NA		NA		NA		NA		NA	
Hexachlorobutadiene	mg/kg	8270	5.3	17	0.0054	NA		NA		NA		NA		NA		NA		NA		NA	
Hexachlorocyclopentadiene	mg/kg	8270	0.75	8	3.2	NA		NA		NA		NA		NA		NA		NA		NA	
Hexachloroethane	mg/kg	8270	8	91	0.004	NA		NA		NA		NA		NA		NA		NA		NA	
Isophorone	mg/kg	8270	2400	37000	0.52	NA		NA		NA		NA		NA		NA		NA		NA	
Nitrobenzene	mg/kg	8270	22	240	0.00184	NA		NA		NA		NA		NA		NA		NA		NA	

TABLE A-4
ANALYTICAL AND SCREENING RESULTS
SUBSURFACE SOIL
CAA VIM AND VIIM
MINGO JUNCTION STEEL WORKS LLC - WEIRTON FACILITY

			Screening Criteria[1]			Sample Information [2]							
Constituent	**Units**	**Analytical Method**	**Industrial Soil RSL**	**Industrial Soil De Minimis**	***Protection of Groundwater RSL***	**IM-W700-S-21A[3] 7/12/2007 Sidewall**	**IM-W700-S-21B[3] 7/12/2007 Sidewall**	**IM-W700-S-22 7/13/2007 Sidewall**	**IM-W700-S-23 7/13/2007 Sidewall**	**IM-W700-S-24 7/13/2007 Sidewall**	**IM-W700-S-25 7/13/2007 Sidewall**	**IM-W700-S-26 7/13/2007 Sidewall**	**IM-W700-S-27 7/12/2007 Floor**
N-Nitrosodi-n-propylamine	mg/kg	8270	0.33	5.1	0.000162	NA	NA	NA	NA	NA	NA	NA	NA
N-Nitrosodiphenylamine	mg/kg	8270	470	7200	1.34	NA	NA	NA	NA	NA	NA	NA	NA
Pentachlorophenol	mg/kg	8270	4	52	0.028	NA	NA	NA	NA	NA	NA	NA	NA
Phenol	mg/kg	8270	25000	380000	6.6	NA	NA	NA	NA	NA	NA	NA	NA
Polychlorinated Biphenyls													
PCB-1016	mg/kg	8082	5.1	160	0.26	< 0.003	< 0.0026	< 0.0027	< 0.0028	< 0.0029	< 0.0031	< 0.0028	< 0.0032
PCB-1221	mg/kg	8082	0.83	19	0.0016	< 0.0039	< 0.0034	< 0.0035	< 0.0035	< 0.0037	< 0.004	< 0.0037	< 0.0041
PCB-1232	mg/kg	8082	0.72	14	0.0016	< 0.0035	< 0.003	< 0.0031	< 0.0032	< 0.0033	< 0.0036	< 0.0033	< 0.0037
PCB-1242	mg/kg	8082	0.95	26	0.024	< 0.0033	< 0.0029	< 0.003	< 0.003	< 0.0032	< 0.0034	< 0.0031	< 0.0035
PCB-1248	mg/kg	8082	0.94	27	0.024	< 0.0019	0.0083 J	< 0.0017	< 0.0018	< 0.0018	< 0.002	< 0.0018	< 0.002
PCB-1254	mg/kg	8082	0.97	28	0.04	< 0.0029	< 0.0025	< 0.0026	< 0.0026	< 0.0028	< 0.003	< 0.0027	< 0.0031
PCB-1260	mg/kg	8082	0.99	30	0.11	< 0.0029	< 0.0025	< 0.0026	< 0.0026	< 0.0028	< 0.003	< 0.0027	< 0.0031
Inorganics													
Aluminum	mg/kg	6020	110000	1000000	60000	NA	NA	NA	NA	NA	NA	NA	NA
Antimony	mg/kg	6020	47	930	5.4	NA	NA	NA	NA	NA	NA	NA	NA
Arsenic	mg/kg	6020	3	35	5.8	NA	NA	NA	NA	NA	NA	NA	NA
Barium	mg/kg	6020	22000	400000	1640	NA	NA	NA	NA	NA	NA	NA	NA
Beryllium	mg/kg	6020	230	4500	64	NA	NA	NA	NA	NA	NA	NA	NA
Cadmium	mg/kg	6020	98	980	7.6	NA	NA	NA	NA	NA	NA	NA	NA
Calcium	mg/kg	6020	- -	- -	- -	NA	NA	NA	NA	NA	NA	NA	NA
Chromium [1]	mg/kg	6020	180000	1000000	3600000	NA	NA	NA	NA	NA	NA	NA	NA
Cobalt	mg/kg	6020	35	690	0.54	NA	NA	NA	NA	NA	NA	NA	NA
Copper	mg/kg	6020	4700	93000	920	NA	NA	NA	NA	NA	NA	NA	NA
Iron	mg/kg	6020	82000	1000000	700	NA	NA	NA	NA	NA	NA	NA	NA
Lead	mg/kg	6020	800	1000	280	NA	NA	NA	NA	NA	NA	NA	NA
Magnesium	mg/kg	6020	- -	- -	- -	NA	NA	NA	NA	NA	NA	NA	NA
Manganese [1]	mg/kg	6020	2600	80000	56	NA	NA	NA	NA	NA	NA	NA	NA
Mercury	mg/kg	7471	4.6	3.1	2	NA	NA	NA	NA	NA	NA	NA	NA
Nickel	mg/kg	6020	2200	43000	52	NA	NA	NA	NA	NA	NA	NA	NA
Potassium	mg/kg	6020	- -	- -	- -	NA	NA	NA	NA	NA	NA	NA	NA
Selenium	mg/kg	6020	580	12000	5.2	NA	NA	NA	NA	NA	NA	NA	NA
Silver	mg/kg	6020	580	12000	1.6	NA	NA	NA	NA	NA	NA	NA	NA
Sodium	mg/kg	6020	- -	- -	- -	NA	NA	NA	NA	NA	NA	NA	NA
Thallium	mg/kg	6020	1.2	23	2.8	NA	NA	NA	NA	NA	NA	NA	NA
Vanadium	mg/kg	6020	580	160	172	NA	NA	NA	NA	NA	NA	NA	NA
Zinc	mg/kg	6020	35000	700000	740	NA	NA	NA	NA	NA	NA	NA	NA
Other Parameters													
Cyanide, Total	mg/kg	9012	15	170	40	NA	NA	NA	NA	NA	NA	NA	NA
Total Organic Carbon	mg/kg	WALKLEY	- -	- -	- -	NA	NA	NA	NA	NA	NA	NA	NA
Percent Moisture	%	- -	- -	- -	- -	NA	NA	NA	NA	NA	NA	NA	NA
Percent Solids	%	MCAWW 16	- -	- -	- -	80.8	93.2	90.8	89.7	85.4	80	86.2	77

TABLE A-4
ANALYTICAL AND SCREENING RESULTS
SUBSURFACE SOIL
CAA VIM AND VIIM
MINGO JUNCTION STEEL WORKS LLC - WEIRTON FACILITY

Constituent	Units	Analytical Method	Screening Criteria[1]			Sample Information [2]							
			Industrial Soil RSL	Industrial Soil De Minimis	*Protection of Groundwater RSL*	IM-W700-S-28 7/12/2007 Floor	IM-W700-S-29 7/12/2007 Floor	IM-W700-S-30 7/12/2007 Floor	IM-W700-S-31 7/12/2007 Floor	IM-W700-S-32 7/12/2007 Floor	IM-W700-S-33 7/12/2007 Floor	IM-W700-S-34 7/12/2007 Floor	IM-W700-S-35 7/12/2007 Floor
Volatile Organic Compounds													
Benzene	mg/kg	8260	5.1	57	0.052	< 0.0012	< 0.0012	< 0.0013	< 0.0012	< 0.0012	< 0.0012	< 0.0012	< 0.0012
Toluene	mg/kg	8260	4700	820	13.8	< 0.00095	< 0.00091	< 0.00096	< 0.00094	< 0.00092	< 0.00093	< 0.00091	< 0.00091
Ethylbenzene	mg/kg	8260	25	280	15.6	< 0.0014	< 0.0014	< 0.0014	< 0.0014	< 0.0014	< 0.0014	< 0.0014	< 0.0014
Xylenes, Total	mg/kg	8260	250	260	198	< 0.0042	< 0.004	< 0.0043	< 0.0042	< 0.0041	< 0.0041	< 0.0041	< 0.0041
1,1,1-Trichloroethane	mg/kg	8260	3600	640	5.6	NA	NA	NA	NA	NA	NA	NA	NA
1,1,2,2-Tetrachloroethane	mg/kg	8260	2.7	31	0.0006	NA	NA	NA	NA	NA	NA	NA	NA
1,1,2-Trichloro-1,2,2-trifluoroethane	mg/kg	8260	2800	910	52	NA	NA	NA	NA	NA	NA	NA	NA
1,1,2-Trichloroethane	mg/kg	8260	0.63	6.8	0.032	NA	NA	NA	NA	NA	NA	NA	NA
1,1-Dichloroethane	mg/kg	8260	16	170	0.0156	NA	NA	NA	NA	NA	NA	NA	NA
1,1-Dichloroethene	mg/kg	8260	100	1100	0.2	NA	NA	NA	NA	NA	NA	NA	NA
1,2,4-Trichlorobenzene	mg/kg	8260	26	280	4	NA	NA	NA	NA	NA	NA	NA	NA
1,2-Dibromo-3-Chloropropane	mg/kg	8260	0.064	0.7	0.00172	NA	NA	NA	NA	NA	NA	NA	NA
1,2-Dibromoethane (EDB)	mg/kg	8260	0.16	1.8	0.00028	NA	NA	NA	NA	NA	NA	NA	NA
1,2-Dichlorobenzene	mg/kg	8260	930	380	11.6	NA	NA	NA	NA	NA	NA	NA	NA
1,2-Dichloroethane	mg/kg	8260	2	23	0.028	NA	NA	NA	NA	NA	NA	NA	NA
1,2-Dichloroethene, Total	mg/kg	8260	- -	- -	- -	NA	NA	NA	NA	NA	NA	NA	NA
cis-1,2-Dichloroethene	mg/kg	8260	230	81	0.42	NA	NA	NA	NA	NA	NA	NA	NA
trans-1,2-Dichloroethene	mg/kg	8260	30	570	0.62	NA	NA	NA	NA	NA	NA	NA	NA
1,2-Dichloropropane	mg/kg	8260	6.6	49	0.034	NA	NA	NA	NA	NA	NA	NA	NA
cis-1,3-Dichloropropene [1]	mg/kg	8260	8.2	99	0.0034	NA	NA	NA	NA	NA	NA	NA	NA
trans-1,3-Dichloropropene [1]	mg/kg	8260	8.2	99	0.0034	NA	NA	NA	NA	NA	NA	NA	NA
1,3-Dichlorobenzene [1]	mg/kg	8260	11	120	1.44	NA	NA	NA	NA	NA	NA	NA	NA
1,4-Dichlorobenzene	mg/kg	8260	11	120	1.44	NA	NA	NA	NA	NA	NA	NA	NA
2-Butanone (MEK)	mg/kg	8260	19000	28000	2.4	NA	NA	NA	NA	NA	NA	NA	NA
2-Hexanone	mg/kg	8260	130	- -	0.0176	NA	NA	NA	NA	NA	NA	NA	NA
4-Methyl-2-pentanone (MIBK)	mg/kg	8260	14000	3400	2.8	NA	NA	NA	NA	NA	NA	NA	NA
Acetone	mg/kg	8260	67000	110000	5.8	NA	NA	NA	NA	NA	NA	NA	NA
Bromoform	mg/kg	8260	86	910	0.42	NA	NA	NA	NA	NA	NA	NA	NA
Bromomethane	mg/kg	8260	3	33	0.0038	NA	NA	NA	NA	NA	NA	NA	NA
Carbon disulfide	mg/kg	8260	350	740	0.48	NA	NA	NA	NA	NA	NA	NA	NA
Carbon tetrachloride	mg/kg	8260	2.9	32	0.038	NA	NA	NA	NA	NA	NA	NA	NA
Chlorobenzene	mg/kg	8260	130	760	1.36	NA	NA	NA	NA	NA	NA	NA	NA
Chlorodibromomethane	mg/kg	8260	39	780	0.42	NA	NA	NA	NA	NA	NA	NA	NA
Chloroethane	mg/kg	8260	5700	2100	11.8	NA	NA	NA	NA	NA	NA	NA	NA
Chloroform	mg/kg	8260	1.4	15	0.44	NA	NA	NA	NA	NA	NA	NA	NA
Chloromethane	mg/kg	8260	46	500	0.098	NA	NA	NA	NA	NA	NA	NA	NA
Cyclohexane	mg/kg	8260	2700	120	26	NA	NA	NA	NA	NA	NA	NA	NA
Dichlorobromomethane	mg/kg	8260	1.3	14	0.44	NA	NA	NA	NA	NA	NA	NA	NA
Dichlorodifluoromethane	mg/kg	8260	37	400	0.6	NA	NA	NA	NA	NA	NA	NA	NA
Isopropylbenzene	mg/kg	8260	990	270	1.48	NA	NA	NA	NA	NA	NA	NA	NA
Methyl acetate	mg/kg	8260	120000	29000	8.2	NA	NA	NA	NA	NA	NA	NA	NA
Methyl tert-butyl ether	mg/kg	8260	210	2300	0.064	NA	NA	NA	NA	NA	NA	NA	NA
Methylcyclohexane [1]	mg/kg	8260	2700	120	26	NA	NA	NA	NA	NA	NA	NA	NA
Methylene Chloride	mg/kg	8260	320	3300	0.054	NA	NA	NA	NA	NA	NA	NA	NA
Naphthalene	mg/kg	8260	8.6	180	0.0076	NA	NA	NA	NA	NA	NA	NA	NA
Styrene	mg/kg	8260	3500	870	2.6	NA	NA	NA	NA	NA	NA	NA	NA
Tetrachloroethene	mg/kg	8260	39	170	0.046	NA	NA	NA	NA	NA	NA	NA	NA
Trichloroethene	mg/kg	8260	1.9	20	0.036	NA	NA	NA	NA	NA	NA	NA	NA
Trichlorofluoromethane	mg/kg	8260	35000	1200	6.6	NA	NA	NA	NA	NA	NA	NA	NA
Vinyl chloride	mg/kg	8260	1.7	22	0.0138	NA	NA	NA	NA	NA	NA	NA	NA
Semi-Volatile Organic Compounds													
Acenaphthene	mg/kg	8310	4500	70000	11	< 0.029	< 0.0055	< 0.018	< 0.0057	< 0.0056	0.011 J, PG	< 0.017	< 0.0055
Acenaphthylene [1]	mg/kg	8310	4500	80000	11	0.29	0.45	1.1	< 0.0053	0.62	0.018 J	0.66	0.063
Anthracene	mg/kg	8310	23000	700000	116	0.035 J	0.04	0.028 PG	0.0026 J	0.023 PG	0.002 J, PG	0.024 PG	0.0025 J
Benzo[a]anthracene	mg/kg	8310	21	88	0.22	0.21	0.033 PG	0.027 PG	0.0062 J	0.033 PG	0.0012 J, PG	0.042 PG	0.0017 J, PG
Benzo[a]pyrene	mg/kg	8310	2.1	4.3	4.8	0.44	0.029 PG	0.034	0.012	0.038 PG	0.0026 J	0.072	0.0028 J

TABLE A-4
ANALYTICAL AND SCREENING RESULTS
SUBSURFACE SOIL
CAA VIM AND VIIM
MINGO JUNCTION STEEL WORKS LLC - WEIRTON FACILITY

			Screening Criteria[1]			Sample Information [2]																			
						IM-W700-S-28 7/12/2007 Floor		IM-W700-S-29 7/12/2007 Floor		IM-W700-S-30 7/12/2007 Floor		IM-W700-S-31 7/12/2007 Floor		IM-W700-S-32 7/12/2007 Floor		IM-W700-S-33 7/12/2007 Floor		IM-W700-S-34 7/12/2007 Floor		IM-W700-S-35 7/12/2007 Floor	
Constituent	**Units**	**Analytical Method**	**Industrial Soil RSL**	**Industrial Soil De Minimis**	***Protection of Groundwater RSL***																
Benzo[b]fluoranthene	mg/kg	8310	21	43	6	0.65		0.086	PG	0.11	PG	0.015		0.26		0.032	PG	0.21		0.0064	J, PG
Benzo[g,h,i]perylene [1]	mg/kg	8310	2300	33000	26	0.4		0.018	PG	0.011	J, PG	0.0068	J	0.04		0.0046	J	0.026	PG	0.0015	J, PG
Benzo[k]fluoranthene	mg/kg	8310	210	430	58	0.3		< 0.00099		< 0.0031		0.0048	J, PG	< 0.00099		0.0015	J	< 0.003		< 0.00098	
Chrysene	mg/kg	8310	2100	4300	180	0.22		0.07		0.068		0.0067	J	0.024	PG	0.0024	J	0.078		< 0.001	
Dibenz(a,h)anthracene	mg/kg	8310	2.1	4.3	1.92	< 0.0051		< 0.00097		< 0.0031		< 0.001		< 0.00098		< 0.00099		< 0.0029		< 0.00097	
Fluoranthene	mg/kg	8310	3000	44000	178	0.21		0.16		< 0.0033		0.011		< 0.0011		< 0.0011		< 0.0032		< 0.0011	
Fluorene	mg/kg	8310	3000	62000	10.8	0.024	J, PG	0.034		0.044	PG	0.0036	J, PG	0.067		0.0076	J, PG	0.043	PG	0.0036	J
Indeno[1,2,3-cd]pyrene	mg/kg	8310	21	43	19.6	0.56		< 0.00097		0.023	J, PG	0.01		0.063		0.0021	J, PG	0.066		0.0028	J, PG
Naphthalene	mg/kg	8310	8.6	180	0.0076	***0.079***	J	***0.092***		***0.23***		***0.0081***	J	***0.17***	PG	0.0075	J, PG	***0.082***	J	0.0072	J
Phenanthrene [1]	mg/kg	8310	23000	700000	116	0.078	PG	0.099	PG	0.29		0.011	PG	0.19		0.012	PG	0.18		0.014	
Pyrene	mg/kg	8310	2300	66000	26	0.26	PG	0.23	PG	0.21	PG	0.011	PG	0.13	PG	0.007	J, PG	0.27	PG	0.011	PG
1,1'-Biphenyl	mg/kg	8270	20	210	0.0174	NA		NA		NA		NA		NA		NA		NA		NA	
2,4,5-Trichlorophenol	mg/kg	8270	8200	130000	8	NA		NA		NA		NA		NA		NA		NA		NA	
2,4,6-Trichlorophenol	mg/kg	8270	82	1300	0.024	NA		NA		NA		NA		NA		NA		NA		NA	
2,4-Dichlorophenol	mg/kg	8270	250	3800	0.046	NA		NA		NA		NA		NA		NA		NA		NA	
2,4-Dimethylphenol	mg/kg	8270	1600	25000	0.84	NA		NA		NA		NA		NA		NA		NA		NA	
2,4-Dinitrophenol	mg/kg	8270	160	2500	0.088	NA		NA		NA		NA		NA		NA		NA		NA	
2,4-Dinitrotoluene	mg/kg	8270	7.4	110	0.0064	NA		NA		NA		NA		NA		NA		NA		NA	
2,6-Dinitrotoluene	mg/kg	8270	1.5	24	0.00134	NA		NA		NA		NA		NA		NA		NA		NA	
2-Chloronaphthalene	mg/kg	8270	6000	67000	7.8	NA		NA		NA		NA		NA		NA		NA		NA	
2-Chlorophenol	mg/kg	8270	580	5500	0.178	NA		NA		NA		NA		NA		NA		NA		NA	
2-Methylnaphthalene	mg/kg	8270	300	9300	0.38	NA		NA		NA		NA		NA		NA		NA		NA	
2-Methylphenol	mg/kg	8270	4100	63000	1.5	NA		NA		NA		NA		NA		NA		NA		NA	
2-Nitroaniline	mg/kg	8270	800	12000	0.16	NA		NA		NA		NA		NA		NA		NA		NA	
2-Nitrophenol	mg/kg	8270	- -	- -	- -	NA		NA		NA		NA		NA		NA		NA		NA	
3,3'-Dichlorobenzidine	mg/kg	8270	5.1	79	0.0164	NA		NA		NA		NA		NA		NA		NA		NA	
Methylphenol, 3 & 4 [1]	mg/kg	8270	4100	63000	1.48	NA		NA		NA		NA		NA		NA		NA		NA	
3-Nitroaniline	mg/kg	8270	- -	- -	- -	NA		NA		NA		NA		NA		NA		NA		NA	
4,6-Dinitro-2-methylphenol	mg/kg	8270	6.6	- -	0.0052	NA		NA		NA		NA		NA		NA		NA		NA	
4-Bromophenyl phenyl ether	mg/kg	8270	- -	- -	- -	NA		NA		NA		NA		NA		NA		NA		NA	
4-Chloro-3-methylphenol	mg/kg	8270	8200	- -	3.4	NA		NA		NA		NA		NA		NA		NA		NA	
4-Chloroaniline	mg/kg	8270	11	180	0.0032	NA		NA		NA		NA		NA		NA		NA		NA	
4-Chlorophenyl phenyl ether	mg/kg	8270	- -	- -	- -	NA		NA		NA		NA		NA		NA		NA		NA	
4-Nitroaniline	mg/kg	8270	110	- -	0.032	NA		NA		NA		NA		NA		NA		NA		NA	
4-Nitrophenol	mg/kg	8270	- -	- -	- -	NA		NA		NA		NA		NA		NA		NA		NA	
Acetophenone	mg/kg	8270	12000	2500	1.16	NA		NA		NA		NA		NA		NA		NA		NA	
Atrazine	mg/kg	8270	10	150	0.038	NA		NA		NA		NA		NA		NA		NA		NA	
Benzaldehyde	mg/kg	8270	820	1200	0.082	NA		NA		NA		NA		NA		NA		NA		NA	
Bis(2-chloroisopropyl)ether	mg/kg	8270	4700	310	0.52	NA		NA		NA		NA		NA		NA		NA		NA	
Bis(2-chloroethoxy)methane	mg/kg	8270	250	- -	0.026	NA		NA		NA		NA		NA		NA		NA		NA	
Bis(2-chloroethyl)ether	mg/kg	8270	1	13	0.000072	NA		NA		NA		NA		NA		NA		NA		NA	
Bis(2-ethylhexyl) phthalate	mg/kg	8270	160	2500	28	NA		NA		NA		NA		NA		NA		NA		NA	
Butyl benzyl phthalate	mg/kg	8270	1200	19000	4.8	NA		NA		NA		NA		NA		NA		NA		NA	
Caprolactam	mg/kg	8270	40000	600000	5	NA		NA		NA		NA		NA		NA		NA		NA	
Carbazole [1]	mg/kg	8270	23000	700000	116	NA		NA		NA		NA		NA		NA		NA		NA	
Dibenzofuran	mg/kg	8270	120	2300	0.3	NA		NA		NA		NA		NA		NA		NA		NA	
Diethyl phthalate	mg/kg	8270	66000	1000000	12.2	NA		NA		NA		NA		NA		NA		NA		NA	
Dimethyl phthalate	mg/kg	8270	- -	- -	- -	NA		NA		NA		NA		NA		NA		NA		NA	
Di-n-butyl phthalate	mg/kg	8270	8200	130000	4.6	NA		NA		NA		NA		NA		NA		NA		NA	
Di-n-octyl phthalate	mg/kg	8270	820	- -	114	NA		NA		NA		NA		NA		NA		NA		NA	
Hexachlorobenzene	mg/kg	8270	0.96	13	0.26	NA		NA		NA		NA		NA		NA		NA		NA	
Hexachlorobutadiene	mg/kg	8270	5.3	17	0.0054	NA		NA		NA		NA		NA		NA		NA		NA	
Hexachlorocyclopentadiene	mg/kg	8270	0.75	8	3.2	NA		NA		NA		NA		NA		NA		NA		NA	
Hexachloroethane	mg/kg	8270	8	91	0.004	NA		NA		NA		NA		NA		NA		NA		NA	
Isophorone	mg/kg	8270	2400	37000	0.52	NA		NA		NA		NA		NA		NA		NA		NA	
Nitrobenzene	mg/kg	8270	22	240	0.00184	NA		NA		NA		NA		NA		NA		NA		NA	

TABLE A-4
ANALYTICAL AND SCREENING RESULTS
SUBSURFACE SOIL
CAA VIM AND VIIM
MINGO JUNCTION STEEL WORKS LLC - WEIRTON FACILITY

			Screening Criteria[1]			Sample Information [2]							
Constituent	**Units**	**Analytical Method**	**Industrial Soil RSL**	**Industrial Soil De Minimis**	***Protection of Groundwater RSL***	**IM-W700-S-28 7/12/2007 Floor**	**IM-W700-S-29 7/12/2007 Floor**	**IM-W700-S-30 7/12/2007 Floor**	**IM-W700-S-31 7/12/2007 Floor**	**IM-W700-S-32 7/12/2007 Floor**	**IM-W700-S-33 7/12/2007 Floor**	**IM-W700-S-34 7/12/2007 Floor**	**IM-W700-S-35 7/12/2007 Floor**
N-Nitrosodi-n-propylamine	mg/kg	8270	0.33	5.1	0.000162	NA	NA	NA	NA	NA	NA	NA	NA
N-Nitrosodiphenylamine	mg/kg	8270	470	7200	1.34	NA	NA	NA	NA	NA	NA	NA	NA
Pentachlorophenol	mg/kg	8270	4	52	0.028	NA	NA	NA	NA	NA	NA	NA	NA
Phenol	mg/kg	8270	25000	380000	6.6	NA	NA	NA	NA	NA	NA	NA	NA
Polychlorinated Biphenyls													
PCB-1016	mg/kg	8082	5.1	160	0.26	< 0.003	< 0.0028	< 0.003	< 0.0029	< 0.0029	< 0.0029	< 0.0029	< 0.0029
PCB-1221	mg/kg	8082	0.83	19	0.0016	< 0.0038	< 0.0036	< 0.0038	< 0.0038	< 0.0037	< 0.0037	< 0.0037	< 0.0037
PCB-1232	mg/kg	8082	0.72	14	0.0016	< 0.0034	< 0.0033	< 0.0034	< 0.0034	< 0.0033	< 0.0034	< 0.0033	< 0.0033
PCB-1242	mg/kg	8082	0.95	26	0.024	< 0.0032	< 0.0031	< 0.0032	< 0.0032	< 0.0031	< 0.0032	< 0.0031	< 0.0031
PCB-1248	mg/kg	8082	0.94	27	0.024	< 0.0019	< 0.0018	< 0.0019	< 0.0019	< 0.0018	< 0.0019	< 0.0018	< 0.0018
PCB-1254	mg/kg	8082	0.97	28	0.04	< 0.0028	< 0.0027	< 0.0028	< 0.0028	< 0.0027	< 0.0028	< 0.0027	< 0.0027
PCB-1260	mg/kg	8082	0.99	30	0.11	< 0.0028	< 0.0027	< 0.0028	< 0.0028	< 0.0027	< 0.0028	< 0.0027	< 0.0027
Inorganics													
Aluminum	mg/kg	6020	110000	1000000	60000	NA	NA	NA	NA	NA	NA	NA	NA
Antimony	mg/kg	6020	47	930	5.4	NA	NA	NA	NA	NA	NA	NA	NA
Arsenic	mg/kg	6020	3	35	5.8	NA	NA	NA	NA	NA	NA	NA	NA
Barium	mg/kg	6020	22000	400000	1640	NA	NA	NA	NA	NA	NA	NA	NA
Beryllium	mg/kg	6020	230	4500	64	NA	NA	NA	NA	NA	NA	NA	NA
Cadmium	mg/kg	6020	98	980	7.6	NA	NA	NA	NA	NA	NA	NA	NA
Calcium	mg/kg	6020	- -	- -	- -	NA	NA	NA	NA	NA	NA	NA	NA
Chromium [1]	mg/kg	6020	180000	1000000	3600000	NA	NA	NA	NA	NA	NA	NA	NA
Cobalt	mg/kg	6020	35	690	0.54	NA	NA	NA	NA	NA	NA	NA	NA
Copper	mg/kg	6020	4700	93000	920	NA	NA	NA	NA	NA	NA	NA	NA
Iron	mg/kg	6020	82000	1000000	700	NA	NA	NA	NA	NA	NA	NA	NA
Lead	mg/kg	6020	800	1000	280	NA	NA	NA	NA	NA	NA	NA	NA
Magnesium	mg/kg	6020	- -	- -	- -	NA	NA	NA	NA	NA	NA	NA	NA
Manganese [1]	mg/kg	6020	2600	80000	56	NA	NA	NA	NA	NA	NA	NA	NA
Mercury	mg/kg	7471	4.6	3.1	2	NA	NA	NA	NA	NA	NA	NA	NA
Nickel	mg/kg	6020	2200	43000	52	NA	NA	NA	NA	NA	NA	NA	NA
Potassium	mg/kg	6020	- -	- -	- -	NA	NA	NA	NA	NA	NA	NA	NA
Selenium	mg/kg	6020	580	12000	5.2	NA	NA	NA	NA	NA	NA	NA	NA
Silver	mg/kg	6020	580	12000	1.6	NA	NA	NA	NA	NA	NA	NA	NA
Sodium	mg/kg	6020	- -	- -	- -	NA	NA	NA	NA	NA	NA	NA	NA
Thallium	mg/kg	6020	1.2	23	2.8	NA	NA	NA	NA	NA	NA	NA	NA
Vanadium	mg/kg	6020	580	160	172	NA	NA	NA	NA	NA	NA	NA	NA
Zinc	mg/kg	6020	35000	700000	740	NA	NA	NA	NA	NA	NA	NA	NA
Other Parameters													
Cyanide, Total	mg/kg	9012	15	170	40	NA	NA	NA	NA	NA	NA	NA	NA
Total Organic Carbon	mg/kg	WALKLEY	- -	- -	- -	NA	NA	NA	NA	NA	NA	NA	NA
Percent Moisture	%	- -	- -	- -	- -	NA	NA	NA	NA	NA	NA	NA	NA
Percent Solids	%	MCAWW 160	- -	- -	- -	83.6	87.3	82.8	84.4	86.5	84.9	86.7	86.7

TABLE A-4
ANALYTICAL AND SCREENING RESULTS
SUBSURFACE SOIL
CAA VIM AND VIIM
MINGO JUNCTION STEEL WORKS LLC - WEIRTON FACILITY

Constituent	Units	Analytical Method	Screening Criteria[1]			Sample Information [2]							
			Industrial Soil RSL	Industrial Soil De Minimis	*Protection of Groundwater RSL*	IM-W700-S-36 7/13/2007 Floor	IM-W700-S-37 7/13/2007 Floor	IM-W700-S-38 7/13/2007 Sidewall	IM-W700-S-39 7/13/2007 Sidewall	IM-W700-S-39D 7/13/2007 Duplicate	IM-W700-S-40 7/13/2007 Sidewall	IM-W700-S-41 7/13/2007 Sidewall	IM-W700-S-42 7/13/2007 Floor
Volatile Organic Compounds													
Benzene	mg/kg	8260	5.1	57	0.052	< 0.0013	< 0.0013	< 0.0024	< 0.0013	< 0.0012	< 0.0013	< 0.0013	< 0.0013
Toluene	mg/kg	8260	4700	820	13.8	< 0.00097	< 0.00099	< 0.0018	< 0.00096	< 0.00094	< 0.001	< 0.001	< 0.00096
Ethylbenzene	mg/kg	8260	25	280	15.6	< 0.0014	< 0.0015	< 0.0027	< 0.0014	< 0.0014	< 0.0015	< 0.0015	< 0.0014
Xylenes, Total	mg/kg	8260	250	260	198	< 0.0043	< 0.0044	< 0.008	< 0.0043	< 0.0042	< 0.0045	< 0.0045	< 0.0043
1,1,1-Trichloroethane	mg/kg	8260	3600	640	5.6	NA	NA	NA	NA	NA	NA	NA	NA
1,1,2,2-Tetrachloroethane	mg/kg	8260	2.7	31	0.0006	NA	NA	NA	NA	NA	NA	NA	NA
1,1,2-Trichloro-1,2,2-trifluoroethane	mg/kg	8260	2800	910	52	NA	NA	NA	NA	NA	NA	NA	NA
1,1,2-Trichloroethane	mg/kg	8260	0.63	6.8	0.032	NA	NA	NA	NA	NA	NA	NA	NA
1,1-Dichloroethane	mg/kg	8260	16	170	0.0156	NA	NA	NA	NA	NA	NA	NA	NA
1,1-Dichloroethene	mg/kg	8260	100	1100	0.2	NA	NA	NA	NA	NA	NA	NA	NA
1,2,4-Trichlorobenzene	mg/kg	8260	26	280	4	NA	NA	NA	NA	NA	NA	NA	NA
1,2-Dibromo-3-Chloropropane	mg/kg	8260	0.064	0.7	0.00172	NA	NA	NA	NA	NA	NA	NA	NA
1,2-Dibromoethane (EDB)	mg/kg	8260	0.16	1.8	0.00028	NA	NA	NA	NA	NA	NA	NA	NA
1,2-Dichlorobenzene	mg/kg	8260	930	380	11.6	NA	NA	NA	NA	NA	NA	NA	NA
1,2-Dichloroethane	mg/kg	8260	2	23	0.028	NA	NA	NA	NA	NA	NA	NA	NA
1,2-Dichloroethene, Total	mg/kg	8260	- -	- -	- -	NA	NA	NA	NA	NA	NA	NA	NA
cis-1,2-Dichloroethene	mg/kg	8260	230	81	0.42	NA	NA	NA	NA	NA	NA	NA	NA
trans-1,2-Dichloroethene	mg/kg	8260	30	570	0.62	NA	NA	NA	NA	NA	NA	NA	NA
1,2-Dichloropropane	mg/kg	8260	6.6	49	0.034	NA	NA	NA	NA	NA	NA	NA	NA
cis-1,3-Dichloropropene [1]	mg/kg	8260	8.2	99	0.0034	NA	NA	NA	NA	NA	NA	NA	NA
trans-1,3-Dichloropropene [1]	mg/kg	8260	8.2	99	0.0034	NA	NA	NA	NA	NA	NA	NA	NA
1,3-Dichlorobenzene [1]	mg/kg	8260	11	120	1.44	NA	NA	NA	NA	NA	NA	NA	NA
1,4-Dichlorobenzene	mg/kg	8260	11	120	1.44	NA	NA	NA	NA	NA	NA	NA	NA
2-Butanone (MEK)	mg/kg	8260	19000	28000	2.4	NA	NA	NA	NA	NA	NA	NA	NA
2-Hexanone	mg/kg	8260	130	- -	0.0176	NA	NA	NA	NA	NA	NA	NA	NA
4-Methyl-2-pentanone (MIBK)	mg/kg	8260	14000	3400	2.8	NA	NA	NA	NA	NA	NA	NA	NA
Acetone	mg/kg	8260	67000	110000	5.8	NA	NA	NA	NA	NA	NA	NA	NA
Bromoform	mg/kg	8260	86	910	0.42	NA	NA	NA	NA	NA	NA	NA	NA
Bromomethane	mg/kg	8260	3	33	0.0038	NA	NA	NA	NA	NA	NA	NA	NA
Carbon disulfide	mg/kg	8260	350	740	0.48	NA	NA	NA	NA	NA	NA	NA	NA
Carbon tetrachloride	mg/kg	8260	2.9	32	0.038	NA	NA	NA	NA	NA	NA	NA	NA
Chlorobenzene	mg/kg	8260	130	760	1.36	NA	NA	NA	NA	NA	NA	NA	NA
Chlorodibromomethane	mg/kg	8260	39	780	0.42	NA	NA	NA	NA	NA	NA	NA	NA
Chloroethane	mg/kg	8260	5700	2100	11.8	NA	NA	NA	NA	NA	NA	NA	NA
Chloroform	mg/kg	8260	1.4	15	0.44	NA	NA	NA	NA	NA	NA	NA	NA
Chloromethane	mg/kg	8260	46	500	0.098	NA	NA	NA	NA	NA	NA	NA	NA
Cyclohexane	mg/kg	8260	2700	120	26	NA	NA	NA	NA	NA	NA	NA	NA
Dichlorobromomethane	mg/kg	8260	1.3	14	0.44	NA	NA	NA	NA	NA	NA	NA	NA
Dichlorodifluoromethane	mg/kg	8260	37	400	0.6	NA	NA	NA	NA	NA	NA	NA	NA
Isopropylbenzene	mg/kg	8260	990	270	1.48	NA	NA	NA	NA	NA	NA	NA	NA
Methyl acetate	mg/kg	8260	120000	29000	8.2	NA	NA	NA	NA	NA	NA	NA	NA
Methyl tert-butyl ether	mg/kg	8260	210	2300	0.064	NA	NA	NA	NA	NA	NA	NA	NA
Methylcyclohexane [1]	mg/kg	8260	2700	120	26	NA	NA	NA	NA	NA	NA	NA	NA
Methylene Chloride	mg/kg	8260	320	3300	0.054	NA	NA	NA	NA	NA	NA	NA	NA
Naphthalene	mg/kg	8260	8.6	180	0.0076	NA	NA	NA	NA	NA	NA	NA	NA
Styrene	mg/kg	8260	3500	870	2.6	NA	NA	NA	NA	NA	NA	NA	NA
Tetrachloroethene	mg/kg	8260	39	170	0.046	NA	NA	NA	NA	NA	NA	NA	NA
Trichloroethene	mg/kg	8260	1.9	20	0.036	NA	NA	NA	NA	NA	NA	NA	NA
Trichlorofluoromethane	mg/kg	8260	35000	1200	6.6	NA	NA	NA	NA	NA	NA	NA	NA
Vinyl chloride	mg/kg	8260	1.7	22	0.0138	NA	NA	NA	NA	NA	NA	NA	NA
Semi-Volatile Organic Compounds													
Acenaphthene	mg/kg	8310	4500	70000	11	0.055 J, PG	< 0.0061	0.72 J, PG	< 0.12	< 0.78	< 0.019	< 0.64	< 0.0059
Acenaphthylene [1]	mg/kg	8310	4500	80000	11	0.13 J	0.081	< 0.38	1.5	2.2 J	0.62	< 0.6	0.016 J
Anthracene	mg/kg	8310	23000	700000	116	0.024 J, PG	0.0088	1.3 PG	0.37 PG	4.3	0.058	2.8	0.0087
Benzo[a]anthracene	mg/kg	8310	21	88	0.22	< 0.0086	0.011	***2.2***	***0.74***	***4.5***	0.08 PG	***8.7***	0.012 PG
Benzo[a]pyrene	mg/kg	8310	2.1	4.3	4.8	< 0.0082	0.011	1.2	0.9	4.1	0.21	4.6	0.014

TABLE A-4
ANALYTICAL AND SCREENING RESULTS
SUBSURFACE SOIL
CAA VIM AND VIIM
MINGO JUNCTION STEEL WORKS LLC - WEIRTON FACILITY

			Screening Criteria[1]			Sample Information [2]							
Constituent	Units	Analytical Method	Industrial Soil RSL	Industrial Soil De Minimis	*Protection of Groundwater RSL*	IM-W700-S-36 7/13/2007 Floor	IM-W700-S-37 7/13/2007 Floor	IM-W700-S-38 7/13/2007 Sidewall	IM-W700-S-39 7/13/2007 Sidewall	IM-W700-S-39D 7/13/2007 Duplicate	IM-W700-S-40 7/13/2007 Sidewall	IM-W700-S-41 7/13/2007 Sidewall	IM-W700-S-42 7/13/2007 Floor
Benzo[b]fluoranthene	mg/kg	8310	21	43	6	0.032 J, PG	0.024 PG	2.3	1.5	***6.9***	0.44	***8.7***	0.026 PG
Benzo[g,h,i]perylene [1]	mg/kg	8310	2300	33000	26	< 0.0084	0.0083 J	0.65	0.43	1.7	0.16	2.4	0.012
Benzo[k]fluoranthene	mg/kg	8310	210	430	58	< 0.0084	< 0.0011	1	0.55	2.6	< 0.0033	3.7	0.008 J, PG
Chrysene	mg/kg	8310	2100	4300	180	< 0.0087	0.0089 PG	2	0.78	4	0.16	7.2	0.016
Dibenz(a,h)anthracene	mg/kg	8310	2.1	4.3	1.92	< 0.0083	< 0.0011	< 0.073	< 0.022	< 0.14	< 0.0033	< 0.11	< 0.001
Fluoranthene	mg/kg	8310	3000	44000	178	< 0.009	< 0.0012	8	3	21	0.21	14 PG	0.06
Fluorene	mg/kg	8310	3000	62000	10.8	0.23	0.012	1.7	0.59	3.1	0.036	1.9	0.0059 J
Indeno[1,2,3-cd]pyrene	mg/kg	8310	21	43	19.6	< 0.0083	0.0079 J, PG	1	0.57 PG	3.1	0.31	4.6	0.016 PG
Naphthalene	mg/kg	8310	8.6	180	0.0076	< 0.042	***0.012*** J, PG	< 0.36	***1.8***	***7.5***	***0.21***	***3.9*** J	***0.02*** J
Phenanthrene [1]	mg/kg	8310	23000	700000	116	0.72	0.037	6	1.6	12	0.27	8.8	0.023
Pyrene	mg/kg	8310	2300	66000	26	0.09 PG	0.037 PG	6.4 PG	2.8 PG	15 PG	0.46 PG	12 PG	0.045 PG
1,1'-Biphenyl	mg/kg	8270	20	210	0.0174	NA	NA	NA	NA	NA	NA	NA	NA
2,4,5-Trichlorophenol	mg/kg	8270	8200	130000	8	NA	NA	NA	NA	NA	NA	NA	NA
2,4,6-Trichlorophenol	mg/kg	8270	82	1300	0.024	NA	NA	NA	NA	NA	NA	NA	NA
2,4-Dichlorophenol	mg/kg	8270	250	3800	0.046	NA	NA	NA	NA	NA	NA	NA	NA
2,4-Dimethylphenol	mg/kg	8270	1600	25000	0.84	NA	NA	NA	NA	NA	NA	NA	NA
2,4-Dinitrophenol	mg/kg	8270	160	2500	0.088	NA	NA	NA	NA	NA	NA	NA	NA
2,4-Dinitrotoluene	mg/kg	8270	7.4	110	0.0064	NA	NA	NA	NA	NA	NA	NA	NA
2,6-Dinitrotoluene	mg/kg	8270	1.5	24	0.00134	NA	NA	NA	NA	NA	NA	NA	NA
2-Chloronaphthalene	mg/kg	8270	6000	67000	7.8	NA	NA	NA	NA	NA	NA	NA	NA
2-Chlorophenol	mg/kg	8270	580	5500	0.178	NA	NA	NA	NA	NA	NA	NA	NA
2-Methylnaphthalene	mg/kg	8270	300	9300	0.38	NA	NA	NA	NA	NA	NA	NA	NA
2-Methylphenol	mg/kg	8270	4100	63000	1.5	NA	NA	NA	NA	NA	NA	NA	NA
2-Nitroaniline	mg/kg	8270	800	12000	0.16	NA	NA	NA	NA	NA	NA	NA	NA
2-Nitrophenol	mg/kg	8270	- -	- -	- -	NA	NA	NA	NA	NA	NA	NA	NA
3,3'-Dichlorobenzidine	mg/kg	8270	5.1	79	0.0164	NA	NA	NA	NA	NA	NA	NA	NA
Methylphenol, 3 & 4 [1]	mg/kg	8270	4100	63000	1.48	NA	NA	NA	NA	NA	NA	NA	NA
3-Nitroaniline	mg/kg	8270	- -	- -	- -	NA	NA	NA	NA	NA	NA	NA	NA
4,6-Dinitro-2-methylphenol	mg/kg	8270	6.6	- -	0.0052	NA	NA	NA	NA	NA	NA	NA	NA
4-Bromophenyl phenyl ether	mg/kg	8270	- -	- -	- -	NA	NA	NA	NA	NA	NA	NA	NA
4-Chloro-3-methylphenol	mg/kg	8270	8200	- -	3.4	NA	NA	NA	NA	NA	NA	NA	NA
4-Chloroaniline	mg/kg	8270	11	180	0.0032	NA	NA	NA	NA	NA	NA	NA	NA
4-Chlorophenyl phenyl ether	mg/kg	8270	- -	- -	- -	NA	NA	NA	NA	NA	NA	NA	NA
4-Nitroaniline	mg/kg	8270	110	- -	0.032	NA	NA	NA	NA	NA	NA	NA	NA
4-Nitrophenol	mg/kg	8270	- -	- -	- -	NA	NA	NA	NA	NA	NA	NA	NA
Acetophenone	mg/kg	8270	12000	2500	1.16	NA	NA	NA	NA	NA	NA	NA	NA
Atrazine	mg/kg	8270	10	150	0.038	NA	NA	NA	NA	NA	NA	NA	NA
Benzaldehyde	mg/kg	8270	820	1200	0.082	NA	NA	NA	NA	NA	NA	NA	NA
Bis(2-chloroisopropyl)ether	mg/kg	8270	4700	310	0.52	NA	NA	NA	NA	NA	NA	NA	NA
Bis(2-chloroethoxy)methane	mg/kg	8270	250	- -	0.026	NA	NA	NA	NA	NA	NA	NA	NA
Bis(2-chloroethyl)ether	mg/kg	8270	1	13	0.000072	NA	NA	NA	NA	NA	NA	NA	NA
Bis(2-ethylhexyl) phthalate	mg/kg	8270	160	2500	28	NA	NA	NA	NA	NA	NA	NA	NA
Butyl benzyl phthalate	mg/kg	8270	1200	19000	4.8	NA	NA	NA	NA	NA	NA	NA	NA
Caprolactam	mg/kg	8270	40000	600000	5	NA	NA	NA	NA	NA	NA	NA	NA
Carbazole [1]	mg/kg	8270	23000	700000	116	NA	NA	NA	NA	NA	NA	NA	NA
Dibenzofuran	mg/kg	8270	120	2300	0.3	NA	NA	NA	NA	NA	NA	NA	NA
Diethyl phthalate	mg/kg	8270	66000	1000000	12.2	NA	NA	NA	NA	NA	NA	NA	NA
Dimethyl phthalate	mg/kg	8270	- -	- -	- -	NA	NA	NA	NA	NA	NA	NA	NA
Di-n-butyl phthalate	mg/kg	8270	8200	130000	4.6	NA	NA	NA	NA	NA	NA	NA	NA
Di-n-octyl phthalate	mg/kg	8270	820	- -	114	NA	NA	NA	NA	NA	NA	NA	NA
Hexachlorobenzene	mg/kg	8270	0.96	13	0.26	NA	NA	NA	NA	NA	NA	NA	NA
Hexachlorobutadiene	mg/kg	8270	5.3	17	0.0054	NA	NA	NA	NA	NA	NA	NA	NA
Hexachlorocyclopentadiene	mg/kg	8270	0.75	8	3.2	NA	NA	NA	NA	NA	NA	NA	NA
Hexachloroethane	mg/kg	8270	8	91	0.004	NA	NA	NA	NA	NA	NA	NA	NA
Isophorone	mg/kg	8270	2400	37000	0.52	NA	NA	NA	NA	NA	NA	NA	NA
Nitrobenzene	mg/kg	8270	22	240	0.00184	NA	NA	NA	NA	NA	NA	NA	NA

TABLE A-4
ANALYTICAL AND SCREENING RESULTS
SUBSURFACE SOIL
CAA VIM AND VIIM
MINGO JUNCTION STEEL WORKS LLC - WEIRTON FACILITY

			Screening Criteria[1]			Sample Information [2]							
Constituent	**Units**	**Analytical Method**	**Industrial Soil RSL**	**Industrial Soil De Minimis**	***Protection of Groundwater RSL***	**IM-W700-S-36 7/13/2007 Floor**	**IM-W700-S-37 7/13/2007 Floor**	**IM-W700-S-38 7/13/2007 Sidewall**	**IM-W700-S-39 7/13/2007 Sidewall**	**IM-W700-S-39D 7/13/2007 Duplicate**	**IM-W700-S-40 7/13/2007 Sidewall**	**IM-W700-S-41 7/13/2007 Sidewall**	**IM-W700-S-42 7/13/2007 Floor**
N-Nitrosodi-n-propylamine	mg/kg	8270	0.33	5.1	0.000162	NA	NA	NA	NA	NA	NA	NA	NA
N-Nitrosodiphenylamine	mg/kg	8270	470	7200	1.34	NA	NA	NA	NA	NA	NA	NA	NA
Pentachlorophenol	mg/kg	8270	4	52	0.028	NA	NA	NA	NA	NA	NA	NA	NA
Phenol	mg/kg	8270	25000	380000	6.6	NA	NA	NA	NA	NA	NA	NA	NA
Polychlorinated Biphenyls													
PCB-1016	mg/kg	8082	5.1	160	0.26	< 0.003	< 0.0031	< 0.0028	< 0.003	< 0.0029	< 0.0032	< 0.0031	< 0.003
PCB-1221	mg/kg	8082	0.83	19	0.0016	< 0.0039	< 0.004	< 0.0036	< 0.0039	< 0.0038	< 0.0041	< 0.004	< 0.0039
PCB-1232	mg/kg	8082	0.72	14	0.0016	< 0.0035	< 0.0036	< 0.0032	< 0.0035	< 0.0034	< 0.0037	< 0.0036	< 0.0035
PCB-1242	mg/kg	8082	0.95	26	0.024	< 0.0033	< 0.0034	< 0.0031	< 0.0033	< 0.0032	< 0.0035	< 0.0034	< 0.0033
PCB-1248	mg/kg	8082	0.94	27	0.024	< 0.0019	< 0.002	< 0.0018	< 0.0019	***0.027***	< 0.002	< 0.002	< 0.0019
PCB-1254	mg/kg	8082	0.97	28	0.04	< 0.0029	< 0.003	0.023	< 0.0029	< 0.0028	< 0.0031	< 0.003	< 0.0029
PCB-1260	mg/kg	8082	0.99	30	0.11	< 0.0029	< 0.003	< 0.0027	< 0.0029	< 0.0028	< 0.0031	< 0.003	< 0.0029
Inorganics													
Aluminum	mg/kg	6020	110000	1000000	60000	NA	NA	NA	NA	NA	NA	NA	NA
Antimony	mg/kg	6020	47	930	5.4	NA	NA	NA	NA	NA	NA	NA	NA
Arsenic	mg/kg	6020	3	35	5.8	NA	NA	NA	NA	NA	NA	NA	NA
Barium	mg/kg	6020	22000	400000	1640	NA	NA	NA	NA	NA	NA	NA	NA
Beryllium	mg/kg	6020	230	4500	64	NA	NA	NA	NA	NA	NA	NA	NA
Cadmium	mg/kg	6020	98	980	7.6	NA	NA	NA	NA	NA	NA	NA	NA
Calcium	mg/kg	6020	- -	- -	- -	NA	NA	NA	NA	NA	NA	NA	NA
Chromium [1]	mg/kg	6020	180000	1000000	3600000	NA	NA	NA	NA	NA	NA	NA	NA
Cobalt	mg/kg	6020	35	690	0.54	NA	NA	NA	NA	NA	NA	NA	NA
Copper	mg/kg	6020	4700	93000	920	NA	NA	NA	NA	NA	NA	NA	NA
Iron	mg/kg	6020	82000	1000000	700	NA	NA	NA	NA	NA	NA	NA	NA
Lead	mg/kg	6020	800	1000	280	NA	NA	NA	NA	NA	NA	NA	NA
Magnesium	mg/kg	6020	- -	- -	- -	NA	NA	NA	NA	NA	NA	NA	NA
Manganese [1]	mg/kg	6020	2600	80000	56	NA	NA	NA	NA	NA	NA	NA	NA
Mercury	mg/kg	7471	4.6	3.1	2	NA	NA	NA	NA	NA	NA	NA	NA
Nickel	mg/kg	6020	2200	43000	52	NA	NA	NA	NA	NA	NA	NA	NA
Potassium	mg/kg	6020	- -	- -	- -	NA	NA	NA	NA	NA	NA	NA	NA
Selenium	mg/kg	6020	580	12000	5.2	NA	NA	NA	NA	NA	NA	NA	NA
Silver	mg/kg	6020	580	12000	1.6	NA	NA	NA	NA	NA	NA	NA	NA
Sodium	mg/kg	6020	- -	- -	- -	NA	NA	NA	NA	NA	NA	NA	NA
Thallium	mg/kg	6020	1.2	23	2.8	NA	NA	NA	NA	NA	NA	NA	NA
Vanadium	mg/kg	6020	580	160	172	NA	NA	NA	NA	NA	NA	NA	NA
Zinc	mg/kg	6020	35000	700000	740	NA	NA	NA	NA	NA	NA	NA	NA
Other Parameters													
Cyanide, Total	mg/kg	9012	15	170	40	NA	NA	NA	NA	NA	NA	NA	NA
Total Organic Carbon	mg/kg	WALKLEY	- -	- -	- -	NA	NA	NA	NA	NA	NA	NA	NA
Percent Moisture	%	- -	- -	- -	- -	NA	NA	NA	NA	NA	NA	NA	NA
Percent Solids	%	MCAWW 16	- -	- -	- -	81.5	79.7	87.9	82.2	84	77.7	78.9	82.4

TABLE A-4
ANALYTICAL AND SCREENING RESULTS
SUBSURFACE SOIL
CAA VIM AND VIIM
MINGO JUNCTION STEEL WORKS LLC - WEIRTON FACILITY

Constituent	Units	Analytical Method	Screening Criteria [1]			Sample Information [2]							
			Industrial Soil RSL	Industrial Soil De Minimis	*Protection of Groundwater RSL*	VI-MW-01A(14-16) 10/04/2013	VI-MW-01A(68-69) 10/08/2013	VI-MW-02A(9.7-10) 10/01/2013	VI-MW-02A(42.1-43) 10/02/2013	VI-MW-02AR(62-64) 10/31/2013	VI-MW-01P(9-10) 10/03/2013	VI-SB-102(6-8) 10/09/2013	VI-SB-102(68-70) 10/10/2013
Volatile Organic Compounds													
Benzene	mg/kg	8260	5.1	57	0.052	< 0.00083	< 0.00082	< 0.00084	< 0.00076	< 0.00076	< 0.00084	< 0.00091	< 0.0008
Toluene	mg/kg	8260	4700	820	13.8	< 0.00089	< 0.00089	< 0.0009	< 0.00082	< 0.00082	< 0.0009	< 0.00098	< 0.00086
Ethylbenzene	mg/kg	8260	25	280	15.6	< 0.00079	< 0.00078	< 0.0008	< 0.00072	< 0.00072	< 0.0008	< 0.00087	< 0.00076
Xylenes, Total	mg/kg	8260	250	260	198	< 0.0027	< 0.0027	< 0.0028	< 0.0025	< 0.0025	< 0.0028	< 0.003	< 0.0026
1,1,1-Trichloroethane	mg/kg	8260	3600	640	5.6	NA	NA	< 0.0006	< 0.00055	< 0.00055	NA	< 0.00066	< 0.00057
1,1,2,2-Tetrachloroethane	mg/kg	8260	2.7	31	0.0006	NA	NA	< 0.00089	< 0.00081	< 0.00081	NA	< 0.00097	< 0.00085
1,1,2-Trichloro-1,2,2-trifluoroethane	mg/kg	8260	2800	910	52	NA	NA	< 0.0013	< 0.0012	< 0.0012	NA	< 0.0014	< 0.0013
1,1,2-Trichloroethane	mg/kg	8260	0.63	6.8	0.032	NA	NA	< 0.001	< 0.00093	< 0.00093	NA	< 0.0011	< 0.00098
1,1-Dichloroethane	mg/kg	8260	16	170	0.0156	NA	NA	< 0.00071	< 0.00065	< 0.00065	NA	< 0.00078	< 0.00068
1,1-Dichloroethene	mg/kg	8260	100	1100	0.2	NA	NA	< 0.0011	< 0.00095	< 0.00095	NA	< 0.0011	< 0.001
1,2,4-Trichlorobenzene	mg/kg	8260	26	280	4	NA	NA	< 0.0011	< 0.00099	< 0.00099	NA	< 0.0012	< 0.001
1,2-Dibromo-3-Chloropropane	mg/kg	8260	0.064	0.7	0.00172	NA	NA	< 0.00093	< 0.00084	< 0.00084	NA	< 0.001	< 0.00088
1,2-Dibromoethane (EDB)	mg/kg	8260	0.16	1.8	0.00028	NA	NA	< 0.0011	< 0.00097	< 0.00097	NA	< 0.0012	< 0.001
1,2-Dichlorobenzene	mg/kg	8260	930	380	11.6	NA	NA	< 0.00099	< 0.0009	< 0.00089	NA	< 0.0011	< 0.00094
1,2-Dichloroethane	mg/kg	8260	2	23	0.028	NA	NA	< 0.00076	< 0.00069	< 0.00069	NA	< 0.00083	< 0.00072
1,2-Dichloroethene, Total	mg/kg	8260	- -	- -	- -	NA	NA	< 0.0016	< 0.0014	< 0.0014	NA	< 0.0017	< 0.0015
cis-1,2-Dichloroethene	mg/kg	8260	230	81	0.42	NA	NA	< 0.00087	< 0.00079	< 0.00079	NA	< 0.00095	< 0.00083
trans-1,2-Dichloroethene	mg/kg	8260	2300	570	0.62	NA	NA	< 0.00074	< 0.00067	< 0.00067	NA	< 0.0008	< 0.0007
1,2-Dichloropropane	mg/kg	8260	6.6	49	0.034	NA	NA	< 0.00067	< 0.00061	< 0.00061	NA	< 0.00073	< 0.00064
cis-1,3-Dichloropropene [1]	mg/kg	8260	8.2	99	0.0034	NA	NA	< 0.00084	< 0.00076	< 0.00076	NA	< 0.00091	< 0.0008
trans-1,3-Dichloropropene [1]	mg/kg	8260	8.2	99	0.0034	NA	NA	< 0.00074	< 0.00067	< 0.00067	NA	< 0.00081	< 0.0007
1,3-Dichlorobenzene [1]	mg/kg	8260	11	120	1.44	NA	NA	< 0.00081	< 0.00074	< 0.00074	NA	< 0.00088	< 0.00077
1,4-Dichlorobenzene	mg/kg	8260	11	120	1.44	NA	NA	< 0.00079	< 0.00072	< 0.00071	NA	< 0.00086	< 0.00075
2-Butanone (MEK)	mg/kg	8260	19000	28000	2.4	NA	NA	< 0.0011	< 0.00099	< 0.00099	NA	< 0.0012	< 0.001
2-Hexanone	mg/kg	8260	130	- -	0.0176	NA	NA	< 0.00085	< 0.00078	< 0.00077	NA	< 0.00093	< 0.00081
4-Methyl-2-pentanone (MIBK)	mg/kg	8260	14000	3400	2.8	NA	NA	< 0.00081	< 0.00073	< 0.00073	NA	< 0.00088	< 0.00077
Acetone	mg/kg	8260	67000	110000	5.8	NA	NA	< 0.0062	< 0.0056	< 0.0056 R	NA	< 0.0067	< 0.0059
Bromoform	mg/kg	8260	86	910	0.42	NA	NA	< 0.00055	< 0.0005	< 0.0005	NA	< 0.0006	< 0.00052
Bromomethane	mg/kg	8260	3	33	0.0038	NA	NA	< 0.00091	< 0.00083	< 0.00083	NA	< 0.001	< 0.00087
Carbon disulfide	mg/kg	8260	350	740	0.48	NA	NA	< 0.00063	< 0.00058	< 0.00057	NA	< 0.00069	< 0.0006
Carbon tetrachloride	mg/kg	8260	2.9	32	0.038	NA	NA	< 0.00055	< 0.0005	< 0.0005	NA	< 0.0006	< 0.00053
Chlorobenzene	mg/kg	8260	130	760	1.36	NA	NA	< 0.00094	< 0.00085	< 0.00085	NA	< 0.001	< 0.00089
Chlorodibromomethane	mg/kg	8260	39	780	0.42	NA	NA	< 0.00088	< 0.0008	< 0.0008	NA	< 0.00096	< 0.00084
Chloroethane	mg/kg	8260	5700	2100	11.8	NA	NA	< 0.0019	< 0.0017	< 0.0017	NA	< 0.0021	< 0.0018
Chloroform	mg/kg	8260	1.4	15	0.44	NA	NA	< 0.00072	< 0.00066	< 0.00066	NA	< 0.00079	< 0.00069
Chloromethane	mg/kg	8260	46	500	0.098	NA	NA	< 0.0011	< 0.00096	< 0.00096	NA	< 0.0011	< 0.001
Cyclohexane	mg/kg	8260	2700	120	26	NA	NA	< 0.00046	< 0.00042	< 0.00042	NA	< 0.0005	< 0.00044
Dichlorobromomethane	mg/kg	8260	1.3	14	0.44	NA	NA	< 0.00069	< 0.00063	< 0.00063	NA	< 0.00076	< 0.00066
Dichlorodifluoromethane	mg/kg	8260	37	400	0.6	NA	NA	< 0.00082	< 0.00075	< 0.00075	NA	< 0.0009	< 0.00078
Isopropylbenzene	mg/kg	8260	990	270	1.48	NA	NA	< 0.00084	< 0.00076	< 0.00076	NA	< 0.00092	< 0.0008
Methyl acetate	mg/kg	8260	120000	29000	8.2	NA	NA	< 0.0011	< 0.001	< 0.001	NA	< 0.0012	< 0.0011
Methyl tert-butyl ether	mg/kg	8260	210	2300	0.064	NA	NA	< 0.00093	< 0.00084	< 0.00084	NA	< 0.001	< 0.00088
Methylcyclohexane [1]	mg/kg	8260	2700	120	26	NA	NA	< 0.0009	< 0.00082	< 0.00081	NA	< 0.00098	< 0.00085
Methylene Chloride	mg/kg	8260	320	3300	0.054	NA	NA	0.0027 B	0.0021 B	0.0029 J	NA	0.0028 B	0.0026 B
Naphthalene	mg/kg	8260	8.6	180	0.0076	NA	NA	NA	NA	NA	NA	NA	NA
Styrene	mg/kg	8260	3500	870	2.6	NA	NA	< 0.00087	< 0.00079	< 0.00079	NA	< 0.00095	< 0.00083
Tetrachloroethene	mg/kg	8260	39	170	0.046	NA	NA	< 0.00084	< 0.00076	< 0.00076	NA	< 0.00092	< 0.0008
Trichloroethene	mg/kg	8260	1.9	20	0.036	NA	NA	< 0.00081	< 0.00074	< 0.00074	NA	< 0.00089	< 0.00078
Trichlorofluoromethane	mg/kg	8260	35000	1200	6.6	NA	NA	< 0.0011	< 0.001	< 0.001	NA	< 0.0012	< 0.0011
Vinyl chloride	mg/kg	8260	1.7	22	0.0138	NA	NA	< 0.00058	< 0.00053	< 0.00053	NA	< 0.00063	< 0.00055
Semi-Volatile Organic Compounds													
Acenaphthene	mg/kg	8270	4500	70000	11	< 0.00078 UJ	< 0.00077	< 0.0079 UJ	< 0.0072 UJ	< 0.0072 UJ	< 0.0008 UJ	< 0.0086	< 0.0076
Acenaphthylene [1]	mg/kg	8270	4500	80000	11	< 0.00093 UJ	< 0.00092	< 0.0095 UJ	< 0.0086 UJ	< 0.0086 UJ	< 0.00095 UJ	< 0.01	< 0.009
Anthracene	mg/kg	8270	23000	700000	116	< 0.0008 UJ	< 0.00079	< 0.0081 UJ	< 0.0074 UJ	< 0.0073 UJ	< 0.00081 UJ	0.015 J	< 0.0077
Benzo[a]anthracene	mg/kg	8270	21	88	0.22	< 0.001 UJ	< 0.001	0.039 J	< 0.0094 UJ	< 0.0094 UJ	0.11 J	0.023 J	< 0.0099
Benzo[a]pyrene	mg/kg	8270	2.1	4.3	4.8	< 0.00082 UJ	< 0.00081	< 0.0083 UJ	< 0.0075 UJ	< 0.0075 UJ	0.069 J	< 0.009	< 0.0079

TABLE A-4
ANALYTICAL AND SCREENING RESULTS
SUBSURFACE SOIL
CAA VIM AND VIIM
MINGO JUNCTION STEEL WORKS LLC - WEIRTON FACILITY

Constituent	Units	Analytical Method	Screening Criteria [1]			Sample Information [2]																							
			Industrial Soil RSL	Industrial Soil De Minimis	*Protection of Groundwater RSL*	VI-MW-01A(14-16) 10/04/2013		VI-MW-01A(68-69) 10/08/2013		VI-MW-02A(9.7-10) 10/01/2013		VI-MW-02A(42.1-43) 10/02/2013		VI-MW-02AR(62-64) 10/31/2013		VI-MW-01P(9-10) 10/03/2013		VI-SB-102(6-8) 10/09/2013		VI-SB-102(68-70) 10/10/2013	
Benzo[b]fluoranthene	mg/kg	8270	21	43	6	< 0.0013	UJ	< 0.0013		< 0.013	UJ	< 0.012	UJ	< 0.012	UJ	0.09	J	< 0.014		< 0.012	
Benzo[g,h,i]perylene [1]	mg/kg	8270	2300	33000	26	< 0.00081	UJ	< 0.0008		< 0.0082	UJ	< 0.0075	UJ	< 0.0074	UJ	0.046	J	< 0.0089		< 0.0078	
Benzo[k]fluoranthene	mg/kg	8270	210	430	58	< 0.0016	UJ	< 0.0016		< 0.017	UJ	< 0.015	UJ	< 0.015	UJ	0.034	J	< 0.018		< 0.016	
Chrysene	mg/kg	8270	2100	4300	180	< 0.00097	UJ	< 0.00096		0.032	J	< 0.009	UJ	< 0.0089	UJ	0.11	J	0.019	J	< 0.0094	
Dibenz(a,h)anthracene	mg/kg	8270	2.1	4.3	1.92	< 0.00091	UJ	< 0.0009		< 0.0092	UJ	< 0.0084	UJ	< 0.0083	UJ	0.0094	J	< 0.01		< 0.0088	
Fluoranthene	mg/kg	8270	3000	44000	178	0.0014	J	< 0.00086		0.046	J	< 0.0081	UJ	< 0.008	UJ	0.42	J	0.038	J	< 0.0084	
Fluorene	mg/kg	8270	3000	62000	10.8	< 0.0011	UJ	< 0.0011		< 0.011	UJ	< 0.0099	UJ	< 0.0099	UJ	< 0.0011	UJ	< 0.012		< 0.01	
Indeno[1,2,3-cd]pyrene	mg/kg	8270	21	43	19.6	< 0.00084	UJ	< 0.00083		< 0.0085	UJ	< 0.0078	UJ	< 0.0077	UJ	0.038	J	< 0.0092		< 0.0081	
Naphthalene	mg/kg	8270	8.6	180	0.0076	< 0.0007	UJ	< 0.00069		< 0.0071	UJ	< 0.0065	UJ	< 0.0064	UJ	< 0.00071	UJ	***0.031***	J	< 0.0068	
Phenanthrene [1]	mg/kg	8270	23000	700000	116	0.0048	J	< 0.0013		0.018	J	< 0.012	UJ	< 0.012	UJ	< 0.0013	UJ	0.054	J	< 0.013	
Pyrene	mg/kg	8270	2300	66000	26	0.0018	J	< 0.00081		0.047	J	< 0.0076	UJ	< 0.0076	UJ	0.38	J	0.033	J	< 0.008	
1,1'-Biphenyl	mg/kg	8270	20	210	0.0174	NA		NA		< 0.037	UJ	< 0.034	UJ	< 0.033	UJ	NA		< 0.04		< 0.035	
2,4,5-Trichlorophenol	mg/kg	8270	8200	130000	8	NA		NA		< 0.044	UJ	< 0.04	UJ	< 0.04	UJ	NA		< 0.048		< 0.042	
2,4,6-Trichlorophenol	mg/kg	8270	82	1300	0.024	NA		NA		< 0.062	UJ	< 0.056	UJ	< 0.056	UJ	NA		< 0.067		< 0.059	
2,4-Dichlorophenol	mg/kg	8270	250	3800	0.046	NA		NA		< 0.0083	UJ	< 0.0076	UJ	< 0.0075	UJ	NA		< 0.009		< 0.0079	
2,4-Dimethylphenol	mg/kg	8270	1600	25000	0.84	NA		NA		< 0.065	UJ	< 0.059	UJ	< 0.059	UJ	NA		< 0.07		< 0.062	
2,4-Dinitrophenol	mg/kg	8270	160	2500	0.088	NA		NA		< 0.49	UJ	< 0.45	UJ	< 0.45	UJ	NA		< 0.53		< 0.47	
2,4-Dinitrotoluene	mg/kg	8270	7.4	110	0.0064	NA		NA		< 0.033	UJ	< 0.03	UJ	< 0.03	UJ	NA		< 0.036		< 0.032	
2,6-Dinitrotoluene	mg/kg	8270	1.5	24	0.00134	NA		NA		< 0.043	UJ	< 0.039	UJ	< 0.039	UJ	NA		< 0.046		< 0.041	
2-Chloronaphthalene	mg/kg	8270	6000	67000	7.8	NA		NA		< 0.0086	UJ	< 0.0079	UJ	< 0.0078	UJ	NA		< 0.0094		< 0.0082	
2-Chlorophenol	mg/kg	8270	580	5500	0.178	NA		NA		< 0.034	UJ	< 0.031	UJ	< 0.031	UJ	NA		< 0.037		< 0.032	
2-Methylnaphthalene	mg/kg	8270	300	9300	0.38	NA		NA		< 0.0074	UJ	< 0.0068	UJ	< 0.0067	UJ	NA		0.035	J	< 0.0071	
2-Methylphenol	mg/kg	8270	4100	63000	1.5	NA		NA		< 0.029	UJ	< 0.026	UJ	< 0.026	UJ	NA		< 0.031		< 0.027	
2-Nitroaniline	mg/kg	8270	800	12000	0.16	NA		NA		< 0.19	UJ	< 0.17	UJ	< 0.17	UJ	NA		< 0.2		< 0.18	
2-Nitrophenol	mg/kg	8270	- -	- -	- -	NA		NA		< 0.046	UJ	< 0.042	UJ	< 0.041	UJ	NA		< 0.049		< 0.043	
3,3'-Dichlorobenzidine	mg/kg	8270	5.1	79	0.0164	NA		NA		< 0.044	UJ	< 0.04	UJ	< 0.04	UJ	NA		< 0.047		< 0.042	
Methylphenol, 3 & 4 [1]	mg/kg	8270	4100	63000	1.48	NA		NA		< 0.04	UJ	< 0.037	UJ	< 0.037	UJ	NA		< 0.044		< 0.039	
3-Nitroaniline	mg/kg	8270	- -	- -	- -	NA		NA		< 0.17	UJ	< 0.16	UJ	< 0.15	UJ	NA		< 0.18		< 0.16	
4,6-Dinitro-2-methylphenol	mg/kg	8270	6.6	- -	0.0052	NA		NA		< 0.17	UJ	< 0.15	UJ	< 0.15	UJ	NA		< 0.18		< 0.16	
4-Bromophenyl phenyl ether	mg/kg	8270	- -	- -	- -	NA		NA		< 0.036	UJ	< 0.033	UJ	< 0.033	UJ	NA		< 0.039		< 0.034	
4-Chloro-3-methylphenol	mg/kg	8270	8200	- -	3.4	NA		NA		< 0.038	UJ	< 0.035	UJ	< 0.034	UJ	NA		< 0.041		< 0.036	
4-Chloroaniline	mg/kg	8270	11	180	0.0032	NA		NA		< 0.033	UJ	< 0.03	UJ	< 0.03	UJ	NA		< 0.036		< 0.031	
4-Chlorophenyl phenyl ether	mg/kg	8270	- -	- -	- -	NA		NA		< 0.046	UJ	< 0.042	UJ	< 0.042	UJ	NA		< 0.05		< 0.044	
4-Nitroaniline	mg/kg	8270	110	- -	0.032	NA		NA		< 0.17	UJ	< 0.15	UJ	< 0.15	UJ	NA		< 0.18		< 0.16	
4-Nitrophenol	mg/kg	8270	- -	- -	- -	NA		NA		< 0.15	UJ	< 0.14	UJ	< 0.14	UJ	NA		< 0.16		< 0.14	
Acetophenone	mg/kg	8270	12000	2500	1.16	NA		NA		< 0.034	UJ	< 0.031	UJ	< 0.031	UJ	NA		< 0.037		< 0.032	
Atrazine	mg/kg	8270	10	150	0.038	NA		NA		< 0.04	UJ	< 0.037	UJ	< 0.036	UJ	NA		< 0.044		< 0.038	
Benzaldehyde	mg/kg	8270	820	1200	0.082	NA		NA		< 0.062	UJ	< 0.056	UJ	< 0.056	UJ	NA		< 0.067		< 0.059	
Bis(2-chloroisopropyl)ether	mg/kg	8270	4700	310	0.52	NA		NA		< 0.0089	UJ	< 0.0081	UJ	< 0.0081	UJ	NA		< 0.0097		< 0.0085	
Bis(2-chloroethoxy)methane	mg/kg	8270	250	- -	0.026	NA		NA		< 0.027	UJ	< 0.025	UJ	< 0.025	UJ	NA		< 0.029		< 0.026	
Bis(2-chloroethyl)ether	mg/kg	8270	1	13	0.000072	NA		NA		< 0.011	UJ	< 0.01	UJ	< 0.01	UJ	NA		< 0.012		< 0.011	
Bis(2-ethylhexyl) phthalate	mg/kg	8270	160	2500	28	NA		NA		< 0.067	UJ	< 0.061	UJ	< 0.06	UJ	NA		< 0.072		< 0.064	
Butyl benzyl phthalate	mg/kg	8270	1200	19000	4.8	NA		NA		< 0.056	UJ	< 0.051	UJ	< 0.051	UJ	NA		< 0.061		< 0.054	
Caprolactam	mg/kg	8270	40000	600000	5	NA		NA		< 0.31	UJ	< 0.28	UJ	< 0.28	UJ	NA		< 0.34		< 0.3	
Carbazole [1]	mg/kg	8270	23000	700000	116	NA		NA		< 0.0076	UJ	< 0.0069	UJ	< 0.0069	UJ	NA		< 0.0083		< 0.0072	
Dibenzofuran	mg/kg	8270	120	2300	0.3	NA		NA		< 0.041	UJ	< 0.037	UJ	< 0.037	UJ	NA		< 0.044		< 0.039	
Diethyl phthalate	mg/kg	8270	66000	1000000	12.2	NA		NA		< 0.045	UJ	< 0.041	UJ	< 0.041	UJ	NA		< 0.049		< 0.043	
Dimethyl phthalate	mg/kg	8270	- -	- -	- -	NA		NA		< 0.045	UJ	< 0.041	UJ	< 0.041	UJ	NA		< 0.049		< 0.043	
Di-n-butyl phthalate	mg/kg	8270	8200	130000	4.6	NA		NA		< 0.052	UJ	< 0.047	UJ	< 0.047	UJ	NA		< 0.056		< 0.049	
Di-n-octyl phthalate	mg/kg	8270	820	- -	114	NA		NA		< 0.044	UJ	< 0.04	UJ	< 0.039	UJ	NA		< 0.047		< 0.041	
Hexachlorobenzene	mg/kg	8270	0.96	13	0.26	NA		NA		< 0.0088	UJ	< 0.008	UJ	< 0.008	UJ	NA		< 0.0095		< 0.0084	
Hexachlorobutadiene	mg/kg	8270	5.3	17	0.0054	NA		NA		< 0.0092	UJ	< 0.0084	UJ	< 0.0084	UJ	NA		< 0.01		< 0.0088	
Hexachlorocyclopentadiene	mg/kg	8270	0.75	8	3.2	NA		NA		< 0.045	UJ	< 0.041	UJ	< 0.04	UJ	NA		< 0.048		< 0.042	
Hexachloroethane	mg/kg	8270	8	91	0.004	NA		NA		< 0.03	UJ	< 0.027	UJ	< 0.027	UJ	NA		< 0.032		< 0.028	
Isophorone	mg/kg	8270	2400	37000	0.52	NA		NA		< 0.031	UJ	< 0.028	UJ	< 0.028	UJ	NA		< 0.034		< 0.03	
Nitrobenzene	mg/kg	8270	22	240	0.00184	NA		NA		< 0.034	UJ	< 0.031	UJ	< 0.031	UJ	NA		< 0.037		< 0.033	

TABLE A-4
ANALYTICAL AND SCREENING RESULTS
SUBSURFACE SOIL
CAA VIM AND VIIM
MINGO JUNCTION STEEL WORKS LLC - WEIRTON FACILITY

			Screening Criteria [1]			Sample Information [2]																			
						VI-MW-01A(14-16) 10/04/2013	VI-MW-01A(68-69) 10/08/2013	VI-MW-02A(9.7-10) 10/01/2013			VI-MW-02A(42.1-43) 10/02/2013			VI-MW-02AR(62-64) 10/31/2013			VI-MW-01P(9-10) 10/03/2013	VI-SB-102(6-8) 10/09/2013			VI-SB-102(68-70) 10/10/2013		
Constituent	**Units**	**Analytical Method**	**Industrial Soil RSL**	**Industrial Soil De Minimis**	***Protection of Groundwater RSL***																				
N-Nitrosodi-n-propylamine	mg/kg	8270	0.33	5.1	0.000162	NA	NA	<	0.0097	UJ	<	0.0088	UJ	<	0.0088	UJ	NA	<	0.011		<	0.0092			
N-Nitrosodiphenylamine	mg/kg	8270	470	7200	1.34	NA	NA	<	0.038	UJ	<	0.035	UJ	<	0.035	UJ	NA	<	0.041		<	0.036			
Pentachlorophenol	mg/kg	8270	4	52	0.028	NA	NA	<	0.037	UJ	<	0.034	UJ	<	0.033	UJ	NA	<	0.04		<	0.035			
Phenol	mg/kg	8270	25000	380000	6.6	NA	NA	<	0.0098	UJ	<	0.0089	UJ	<	0.0088	UJ	NA	<	0.011		<	0.0093			
Polychlorinated Biphenyls																									
PCB-1016	mg/kg	8082	5.1	160	0.26	NA	NA	<	0.0031	UJ	<	0.0028	UJ	<	0.0028	UJ	NA	<	0.0033		<	0.0029			
PCB-1221	mg/kg	8082	0.83	19	0.0016	NA	NA	<	0.0039	UJ	<	0.0036	UJ	<	0.0036	UJ	NA	<	0.0043		<	0.0038			
PCB-1232	mg/kg	8082	0.72	14	0.0016	NA	NA	<	0.0035	UJ	<	0.0032	UJ	<	0.0032	UJ	NA	<	0.0038		<	0.0034			
PCB-1242	mg/kg	8082	0.95	26	0.024	NA	NA	<	0.0034	UJ	<	0.0031	UJ	<	0.003	UJ	NA	<	0.0036		<	0.0032			
PCB-1248	mg/kg	8082	0.94	27	0.024	NA	NA	<	0.002	UJ	<	0.0018	UJ	<	0.0018	UJ	NA	<	0.0021		<	0.0019			
PCB-1254	mg/kg	8082	0.97	28	0.04	NA	NA	<	0.0029	UJ	<	0.0027	UJ	<	0.0027	UJ	NA	<	0.0032		<	0.0028			
PCB-1260	mg/kg	8082	0.99	30	0.11	NA	NA	<	0.0029	UJ	<	0.0027	UJ	<	0.0027	UJ	NA	<	0.0032		<	0.0028			
Inorganics																									
Aluminum	mg/kg	6020	110000	1000000	60000	NA	NA		9500			7400			9700	K	NA		10000			8900			
Antimony	mg/kg	6020	47	930	5.4	NA	NA		0.18	L		0.21	L		0.2	J	NA		0.2	L		0.14	L		
Arsenic	mg/kg	6020	3	35	5.8	NA	NA		***7***			***5.9***			***6.4***	K	NA		***7.4***			4.3			
Barium	mg/kg	6020	22000	400000	1640	NA	NA		99			73			100		NA		90			80			
Beryllium	mg/kg	6020	230	4500	64	NA	NA		0.76			0.78			0.73	K	NA		0.73			0.74			
Cadmium	mg/kg	6020	98	980	7.6	NA	NA		0.25			0.17			0.25		NA		0.33			0.2			
Calcium	mg/kg	6020	- -	- -	- -	NA	NA		21000	B		810			1600		NA		7300			1300			
Chromium [1]	mg/kg	6020	180000	1000000	3600000	NA	NA		270	B		17			19		NA		43			16			
Cobalt	mg/kg	6020	35	690	0.54	NA	NA		***6.9***			***19***			***13***	K	NA		***9.7***			***13***			
Copper	mg/kg	6020	4700	93000	920	NA	NA		21			14			19	K	NA		18			13			
Iron	mg/kg	6020	82000	1000000	700	NA	NA		***37000***	B		***33000***			***38000***	K	NA		***30000***			***30000***			
Lead	mg/kg	6020	800	1000	280	NA	NA		15	K		19	K		16		NA		25	K		14	K		
Magnesium	mg/kg	6020	- -	- -	- -	NA	NA		8800	K		1500	K		2700		NA		3000	K		2300	K		
Manganese [1]	mg/kg	6020	2600	80000	56	NA	NA		***2700***			***1400***			***940***		NA		***1700***			***760***			
Mercury	mg/kg	7471	4.6	3.1	2	NA	NA		0.022	J		0.023	J		0.012	J	NA		0.03			0.018	J		
Nickel	mg/kg	6020	2200	43000	52	NA	NA		16	K		17	K		25	K	NA		18	K		20	K		
Potassium	mg/kg	6020	- -	- -	- -	NA	NA		1100			670			970		NA		1100			930			
Selenium	mg/kg	6020	580	12000	5.2	NA	NA		0.43	J		0.21	J		0.5	K	NA		0.44	J		0.23	J		
Silver	mg/kg	6020	580	12000	1.6	NA	NA		0.042	B		0.013	B		0.0064	J	NA		0.064	B		0.017	B		
Sodium	mg/kg	6020	- -	- -	- -	NA	NA		180			72			100		NA		470			80			
Thallium	mg/kg	6020	1.2	23	2.8	NA	NA		0.15			0.097	J		0.11		NA		0.17			0.083	J		
Vanadium	mg/kg	6020	580	160	172	NA	NA		24			17			17		NA		22			16			
Zinc	mg/kg	6020	35000	700000	740	NA	NA		62	L		38	L		64	K	NA		77	L		48	L		
Other Parameters																									
Cyanide, Total	mg/kg	9012	15	170	40	NA	NA	<	0.12		<	0.11		<	0.11		NA	<	0.13		<	0.11			
Total Organic Carbon	mg/kg	WALKLEY	- -	- -	- -	NA	NA		990		<	76		<	75		NA		5000		<	79			
Percent Moisture	%	- -	- -	- -	- -	18	18		19			11			11		20		26			15			
Percent Solids	%	MCAWW 16	- -	- -	- -	NA	NA		NA			NA			NA		NA		NA			NA			

TABLE A-4
ANALYTICAL AND SCREENING RESULTS
SUBSURFACE SOIL
CAA VIM AND VIIM
MINGO JUNCTION STEEL WORKS LLC - WEIRTON FACILITY

Constituent	Units	Analytical Method	Screening Criteria [1]			Sample Information [2]							
			Industrial Soil RSL	Industrial Soil De Minimis	*Protection of Groundwater RSL*	VI-SB-102(68-70)DUP 10/10/2013 Duplicate	VI-SB-103 (4-5') 11/30/2017	VII-MW-01A(6-8) 10/17/2013	VII-MW-01A(34-36) 10/18/2013	VII-MW-02A(4-6) 10/16/2013	VII-MW-02A(40-42) 10/16/2013	VII-MW-02A(40-42)DUP 10/16/2013 Duplicate	VII-MW-03A(11-12) 10/11/2013
Volatile Organic Compounds													
Benzene	mg/kg	8260	5.1	57	0.052	< 0.00076	NA	< 0.00082	< 0.00082	< 0.00084	< 0.00084	< 0.00082	< 0.00076 UJ
Toluene	mg/kg	8260	4700	820	13.8	< 0.00082	NA	< 0.00089	< 0.00089	< 0.0009	< 0.00091	< 0.00088	< 0.00082 UJ
Ethylbenzene	mg/kg	8260	25	280	15.6	< 0.00072	NA	< 0.00078	< 0.00078	< 0.0008	< 0.0008	< 0.00078	< 0.00072 UJ
Xylenes, Total	mg/kg	8260	250	260	198	< 0.0025	NA	< 0.0027	< 0.0027	< 0.0028	< 0.0028	< 0.0027	< 0.0025 UJ
1,1,1-Trichloroethane	mg/kg	8260	3600	640	5.6	< 0.00055	NA	< 0.00059	< 0.00059	< 0.0006	0.00095 J	< 0.00059	< 0.00055 UJ
1,1,2,2-Tetrachloroethane	mg/kg	8260	2.7	31	0.0006	< 0.00081	NA	< 0.00087	< 0.00087	< 0.00089	< 0.0009	< 0.00087	< 0.00081 UJ
1,1,2-Trichloro-1,2,2-trifluoroethane	mg/kg	8260	2800	910	52	< 0.0012	NA	< 0.0013	< 0.0013	< 0.0013	< 0.0013	< 0.0013	< 0.0012 UJ
1,1,2-Trichloroethane	mg/kg	8260	0.63	6.8	0.032	< 0.00094	NA	< 0.001	< 0.001	< 0.001	< 0.001	< 0.001	< 0.00094 UJ
1,1-Dichloroethane	mg/kg	8260	16	170	0.0156	< 0.00065	NA	< 0.0007	< 0.0007	< 0.00071	< 0.00072	< 0.0007	< 0.00065 UJ
1,1-Dichloroethene	mg/kg	8260	100	1100	0.2	< 0.00096	NA	< 0.001	< 0.001	< 0.0011	< 0.0011	< 0.001	< 0.00096 UJ
1,2,4-Trichlorobenzene	mg/kg	8260	26	280	4	< 0.00099	NA	< 0.0011	< 0.0011	< 0.0011	< 0.0011	< 0.0011	< 0.00099 UJ
1,2-Dibromo-3-Chloropropane	mg/kg	8260	0.064	0.7	0.00172	< 0.00084	NA	< 0.00091	< 0.00091	< 0.00093	< 0.00094	< 0.00091	< 0.00084 UJ
1,2-Dibromoethane (EDB)	mg/kg	8260	0.16	1.8	0.00028	< 0.00097	NA	< 0.001	< 0.001	< 0.0011	< 0.0011	< 0.001	< 0.00097 UJ
1,2-Dichlorobenzene	mg/kg	8260	930	380	11.6	< 0.0009	NA	< 0.00097	< 0.00097	< 0.00099	< 0.001	< 0.00097	< 0.0009 UJ
1,2-Dichloroethane	mg/kg	8260	2	23	0.028	< 0.00069	NA	< 0.00074	< 0.00075	< 0.00076	< 0.00077	< 0.00074	< 0.00069 UJ
1,2-Dichloroethene, Total	mg/kg	8260	- -	- -	- -	< 0.0014	NA	< 0.0016	< 0.0016	< 0.0016	< 0.0016	< 0.0015	< 0.0014 UJ
cis-1,2-Dichloroethene	mg/kg	8260	230	81	0.42	< 0.00079	NA	< 0.00085	< 0.00085	< 0.00087	< 0.00088	< 0.00085	< 0.00079 UJ
trans-1,2-Dichloroethene	mg/kg	8260	2300	570	0.62	< 0.00067	NA	< 0.00072	< 0.00072	< 0.00074	< 0.00075	< 0.00072	< 0.00067 UJ
1,2-Dichloropropane	mg/kg	8260	6.6	49	0.034	< 0.00061	NA	< 0.00066	< 0.00066	< 0.00067	< 0.00068	< 0.00066	< 0.00061 UJ
cis-1,3-Dichloropropene [1]	mg/kg	8260	8.2	99	0.0034	< 0.00076	NA	< 0.00082	< 0.00082	< 0.00084	< 0.00085	< 0.00082	< 0.00076 UJ
trans-1,3-Dichloropropene [1]	mg/kg	8260	8.2	99	0.0034	< 0.00067	NA	< 0.00073	< 0.00073	< 0.00074	< 0.00075	< 0.00072	< 0.00067 UJ
1,3-Dichlorobenzene [1]	mg/kg	8260	11	120	1.44	< 0.00074	NA	< 0.0008	< 0.0008	< 0.00081	< 0.00082	< 0.00079	< 0.00074 UJ
1,4-Dichlorobenzene	mg/kg	8260	11	120	1.44	< 0.00072	NA	< 0.00077	< 0.00077	< 0.00079	< 0.0008	< 0.00077	< 0.00072 UJ
2-Butanone (MEK)	mg/kg	8260	19000	28000	2.4	< 0.00099	NA	< 0.0011	< 0.0011	< 0.0011	< 0.0011	< 0.0011	< 0.00099 UJ
2-Hexanone	mg/kg	8260	130	- -	0.0176	< 0.00078	NA	< 0.00084	< 0.00084	< 0.00085	< 0.00086	< 0.00084	< 0.00078 UJ
4-Methyl-2-pentanone (MIBK)	mg/kg	8260	14000	3400	2.8	< 0.00073	NA	< 0.00079	< 0.00079	< 0.00081	< 0.00082	< 0.00079	< 0.00073 UJ
Acetone	mg/kg	8260	67000	110000	5.8	< 0.0056	NA	< 0.0061	< 0.0061	< 0.0062	< 0.0063	< 0.0061	< 0.0056 UJ
Bromoform	mg/kg	8260	86	910	0.42	< 0.0005	NA	< 0.00054	< 0.00054	< 0.00055	< 0.00055	< 0.00054	< 0.0005 UJ
Bromomethane	mg/kg	8260	3	33	0.0038	< 0.00083	NA	< 0.0009	< 0.0009	< 0.00091	< 0.00092	< 0.00089	< 0.00083 UJ
Carbon disulfide	mg/kg	8260	350	740	0.48	< 0.00058	NA	< 0.00062	< 0.00062	< 0.00063	< 0.00064	< 0.00062	< 0.00058 UJ
Carbon tetrachloride	mg/kg	8260	2.9	32	0.038	< 0.0005	NA	< 0.00054	< 0.00054	< 0.00055	< 0.00056	< 0.00054	< 0.0005 UJ
Chlorobenzene	mg/kg	8260	130	760	1.36	< 0.00085	NA	< 0.00092	< 0.00092	< 0.00094	< 0.00095	< 0.00092	< 0.00085 UJ
Chlorodibromomethane	mg/kg	8260	39	780	0.42	< 0.0008	NA	< 0.00086	< 0.00086	< 0.00088	< 0.00089	< 0.00086	< 0.0008 UJ
Chloroethane	mg/kg	8260	5700	2100	11.8	< 0.0017	NA	< 0.0019	< 0.0019	< 0.0019	< 0.0019	< 0.0019	< 0.0017 UJ
Chloroform	mg/kg	8260	1.4	15	0.44	< 0.00066	NA	< 0.00071	< 0.00071	< 0.00072	0.00082 J	< 0.00071	< 0.00066 UJ
Chloromethane	mg/kg	8260	46	500	0.098	< 0.00096	NA	< 0.001	< 0.001	< 0.0011	< 0.0011	< 0.001	< 0.00096 UJ
Cyclohexane	mg/kg	8260	2700	120	26	< 0.00042	NA	< 0.00045	< 0.00045	< 0.00046	< 0.00046	< 0.00045	< 0.00042 UJ
Dichlorobromomethane	mg/kg	8260	1.3	14	0.44	< 0.00063	NA	< 0.00068	< 0.00068	< 0.00069	< 0.0007	< 0.00068	< 0.00063 UJ
Dichlorodifluoromethane	mg/kg	8260	37	400	0.6	< 0.00075	NA	< 0.00081	< 0.00081	< 0.00082	< 0.00083	< 0.00081	< 0.00075 UJ
Isopropylbenzene	mg/kg	8260	990	270	1.48	< 0.00076	NA	< 0.00082	< 0.00082	< 0.00084	< 0.00085	< 0.00082	< 0.00076 UJ
Methyl acetate	mg/kg	8260	120000	29000	8.2	< 0.001	NA	< 0.0011	< 0.0011	< 0.0011	< 0.0011	< 0.0011	< 0.001 UJ
Methyl tert-butyl ether	mg/kg	8260	210	2300	0.064	< 0.00084	NA	< 0.00091	< 0.00091	< 0.00093	< 0.00093	< 0.0009	< 0.00084 UJ
Methylcyclohexane [1]	mg/kg	8260	2700	120	26	< 0.00082	NA	< 0.00088	< 0.00088	< 0.0009	< 0.00091	< 0.00088	< 0.00082 UJ
Methylene Chloride	mg/kg	8260	320	3300	0.054	0.0025 B	NA	0.0023 B	0.0014 B	0.003 B	0.0029 B	0.0027 B	0.0026 B
Naphthalene	mg/kg	8260	8.6	180	0.0076	NA	NA	NA	NA	NA	NA	NA	NA
Styrene	mg/kg	8260	3500	870	2.6	< 0.00079	NA	< 0.00086	< 0.00086	< 0.00087	< 0.00088	< 0.00085	< 0.00079 UJ
Tetrachloroethene	mg/kg	8260	39	170	0.046	< 0.00077	NA	< 0.00083	< 0.00083	< 0.00084	0.0032 J	< 0.00082	< 0.00077 UJ
Trichloroethene	mg/kg	8260	1.9	20	0.036	< 0.00074	NA	< 0.0008	< 0.0008	< 0.00081	0.0012 J	< 0.0008	< 0.00074 UJ
Trichlorofluoromethane	mg/kg	8260	35000	1200	6.6	< 0.001	NA	< 0.0011	< 0.0011	< 0.0011	< 0.0011	< 0.0011	< 0.001 UJ
Vinyl chloride	mg/kg	8260	1.7	22	0.0138	< 0.00053	NA	< 0.00057	< 0.00057	< 0.00058	< 0.00059	< 0.00057	< 0.00053 UJ
Semi-Volatile Organic Compounds													
Acenaphthene	mg/kg	8270	4500	70000	11	< 0.0072	NA	< 0.0078 UJ	< 0.0078 UJ	0.0095 J	< 0.008	< 0.0078	< 0.0072 UJ
Acenaphthylene [1]	mg/kg	8270	4500	80000	11	< 0.0086	NA	< 0.0093 UJ	< 0.0093 UJ	0.023 J	< 0.0096	< 0.0092	< 0.0086 UJ
Anthracene	mg/kg	8270	23000	700000	116	< 0.0073	NA	< 0.0079 UJ	< 0.0079 UJ	0.021 J	< 0.0082	< 0.0079	< 0.0073 UJ
Benzo[a]anthracene	mg/kg	8270	21	88	0.22	< 0.0094	NA	< 0.01 UJ	< 0.01 UJ	0.087	< 0.011	< 0.01	< 0.0094 UJ
Benzo[a]pyrene	mg/kg	8270	2.1	4.3	4.8	< 0.0075	NA	< 0.0081 UJ	< 0.0081 UJ	0.071 J	< 0.0084	< 0.0081	< 0.0075 UJ

TABLE A-4
ANALYTICAL AND SCREENING RESULTS
SUBSURFACE SOIL
CAA VIM AND VIIM
MINGO JUNCTION STEEL WORKS LLC - WEIRTON FACILITY

Constituent	Units	Analytical Method	Screening Criteria [1]			Sample Information [2]																			
			Industrial Soil RSL	Industrial Soil De Minimis	*Protection of Groundwater RSL*	VI-SB-102(68-70)DUP 10/10/2013 Duplicate		VI-SB-103 (4-5') 11/30/2017	VII-MW-01A(6-8) 10/17/2013		VII-MW-01A(34-36) 10/18/2013		VII-MW-02A(4-6) 10/16/2013		VII-MW-02A(40-42) 10/16/2013		VII-MW-02A(40-42)DUP 10/16/2013 Duplicate		VII-MW-03A(11-12) 10/11/2013	
Benzo[b]fluoranthene	mg/kg	8270	21	43	6	< 0.012		NA	< 0.013	UJ	< 0.013	UJ	0.086		< 0.013		< 0.013		< 0.012	UJ
Benzo[g,h,i]perylene [1]	mg/kg	8270	2300	33000	26	< 0.0074		NA	< 0.0081	UJ	< 0.0081	UJ	0.047	J	< 0.0083		< 0.008		< 0.0074	UJ
Benzo[k]fluoranthene	mg/kg	8270	210	430	58	< 0.015		NA	< 0.016	UJ	< 0.016	UJ	0.071	J	< 0.017		< 0.016		< 0.015	UJ
Chrysene	mg/kg	8270	2100	4300	180	< 0.0089		NA	< 0.0097	UJ	< 0.0097	UJ	0.094		< 0.01		< 0.0096		< 0.0089	UJ
Dibenz(a,h)anthracene	mg/kg	8270	2.1	4.3	1.92	< 0.0083		NA	< 0.009	UJ	< 0.009	UJ	< 0.0092		< 0.0093		< 0.009		< 0.0083	UJ
Fluoranthene	mg/kg	8270	3000	44000	178	< 0.008		NA	0.011	J	< 0.0087	UJ	0.14		< 0.009		< 0.0086		< 0.008	UJ
Fluorene	mg/kg	8270	3000	62000	10.8	< 0.0098		NA	< 0.011	UJ	< 0.011	UJ	0.013	J	< 0.011		< 0.011		< 0.0099	UJ
Indeno[1,2,3-cd]pyrene	mg/kg	8270	21	43	19.6	< 0.0077		NA	< 0.0084	UJ	< 0.0084	UJ	0.047	J	< 0.0086		< 0.0083		< 0.0077	UJ
Naphthalene	mg/kg	8270	8.6	180	0.0076	< 0.0064		NA	< 0.007	UJ	< 0.007	UJ	***0.031***	J	< 0.0072		< 0.007		< 0.0065	UJ
Phenanthrene [1]	mg/kg	8270	23000	700000	116	< 0.012		NA	< 0.013	UJ	< 0.013	UJ	0.1		< 0.013		< 0.013		< 0.012	UJ
Pyrene	mg/kg	8270	2300	66000	26	< 0.0075		NA	0.011	J	< 0.0082	UJ	0.12		< 0.0085		< 0.0082		0.037	J
1,1'-Biphenyl	mg/kg	8270	20	210	0.0174	< 0.033		NA	< 0.036	UJ	< 0.036	UJ	< 0.037		< 0.037		< 0.036		< 0.033	UJ
2,4,5-Trichlorophenol	mg/kg	8270	8200	130000	8	< 0.04		NA	< 0.043	UJ	< 0.043	UJ	< 0.044		< 0.045		< 0.043		< 0.04	UJ
2,4,6-Trichlorophenol	mg/kg	8270	82	1300	0.024	< 0.056		NA	< 0.061	UJ	< 0.061	UJ	< 0.062		< 0.063		< 0.06		< 0.056	UJ
2,4-Dichlorophenol	mg/kg	8270	250	3800	0.046	< 0.0075		NA	< 0.0081	UJ	< 0.0081	UJ	< 0.0083		< 0.0084		< 0.0081		< 0.0075	UJ
2,4-Dimethylphenol	mg/kg	8270	1600	25000	0.84	< 0.058		NA	< 0.063	UJ	< 0.063	UJ	< 0.065		< 0.066		< 0.063		< 0.059	UJ
2,4-Dinitrophenol	mg/kg	8270	160	2500	0.088	< 0.44		NA	< 0.48	UJ	< 0.48	UJ	< 0.49		< 0.5		< 0.48		< 0.45	UJ
2,4-Dinitrotoluene	mg/kg	8270	7.4	110	0.0064	< 0.03		NA	< 0.033	UJ	< 0.033	UJ	< 0.033		< 0.034		< 0.033		< 0.03	UJ
2,6-Dinitrotoluene	mg/kg	8270	1.5	24	0.00134	< 0.039		NA	< 0.042	UJ	< 0.042	UJ	< 0.043		< 0.043		< 0.042		< 0.039	UJ
2-Chloronaphthalene	mg/kg	8270	6000	67000	7.8	< 0.0078		NA	< 0.0085	UJ	< 0.0085	UJ	< 0.0086		< 0.0087		< 0.0084		< 0.0078	UJ
2-Chlorophenol	mg/kg	8270	580	5500	0.178	< 0.031		NA	< 0.033	UJ	< 0.033	UJ	< 0.034		< 0.034		< 0.033		< 0.031	UJ
2-Methylnaphthalene	mg/kg	8270	300	9300	0.38	< 0.0067		NA	< 0.0073	UJ	< 0.0073	UJ	0.067	J	< 0.0075		< 0.0073		0.029	J
2-Methylphenol	mg/kg	8270	4100	63000	1.5	< 0.026		NA	< 0.028	UJ	< 0.028	UJ	< 0.029		< 0.029		< 0.028		< 0.026	UJ
2-Nitroaniline	mg/kg	8270	800	12000	0.16	< 0.17		NA	< 0.18	UJ	< 0.18	UJ	< 0.19		< 0.19		< 0.18		< 0.17	UJ
2-Nitrophenol	mg/kg	8270	- -	- -	- -	< 0.041		NA	< 0.045	UJ	< 0.045	UJ	< 0.046		< 0.046		< 0.045		< 0.041	UJ
3,3'-Dichlorobenzidine	mg/kg	8270	5.1	79	0.0164	< 0.039		NA	< 0.043	UJ	< 0.043	UJ	< 0.044		< 0.044		< 0.043		< 0.04	UJ
Methylphenol, 3 & 4 [1]	mg/kg	8270	4100	63000	1.48	< 0.037		NA	< 0.04	UJ	< 0.04	UJ	< 0.04		< 0.041		< 0.04		< 0.037	UJ
3-Nitroaniline	mg/kg	8270	- -	- -	- -	< 0.15		NA	< 0.17	UJ	< 0.17	UJ	< 0.17		< 0.17		< 0.17		< 0.15	UJ
4,6-Dinitro-2-methylphenol	mg/kg	8270	6.6	- -	0.0052	< 0.15		NA	< 0.16	UJ	< 0.16	UJ	< 0.17		< 0.17		< 0.16		< 0.15	UJ
4-Bromophenyl phenyl ether	mg/kg	8270	- -	- -	- -	< 0.032		NA	< 0.035	UJ	< 0.035	UJ	< 0.036		< 0.036		< 0.035		< 0.033	UJ
4-Chloro-3-methylphenol	mg/kg	8270	8200	- -	3.4	< 0.034		NA	< 0.037	UJ	< 0.037	UJ	< 0.038		< 0.039		< 0.037		< 0.034	UJ
4-Chloroaniline	mg/kg	8270	11	180	0.0032	< 0.03		NA	< 0.032	UJ	< 0.032	UJ	< 0.033		< 0.034		< 0.032		< 0.03	UJ
4-Chlorophenyl phenyl ether	mg/kg	8270	- -	- -	- -	< 0.041		NA	< 0.045	UJ	< 0.045	UJ	< 0.046		< 0.047		< 0.045		< 0.042	UJ
4-Nitroaniline	mg/kg	8270	110	- -	0.032	< 0.15		NA	< 0.16	UJ	< 0.16	UJ	< 0.17		< 0.17		< 0.16		< 0.15	UJ
4-Nitrophenol	mg/kg	8270	- -	- -	- -	< 0.14		NA	< 0.15	UJ	< 0.15	UJ	< 0.15		< 0.15		< 0.15		< 0.14	UJ
Acetophenone	mg/kg	8270	12000	2500	1.16	< 0.031		NA	< 0.033	UJ	< 0.033	UJ	< 0.034		< 0.034		< 0.033		< 0.031	UJ
Atrazine	mg/kg	8270	10	150	0.038	< 0.036		NA	< 0.04	UJ	< 0.039	UJ	< 0.04		< 0.041		< 0.039		< 0.036	UJ
Benzaldehyde	mg/kg	8270	820	1200	0.082	< 0.056		NA	< 0.061	UL	< 0.061	UL	< 0.062	UL	< 0.063	UL	< 0.061	UL	< 0.056	UJ
Bis(2-chloroisopropyl)ether	mg/kg	8270	4700	310	0.52	< 0.0081		NA	< 0.0088		< 0.0088	UJ	< 0.0089		< 0.009		< 0.0087		< 0.0081	UJ
Bis(2-chloroethoxy)methane	mg/kg	8270	250	- -	0.026	< 0.025		NA	< 0.027	UJ	< 0.027	UJ	< 0.027		< 0.028		< 0.027		< 0.025	UJ
Bis(2-chloroethyl)ether	mg/kg	8270	1	13	0.000072	< 0.01		NA	< 0.011	UJ	< 0.011	UJ	< 0.011		< 0.011		< 0.011		< 0.01	UJ
Bis(2-ethylhexyl) phthalate	mg/kg	8270	160	2500	28	< 0.06		NA	0.26	J	< 0.066	UJ	< 0.067		< 0.068		< 0.065		< 0.06	UJ
Butyl benzyl phthalate	mg/kg	8270	1200	19000	4.8	< 0.051		NA	< 0.055	UJ	< 0.055	UJ	< 0.056		< 0.057		< 0.055		< 0.06	UJ
Caprolactam	mg/kg	8270	40000	600000	5	< 0.28		NA	< 0.31	UJ	< 0.31	UJ	< 0.31		< 0.32		< 0.3		< 0.06	UJ
Carbazole [1]	mg/kg	8270	23000	700000	116	< 0.0069		NA	< 0.0075	UJ	< 0.0075	UJ	< 0.0076		< 0.0077		< 0.0074		< 0.06	UJ
Dibenzofuran	mg/kg	8270	120	2300	0.3	< 0.037		NA	< 0.04	UJ	< 0.04	UJ	< 0.041		< 0.041		< 0.04		< 0.06	UJ
Diethyl phthalate	mg/kg	8270	66000	1000000	12.2	< 0.041		NA	< 0.044	UJ	< 0.044	UJ	< 0.045		< 0.046		< 0.044		< 0.041	UJ
Dimethyl phthalate	mg/kg	8270	- -	- -	- -	< 0.041		NA	< 0.044	UJ	< 0.044	UJ	< 0.045		< 0.046		< 0.044		< 0.041	UJ
Di-n-butyl phthalate	mg/kg	8270	8200	130000	4.6	< 0.047		NA	< 0.051	UJ	< 0.051	UJ	< 0.052		< 0.053		< 0.051		< 0.06	UJ
Di-n-octyl phthalate	mg/kg	8270	820	- -	114	< 0.039		NA	< 0.043	UJ	< 0.043	UJ	< 0.044		< 0.044		< 0.043		< 0.06	UJ
Hexachlorobenzene	mg/kg	8270	0.96	13	0.26	< 0.008		NA	< 0.0086	UJ	< 0.0086	UJ	< 0.0088		< 0.0089		< 0.0086		< 0.06	UJ
Hexachlorobutadiene	mg/kg	8270	5.3	17	0.0054	< 0.0084		NA	< 0.0091	UJ	< 0.0091	UJ	< 0.0092		< 0.0094		< 0.009		< 0.06	UJ
Hexachlorocyclopentadiene	mg/kg	8270	0.75	8	3.2	< 0.04		NA	< 0.044	UJ	< 0.044	UJ	< 0.045		< 0.045		< 0.044		< 0.06	UJ
Hexachloroethane	mg/kg	8270	8	91	0.004	< 0.027		NA	< 0.029	UJ	< 0.029	UJ	< 0.03		< UJU		< 0.029		< 0.06	UJ
Isophorone	mg/kg	8270	2400	37000	0.52	< 0.028		NA	< 0.031	UJ	< 0.031	UJ	< 0.031		< 0.032		< 0.03		< 0.028	UJ
Nitrobenzene	mg/kg	8270	22	240	0.00184	< 0.031		NA	< 0.034	UJ	< 0.034	UJ	< 0.034		< 0.035		< 0.034		< 0.06	UJ

TABLE A-4
ANALYTICAL AND SCREENING RESULTS
SUBSURFACE SOIL
CAA VIM AND VIIM
MINGO JUNCTION STEEL WORKS LLC - WEIRTON FACILITY

			Screening Criteria [1]			Sample Information [2]																			
Constituent	Units	Analytical Method	Industrial Soil RSL	Industrial Soil De Minimis	*Protection of Groundwater RSL*	VI-SB-102(68-70)DUP 10/10/2013 Duplicate		VI-SB-103 (4-5') 11/30/2017		VII-MW-01A(6-8) 10/17/2013		VII-MW-01A(34-36) 10/18/2013		VII-MW-02A(4-6) 10/16/2013		VII-MW-02A(40-42) 10/16/2013		VII-MW-02A(40-42)DUP 10/16/2013 Duplicate		VII-MW-03A(11-12) 10/11/2013	
N-Nitrosodi-n-propylamine	mg/kg	8270	0.33	5.1	0.000162	< 0.0088		NA		< 0.0095	UJ	< 0.0095	UJ	< 0.0097		< 0.0098		< 0.0095		< 0.06	UJ
N-Nitrosodiphenylamine	mg/kg	8270	470	7200	1.34	< 0.035		NA		< 0.038	UJ	< 0.038	UJ	< 0.038		< 0.039		< 0.037		< 0.06	UJ
Pentachlorophenol	mg/kg	8270	4	52	0.028	< 0.033		NA		< 0.036	UJ	< 0.036	UJ	< 0.037		< 0.037		< 0.036		< 0.033	UJ
Phenol	mg/kg	8270	25000	380000	6.6	< 0.0088		NA		< 0.0096	UJ	< 0.0096	UJ	< 0.0098		< 0.0099		< 0.0095		< 0.0088	UJ
Polychlorinated Biphenyls																					
PCB-1016	mg/kg	8082	5.1	160	0.26	< 0.0028		< 0.0016		< 0.003	UJ	< 0.003		< 0.0031		< 0.0031		< 0.003		< 0.0027	
PCB-1221	mg/kg	8082	0.83	19	0.0016	< 0.0036		< 0.0031		< 0.0039	UJ	< 0.0038		< 0.0039		< 0.004		< 0.0038		< 0.0035	
PCB-1232	mg/kg	8082	0.72	14	0.0016	< 0.0032		< 0.0028		< 0.0035	UJ	< 0.0034		< 0.0035		< 0.0036		< 0.0034		< 0.0031	
PCB-1242	mg/kg	8082	0.95	26	0.024	< 0.003		< 0.0029		< 0.0033	UJ	< 0.0033		< 0.0033		< 0.0034		< 0.0033		< 0.0029	
PCB-1248	mg/kg	8082	0.94	27	0.024	< 0.0018		< 0.0038		< 0.0019	UJ	< 0.0019		< 0.0019		< 0.002		< 0.0019		< 0.0017	
PCB-1254	mg/kg	8082	0.97	28	0.04	< 0.0027		< 0.0033		< 0.0029	UJ	< 0.0029		< 0.0029		< 0.003		< 0.0029		< 0.0026	
PCB-1260	mg/kg	8082	0.99	30	0.11	< 0.0027		***0.13***		< 0.0029	UJ	< 0.0029		< 0.0029		< 0.003		< 0.0028		< 0.0026	
Inorganics																					
Aluminum	mg/kg	6020	110000	1000000	60000	8100		NA		24000	K	5200	K	15000		6100		7600		16000	K
Antimony	mg/kg	6020	47	930	5.4	0.19	J	NA		0.15	J	0.28		0.11	J	0.26		0.23		< 0.0029	UL
Arsenic	mg/kg	6020	3	35	5.8	4.6		NA		1.9	J	3.4		5.1		3.2		3		0.32	J
Barium	mg/kg	6020	22000	400000	1640	87		NA		190	J	39		150	L	59	L	56	L	140	J
Beryllium	mg/kg	6020	230	4500	64	0.83		NA		3.3	L	0.36	L	2.5		0.69		0.67		3.5	L
Cadmium	mg/kg	6020	98	980	7.6	0.2		NA		0.54	J	0.16		0.28		0.29		0.21		0.7	J
Calcium	mg/kg	6020	- -	- -	- -	1100	B	NA		85000	J	730		79000	K	1300	K	1400	K	160000	K
Chromium [1]	mg/kg	6020	180000	1000000	3600000	17	B	NA		71	J	10	J	87		18		16		290	J
Cobalt	mg/kg	6020	35	690	0.54	***19***		NA		***4.1***	J	***6.5***		***3.8***		***12***		***12***		***1.1***	J
Copper	mg/kg	6020	4700	93000	920	12		NA		19	K	12	K	9		18		18		11	K
Iron	mg/kg	6020	82000	1000000	700	***35000***	B	NA		***24000***	K	***22000***	K	***25000***		***41000***		***33000***		***69000***	K
Lead	mg/kg	6020	800	1000	280	19		NA		13	J	8.8		19		16		16		1	J
Magnesium	mg/kg	6020	- -	- -	- -	2000	B	NA		32000	J	880		24000		2000		2300		39000	K
Manganese [1]	mg/kg	6020	2600	80000	56	***990***	B	NA		***1500***	J	***550***	J	***4100***	K	***2000***		***1000***		***9000***	J
Mercury	mg/kg	7471	4.6	3.1	2	0.017	J	NA		0.044	K	0.028	K	0.023	J	0.018	J	0.022	J	0.019	J
Nickel	mg/kg	6020	2200	43000	52	20		NA		15	K	12	K	6.5		20		20		3.8	K
Potassium	mg/kg	6020	- -	- -	- -	680		NA		1400	K	480	K	760		810		1000		500	J
Selenium	mg/kg	6020	580	12000	5.2	0.31	J	NA		1.4	J	0.34	J	< 0.055	UL	0.11	L	< 0.058	UL	0.23	J
Silver	mg/kg	6020	580	12000	1.6	0.016	J B	NA		0.09	K	< 0.0047		0.047	J	0.024	J	0.019	J	0.1	J
Sodium	mg/kg	6020	- -	- -	- -	54		NA		650	J	42		440		70		73		640	J
Thallium	mg/kg	6020	1.2	23	2.8	0.088	J	NA		0.18	J	0.074	J	0.09	J	0.13		0.12		0.0059	J
Vanadium	mg/kg	6020	580	160	172	17		NA		13	J	7.6		20		12		16		110	J
Zinc	mg/kg	6020	35000	700000	740	47		NA		60	K	32	K	33		55		52		14	K
Other Parameters																					
Cyanide, Total	mg/kg	9012	15	170	40	< 0.11		NA		0.22	J	< 0.11		< 0.12		< 0.12		< 0.13		< 0.11	
Total Organic Carbon	mg/kg	WALKLEY	- -	- -	- -	< 75		NA		2700		< 81		12000		2600		2900		2300	
Percent Moisture	%	- -	- -	- -	- -	11		NA		18		18		19		20		17		11	
Percent Solids	%	MCAWW 16	- -	- -	- -	NA		NA		NA		NA		NA		NA		NA		NA	

TABLE A-4
ANALYTICAL AND SCREENING RESULTS
SUBSURFACE SOIL
CAA VIM AND VIIM
MINGO JUNCTION STEEL WORKS LLC - WEIRTON FACILITY

			Screening Criteria [1]			Sample Information [2]															
						VII-MW-03A(21-22)		VII-MW-01P(11-12)		VII-MW-02P(12-14)		VII-MW-03P(8-10)		VII-MW-03P(10-12)		VII-SB-101(18-20)		VII-SB-102(6-8)		VII-SB-102(40-42)	
Constituent	**Units**	**Analytical Method**	**Industrial Soil RSL**	**Industrial Soil De Minimis**	***Protection of Groundwater RSL***	10/15/2013		10/11/2013		10/21/2013		10/30/2013		10/30/2013		10/23/2013		10/28/2013		10/29/2013	
Volatile Organic Compounds																					
Benzene	mg/kg	8260	5.1	57	0.052	< 0.00092		< 0.00085		< 0.00079		< 0.00076		< 0.00079		< 0.0008		< 0.00075		< 0.00075	
Toluene	mg/kg	8260	4700	820	13.8	< 0.00099		< 0.00091		< 0.00086		< 0.00082		0.0016	J	< 0.00086		< 0.00081		< 0.00081	
Ethylbenzene	mg/kg	8260	25	280	15.6	< 0.00087		0.0014	J	< 0.00076		< 0.00072		0.019		< 0.00076		< 0.00071		< 0.00071	
Xylenes, Total	mg/kg	8260	250	260	198	< 0.003		0.0058	J	< 0.0026		< 0.0025		0.044		< 0.0026		< 0.0025		< 0.0025	
1,1,1-Trichloroethane	mg/kg	8260	3600	640	5.6	< 0.00066		< 0.00061		< 0.00057		< 0.00054		< 0.00057		NA		< 0.00054		< 0.00054	
1,1,2,2-Tetrachloroethane	mg/kg	8260	2.7	31	0.0006	< 0.00097		< 0.0009		< 0.00084		< 0.0008		< 0.00084		NA		< 0.00079		< 0.0008	
1,1,2-Trichloro-1,2,2-trifluoroethane	mg/kg	8260	2800	910	52	< 0.0014		< 0.0013		< 0.0013		< 0.0012		< 0.0013		NA		< 0.0012		< 0.0012	
1,1,2-Trichloroethane	mg/kg	8260	0.63	6.8	0.032	< 0.0011		< 0.001		< 0.00098		< 0.00093		< 0.00098		NA		< 0.00092		< 0.00092	
1,1-Dichloroethane	mg/kg	8260	16	170	0.0156	< 0.00078		< 0.00072		< 0.00068		< 0.00064		< 0.00068		NA		< 0.00064		< 0.00064	
1,1-Dichloroethene	mg/kg	8260	100	1100	0.2	< 0.0012		< 0.0011		< 0.001		< 0.00095		< 0.001		NA		< 0.00094		< 0.00094	
1,2,4-Trichlorobenzene	mg/kg	8260	26	280	4	< 0.0012		< 0.0011		< 0.001		< 0.00099		< 0.001		NA		< 0.00097		< 0.00098	
1,2-Dibromo-3-Chloropropane	mg/kg	8260	0.064	0.7	0.00172	< 0.001		< 0.00094		< 0.00088		< 0.00084		< 0.00088		NA		< 0.00083		< 0.00083	
1,2-Dibromoethane (EDB)	mg/kg	8260	0.16	1.8	0.00028	< 0.0012		< 0.0011		< 0.001		< 0.00097		< 0.001		NA		< 0.00095		< 0.00096	
1,2-Dichlorobenzene	mg/kg	8260	930	380	11.6	< 0.0011		< 0.001		< 0.00094		< 0.00089		0.097		NA		< 0.00088		< 0.00089	
1,2-Dichloroethane	mg/kg	8260	2	23	0.028	< 0.00083		< 0.00077		< 0.00072		< 0.00069		< 0.00072		NA		< 0.00068		< 0.00068	
1,2-Dichloroethene, Total	mg/kg	8260	- -	- -	- -	< 0.0017		< 0.0016		< 0.0015		< 0.0014		< 0.0015		NA		< 0.0014		< 0.0014	
cis-1,2-Dichloroethene	mg/kg	8260	230	81	0.42	< 0.00095		< 0.00088		< 0.00083		< 0.00079		< 0.00083		NA		< 0.00078		< 0.00078	
trans-1,2-Dichloroethene	mg/kg	8260	2300	570	0.62	< 0.00081		< 0.00075		< 0.0007		< 0.00067		< 0.0007		NA		< 0.00066		< 0.00066	
1,2-Dichloropropane	mg/kg	8260	6.6	49	0.034	< 0.00074		< 0.00068		< 0.00064		< 0.00061		< 0.00064		NA		< 0.0006		< 0.0006	
cis-1,3-Dichloropropene [1]	mg/kg	8260	8.2	99	0.0034	< 0.00092		< 0.00085		< 0.0008		< 0.00076		< 0.0008		NA		< 0.00075		< 0.00075	
trans-1,3-Dichloropropene [1]	mg/kg	8260	8.2	99	0.0034	< 0.00081		< 0.00075		< 0.0007		< 0.00067		< 0.0007		NA		< 0.00066		< 0.00066	
1,3-Dichlorobenzene [1]	mg/kg	8260	11	120	1.44	< 0.00089		< 0.00082		< 0.00077		< 0.00073		< 0.00077		NA		< 0.00072		< 0.00073	
1,4-Dichlorobenzene	mg/kg	8260	11	120	1.44	< 0.00086		< 0.0008		< 0.00075		< 0.00071		< 0.00075		NA		< 0.0007		< 0.00071	
2-Butanone (MEK)	mg/kg	8260	19000	28000	2.4	< 0.0012		< 0.0011		< 0.001		< 0.00099		< 0.001		NA		< 0.00097		< 0.00098	
2-Hexanone	mg/kg	8260	130	- -	0.0176	< 0.00094		< 0.00086		< 0.00081		< 0.00077		< 0.00081		NA		< 0.00076		< 0.00077	
4-Methyl-2-pentanone (MIBK)	mg/kg	8260	14000	3400	2.8	< 0.00088		< 0.00082		< 0.00077		< 0.00073		< 0.00077		NA		< 0.00072		< 0.00073	
Acetone	mg/kg	8260	67000	110000	5.8	< 0.0068		< 0.0063		< 0.0059		< 0.0056		< 0.0059		NA		< 0.0055		< 0.0056	
Bromoform	mg/kg	8260	86	910	0.42	< 0.0006		< 0.00055		< 0.00052		< 0.0005		< 0.00052		NA		< 0.00049		< 0.00049	
Bromomethane	mg/kg	8260	3	33	0.0038	< 0.001		< 0.00093		< 0.00087		< 0.00083		< 0.00087		NA		< 0.00082		< 0.00082	
Carbon disulfide	mg/kg	8260	350	740	0.48	< 0.00069		< 0.00064		< 0.0006		0.0011	J	0.0019	J	NA		< 0.00057		< 0.00057	
Carbon tetrachloride	mg/kg	8260	2.9	32	0.038	< 0.00061		< 0.00056		< 0.00052		< 0.0005		< 0.00053		NA		< 0.00049		< 0.0005	
Chlorobenzene	mg/kg	8260	130	760	1.36	< 0.001		< 0.00095		< 0.00089		< 0.00085		< 0.00089		NA		< 0.00084		< 0.00084	
Chlorodibromomethane	mg/kg	8260	39	780	0.42	< 0.00096		< 0.00089		< 0.00083		< 0.00079		< 0.00083		NA		< 0.00078		< 0.00079	
Chloroethane	mg/kg	8260	5700	2100	11.8	< 0.0021		< 0.0019		< 0.0018		< 0.0017		< 0.0018		NA		< 0.0017		< 0.0017	
Chloroform	mg/kg	8260	1.4	15	0.44	0.00087	B	< 0.00073		0.00088	J	< 0.00065		0.00079	J	NA		< 0.00065		< 0.00065	
Chloromethane	mg/kg	8260	46	500	0.098	< 0.0012		< 0.0011		< 0.001		< 0.00095		< 0.001		NA		< 0.00094		< 0.00095	
Cyclohexane	mg/kg	8260	2700	120	26	< 0.0005		< 0.00047		< 0.00044		< 0.00042		< 0.00044		NA		< 0.00041		< 0.00041	
Dichlorobromomethane	mg/kg	8260	1.3	14	0.44	< 0.00076		< 0.0007		< 0.00066		< 0.00063		< 0.00066		NA		< 0.00062		< 0.00062	
Dichlorodifluoromethane	mg/kg	8260	37	400	0.6	< 0.0009		< 0.00083		< 0.00078		< 0.00075		< 0.00078		NA		< 0.00073		< 0.00074	
Isopropylbenzene	mg/kg	8260	990	270	1.48	< 0.00092		0.0017	J	< 0.0008		< 0.00076		0.012		NA		< 0.00075		< 0.00075	
Methyl acetate	mg/kg	8260	120000	29000	8.2	< 0.0012		< 0.0011		< 0.0011		< 0.001		< 0.0011		NA		< 0.00099		< 0.001	
Methyl tert-butyl ether	mg/kg	8260	210	2300	0.064	< 0.001		< 0.00094		< 0.00088		< 0.00084		< 0.00088		NA		< 0.00083		< 0.00083	
Methylcyclohexane [1]	mg/kg	8260	2700	120	26	< 0.00098		0.0014	J	< 0.00085		< 0.00081		0.0046	J	NA		< 0.0008		< 0.00081	
Methylene Chloride	mg/kg	8260	320	3300	0.054	0.0038	B	0.003	B	0.0039	B	0.004	B	0.0047	B	NA		0.0043	B	0.0038	B
Naphthalene	mg/kg	8260	8.6	180	0.0076	NA		NA		NA		NA		NA		NA		NA		NA	
Styrene	mg/kg	8260	3500	870	2.6	< 0.00096		< 0.00088		< 0.00083		< 0.00079		< 0.00083		NA		< 0.00078		< 0.00078	
Tetrachloroethene	mg/kg	8260	39	170	0.046	< 0.00092		0.0011	J	< 0.0008		***0.051***		0.0049	J	NA		< 0.00075		< 0.00076	
Trichloroethene	mg/kg	8260	1.9	20	0.036	< 0.00089		< 0.00082		< 0.00077		< 0.00074		0.0011	J	NA		< 0.00073		< 0.00073	
Trichlorofluoromethane	mg/kg	8260	35000	1200	6.6	< 0.0012		< 0.0012		< 0.0011		< 0.001		< 0.0011		NA		< 0.001		< 0.001	
Vinyl chloride	mg/kg	8260	1.7	22	0.0138	< 0.00064		< 0.00059		< 0.00055		< 0.00053		< 0.00055		NA		< 0.00052		< 0.00052	
Semi-Volatile Organic Compounds																					
Acenaphthene	mg/kg	8270	4500	70000	11	< 0.0087		< 0.008	UJ	0.03	J	< 0.0073	UJ	2.7	J	1		0.0089	J	< 0.0071	UJ
Acenaphthylene [1]	mg/kg	8270	4500	80000	11	< 0.01		< 0.0096	UJ	< 0.0089	UJ	< 0.0087	UJ	< 0.045	UJ	0.035	J	0.012	J	< 0.0085	UJ
Anthracene	mg/kg	8270	23000	700000	116	< 0.0089		< 0.0082	UJ	< 0.0076	UJ	< 0.0074	UJ	0.57	J	1.9		0.026	J	< 0.0073	UJ
Benzo[a]anthracene	mg/kg	8270	21	88	0.22	< 0.011		< 0.01	UJ	< 0.0098	UJ	***0.52***	J	***0.46***	J	***2.2***		0.084	J	< 0.0093	UJ
Benzo[a]pyrene	mg/kg	8270	2.1	4.3	4.8	< 0.0091		< 0.0084	UJ	< 0.0078	UJ	0.55	J	0.49	J	1.5		0.084	J	< 0.0074	UJ

TABLE A-4
ANALYTICAL AND SCREENING RESULTS
SUBSURFACE SOIL
CAA VIM AND VIIM
MINGO JUNCTION STEEL WORKS LLC - WEIRTON FACILITY

Constituent	Units	Analytical Method	Screening Criteria [1]			Sample Information [2]						
			Industrial Soil RSL	Industrial Soil De Minimis	*Protection of Groundwater RSL*	VII-MW-03A(21-22) 10/15/2013	VII-MW-01P(11-12) 10/11/2013	VII-MW-02P(12-14) 10/21/2013	VII-MW-03P(8-10) 10/30/2013	VII-MW-03P(10-12) 10/30/2013	VII-SB-101(18-20) 10/23/2013	VII-SB-102(6-8) 10/28/2013	VII-SB-102(40-42) 10/29/2013
Benzo[b]fluoranthene	mg/kg	8270	21	43	6	< 0.014	< 0.013 UJ	< 0.012 UJ	0.78 J	0.58 J	1.8	0.099 J	< 0.012 UJ
Benzo[g,h,i]perylene [1]	mg/kg	8270	2300	33000	26	< 0.009	< 0.0083 UJ	< 0.0078 UJ	0.39 J	0.27 J	0.75	0.078 J	< 0.0074 UJ
Benzo[k]fluoranthene	mg/kg	8270	210	430	58	< 0.018	< 0.017 UJ	< 0.016 UJ	0.38 J	0.2 J	0.99	0.075 J	< 0.015 UJ
Chrysene	mg/kg	8270	2100	4300	180	< 0.011	< 0.01 UJ	< 0.0093 UJ	0.58 J	0.61 J	1.8	0.11 J	< 0.0089 UJ
Dibenz(a,h)anthracene	mg/kg	8270	2.1	4.3	1.92	< 0.01	< 0.0093 UJ	< 0.0087 UJ	0.095 J	< 0.044 UJ	0.26 J	< 0.0081 UJ	< 0.0083 UJ
Fluoranthene	mg/kg	8270	3000	44000	178	< 0.0097	0.036 J	< 0.0083 UJ	0.36 J	1.6 J	5.1	0.16 J	< 0.008 UJ
Fluorene	mg/kg	8270	3000	62000	10.8	< 0.012	0.15 J	0.012 J	< 0.01 UJ	3 J	1.1	0.0099 J	< 0.0098 UJ
Indeno[1,2,3-cd]pyrene	mg/kg	8270	21	43	19.6	< 0.0093	< 0.0086 UJ	< 0.008 UJ	0.34 J	0.26 J	0.69	0.069 J	< 0.0077 UJ
Naphthalene	mg/kg	8270	8.6	180	0.0076	< 0.0078	< 0.0072 UJ	< 0.0067 UJ	< 0.0066 UJ	***1.6*** J	***0.073*** J	***0.11*** J	< 0.0064 UJ
Phenanthrene [1]	mg/kg	8270	23000	700000	116	0.039 J	0.38 J	0.016 J	< 0.012 UJ	7 J	5.5	0.15 J	< 0.012 UJ
Pyrene	mg/kg	8270	2300	66000	26	0.02 J	0.066 J	< 0.0079 UJ	2.3 J	2 J	4.5 J	0.14 J	< 0.0075 UJ
1,1'-Biphenyl	mg/kg	8270	20	210	0.0174	< 0.04	***0.065*** J	< 0.035 UJ	< 0.034 UJ	< 0.18 UJ	NA	< 0.033 UJ	< 0.033 UJ
2,4,5-Trichlorophenol	mg/kg	8270	8200	130000	8	< 0.048	< 0.045 UJ	< 0.042 UJ	< 0.041 UJ	< 0.21 UJ	NA	< 0.039 UJ	< 0.04 UJ
2,4,6-Trichlorophenol	mg/kg	8270	82	1300	0.024	< 0.068	< 0.063 UJ	< 0.058 UJ	< 0.057 UJ	< 0.3 UJ	NA	< 0.055 UJ	< 0.056 UJ
2,4-Dichlorophenol	mg/kg	8270	250	3800	0.046	< 0.0091	< 0.0084 UJ	< 0.0078 UJ	< 0.0076 UJ	< 0.04 UJ	NA	< 0.0073 UJ	< 0.0075 UJ
2,4-Dimethylphenol	mg/kg	8270	1600	25000	0.84	< 0.071	< 0.065 UJ	< 0.061 UJ	< 0.059 UJ	< 0.31 UJ	NA	< 0.057 UJ	< 0.058 UJ
2,4-Dinitrophenol	mg/kg	8270	160	2500	0.088	< 0.54 UJ	< 0.5 UJ	< 0.46 UJ	< 0.45 UJ	< 2.4 UJ	NA	< 0.44 UJ	< 0.44 UJ
2,4-Dinitrotoluene	mg/kg	8270	7.4	110	0.0064	< 0.037	< 0.034 UJ	< 0.031 UJ	< 0.031 UJ	< 0.16 UJ	NA	< 0.03 UJ	< 0.03 UJ
2,6-Dinitrotoluene	mg/kg	8270	1.5	24	0.00134	< 0.047	< 0.043 UJ	< 0.04 UJ	< 0.039 UJ	< 0.2 UJ	NA	< 0.038 UJ	< 0.038 UJ
2-Chloronaphthalene	mg/kg	8270	6000	67000	7.8	< 0.0094	< 0.0087 UJ	< 0.0081 UJ	< 0.0079 UJ	< 0.041 UJ	NA	< 0.0076 UJ	< 0.0078 UJ
2-Chlorophenol	mg/kg	8270	580	5500	0.178	< 0.037	< 0.034 UJ	< 0.032 UJ	< 0.031 UJ	< 0.16 UJ	NA	< 0.03 UJ	< 0.03 UJ
2-Methylnaphthalene	mg/kg	8270	300	9300	0.38	0.0089 J	***0.42*** J	< 0.007 UJ	< 0.0068 UJ	***11*** J	NA	0.16 J	< 0.0067 UJ
2-Methylphenol	mg/kg	8270	4100	63000	1.5	< 0.032	< 0.029 UJ	< 0.027 UJ	< 0.027 UJ	< 0.14 UJ	NA	< 0.026 UJ	< 0.026 UJ
2-Nitroaniline	mg/kg	8270	800	12000	0.16	< 0.2	< 0.19 UJ	< 0.17 UJ	< 0.17 UJ	< 0.88 UJ	NA	< 0.16 UJ	< 0.17 UJ
2-Nitrophenol	mg/kg	8270	- -	- -	- -	< 0.05	< 0.046 UJ	< 0.043 UJ	< 0.042 UJ	< 0.22 UJ	NA	< 0.04 UJ	< 0.041 UJ
3,3'-Dichlorobenzidine	mg/kg	8270	5.1	79	0.0164	< 0.048	< 0.044 UJ	< 0.041 UJ	< 0.04 UJ	< 0.21 UJ	NA	< 0.039 UJ	< 0.039 UJ
Methylphenol, 3 & 4 [1]	mg/kg	8270	4100	63000	1.48	< 0.044	< 0.041 UJ	< 0.038 UJ	< 0.037 UJ	< 0.19 UJ	NA	< 0.036 UJ	< 0.036 UJ
3-Nitroaniline	mg/kg	8270	- -	- -	- -	< 0.19	< 0.17 UJ	< 0.16 UJ	< 0.16 UJ	< 0.81 UJ	NA	< 0.15 UJ	< 0.15 UJ
4,6-Dinitro-2-methylphenol	mg/kg	8270	6.6	- -	0.0052	< 0.18	< 0.17 UJ	< 0.16 UJ	< 0.15 UJ	< 0.79 UJ	NA	< 0.15 UJ	< 0.15 UJ
4-Bromophenyl phenyl ether	mg/kg	8270	- -	- -	- -	< 0.039	< 0.036 UJ	< 0.034 UJ	< 0.033 UJ	< 0.17 UJ	NA	< 0.032 UJ	< 0.032 UJ
4-Chloro-3-methylphenol	mg/kg	8270	8200	- -	3.4	< 0.042	< 0.039 UJ	< 0.036 UJ	< 0.035 UJ	< 0.18 UJ	NA	< 0.034 UJ	< 0.034 UJ
4-Chloroaniline	mg/kg	8270	11	180	0.0032	< 0.036	< 0.033 UJ	< 0.031 UJ	< 0.03 UJ	< 0.16 UJ	NA	< 0.029 UJ	< 0.03 UJ
4-Chlorophenyl phenyl ether	mg/kg	8270	- -	- -	- -	< 0.05	< 0.046 UJ	< 0.043 UJ	< 0.042 UJ	< 0.22 UJ	NA	< 0.041 UJ	< 0.041 UJ
4-Nitroaniline	mg/kg	8270	110	- -	0.032	< 0.18	< 0.17 UJ	< 0.16 UJ	< 0.15 UJ	< 0.8 UJ	NA	< 0.15 UJ	< 0.15 UJ
4-Nitrophenol	mg/kg	8270	- -	- -	- -	< 0.17	< 0.15 UJ	< 0.14 UJ	< 0.14 UJ	< 0.72 UJ	NA	< 0.13 UJ	< 0.14 UJ
Acetophenone	mg/kg	8270	12000	2500	1.16	< 0.037	< 0.034 UJ	< 0.032 UJ	< 0.031 UJ	< 0.16 UJ	NA	< 0.03 UJ	< 0.031 UJ
Atrazine	mg/kg	8270	10	150	0.038	< 0.044	< 0.041 UJ	< 0.038 UJ	< 0.037 UJ	< 0.19 UJ	NA	< 0.036 UJ	< 0.036 UJ
Benzaldehyde	mg/kg	8270	820	1200	0.082	< 0.068 UJ	< 0.063 UJ	< 0.058 UJ	< 0.057 UJ	< 0.3 UJ	NA	< 0.055 UJ	< 0.056 UJ
Bis(2-chloroisopropyl)ether	mg/kg	8270	4700	310	0.52	< 0.0098	< 0.009 UJ	< 0.0084 UJ	< 0.0082 UJ	< 0.043 UJ	NA	< 0.0079 UJ	< 0.008 UJ
Bis(2-chloroethoxy)methane	mg/kg	8270	250	- -	0.026	< 0.03	< 0.028 UJ	< 0.026 UJ	< 0.025 UJ	< 0.13 UJ	NA	< 0.024 UJ	< 0.024 UJ
Bis(2-chloroethyl)ether	mg/kg	8270	1	13	0.000072	< 0.012	< 0.011 UJ	< 0.01 UJ	< 0.01 UJ	< 0.053 UJ	NA	< 0.0098 UJ	< 0.01 UJ
Bis(2-ethylhexyl) phthalate	mg/kg	8270	160	2500	28	< 0.073	< 0.068 UJ	< 0.063 UJ	0.1 J	< 0.32 UJ	NA	< 0.059 UJ	< 0.06 UJ
Butyl benzyl phthalate	mg/kg	8270	1200	19000	4.8	< 0.062	< 0.057 UJ	< 0.053 UJ	< 0.052 UJ	< 0.27 UJ	NA	< 0.05 UJ	< 0.051 UJ
Caprolactam	mg/kg	8270	40000	600000	5	< 0.34	< 0.32 UJ	< 0.29 UJ	< 0.29 UJ	< 1.5 UJ	NA	< 0.28 UJ	< 0.28 UJ
Carbazole [1]	mg/kg	8270	23000	700000	116	< 0.0083	< 0.0077 UJ	< 0.0072 UJ	< 0.007 UJ	< 0.036 UJ	NA	< 0.0067 UJ	< 0.0069 UJ
Dibenzofuran	mg/kg	8270	120	2300	0.3	< 0.045	< 0.041 UJ	< 0.038 UJ	< 0.037 UJ	< 0.19 UJ	NA	0.054 J	< 0.037 UJ
Diethyl phthalate	mg/kg	8270	66000	1000000	12.2	< 0.049	< 0.046 UJ	< 0.043 UJ	< 0.042 UJ	< 0.22 UJ	NA	< 0.04 UJ	< 0.041 UJ
Dimethyl phthalate	mg/kg	8270	- -	- -	- -	< 0.049	< 0.046 UJ	< 0.042 UJ	< 0.041 UJ	< 0.22 UJ	NA	< 0.04 UJ	< 0.041 UJ
Di-n-butyl phthalate	mg/kg	8270	8200	130000	4.6	< 0.057	< 0.052 UJ	< 0.049 UJ	< 0.048 UJ	< 0.25 UJ	NA	< 0.046 UJ	< 0.047 UJ
Di-n-octyl phthalate	mg/kg	8270	820	- -	114	< 0.048	< 0.044 UJ	< 0.041 UJ	< 0.04 UJ	< 0.21 UJ	NA	< 0.039 UJ	< 0.039 UJ
Hexachlorobenzene	mg/kg	8270	0.96	13	0.26	< 0.0096	< 0.0089 UJ	< 0.0083 UJ	< 0.0081 UJ	< 0.042 UJ	NA	< 0.0078 UJ	< 0.0079 UJ
Hexachlorobutadiene	mg/kg	8270	5.3	17	0.0054	< 0.01	< 0.0094 UJ	< 0.0087 UJ	< 0.0085 UJ	< 0.044 UJ	NA	< 0.0082 UJ	< 0.0083 UJ
Hexachlorocyclopentadiene	mg/kg	8270	0.75	8	3.2	< 0.049	< 0.045 UJ	< 0.042 UJ	< 0.041 UJ	< 0.21 UJ	NA	< 0.039 UJ	< 0.04 UJ
Hexachloroethane	mg/kg	8270	8	91	0.004	< 0.033	< 0.03 UJ	< 0.028 UJ	< 0.027 UJ	< 0.14 UJ	NA	< 0.026 UJ	< 0.027 UJ
Isophorone	mg/kg	8270	2400	37000	0.52	< 0.034	< 0.032 UJ	< 0.029 UJ	< 0.029 UJ	< 0.15 UJ	NA	< 0.028 UJ	< 0.028 UJ
Nitrobenzene	mg/kg	8270	22	240	0.00184	< 0.038	< 0.035 UJ	< U UJ	< 0.032 UJ	< 0.16 UJ	NA	< 0.03 UJ	< 0.031 UJ

TABLE A-4
ANALYTICAL AND SCREENING RESULTS
SUBSURFACE SOIL
CAA VIM AND VIIM
MINGO JUNCTION STEEL WORKS LLC - WEIRTON FACILITY

			Screening Criteria [1]			Sample Information [2]																							
						VII-MW-03A(21-22) 10/15/2013			VII-MW-01P(11-12) 10/11/2013			VII-MW-02P(12-14) 10/21/2013			VII-MW-03P(8-10) 10/30/2013			VII-MW-03P(10-12) 10/30/2013			VII-SB-101(18-20) 10/23/2013			VII-SB-102(6-8) 10/28/2013			VII-SB-102(40-42) 10/29/2013		
Constituent	**Units**	**Analytical Method**	**Industrial Soil RSL**	**Industrial Soil De Minimis**	***Protection of Groundwater RSL***																								
N-Nitrosodi-n-propylamine	mg/kg	8270	0.33	5.1	0.000162	<	0.011		<	0.0098	UJ	<	0.0091	UJ	<	0.0089	UJ	<	0.046	UJ	NA		<	0.0086	UJ	<	0.0087	UJ
N-Nitrosodiphenylamine	mg/kg	8270	470	7200	1.34	<	0.042		<	0.039	UJ	<	0.036	UJ	<	0.035	UJ	<	0.18	UJ	NA		<	0.034	UJ	<	0.034	UJ
Pentachlorophenol	mg/kg	8270	4	52	0.028	<	0.04	UJ	<	0.037	UJ	<	0.035	UJ	<	0.034	UJ	<	0.18	UJ	NA		<	0.033	UJ	<	0.033	UJ
Phenol	mg/kg	8270	25000	380000	6.6	<	0.011		<	0.0099	UJ	<	0.0092	UJ	<	0.009	UJ	<	0.047	UJ	NA		<	0.0087	UJ	<	0.0088	UJ
Polychlorinated Biphenyls																													
PCB-1016	mg/kg	8082	5.1	160	0.26	<	0.0033		<	0.003		<	0.0029		<	0.0028	UJ	<	0.0029	UJ	NA		<	0.0027	UJ	<	0.0028	UJ
PCB-1221	mg/kg	8082	0.83	19	0.0016	<	0.0043		<	0.0038		<	0.0037		<	0.0037	UJ	<	0.0038	UJ	NA		<	0.0035	UJ	<	0.0035	UJ
PCB-1232	mg/kg	8082	0.72	14	0.0016	<	0.0038		<	0.0034		<	0.0033		<	0.0033	UJ	<	0.0034	UJ	NA		<	0.0032	UJ	<	0.0032	UJ
PCB-1242	mg/kg	8082	0.95	26	0.024	<	0.0037		<	0.0033		<	0.0032		<	0.0031	UJ	<	0.0032	UJ	NA		<	0.003	UJ	<	0.003	UJ
PCB-1248	mg/kg	8082	0.94	27	0.024	<	0.0021		<	0.0019		<	0.0018		<	0.0018	UJ	<	0.0019	UJ	NA		<	0.0017	UJ	<	0.0018	UJ
PCB-1254	mg/kg	8082	0.97	28	0.04	<	0.0032		<	0.0029		<	0.0028		<	0.0027	UJ	<	0.0028	UJ	NA		<	0.0026	UJ	<	0.0026	UJ
PCB-1260	mg/kg	8082	0.99	30	0.11	<	0.0032		<	0.0029		<	0.0028		<	0.0027	UJ	<	0.0028	UJ	NA		<	0.0026	UJ	<	0.0026	UJ
Inorganics																													
Aluminum	mg/kg	6020	110000	1000000	60000		5200	K		9800	K		11000	K		32000	K		30000	K	NA			13000	K		3100	K
Antimony	mg/kg	6020	47	930	5.4		0.1	L		0.11	L		0.21	J		0.016	J		0.024	J	NA			0.26	L		0.13	J
Arsenic	mg/kg	6020	3	35	5.8		3.7	L		3	J		***6.4***			0.58	K		0.79	K	NA			5.5	K		3.3	K
Barium	mg/kg	6020	22000	400000	1640		76			89			81			320	J		270	J	NA			120	J		34	
Beryllium	mg/kg	6020	230	4500	64		0.38	L		1.3	L		0.69	L		7.5	J		7.1	J	NA			1.6	J		0.27	
Cadmium	mg/kg	6020	98	980	7.6		0.22			0.4			0.35			0.44	J		0.48	J	NA			0.92	J		0.24	
Calcium	mg/kg	6020	- -	- -	- -		2400	K		31000	K		3400			190000			170000		NA			62000	J		830	
Chromium [1]	mg/kg	6020	180000	1000000	3600000		14			66			19			15	J		48	J	NA			92	J		5.4	
Cobalt	mg/kg	6020	35	690	0.54		***6.6***			***6.7***			***13***			***1.4***	J		***1.8***	J	NA			***3.8***	J		***3.6***	
Copper	mg/kg	6020	4700	93000	920		18			20	K		19	K		2.4	K		4.4	K	NA			20	K		9.8	K
Iron	mg/kg	6020	82000	1000000	700		***23000***			***29000***	K		***29000***	K		***30000***	J		***50000***	J	NA			***30000***	J		***14000***	
Lead	mg/kg	6020	800	1000	280		9.6			13			14			0.35	J		1.5	J	NA			78	J		7.3	
Magnesium	mg/kg	6020	- -	- -	- -		1600	K		9600	K		3600			56000	J		60000	J	NA			15000	L		740	
Manganese [1]	mg/kg	6020	2600	80000	56		***230***			***1700***			***780***			***1800***	J		***4000***		NA			***4800***			***5200***	
Mercury	mg/kg	7471	4.6	3.1	2		0.036	J		0.018	J		0.033	K	<	0.012		<	0.012		NA			0.33			0.033	
Nickel	mg/kg	6020	2200	43000	52		16	K		17	K		24	K		0.87	J		3	J	NA			8.8	J		14	
Potassium	mg/kg	6020	- -	- -	- -		720			910			1100	K		1700	L		1300	L	NA			720	L		440	L
Selenium	mg/kg	6020	580	12000	5.2		0.18	J		0.14	J		0.52	J		2.3	K		1.6	K	NA			0.9	K		0.29	K
Silver	mg/kg	6020	580	12000	1.6		0.013	J		0.24			0.027	K		0.061	K		0.067	K	NA			0.071	K		0.0072	K
Sodium	mg/kg	6020	- -	- -	- -		75	J		200			58			1100	L		910	L	NA			250	L		37	L
Thallium	mg/kg	6020	1.2	23	2.8		0.095	J		0.15			0.16			0.0023	J		0.0053	J	NA			0.075	J		0.058	J
Vanadium	mg/kg	6020	580	160	172		10	J		26	J		21			3	J		39	J	NA			21	K		7.6	
Zinc	mg/kg	6020	35000	700000	740		46	K		51	K		51	K		1.9	K		9.2	K	NA			200	K		26	K
Other Parameters																													
Cyanide, Total	mg/kg	9012	15	170	40	<	0.13		<	0.12		<	0.12	J		3.7			1.6		NA			0.25	J		0.67	
Total Organic Carbon	mg/kg	WALKLEY	- -	- -	- -		1800			4200			1900			12000			7000		NA			8200		<	75	
Percent Moisture	%	- -	- -	- -	- -		26			20			15			13			16		15			9.5			10	
Percent Solids	%	MCAWW 16	- -	- -	- -		NA			NA			NA			NA			NA		NA			NA			NA	

TABLE A-4
ANALYTICAL AND SCREENING RESULTS
SUBSURFACE SOIL
CAA VIM AND VIIM
MINGO JUNCTION STEEL WORKS LLC - WEIRTON FACILITY

Constituent	Units	Analytical Method	Screening Criteria [1]			Sample Information [2]							
			Industrial Soil RSL	Industrial Soil De Minimis	*Protection of Groundwater RSL*	VII-SB-103(36-38) 10/29/2013	VII-SB-104(6-8) 10/24/2013	VII-SB-104(38-40) 10/25/2013	VII-SB-105(6-8) 10/25/2013	VII-SB-105(36-38) 10/28/2013	VII-SB-107(4-6) 10/23/2013	VII-SB-107(44-46) 10/24/2013	VII-SB-109(4-6) 10/22/2013
Volatile Organic Compounds													
Benzene	mg/kg	8260	5.1	57	0.052	< 0.00074	< 0.061	< 0.055	< 0.059	< 0.055	< 0.056	< 0.058	< 0.0009
Toluene	mg/kg	8260	4700	820	13.8	< 0.00079	< 0.052	< 0.047	< 0.051	< 0.047	< 0.047	< 0.049	0.0052 J
Ethylbenzene	mg/kg	8260	25	280	15.6	< 0.0007	< 0.038	< 0.035	< 0.037	< 0.035	< 0.035	< 0.036	0.0053 J
Xylenes, Total	mg/kg	8260	250	260	198	< 0.0024	< 0.12	< 0.11	< 0.12	< 0.11	< 0.11	< 0.11	0.037
1,1,1-Trichloroethane	mg/kg	8260	3600	640	5.6	< 0.00053	< 0.063	< 0.058	< 0.062	< 0.057	< 0.058	< 0.06	NA
1,1,2,2-Tetrachloroethane	mg/kg	8260	2.7	31	0.0006	< 0.00078	< 0.057	< 0.052	< 0.056	< 0.052	< 0.052	< 0.054	NA
1,1,2-Trichloro-1,2,2-trifluoroethane	mg/kg	8260	2800	910	52	< 0.0012	< 0.02	< 0.019	< 0.02	< 0.018	< 0.019	< 0.019	NA
1,1,2-Trichloroethane	mg/kg	8260	0.63	6.8	0.032	< 0.00091	< 0.071	< 0.065	< 0.07	< 0.065	< 0.065	< 0.068	NA
1,1-Dichloroethane	mg/kg	8260	16	170	0.0156	< 0.00063	< 0.062	< 0.057	< 0.061	< 0.056	< 0.057	< 0.059	NA
1,1-Dichloroethene	mg/kg	8260	100	1100	0.2	< 0.00092	< 0.065	< 0.06	< 0.064	< 0.059	< 0.06	< 0.062	NA
1,2,4-Trichlorobenzene	mg/kg	8260	26	280	4	< 0.00096	< 0.023	< 0.021	< 0.023	< 0.021	< 0.021	< 0.022	NA
1,2-Dibromo-3-Chloropropane	mg/kg	8260	0.064	0.7	0.00172	< 0.00082	< 0.022	< 0.02	< 0.021	< 0.02	< 0.02	< 0.02	NA
1,2-Dibromoethane (EDB)	mg/kg	8260	0.16	1.8	0.00028	< 0.00094	< 0.038	< 0.034	< 0.037	< 0.034	< 0.034	< 0.036	NA
1,2-Dichlorobenzene	mg/kg	8260	930	380	11.6	< 0.00087	< 0.042	< 0.038	< 0.041	< 0.038	< 0.038	< 0.04	NA
1,2-Dichloroethane	mg/kg	8260	2	23	0.028	< 0.00067	< 0.059	< 0.054	< 0.058	< 0.053	< 0.054	< 0.056	NA
1,2-Dichloroethene, Total	mg/kg	8260	- -	- -	- -	< 0.0014	< 0.058	< 0.053	< 0.057	< 0.053	< 0.053	< 0.055	NA
cis-1,2-Dichloroethene	mg/kg	8260	230	81	0.42	< 0.00077	< 0.041	< 0.037	< 0.04	< 0.037	< 0.037	< 0.039	NA
trans-1,2-Dichloroethene	mg/kg	8260	2300	570	0.62	< 0.00065	< 0.046	< 0.042	< 0.045	< 0.042	< 0.042	< 0.044	NA
1,2-Dichloropropane	mg/kg	8260	6.6	49	0.034	< 0.00059	< 0.078	< 0.071	< 0.077	< 0.071	< 0.072	< 0.074	NA
cis-1,3-Dichloropropene [1]	mg/kg	8260	8.2	99	0.0034	< 0.00074	< 0.045	< 0.041	< 0.044	< 0.04	< 0.041	< 0.042	NA
trans-1,3-Dichloropropene [1]	mg/kg	8260	8.2	99	0.0034	< 0.00065	< 0.036	< 0.033	< 0.035	< 0.032	< 0.033	< 0.034	NA
1,3-Dichlorobenzene [1]	mg/kg	8260	11	120	1.44	< 0.00071	< 0.031	< 0.028	< 0.03	< 0.028	< 0.028	< 0.029	NA
1,4-Dichlorobenzene	mg/kg	8260	11	120	1.44	< 0.00069	< 0.032	< 0.029	< 0.032	< 0.029	< 0.03	< 0.031	NA
2-Butanone (MEK)	mg/kg	8260	19000	28000	2.4	< 0.00096	< 0.067	< 0.061	< 0.065	< 0.06	< 0.061	< 0.063	NA
2-Hexanone	mg/kg	8260	130	- -	0.0176	< 0.00075	< 0.035	< 0.032	< 0.034	< 0.032	< 0.032	< 0.033	NA
4-Methyl-2-pentanone (MIBK)	mg/kg	8260	14000	3400	2.8	< 0.00071	< 0.036	< 0.033	< 0.035	< 0.033	< 0.033	< 0.034	NA
Acetone	mg/kg	8260	67000	110000	5.8	< 0.0054	< 0.31	< 0.28	< 0.3	< 0.28	< 0.28	< 0.29	NA
Bromoform	mg/kg	8260	86	910	0.42	< 0.00048	< 0.066	< 0.06	< 0.064	< 0.06	< 0.06	< 0.062	NA
Bromomethane	mg/kg	8260	3	33	0.0038	< 0.0008	< 0.097	< 0.088	< 0.095	< 0.088	< 0.089	< 0.092	NA
Carbon disulfide	mg/kg	8260	350	740	0.48	< 0.00056	< 0.066	< 0.06	< 0.064	< 0.06	< 0.06	< 0.063	NA
Carbon tetrachloride	mg/kg	8260	2.9	32	0.038	< 0.00049	< 0.066	< 0.061	< 0.065	< 0.06	< 0.061	< 0.063	NA
Chlorobenzene	mg/kg	8260	130	760	1.36	< 0.00082	< 0.032	< 0.029	< 0.032	< 0.029	< 0.03	< 0.031	NA
Chlorodibromomethane	mg/kg	8260	39	780	0.42	< 0.00077	< 0.04	< 0.036	< 0.039	< 0.036	< 0.036	< 0.038	NA
Chloroethane	mg/kg	8260	5700	2100	11.8	< 0.0017	< 0.046	< 0.042	< 0.045	< 0.042	< 0.042	< 0.043	NA
Chloroform	mg/kg	8260	1.4	15	0.44	< 0.00064	< 0.062	< 0.056	< 0.06	< 0.056	< 0.057	< 0.059	NA
Chloromethane	mg/kg	8260	46	500	0.098	< 0.00093	< 0.085	< 0.078	< 0.083	< 0.078	< 0.078	< 0.081	NA
Cyclohexane	mg/kg	8260	2700	120	26	< 0.0004	< 0.037	< 0.033	< 0.036	< 0.033	< 0.034	< 0.035	NA
Dichlorobromomethane	mg/kg	8260	1.3	14	0.44	< 0.00061	< 0.057	< 0.052	< 0.056	< 0.052	< 0.052	< 0.054	NA
Dichlorodifluoromethane	mg/kg	8260	37	400	0.6	< 0.00073	< 0.039	< 0.036	< 0.038	< 0.035	< 0.036	< 0.037	NA
Isopropylbenzene	mg/kg	8260	990	270	1.48	< 0.00074	< 0.033	< 0.03	< 0.032	< 0.03	< 0.03	< 0.031	NA
Methyl acetate	mg/kg	8260	120000	29000	8.2	< 0.00098	< 0.075	< 0.069	< 0.074	< 0.068	< 0.069	< 0.071	NA
Methyl tert-butyl ether	mg/kg	8260	210	2300	0.064	< 0.00081	< 0.063	< 0.057	< 0.062	< 0.057	< 0.058	< 0.06	NA
Methylcyclohexane [1]	mg/kg	8260	2700	120	26	< 0.00079	< 0.034	< 0.031	< 0.033	< 0.031	< 0.031	< 0.032	NA
Methylene Chloride	mg/kg	8260	320	3300	0.054	0.0035 B	< 0.067	***0.089*** J	***0.089*** J	< 0.061	< 0.061	< 0.063	NA
Naphthalene	mg/kg	8260	8.6	180	0.0076	NA	NA	NA	NA	NA	NA	NA	NA
Styrene	mg/kg	8260	3500	870	2.6	< 0.00077	< 0.039	< 0.036	< 0.038	< 0.036	< 0.036	< 0.037	NA
Tetrachloroethene	mg/kg	8260	39	170	0.046	< 0.00074	< 0.051	< 0.046	< 0.05	< 0.046	< 0.046	< 0.048	NA
Trichloroethene	mg/kg	8260	1.9	20	0.036	< 0.00072	< 0.049	< 0.045	< 0.048	< 0.045	< 0.045	< 0.047	NA
Trichlorofluoromethane	mg/kg	8260	35000	1200	6.6	< 0.001	< 0.069	< 0.063	< 0.067	< 0.062	< 0.063	< 0.065	NA
Vinyl chloride	mg/kg	8260	1.7	22	0.0138	< 0.00051	< 0.079	< 0.072	< 0.077	< 0.072	< 0.072	< 0.075	NA
Semi-Volatile Organic Compounds													
Acenaphthene	mg/kg	8270	4500	70000	11	< 0.007 UJ	< 0.0078 UJ	< 0.0072	< 0.0077	< 0.0071	0.047 J	< 0.0075 UJ	0.76
Acenaphthylene [1]	mg/kg	8270	4500	80000	11	< 0.0084 UJ	< 0.0093 UJ	< 0.0086	< 0.0091	< 0.0085	0.039 J	< 0.0089 UJ	< 0.01
Anthracene	mg/kg	8270	23000	700000	116	< 0.0072 UJ	< 0.008 UJ	< 0.0073	< 0.0078	< 0.0072	0.22 J	< 0.0076 UJ	0.36
Benzo[a]anthracene	mg/kg	8270	21	88	0.22	< 0.0092 UJ	< 0.01 UJ	< 0.0094	< 0.01	< 0.0093	***0.39*** J	< 0.0097 UJ	***0.75***
Benzo[a]pyrene	mg/kg	8270	2.1	4.3	4.8	< 0.0073 UJ	< 0.0081 UJ	< 0.0075	< 0.008	< 0.0074	0.35 J	< 0.0078 UJ	0.45

TABLE A-4
ANALYTICAL AND SCREENING RESULTS
SUBSURFACE SOIL
CAA VIM AND VIIM
MINGO JUNCTION STEEL WORKS LLC - WEIRTON FACILITY

Constituent	Units	Analytical Method	Screening Criteria [1]			Sample Information [2]																							
			Industrial Soil RSL	Industrial Soil De Minimis	*Protection of Groundwater RSL*	VII-SB-103(36-38) 10/29/2013			VII-SB-104(6-8) 10/24/2013			VII-SB-104(38-40) 10/25/2013			VII-SB-105(6-8) 10/25/2013			VII-SB-105(36-38) 10/28/2013			VII-SB-107(4-6) 10/23/2013			VII-SB-107(44-46) 10/24/2013			VII-SB-109(4-6) 10/22/2013		
Benzo[b]fluoranthene	mg/kg	8270	21	43	6	<	0.012	UJ	<	0.013	UJ	<	0.012		<	0.013		<	0.012			0.48	J	<	0.012	UJ		0.53	
Benzo[g,h,i]perylene [1]	mg/kg	8270	2300	33000	26	<	0.0073	UJ	<	0.0081	UJ	<	0.0074		<	0.0079		<	0.0074			0.29	J	<	0.0077	UJ		0.35	
Benzo[k]fluoranthene	mg/kg	8270	210	430	58	<	0.015	UJ	<	0.016	UJ	<	0.015		<	0.016		<	0.015			0.21	J	<	0.016	UJ		0.32	
Chrysene	mg/kg	8270	2100	4300	180	<	0.0087	UJ	<	0.0097	UJ	<	0.0089		<	0.0095		<	0.0088			0.44	J	<	0.0093	UJ		0.85	
Dibenz(a,h)anthracene	mg/kg	8270	2.1	4.3	1.92	<	0.0081	UJ	<	0.009	UJ	<	0.0083		<	0.0089		<	0.0082			0.078	J	<	0.0086	UJ		0.087	J
Fluoranthene	mg/kg	8270	3000	44000	178	<	0.0078	UJ	<	0.0087	UJ	<	0.008		<	0.0085		<	0.0079			0.87	J	<	0.0083	UJ		2	
Fluorene	mg/kg	8270	3000	62000	10.8	<	0.0096	UJ	<	0.011	UJ	<	0.0099		<	0.01		<	0.0097			0.059	J	<	0.01	UJ		0.84	
Indeno[1,2,3-cd]pyrene	mg/kg	8270	21	43	19.6	<	0.0075	UJ	<	0.0084	UJ	<	0.0077		<	0.0082		<	0.0076			0.24	J	<	0.008	UJ		0.3	
Naphthalene	mg/kg	8270	8.6	180	0.0076		***0.029***	J	<	0.007	UJ	<	0.0064		<	0.0069		<	0.0064			***0.07***	J	<	0.0067	UJ		***0.42***	
Phenanthrene [1]	mg/kg	8270	23000	700000	116	<	0.012	UJ	<	0.013	UJ	<	0.012		<	0.013		<	0.012			0.65	J	<	0.012	UJ		2.4	
Pyrene	mg/kg	8270	2300	66000	26	<	0.0074	UJ	<	0.0082	UJ	<	0.0076		<	0.0081		<	0.0075			0.8	J	<	0.0079	UJ		2.5	J
1,1'-Biphenyl	mg/kg	8270	20	210	0.0174	<	0.033	UJ	<	0.036	UJ	<	0.033		<	0.036		<	0.033		<	0.033	UJ	<	0.035	UJ		NA	
2,4,5-Trichlorophenol	mg/kg	8270	8200	130000	8	<	0.039	UJ	<	0.043	UJ	<	0.04		<	0.043		<	0.039		<	0.04	UJ	<	0.041	UJ		NA	
2,4,6-Trichlorophenol	mg/kg	8270	82	1300	0.024	<	0.055	UJ	<	0.061	UJ	<	0.056		<	0.06		<	0.055		<	0.056	UJ	<	0.058	UJ		NA	
2,4-Dichlorophenol	mg/kg	8270	250	3800	0.046	<	0.0073	UJ	<	0.0082	UJ	<	0.0075		<	0.008		<	0.0074		<	0.0075	UJ	<	0.0078	UJ		NA	
2,4-Dimethylphenol	mg/kg	8270	1600	25000	0.84	<	0.057	UJ	<	0.064	UJ	<	0.059		<	0.062		<	0.058		<	0.059	UJ	<	0.061	UJ		NA	
2,4-Dinitrophenol	mg/kg	8270	160	2500	0.088	<	0.44	UJ	<	0.48	UJ	<	0.45		<	0.47		<	0.44		<	0.45	UJ	<	0.46	UJ		NA	
2,4-Dinitrotoluene	mg/kg	8270	7.4	110	0.0064	<	0.03	UJ	<	0.033	UJ	<	0.03		<	0.032		<	0.03		<	0.03	UJ	<	0.031	UJ		NA	
2,6-Dinitrotoluene	mg/kg	8270	1.5	24	0.00134	<	0.038	UJ	<	0.042	UJ	<	0.039		<	0.041		<	0.038		<	0.039	UJ	<	0.04	UJ		NA	
2-Chloronaphthalene	mg/kg	8270	6000	67000	7.8	<	0.0076	UJ	<	0.0085	UJ	<	0.0078		<	0.0083		<	0.0077		<	0.0078	UJ	<	0.0081	UJ		NA	
2-Chlorophenol	mg/kg	8270	580	5500	0.178	<	0.03	UJ	<	0.033	UJ	<	0.031		<	0.033		<	0.03		<	0.031	UJ	<	0.032	UJ		NA	
2-Methylnaphthalene	mg/kg	8270	300	9300	0.38		0.031	J	<	0.0073	UJ	<	0.0067		<	0.0072		<	0.0066			0.13	J	<	0.007	UJ		NA	
2-Methylphenol	mg/kg	8270	4100	63000	1.5	<	0.026	UJ	<	0.028	UJ	<	0.026		<	0.028		<	0.026		<	0.026	UJ	<	0.027	UJ		NA	
2-Nitroaniline	mg/kg	8270	800	12000	0.16	<	0.16	UJ	<	0.18	UJ	<	0.17		<	0.18		<	0.17		<	0.17	UJ	<	0.17	UJ		NA	
2-Nitrophenol	mg/kg	8270	- -	- -	- -	<	0.04	UJ	<	0.045	UJ	<	0.041		<	0.044		<	0.041		<	0.041	UJ	<	0.043	UJ		NA	
3,3'-Dichlorobenzidine	mg/kg	8270	5.1	79	0.0164	<	0.039	UJ	<	0.043	UJ	<	0.04		<	0.042		<	0.039		<	0.04	UJ	<	0.041	UJ		NA	
Methylphenol, 3 & 4 [1]	mg/kg	8270	4100	63000	1.48	<	0.036	UJ	<	0.04	UJ	<	0.037		<	0.039		<	0.036		<	0.037	UJ	<	0.038	UJ		NA	
3-Nitroaniline	mg/kg	8270	- -	- -	- -	<	0.15	UJ	<	0.17	UJ	<	0.15		<	0.16		<	0.15		<	0.15	UJ	<	0.16	UJ		NA	
4,6-Dinitro-2-methylphenol	mg/kg	8270	6.6	- -	0.0052	<	0.15	UJ	<	0.16	UJ	<	0.15		<	0.16		<	0.15		<	0.15	UJ	<	0.16	UJ		NA	
4-Bromophenyl phenyl ether	mg/kg	8270	- -	- -	- -	<	0.032	UJ	<	0.035	UJ	<	0.033		<	0.035		<	0.032		<	0.033	UJ	<	0.034	UJ		NA	
4-Chloro-3-methylphenol	mg/kg	8270	8200	- -	3.4	<	0.034	UJ	<	0.037	UJ	<	0.034		<	0.037		<	0.034		<	0.035	UJ	<	0.036	UJ		NA	
4-Chloroaniline	mg/kg	8270	11	180	0.0032	<	0.029	UJ	<	0.033	UJ	<	0.03		<	0.032		<	0.03		<	0.03	UJ	<	0.031	UJ		NA	
4-Chlorophenyl phenyl ether	mg/kg	8270	- -	- -	- -	<	0.041	UJ	<	0.045	UJ	<	0.042		<	0.044		<	0.041		<	0.042	UJ	<	0.043	UJ		NA	
4-Nitroaniline	mg/kg	8270	110	- -	0.032	<	0.15	UJ	<	0.16	UJ	<	0.15		<	0.16		<	0.15		<	0.15	UJ	<	0.16	UJ		NA	
4-Nitrophenol	mg/kg	8270	- -	- -	- -	<	0.13	UJ	<	0.15	UJ	<	0.14		<	0.15		<	0.13		<	0.14	UJ	<	0.14	UJ		NA	
Acetophenone	mg/kg	8270	12000	2500	1.16	<	0.03	UJ	<	0.033	UJ	<	0.031		<	0.033		<	0.03		<	0.031	UJ	<	0.032	UJ		NA	
Atrazine	mg/kg	8270	10	150	0.038	<	0.036	UJ	<	0.04	UJ	<	0.036		<	0.039		<	0.036		<	0.037	UJ	<	0.038	UJ		NA	
Benzaldehyde	mg/kg	8270	820	1200	0.082	<	0.055	UJ	<	0.061	UJ	<	0.056	UL	<	0.06		<	0.055		<	0.056	UJ	<	0.058	UJ		NA	
Bis(2-chloroisopropyl)ether	mg/kg	8270	4700	310	0.52	<	0.0079	UJ	<	0.0088	UJ	<	0.0081		<	0.0086		<	0.008		<	0.0081	UJ	<	0.0084	UJ		NA	
Bis(2-chloroethoxy)methane	mg/kg	8270	250	- -	0.026	<	0.024	UJ	<	0.027	UJ	<	0.025		<	0.026		<	0.024		<	0.025	UJ	<	0.026	UJ		NA	
Bis(2-chloroethyl)ether	mg/kg	8270	1	13	0.000072	<	0.0098	UJ	<	0.011	UJ	<	0.01		<	0.011		<	0.0099		<	0.01	UJ	<	0.01	UJ		NA	
Bis(2-ethylhexyl) phthalate	mg/kg	8270	160	2500	28	<	0.059	UJ	<	0.066	UJ	<	0.06		<	0.064		<	0.06			0.14	J	<	0.063	UJ		NA	
Butyl benzyl phthalate	mg/kg	8270	1200	19000	4.8	<	0.05	UJ	<	0.056	UJ	<	0.051		<	0.054		<	0.05		<	0.051	UJ	<	0.053	UJ		NA	
Caprolactam	mg/kg	8270	40000	600000	5	<	0.28	UJ	<	0.31	UJ	<	0.28		<	0.3		<	0.28		<	0.28	UJ	<	0.29	UJ		NA	
Carbazole [1]	mg/kg	8270	23000	700000	116	<	0.0067	UJ	<	0.0075	UJ	<	0.0069		<	0.0073		<	0.0068			0.054	J	<	0.0072	UJ		NA	
Dibenzofuran	mg/kg	8270	120	2300	0.3	<	0.036	UJ	<	0.04	UJ	<	0.037		<	0.039		<	0.036			0.06	J	<	0.038	UJ		NA	
Diethyl phthalate	mg/kg	8270	66000	1000000	12.2	<	0.04	UJ	<	0.044	UJ	<	0.041		<	0.043			0.058	J	<	0.041	UJ	<	0.042	UJ		NA	
Dimethyl phthalate	mg/kg	8270	- -	- -	- -	<	0.04	UJ	<	0.044	UJ	<	0.041		<	0.043		<	0.04		<	0.041	UJ	<	0.042	UJ		NA	
Di-n-butyl phthalate	mg/kg	8270	8200	130000	4.6	<	0.046	UJ	<	0.051	UJ	<	0.047		<	0.05		<	0.046		<	0.047	UJ	<	0.049	UJ		NA	
Di-n-octyl phthalate	mg/kg	8270	820	- -	114	<	0.039	UJ	<	0.043	UJ	<	0.039		<	0.042		<	0.039		<	0.04	UJ	<	0.041	UJ		NA	
Hexachlorobenzene	mg/kg	8270	0.96	13	0.26	<	0.0078	UJ	<	0.0087	UJ	<	0.008		<	0.0085		<	0.0079		<	0.008	UJ	<	0.0083	UJ		NA	
Hexachlorobutadiene	mg/kg	8270	5.3	17	0.0054	<	0.0082	UJ	<	0.0091	UJ	<	0.0084		<	0.0089		<	0.0083		<	0.0084	UJ	<	0.0087	UJ		NA	
Hexachlorocyclopentadiene	mg/kg	8270	0.75	8	3.2	<	0.039	UJ	<	0.044	UJ	<	0.04		<	0.043		<	0.04		<	0.04	UJ	<	0.042	UJ		NA	
Hexachloroethane	mg/kg	8270	8	91	0.004	<	0.026	UJ	<	0.029	UJ	<	0.027		<	0.029		<	0.027		<	0.027	UJ	<	0.028	UJ		NA	
Isophorone	mg/kg	8270	2400	37000	0.52	<	0.028	UJ	<	0.031	UJ	<	0.028		<	0.03		<	0.028		<	0.028	UJ	<	0.029	UJ		NA	
Nitrobenzene	mg/kg	8270	22	240	0.00184	<	0.03	UJ	<	0.034	UJ	<	0.031		<	0.033		<	0.031		<	0.031	UJ	<	0.032	UJ		NA	

TABLE A-4
ANALYTICAL AND SCREENING RESULTS
SUBSURFACE SOIL
CAA VIM AND VIIM
MINGO JUNCTION STEEL WORKS LLC - WEIRTON FACILITY

			Screening Criteria [1]			Sample Information [2]																							
						VII-SB-103(36-38) 10/29/2013			VII-SB-104(6-8) 10/24/2013			VII-SB-104(38-40) 10/25/2013			VII-SB-105(6-8) 10/25/2013			VII-SB-105(36-38) 10/28/2013			VII-SB-107(4-6) 10/23/2013			VII-SB-107(44-46) 10/24/2013			VII-SB-109(4-6) 10/22/2013		
Constituent	**Units**	**Analytical Method**	**Industrial Soil RSL**	**Industrial Soil De Minimis**	***Protection of Groundwater RSL***																								
N-Nitrosodi-n-propylamine	mg/kg	8270	0.33	5.1	0.000162	<	0.0086	UJ	<	0.0095	UJ	<	0.0088		<	0.0093		<	0.0087		<	0.0088	UJ	<	0.0091	UJ		NA	
N-Nitrosodiphenylamine	mg/kg	8270	470	7200	1.34	<	0.034	UJ	<	0.038	UJ	<	0.035		<	0.037		<	0.034		<	0.035	UJ	<	0.036	UJ		NA	
Pentachlorophenol	mg/kg	8270	4	52	0.028	<	0.033	UJ	<	0.036	UJ	<	0.033		<	0.036		<	0.033		<	0.034	UJ	<	0.035	UJ		NA	
Phenol	mg/kg	8270	25000	380000	6.6	<	0.0086	UJ	<	0.0096	UJ	<	0.0088		<	0.0094		<	0.0087		<	0.0089	UJ	<	0.0092	UJ		NA	
Polychlorinated Biphenyls																													
PCB-1016	mg/kg	8082	5.1	160	0.26	<	0.0027	UJ	<	0.003	UJ	<	0.0028		<	0.003		<	0.0028		<	0.0028	UJ	<	0.0029	UJ		NA	
PCB-1221	mg/kg	8082	0.83	19	0.0016	<	0.0035	UJ	<	0.0039	UJ	<	0.0036		<	0.0038		<	0.0035		<	0.0036	UJ	<	0.0037	UJ		NA	
PCB-1232	mg/kg	8082	0.72	14	0.0016	<	0.0031	UJ	<	0.0035	UJ	<	0.0032		<	0.0034		<	0.0032		<	0.0032	UJ	<	0.0033	UJ		NA	
PCB-1242	mg/kg	8082	0.95	26	0.024	<	0.003	UJ	<	0.0033	UJ	<	0.003		<	0.0032		<	0.003		<	0.0031	UJ	<	0.0032	UJ		NA	
PCB-1248	mg/kg	8082	0.94	27	0.024	<	0.0017	UJ	<	0.0019	UJ	<	0.0018		<	0.0019		<	0.0018		<	0.0018	UJ	<	0.0018	UJ		NA	
PCB-1254	mg/kg	8082	0.97	28	0.04	<	0.0026	UJ	<	0.0029	UJ	<	0.0027		<	0.0028		<	0.0026		<	0.0027	UJ	<	0.0028	UJ		NA	
PCB-1260	mg/kg	8082	0.99	30	0.11	<	0.0026	UJ	<	0.0029	UJ	<	0.0027		<	0.0028		<	0.0026			0.015	J	<	0.0028	UJ		NA	
Inorganics																													
Aluminum	mg/kg	6020	110000	1000000	60000		4700	K		13000	K		5900	K		12000	K		4700	K		9900	K		13000	K		NA	
Antimony	mg/kg	6020	47	930	5.4		0.21			0.35			0.15	J		0.39			0.25			0.46			0.11	J		NA	
Arsenic	mg/kg	6020	3	35	5.8		3.8	K		***12***			3			***13***			2.8			***7.4***			2.1			NA	
Barium	mg/kg	6020	22000	400000	1640		56			85			32			120			32			98			57			NA	
Beryllium	mg/kg	6020	230	4500	64		0.58			1.3	L		0.33	L		1	L		0.47	L		0.65	L		0.8	L		NA	
Cadmium	mg/kg	6020	98	980	7.6		0.17			0.44			0.12			1.3			0.16			0.98			0.23			NA	
Calcium	mg/kg	6020	- -	- -	- -		3300			24000			790			5500			590			31000			1900			NA	
Chromium [1]	mg/kg	6020	180000	1000000	3600000		8.7			70			11			86			9.1			450			17			NA	
Cobalt	mg/kg	6020	35	690	0.54		***7.2***			***11***			***6.4***			***15***			***7.1***			***11***			***19***			NA	
Copper	mg/kg	6020	4700	93000	920		13	K		53	K		13	K		150	K		17	K		43	K		15	K		NA	
Iron	mg/kg	6020	82000	1000000	700		***25000***			***42000***	K		***22000***	K		***40000***	K		***34000***	K		***86000***	J		***17000***	K		NA	
Lead	mg/kg	6020	800	1000	280		9.6			22			7.3			44			8.5			76			19			NA	
Magnesium	mg/kg	6020	- -	- -	- -		1600			9300			1400			4100			860			12000			2400			NA	
Manganese [1]	mg/kg	6020	2600	80000	56		***870***			***1800***			***520***			***350***			***650***			***7800***	J		***600***			NA	
Mercury	mg/kg	7471	4.6	3.1	2		0.014	J		0.022	J		0.02	J		0.026	J		0.031	J		0.091			0.028	J		NA	
Nickel	mg/kg	6020	2200	43000	52		14			23	K		13	K		***55***	K		13	K		23	K		19	K		NA	
Potassium	mg/kg	6020	- -	- -	- -		480	L		1400	K		550	K		840	K		440	K		790	K		850	K		NA	
Selenium	mg/kg	6020	580	12000	5.2		0.33	K		1.1			0.31	J		2.3			0.44	J		1			0.38	J		NA	
Silver	mg/kg	6020	580	12000	1.6		0.012	K		0.048	K		0.0057	B		0.05	K		0.0056	B		0.14	K		0.026	K		NA	
Sodium	mg/kg	6020	- -	- -	- -		78	L		270			53			87			35			220			58			NA	
Thallium	mg/kg	6020	1.2	23	2.8		0.13			0.13			0.058	J		0.24			0.072	J		0.15			0.14			NA	
Vanadium	mg/kg	6020	580	160	172		8.6			63			8.2			26			7.2			110			22			NA	
Zinc	mg/kg	6020	35000	700000	740		36	K		82	K		32	K		120	K		40	K		260	K		46	K		NA	
Other Parameters																													
Cyanide, Total	mg/kg	9012	15	170	40	<	0.1		<	0.12		<	0.11		<	0.12		<	0.11		<	0.11		<	0.11			NA	
Total Organic Carbon	mg/kg	WALKLEY	- -	- -	- -	<	74			8800		<	75			67000		<	75			5200			1400			NA	
Percent Moisture	%	- -	- -	- -	- -		8.8			19			11			17			10			11			14			25	
Percent Solids	%	MCAWW 16	- -	- -	- -		NA			NA			NA			NA			NA			NA			NA			NA	

TABLE A-4
ANALYTICAL AND SCREENING RESULTS
SUBSURFACE SOIL
CAA VIM AND VIIM
MINGO JUNCTION STEEL WORKS LLC - WEIRTON FACILITY

			Screening Criteria [1]			Sample Information [2]							
Constituent	Units	Analytical Method	Industrial Soil RSL	Industrial Soil De Minimis	*Protection of Groundwater RSL*	VII-SB-110(6-8) 10/22/2013	VII-SB-110(6-8)DUP 10/22/2013 Duplicate	VII-SB-111(2-4) 10/22/2013	VII-SB-112(2-4) 10/22/2013	VII-SB-113(2-4) 10/22/2013	VII-SB-114(4-6) 10/22/2013	VII-SB-115(2-4) 10/22/2013	VII-SB-116(2-4) 10/22/2013
Volatile Organic Compounds													
Benzene	mg/kg	8260	5.1	57	0.052	0.0033 J	0.0012 L	0.00095 J	< 0.00095	< 0.00087	< 0.00083	< 0.00093	< 0.00081 UJ
Toluene	mg/kg	8260	4700	820	13.8	0.034 J	0.014 L	0.0021 J	< 0.001	< 0.00094	< 0.0009	0.0011 J	< 0.00088 UJ
Ethylbenzene	mg/kg	8260	25	280	15.6	0.037 J	0.012 L	0.0027 J	< 0.0009	0.0013 J	< 0.00079	0.0015 J	< 0.00077 UJ
Xylenes, Total	mg/kg	8260	250	260	198	0.22 J	0.079 L	0.01 J	< 0.0031	< 0.0029	< 0.0028	0.006 J	< 0.0027 UJ
1,1,1-Trichloroethane	mg/kg	8260	3600	640	5.6	NA	NA	NA	NA	NA	NA	NA	NA
1,1,2,2-Tetrachloroethane	mg/kg	8260	2.7	31	0.0006	NA	NA	NA	NA	NA	NA	NA	NA
1,1,2-Trichloro-1,2,2-trifluoroethane	mg/kg	8260	2800	910	52	NA	NA	NA	NA	NA	NA	NA	NA
1,1,2-Trichloroethane	mg/kg	8260	0.63	6.8	0.032	NA	NA	NA	NA	NA	NA	NA	NA
1,1-Dichloroethane	mg/kg	8260	16	170	0.0156	NA	NA	NA	NA	NA	NA	NA	NA
1,1-Dichloroethene	mg/kg	8260	100	1100	0.2	NA	NA	NA	NA	NA	NA	NA	NA
1,2,4-Trichlorobenzene	mg/kg	8260	26	280	4	NA	NA	NA	NA	NA	NA	NA	NA
1,2-Dibromo-3-Chloropropane	mg/kg	8260	0.064	0.7	0.00172	NA	NA	NA	NA	NA	NA	NA	NA
1,2-Dibromoethane (EDB)	mg/kg	8260	0.16	1.8	0.00028	NA	NA	NA	NA	NA	NA	NA	NA
1,2-Dichlorobenzene	mg/kg	8260	930	380	11.6	NA	NA	NA	NA	NA	NA	NA	NA
1,2-Dichloroethane	mg/kg	8260	2	23	0.028	NA	NA	NA	NA	NA	NA	NA	NA
1,2-Dichloroethene, Total	mg/kg	8260	- -	- -	- -	NA	NA	NA	NA	NA	NA	NA	NA
cis-1,2-Dichloroethene	mg/kg	8260	230	81	0.42	NA	NA	NA	NA	NA	NA	NA	NA
trans-1,2-Dichloroethene	mg/kg	8260	2300	570	0.62	NA	NA	NA	NA	NA	NA	NA	NA
1,2-Dichloropropane	mg/kg	8260	6.6	49	0.034	NA	NA	NA	NA	NA	NA	NA	NA
cis-1,3-Dichloropropene [1]	mg/kg	8260	8.2	99	0.0034	NA	NA	NA	NA	NA	NA	NA	NA
trans-1,3-Dichloropropene [1]	mg/kg	8260	8.2	99	0.0034	NA	NA	NA	NA	NA	NA	NA	NA
1,3-Dichlorobenzene [1]	mg/kg	8260	11	120	1.44	NA	NA	NA	NA	NA	NA	NA	NA
1,4-Dichlorobenzene	mg/kg	8260	11	120	1.44	NA	NA	NA	NA	NA	NA	NA	NA
2-Butanone (MEK)	mg/kg	8260	19000	28000	2.4	NA	NA	NA	NA	NA	NA	NA	NA
2-Hexanone	mg/kg	8260	130	- -	0.0176	NA	NA	NA	NA	NA	NA	NA	NA
4-Methyl-2-pentanone (MIBK)	mg/kg	8260	14000	3400	2.8	NA	NA	NA	NA	NA	NA	NA	NA
Acetone	mg/kg	8260	67000	110000	5.8	NA	NA	NA	NA	NA	NA	NA	NA
Bromoform	mg/kg	8260	86	910	0.42	NA	NA	NA	NA	NA	NA	NA	NA
Bromomethane	mg/kg	8260	3	33	0.0038	NA	NA	NA	NA	NA	NA	NA	NA
Carbon disulfide	mg/kg	8260	350	740	0.48	NA	NA	NA	NA	NA	NA	NA	NA
Carbon tetrachloride	mg/kg	8260	2.9	32	0.038	NA	NA	NA	NA	NA	NA	NA	NA
Chlorobenzene	mg/kg	8260	130	760	1.36	NA	NA	NA	NA	NA	NA	NA	NA
Chlorodibromomethane	mg/kg	8260	39	780	0.42	NA	NA	NA	NA	NA	NA	NA	NA
Chloroethane	mg/kg	8260	5700	2100	11.8	NA	NA	NA	NA	NA	NA	NA	NA
Chloroform	mg/kg	8260	1.4	15	0.44	NA	NA	NA	NA	NA	NA	NA	NA
Chloromethane	mg/kg	8260	46	500	0.098	NA	NA	NA	NA	NA	NA	NA	NA
Cyclohexane	mg/kg	8260	2700	120	26	NA	NA	NA	NA	NA	NA	NA	NA
Dichlorobromomethane	mg/kg	8260	1.3	14	0.44	NA	NA	NA	NA	NA	NA	NA	NA
Dichlorodifluoromethane	mg/kg	8260	37	400	0.6	NA	NA	NA	NA	NA	NA	NA	NA
Isopropylbenzene	mg/kg	8260	990	270	1.48	NA	NA	NA	NA	NA	NA	NA	NA
Methyl acetate	mg/kg	8260	120000	29000	8.2	NA	NA	NA	NA	NA	NA	NA	NA
Methyl tert-butyl ether	mg/kg	8260	210	2300	0.064	NA	NA	NA	NA	NA	NA	NA	NA
Methylcyclohexane [1]	mg/kg	8260	2700	120	26	NA	NA	NA	NA	NA	NA	NA	NA
Methylene Chloride	mg/kg	8260	320	3300	0.054	NA	NA	NA	NA	NA	NA	NA	NA
Naphthalene	mg/kg	8260	8.6	180	0.0076	NA	NA	NA	NA	NA	NA	NA	NA
Styrene	mg/kg	8260	3500	870	2.6	NA	NA	NA	NA	NA	NA	NA	NA
Tetrachloroethene	mg/kg	8260	39	170	0.046	NA	NA	NA	NA	NA	NA	NA	NA
Trichloroethene	mg/kg	8260	1.9	20	0.036	NA	NA	NA	NA	NA	NA	NA	NA
Trichlorofluoromethane	mg/kg	8260	35000	1200	6.6	NA	NA	NA	NA	NA	NA	NA	NA
Vinyl chloride	mg/kg	8260	1.7	22	0.0138	NA	NA	NA	NA	NA	NA	NA	NA
Semi-Volatile Organic Compounds													
Acenaphthene	mg/kg	8270	4500	70000	11	1.6	1.2	2.3	5.4	1.2	1.9	3.3	0.32
Acenaphthylene [1]	mg/kg	8270	4500	80000	11	0.19	0.15	< 0.0099	0.78	0.12	0.08 J	< 0.01	< 0.0092
Anthracene	mg/kg	8270	23000	700000	116	0.41	0.31	1	3.3	0.59	1.5	1.4	0.16
Benzo[a]anthracene	mg/kg	8270	21	88	0.22	0.18	0.17	***0.96***	***0.98***	***0.66***	***1.4***	***1.6***	0.22
Benzo[a]pyrene	mg/kg	8270	2.1	4.3	4.8	0.074 J	0.072 J	0.38	0.39	0.33	0.6	0.68	0.15

TABLE A-4
ANALYTICAL AND SCREENING RESULTS
SUBSURFACE SOIL
CAA VIM AND VIIM
MINGO JUNCTION STEEL WORKS LLC - WEIRTON FACILITY

Constituent	Units	Analytical Method	Screening Criteria [1]			Sample Information [2]							
			Industrial Soil RSL	Industrial Soil De Minimis	*Protection of Groundwater RSL*	VII-SB-110(6-8) 10/22/2013	VII-SB-110(6-8)DUP 10/22/2013 Duplicate	VII-SB-111(2-4) 10/22/2013	VII-SB-112(2-4) 10/22/2013	VII-SB-113(2-4) 10/22/2013	VII-SB-114(4-6) 10/22/2013	VII-SB-115(2-4) 10/22/2013	VII-SB-116(2-4) 10/22/2013
Benzo[b]fluoranthene	mg/kg	8270	21	43	6	0.16	0.1	0.55	0.57	0.49	0.94	1.1	0.21
Benzo[g,h,i]perylene [1]	mg/kg	8270	2300	33000	26	0.053 J	0.031 J	0.18 J	0.3	0.25	0.26	0.32 J	0.11 J
Benzo[k]fluoranthene	mg/kg	8270	210	430	58	0.055 J	0.066 J	0.17	0.35	0.24	0.38	0.36	0.1
Chrysene	mg/kg	8270	2100	4300	180	0.19	0.16	1	1	0.68	1.5	1.8	0.25
Dibenz(a,h)anthracene	mg/kg	8270	2.1	4.3	1.92	< 0.0084	< 0.0085	< 0.0096	0.08 J	0.086 J	< 0.0091	0.11 J	< 0.0089
Fluoranthene	mg/kg	8270	3000	44000	178	0.95	0.86	4.6	3	2.6	6	8	0.97
Fluorene	mg/kg	8270	3000	62000	10.8	1.2	0.53	2.5	8.8	1.4	1.4	3.2	0.2
Indeno[1,2,3-cd]pyrene	mg/kg	8270	21	43	19.6	0.052 J	0.028 J	0.16 J	0.24	0.19	0.25	0.26 J	0.087 J
Naphthalene	mg/kg	8270	8.6	180	0.0076	***0.52***	***0.75***	***1.7***	***1.3***	***0.31***	***1***	***1.7***	***0.056*** J
Phenanthrene [1]	mg/kg	8270	23000	700000	116	4	3.6	4.3	9.8	0.41	4.9	8.1	0.45
Pyrene	mg/kg	8270	2300	66000	26	1.2 J	1.1 J	4.4	5.5 J	3.2 J	5.3 J	7.2	0.84
1,1'-Biphenyl	mg/kg	8270	20	210	0.0174	NA	NA	NA	NA	NA	NA	NA	NA
2,4,5-Trichlorophenol	mg/kg	8270	8200	130000	8	NA	NA	NA	NA	NA	NA	NA	NA
2,4,6-Trichlorophenol	mg/kg	8270	82	1300	0.024	NA	NA	NA	NA	NA	NA	NA	NA
2,4-Dichlorophenol	mg/kg	8270	250	3800	0.046	NA	NA	NA	NA	NA	NA	NA	NA
2,4-Dimethylphenol	mg/kg	8270	1600	25000	0.84	NA	NA	NA	NA	NA	NA	NA	NA
2,4-Dinitrophenol	mg/kg	8270	160	2500	0.088	NA	NA	NA	NA	NA	NA	NA	NA
2,4-Dinitrotoluene	mg/kg	8270	7.4	110	0.0064	NA	NA	NA	NA	NA	NA	NA	NA
2,6-Dinitrotoluene	mg/kg	8270	1.5	24	0.00134	NA	NA	NA	NA	NA	NA	NA	NA
2-Chloronaphthalene	mg/kg	8270	6000	67000	7.8	NA	NA	NA	NA	NA	NA	NA	NA
2-Chlorophenol	mg/kg	8270	580	5500	0.178	NA	NA	NA	NA	NA	NA	NA	NA
2-Methylnaphthalene	mg/kg	8270	300	9300	0.38	NA	NA	NA	NA	NA	NA	NA	NA
2-Methylphenol	mg/kg	8270	4100	63000	1.5	NA	NA	NA	NA	NA	NA	NA	NA
2-Nitroaniline	mg/kg	8270	800	12000	0.16	NA	NA	NA	NA	NA	NA	NA	NA
2-Nitrophenol	mg/kg	8270	- -	- -	- -	NA	NA	NA	NA	NA	NA	NA	NA
3,3'-Dichlorobenzidine	mg/kg	8270	5.1	79	0.0164	NA	NA	NA	NA	NA	NA	NA	NA
Methylphenol, 3 & 4 [1]	mg/kg	8270	4100	63000	1.48	NA	NA	NA	NA	NA	NA	NA	NA
3-Nitroaniline	mg/kg	8270	- -	- -	- -	NA	NA	NA	NA	NA	NA	NA	NA
4,6-Dinitro-2-methylphenol	mg/kg	8270	6.6	- -	0.0052	NA	NA	NA	NA	NA	NA	NA	NA
4-Bromophenyl phenyl ether	mg/kg	8270	- -	- -	- -	NA	NA	NA	NA	NA	NA	NA	NA
4-Chloro-3-methylphenol	mg/kg	8270	8200	- -	3.4	NA	NA	NA	NA	NA	NA	NA	NA
4-Chloroaniline	mg/kg	8270	11	180	0.0032	NA	NA	NA	NA	NA	NA	NA	NA
4-Chlorophenyl phenyl ether	mg/kg	8270	- -	- -	- -	NA	NA	NA	NA	NA	NA	NA	NA
4-Nitroaniline	mg/kg	8270	110	- -	0.032	NA	NA	NA	NA	NA	NA	NA	NA
4-Nitrophenol	mg/kg	8270	- -	- -	- -	NA	NA	NA	NA	NA	NA	NA	NA
Acetophenone	mg/kg	8270	12000	2500	1.16	NA	NA	NA	NA	NA	NA	NA	NA
Atrazine	mg/kg	8270	10	150	0.038	NA	NA	NA	NA	NA	NA	NA	NA
Benzaldehyde	mg/kg	8270	820	1200	0.082	NA	NA	NA	NA	NA	NA	NA	NA
Bis(2-chloroisopropyl)ether	mg/kg	8270	4700	310	0.52	NA	NA	NA	NA	NA	NA	NA	NA
Bis(2-chloroethoxy)methane	mg/kg	8270	250	- -	0.026	NA	NA	NA	NA	NA	NA	NA	NA
Bis(2-chloroethyl)ether	mg/kg	8270	1	13	0.000072	NA	NA	NA	NA	NA	NA	NA	NA
Bis(2-ethylhexyl) phthalate	mg/kg	8270	160	2500	28	NA	NA	NA	NA	NA	NA	NA	NA
Butyl benzyl phthalate	mg/kg	8270	1200	19000	4.8	NA	NA	NA	NA	NA	NA	NA	NA
Caprolactam	mg/kg	8270	40000	600000	5	NA	NA	NA	NA	NA	NA	NA	NA
Carbazole [1]	mg/kg	8270	23000	700000	116	NA	NA	NA	NA	NA	NA	NA	NA
Dibenzofuran	mg/kg	8270	120	2300	0.3	NA	NA	NA	NA	NA	NA	NA	NA
Diethyl phthalate	mg/kg	8270	66000	1000000	12.2	NA	NA	NA	NA	NA	NA	NA	NA
Dimethyl phthalate	mg/kg	8270	- -	- -	- -	NA	NA	NA	NA	NA	NA	NA	NA
Di-n-butyl phthalate	mg/kg	8270	8200	130000	4.6	NA	NA	NA	NA	NA	NA	NA	NA
Di-n-octyl phthalate	mg/kg	8270	820	- -	114	NA	NA	NA	NA	NA	NA	NA	NA
Hexachlorobenzene	mg/kg	8270	0.96	13	0.26	NA	NA	NA	NA	NA	NA	NA	NA
Hexachlorobutadiene	mg/kg	8270	5.3	17	0.0054	NA	NA	NA	NA	NA	NA	NA	NA
Hexachlorocyclopentadiene	mg/kg	8270	0.75	8	3.2	NA	NA	NA	NA	NA	NA	NA	NA
Hexachloroethane	mg/kg	8270	8	91	0.004	NA	NA	NA	NA	NA	NA	NA	NA
Isophorone	mg/kg	8270	2400	37000	0.52	NA	NA	NA	NA	NA	NA	NA	NA
Nitrobenzene	mg/kg	8270	22	240	0.00184	NA	NA	NA	NA	NA	NA	NA	NA

TABLE A-4
ANALYTICAL AND SCREENING RESULTS
SUBSURFACE SOIL
CAA VIM AND VIIM
MINGO JUNCTION STEEL WORKS LLC - WEIRTON FACILITY

Constituent	Units	Analytical Method	Screening Criteria [1]			Sample Information [2]							
			Industrial Soil RSL	Industrial Soil De Minimis	*Protection of Groundwater RSL*	VII-SB-110(6-8) 10/22/2013	VII-SB-110(6-8)DUP 10/22/2013 Duplicate	VII-SB-111(2-4) 10/22/2013	VII-SB-112(2-4) 10/22/2013	VII-SB-113(2-4) 10/22/2013	VII-SB-114(4-6) 10/22/2013	VII-SB-115(2-4) 10/22/2013	VII-SB-116(2-4) 10/22/2013
N-Nitrosodi-n-propylamine	mg/kg	8270	0.33	5.1	0.000162	NA	NA	NA	NA	NA	NA	NA	NA
N-Nitrosodiphenylamine	mg/kg	8270	470	7200	1.34	NA	NA	NA	NA	NA	NA	NA	NA
Pentachlorophenol	mg/kg	8270	4	52	0.028	NA	NA	NA	NA	NA	NA	NA	NA
Phenol	mg/kg	8270	25000	380000	6.6	NA	NA	NA	NA	NA	NA	NA	NA
Polychlorinated Biphenyls													
PCB-1016	mg/kg	8082	5.1	160	0.26	NA	NA	NA	NA	NA	NA	NA	NA
PCB-1221	mg/kg	8082	0.83	19	0.0016	NA	NA	NA	NA	NA	NA	NA	NA
PCB-1232	mg/kg	8082	0.72	14	0.0016	NA	NA	NA	NA	NA	NA	NA	NA
PCB-1242	mg/kg	8082	0.95	26	0.024	NA	NA	NA	NA	NA	NA	NA	NA
PCB-1248	mg/kg	8082	0.94	27	0.024	NA	NA	NA	NA	NA	NA	NA	NA
PCB-1254	mg/kg	8082	0.97	28	0.04	NA	NA	NA	NA	NA	NA	NA	NA
PCB-1260	mg/kg	8082	0.99	30	0.11	NA	NA	NA	NA	NA	NA	NA	NA
Inorganics													
Aluminum	mg/kg	6020	110000	1000000	60000	NA	NA	NA	NA	NA	NA	NA	NA
Antimony	mg/kg	6020	47	930	5.4	NA	NA	NA	NA	NA	NA	NA	NA
Arsenic	mg/kg	6020	3	35	5.8	NA	NA	NA	NA	NA	NA	NA	NA
Barium	mg/kg	6020	22000	400000	1640	NA	NA	NA	NA	NA	NA	NA	NA
Beryllium	mg/kg	6020	230	4500	64	NA	NA	NA	NA	NA	NA	NA	NA
Cadmium	mg/kg	6020	98	980	7.6	NA	NA	NA	NA	NA	NA	NA	NA
Calcium	mg/kg	6020	- -	- -	- -	NA	NA	NA	NA	NA	NA	NA	NA
Chromium [1]	mg/kg	6020	180000	1000000	3600000	NA	NA	NA	NA	NA	NA	NA	NA
Cobalt	mg/kg	6020	35	690	0.54	NA	NA	NA	NA	NA	NA	NA	NA
Copper	mg/kg	6020	4700	93000	920	NA	NA	NA	NA	NA	NA	NA	NA
Iron	mg/kg	6020	82000	1000000	700	NA	NA	NA	NA	NA	NA	NA	NA
Lead	mg/kg	6020	800	1000	280	NA	NA	NA	NA	NA	NA	NA	NA
Magnesium	mg/kg	6020	- -	- -	- -	NA	NA	NA	NA	NA	NA	NA	NA
Manganese [1]	mg/kg	6020	2600	80000	56	NA	NA	NA	NA	NA	NA	NA	NA
Mercury	mg/kg	7471	4.6	3.1	2	NA	NA	NA	NA	NA	NA	NA	NA
Nickel	mg/kg	6020	2200	43000	52	NA	NA	NA	NA	NA	NA	NA	NA
Potassium	mg/kg	6020	- -	- -	- -	NA	NA	NA	NA	NA	NA	NA	NA
Selenium	mg/kg	6020	580	12000	5.2	NA	NA	NA	NA	NA	NA	NA	NA
Silver	mg/kg	6020	580	12000	1.6	NA	NA	NA	NA	NA	NA	NA	NA
Sodium	mg/kg	6020	- -	- -	- -	NA	NA	NA	NA	NA	NA	NA	NA
Thallium	mg/kg	6020	1.2	23	2.8	NA	NA	NA	NA	NA	NA	NA	NA
Vanadium	mg/kg	6020	580	160	172	NA	NA	NA	NA	NA	NA	NA	NA
Zinc	mg/kg	6020	35000	700000	740	NA	NA	NA	NA	NA	NA	NA	NA
Other Parameters													
Cyanide, Total	mg/kg	9012	15	170	40	NA	NA	NA	NA	NA	NA	NA	NA
Total Organic Carbon	mg/kg	WALKLEY	- -	- -	- -	NA	NA	NA	NA	NA	NA	NA	NA
Percent Moisture	%	- -	- -	- -	- -	11	12	23	29	23	19	28	17
Percent Solids	%	MCAWW 16	- -	- -	- -	NA	NA	NA	NA	NA	NA	NA	NA

TABLE A-4
ANALYTICAL AND SCREENING RESULTS
SUBSURFACE SOIL
CAA VIM AND VIIM
MINGO JUNCTION STEEL WORKS LLC - WEIRTON FACILITY

Constituent	Units	Analytical Method	Screening Criteria [1]			Sample Information [2]		
			Industrial Soil RSL	Industrial Soil De Minimis	*Protection of Groundwater RSL*	VII-SB-117(6-8) 10/22/2013	VII-SB-118 (4-5') 11/30/2017	VII-SB-119 (4-5') 12/08/2017
Volatile Organic Compounds								
Benzene	mg/kg	8260	5.1	57	0.052	< 0.00087	NA	< 0.012
Toluene	mg/kg	8260	4700	820	13.8	< 0.00094	NA	< 0.01
Ethylbenzene	mg/kg	8260	25	280	15.6	< 0.00083	NA	< 0.013
Xylenes, Total	mg/kg	8260	250	260	198	< 0.0029	NA	< 0.026
1,1,1-Trichloroethane	mg/kg	8260	3600	640	5.6	NA	NA	< 0.015
1,1,2,2-Tetrachloroethane	mg/kg	8260	2.7	31	0.0006	NA	NA	< 0.018
1,1,2-Trichloro-1,2,2-trifluoroethane	mg/kg	8260	2800	910	52	NA	NA	< 0.011
1,1,2-Trichloroethane	mg/kg	8260	0.63	6.8	0.032	NA	NA	< 0.014
1,1-Dichloroethane	mg/kg	8260	16	170	0.0156	NA	NA	< 0.011
1,1-Dichloroethene	mg/kg	8260	100	1100	0.2	NA	NA	< 0.017
1,2,4-Trichlorobenzene	mg/kg	8260	26	280	4	NA	NA	< 0.0096
1,2-Dibromo-3-Chloropropane	mg/kg	8260	0.064	0.7	0.00172	NA	NA	< 0.018
1,2-Dibromoethane (EDB)	mg/kg	8260	0.16	1.8	0.00028	NA	NA	< 0.016
1,2-Dichlorobenzene	mg/kg	8260	930	380	11.6	NA	NA	< 0.024
1,2-Dichloroethane	mg/kg	8260	2	23	0.028	NA	NA	< 0.0086
1,2-Dichloroethene, Total	mg/kg	8260	- -	- -	- -	NA	NA	NA
cis-1,2-Dichloroethene	mg/kg	8260	230	81	0.42	NA	NA	< 0.0094
trans-1,2-Dichloroethene	mg/kg	8260	2300	570	0.62	NA	NA	< 0.015
1,2-Dichloropropane	mg/kg	8260	6.6	49	0.034	NA	NA	< 0.015
cis-1,3-Dichloropropene [1]	mg/kg	8260	8.2	99	0.0034	NA	NA	< 0.0095
trans-1,3-Dichloropropene [1]	mg/kg	8260	8.2	99	0.0034	NA	NA	< 0.01
1,3-Dichlorobenzene [1]	mg/kg	8260	11	120	1.44	NA	NA	< 0.0095
1,4-Dichlorobenzene	mg/kg	8260	11	120	1.44	NA	NA	< 0.0061
2-Butanone (MEK)	mg/kg	8260	19000	28000	2.4	NA	NA	< 0.017
2-Hexanone	mg/kg	8260	130	- -	0.0176	NA	NA	< 0.025
4-Methyl-2-pentanone (MIBK)	mg/kg	8260	14000	3400	2.8	NA	NA	< 0.011
Acetone	mg/kg	8260	67000	110000	5.8	NA	NA	< 0.019
Bromoform	mg/kg	8260	86	910	0.42	NA	NA	< 0.016
Bromomethane	mg/kg	8260	3	33	0.0038	NA	NA	< 0.027
Carbon disulfide	mg/kg	8260	350	740	0.48	NA	NA	< 0.018
Carbon tetrachloride	mg/kg	8260	2.9	32	0.038	NA	NA	< 0.02
Chlorobenzene	mg/kg	8260	130	760	1.36	NA	NA	< 0.0094
Chlorodibromomethane	mg/kg	8260	39	780	0.42	NA	NA	< 0.014
Chloroethane	mg/kg	8260	5700	2100	11.8	NA	NA	< 0.015
Chloroform	mg/kg	8260	1.4	15	0.44	NA	NA	< 0.013
Chloromethane	mg/kg	8260	46	500	0.098	NA	NA	< 0.023
Cyclohexane	mg/kg	8260	2700	120	26	NA	NA	< 0.0073
Dichlorobromomethane	mg/kg	8260	1.3	14	0.44	NA	NA	< 0.014
Dichlorodifluoromethane	mg/kg	8260	37	400	0.6	NA	NA	< 0.017
Isopropylbenzene	mg/kg	8260	990	270	1.48	NA	NA	< 0.014
Methyl acetate	mg/kg	8260	120000	29000	8.2	NA	NA	< 0.035
Methyl tert-butyl ether	mg/kg	8260	210	2300	0.064	NA	NA	< 0.022
Methylcyclohexane [1]	mg/kg	8260	2700	120	26	NA	NA	< 0.012
Methylene Chloride	mg/kg	8260	320	3300	0.054	NA	NA	< 0.014
Naphthalene	mg/kg	8260	8.6	180	0.0076	NA	NA	< 0.019
Styrene	mg/kg	8260	3500	870	2.6	NA	NA	< 0.0079
Tetrachloroethene	mg/kg	8260	39	170	0.046	NA	NA	< 0.012
Trichloroethene	mg/kg	8260	1.9	20	0.036	NA	NA	< 0.0089
Trichlorofluoromethane	mg/kg	8260	35000	1200	6.6	NA	NA	< 0.0087
Vinyl chloride	mg/kg	8260	1.7	22	0.0138	NA	NA	< 0.022
Semi-Volatile Organic Compounds								
Acenaphthene	mg/kg	8270	4500	70000	11	0.27	< 0.0031	NA
Acenaphthylene [1]	mg/kg	8270	4500	80000	11	0.05 J	< 0.0031	NA
Anthracene	mg/kg	8270	23000	700000	116	0.12	< 0.0034	NA
Benzo[a]anthracene	mg/kg	8270	21	88	0.22	***0.26***	< 0.0036	NA
Benzo[a]pyrene	mg/kg	8270	2.1	4.3	4.8	0.22	< 0.0038	NA

TABLE A-4
ANALYTICAL AND SCREENING RESULTS
SUBSURFACE SOIL
CAA VIM AND VIIM
MINGO JUNCTION STEEL WORKS LLC - WEIRTON FACILITY

Constituent	Units	Analytical Method	Screening Criteria [1]			Sample Information [2]				
			Industrial Soil RSL	Industrial Soil De Minimis	*Protection of Groundwater RSL*	VII-SB-117(6-8) 10/22/2013		VII-SB-118 (4-5') 11/30/2017		VII-SB-119 (4-5') 12/08/2017
Benzo[b]fluoranthene	mg/kg	8270	21	43	6	0.26		<	0.004	NA
Benzo[g,h,i]perylene [1]	mg/kg	8270	2300	33000	26	0.14		<	0.004	NA
Benzo[k]fluoranthene	mg/kg	8270	210	430	58	0.11		<	0.0032	NA
Chrysene	mg/kg	8270	2100	4300	180	0.31		<	0.0036	NA
Dibenz(a,h)anthracene	mg/kg	8270	2.1	4.3	1.92	0.053	J	<	0.0038	NA
Fluoranthene	mg/kg	8270	3000	44000	178	0.81		<	0.0036	NA
Fluorene	mg/kg	8270	3000	62000	10.8	0.32		<	0.0033	NA
Indeno[1,2,3-cd]pyrene	mg/kg	8270	21	43	19.6	0.13		<	0.0036	NA
Naphthalene	mg/kg	8270	8.6	180	0.0076	***0.18***		<	0.0033	NA
Phenanthrene [1]	mg/kg	8270	23000	700000	116	0.61		<	0.0038	NA
Pyrene	mg/kg	8270	2300	66000	26	0.96	J	<	0.0041	NA
1,1'-Biphenyl	mg/kg	8270	20	210	0.0174	NA			NA	NA
2,4,5-Trichlorophenol	mg/kg	8270	8200	130000	8	NA			NA	NA
2,4,6-Trichlorophenol	mg/kg	8270	82	1300	0.024	NA			NA	NA
2,4-Dichlorophenol	mg/kg	8270	250	3800	0.046	NA			NA	NA
2,4-Dimethylphenol	mg/kg	8270	1600	25000	0.84	NA			NA	NA
2,4-Dinitrophenol	mg/kg	8270	160	2500	0.088	NA			NA	NA
2,4-Dinitrotoluene	mg/kg	8270	7.4	110	0.0064	NA			NA	NA
2,6-Dinitrotoluene	mg/kg	8270	1.5	24	0.00134	NA			NA	NA
2-Chloronaphthalene	mg/kg	8270	6000	67000	7.8	NA			NA	NA
2-Chlorophenol	mg/kg	8270	580	5500	0.178	NA			NA	NA
2-Methylnaphthalene	mg/kg	8270	300	9300	0.38	NA			NA	NA
2-Methylphenol	mg/kg	8270	4100	63000	1.5	NA			NA	NA
2-Nitroaniline	mg/kg	8270	800	12000	0.16	NA			NA	NA
2-Nitrophenol	mg/kg	8270	- -	- -	- -	NA			NA	NA
3,3'-Dichlorobenzidine	mg/kg	8270	5.1	79	0.0164	NA			NA	NA
Methylphenol, 3 & 4 [1]	mg/kg	8270	4100	63000	1.48	NA			NA	NA
3-Nitroaniline	mg/kg	8270	- -	- -	- -	NA			NA	NA
4,6-Dinitro-2-methylphenol	mg/kg	8270	6.6	- -	0.0052	NA			NA	NA
4-Bromophenyl phenyl ether	mg/kg	8270	- -	- -	- -	NA			NA	NA
4-Chloro-3-methylphenol	mg/kg	8270	8200	- -	3.4	NA			NA	NA
4-Chloroaniline	mg/kg	8270	11	180	0.0032	NA			NA	NA
4-Chlorophenyl phenyl ether	mg/kg	8270	- -	- -	- -	NA			NA	NA
4-Nitroaniline	mg/kg	8270	110	- -	0.032	NA			NA	NA
4-Nitrophenol	mg/kg	8270	- -	- -	- -	NA			NA	NA
Acetophenone	mg/kg	8270	12000	2500	1.16	NA			NA	NA
Atrazine	mg/kg	8270	10	150	0.038	NA			NA	NA
Benzaldehyde	mg/kg	8270	820	1200	0.082	NA			NA	NA
Bis(2-chloroisopropyl)ether	mg/kg	8270	4700	310	0.52	NA			NA	NA
Bis(2-chloroethoxy)methane	mg/kg	8270	250	- -	0.026	NA			NA	NA
Bis(2-chloroethyl)ether	mg/kg	8270	1	13	0.000072	NA			NA	NA
Bis(2-ethylhexyl) phthalate	mg/kg	8270	160	2500	28	NA			NA	NA
Butyl benzyl phthalate	mg/kg	8270	1200	19000	4.8	NA			NA	NA
Caprolactam	mg/kg	8270	40000	600000	5	NA			NA	NA
Carbazole [1]	mg/kg	8270	23000	700000	116	NA			NA	NA
Dibenzofuran	mg/kg	8270	120	2300	0.3	NA			NA	NA
Diethyl phthalate	mg/kg	8270	66000	1000000	12.2	NA			NA	NA
Dimethyl phthalate	mg/kg	8270	- -	- -	- -	NA			NA	NA
Di-n-butyl phthalate	mg/kg	8270	8200	130000	4.6	NA			NA	NA
Di-n-octyl phthalate	mg/kg	8270	820	- -	114	NA			NA	NA
Hexachlorobenzene	mg/kg	8270	0.96	13	0.26	NA			NA	NA
Hexachlorobutadiene	mg/kg	8270	5.3	17	0.0054	NA			NA	NA
Hexachlorocyclopentadiene	mg/kg	8270	0.75	8	3.2	NA			NA	NA
Hexachloroethane	mg/kg	8270	8	91	0.004	NA			NA	NA
Isophorone	mg/kg	8270	2400	37000	0.52	NA			NA	NA
Nitrobenzene	mg/kg	8270	22	240	0.00184	NA			NA	NA

TABLE A-4
ANALYTICAL AND SCREENING RESULTS
SUBSURFACE SOIL
CAA VIM AND VIIM
MINGO JUNCTION STEEL WORKS LLC - WEIRTON FACILITY

Constituent	Units	Analytical Method	Screening Criteria [1]			Sample Information [2]		
			Industrial Soil RSL	Industrial Soil De Minimis	*Protection of Groundwater RSL*	VII-SB-117(6-8) 10/22/2013	VII-SB-118 (4-5') 11/30/2017	VII-SB-119 (4-5') 12/08/2017
N-Nitrosodi-n-propylamine	mg/kg	8270	0.33	5.1	0.000162	NA	NA	NA
N-Nitrosodiphenylamine	mg/kg	8270	470	7200	1.34	NA	NA	NA
Pentachlorophenol	mg/kg	8270	4	52	0.028	NA	NA	NA
Phenol	mg/kg	8270	25000	380000	6.6	NA	NA	NA
Polychlorinated Biphenyls								
PCB-1016	mg/kg	8082	5.1	160	0.26	NA	NA	NA
PCB-1221	mg/kg	8082	0.83	19	0.0016	NA	NA	NA
PCB-1232	mg/kg	8082	0.72	14	0.0016	NA	NA	NA
PCB-1242	mg/kg	8082	0.95	26	0.024	NA	NA	NA
PCB-1248	mg/kg	8082	0.94	27	0.024	NA	NA	NA
PCB-1254	mg/kg	8082	0.97	28	0.04	NA	NA	NA
PCB-1260	mg/kg	8082	0.99	30	0.11	NA	NA	NA
Inorganics								
Aluminum	mg/kg	6020	110000	1000000	60000	NA	NA	NA
Antimony	mg/kg	6020	47	930	5.4	NA	NA	NA
Arsenic	mg/kg	6020	3	35	5.8	NA	NA	NA
Barium	mg/kg	6020	22000	400000	1640	NA	NA	NA
Beryllium	mg/kg	6020	230	4500	64	NA	NA	NA
Cadmium	mg/kg	6020	98	980	7.6	NA	NA	NA
Calcium	mg/kg	6020	- -	- -	- -	NA	NA	NA
Chromium [1]	mg/kg	6020	180000	1000000	3600000	NA	NA	NA
Cobalt	mg/kg	6020	35	690	0.54	NA	NA	NA
Copper	mg/kg	6020	4700	93000	920	NA	NA	NA
Iron	mg/kg	6020	82000	1000000	700	NA	NA	NA
Lead	mg/kg	6020	800	1000	280	NA	NA	NA
Magnesium	mg/kg	6020	- -	- -	- -	NA	NA	NA
Manganese [1]	mg/kg	6020	2600	80000	56	NA	NA	NA
Mercury	mg/kg	7471	4.6	3.1	2	NA	NA	NA
Nickel	mg/kg	6020	2200	43000	52	NA	NA	NA
Potassium	mg/kg	6020	- -	- -	- -	NA	NA	NA
Selenium	mg/kg	6020	580	12000	5.2	NA	NA	NA
Silver	mg/kg	6020	580	12000	1.6	NA	NA	NA
Sodium	mg/kg	6020	- -	- -	- -	NA	NA	NA
Thallium	mg/kg	6020	1.2	23	2.8	NA	NA	NA
Vanadium	mg/kg	6020	580	160	172	NA	NA	NA
Zinc	mg/kg	6020	35000	700000	740	NA	NA	NA
Other Parameters								
Cyanide, Total	mg/kg	9012	15	170	40	NA	NA	NA
Total Organic Carbon	mg/kg	WALKLEY	- -	- -	- -	NA	NA	NA
Percent Moisture	%	- -	- -	- -	- -	23	NA	NA
Percent Solids	%	MCAWW 16	- -	- -	- -	NA	NA	NA

TABLE A-4
ANALYTICAL AND SCREENING RESULTS
SUBSURFACE SOIL
CAA VIM AND VIIM
MINGO JUNCTION STEEL WORKS LLC - WEIRTON FACILITY

1 - Screening criteria based on the May 2021 USEPA Regional Screening Table and the June 2020 WVDEP De Minimis Table. Direct contact USEPA regional screening levels (RSLs) and WVDEP De Minimis values are based on industrial land use. RSLs for the protection of groundwater are based on a dilution attenuation factor (DAF) of 20. For chemicals with both risk-based and MCL-based protection of groundwater RSLs, the higher of the two values was used. RSLs for noncarcinogenic chemicals are divided by 10 to account for potential cumulative effects. Notes regarding specific values for various chemicals (e.g., surrogates used, effects basis, etc.) are as follows:

RSLs for cis-1,3-dichloropropene and trans-1,3-dichloropropene are based on the RSLs for total 1,3-dichloropropene.
RSLs for 1,3-dichlorobenzene are based on the RSLs for 1,4-dichlorobenzene.
RSLs for methylcyclohexane are based on the RSLs for cyclohexane.
RSLs for acenaphthylene are based on the RSLs for acenaphthene.
RSLs for benzo(g,h,i)perylene are based on the RSLs for pyrene.
RSLs for phenanthrene and carbazole are based on the RSLs for anthracene.
RSLs for 3&4-methylphenol are conservatively based on the RSLs for 3-methylphenol.
Direct contact RSL for chromium is for the trivalent valence state; protection of groundwater RSL is based on total chromium.
RSLs for manganese are based on the non-diet values.

Shading indicates an exceedance of the lower of the industrial soil RSL or De Minimis value.
Bold italics numbers indicate exceedance of the RSL for Protection of Groundwater

2 - General sample information provided in column headings includes sample identification number and sampling date. Table qualifier codes are consistent with Region 3 data qualifiers related to identification and quantitation and are as follows:

Data Qualifiers

NA - Not Analyzed
- - - Screening Criterion not available for this chemical constituent.
* - LCS or LCSD exceeds the control limits.
4 - MS, MSD: The analyte present in the original sample is greater than 4 times the matrix spike concentration; therefore, control limits are not applicable.
B - Compound was found in the blank and sample.
F1 - MS and/or MSD Recovery is outside acceptance limits.
F2 - MS/MSD RPD exceeds control limits.
J - Result is less than the reporting limit but greater than or equal to the method detection limit and the concentration is an approximate value.
K - Analyte present. Reported value may be biased high. Actual value is expected to be lower.
L - Analyte present. Reported value may be biased low. Actual value is expected to be higher.
PG - The difference between the original results and the laboratory confirmation analysis is greater than 40%.
R - Unusable result. Analyte may or may not be present in the sample.
UJ - Not Detected. Quantitation limit may be inaccurate or imprecise.

3- Sample ID's ending in "A" were taken in the zone with the greatest potential for contamination based on field screening (just above the base of fill). Sample ID's ending in "B" were taken several feet above the apparent area of contamination (above the "A" samples). Sample IM-W700-S-19D is a field duplicate of sample IM-W700-S-19.

TABLE A-5
ANALYTICAL AND SCREENING RESULTS
GROUNDWATER
CAA VIM AND VIIM
MINGO JUNCTION STEEL WORK LLC - WEIRTON FACILITY

			Screening Criteria [1]			Sample Information [2]								
	Units	Analytical Method	Tapwater RSL	Groundwater De Minimis	*MCL*	MA-MW-07A 11/15/2013	MA-MW-07D 11/15/2013	VI-MW-01A 11/19/2013	VI-MW-02AR 11/14/2013	VI-MW-01P 11/18/2013	VII-MW-01A 11/18/2013	VII-MW-01A DUP 11/18/2013 Duplicate	VII-MW-02A 11/18/2013	VII-MW-03A 11/04/2013
Volatile Organic Compounds														
1,1,1-Trichloroethane	ug/l	8260	800	200	200	< 0.29	< 0.29	< 0.29	< 0.29	< 0.29	< 0.29	< 0.29	< 0.29	< 0.29
1,1,2,2-Tetrachloroethane	ug/l	8260	0.076	0.076	- -	< 0.2	< 0.2	< 0.2	< 0.2	< 0.2	< 0.2	< 0.2	< 0.2	< 0.2
1,1,2-Trichloro-1,2,2-trifluoroethane	ug/l	8260	1000	57000	- -	< 0.32	< 0.32	< 0.32	< 0.32	< 0.32	< 0.32	< 0.32	< 0.32	< 0.32
1,1,2-Trichloroethane	ug/l	8260	0.041	5	5	< 0.2	< 0.2	< 0.2	< 0.2	< 0.2	< 0.2	< 0.2	< 0.2	< 0.2
1,1-Dichloroethane	ug/l	8260	2.8	2.8	- -	< 0.12	< 0.12	< 0.12	0.19 J	< 0.12	7	6.4	0.95 J	0.88 J
1,1-Dichloroethene	ug/l	8260	28	7	7	< 0.3	1.1	< 0.3	0.4 J	< 0.3	< 0.3	< 0.3	0.42 J	< 0.3
1,2,4-Trichlorobenzene	ug/l	8260	0.4	70	70	< 0.27	< 0.27	< 0.27	< 0.27	< 0.27	< 0.27	< 0.27	< 0.27	< 0.27
1,2-Dibromo-3-Chloropropane	ug/l	8260	0.00033	0.2	0.2	< 0.14	< 0.14	< 0.14	< 0.14	< 0.14	< 0.14	< 0.14	< 0.14	< 0.14
1,2-Dibromoethane (EDB)	ug/l	8260	0.0075	0.05	0.05	< 0.18	< 0.18	< 0.18	< 0.18	< 0.18	< 0.18	< 0.18	< 0.18	< 0.18
1,2-Dichlorobenzene	ug/l	8260	30	600	600	< 0.15	< 0.15	< 0.15	< 0.15	0.2 J	< 0.15	< 0.15	< 0.15	< 0.15
1,2-Dichloroethane	ug/l	8260	0.17	5	5	< 0.21	< 0.21	< 0.21	< 0.21	< 0.21	< 0.21	< 0.21	< 0.21	< 0.21
1,2-Dichloroethene, Total	ug/l	8260	- -	- -	- -	< 0.51	< 0.51	< 0.51	< 0.51	2.5	10	9.5	1.7	2.3
cis-1,2-Dichloroethene	ug/l	8260	3.6	70	70	< 0.24	< 0.24	< 0.24	< 0.24	2.4	10	9.3	1.6	2.1
trans-1,2-Dichloroethene	ug/l	8260	6.8	100	100	< 0.17	< 0.17	< 0.17	< 0.17	< 0.17	< 0.17	< 0.17	< 0.17	< 0.17
1,2-Dichloropropane	ug/l	8260	0.82	5	5	< 0.095	< 0.095	< 0.095	< 0.095	< 0.095	< 0.095	< 0.095	< 0.095	< 0.095
cis-1,3-Dichloropropene [1]	ug/l	8260	0.47	0.47	- -	< 0.19	< 0.19	< 0.19	< 0.19	< 0.19	< 0.19	< 0.19	< 0.19	< 0.19
trans-1,3-Dichloropropene [1]	ug/l	8260	0.47	0.47	- -	< 0.15	< 0.15	< 0.15	< 0.15	< 0.15	< 0.15	< 0.15	< 0.15	< 0.15
1,3-Dichlorobenzene [1]	ug/l	8260	0.48	75	75	< 0.11	< 0.11	< 0.11	< 0.11	< 0.11	< 0.11	< 0.11	< 0.11	< 0.11
1,4-Dichlorobenzene	ug/l	8260	0.48	75	75	< 0.21	< 0.21	< 0.21	< 0.21	< 0.21	< 0.21	< 0.21	< 0.21	< 0.21
2-Butanone (MEK)	ug/l	8260	560	5600	- -	< 0.55	< 0.55	< 0.55	< 0.55	< 0.55	< 0.55	< 0.55	< 0.55	< 0.55
2-Hexanone	ug/l	8260	3.8	- -	- -	< 0.16	< 0.16	< 0.16	< 0.16	< 0.16	< 0.16	< 0.16	< 0.16	< 0.16
4-Methyl-2-pentanone (MIBK)	ug/l	8260	630	1200	- -	< 0.53	< 0.53	< 0.53	< 0.53	< 0.53	< 0.53	< 0.53	< 0.53	< 0.53
Acetone	ug/l	8260	1400	14000	- -	< 2.5	< 2.5	< 2.5	< 2.5	< 2.5	< 2.5	< 2.5	< 2.5	< 2.5
Benzene	ug/l	8260	0.46	5	5	< 0.11	< 0.11	< 0.11	< 0.11	< 0.11	< 0.11	< 0.11	< 0.11	< 0.11
Bromoform	ug/l	8260	3.3	3.3	80	< 0.19	< 0.19	< 0.19	< 0.19	< 0.19	< 0.19	< 0.19	< 0.19	< 0.19
Bromomethane	ug/l	8260	0.75	7.5	- -	< 0.31	< 0.31	< 0.31	< 0.31	< 0.31	< 0.31	< 0.31	< 0.31	< 0.31
Carbon disulfide	ug/l	8260	81	810	- -	< 0.21	< 0.21	< 0.21	< 0.21	< 0.21	< 0.21	< 0.21	< 0.21	< 0.21
Carbon tetrachloride	ug/l	8260	0.46	5	5	< 0.14	< 0.14	< 0.14	< 0.14	< 0.14	< 0.14	< 0.14	< 0.14	< 0.14
Chlorobenzene	ug/l	8260	7.8	100	100	< 0.14	< 0.14	< 0.14	< 0.14	< 0.14	< 0.14	< 0.14	< 0.14	< 0.14
Chlorodibromomethane	ug/l	8260	0.87	0.87	80	< 0.14	< 0.14	< 0.14	< 0.14	< 0.14	< 0.14	< 0.14	< 0.14	< 0.14
Chloroethane	ug/l	8260	2100	21000	- -	< 0.21	< 0.21	< 0.21	< 0.21	< 0.21	< 0.21	< 0.21	< 0.21	< 0.21
Chloroform	ug/l	8260	0.22	0.22	80	0.64 B	1.5 B	3.7	0.21 B	1.5	0.25 B	0.19 B	1.2 B	< 0.17
Chloromethane	ug/l	8260	19	190	- -	< 0.28	< 0.28	< 0.28	< 0.28	< 0.28	< 0.28	< 0.28	< 0.28	< 0.28
Cyclohexane	ug/l	8260	1300	13000	- -	< 0.25	< 0.25	< 0.25	< 0.25	< 0.25	< 0.25	< 0.25	< 0.25	< 0.25
Dichlorobromomethane	ug/l	8260	0.13	0.13	80	< 0.13	< 0.13	1.1	< 0.13	< 0.13	< 0.13	< 0.13	< 0.13	< 0.13
Dichlorodifluoromethane	ug/l	8260	20	200	- -	< 0.19	< 0.19	< 0.19	< 0.19	< 0.19	< 0.19	< 0.19	< 0.19	< 0.19
Ethylbenzene	ug/l	8260	1.5	700	700	< 0.23	< 0.23	< 0.23	< 0.23	< 0.23	< 0.23	< 0.23	< 0.23	< 0.23
Isopropylbenzene	ug/l	8260	45	450	- -	< 0.16	< 0.16	< 0.16	< 0.16	< 0.16	< 0.16	< 0.16	< 0.16	< 0.16
Methyl acetate	ug/l	8260	2000	5300	- -	< 0.14	< 0.14	< 0.14	< 0.14	< 0.14	< 0.14	< 0.14	< 0.14	< 0.14
Methyl tert-butyl ether	ug/l	8260	14	14	- -	< 0.18	< 0.18	< 0.18	< 0.18	< 0.18	< 0.18	< 0.18	< 0.18	< 0.18
Methylcyclohexane [1]	ug/l	8260	1300	13000	- -	< 0.26	< 0.26	< 0.26	< 0.26	< 0.26	< 0.26	< 0.26	< 0.26	< 0.26
Methylene Chloride	ug/l	8260	11	5	5	< 0.13	< 0.13	< 0.13	< 0.13	< 0.13	< 0.13	< 0.13	< 0.13	< 0.13
Naphthalene	ug/l	8260	0.12	0.17	- -	NA	NA	NA	NA	NA	NA	NA	NA	NA
Styrene	ug/l	8260	120	100	100	< 0.097	< 0.097	< 0.097	< 0.097	< 0.097	< 0.097	< 0.097	< 0.097	< 0.097
Tetrachloroethene	ug/l	8260	4.1	5	5	0.17 J	0.29 J	0.23 J	0.2 J	< 0.15	4.1	3.5	2.4	0.32 J
Toluene	ug/l	8260	110	1000	1000	< 0.15	< 0.15	< 0.15	< 0.15	< 0.15	< 0.15	< 0.15	< 0.15	< 0.15
Trichloroethene	ug/l	8260	0.28	5	5	0.39 J	0.46 J	< 0.14	0.4 J	0.57 J	1.4	1.3	1	0.84 J
Trichlorofluoromethane	ug/l	8260	520	1100	- -	< 0.2	< 0.2	< 0.2	< 0.2	< 0.2	< 0.2	< 0.2	< 0.2	< 0.2
Vinyl chloride	ug/l	8260	0.019	2	2	< 0.23	< 0.23	< 0.23	< 0.23	< 0.23	< 0.23	0.25 J	< 0.23	< 0.23
Xylenes, Total	ug/l	8260	19	10000	10000	< 0.49	< 0.49	< 0.49	< 0.49	< 0.49	< 0.49	< 0.49	< 0.49	< 0.49
Semi-Volatile Organics														
1,1'-Biphenyl	ug/l	8270	0.083	0.83	- -	< 0.11	< 0.1	< 0.1	< 0.11	< 0.11	< 0.11	< 0.11	< 0.11	< 0.1
2,4,5-Trichlorophenol	ug/l	8270	120	1200	- -	< 0.12	< 0.12	< 0.12	< 0.12	< 0.13	< 0.12	< 0.12	< 0.13	< 0.12
2,4,6-Trichlorophenol	ug/l	8270	1.2	4.1	- -	< 0.3	< 0.29	< 0.29	< 0.3	< 0.31	< 0.3	< 0.3	< 0.31	< 0.29
2,4-Dichlorophenol	ug/l	8270	4.6	46	- -	< 0.067	< 0.065	< 0.065	< 0.067	< 0.07	< 0.067	< 0.067	< 0.07	< 0.065
2,4-Dimethylphenol	ug/l	8270	36	360	- -	< 0.17	< 0.16	< 0.16	< 0.17	< 0.18	< 0.17	< 0.17	< 0.18	< 0.16

TABLE A-5
ANALYTICAL AND SCREENING RESULTS
GROUNDWATER
CAA VIM AND VIIM
MINGO JUNCTION STEEL WORK LLC - WEIRTON FACILITY

			Screening Criteria [1]			Sample Information [2]								
	Units	Analytical Method	Tapwater RSL	Groundwater De Minimis	*MCL*	MA-MW-07A 11/15/2013	MA-MW-07D 11/15/2013	VI-MW-01A 11/19/2013	VI-MW-02AR 11/14/2013	VI-MW-01P 11/18/2013	VII-MW-01A 11/18/2013	VII-MW-01A DUP 11/18/2013 Duplicate	VII-MW-02A 11/18/2013	VII-MW-03A 11/04/2013
2,4-Dinitrophenol	ug/l	8270	3.9	39	- -	< 2.5	< 2.4	< 2.4	< 2.5	< 2.6	< 2.5	< 2.5	< 2.6	< 2.4
2,4-Dinitrotoluene	ug/l	8270	0.24	0.24	- -	< 0.21	< 0.21	< 0.21	< 0.21	< 0.22	< 0.21	< 0.21	< 0.22	< 0.21
2,6-Dinitrotoluene	ug/l	8270	0.049	0.049	- -	< 0.14	< 0.13	< 0.13	< 0.14	< 0.14	< 0.14	< 0.14	< 0.14	< 0.13
2-Chloronaphthalene	ug/l	8270	75	330	- -	< 0.031	< 0.03	< 0.03	< 0.031	< 0.032	< 0.031	< 0.031	< 0.032	< 0.03
2-Chlorophenol	ug/l	8270	9.1	27	- -	< 0.23	< 0.22	< 0.22	< 0.23	< 0.23	< 0.23	< 0.23	< 0.23	< 0.22
2-Methylnaphthalene	ug/l	8270	3.6	36	- -	< 0.019	< 0.018	< 0.018	< 0.019	< 0.02	< 0.019	< 0.019	< 0.02	< 0.018
2-Methylphenol	ug/l	8270	93	930	- -	< 0.19	< 0.18	< 0.18	< 0.19	< 0.19	< 0.19	< 0.19	< 0.19	< 0.18
2-Nitroaniline	ug/l	8270	19	190	- -	< 0.67	< 0.65	< 0.65	< 0.67	< 0.7	< 0.67	< 0.67	< 0.7	< 0.65
2-Nitrophenol	ug/l	8270	- -	- -	- -	< 0.11	< 0.11	< 0.11	< 0.11	< 0.12	< 0.11	< 0.11	< 0.12	< 0.11
3,3'-Dichlorobenzidine	ug/l	8270	0.13	0.13	- -	< 0.15	< 0.14	< 0.14	< 0.15	< 0.15	< 0.15	< 0.15	< 0.15	< 0.14
3-Nitroaniline	ug/l	8270	- -	- -	- -	< 0.81	< 0.77	< 0.77	< 0.81	< 0.84	< 0.81	< 0.81	< 0.84	< 0.77
4,6-Dinitro-2-methylphenol	ug/l	8270	0.15	- -	- -	< 1.6	< 1.5	< 1.5	< 1.6	< 1.6	< 1.6	< 1.6	< 1.6	< 1.5
4-Bromophenyl phenyl ether	ug/l	8270	- -	- -	- -	< 0.12	< 0.11	< 0.11	< 0.12	< 0.12	< 0.12	< 0.12	< 0.12	< 0.11
4-Chloro-3-methylphenol	ug/l	8270	140	- -	- -	< 0.17	< 0.16	< 0.16	< 0.17	< 0.18	< 0.17	< 0.17	< 0.18	< 0.16
4-Chloroaniline	ug/l	8270	0.37	0.37	- -	< 0.29	< 0.28	0.31 J	< 0.29	< 0.3	< 0.29	< 0.29	< 0.3	< 0.28
4-Chlorophenyl phenyl ether	ug/l	8270	- -	- -	- -	< 0.08	< 0.077	< 0.077	< 0.08	< 0.083	< 0.08	< 0.08	< 0.083	< 0.077
4-Nitroaniline	ug/l	8270	3.8	- -	- -	< 0.77	< 0.74	< 0.74	< 0.77	< 0.81	< 0.77	< 0.77	< 0.81	< 0.74
4-Nitrophenol [1]	ug/l	8270	3.9	39	- -	< 0.8	< 0.77	< 0.77	< 0.8	< 0.84	0.85 J	< 0.8	< 0.84	< 0.77
Acenaphthene	ug/l	8270	53	240	- -	< 0.029	< 0.028	< 0.028	< 0.029	0.66	< 0.029	< 0.029	< 0.03	< 0.028
Acenaphthylene [1]	ug/l	8270	53	320	- -	< 0.022	< 0.021	< 0.021	< 0.022	< 0.022	< 0.022	< 0.022	< 0.022	< 0.021
Acetophenone	ug/l	8270	190	1900	- -	< 0.11	< 0.11	< 0.11	< 0.11	< 0.12	< 0.11	< 0.11	< 0.12	< 0.11
Anthracene	ug/l	8270	180	1800	- -	< 0.019	< 0.018	0.027 J	< 0.019	0.23	0.034 J	< 0.019	< 0.02	< 0.018
Atrazine	ug/l	8270	0.3	3	3	< 0.22	< 0.21	< 0.21	< 0.22	< 0.23	< 0.22	< 0.22	< 0.23	< 0.21
Benzaldehyde	ug/l	8270	19	1900	- -	< 0.11	< 0.1	< 0.1	< 0.11	< 0.11	< 0.11	< 0.11	< 0.11	< 0.1
Benzo[a]anthracene	ug/l	8270	0.03	0.012	- -	< 0.037	0.22	< 0.035	< 0.037	< 0.038	< 0.037	< 0.037	0.24	< 0.035
Benzo[a]pyrene	ug/l	8270	0.025	0.2	0.2	< 0.028	0.14 J	< 0.027	< 0.028	< 0.029	< 0.028	< 0.028	***0.21***	< 0.027
Benzo[b]fluoranthene	ug/l	8270	0.25	0.034	- -	< 0.049	0.2	< 0.047	< 0.049	< 0.051	< 0.049	< 0.049	0.34	< 0.047
Benzo[g,h,i]perylene [1]	ug/l	8270	12	600	- -	< 0.029	0.15 J	< 0.028	< 0.029	< 0.03	< 0.029	< 0.029	0.37	< 0.028
Benzo[k]fluoranthene	ug/l	8270	2.5	0.34	- -	< 0.03	0.22	< 0.029	< 0.03	< 0.031	< 0.03	< 0.03	0.36	< 0.029
Bis(2-chloroisopropyl)ether	ug/l	8270	71	0.36	- -	< 0.024	< 0.023	< 0.023	< 0.024	< 0.025	< 0.024	< 0.024	< 0.025	< 0.023
Bis(2-chloroethoxy)methane	ug/l	8270	5.9	- -	- -	< 0.13	< 0.13	< 0.13	< 0.13	< 0.14	< 0.13	< 0.13	< 0.14	< 0.13
Bis(2-chloroethyl)ether	ug/l	8270	0.014	0.014	- -	< 0.032	< 0.03	< 0.03	< 0.032	< 0.033	< 0.032	< 0.032	< 0.033	< 0.03
Bis(2-ethylhexyl) phthalate	ug/l	8270	5.6	6	6	***6.6***	1 J	1.1 J	0.51 J	0.63 J	1.1 J	0.51 J	0.62 J	***13***
Butyl benzyl phthalate	ug/l	8270	16	16	- -	< 0.21	0.42 J	0.78 J	< 0.21	0.83 J	1.8	0.56 J	0.69 J	0.51 J
Caprolactam	ug/l	8270	990	9900	- -	< 1.5	< 1.4	< 1.4	36	< 1.5	< 1.5	< 1.5	< 1.5	< 1.4
Carbazole [1]	ug/l	8270	180	1800	- -	< 0.027	< 0.026	< 0.026	< 0.027	< 0.028	< 0.027	< 0.027	< 0.028	< 0.026
Chrysene	ug/l	8270	25	3.4	- -	< 0.031	0.26	< 0.03	< 0.031	< 0.032	< 0.031	< 0.031	0.35	< 0.03
Dibenz(a,h)anthracene	ug/l	8270	0.025	0.0034	- -	< 0.027	0.18 J	< 0.026	< 0.027	< 0.028	< 0.027	< 0.027	0.41	< 0.026
Dibenzofuran	ug/l	8270	0.79	7.9	- -	< 0.097	< 0.093	< 0.093	< 0.097	< 0.1	< 0.097	< 0.097	< 0.1	< 0.093
Diethyl phthalate	ug/l	8270	1500	15000	- -	< 0.3	< 0.29	< 0.29	< 0.3	< 0.31	< 0.3	< 0.3	< 0.31	< 0.29
Dimethyl phthalate	ug/l	8270	- -	- -	- -	< 0.18	< 0.18	< 0.18	< 0.18	< 0.19	< 0.18	< 0.18	< 0.19	< 0.18
Di-n-butyl phthalate	ug/l	8270	90	900	- -	< 0.24	< 0.23	< 0.23	< 0.24	< 0.25	< 0.24	< 0.24	< 0.25	< 0.23
Di-n-octyl phthalate	ug/l	8270	20	- -	- -	< 0.2	< 0.2	< 0.2	< 0.2	< 0.21	< 0.2	< 0.2	0.23 J	< 0.2
Fluoranthene	ug/l	8270	80	800	- -	< 0.021	< 0.02	0.027 J	< 0.021	0.44	< 0.021	< 0.021	< 0.022	< 0.02
Fluorene	ug/l	8270	29	150	- -	< 0.024	< 0.023	< 0.023	< 0.024	0.86	< 0.024	< 0.024	< 0.025	< 0.023
Hexachlorobenzene	ug/l	8270	0.0098	1	1	< 0.061	< 0.059	< 0.059	< 0.061	< 0.064	< 0.061	< 0.061	< 0.064	< 0.059
Hexachlorobutadiene	ug/l	8270	0.14	0.14	- -	< 0.094	< 0.09	< 0.09	< 0.094	< 0.098	< 0.094	< 0.094	< 0.098	< 0.09
Hexachlorocyclopentadiene	ug/l	8270	0.041	50	50	< 0.14	< 0.13	< 0.13	< 0.14	< 0.14	< 0.14	< 0.14	< 0.14	< 0.13
Hexachloroethane	ug/l	8270	0.33	0.33	- -	< 0.14	< 0.13	< 0.13	< 0.14	< 0.14	< 0.14	< 0.14	< 0.14	< 0.13
Indeno[1,2,3-cd]pyrene	ug/l	8270	0.25	0.034	- -	< 0.043	0.15 J	< 0.042	< 0.043	< 0.045	< 0.043	< 0.043	0.37	< 0.042
Isophorone	ug/l	8270	78	78	- -	< 0.074	< 0.071	< 0.071	< 0.074	< 0.077	< 0.074	< 0.074	< 0.077	< 0.071
Methylphenol, 3 & 4 [1]	ug/l	8270	93	930	- -	< 0.21	< 0.2	< 0.2	< 0.21	< 0.22	< 0.21	< 0.21	< 0.22	< 0.2
Naphthalene	ug/l	8270	0.12	0.17	- -	< 0.023	< 0.022	0.046 J	< 0.023	< 0.024	< 0.023	< 0.023	< 0.024	< 0.022
Nitrobenzene	ug/l	8270	0.14	0.14	- -	< 0.15	< 0.14	< 0.14	< 0.15	< 0.16	< 0.15	< 0.15	< 0.16	< 0.14
N-Nitrosodi-n-propylamine	ug/l	8270	0.011	0.011	- -	< 0.05	< 0.048	< 0.048	< 0.05	< 0.052	< 0.05	< 0.05	< 0.052	< 0.048
N-Nitrosodiphenylamine	ug/l	8270	12	12	- -	< 0.12	< 0.12	< 0.12	< 0.12	< 0.13	< 0.12	< 0.12	< 0.13	< 0.12
Pentachlorophenol	ug/l	8270	0.041	1	1	< 0.5	< 0.48	< 0.48	< 0.5	< 0.52	< 0.5	< 0.5	< 0.52	< 0.48

TABLE A-5
ANALYTICAL AND SCREENING RESULTS
GROUNDWATER
CAA VIM AND VIIM
MINGO JUNCTION STEEL WORK LLC - WEIRTON FACILITY

			Screening Criteria [1]			Sample Information [2]								
	Units	Analytical Method	Tapwater RSL	Groundwater De Minimis	*MCL*	MA-MW-07A 11/15/2013	MA-MW-07D 11/15/2013	VI-MW-01A 11/19/2013	VI-MW-02AR 11/14/2013	VI-MW-01P 11/18/2013	VII-MW-01A 11/18/2013	VII-MW-01A DUP 11/18/2013 Duplicate	VII-MW-02A 11/18/2013	VII-MW-03A 11/04/2013
Phenanthrene [1]	ug/l	8270	180	6000	- -	< 0.042	< 0.04	0.075 J	< 0.042	0.082 J	0.077 J	< 0.042	< 0.043	< 0.04
Phenol	ug/l	8270	580	5800	- -	< 0.055	< 0.053	< 0.053	< 0.055	0.2 J	< 0.055	< 0.055	< 0.058	< 0.053
Pyrene	ug/l	8270	12	79	- -	< 0.023	< 0.022	< 0.022	< 0.023	0.28	< 0.023	< 0.023	< 0.024	< 0.022
Inorganics [3]														
Aluminum	ug/l	6020	2000	20000	*200*	8.6 K	56 K	***1400*** K	***310*** K	18 K	***5300*** K	***6300*** K	***1100*** K	***7000***
Antimony	ug/l	6020	0.78	7.8	6	0.081 B	0.052 B	0.32 J	0.077 B	0.24 J	0.35 J	0.29 J	0.12 B	0.053 J
Arsenic	ug/l	6020	0.052	10	10	< 0.29	< 0.29	0.47 J	< 0.29	1.8	1.6	1.7	< 0.29	1.5
Barium	ug/l	6020	380	2000	2000	25	19	39	23	46	69	67	43	110
Beryllium	ug/l	6020	2.5	4	4	< 0.037	< 0.037	0.092 K	< 0.037	< 0.037	0.19 J	0.21 K	0.077 K	1.6
Cadmium	ug/l	6020	0.92	5	5	< 0.11	< 0.11	< 0.11	< 0.11	< 0.11	0.12 J	0.12 J	< 0.11	1.4
Calcium	ug/l	6020	- -	- -	- -	82000	85000	93000	160000	34000	130000	130000	85000	180000 B
Chromium [1]	ug/l	6020	2200	22000	100	1.6 J	2.2	3.8	2.5	1.7 J	7	7.5	3.9	14 B
Cobalt	ug/l	6020	0.6	6	- -	0.17 J	0.25 J	2.3	1.2	3.5	3.8	3.5	1.2	60 B
Copper	ug/l	6020	80	800	1300	0.39 K	0.88 K	3.3	1.6 K	0.48 J	7.3	7.1	1.7 J	26
Iron	ug/l	6020	1400	14000	*300*	36 J	200	***2900***	***990***	***7900***	***5900***	***6100***	***2400***	***29000*** B
Lead	ug/l	6020	15	15	15	0.051 B	0.2 B	1.5	0.55 B	0.052 B	4	3.7	1.1	***31*** B
Magnesium	ug/l	6020	- -	- -	- -	26000	28000	29000	62000	9600	27000	28000	23000	19000
Manganese [1]	ug/l	6020	43	850	*50*	1.4 J	30	***1100***	***920***	***5900***	***1300***	***1200***	***350***	***19000*** B
Mercury	ug/l	7470	0.063	2	2	< 0.038	< 0.038	< 0.038	0.067 J	< 0.038	< 0.038	< 0.038	0.044 J	< 0.038
Nickel	ug/l	6020	39	390	- -	0.65 K	0.65 K	5.7 K	4.6 K	1.2 K	9.3	9.4 K	3.4 K	39
Potassium	ug/l	6020	- -	- -	- -	9000	8600	2400	2300	4800	3900	4200	3700	20000 B
Selenium	ug/l	6020	10	50	50	2.8 B	2.6 B	1.1 J	0.99 B	1.1 J	< 0.42	< 0.42	0.87 J	2.1 J
Silver	ug/l	6020	9.4	94	*100*	< 0.036	< 0.036	< 0.036	< 0.036	< 0.036	< 0.036	< 0.036	< 0.036	0.7 J
Sodium	ug/l	6020	- -	- -	- -	110000	110000	21000	88000	84000	55000 K	54000	65000	53000 B
Thallium	ug/l	6020	0.02	2	2	< 0.015	< 0.015	0.084 J	0.017 J	< 0.015	0.069 J	0.075 J	0.041 J	0.15 J
Vanadium	ug/l	6020	8.6	1.2	- -	0.57 B	0.8 B	2.2 L	1.4	< 0.082 UL	5.8	7 L	1.9 L	2.2 B
Zinc	ug/l	6020	600	6000	*5000*	2.6 B	6.5 K	23 K	4.8 B	5 K	23 K	29 K	6.4 K	130 B
Other Parameters														
Cyanide, Total	ug/l	9012	0.15	200	200	60	60	1.5 J	< 1.5	3.9 J	< 1.5	1.9 J	1.6 J	< 1.5

TABLE A-5
ANALYTICAL AND SCREENING RESULTS
GROUNDWATER
CAA VIM AND VIIM
MINGO JUNCTION STEEL WORK LLC - WEIRTON FACILITY

			Screening Criteria [1]			Sample Information [2]								
	Units	Analytical Method	Tapwater RSL	Groundwater De Minimis	*MCL*	VII-MW-01P 11/18/2013	VII-MW-02P 11/18/2013	VII-MW-03P 11/18/2013	MA-MW-07A 02/17/2014	MA-MW-07D 02/17/2014	VI-MW-01A 02/13/2014	VI-MW-02AR 02/13/2014	VI-MW-01P 02/13/2014	VII-MW-01A 02/19/2014
Volatile Organic Compounds														
1,1,1-Trichloroethane	ug/l	8260	800	200	200	< 0.29	< 0.29	< 0.29 UJ	< 0.29	< 0.29	< 0.29	< 0.29	< 0.29	< 0.29
1,1,2,2-Tetrachloroethane	ug/l	8260	0.076	0.076	- -	< 0.2	< 0.2	< 0.2 UJ	< 0.2	< 0.2	< 0.2	< 0.2	< 0.2	< 0.2
1,1,2-Trichloro-1,2,2-trifluoroethane	ug/l	8260	1000	57000	- -	< 0.32	< 0.32	< 0.32 UJ	< 0.32	< 0.32	< 0.32	< 0.32	< 0.32	< 0.32
1,1,2-Trichloroethane	ug/l	8260	0.041	5	5	< 0.2	< 0.2	< 0.2 UJ	< 0.2	< 0.2	< 0.2	< 0.2	< 0.2	< 0.2
1,1-Dichloroethane	ug/l	8260	2.8	2.8	- -	0.24 J	< 0.12	< 0.12 UJ	< 0.12	< 0.12	< 0.12	0.24 J	0.36 J	6.7
1,1-Dichloroethene	ug/l	8260	28	7	7	< 0.3	< 0.3	< 0.3 UJ	0.34 J	1.2	< 0.3	0.53 J	< 0.3	< 0.3
1,2,4-Trichlorobenzene	ug/l	8260	0.4	70	70	< 0.27	< 0.27	< 0.27 UJ	< 0.27	< 0.27	< 0.27	< 0.27	< 0.27	< 0.27
1,2-Dibromo-3-Chloropropane	ug/l	8260	0.00033	0.2	0.2	< 0.14	< 0.14	< 0.14 UJ	< 0.14	< 0.14	< 0.14	< 0.14	< 0.14	< 0.14
1,2-Dibromoethane (EDB)	ug/l	8260	0.0075	0.05	0.05	< 0.18	< 0.18	< 0.18 UJ	< 0.18	< 0.18	< 0.18	< 0.18	< 0.18	< 0.18
1,2-Dichlorobenzene	ug/l	8260	30	600	600	< 0.15	< 0.15	37 J	< 0.15	< 0.15	< 0.15	< 0.15	0.34 J	< 0.15
1,2-Dichloroethane	ug/l	8260	0.17	5	5	< 0.21	< 0.21	< 0.21 UJ	< 0.21	< 0.21	< 0.21	< 0.21	< 0.21	< 0.21
1,2-Dichloroethene, Total	ug/l	8260	- -	- -	- -	1	< 0.51	4.7 J	< 0.51	< 0.51	< 0.51	< 0.51	3.5	10
cis-1,2-Dichloroethene	ug/l	8260	3.6	70	70	1	< 0.24	2.7 J	< 0.24	< 0.24	< 0.24	< 0.24	3.5	9.7
trans-1,2-Dichloroethene	ug/l	8260	6.8	100	100	< 0.17	< 0.17	2 J	< 0.17	< 0.17	< 0.17	< 0.17	< 0.17	< 0.17
1,2-Dichloropropane	ug/l	8260	0.82	5	5	< 0.095	< 0.095	< 0.095 UJ	< 0.095	< 0.095	< 0.095	< 0.095	< 0.095	< 0.095
cis-1,3-Dichloropropene [1]	ug/l	8260	0.47	0.47	- -	< 0.19	< 0.19	< 0.19 UJ	< 0.19	< 0.19	< 0.19	< 0.19	< 0.19	< 0.19
trans-1,3-Dichloropropene [1]	ug/l	8260	0.47	0.47	- -	< 0.15	< 0.15	< 0.15 UJ	< 0.15	< 0.15	< 0.15	< 0.15	< 0.15	< 0.15
1,3-Dichlorobenzene [1]	ug/l	8260	0.48	75	75	< 0.11	< 0.11	< 0.11 UJ	< 0.11	< 0.11	< 0.11	< 0.11	< 0.11	< 0.11
1,4-Dichlorobenzene	ug/l	8260	0.48	75	75	< 0.21	< 0.21	0.54 J	< 0.21	< 0.21	< 0.21	< 0.21	< 0.21	< 0.21
2-Butanone (MEK)	ug/l	8260	560	5600	- -	< 0.55	< 0.55	4.7 J	< 0.55	< 0.55	< 0.55	< 0.55	< 0.55	< 0.55
2-Hexanone	ug/l	8260	3.8	- -	- -	< 0.16	< 0.16	0.66 J	< 0.16	< 0.16	< 0.16	< 0.16	< 0.16	< 0.16
4-Methyl-2-pentanone (MIBK)	ug/l	8260	630	1200	- -	< 0.53	< 0.53	0.53 J	< 0.53	< 0.53	< 0.53	< 0.53	< 0.53	< 0.53
Acetone	ug/l	8260	1400	14000	- -	3.1 J	8.8	8.8 J	< 2.5	< 2.5	< 2.5	< 2.5	< 2.5	< 2.5
Benzene	ug/l	8260	0.46	5	5	0.13 J	< 0.11	0.54 J	< 0.11	< 0.11	< 0.11	< 0.11	< 0.11	< 0.11
Bromoform	ug/l	8260	3.3	3.3	80	< 0.19	< 0.19	< 0.19 UJ	< 0.19	< 0.19	< 0.19	< 0.19	< 0.19	< 0.19
Bromomethane	ug/l	8260	0.75	7.5	- -	< 0.31	< 0.31	< 0.31 UJ	< 0.31	< 0.31	< 0.31	< 0.31	< 0.31	< 0.31
Carbon disulfide	ug/l	8260	81	810	- -	< 0.21	< 0.21	< 0.21 UJ	< 0.21	< 0.21	< 0.21	< 0.21	< 0.21	< 0.21
Carbon tetrachloride	ug/l	8260	0.46	5	5	< 0.14	< 0.14	< 0.14 UJ	< 0.14	< 0.14	< 0.14	< 0.14	< 0.14	< 0.14
Chlorobenzene	ug/l	8260	7.8	100	100	< 0.14	< 0.14	0.96 J	< 0.14	< 0.14	< 0.14	< 0.14	< 0.14	< 0.14
Chlorodibromomethane	ug/l	8260	0.87	0.87	80	< 0.14	< 0.14	< 0.14 UJ	< 0.14	< 0.14	0.19 J	< 0.14	< 0.14	< 0.14
Chloroethane	ug/l	8260	2100	21000	- -	< 0.21	< 0.21	< 0.21 UJ	< 0.21	< 0.21	< 0.21	< 0.21	< 0.21	< 0.21
Chloroform	ug/l	8260	0.22	0.22	80	< 0.17	< 0.17	< 0.17 UJ	0.67 J	1.8	4.1	0.25 J	2.6	< 0.17
Chloromethane	ug/l	8260	19	190	- -	< 0.28	< 0.28	< 0.28 UJ	< 0.28	< 0.28	< 0.28	< 0.28	< 0.28	< 0.28
Cyclohexane	ug/l	8260	1300	13000	- -	0.58 J	< 0.25	0.41 J	< 0.25	< 0.25	< 0.25	< 0.25	< 0.25	< 0.25
Dichlorobromomethane	ug/l	8260	0.13	0.13	80	< 0.13	< 0.13	< 0.13 UJ	< 0.13	< 0.13	1.4	< 0.13	< 0.13	< 0.13
Dichlorodifluoromethane	ug/l	8260	20	200	- -	< 0.19	< 0.19	< 0.19 UJ	< 0.19	< 0.19	< 0.19	< 0.19	< 0.19	< 0.19
Ethylbenzene	ug/l	8260	1.5	700	700	3.5	< 0.23	16 J	< 0.23	< 0.23	< 0.23	< 0.23	< 0.23	< 0.23
Isopropylbenzene	ug/l	8260	45	450	- -	1.8	< 0.16	4.8 J	< 0.16	< 0.16	< 0.16	< 0.16	< 0.16	< 0.16
Methyl acetate	ug/l	8260	2000	5300	- -	< 0.14	< 0.14	< 0.14 UJ	< 0.14	< 0.14	< 0.14	< 0.14	< 0.14	< 0.14
Methyl tert-butyl ether	ug/l	8260	14	14	- -	< 0.18	< 0.18	< 0.18 UJ	< 0.18	< 0.18	< 0.18	< 0.18	< 0.18	< 0.18
Methylcyclohexane [1]	ug/l	8260	1300	13000	- -	1.1	< 0.26	1 J	< 0.26	< 0.26	< 0.26	< 0.26	< 0.26	< 0.26
Methylene Chloride	ug/l	8260	11	5	5	< 0.13	< 0.13	< 0.13 UJ	< 0.13	< 0.13	< 0.13	< 0.13	< 0.13	< 0.13
Naphthalene	ug/l	8260	0.12	0.17	- -	NA	NA	NA	NA	NA	NA	NA	NA	NA
Styrene	ug/l	8260	120	100	100	< 0.097	< 0.097	< 0.097 UJ	< 0.097	< 0.097	< 0.097	< 0.097	< 0.097	< 0.097
Tetrachloroethene	ug/l	8260	4.1	5	5	2.5	< 0.15	2.9 J	0.23 J	0.34 J	0.41 J	0.23 J	< 0.15	3.6
Toluene	ug/l	8260	110	1000	1000	0.96 J	< 0.15	5 J	< 0.15	< 0.15	< 0.15	< 0.15	< 0.15	< 0.15
Trichloroethene	ug/l	8260	0.28	5	5	0.51 J	< 0.14	1.3 J	0.38 J	0.43 J	0.15 J	0.4 J	0.75 J	1.3
Trichlorofluoromethane	ug/l	8260	520	1100	- -	< 0.2	< 0.2	< 0.2 UJ	< 0.2	< 0.2	< 0.2	< 0.2	< 0.2	< 0.2
Vinyl chloride	ug/l	8260	0.019	2	2	< 0.23	< 0.23	0.49 J	< 0.23	< 0.23	< 0.23	< 0.23	< 0.23	< 0.23
Xylenes, Total	ug/l	8260	19	10000	10000	16	0.78 J	61 J	< 0.49	< 0.49	< 0.49	< 0.49	< 0.49	< 0.49
Semi-Volatile Organics														
1,1'-Biphenyl	ug/l	8270	0.083	0.83	- -	0.78 J	< 0.11	1.6	< 0.097	< 0.1	< 0.13	< 0.13	< 0.11	< 0.11
2,4,5-Trichlorophenol	ug/l	8270	120	1200	- -	< 0.13	< 0.12	< 0.12	< 0.11	< 0.12	< 0.15	< 0.15	< 0.13	< 0.13
2,4,6-Trichlorophenol	ug/l	8270	1.2	4.1	- -	< 0.31	< 0.3	< 0.3	< 0.28	< 0.29	< 0.36	< 0.36	< 0.31	< 0.31
2,4-Dichlorophenol	ug/l	8270	4.6	46	- -	< 0.07	< 0.067	< 0.067	< 0.062	< 0.065	< 0.08	< 0.08	< 0.07	< 0.07
2,4-Dimethylphenol	ug/l	8270	36	360	- -	< 0.18	< 0.17	< 0.17	< 0.16	< 0.16	< 0.2	< 0.2	< 0.18	< 0.18

TABLE A-5
ANALYTICAL AND SCREENING RESULTS
GROUNDWATER
CAA VIM AND VIIM
MINGO JUNCTION STEEL WORK LLC - WEIRTON FACILITY

			Screening Criteria [1]			Sample Information [2]								
	Units	Analytical Method	Tapwater RSL	Groundwater De Minimis	*MCL*	VII-MW-01P 11/18/2013	VII-MW-02P 11/18/2013	VII-MW-03P 11/18/2013	MA-MW-07A 02/17/2014	MA-MW-07D 02/17/2014	VI-MW-01A 02/13/2014	VI-MW-02AR 02/13/2014	VI-MW-01P 02/13/2014	VII-MW-01A 02/19/2014
2,4-Dinitrophenol	ug/l	8270	3.9	39	- -	< 2.6	< 2.5	< 2.5	< 2.3	< 2.4	< 3	< 3	< 2.6	< 2.6
2,4-Dinitrotoluene	ug/l	8270	0.24	0.24	- -	< 0.22	< 0.21	< 0.21	< 0.2	< 0.21	< 0.25	< 0.25	< 0.22	< 0.22
2,6-Dinitrotoluene	ug/l	8270	0.049	0.049	- -	< 0.14	< 0.14	< 0.14	< 0.13	< 0.13	< 0.16	< 0.16	< 0.14	< 0.14
2-Chloronaphthalene	ug/l	8270	75	330	- -	< 0.032	< 0.031	< 0.031	< 0.028	< 0.03	< 0.037	< 0.037	< 0.032	< 0.032
2-Chlorophenol	ug/l	8270	9.1	27	- -	< 0.23	< 0.23	< 0.23	< 0.21	< 0.22	< 0.27	< 0.27	< 0.23	< 0.23
2-Methylnaphthalene	ug/l	8270	3.6	36	- -	13	0.26	30	< 0.018	< 0.018	< 0.023	0.024 J	< 0.02	< 0.02
2-Methylphenol	ug/l	8270	93	930	- -	< 0.19	< 0.19	0.23 J	< 0.17	< 0.18	< 0.22	< 0.22	< 0.19	< 0.19
2-Nitroaniline	ug/l	8270	19	190	- -	< 0.7	< 0.67	< 0.67	< 0.62	< 0.65	< 0.8	< 0.8	< 0.7	< 0.7
2-Nitrophenol	ug/l	8270	- -	- -	- -	< 0.12	< 0.11	< 0.11	< 0.1	< 0.11	< 0.13	< 0.13	< 0.12	< 0.12
3,3'-Dichlorobenzidine	ug/l	8270	0.13	0.13	- -	< 0.15	< 0.15	< 0.15	< 0.14	< 0.14	< 0.17	< 0.17	< 0.15	< 0.15
3-Nitroaniline	ug/l	8270	- -	- -	- -	< 0.84	< 0.81	< 0.81	< 0.75	< 0.77	< 0.96	< 0.96	< 0.84	< 0.84
4,6-Dinitro-2-methylphenol	ug/l	8270	0.15	- -	- -	< 1.6	< 1.6	< 1.6	< 1.4	< 1.5	< 1.9	< 1.9	< 1.6	< 1.6
4-Bromophenyl phenyl ether	ug/l	8270	- -	- -	- -	< 0.12	< 0.12	< 0.12	< 0.11	< 0.11	< 0.14	< 0.14	< 0.12	< 0.12
4-Chloro-3-methylphenol	ug/l	8270	140	- -	- -	< 0.18	< 0.17	< 0.17	< 0.16	< 0.16	< 0.2	< 0.2	< 0.18	< 0.18
4-Chloroaniline	ug/l	8270	0.37	0.37	- -	< 0.3	< 0.29	< 0.29	< 0.27	< 0.28	< 0.35	< 0.35	< 0.3	< 0.3
4-Chlorophenyl phenyl ether	ug/l	8270	- -	- -	- -	< 0.083	< 0.08	< 0.08	< 0.074	< 0.077	< 0.095	< 0.095	< 0.083	< 0.083
4-Nitroaniline	ug/l	8270	3.8	- -	- -	< 0.81	< 0.77	< 0.77	< 0.72	< 0.74	< 0.92	< 0.92	< 0.81	< 0.81
4-Nitrophenol [1]	ug/l	8270	3.9	39	- -	< 0.84	< 0.8	< 0.8	< 0.74	< 0.77	< 0.96	< 0.96	< 0.84	< 0.84
Acenaphthene	ug/l	8270	53	240	- -	< 0.03	0.091 J	1.8	< 0.027	< 0.028	< 0.035	< 0.035	0.38	< 0.03
Acenaphthylene [1]	ug/l	8270	53	320	- -	< 0.022	< 0.022	< 0.022	< 0.02	< 0.021	< 0.026	< 0.026	< 0.022	< 0.022
Acetophenone	ug/l	8270	190	1900	- -	< 0.12	0.13 J	< 0.11	< 0.1	< 0.11	< 0.13	< 0.13	< 0.12	< 0.12
Anthracene	ug/l	8270	180	1800	- -	< 0.02	0.042 J	0.23	< 0.018	< 0.018	< 0.023	0.025 J	< 0.02	< 0.02
Atrazine	ug/l	8270	0.3	3	3	< 0.23	< 0.22	< 0.22	< 0.21	< 0.21	< 0.27	< 0.27	< 0.23	< 0.23
Benzaldehyde	ug/l	8270	19	1900	- -	< 0.11	< 0.11	< 0.11	< 0.098	< 0.1	< 0.13	< 0.13	< 0.11	< 0.11
Benzo[a]anthracene	ug/l	8270	0.03	0.012	- -	< 0.038	< 0.037	< 0.037	< 0.034	< 0.035	< 0.044	< 0.044	< 0.038	< 0.038
Benzo[a]pyrene	ug/l	8270	0.025	0.2	0.2	< 0.029	< 0.028	< 0.028	< 0.026	< 0.027	< 0.034	< 0.034	< 0.029	< 0.029
Benzo[b]fluoranthene	ug/l	8270	0.25	0.034	- -	< 0.051	< 0.049	< 0.049	< 0.045	< 0.047	< 0.058	< 0.058	< 0.051	< 0.051
Benzo[g,h,i]perylene [1]	ug/l	8270	12	600	- -	< 0.03	< 0.029	< 0.029	< 0.027	< 0.028	< 0.035	< 0.035	< 0.03	< 0.03
Benzo[k]fluoranthene	ug/l	8270	2.5	0.34	- -	< 0.031	< 0.03	< 0.03	< 0.028	< 0.029	< 0.036	< 0.036	< 0.031	< 0.031
Bis(2-chloroisopropyl)ether	ug/l	8270	71	0.36	- -	< 0.025	< 0.024	< 0.024	< 0.022	< 0.023	< 0.028	< 0.028	< 0.025	< 0.025
Bis(2-chloroethoxy)methane	ug/l	8270	5.9	- -	- -	< 0.14	< 0.13	< 0.13	< 0.12	< 0.13	< 0.16	< 0.16	< 0.14	< 0.14
Bis(2-chloroethyl)ether	ug/l	8270	0.014	0.014	- -	< 0.033	< 0.032	< 0.032	< 0.029	< 0.03	< 0.038	< 0.038	< 0.033	< 0.033
Bis(2-ethylhexyl) phthalate	ug/l	8270	5.6	6	6	0.67 J	0.61 J	0.52 J	< 0.41	< 0.42	2.4	1.2 J	1 J	< 0.46
Butyl benzyl phthalate	ug/l	8270	16	16	- -	0.62 J	0.84 J	0.62 J	0.21 J	0.32 J	4.1	2.8	2.1	< 0.22
Caprolactam	ug/l	8270	990	9900	- -	< 1.5	< 1.5	< 1.5	< 1.4	< 1.4	< 1.8	< 1.8	< 1.5	< 1.5
Carbazole [1]	ug/l	8270	180	1800	- -	< 0.028	0.036 J	2	< 0.025	< 0.026	< 0.032	< 0.032	< 0.028	< 0.028
Chrysene	ug/l	8270	25	3.4	- -	< 0.032	< 0.031	< 0.031	0.034 J	< 0.03	< 0.037	< 0.037	< 0.032	< 0.032
Dibenz(a,h)anthracene	ug/l	8270	0.025	0.0034	- -	< 0.028	< 0.027	< 0.027	< 0.025	< 0.026	< 0.032	< 0.032	< 0.028	< 0.028
Dibenzofuran	ug/l	8270	0.79	7.9	- -	0.6 J	< 0.097	1.5	< 0.089	< 0.093	< 0.11	< 0.11	< 0.1	< 0.1
Diethyl phthalate	ug/l	8270	1500	15000	- -	< 0.31	< 0.3	< 0.3	< 0.27	< 0.29	0.56 B	0.36 B	0.37 B	< 0.31
Dimethyl phthalate	ug/l	8270	- -	- -	- -	< 0.19	< 0.18	< 0.18	< 0.17	< 0.18	< 0.22	< 0.22	< 0.19	< 0.19
Di-n-butyl phthalate	ug/l	8270	90	900	- -	< 0.25	< 0.24	< 0.24	< 0.22	< 0.23	< 0.29	< 0.29	< 0.25	< 0.25
Di-n-octyl phthalate	ug/l	8270	20	- -	- -	< 0.21	< 0.2	< 0.2	< 0.19	< 0.2	0.3 J	< 0.24	< 0.21	< 0.21
Fluoranthene	ug/l	8270	80	800	- -	0.038 J	0.026 J	0.17 J	0.021 J	0.035 J	0.035 J	0.04 J	0.26	< 0.022
Fluorene	ug/l	8270	29	150	- -	0.94	0.079 J	2.2	< 0.022	< 0.023	< 0.029	< 0.029	0.19 J	< 0.025
Hexachlorobenzene	ug/l	8270	0.0098	1	1	< 0.064	< 0.061	< 0.061	< 0.056	< 0.059	< 0.073	< 0.073	< 0.064	< 0.064
Hexachlorobutadiene	ug/l	8270	0.14	0.14	- -	< 0.098	< 0.094	< 0.094	< 0.087	< 0.09	< 0.11	< 0.11	< 0.098	< 0.098
Hexachlorocyclopentadiene	ug/l	8270	0.041	50	50	< 0.14	< 0.14	< 0.14	< 0.13	< 0.13	< 0.16 UJ	< 0.16	< 0.14	< 0.14
Hexachloroethane	ug/l	8270	0.33	0.33	- -	< 0.14	< 0.14	< 0.14	< 0.13	< 0.13	< 0.16	< 0.16	< 0.14	< 0.14
Indeno[1,2,3-cd]pyrene	ug/l	8270	0.25	0.034	- -	< 0.045	< 0.043	< 0.043	< 0.04	< 0.042	< 0.052	< 0.052	< 0.045	< 0.045
Isophorone	ug/l	8270	78	78	- -	< 0.077	< 0.074	< 0.074	< 0.068	< 0.071	< 0.088	< 0.088	< 0.077	< 0.077
Methylphenol, 3 & 4 [1]	ug/l	8270	93	930	- -	< 0.22	< 0.21	0.35 J	< 0.19	< 0.2	< 0.25	< 0.25	< 0.22	< 0.22
Naphthalene	ug/l	8270	0.12	0.17	- -	4.7	0.21	23	< 0.021	< 0.022	0.044 J	0.047 J	< 0.024	< 0.024
Nitrobenzene	ug/l	8270	0.14	0.14	- -	< 0.16	< 0.15	< 0.15	< 0.14	< 0.14	< 0.18	< 0.18	< 0.16	< 0.16
N-Nitrosodi-n-propylamine	ug/l	8270	0.011	0.011	- -	< 0.052	< 0.05	< 0.05	< 0.046	< 0.048	< 0.06	< 0.06	< 0.052	< 0.052
N-Nitrosodiphenylamine	ug/l	8270	12	12	- -	< 0.13	< 0.12	< 0.12	< 0.11	< 0.12	< 0.14	< 0.14	< 0.13	< 0.13
Pentachlorophenol	ug/l	8270	0.041	1	1	< 0.52	< 0.5	< 0.5	< 0.46	< 0.48	< 0.6	< 0.6	< 0.52	< 0.52

TABLE A-5
ANALYTICAL AND SCREENING RESULTS
GROUNDWATER
CAA VIM AND VIIM
MINGO JUNCTION STEEL WORK LLC - WEIRTON FACILITY

			Screening Criteria [1]			Sample Information [2]								
	Units	Analytical Method	Tapwater RSL	Groundwater De Minimis	*MCL*	VII-MW-01P 11/18/2013	VII-MW-02P 11/18/2013	VII-MW-03P 11/18/2013	MA-MW-07A 02/17/2014	MA-MW-07D 02/17/2014	VI-MW-01A 02/13/2014	VI-MW-02AR 02/13/2014	VI-MW-01P 02/13/2014	VII-MW-01A 02/19/2014
Phenanthrene [1]	ug/l	8270	180	6000	- -	1.6	0.09 J	2.6	0.039 J	0.067 J	0.056 J	0.075 J	< 0.043	< 0.043
Phenol	ug/l	8270	580	5800	- -	< 0.058	< 0.055	0.42 J	< 0.051	< 0.053	< 0.066	< 0.066	< 0.058	< 0.058
Pyrene	ug/l	8270	12	79	- -	< 0.024	0.037 J	0.14 J	< 0.021	0.024 J	< 0.027	< 0.027	0.2 J	< 0.024
Inorganics [3]														
Aluminum	ug/l	6020	2000	20000	*200*	***920*** K	140 K	52 K	< 2.6	< 2.6	34 K	7.1 J	17 J	3.6 J
Antimony	ug/l	6020	0.78	7.8	6	0.094 B	0.94 J	0.12 B	0.061 J	0.052 J	< 0.019 UL	< 0.019 UL	< 0.019 UL	0.047 J
Arsenic	ug/l	6020	0.052	10	10	< 0.29	1.6	1.4	< 0.29	< 0.29	0.41 K	< 0.29 UJ	1.2 K	< 0.29 UJ
Barium	ug/l	6020	380	2000	2000	110	22	39	26	19	28	16 J	44 J	30 J
Beryllium	ug/l	6020	2.5	4	4	1.2 K	< 0.037	< 0.037	< 0.037	< 0.037	< 0.037	< 0.037 UJ	< 0.037 UJ	0.048 J
Cadmium	ug/l	6020	0.92	5	5	0.84 J	< 0.11	< 0.11	< 0.11	< 0.11	< 0.11	< 0.11 UJ	< 0.11 UJ	< 0.11 UJ
Calcium	ug/l	6020	- -	- -	- -	760000	25000	310000	77000 K	81000 K	98000	170000 J	38000 J	140000 K
Chromium [1]	ug/l	6020	2200	22000	100	1.9 J	2.4	1.5 J	1.5 J	1.8 J	2.1	2.8 J	0.75 J	1.4 J
Cobalt	ug/l	6020	0.6	6	- -	98	0.13 J	0.42 J	0.17 J	0.17 J	0.21 J	0.43 J	3.8 J	1.1 J
Copper	ug/l	6020	80	800	1300	2.6	2.4	1.4 J	0.56 K	0.5 K	1.2 K	1.7 K	0.95 K	0.57 K
Iron	ug/l	6020	1400	14000	*300*	***60000***	200	65	33 B	31 B	15 J	16 J	***7500*** J	7.4 B
Lead	ug/l	6020	15	15	15	1 B	2.8	0.052 B	1.5	< 0.019	0.15 J	0.13 J	0.057 B	0.029 B
Magnesium	ug/l	6020	- -	- -	- -	5900	4000	22000	27000	29000	27000 L	54000 L	10000 L	31000 J
Manganese [1]	ug/l	6020	43	850	*50*	***30000***	***93***	48	0.65 B	1.3 B	***94***	***61*** J	***6000*** J	***1100*** J
Mercury	ug/l	7470	0.063	2	2	< 0.038	< 0.038	< 0.038	< 0.038 UL	< 0.038 UL	< 0.038 UL	< 0.038	< 0.038	< 0.038
Nickel	ug/l	6020	39	390	- -	110 K	0.46 K	0.21 K	0.86 J	0.66 J	2.1	2.5 J	1.7 J	4.7 J
Potassium	ug/l	6020	- -	- -	- -	43000	3100	33000	8500	8200	1500 J	2100 J	3600 J	2700 J
Selenium	ug/l	6020	10	50	50	7.2	0.48 J	2 J	2.9 B	3 B	1.8 J	1.3 J	< 0.42 UJ	< 0.42 UJ
Silver	ug/l	6020	9.4	94	*100*	< 0.036	< 0.036	< 0.036	< 0.036	< 0.036	< 0.036	< 0.036 UJ	< 0.036 UJ	< 0.036 UJ
Sodium	ug/l	6020	- -	- -	- -	48000	5600	59000	93000 K	95000 K	20000	79000 J	66000 J	48000 K
Thallium	ug/l	6020	0.02	2	2	0.11 J	0.034 J	< 0.015	< 0.015	< 0.015	0.052 B	0.084 B	0.13 J	< 0.015 UJ
Vanadium	ug/l	6020	8.6	1.2	- -	0.33 L	10 L	1.3 L	0.11 B	0.4 B	1.5	1.8 J	< 0.082 UJ	0.46 B
Zinc	ug/l	6020	600	6000	*5000*	160 K	6.9 K	2.3 K	4.4 K	3.3 K	8.4	8.6 J	15 J	6.3 K
Other Parameters														
Cyanide, Total	ug/l	9012	0.15	200	200	< 1.5	3.5 J	< 1.5	50	54	< 1.5	< 1.5	< 1.5	< 1.5

TABLE A-5
ANALYTICAL AND SCREENING RESULTS
GROUNDWATER
CAA VIM AND VIIM
MINGO JUNCTION STEEL WORK LLC - WEIRTON FACILITY

			Screening Criteria [1]			Sample Information [2]								
	Units	Analytical Method	Tapwater RSL	Groundwater De Minimis	*MCL*	VII-MW-01A DUP 02/19/2014 Duplicate	VII-MW-02A 02/19/2014	VII-MW-03A 02/19/2014	VII-MW-01P 02/14/2014	VII-MW-02P 02/13/2014	VII-MW-03P 02/14/2014	VI-MW-03A 01/17/2019	VI-MW-03A DUP 01/17/2019 Duplicate	VI-MW-04A 01/17/2019
Volatile Organic Compounds														
1,1,1-Trichloroethane	ug/l	8260	800	200	200	< 0.29	< 0.29	< 0.29	< 0.29	< 0.29	< 0.29	NA	NA	NA
1,1,2,2-Tetrachloroethane	ug/l	8260	0.076	0.076	- -	< 0.2	< 0.2	< 0.2	< 0.2	< 0.2	< 0.2	NA	NA	NA
1,1,2-Trichloro-1,2,2-trifluoroethane	ug/l	8260	1000	57000	- -	< 0.32	< 0.32	< 0.32	< 0.32	< 0.32	< 0.32	NA	NA	NA
1,1,2-Trichloroethane	ug/l	8260	0.041	5	5	< 0.2	< 0.2	< 0.2	< 0.2	< 0.2	< 0.2	NA	NA	NA
1,1-Dichloroethane	ug/l	8260	2.8	2.8	- -	6.9	< 0.12	0.54 J	0.25 J	< 0.12	< 0.12	NA	NA	NA
1,1-Dichloroethene	ug/l	8260	28	7	7	< 0.3	< 0.3	< 0.3	< 0.3	< 0.3	< 0.3	NA	NA	NA
1,2,4-Trichlorobenzene	ug/l	8260	0.4	70	70	< 0.27	< 0.27	< 0.27	< 0.27	< 0.27	< 0.27	NA	NA	NA
1,2-Dibromo-3-Chloropropane	ug/l	8260	0.00033	0.2	0.2	< 0.14	< 0.14	< 0.14	< 0.14	< 0.14	< 0.14	NA	NA	NA
1,2-Dibromoethane (EDB)	ug/l	8260	0.0075	0.05	0.05	< 0.18	< 0.18	< 0.18	< 0.18	< 0.18	< 0.18	NA	NA	NA
1,2-Dichlorobenzene	ug/l	8260	30	600	600	< 0.15	< 0.15	< 0.15	< 0.15	< 0.15	34	NA	NA	NA
1,2-Dichloroethane	ug/l	8260	0.17	5	5	< 0.21	< 0.21	< 0.21	< 0.21	< 0.21	< 0.21	NA	NA	NA
1,2-Dichloroethene, Total	ug/l	8260	- -	- -	- -	10	1.3	1.9	0.55 J	< 0.51	6.5	NA	NA	NA
cis-1,2-Dichloroethene	ug/l	8260	3.6	70	70	9.8	1.3	1.8	0.54 J	< 0.24	4.3	NA	NA	NA
trans-1,2-Dichloroethene	ug/l	8260	6.8	100	100	< 0.17	< 0.17	< 0.17	< 0.17	< 0.17	2.2	NA	NA	NA
1,2-Dichloropropane	ug/l	8260	0.82	5	5	< 0.095	< 0.095	< 0.095	< 0.095	< 0.095	< 0.095	NA	NA	NA
cis-1,3-Dichloropropene [1]	ug/l	8260	0.47	0.47	- -	< 0.19	< 0.19	< 0.19	< 0.19	< 0.19	< 0.19	NA	NA	NA
trans-1,3-Dichloropropene [1]	ug/l	8260	0.47	0.47	- -	< 0.15	< 0.15	< 0.15	< 0.15	< 0.15	< 0.15	NA	NA	NA
1,3-Dichlorobenzene [1]	ug/l	8260	0.48	75	75	< 0.11	< 0.11	< 0.11	< 0.11	< 0.11	< 0.11	NA	NA	NA
1,4-Dichlorobenzene	ug/l	8260	0.48	75	75	< 0.21	< 0.21	< 0.21	< 0.21	< 0.21	0.59 J	NA	NA	NA
2-Butanone (MEK)	ug/l	8260	560	5600	- -	< 0.55	< 0.55	< 0.55	< 0.55	< 0.55	3.9 J	NA	NA	NA
2-Hexanone	ug/l	8260	3.8	- -	- -	< 0.16	< 0.16	< 0.16	< 0.16	< 0.16	< 0.16	NA	NA	NA
4-Methyl-2-pentanone (MIBK)	ug/l	8260	630	1200	- -	< 0.53	< 0.53	< 0.53	< 0.53	< 0.53	< 0.53	NA	NA	NA
Acetone	ug/l	8260	1400	14000	- -	< 2.5	< 2.5	< 2.5	< 2.5	4.9 J	5.2	NA	NA	NA
Benzene	ug/l	8260	0.46	5	5	< 0.11	< 0.11	< 0.11	0.19 J	< 0.11	0.35 J	NA	NA	NA
Bromoform	ug/l	8260	3.3	3.3	80	< 0.19	< 0.19	< 0.19	< 0.19	< 0.19	< 0.19	NA	NA	NA
Bromomethane	ug/l	8260	0.75	7.5	- -	< 0.31	< 0.31	< 0.31	< 0.31	< 0.31	< 0.31	NA	NA	NA
Carbon disulfide	ug/l	8260	81	810	- -	< 0.21	< 0.21	< 0.21	0.58 J	< 0.21	< 0.21	NA	NA	NA
Carbon tetrachloride	ug/l	8260	0.46	5	5	< 0.14	< 0.14	< 0.14	< 0.14	< 0.14	< 0.14	NA	NA	NA
Chlorobenzene	ug/l	8260	7.8	100	100	< 0.14	< 0.14	< 0.14	< 0.14	< 0.14	0.6 J	NA	NA	NA
Chlorodibromomethane	ug/l	8260	0.87	0.87	80	< 0.14	< 0.14	< 0.14	< 0.14	< 0.14	< 0.14	NA	NA	NA
Chloroethane	ug/l	8260	2100	21000	- -	< 0.21	< 0.21	< 0.21	< 0.21	< 0.21	< 0.21	NA	NA	NA
Chloroform	ug/l	8260	0.22	0.22	80	< 0.17	4.3	< 0.17	< 0.17	< 0.17	< 0.17	NA	NA	NA
Chloromethane	ug/l	8260	19	190	- -	< 0.28	< 0.28	< 0.28	< 0.28	< 0.28	< 0.28	NA	NA	NA
Cyclohexane	ug/l	8260	1300	13000	- -	< 0.25	< 0.25	< 0.25	1	< 0.25	0.4 J	NA	NA	NA
Dichlorobromomethane	ug/l	8260	0.13	0.13	80	< 0.13	< 0.13	< 0.13	< 0.13	< 0.13	< 0.13	NA	NA	NA
Dichlorodifluoromethane	ug/l	8260	20	200	- -	< 0.19	< 0.19	< 0.19	< 0.19	< 0.19	< 0.19	NA	NA	NA
Ethylbenzene	ug/l	8260	1.5	700	700	< 0.23	< 0.23	< 0.23	7	0.23 J	12	NA	NA	NA
Isopropylbenzene	ug/l	8260	45	450	- -	< 0.16	< 0.16	< 0.16	3.5	< 0.16	4.4	NA	NA	NA
Methyl acetate	ug/l	8260	2000	5300	- -	< 0.14	< 0.14	< 0.14	< 0.14	< 0.14	< 0.14	NA	NA	NA
Methyl tert-butyl ether	ug/l	8260	14	14	- -	< 0.18	< 0.18	< 0.18	< 0.18	< 0.18	< 0.18	NA	NA	NA
Methylcyclohexane [1]	ug/l	8260	1300	13000	- -	< 0.26	< 0.26	< 0.26	2.2	< 0.26	1.3	NA	NA	NA
Methylene Chloride	ug/l	8260	11	5	5	< 0.13	< 0.13	< 0.13	< 0.13	< 0.13	< 0.13	NA	NA	NA
Naphthalene	ug/l	8260	0.12	0.17	- -	NA	NA	NA	NA	NA	NA	NA	NA	NA
Styrene	ug/l	8260	120	100	100	< 0.097	< 0.097	< 0.097	< 0.097	< 0.097	1.1	NA	NA	NA
Tetrachloroethene	ug/l	8260	4.1	5	5	3.7	1.8	0.46 J	4.2	< 0.15	***10***	NA	NA	NA
Toluene	ug/l	8260	110	1000	1000	< 0.15	< 0.15	< 0.15	2.1	< 0.15	4.2	NA	NA	NA
Trichloroethene	ug/l	8260	0.28	5	5	1.4	0.42 J	0.79 J	0.31 J	< 0.14	1.8	NA	NA	NA
Trichlorofluoromethane	ug/l	8260	520	1100	- -	< 0.2	< 0.2	< 0.2	< 0.2	< 0.2	< 0.2	NA	NA	NA
Vinyl chloride	ug/l	8260	0.019	2	2	0.24 J	< 0.23	< 0.23	< 0.23	< 0.23	< 0.23	NA	NA	NA
Xylenes, Total	ug/l	8260	19	10000	10000	< 0.49	< 0.49	< 0.49	31	0.92 J	50	NA	NA	NA
Semi-Volatile Organics														
1,1'-Biphenyl	ug/l	8270	0.083	0.83	- -	< 0.11	< 0.1	< 0.13	1.3	< 0.11	2.6	< 0.057	< 0.057	< 0.059
2,4,5-Trichlorophenol	ug/l	8270	120	1200	- -	< 0.13	< 0.12	< 0.15	< 0.12 R	< 0.13	< 0.12	< 0.059	< 0.059	< 0.061
2,4,6-Trichlorophenol	ug/l	8270	1.2	4.1	- -	< 0.31	< 0.29	< 0.36	< 0.29 R	< 0.31	< 0.3	< 0.065	< 0.065	< 0.068
2,4-Dichlorophenol	ug/l	8270	4.6	46	- -	< 0.07	< 0.065	< 0.08	< 0.065 R	< 0.07	< 0.067	< 0.049	< 0.049	< 0.051
2,4-Dimethylphenol	ug/l	8270	36	360	- -	< 0.18	< 0.16	< 0.2	< 0.16 R	< 0.18	< 0.17	< 0.039	< 0.039	< 0.041

TABLE A-5
ANALYTICAL AND SCREENING RESULTS
GROUNDWATER
CAA VIM AND VIIM
MINGO JUNCTION STEEL WORK LLC - WEIRTON FACILITY

			Screening Criteria [1]			Sample Information [2]								
	Units	Analytical Method	Tapwater RSL	Groundwater De Minimis	*MCL*	VII-MW-01A DUP 02/19/2014 Duplicate	VII-MW-02A 02/19/2014	VII-MW-03A 02/19/2014	VII-MW-01P 02/14/2014	VII-MW-02P 02/13/2014	VII-MW-03P 02/14/2014	VI-MW-03A 01/17/2019	VI-MW-03A DUP 01/17/2019 Duplicate	VI-MW-04A 01/17/2019
2,4-Dinitrophenol	ug/l	8270	3.9	39	- -	< 2.6	< 2.4	< 3	< 2.4 R	< 2.6	< 2.5	< 1.5	< 1.5	< 1.5
2,4-Dinitrotoluene	ug/l	8270	0.24	0.24	- -	< 0.22	< 0.21	< 0.25	< 0.21	< 0.22	< 0.21	< 0.049	< 0.049	< 0.051
2,6-Dinitrotoluene	ug/l	8270	0.049	0.049	- -	< 0.14	< 0.13	< 0.16	< 0.13	< 0.14	< 0.14	< 0.058	< 0.058	< 0.06
2-Chloronaphthalene	ug/l	8270	75	330	- -	< 0.032	< 0.03	< 0.037	< 0.03	< 0.032	< 0.031	< 0.057	< 0.057	< 0.059
2-Chlorophenol	ug/l	8270	9.1	27	- -	< 0.23	< 0.22	< 0.27	< 0.22 R	< 0.23	< 0.23	< 0.062	< 0.062	< 0.064
2-Methylnaphthalene	ug/l	8270	3.6	36	- -	< 0.02	< 0.018	< 0.023	22	0.12 J	29	< 0.06	< 0.06	< 0.062
2-Methylphenol	ug/l	8270	93	930	- -	< 0.19	< 0.18	< 0.22	< 0.18 R	< 0.19	< 0.19	< 0.1	< 0.1	< 0.11
2-Nitroaniline	ug/l	8270	19	190	- -	< 0.7	< 0.65	< 0.8	< 0.65	< 0.7	< 0.67	< 0.2	< 0.2	< 0.21
2-Nitrophenol	ug/l	8270	- -	- -	- -	< 0.12	< 0.11	< 0.13	< 0.11 R	< 0.12	< 0.11	< 0.059	< 0.059	< 0.061
3,3'-Dichlorobenzidine	ug/l	8270	0.13	0.13	- -	< 0.15	< 0.14	< 0.17	< 0.14	< 0.15	< 0.15	< 0.56	< 0.56	< 0.58
3-Nitroaniline	ug/l	8270	- -	- -	- -	< 0.84	< 0.77	< 0.96	< 0.77	< 0.84	< 0.81	< 0.064	< 0.064	< 0.067
4,6-Dinitro-2-methylphenol	ug/l	8270	0.15	- -	- -	< 1.6	< 1.5	< 1.9	< 1.5 R	< 1.6	< 1.6	< 1.4	< 1.4	< 1.5
4-Bromophenyl phenyl ether	ug/l	8270	- -	- -	- -	< 0.12	< 0.11	< 0.14	< 0.11	< 0.12	< 0.12	< 0.061	< 0.061	< 0.063
4-Chloro-3-methylphenol	ug/l	8270	140	- -	- -	< 0.18	< 0.16	< 0.2	< 0.16 R	< 0.18	< 0.17	< 0.059	< 0.059	< 0.061
4-Chloroaniline	ug/l	8270	0.37	0.37	- -	< 0.3	< 0.28	< 0.35	< 0.28	< 0.3	< 0.29	< 0.042	< 0.042	< 0.044
4-Chlorophenyl phenyl ether	ug/l	8270	- -	- -	- -	< 0.083	< 0.077	< 0.095	< 0.077	< 0.083	< 0.08	< 0.059	< 0.059	< 0.061
4-Nitroaniline	ug/l	8270	3.8	- -	- -	< 0.81	< 0.74	< 0.92	< 0.74	< 0.81	< 0.77	< 0.056	< 0.056	< 0.058
4-Nitrophenol [1]	ug/l	8270	3.9	39	- -	< 0.84	< 0.77	< 0.96	< 0.77 R	< 0.84	< 0.8	< 0.14	< 0.14	< 0.14
Acenaphthene	ug/l	8270	53	240	- -	< 0.03	< 0.028	< 0.035	< 0.028	0.082 J	2.1	< 0.063	< 0.063	< 0.065
Acenaphthylene [1]	ug/l	8270	53	320	- -	< 0.022	< 0.021	< 0.026	< 0.021	< 0.022	< 0.022	< 0.063	< 0.063	< 0.065
Acetophenone	ug/l	8270	190	1900	- -	< 0.12	< 0.11	< 0.13	< 0.11	< 0.12	< 0.11	< 0.06	< 0.06	< 0.062
Anthracene	ug/l	8270	180	1800	- -	< 0.02	< 0.018	< 0.023	< 0.018	0.058 J	0.29	< 0.047	< 0.047	< 0.049
Atrazine	ug/l	8270	0.3	3	3	< 0.23	< 0.21	< 0.27	< 0.21	< 0.23	< 0.22	< 0.18	< 0.18	< 0.18
Benzaldehyde	ug/l	8270	19	1900	- -	< 0.11	< 0.1	< 0.13	< 0.1	< 0.11	< 0.11	< 0.11	< 0.11	< 0.11
Benzo[a]anthracene	ug/l	8270	0.03	0.012	- -	< 0.038	< 0.035	< 0.044	< 0.035	< 0.038	< 0.037	< 0.072	< 0.072	< 0.075
Benzo[a]pyrene	ug/l	8270	0.025	0.2	0.2	< 0.029	< 0.027	< 0.034	< 0.027	< 0.029	< 0.028	< 0.051	< 0.051	< 0.053
Benzo[b]fluoranthene	ug/l	8270	0.25	0.034	- -	< 0.051	< 0.047	< 0.058	< 0.047	< 0.051	< 0.049	< 0.093	< 0.093	< 0.097
Benzo[g,h,i]perylene [1]	ug/l	8270	12	600	- -	< 0.03	< 0.028	< 0.035	< 0.028	< 0.03	< 0.029	< 0.066	< 0.066	< 0.069
Benzo[k]fluoranthene	ug/l	8270	2.5	0.34	- -	< 0.031	< 0.029	< 0.036	< 0.029	< 0.031	< 0.03	< 0.085	< 0.085	< 0.088
Bis(2-chloroisopropyl)ether	ug/l	8270	71	0.36	- -	< 0.025	< 0.023	< 0.028	< 0.023	< 0.025	< 0.024	< 0.056 UJ	< 0.056 UJ	< 0.058 UJ
Bis(2-chloroethoxy)methane	ug/l	8270	5.9	- -	- -	< 0.14	< 0.13	< 0.16	< 0.13	< 0.14	< 0.13	< 0.064	< 0.064	< 0.067
Bis(2-chloroethyl)ether	ug/l	8270	0.014	0.014	- -	< 0.033	< 0.03	< 0.038	< 0.03	< 0.033	< 0.032	< 0.038	< 0.038	< 0.04
Bis(2-ethylhexyl) phthalate	ug/l	8270	5.6	6	6	0.61 J	0.8 J	0.6 J	1.6 J	1 J	1.6 J	< 4.4	< 4.4	< 4.6
Butyl benzyl phthalate	ug/l	8270	16	16	- -	< 0.22	0.29 J	< 0.25	3.6	3.3	1.6	0.44 J	< 0.44	< 0.46
Caprolactam	ug/l	8270	990	9900	- -	< 1.5	< 1.4	< 1.8	< 1.4	< 1.5	< 1.5	< 0.45	< 0.45	< 0.47
Carbazole [1]	ug/l	8270	180	1800	- -	< 0.028	< 0.026	< 0.032	< 0.026	< 0.028	1.3	< 0.049	< 0.049	< 0.051
Chrysene	ug/l	8270	25	3.4	- -	< 0.032	< 0.03	< 0.037	< 0.03	< 0.032	< 0.031	< 0.078	< 0.078	< 0.081
Dibenz(a,h)anthracene	ug/l	8270	0.025	0.0034	- -	< 0.028	< 0.026	< 0.032	< 0.026	< 0.028	< 0.027	< 0.069	< 0.069	< 0.072
Dibenzofuran	ug/l	8270	0.79	7.9	- -	< 0.1	< 0.093	< 0.11	1.1	< 0.1	1.5	< 0.07	< 0.07	< 0.073
Diethyl phthalate	ug/l	8270	1500	15000	- -	< 0.31	< 0.29	< 0.35	< 0.29	0.34 B	< 0.3	< 0.55	< 0.55	< 0.57
Dimethyl phthalate	ug/l	8270	- -	- -	- -	< 0.19	< 0.18	< 0.22	< 0.18	< 0.19	< 0.18	< 0.054	< 0.054	< 0.056
Di-n-butyl phthalate	ug/l	8270	90	900	- -	< 0.25	< 0.23	< 0.29	0.23 J	< 0.25	< 0.24	< 0.71	< 0.71	< 0.74
Di-n-octyl phthalate	ug/l	8270	20	- -	- -	< 0.21	< 0.2	< 0.24	< 0.2	< 0.21	< 0.2	< 0.66	< 0.66	< 0.69
Fluoranthene	ug/l	8270	80	800	- -	< 0.022	< 0.02	< 0.025	0.11 J	0.023 J	0.16 J	< 0.058	< 0.058	< 0.06
Fluorene	ug/l	8270	29	150	- -	< 0.025	< 0.023	< 0.029	1.7	0.04 J	2.4	< 0.066	< 0.066	< 0.069
Hexachlorobenzene	ug/l	8270	0.0098	1	1	< 0.064	< 0.059	< 0.073	< 0.059	< 0.064	< 0.061	< 0.054	< 0.054	< 0.056
Hexachlorobutadiene	ug/l	8270	0.14	0.14	- -	< 0.098	< 0.09	< 0.11	< 0.09	< 0.098	< 0.094	< 0.066	< 0.066	< 0.069
Hexachlorocyclopentadiene	ug/l	8270	0.041	50	50	< 0.14	< 0.13	< 0.16	< 0.13	< 0.14	< 0.14	< 0.48	< 0.48	< 0.5
Hexachloroethane	ug/l	8270	0.33	0.33	- -	< 0.14	< 0.13	< 0.16	< 0.13	< 0.14	< 0.14	< 0.06	< 0.06	< 0.062
Indeno[1,2,3-cd]pyrene	ug/l	8270	0.25	0.034	- -	< 0.045	< 0.042	< 0.052	< 0.042	< 0.045	< 0.043	< 0.082	< 0.082	< 0.085
Isophorone	ug/l	8270	78	78	- -	< 0.077	< 0.071	< 0.088	< 0.071	< 0.077	< 0.074	< 0.052	< 0.052	< 0.054
Methylphenol, 3 & 4 [1]	ug/l	8270	93	930	- -	< 0.22	< 0.2	< 0.25	< 0.2 R	< 0.22	< 0.21	< 0.4	< 0.4	< 0.42
Naphthalene	ug/l	8270	0.12	0.17	- -	< 0.024	< 0.022	< 0.027	9.1	0.16 J	17	< 0.057	< 0.057	< 0.059
Nitrobenzene	ug/l	8270	0.14	0.14	- -	< 0.16	< 0.14	< 0.18	< 0.14	< 0.16	< 0.15	< 0.16	< 0.16	< 0.17
N-Nitrosodi-n-propylamine	ug/l	8270	0.011	0.011	- -	< 0.052	< 0.048	< 0.06	< 0.048	< 0.052	< 0.05	< 0.068	< 0.068	< 0.071
N-Nitrosodiphenylamine	ug/l	8270	12	12	- -	< 0.13	< 0.12	< 0.14	< 0.12	< 0.13	< 0.12	< 0.11	< 0.11	< 0.12
Pentachlorophenol	ug/l	8270	0.041	1	1	< 0.52	< 0.48	< 0.6	< 0.48 R	< 0.52	< 0.5	< 0.23	< 0.23	< 0.24

TABLE A-5
ANALYTICAL AND SCREENING RESULTS
GROUNDWATER
CAA VIM AND VIIM
MINGO JUNCTION STEEL WORK LLC - WEIRTON FACILITY

			Screening Criteria [1]			Sample Information [2]								
	Units	Analytical Method	Tapwater RSL	Groundwater De Minimis	*MCL*	VII-MW-01A DUP 02/19/2014 Duplicate	VII-MW-02A 02/19/2014	VII-MW-03A 02/19/2014	VII-MW-01P 02/14/2014	VII-MW-02P 02/13/2014	VII-MW-03P 02/14/2014	VI-MW-03A 01/17/2019	VI-MW-03A DUP 01/17/2019 Duplicate	VI-MW-04A 01/17/2019
Phenanthrene [1]	ug/l	8270	180	6000	- -	< 0.043	< 0.04	0.054 J	2.6	0.051 J	2.5	< 0.053	< 0.053	< 0.055
Phenol	ug/l	8270	580	5800	- -	< 0.058	< 0.053	< 0.066	< 0.053 R	< 0.058	0.33 J	< 0.094	< 0.094	< 0.098
Pyrene	ug/l	8270	12	79	- -	< 0.024	< 0.022	< 0.027	< 0.022	0.036 J	0.15 J	< 0.052	< 0.052	< 0.054
Inorganics [3]														
Aluminum	ug/l	6020	2000	20000	*200*	< 2.6 UJ	< 2.6 UJ	***2600*** J	5.5 J	24 J	50 J	NA	NA	NA
Antimony	ug/l	6020	0.78	7.8	6	0.082 J	0.079 J	0.1 J	< 0.019 UL	0.047 L	< 0.019 UL	NA	NA	NA
Arsenic	ug/l	6020	0.052	10	10	< 0.29 UJ	< 0.29 UJ	< 0.29 UJ	1.2 K	2.3 K	1.9 K	NA	NA	NA
Barium	ug/l	6020	380	2000	2000	29 J	23 J	41 J	94 J	20 J	26 J	NA	NA	NA
Beryllium	ug/l	6020	2.5	4	4	< 0.037 UJ	< 0.037 UJ	0.85 J	< 0.037 UJ	< 0.037 UJ	< 0.037 UJ	NA	NA	NA
Cadmium	ug/l	6020	0.92	5	5	< 0.11 UJ	< 0.11 UJ	1.4 J	< 0.11 UJ	< 0.11 UJ	< 0.11 UJ	NA	NA	NA
Calcium	ug/l	6020	- -	- -	- -	140000 K	56000 K	140000 K	1000000 J	31000 J	220000 J	NA	NA	NA
Chromium [1]	ug/l	6020	2200	22000	100	1.1 J	2.1 J	3.4 J	1.5 J	0.95 J	0.98 J	NA	NA	NA
Cobalt	ug/l	6020	0.6	6	- -	1.1 J	0.1 J	47 J	0.71 J	0.11 J	0.14 J	NA	NA	NA
Copper	ug/l	6020	80	800	1300	0.43 K	1 K	7.3 K	1.8 K	0.74 K	0.75 K	NA	NA	NA
Iron	ug/l	6020	1400	14000	*300*	< 6.1 UJ	< 6.1 UJ	***1400*** J	42 J	10 J	20 J	NA	NA	NA
Lead	ug/l	6020	15	15	15	0.033 B	0.031 B	4.4 J	0.056 B	0.072 B	0.073 B	NA	NA	NA
Magnesium	ug/l	6020	- -	- -	- -	32000 J	16000 J	13000 J	690 L	4400 L	16000 L	NA	NA	NA
Manganese [1]	ug/l	6020	43	850	*50*	***1100*** J	24 J	***19000*** J	25 J	***260*** J	8.6 J	NA	NA	NA
Mercury	ug/l	7470	0.063	2	2	< 0.038	0.043 J	< 0.038	0.05 J	< 0.038	< 0.038	NA	NA	NA
Nickel	ug/l	6020	39	390	- -	4.1 J	1.7 J	46 J	< 1.7 UJ	0.95 J	< 0.17 UJ	NA	NA	NA
Potassium	ug/l	6020	- -	- -	- -	2700 J	4100 J	15000 J	49000 J	2600 J	22000 J	NA	NA	NA
Selenium	ug/l	6020	10	50	50	< 0.42 UJ	0.72 B	1 B	15 J	0.45 J	1.1 J	NA	NA	NA
Silver	ug/l	6020	9.4	94	*100*	< 0.036 UJ	< 0.036 UJ	0.092 J	< 0.036 UJ	< 0.036 UJ	< 0.036 UJ	NA	NA	NA
Sodium	ug/l	6020	- -	- -	- -	47000 K	52000 K	47000 K	42000 J	7400 J	35000 J	NA	NA	NA
Thallium	ug/l	6020	0.02	2	2	< 0.015 UJ	< 0.015 UJ	0.093 B	0.043 B	0.035 B	< 0.015 UJ	NA	NA	NA
Vanadium	ug/l	6020	8.6	1.2	- -	0.34 B	0.39 B	0.13 B	< 0.082 UJ	1.8 J	1.5 J	NA	NA	NA
Zinc	ug/l	6020	600	6000	*5000*	4.7 K	7.2 K	100 K	4.7 J	5.7 J	8.1 J	NA	NA	NA
Other Parameters														
Cyanide, Total	ug/l	9012	0.15	200	200	< 1.5	< 1.5	< 1.5	< 1.5	< 1.5	< 1.5	NA	NA	NA

TABLE A-5
ANALYTICAL AND SCREENING RESULTS
GROUNDWATER
CAA VIM AND VIIM
MINGO JUNCTION STEEL WORK LLC - WEIRTON FACILITY

			Screening Criteria [1]			Sample Information [2]								
	Units	Analytical Method	Tapwater RSL	Groundwater De Minimis	*MCL*	VII-MW-04P 01/17/2019	VII-MW-05P 01/17/2019	VII-MW-06P 01/17/2019	VII-MW-07P 01/17/2019	MA-MW-07A 04/04/2019	MA-MW-07D 04/04/2019	VI-MW-01A 04/01/2019	VI-MW-01P 04/01/2019	VI-MW-02AR 04/01/2019
Volatile Organic Compounds														
1,1,1-Trichloroethane	ug/l	8260	800	200	200	< 0.6	< 0.6	< 0.6	< 0.6	< 0.6	< 0.6	< 0.6	< 0.6	< 0.6
1,1,2,2-Tetrachloroethane	ug/l	8260	0.076	0.076	- -	< 0.6	< 0.6	< 0.6	< 0.6	< 0.6	< 0.6	< 0.6	< 0.6	< 0.6
1,1,2-Trichloro-1,2,2-trifluoroethane	ug/l	8260	1000	57000	- -	NA	NA	NA	NA	NA	NA	NA	NA	NA
1,1,2-Trichloroethane	ug/l	8260	0.041	5	5	< 0.45	< 0.45	< 0.45	< 0.45	< 0.45	< 0.45	< 0.45	< 0.45	< 0.45
1,1-Dichloroethane	ug/l	8260	2.8	2.8	- -	< 0.63	< 0.63	< 0.63	< 0.63	< 0.63	< 0.63	< 0.63	< 0.63	< 0.63
1,1-Dichloroethene	ug/l	8260	28	7	7	< 0.55	< 0.55	< 0.55	< 0.55	< 0.55	0.96 J	< 0.55	< 0.55	< 0.55
1,2,4-Trichlorobenzene	ug/l	8260	0.4	70	70	NA	NA	NA	NA	NA	NA	NA	NA	NA
1,2-Dibromo-3-Chloropropane	ug/l	8260	0.00033	0.2	0.2	NA	NA	NA	NA	NA	NA	NA	NA	NA
1,2-Dibromoethane (EDB)	ug/l	8260	0.0075	0.05	0.05	NA	NA	NA	NA	NA	NA	NA	NA	NA
1,2-Dichlorobenzene	ug/l	8260	30	600	600	NA	NA	NA	NA	NA	NA	NA	NA	NA
1,2-Dichloroethane	ug/l	8260	0.17	5	5	< 0.57	< 0.57	< 0.57	< 0.57	< 0.57	< 0.57	< 0.57	< 0.57	< 0.57
1,2-Dichloroethene, Total	ug/l	8260	- -	- -	- -	< 1.3	< 1.3	< 1.3	< 1.3	< 1.3	< 1.3	< 1.3	< 1.3	< 1.3
cis-1,2-Dichloroethene	ug/l	8260	3.6	70	70	< 0.71	< 0.71	< 0.71	< 0.71	< 0.71	< 0.71	1.2	< 0.71	< 0.71
trans-1,2-Dichloroethene	ug/l	8260	6.8	100	100	< 0.67	< 0.67	< 0.67	< 0.67	< 0.67	< 0.67	< 0.67	< 0.67	< 0.67
1,2-Dichloropropane	ug/l	8260	0.82	5	5	< 0.66	< 0.66	< 0.66	< 0.66	< 0.66	< 0.66	< 0.66	< 0.66	< 0.66
cis-1,3-Dichloropropene [1]	ug/l	8260	0.47	0.47	- -	< 0.59	< 0.59	< 0.59	< 0.59	< 0.59	< 0.59	< 0.59	< 0.59	< 0.59
trans-1,3-Dichloropropene [1]	ug/l	8260	0.47	0.47	- -	< 0.58	< 0.58	< 0.58	< 0.58	< 0.58	< 0.58	< 0.58	< 0.58	< 0.58
1,3-Dichlorobenzene [1]	ug/l	8260	0.48	75	75	NA	NA	NA	NA	NA	NA	NA	NA	NA
1,4-Dichlorobenzene	ug/l	8260	0.48	75	75	NA	NA	NA	NA	NA	NA	NA	NA	NA
2-Butanone (MEK)	ug/l	8260	560	5600	- -	< 2.6	< 2.6	< 2.6	< 2.6	< 2.6	< 2.6	< 2.6	< 2.6	< 2.6
2-Hexanone	ug/l	8260	3.8	- -	- -	< 3.3	< 3.3	< 3.3	< 3.3	< 3.3	< 3.3	< 3.3	< 3.3	< 3.3
4-Methyl-2-pentanone (MIBK)	ug/l	8260	630	1200	- -	< 3.1	< 3.1	< 3.1	< 3.1	< 3.1	< 3.1	< 3.1	< 3.1	< 3.1
Acetone	ug/l	8260	1400	14000	- -	< 3.4	< 3.4	< 3.4	< 3.4	< 3.4	5.8	4 J	5.7 J	5.2 J
Benzene	ug/l	8260	0.46	5	5	< 0.6	< 0.6	< 0.6	< 0.6	< 0.6	< 0.6	< 0.6	< 0.6	< 0.6
Bromoform	ug/l	8260	3.3	3.3	80	< 0.98	< 0.98	< 0.98	< 0.98	< 0.98	< 0.98	< 0.98	< 0.98	< 0.98
Bromomethane	ug/l	8260	0.75	7.5	- -	< 0.89	< 0.89 UJ	< 0.89 UJ	< 0.89 UJ	< 0.89	< 0.89	< 0.89	< 0.89	< 0.89
Carbon disulfide	ug/l	8260	81	810	- -	< 0.88	< 0.88	< 0.88	< 0.88	< 0.88	< 0.88	< 0.88	< 0.88	< 0.88
Carbon tetrachloride	ug/l	8260	0.46	5	5	< 0.88	< 0.88 UJ	< 0.88 UJ	< 0.88 UJ	< 0.88	< 0.88	< 0.88	< 0.88	< 0.88
Chlorobenzene	ug/l	8260	7.8	100	100	< 0.5	< 0.5	< 0.5	< 0.5	< 0.5	< 0.5	< 0.5	< 0.5	< 0.5
Chlorodibromomethane	ug/l	8260	0.87	0.87	80	< 0.84	< 0.84	< 0.84	< 0.84	< 0.84	< 0.84	< 0.84	< 0.84	< 0.84
Chloroethane	ug/l	8260	2100	21000	- -	< 0.9	< 0.9	< 0.9	< 0.9	< 0.9	< 0.9	< 0.9	< 0.9	< 0.9
Chloroform	ug/l	8260	0.22	0.22	80	< 0.6	< 0.6	< 0.6	< 0.6	< 0.6	< 0.6	4.3	< 0.6	< 0.6
Chloromethane	ug/l	8260	19	190	- -	< 0.9	< 0.9	< 0.9	< 0.9	< 0.9	< 0.9	< 0.9	< 0.9	< 0.9
Cyclohexane	ug/l	8260	1300	13000	- -	NA	NA	NA	NA	NA	NA	NA	NA	NA
Dichlorobromomethane	ug/l	8260	0.13	0.13	80	< 0.64	< 0.64	< 0.64	< 0.64	< 0.64	< 0.64	< 0.64	< 0.64	< 0.64
Dichlorodifluoromethane	ug/l	8260	20	200	- -	NA	NA	NA	NA	NA	NA	NA	NA	NA
Ethylbenzene	ug/l	8260	1.5	700	700	0.54 J	< 0.51	< 0.51	< 0.51	< 0.51	< 0.51	< 0.51	< 0.51	< 0.51
Isopropylbenzene	ug/l	8260	45	450	- -	NA	NA	NA	NA	NA	NA	NA	NA	NA
Methyl acetate	ug/l	8260	2000	5300	- -	NA	NA	NA	NA	NA	NA	NA	NA	NA
Methyl tert-butyl ether	ug/l	8260	14	14	- -	< 0.59	< 0.59	< 0.59	< 0.59	< 0.59	< 0.59	< 0.59	< 0.59	< 0.59
Methylcyclohexane [1]	ug/l	8260	1300	13000	- -	NA	NA	NA	NA	NA	NA	NA	NA	NA
Methylene Chloride	ug/l	8260	11	5	5	< 0.89	< 0.89	< 0.89	< 0.89	< 0.89	< 0.89	< 0.89	< 0.89	< 0.89
Naphthalene	ug/l	8260	0.12	0.17	- -	2.4	< 0.79	< 0.79	< 0.79	< 0.79 UJ	< 0.79 UJ	< 0.79	< 0.79	< 0.79
Styrene	ug/l	8260	120	100	100	< 0.47	< 0.47	< 0.47	< 0.47	< 0.47	< 0.47	< 0.47	< 0.47	< 0.47
Tetrachloroethene	ug/l	8260	4.1	5	5	2.4	< 0.47	0.9 J	< 0.47	< 0.47	< 0.47	1.4	< 0.47	< 0.47
Toluene	ug/l	8260	110	1000	1000	< 0.46	< 0.46	< 0.46	< 0.46	< 0.46	< 0.46	< 0.46	< 0.46	< 0.46
Trichloroethene	ug/l	8260	0.28	5	5	< 0.69	< 0.69	< 0.69	< 0.69	< 0.69	< 0.69	0.84 J	< 0.69	< 0.69
Trichlorofluoromethane	ug/l	8260	520	1100	- -	NA	NA	NA	NA	NA	NA	NA	NA	NA
Vinyl chloride	ug/l	8260	0.019	2	2	< 0.88	< 0.88	< 0.88	< 0.88	< 0.88	< 0.88	< 0.88	< 0.88	< 0.88
Xylenes, Total	ug/l	8260	19	10000	10000	1.3 J	< 0.89	< 0.89	< 0.89	< 0.89	< 0.89	< 0.89	< 0.89	< 0.89
Semi-Volatile Organics														
1,1'-Biphenyl	ug/l	8270	0.083	0.83	- -	NA	NA	NA	NA	< 0.055	< 0.057	< 0.055	< 0.061	< 0.057
2,4,5-Trichlorophenol	ug/l	8270	120	1200	- -	NA	NA	NA	NA	< 0.056	< 0.059	< 0.056	< 0.064	< 0.059
2,4,6-Trichlorophenol	ug/l	8270	1.2	4.1	- -	NA	NA	NA	NA	< 0.063	< 0.065	< 0.063	< 0.071	< 0.065
2,4-Dichlorophenol	ug/l	8270	4.6	46	- -	NA	NA	NA	NA	< 0.047	< 0.049	< 0.047	< 0.053	< 0.049
2,4-Dimethylphenol	ug/l	8270	36	360	- -	NA	NA	NA	NA	< 0.038	< 0.039	< 0.038	< 0.043	< 0.039

TABLE A-5
ANALYTICAL AND SCREENING RESULTS
GROUNDWATER
CAA VIM AND VIIM
MINGO JUNCTION STEEL WORK LLC - WEIRTON FACILITY

			Screening Criteria [1]			Sample Information [2]																	
	Units	Analytical Method	Tapwater RSL	Groundwater De Minimis	*MCL*	VII-MW-04P 01/17/2019		VII-MW-05P 01/17/2019		VII-MW-06P 01/17/2019		VII-MW-07P 01/17/2019		MA-MW-07A 04/04/2019		MA-MW-07D 04/04/2019		VI-MW-01A 04/01/2019		VI-MW-01P 04/01/2019		VI-MW-02AR 04/01/2019	
2,4-Dinitrophenol	ug/l	8270	3.9	39	- -	NA		NA		NA		NA		< 1.4		< 1.5		< 1.4		< 1.6		< 1.5	
2,4-Dinitrotoluene	ug/l	8270	0.24	0.24	- -	NA		NA		NA		NA		< 0.047		< 0.049		< 0.047		< 0.053		< 0.049	
2,6-Dinitrotoluene	ug/l	8270	0.049	0.049	- -	NA		NA		NA		NA		< 0.056		< 0.058		< 0.056		< 0.063		< 0.058	
2-Chloronaphthalene	ug/l	8270	75	330	- -	NA		NA		NA		NA		< 0.055		< 0.057		< 0.055		< 0.061		< 0.057	
2-Chlorophenol	ug/l	8270	9.1	27	- -	NA		NA		NA		NA		< 0.059		< 0.062		< 0.059		< 0.067		< 0.062	
2-Methylnaphthalene	ug/l	8270	3.6	36	- -	NA		NA		NA		NA		< 0.057		< 0.06		< 0.057		< 0.065		< 0.06	
2-Methylphenol	ug/l	8270	93	930	- -	NA		NA		NA		NA		< 0.28		< 0.29		< 0.28		< 0.31		< 0.29	
2-Nitroaniline	ug/l	8270	19	190	- -	NA		NA		NA		NA		< 0.51		< 0.53		< 0.51		< 0.57		< 0.53	
2-Nitrophenol	ug/l	8270	- -	- -	- -	NA		NA		NA		NA		< 0.056		< 0.059		< 0.056		< 0.064		< 0.059	
3,3'-Dichlorobenzidine	ug/l	8270	0.13	0.13	- -	NA		NA		NA		NA		< 0.54		< 0.56		< 0.54		< 0.61		< 0.56	
3-Nitroaniline	ug/l	8270	- -	- -	- -	NA		NA		NA		NA		< 0.062		< 0.064		< 0.062		< 0.07		< 0.064	
4,6-Dinitro-2-methylphenol	ug/l	8270	0.15	- -	- -	NA		NA		NA		NA		< 1.4		< 1.4		< 1.4		< 1.5		< 1.4	
4-Bromophenyl phenyl ether	ug/l	8270	- -	- -	- -	NA		NA		NA		NA		< 0.058		< 0.061		< 0.058		< 0.066		< 0.061	
4-Chloro-3-methylphenol	ug/l	8270	140	- -	- -	NA		NA		NA		NA		< 0.056		< 0.059		< 0.056		< 0.064		< 0.059	
4-Chloroaniline	ug/l	8270	0.37	0.37	- -	NA		NA		NA		NA		< 0.041		< 0.042		< 0.041		< 0.046		< 0.042	
4-Chlorophenyl phenyl ether	ug/l	8270	- -	- -	- -	NA		NA		NA		NA		< 0.056		< 0.059		< 0.056		< 0.064		< 0.059	
4-Nitroaniline	ug/l	8270	3.8	- -	- -	NA		NA		NA		NA		< 0.054		< 0.056		< 0.054		< 0.06		< 0.056	
4-Nitrophenol [1]	ug/l	8270	3.9	39	- -	NA		NA		NA		NA		< 0.13		< 0.14		< 0.13		< 0.15		< 0.14	
Acenaphthene	ug/l	8270	53	240	- -	NA		NA		NA		NA		< 0.06		< 0.063		< 0.06		0.073	J	< 0.063	
Acenaphthylene [1]	ug/l	8270	53	320	- -	NA		NA		NA		NA		< 0.06		< 0.063		< 0.06		< 0.068		< 0.063	
Acetophenone	ug/l	8270	190	1900	- -	NA		NA		NA		NA		< 0.057		< 0.06		< 0.057		< 0.065		< 0.06	
Anthracene	ug/l	8270	180	1800	- -	NA		NA		NA		NA		< 0.045		< 0.047		< 0.045		< 0.051		< 0.047	
Atrazine	ug/l	8270	0.3	3	3	NA		NA		NA		NA		< 0.59		< 0.61		< 0.59	UJ	< 0.66	UJ	< 0.61	UJ
Benzaldehyde	ug/l	8270	19	1900	- -	NA		NA		NA		NA		< 0.1		< 0.11		< 0.1		< 0.12		< 0.11	
Benzo[a]anthracene	ug/l	8270	0.03	0.012	- -	NA		NA		NA		NA		< 0.069		< 0.072		< 0.069		< 0.078		< 0.072	
Benzo[a]pyrene	ug/l	8270	0.025	0.2	0.2	NA		NA		NA		NA		< 0.049		< 0.051		< 0.049		< 0.055		< 0.051	
Benzo[b]fluoranthene	ug/l	8270	0.25	0.034	- -	NA		NA		NA		NA		< 0.09		< 0.093		< 0.09		< 0.1		< 0.093	
Benzo[g,h,i]perylene [1]	ug/l	8270	12	600	- -	NA		NA		NA		NA		< 0.064		< 0.066		< 0.064		< 0.072		< 0.066	
Benzo[k]fluoranthene	ug/l	8270	2.5	0.34	- -	NA		NA		NA		NA		< 0.081		< 0.085		< 0.081		< 0.092		< 0.085	
Bis(2-chloroisopropyl)ether	ug/l	8270	71	0.36	- -	NA		NA		NA		NA		< 0.054		< 0.056		< 0.054		< 0.06		< 0.056	
Bis(2-chloroethoxy)methane	ug/l	8270	5.9	- -	- -	NA		NA		NA		NA		< 0.062		< 0.064		< 0.062		< 0.07		< 0.064	
Bis(2-chloroethyl)ether	ug/l	8270	0.014	0.014	- -	NA		NA		NA		NA		< 0.037		< 0.038		< 0.037		< 0.042		< 0.038	
Bis(2-ethylhexyl) phthalate	ug/l	8270	5.6	6	6	NA		NA		NA		NA		< 5.8		< 6		< 5.8		< 6.5		< 6	
Butyl benzyl phthalate	ug/l	8270	16	16	- -	NA		NA		NA		NA		0.46	J	< 0.44		0.49	J	0.61	J	0.56	J
Caprolactam	ug/l	8270	990	9900	- -	NA		NA		NA		NA		0.8	J	0.76	J	< 0.44		1.1	J	1.6	J
Carbazole [1]	ug/l	8270	180	1800	- -	NA		NA		NA		NA		< 0.047		< 0.049		< 0.047		< 0.053		< 0.049	
Chrysene	ug/l	8270	25	3.4	- -	NA		NA		NA		NA		< 0.075		< 0.078		< 0.075		< 0.084		< 0.078	
Dibenz(a,h)anthracene	ug/l	8270	0.025	0.0034	- -	NA		NA		NA		NA		< 0.067		< 0.069		< 0.067		< 0.075		< 0.069	
Dibenzofuran	ug/l	8270	0.79	7.9	- -	NA		NA		NA		NA		< 0.068		< 0.07		< 0.068		< 0.076		< 0.07	
Diethyl phthalate	ug/l	8270	1500	15000	- -	NA		NA		NA		NA		< 0.53		< 0.55		< 0.53		< 0.59		< 0.55	
Dimethyl phthalate	ug/l	8270	- -	- -	- -	NA		NA		NA		NA		< 0.052		< 0.054		< 0.052		< 0.058		< 0.054	
Di-n-butyl phthalate	ug/l	8270	90	900	- -	NA		NA		NA		NA		< 0.69		0.72	J	< 0.69		< 0.77		< 0.71	
Di-n-octyl phthalate	ug/l	8270	20	- -	- -	NA		NA		NA		NA		< 0.63		< 0.66		< 0.63		< 0.71		< 0.66	
Fluoranthene	ug/l	8270	80	800	- -	NA		NA		NA		NA		< 0.056		< 0.058		< 0.056		0.086	J	< 0.058	
Fluorene	ug/l	8270	29	150	- -	NA		NA		NA		NA		< 0.064		< 0.066		< 0.064		< 0.072		< 0.066	
Hexachlorobenzene	ug/l	8270	0.0098	1	1	NA		NA		NA		NA		< 0.052		< 0.054		< 0.052		< 0.058		< 0.054	
Hexachlorobutadiene	ug/l	8270	0.14	0.14	- -	NA		NA		NA		NA		< 0.064		< 0.066		< 0.064		< 0.072		< 0.066	
Hexachlorocyclopentadiene	ug/l	8270	0.041	50	50	NA		NA		NA		NA		< 0.46		< 0.48		< 0.46		< 0.52		< 0.48	
Hexachloroethane	ug/l	8270	0.33	0.33	- -	NA		NA		NA		NA		< 0.057		< 0.06		< 0.057		< 0.065		< 0.06	
Indeno[1,2,3-cd]pyrene	ug/l	8270	0.25	0.034	- -	NA		NA		NA		NA		< 0.079		< 0.082		< 0.079		< 0.089		< 0.082	
Isophorone	ug/l	8270	78	78	- -	NA		NA		NA		NA		< 0.05		< 0.052		< 0.05		< 0.056		< 0.052	
Methylphenol, 3 & 4 [1]	ug/l	8270	93	930	- -	NA		NA		NA		NA		< 0.34		< 0.36		< 0.34		< 0.39		< 0.36	
Naphthalene	ug/l	8270	0.12	0.17	- -	NA		NA		NA		NA		< 0.055		< 0.057		< 0.055		< 0.061		< 0.057	
Nitrobenzene	ug/l	8270	0.14	0.14	- -	NA		NA		NA		NA		< 0.46		< 0.48		< 0.46		< 0.52		< 0.48	
N-Nitrosodi-n-propylamine	ug/l	8270	0.011	0.011	- -	NA		NA		NA		NA		< 0.066		< 0.068		< 0.066		< 0.074		< 0.068	
N-Nitrosodiphenylamine	ug/l	8270	12	12	- -	NA		NA		NA		NA		< 0.11		< 0.11		< 0.11		< 0.12		< 0.11	
Pentachlorophenol	ug/l	8270	0.041	1	1	NA		NA		NA		NA		< 0.78		< 0.81		< 0.78		< 0.88		< 0.81	

TABLE A-5
ANALYTICAL AND SCREENING RESULTS
GROUNDWATER
CAA VIM AND VIIM
MINGO JUNCTION STEEL WORK LLC - WEIRTON FACILITY

			Screening Criteria [1]			Sample Information [2]								
	Units	Analytical Method	Tapwater RSL	Groundwater De Minimis	*MCL*	VII-MW-04P 01/17/2019	VII-MW-05P 01/17/2019	VII-MW-06P 01/17/2019	VII-MW-07P 01/17/2019	MA-MW-07A 04/04/2019	MA-MW-07D 04/04/2019	VI-MW-01A 04/01/2019	VI-MW-01P 04/01/2019	VI-MW-02AR 04/01/2019
Phenanthrene [1]	ug/l	8270	180	6000	- -	NA	NA	NA	NA	0.059 J	0.096 J	0.06 J	0.1 J	0.079 J
Phenol	ug/l	8270	580	5800	- -	NA	NA	NA	NA	< 0.45	< 0.47	< 0.45	< 0.51	< 0.47
Pyrene	ug/l	8270	12	79	- -	NA	NA	NA	NA	< 0.05	< 0.052	< 0.05	0.094 J	< 0.052
Inorganics [3]														
Aluminum	ug/l	6020	2000	20000	*200*	NA	NA	NA	NA	< 13	< 13	< 13	< 13	< 13
Antimony	ug/l	6020	0.78	7.8	6	NA	NA	NA	NA	< 0.38	< 0.38	< 0.38	< 0.38	< 0.38
Arsenic	ug/l	6020	0.052	10	10	NA	NA	NA	NA	0.48 J	< 0.32	< 0.32	1.1	< 0.32
Barium	ug/l	6020	380	2000	2000	NA	NA	NA	NA	23	19	22	34	13
Beryllium	ug/l	6020	2.5	4	4	NA	NA	NA	NA	< 0.16	< 0.16	< 0.16	< 0.16	< 0.16
Cadmium	ug/l	6020	0.92	5	5	NA	NA	NA	NA	< 0.13	< 0.13	< 0.13	< 0.13	< 0.13
Calcium	ug/l	6020	- -	- -	- -	NA	NA	NA	NA	54000	63000	140000	77000	160000
Chromium [1]	ug/l	6020	2200	22000	100	NA	NA	NA	NA	3	2.2	< 1.5	1.7 J	1.7 J
Cobalt	ug/l	6020	0.6	6	- -	NA	NA	NA	NA	0.11 J	0.099 J	0.1 J	1.6	0.13 J
Copper	ug/l	6020	80	800	1300	NA	NA	NA	NA	0.82 J	0.69 J	1.6 J	0.84 J	0.8 J
Iron	ug/l	6020	1400	14000	*300*	NA	NA	NA	NA	77	17 J	< 14	***2000***	< 14
Lead	ug/l	6020	15	15	15	NA	NA	NA	NA	< 0.13	< 0.13	< 0.13	< 0.13	< 0.13
Magnesium	ug/l	6020	- -	- -	- -	NA	NA	NA	NA	17000	21000	43000	33000	57000
Manganese [1]	ug/l	6020	43	850	*50*	NA	NA	NA	NA	< 1.4	< 1.4	4 J	***1400***	1.9 J
Mercury	ug/l	7470	0.063	2	2	NA	NA	NA	NA	< 0.1	< 0.1	< 0.1	< 0.1	< 0.1
Nickel	ug/l	6020	39	390	- -	NA	NA	NA	NA	0.45 J	0.45 J	1.4	5.1	1.4
Potassium	ug/l	6020	- -	- -	- -	NA	NA	NA	NA	9300	7500	2200	5000	2100
Selenium	ug/l	6020	10	50	50	NA	NA	NA	NA	3.2 J	< 2.6	< 2.6	< 2.6	2.7 J
Silver	ug/l	6020	9.4	94	*100*	NA	NA	NA	NA	< 0.12	< 0.12	< 0.12	< 0.12	< 0.12
Sodium	ug/l	6020	- -	- -	- -	NA	NA	NA	NA	110000	100000	170000	94000	72000
Thallium	ug/l	6020	0.02	2	2	NA	NA	NA	NA	< 0.13	< 0.13	< 0.13	< 0.13	< 0.13
Vanadium	ug/l	6020	8.6	1.2	- -	NA	NA	NA	NA	2	1.2	1.4	1.7	1.2
Zinc	ug/l	6020	600	6000	*5000*	NA	NA	NA	NA	< 3.2	5.6	< 3.2	6.2	< 3.2
Other Parameters														
Cyanide, Total	ug/l	9012	0.15	200	200	NA	NA	NA	NA	37	31	< 4.4	4.7 J	< 4.4

TABLE A-5
ANALYTICAL AND SCREENING RESULTS
GROUNDWATER
CAA VIM AND VIIM
MINGO JUNCTION STEEL WORK LLC - WEIRTON FACILITY

			Screening Criteria [1]			Sample Information [2]								
	Units	Analytical Method	Tapwater RSL	Groundwater De Minimis	*MCL*	VI-MW-03A 03/28/2019	VI-MW-04A 03/28/2019	VI-MW-04A DUP 03/28/2019 Duplicate	VII-MW-01A 03/28/2019	VII-MW-01P 04/03/2019	VII-MW-02A 03/28/2019	VII-MW-02P 03/28/2019	VII-MW-03A 03/29/2019	VII-MW-03P 04/03/2019
Volatile Organic Compounds														
1,1,1-Trichloroethane	ug/l	8260	800	200	200	NA	NA	NA	< 0.6	< 0.6	< 0.6	< 0.6	< 0.6	< 0.6
1,1,2,2-Tetrachloroethane	ug/l	8260	0.076	0.076	- -	NA	NA	NA	< 0.6	< 0.6	< 0.6	< 0.6	< 0.6	< 0.6
1,1,2-Trichloro-1,2,2-trifluoroethane	ug/l	8260	1000	57000	- -	NA	NA	NA	NA	NA	NA	NA	NA	NA
1,1,2-Trichloroethane	ug/l	8260	0.041	5	5	NA	NA	NA	< 0.45	< 0.45	< 0.45	< 0.45	< 0.45	< 0.45
1,1-Dichloroethane	ug/l	8260	2.8	2.8	- -	NA	NA	NA	6	< 0.63	< 0.63	< 0.63	< 0.63	< 0.63
1,1-Dichloroethene	ug/l	8260	28	7	7	NA	NA	NA	< 0.55	< 0.55	< 0.55	< 0.55	< 0.55	< 0.55
1,2,4-Trichlorobenzene	ug/l	8260	0.4	70	70	NA	NA	NA	NA	NA	NA	NA	NA	NA
1,2-Dibromo-3-Chloropropane	ug/l	8260	0.00033	0.2	0.2	NA	NA	NA	NA	NA	NA	NA	NA	NA
1,2-Dibromoethane (EDB)	ug/l	8260	0.0075	0.05	0.05	NA	NA	NA	NA	NA	NA	NA	NA	NA
1,2-Dichlorobenzene	ug/l	8260	30	600	600	NA	NA	NA	NA	NA	NA	NA	NA	NA
1,2-Dichloroethane	ug/l	8260	0.17	5	5	NA	NA	NA	< 0.57	< 0.57	< 0.57	< 0.57	< 0.57	< 0.57
1,2-Dichloroethene, Total	ug/l	8260	- -	- -	- -	NA	NA	NA	4.9	< 1.3	< 1.3	< 1.3	1.9 J	3.3
cis-1,2-Dichloroethene	ug/l	8260	3.6	70	70	NA	NA	NA	4.9	< 0.71	1	< 0.71	1.9	2.6
trans-1,2-Dichloroethene	ug/l	8260	6.8	100	100	NA	NA	NA	< 0.67	< 0.67	< 0.67	< 0.67	< 0.67	0.68 J
1,2-Dichloropropane	ug/l	8260	0.82	5	5	NA	NA	NA	< 0.66	< 0.66	< 0.66	< 0.66	< 0.66	< 0.66
cis-1,3-Dichloropropene [1]	ug/l	8260	0.47	0.47	- -	NA	NA	NA	< 0.59	< 0.59	< 0.59	< 0.59	< 0.59	< 0.59
trans-1,3-Dichloropropene [1]	ug/l	8260	0.47	0.47	- -	NA	NA	NA	< 0.58	< 0.58	< 0.58	< 0.58	< 0.58	< 0.58
1,3-Dichlorobenzene [1]	ug/l	8260	0.48	75	75	NA	NA	NA	NA	NA	NA	NA	NA	NA
1,4-Dichlorobenzene	ug/l	8260	0.48	75	75	NA	NA	NA	NA	NA	NA	NA	NA	NA
2-Butanone (MEK)	ug/l	8260	560	5600	- -	NA	NA	NA	< 2.6	< 2.6	< 2.6	< 2.6	< 2.6	< 2.6
2-Hexanone	ug/l	8260	3.8	- -	- -	NA	NA	NA	< 3.3	< 3.3	< 3.3	< 3.3	< 3.3	< 3.3
4-Methyl-2-pentanone (MIBK)	ug/l	8260	630	1200	- -	NA	NA	NA	< 3.1	< 3.1	< 3.1	< 3.1	< 3.1	< 3.1
Acetone	ug/l	8260	1400	14000	- -	NA	NA	NA	4.8 J	5.8	7.9	3.6 J	6.3	6.6
Benzene	ug/l	8260	0.46	5	5	NA	NA	NA	< 0.6	< 0.6	< 0.6	< 0.6	< 0.6	< 0.6
Bromoform	ug/l	8260	3.3	3.3	80	NA	NA	NA	< 0.98	< 0.98	< 0.98	< 0.98	< 0.98	< 0.98
Bromomethane	ug/l	8260	0.75	7.5	- -	NA	NA	NA	< 0.89	< 0.89	< 0.89	< 0.89	< 0.89	< 0.89
Carbon disulfide	ug/l	8260	81	810	- -	NA	NA	NA	< 0.88	< 0.88	< 0.88	< 0.88	< 0.88	< 0.88
Carbon tetrachloride	ug/l	8260	0.46	5	5	NA	NA	NA	< 0.88	< 0.88	< 0.88	< 0.88	< 0.88	< 0.88
Chlorobenzene	ug/l	8260	7.8	100	100	NA	NA	NA	< 0.5	< 0.5	< 0.5	< 0.5	< 0.5	< 0.5
Chlorodibromomethane	ug/l	8260	0.87	0.87	80	NA	NA	NA	< 0.84	< 0.84	< 0.84	< 0.84	< 0.84	< 0.84
Chloroethane	ug/l	8260	2100	21000	- -	NA	NA	NA	< 0.9	< 0.9	< 0.9	< 0.9	< 0.9	< 0.9
Chloroform	ug/l	8260	0.22	0.22	80	NA	NA	NA	< 0.6	< 0.6	< 0.6	< 0.6	< 0.6	< 0.6
Chloromethane	ug/l	8260	19	190	- -	NA	NA	NA	< 0.9	< 0.9	< 0.9	< 0.9	< 0.9	< 0.9
Cyclohexane	ug/l	8260	1300	13000	- -	NA	NA	NA	NA	NA	NA	NA	NA	NA
Dichlorobromomethane	ug/l	8260	0.13	0.13	80	NA	NA	NA	< 0.64	< 0.64	< 0.64	< 0.64	< 0.64	< 0.64
Dichlorodifluoromethane	ug/l	8260	20	200	- -	NA	NA	NA	NA	NA	NA	NA	NA	NA
Ethylbenzene	ug/l	8260	1.5	700	700	NA	NA	NA	< 0.51	3.4	< 0.51	< 0.51	< 0.51	0.78 J
Isopropylbenzene	ug/l	8260	45	450	- -	NA	NA	NA	NA	NA	NA	NA	NA	NA
Methyl acetate	ug/l	8260	2000	5300	- -	NA	NA	NA	NA	NA	NA	NA	NA	NA
Methyl tert-butyl ether	ug/l	8260	14	14	- -	NA	NA	NA	< 0.59	< 0.59	< 0.59	< 0.59	< 0.59	< 0.59
Methylcyclohexane [1]	ug/l	8260	1300	13000	- -	NA	NA	NA	NA	NA	NA	NA	NA	NA
Methylene Chloride	ug/l	8260	11	5	5	NA	NA	NA	< 0.89	< 0.89	< 0.89	< 0.89	< 0.89	< 0.89
Naphthalene	ug/l	8260	0.12	0.17	- -	NA	NA	NA	< 0.79	24 J	< 0.79	< 0.79	< 0.79	6.2 J
Styrene	ug/l	8260	120	100	100	NA	NA	NA	< 0.47	< 0.47	< 0.47	< 0.47	< 0.47	< 0.47
Tetrachloroethene	ug/l	8260	4.1	5	5	NA	NA	NA	3.3	3.2	2	< 0.47	< 0.47	2.6
Toluene	ug/l	8260	110	1000	1000	NA	NA	NA	< 0.46	0.99 J	< 0.46	< 0.46	< 0.46	< 0.46
Trichloroethene	ug/l	8260	0.28	5	5	NA	NA	NA	1	< 0.69	0.85 J	< 0.69	1	1.2
Trichlorofluoromethane	ug/l	8260	520	1100	- -	NA	NA	NA	NA	NA	NA	NA	NA	NA
Vinyl chloride	ug/l	8260	0.019	2	2	NA	NA	NA	< 0.88	< 0.88	< 0.88	< 0.88	< 0.88	< 0.88
Xylenes, Total	ug/l	8260	19	10000	10000	NA	NA	NA	< 0.89	16	< 0.89	< 0.89	< 0.89	3
Semi-Volatile Organics														
1,1'-Biphenyl	ug/l	8270	0.083	0.83	- -	NA	NA	NA	< 0.057	2 J	< 0.059	< 0.057 UJ	< 0.064	< 0.28
2,4,5-Trichlorophenol	ug/l	8270	120	1200	- -	NA	NA	NA	< 0.059	< 0.31	< 0.061	< 0.059 UJ	< 0.066	< 0.29
2,4,6-Trichlorophenol	ug/l	8270	1.2	4.1	- -	NA	NA	NA	< 0.065	< 0.34	< 0.068	< 0.065 UJ	< 0.074	< 0.33
2,4-Dichlorophenol	ug/l	8270	4.6	46	- -	NA	NA	NA	< 0.049	< 0.26	< 0.051	< 0.049 UJ	< 0.055	< 0.25
2,4-Dimethylphenol	ug/l	8270	36	360	- -	NA	NA	NA	< 0.039	< 0.21	< 0.041	< 0.039 UJ	< 0.045	< 0.2

TABLE A-5
ANALYTICAL AND SCREENING RESULTS
GROUNDWATER
CAA VIM AND VIIM
MINGO JUNCTION STEEL WORK LLC - WEIRTON FACILITY

			Screening Criteria [1]			Sample Information [2]								
	Units	Analytical Method	Tapwater RSL	Groundwater De Minimis	*MCL*	VI-MW-03A 03/28/2019	VI-MW-04A 03/28/2019	VI-MW-04A DUP 03/28/2019 Duplicate	VII-MW-01A 03/28/2019	VII-MW-01P 04/03/2019	VII-MW-02A 03/28/2019	VII-MW-02P 03/28/2019	VII-MW-03A 03/29/2019	VII-MW-03P 04/03/2019
2,4-Dinitrophenol	ug/l	8270	3.9	39	- -	NA	NA	NA	< 1.5	< 7.7	< 1.5	< 1.5	< 1.7	< 7.4
2,4-Dinitrotoluene	ug/l	8270	0.24	0.24	- -	NA	NA	NA	< 0.049	< 0.26	< 0.051	< 0.049	< 0.055	< 0.25
2,6-Dinitrotoluene	ug/l	8270	0.049	0.049	- -	NA	NA	NA	< 0.058	< 0.3	< 0.06	< 0.058	< 0.065	< 0.29
2-Chloronaphthalene	ug/l	8270	75	330	- -	NA	NA	NA	< 0.057	< 0.3	< 0.059	< 0.057 UJ	< 0.064	< 0.28
2-Chlorophenol	ug/l	8270	9.1	27	- -	NA	NA	NA	< 0.062	< 0.32	< 0.064	< 0.062 UJ	< 0.07	< 0.31
2-Methylnaphthalene	ug/l	8270	3.6	36	- -	NA	NA	NA	< 0.06	21	< 0.062	< 0.06 UJ	< 0.067	< 0.3
2-Methylphenol	ug/l	8270	93	930	- -	NA	NA	NA	< 0.29	< 1.5	< 0.3	< 0.29 UJ	< 0.33	< 1.4
2-Nitroaniline	ug/l	8270	19	190	- -	NA	NA	NA	< 0.53	< 2.7	< 0.55	< 0.53	< 0.6	< 2.6
2-Nitrophenol	ug/l	8270	- -	- -	- -	NA	NA	NA	< 0.059	< 0.31	< 0.061	< 0.059 UJ	< 0.066	< 0.29
3,3'-Dichlorobenzidine	ug/l	8270	0.13	0.13	- -	NA	NA	NA	< 0.56	< 2.9	< 0.58	< 0.56 UR	< 0.63	< 2.8
3-Nitroaniline	ug/l	8270	- -	- -	- -	NA	NA	NA	< 0.064	< 0.34	< 0.067	< 0.064 UJ	< 0.073	< 0.32
4,6-Dinitro-2-methylphenol	ug/l	8270	0.15	- -	- -	NA	NA	NA	< 1.4	< 7.4	< 1.5	< 1.4	< 1.6	< 7.1
4-Bromophenyl phenyl ether	ug/l	8270	- -	- -	- -	NA	NA	NA	< 0.061	< 0.32	< 0.063	< 0.061	< 0.068	< 0.3
4-Chloro-3-methylphenol	ug/l	8270	140	- -	- -	NA	NA	NA	< 0.059	< 0.31	< 0.061	< 0.059 UJ	< 0.066	< 0.29
4-Chloroaniline	ug/l	8270	0.37	0.37	- -	NA	NA	NA	< 0.042	< 0.22	< 0.044	< 0.042 UJ	< 0.048	< 0.21
4-Chlorophenyl phenyl ether	ug/l	8270	- -	- -	- -	NA	NA	NA	< 0.059	< 0.31	< 0.061	< 0.059 UJ	< 0.066	< 0.29
4-Nitroaniline	ug/l	8270	3.8	- -	- -	NA	NA	NA	< 0.056	< 0.29	< 0.058	< 0.056	< 0.063	< 0.28
4-Nitrophenol [1]	ug/l	8270	3.9	39	- -	NA	NA	NA	< 0.14	< 0.71	< 0.14	< 0.14	< 0.15	< 0.68
Acenaphthene	ug/l	8270	53	240	- -	< 0.065	< 0.065	< 0.065	< 0.063	1.8	< 0.065	< 0.063 UJ	< 0.071	< 0.31
Acenaphthylene [1]	ug/l	8270	53	320	- -	< 0.065	< 0.065	< 0.065	< 0.063	< 0.33	< 0.065	< 0.063 UJ	< 0.071	< 0.31
Acetophenone	ug/l	8270	190	1900	- -	NA	NA	NA	< 0.06	< 0.31	< 0.062	< 0.06 UJ	< 0.067	< 0.3
Anthracene	ug/l	8270	180	1800	- -	< 0.049	< 0.049	< 0.049	< 0.047	< 0.25	0.072 J	0.053 J	< 0.053	< 0.24
Atrazine	ug/l	8270	0.3	3	3	NA	NA	NA	< 0.61	< 3.2	< 0.63	< 0.61	< 0.69 UJ	< 3
Benzaldehyde	ug/l	8270	19	1900	- -	NA	NA	NA	< 0.11	< 0.56	< 0.11	< 0.11	< 0.12	< 0.53
Benzo[a]anthracene	ug/l	8270	0.03	0.012	- -	< 0.075	< 0.075	< 0.075	< 0.072	< 0.38	0.1 J	< 0.072	< 0.082	< 0.36
Benzo[a]pyrene	ug/l	8270	0.025	0.2	0.2	< 0.053	< 0.053	< 0.053	< 0.051	< 0.27	0.07 J	< 0.051	< 0.058	< 0.25
Benzo[b]fluoranthene	ug/l	8270	0.25	0.034	- -	< 0.097	< 0.097	< 0.097	< 0.093	< 0.49	0.11 J	< 0.093	< 0.11	< 0.47
Benzo[g,h,i]perylene [1]	ug/l	8270	12	600	- -	< 0.069	< 0.069	< 0.069	< 0.066	< 0.35	0.12 J	< 0.066	< 0.075	< 0.33
Benzo[k]fluoranthene	ug/l	8270	2.5	0.34	- -	< 0.088	< 0.088	< 0.088	< 0.085	< 0.44	0.14 J	< 0.085	< 0.096	< 0.42
Bis(2-chloroisopropyl)ether	ug/l	8270	71	0.36	- -	NA	NA	NA	< 0.056	< 0.29	< 0.058	< 0.056 UJ	< 0.063	< 0.28
Bis(2-chloroethoxy)methane	ug/l	8270	5.9	- -	- -	NA	NA	NA	< 0.064	< 0.34	< 0.067	< 0.064 UJ	< 0.073	< 0.32
Bis(2-chloroethyl)ether	ug/l	8270	0.014	0.014	- -	NA	NA	NA	< 0.038	< 0.2	< 0.04	< 0.038 UJ	< 0.043	< 0.19
Bis(2-ethylhexyl) phthalate	ug/l	8270	5.6	6	6	NA	NA	NA	< 6	< 31	< 6.2	< 6	< 6.8	< 30
Butyl benzyl phthalate	ug/l	8270	16	16	- -	NA	NA	NA	< 0.44	< 2.3	< 0.46	< 0.44	0.53 J	< 2.2
Caprolactam	ug/l	8270	990	9900	- -	NA	NA	NA	0.95 J	< 2.4	< 0.47	0.46 J	< 0.51	< 2.3
Carbazole [1]	ug/l	8270	180	1800	- -	NA	NA	NA	< 0.049	0.48 J	0.091 J	< 0.049	< 0.055	< 0.25
Chrysene	ug/l	8270	25	3.4	- -	< 0.081	< 0.081	< 0.081	< 0.078	< 0.41	0.098 J	< 0.078	< 0.088	< 0.39
Dibenz(a,h)anthracene	ug/l	8270	0.025	0.0034	- -	< 0.072	< 0.072	< 0.072	< 0.069	< 0.36	0.12 J	< 0.069	< 0.078	< 0.35
Dibenzofuran	ug/l	8270	0.79	7.9	- -	NA	NA	NA	< 0.07	1.5 J	< 0.073	< 0.07 UJ	< 0.079	< 0.35
Diethyl phthalate	ug/l	8270	1500	15000	- -	NA	NA	NA	< 0.55	< 2.8	< 0.57	0.75 J	< 0.62	< 2.7
Dimethyl phthalate	ug/l	8270	- -	- -	- -	NA	NA	NA	< 0.054	< 0.28	< 0.056	< 0.054	< 0.061	< 0.27
Di-n-butyl phthalate	ug/l	8270	90	900	- -	NA	NA	NA	< 0.71	< 3.7	< 0.74	< 0.71	< 0.81	< 3.6
Di-n-octyl phthalate	ug/l	8270	20	- -	- -	NA	NA	NA	< 0.66	< 3.4	< 0.69	< 0.66	< 0.74	< 3.3
Fluoranthene	ug/l	8270	80	800	- -	< 0.06	< 0.06	< 0.06	< 0.058	< 0.3	0.12 J	< 0.058	< 0.065	< 0.29
Fluorene	ug/l	8270	29	150	- -	< 0.069	< 0.069	< 0.069	< 0.066	2.6	< 0.069	< 0.066 UJ	< 0.075	< 0.33
Hexachlorobenzene	ug/l	8270	0.0098	1	1	NA	NA	NA	< 0.054	< 0.28	< 0.056	< 0.054 UJ	< 0.061	< 0.27
Hexachlorobutadiene	ug/l	8270	0.14	0.14	- -	NA	NA	NA	< 0.066	< 0.35	< 0.069	< 0.066 UJ	< 0.075	< 0.33
Hexachlorocyclopentadiene	ug/l	8270	0.041	50	50	NA	NA	NA	< 0.48	< 2.5	< 0.5	< 0.48 UR	< 0.54	< 2.4
Hexachloroethane	ug/l	8270	0.33	0.33	- -	NA	NA	NA	< 0.06	< 0.31	< 0.062	< 0.06 UJ	< 0.067	< 0.3
Indeno[1,2,3-cd]pyrene	ug/l	8270	0.25	0.034	- -	< 0.085	< 0.085	< 0.085	< 0.082	< 0.43	0.11 J	< 0.082	< 0.092	< 0.41
Isophorone	ug/l	8270	78	78	- -	NA	NA	NA	< 0.052	< 0.27	< 0.054	< 0.052 UJ	< 0.059	< 0.26
Methylphenol, 3 & 4 [1]	ug/l	8270	93	930	- -	NA	NA	NA	< 0.36	< 1.9	< 0.37	< 0.36 UJ	< 0.4	< 1.8
Naphthalene	ug/l	8270	0.12	0.17	- -	< 0.059	< 0.059	< 0.059	< 0.057	7	< 0.059	< 0.057 UJ	< 0.064	< 0.28
Nitrobenzene	ug/l	8270	0.14	0.14	- -	NA	NA	NA	< 0.48	< 2.5	< 0.5	< 0.48 UJ	< 0.54	< 2.4
N-Nitrosodi-n-propylamine	ug/l	8270	0.011	0.011	- -	NA	NA	NA	< 0.068	< 0.36	< 0.071	< 0.068 UJ	< 0.077	< 0.34
N-Nitrosodiphenylamine	ug/l	8270	12	12	- -	NA	NA	NA	< 0.11	< 0.6	< 0.12	< 0.11 UJ	< 0.13	< 0.57
Pentachlorophenol	ug/l	8270	0.041	1	1	NA	NA	NA	< 0.81 UJ	< 4.2	< 0.85 UJ	< 0.81	< 0.92 UJ	< 4.1

TABLE A-5
ANALYTICAL AND SCREENING RESULTS
GROUNDWATER
CAA VIM AND VIIM
MINGO JUNCTION STEEL WORK LLC - WEIRTON FACILITY

			Screening Criteria [1]			Sample Information [2]								
	Units	Analytical Method	Tapwater RSL	Groundwater De Minimis	*MCL*	VI-MW-03A 03/28/2019	VI-MW-04A 03/28/2019	VI-MW-04A DUP 03/28/2019 Duplicate	VII-MW-01A 03/28/2019	VII-MW-01P 04/03/2019	VII-MW-02A 03/28/2019	VII-MW-02P 03/28/2019	VII-MW-03A 03/29/2019	VII-MW-03P 04/03/2019
Phenanthrene [1]	ug/l	8270	180	6000	- -	0.094 J	< 0.055	0.073 J	0.07 J	3	0.18 J	0.14 J	0.089 J	< 0.26
Phenol	ug/l	8270	580	5800	- -	NA	NA	NA	< 0.47	< 2.4	< 0.49	< 0.47 UJ	< 0.53	< 2.3
Pyrene	ug/l	8270	12	79	- -	< 0.054	< 0.054	< 0.054	< 0.052	< 0.27	0.11 J	< 0.052	< 0.059	< 0.26
Inorganics [3]														
Aluminum	ug/l	6020	2000	20000	*200*	NA	NA	NA	< 13	< 13	< 13	24 J	140	< 13
Antimony	ug/l	6020	0.78	7.8	6	NA	NA	NA	< 0.38	< 0.38	< 0.38	0.47 J	< 0.38	< 0.38
Arsenic	ug/l	6020	0.052	10	10	NA	NA	NA	0.35 J	0.59 J	0.34 J	2.4	2.1	1.4
Barium	ug/l	6020	380	2000	2000	NA	NA	NA	34	29	33	22	38	20
Beryllium	ug/l	6020	2.5	4	4	NA	NA	NA	< 0.16	< 0.16	< 0.16	< 0.16	< 0.16	< 0.16
Cadmium	ug/l	6020	0.92	5	5	NA	NA	NA	0.14 J	< 0.13	0.26 J	< 0.13	0.57 J	< 0.13
Calcium	ug/l	6020	- -	- -	- -	NA	NA	NA	140000	450000	65000	38000	130000	100000
Chromium [1]	ug/l	6020	2200	22000	100	NA	NA	NA	1.7 J	< 1.5	1.5 J	< 1.5	2.6	1.5 J
Cobalt	ug/l	6020	0.6	6	- -	NA	NA	NA	0.52	0.31 J	0.24 J	< 0.075	39	0.077 J
Copper	ug/l	6020	80	800	1300	NA	NA	NA	2.2	1 J	2.1	< 0.63	2.4	0.88 J
Iron	ug/l	6020	1400	14000	*300*	NA	NA	NA	14 J	< 14	< 14	25 J	***74000***	18 J
Lead	ug/l	6020	15	15	15	NA	NA	NA	0.14 J	< 0.13	< 0.13	< 0.13	0.17 J	< 0.13
Magnesium	ug/l	6020	- -	- -	- -	NA	NA	NA	28000	< 83	18000	6300	13000	19000
Manganese [1]	ug/l	6020	43	850	*50*	NA	NA	NA	***450***	< 1.4	***940***	***150***	***9800***	35
Mercury	ug/l	7470	0.063	2	2	NA	NA	NA	< 0.1	< 0.1	< 0.1	< 0.1	< 0.1	< 0.1
Nickel	ug/l	6020	39	390	- -	NA	NA	NA	3.7	0.54 J	9.2	0.67 J	31	< 0.31
Potassium	ug/l	6020	- -	- -	- -	NA	NA	NA	4100	30000	4300	5000	16000	10000
Selenium	ug/l	6020	10	50	50	NA	NA	NA	< 2.6	4 J	< 2.6	< 2.6	< 2.6	< 2.6
Silver	ug/l	6020	9.4	94	*100*	NA	NA	NA	< 0.12	< 0.12	< 0.12	< 0.12	< 0.12	< 0.12
Sodium	ug/l	6020	- -	- -	- -	NA	NA	NA	69000	16000	60000	30000	68000	23000
Thallium	ug/l	6020	0.02	2	2	NA	NA	NA	< 0.13	< 0.13	< 0.13	< 0.13	< 0.13	< 0.13
Vanadium	ug/l	6020	8.6	1.2	- -	NA	NA	NA	1.3	2.2	1.2	8	0.97 J	5.7
Zinc	ug/l	6020	600	6000	*5000*	NA	NA	NA	6.1	< 3.2	14	< 3.2	110	< 3.2
Other Parameters														
Cyanide, Total	ug/l	9012	0.15	200	200	NA	NA	NA	< 4.4	< 4.4	< 4.4	7.3 J	< 4.4	< 4.4

TABLE A-5
ANALYTICAL AND SCREENING RESULTS
GROUNDWATER
CAA VIM AND VIIM
MINGO JUNCTION STEEL WORK LLC - WEIRTON FACILITY

			Screening Criteria [1]			Sample Information [2]			
	Units	Analytical Method	Tapwater RSL	Groundwater De Minimis	*MCL*	VII-MW-04P 04/03/2019	VII-MW-05P 04/03/2019	VII-MW-06P 04/01/2019	VII-MW-07P 04/01/2019
Volatile Organic Compounds									
1,1,1-Trichloroethane	ug/l	8260	800	200	200	< 0.6	< 0.6	< 0.6	< 0.6
1,1,2,2-Tetrachloroethane	ug/l	8260	0.076	0.076	- -	< 0.6	< 0.6	< 0.6	< 0.6
1,1,2-Trichloro-1,2,2-trifluoroethane	ug/l	8260	1000	57000	- -	NA	NA	NA	NA
1,1,2-Trichloroethane	ug/l	8260	0.041	5	5	< 0.45	< 0.45	< 0.45	< 0.45
1,1-Dichloroethane	ug/l	8260	2.8	2.8	- -	< 0.63	< 0.63	< 0.63	< 0.63
1,1-Dichloroethene	ug/l	8260	28	7	7	< 0.55	< 0.55	< 0.55	< 0.55
1,2,4-Trichlorobenzene	ug/l	8260	0.4	70	70	NA	NA	NA	NA
1,2-Dibromo-3-Chloropropane	ug/l	8260	0.00033	0.2	0.2	NA	NA	NA	NA
1,2-Dibromoethane (EDB)	ug/l	8260	0.0075	0.05	0.05	NA	NA	NA	NA
1,2-Dichlorobenzene	ug/l	8260	30	600	600	NA	NA	NA	NA
1,2-Dichloroethane	ug/l	8260	0.17	5	5	< 0.57	< 0.57	< 0.57	< 0.57
1,2-Dichloroethene, Total	ug/l	8260	- -	- -	- -	< 1.3	< 1.3	< 1.3	< 1.3
cis-1,2-Dichloroethene	ug/l	8260	3.6	70	70	0.76 J	< 0.71	< 0.71	< 0.71
trans-1,2-Dichloroethene	ug/l	8260	6.8	100	100	< 0.67	< 0.67	< 0.67	< 0.67
1,2-Dichloropropane	ug/l	8260	0.82	5	5	< 0.66	< 0.66	< 0.66	< 0.66
cis-1,3-Dichloropropene [1]	ug/l	8260	0.47	0.47	- -	< 0.59	< 0.59	< 0.59	< 0.59
trans-1,3-Dichloropropene [1]	ug/l	8260	0.47	0.47	- -	< 0.58	< 0.58	< 0.58	< 0.58
1,3-Dichlorobenzene [1]	ug/l	8260	0.48	75	75	NA	NA	NA	NA
1,4-Dichlorobenzene	ug/l	8260	0.48	75	75	NA	NA	NA	NA
2-Butanone (MEK)	ug/l	8260	560	5600	- -	< 2.6	< 2.6	< 2.6	< 2.6
2-Hexanone	ug/l	8260	3.8	- -	- -	< 3.3	< 3.3	< 3.3	< 3.3
4-Methyl-2-pentanone (MIBK)	ug/l	8260	630	1200	- -	< 3.1	< 3.1	< 3.1	< 3.1
Acetone	ug/l	8260	1400	14000	- -	6.3	< 3.4	4.6 J	5.5 J
Benzene	ug/l	8260	0.46	5	5	< 0.6	< 0.6	< 0.6	< 0.6
Bromoform	ug/l	8260	3.3	3.3	80	< 0.98	< 0.98	< 0.98	< 0.98
Bromomethane	ug/l	8260	0.75	7.5	- -	< 0.89	< 0.89	< 0.89	< 0.89
Carbon disulfide	ug/l	8260	81	810	- -	< 0.88	< 0.88	< 0.88	< 0.88
Carbon tetrachloride	ug/l	8260	0.46	5	5	< 0.88	< 0.88	< 0.88	< 0.88
Chlorobenzene	ug/l	8260	7.8	100	100	0.54 J	< 0.5	< 0.5	< 0.5
Chlorodibromomethane	ug/l	8260	0.87	0.87	80	< 0.84	< 0.84	< 0.84	< 0.84
Chloroethane	ug/l	8260	2100	21000	- -	< 0.9	< 0.9	< 0.9	< 0.9
Chloroform	ug/l	8260	0.22	0.22	80	< 0.6	< 0.6	< 0.6	3.5
Chloromethane	ug/l	8260	19	190	- -	< 0.9	< 0.9	< 0.9	< 0.9
Cyclohexane	ug/l	8260	1300	13000	- -	NA	NA	NA	NA
Dichlorobromomethane	ug/l	8260	0.13	0.13	80	< 0.64	< 0.64	< 0.64	1.3
Dichlorodifluoromethane	ug/l	8260	20	200	- -	NA	NA	NA	NA
Ethylbenzene	ug/l	8260	1.5	700	700	1.1	< 0.51	< 0.51	< 0.51
Isopropylbenzene	ug/l	8260	45	450	- -	NA	NA	NA	NA
Methyl acetate	ug/l	8260	2000	5300	- -	NA	NA	NA	NA
Methyl tert-butyl ether	ug/l	8260	14	14	- -	< 0.59	< 0.59	< 0.59	< 0.59
Methylcyclohexane [1]	ug/l	8260	1300	13000	- -	NA	NA	NA	NA
Methylene Chloride	ug/l	8260	11	5	5	< 0.89	< 0.89	< 0.89	< 0.89
Naphthalene	ug/l	8260	0.12	0.17	- -	13 J	< 0.79 UJ	< 0.79	< 0.79
Styrene	ug/l	8260	120	100	100	< 0.47	< 0.47	< 0.47	< 0.47
Tetrachloroethene	ug/l	8260	4.1	5	5	3.4	< 0.47	0.88 J	< 0.47
Toluene	ug/l	8260	110	1000	1000	< 0.46	< 0.46	< 0.46	< 0.46
Trichloroethene	ug/l	8260	0.28	5	5	< 0.69	< 0.69	< 0.69	< 0.69
Trichlorofluoromethane	ug/l	8260	520	1100	- -	NA	NA	NA	NA
Vinyl chloride	ug/l	8260	0.019	2	2	< 0.88	< 0.88	< 0.88	< 0.88
Xylenes, Total	ug/l	8260	19	10000	10000	3.3	< 0.89	< 0.89	< 0.89
Semi-Volatile Organics									
1,1'-Biphenyl	ug/l	8270	0.083	0.83	- -	NA	NA	NA	NA
2,4,5-Trichlorophenol	ug/l	8270	120	1200	- -	NA	NA	NA	NA
2,4,6-Trichlorophenol	ug/l	8270	1.2	4.1	- -	NA	NA	NA	NA
2,4-Dichlorophenol	ug/l	8270	4.6	46	- -	NA	NA	NA	NA
2,4-Dimethylphenol	ug/l	8270	36	360	- -	NA	NA	NA	NA

TABLE A-5
ANALYTICAL AND SCREENING RESULTS
GROUNDWATER
CAA VIM AND VIIM
MINGO JUNCTION STEEL WORK LLC - WEIRTON FACILITY

			Screening Criteria [1]			Sample Information [2]			
	Units	Analytical Method	Tapwater RSL	Groundwater De Minimis	*MCL*	VII-MW-04P 04/03/2019	VII-MW-05P 04/03/2019	VII-MW-06P 04/01/2019	VII-MW-07P 04/01/2019
2,4-Dinitrophenol	ug/l	8270	3.9	39	- -	NA	NA	NA	NA
2,4-Dinitrotoluene	ug/l	8270	0.24	0.24	- -	NA	NA	NA	NA
2,6-Dinitrotoluene	ug/l	8270	0.049	0.049	- -	NA	NA	NA	NA
2-Chloronaphthalene	ug/l	8270	75	330	- -	NA	NA	NA	NA
2-Chlorophenol	ug/l	8270	9.1	27	- -	NA	NA	NA	NA
2-Methylnaphthalene	ug/l	8270	3.6	36	- -	NA	NA	NA	NA
2-Methylphenol	ug/l	8270	93	930	- -	NA	NA	NA	NA
2-Nitroaniline	ug/l	8270	19	190	- -	NA	NA	NA	NA
2-Nitrophenol	ug/l	8270	- -	- -	- -	NA	NA	NA	NA
3,3'-Dichlorobenzidine	ug/l	8270	0.13	0.13	- -	NA	NA	NA	NA
3-Nitroaniline	ug/l	8270	- -	- -	- -	NA	NA	NA	NA
4,6-Dinitro-2-methylphenol	ug/l	8270	0.15	- -	- -	NA	NA	NA	NA
4-Bromophenyl phenyl ether	ug/l	8270	- -	- -	- -	NA	NA	NA	NA
4-Chloro-3-methylphenol	ug/l	8270	140	- -	- -	NA	NA	NA	NA
4-Chloroaniline	ug/l	8270	0.37	0.37	- -	NA	NA	NA	NA
4-Chlorophenyl phenyl ether	ug/l	8270	- -	- -	- -	NA	NA	NA	NA
4-Nitroaniline	ug/l	8270	3.8	- -	- -	NA	NA	NA	NA
4-Nitrophenol [1]	ug/l	8270	3.9	39	- -	NA	NA	NA	NA
Acenaphthene	ug/l	8270	53	240	- -	NA	NA	NA	NA
Acenaphthylene [1]	ug/l	8270	53	320	- -	NA	NA	NA	NA
Acetophenone	ug/l	8270	190	1900	- -	NA	NA	NA	NA
Anthracene	ug/l	8270	180	1800	- -	NA	NA	NA	NA
Atrazine	ug/l	8270	0.3	3	3	NA	NA	NA	NA
Benzaldehyde	ug/l	8270	19	1900	- -	NA	NA	NA	NA
Benzo[a]anthracene	ug/l	8270	0.03	0.012	- -	NA	NA	NA	NA
Benzo[a]pyrene	ug/l	8270	0.025	0.2	0.2	NA	NA	NA	NA
Benzo[b]fluoranthene	ug/l	8270	0.25	0.034	- -	NA	NA	NA	NA
Benzo[g,h,i]perylene [1]	ug/l	8270	12	600	- -	NA	NA	NA	NA
Benzo[k]fluoranthene	ug/l	8270	2.5	0.34	- -	NA	NA	NA	NA
Bis(2-chloroisopropyl)ether	ug/l	8270	71	0.36	- -	NA	NA	NA	NA
Bis(2-chloroethoxy)methane	ug/l	8270	5.9	- -	- -	NA	NA	NA	NA
Bis(2-chloroethyl)ether	ug/l	8270	0.014	0.014	- -	NA	NA	NA	NA
Bis(2-ethylhexyl) phthalate	ug/l	8270	5.6	6	6	NA	NA	NA	NA
Butyl benzyl phthalate	ug/l	8270	16	16	- -	NA	NA	NA	NA
Caprolactam	ug/l	8270	990	9900	- -	NA	NA	NA	NA
Carbazole [1]	ug/l	8270	180	1800	- -	NA	NA	NA	NA
Chrysene	ug/l	8270	25	3.4	- -	NA	NA	NA	NA
Dibenz(a,h)anthracene	ug/l	8270	0.025	0.0034	- -	NA	NA	NA	NA
Dibenzofuran	ug/l	8270	0.79	7.9	- -	NA	NA	NA	NA
Diethyl phthalate	ug/l	8270	1500	15000	- -	NA	NA	NA	NA
Dimethyl phthalate	ug/l	8270	- -	- -	- -	NA	NA	NA	NA
Di-n-butyl phthalate	ug/l	8270	90	900	- -	NA	NA	NA	NA
Di-n-octyl phthalate	ug/l	8270	20	- -	- -	NA	NA	NA	NA
Fluoranthene	ug/l	8270	80	800	- -	NA	NA	NA	NA
Fluorene	ug/l	8270	29	150	- -	NA	NA	NA	NA
Hexachlorobenzene	ug/l	8270	0.0098	1	1	NA	NA	NA	NA
Hexachlorobutadiene	ug/l	8270	0.14	0.14	- -	NA	NA	NA	NA
Hexachlorocyclopentadiene	ug/l	8270	0.041	50	50	NA	NA	NA	NA
Hexachloroethane	ug/l	8270	0.33	0.33	- -	NA	NA	NA	NA
Indeno[1,2,3-cd]pyrene	ug/l	8270	0.25	0.034	- -	NA	NA	NA	NA
Isophorone	ug/l	8270	78	78	- -	NA	NA	NA	NA
Methylphenol, 3 & 4 [1]	ug/l	8270	93	930	- -	NA	NA	NA	NA
Naphthalene	ug/l	8270	0.12	0.17	- -	NA	NA	NA	NA
Nitrobenzene	ug/l	8270	0.14	0.14	- -	NA	NA	NA	NA
N-Nitrosodi-n-propylamine	ug/l	8270	0.011	0.011	- -	NA	NA	NA	NA
N-Nitrosodiphenylamine	ug/l	8270	12	12	- -	NA	NA	NA	NA
Pentachlorophenol	ug/l	8270	0.041	1	1	NA	NA	NA	NA

TABLE A-5
ANALYTICAL AND SCREENING RESULTS
GROUNDWATER
CAA VIM AND VIIM
MINGO JUNCTION STEEL WORK LLC - WEIRTON FACILITY

			Screening Criteria [1]			Sample Information [2]			
	Units	Analytical Method	Tapwater RSL	Groundwater De Minimis	*MCL*	VII-MW-04P 04/03/2019	VII-MW-05P 04/03/2019	VII-MW-06P 04/01/2019	VII-MW-07P 04/01/2019
Phenanthrene [1]	ug/l	8270	180	6000	- -	NA	NA	NA	NA
Phenol	ug/l	8270	580	5800	- -	NA	NA	NA	NA
Pyrene	ug/l	8270	12	79	- -	NA	NA	NA	NA
Inorganics [3]									
Aluminum	ug/l	6020	2000	20000	*200*	NA	NA	NA	NA
Antimony	ug/l	6020	0.78	7.8	6	NA	NA	NA	NA
Arsenic	ug/l	6020	0.052	10	10	NA	NA	NA	NA
Barium	ug/l	6020	380	2000	2000	NA	NA	NA	NA
Beryllium	ug/l	6020	2.5	4	4	NA	NA	NA	NA
Cadmium	ug/l	6020	0.92	5	5	NA	NA	NA	NA
Calcium	ug/l	6020	- -	- -	- -	NA	NA	NA	NA
Chromium [1]	ug/l	6020	2200	22000	100	NA	NA	NA	NA
Cobalt	ug/l	6020	0.6	6	- -	NA	NA	NA	NA
Copper	ug/l	6020	80	800	1300	NA	NA	NA	NA
Iron	ug/l	6020	1400	14000	*300*	NA	NA	NA	NA
Lead	ug/l	6020	15	15	15	NA	NA	NA	NA
Magnesium	ug/l	6020	- -	- -	- -	NA	NA	NA	NA
Manganese [1]	ug/l	6020	43	850	*50*	NA	NA	NA	NA
Mercury	ug/l	7470	0.063	2	2	NA	NA	NA	NA
Nickel	ug/l	6020	39	390	- -	NA	NA	NA	NA
Potassium	ug/l	6020	- -	- -	- -	NA	NA	NA	NA
Selenium	ug/l	6020	10	50	50	NA	NA	NA	NA
Silver	ug/l	6020	9.4	94	*100*	NA	NA	NA	NA
Sodium	ug/l	6020	- -	- -	- -	NA	NA	NA	NA
Thallium	ug/l	6020	0.02	2	2	NA	NA	NA	NA
Vanadium	ug/l	6020	8.6	1.2	- -	NA	NA	NA	NA
Zinc	ug/l	6020	600	6000	*5000*	NA	NA	NA	NA
Other Parameters									
Cyanide, Total	ug/l	9012	0.15	200	200	NA	NA	NA	NA

TABLE A-5
ANALYTICAL AND SCREENING RESULTS
GROUNDWATER
CAA VIM AND VIIM
MINGO JUNCTION STEEL WORKS LLC - WEIRTON FACILITY

1 - Screening criteria based on the May 2021 USEPA Regional Screening Table and the June 2020 WVDEP De Minimis Table. Screening criteria include the USEPA Tapwater Regional Screening Levels (RSLs), WVDEP groundwater De Minimis values, and USEPA federal Maximum Contaminant Levels (MCLs). Secondary MCLs are shown in italics. Tapwater RSLs for noncarcinogenic chemicals are divided by 10 to account for potential cumulative effects. Only those chemicals for which at least one positive detection was encountered are included in the screening evaluation. Notes regarding specific values for various chemicals (e.g., surrogates used, effects basis, etc.) are as follows:

RSLs for cis-1,3-dichloropropene and trans-1,3-dichloropropene are based on the RSL for total 1,3-dichloropropene.
RSL for 1,3-dichlorobenzene is based on the RSL for 1,4-dichlorobenzene.
RSL for methylcyclohexane is based on the RSL for cyclohexane.
RSL for 4-nitrophenol is based on the RSL for 2,4-dinitrophenol.
RSL for acenaphthylene is based on the RSL for acenaphthene.
RSL for benzo(g,h,i)perylene is based on the RSL for pyrene.
RSLs for carbazole and phenanthrene are based on the RSL for anthracene.
RSLs for 3&4-methylphenol are conservatively based on the RSLs for 3-methylphenol.
RSL for chromium is for the trivalent valence state; MCL is based on total chromium.
RSL for manganese is based on the non-diet value.

Shading indicates an exceedance of the lower of the Tapwater RSL or Groundwater De Minimis value.
Bold italics numbers indicate exceedance of the primary or secondary MCL.

2 - General sample information provided in column headings includes sample identification number and sampling date. Table qualifier codes are consistent with Region 3 data qualifiers related to identification and quantitation and are as follows:

Data Qualifiers
NA - Not Analyzed
- - - Screening Criterion not available for this chemical constituent.
* - LCS or LCSD exceeds the control limits.
B - Compound was found in the blank and sample.
F1 - MS and/or MSD Recovery is outside acceptance limits.
J - Result is less than the reporting limit but greater than or equal to the method detection limit and the concentration is an approximate value.
K - Analyte present. Reported value may be biased high. Actual value is expected to be lower.
L - Analyte present. Reported value may be biased low. Actual value is expected to be higher.
R - Unusable result. Analyte may or may not be present in the sample.
UJ - Not Detected. Quantitation limit may be inaccurate or imprecise.

3 - Groundwater samples were collected for total inorganic analysis during the November 2013 event and dissolved inorganic analysis during the February 2014 and March/April 2019 events.

TABLE A-6
ANALYTICAL AND VAPOR INTRUSTION SCREENING RESULTS
GROUNDWATER SAMPLES
CAA VIM AND VIIM
MINGO JUNCTION STEEL WORK LLC - WEIRTON FACILITY

	Units	Analytical Method	Screening Criteria [1] Residential	Screening Criteria [1] Commercial	Sample Information [2] MA-MW-07A 11/15/2013	MA-MW-07D 11/15/2013	VI-MW-01A 11/19/2013	VI-MW-02AR 11/14/2013	VI-MW-01P 11/18/2013	VII-MW-01A 11/18/2013	VII-MW-01A DUP 11/18/2013 Duplicate	VII-MW-02A 11/18/2013	VII-MW-03A 11/04/2013
Volatile Organic Compounds													
1,1,1-Trichloroethane	ug/l	8260	1240	5210	< 0.29	< 0.29	< 0.29	< 0.29	< 0.29	< 0.29	< 0.29	< 0.29	< 0.29
1,1,2,2-Tetrachloroethane	ug/l	8260	6.59	288	< 0.2	< 0.2	< 0.2	< 0.2	< 0.2	< 0.2	< 0.2	< 0.2	< 0.2
1,1,2-Trichloro-1,2,2-trifluoroethane	ug/l	8260	38	160	< 0.32	< 0.32	< 0.32	< 0.32	< 0.32	< 0.32	< 0.32	< 0.32	< 0.32
1,1,2-Trichloroethane	ug/l	8260	1.17	4.91	< 0.2	< 0.2	< 0.2	< 0.2	< 0.2	< 0.2	< 0.2	< 0.2	< 0.2
1,1-Dichloroethane	ug/l	8260	12.4	541	< 0.12	< 0.12	< 0.12	0.19 J	< 0.12	7	6.4	0.95 J	0.88 J
1,1-Dichloroethene	ug/l	8260	29.7	125	< 0.3	1.1	< 0.3	0.4 J	< 0.3	< 0.3	< 0.3	0.42 J	< 0.3
1,2,4-Trichlorobenzene	ug/l	8260	8.78	36.9	< 0.27	< 0.27	< 0.27	< 0.27	< 0.27	< 0.27	< 0.27	< 0.27	< 0.27
1,2-Dibromo-3-Chloropropane	ug/l	8260	0.0648	7.84	< 0.14	< 0.14	< 0.14	< 0.14	< 0.14	< 0.14	< 0.14	< 0.14	< 0.14
1,2-Dibromoethane (EDB)	ug/l	8260	0.332	14.5	< 0.18	< 0.18	< 0.18	< 0.18	< 0.18	< 0.18	< 0.18	< 0.18	< 0.18
1,2-Dichlorobenzene	ug/l	8260	571	2400	< 0.15	< 0.15	< 0.15	< 0.15	0.2 J	< 0.15	< 0.15	< 0.15	< 0.15
1,2-Dichloroethane	ug/l	8260	3.92	111	< 0.21	< 0.21	< 0.21	< 0.21	< 0.21	< 0.21	< 0.21	< 0.21	< 0.21
1,2-Dichloroethene, Total	ug/l	8260	- -	- -	< 0.51	< 0.51	< 0.51	< 0.51	2.5	10	9.5	1.7	2.3
cis-1,2-Dichloroethene	ug/l	8260	- -	- -	< 0.24	< 0.24	< 0.24	< 0.24	2.4	10	9.3	1.6	2.1
trans-1,2-Dichloroethene	ug/l	8260	- -	- -	< 0.17	< 0.17	< 0.17	< 0.17	< 0.17	< 0.17	< 0.17	< 0.17	< 0.17
1,2-Dichloropropane	ug/l	8260	6.38	26.8	< 0.095	< 0.095	< 0.095	< 0.095	< 0.095	< 0.095	< 0.095	< 0.095	< 0.095
cis-1,3-Dichloropropene [1]	ug/l	8260	8.93	111	< 0.19	< 0.19	< 0.19	< 0.19	< 0.19	< 0.19	< 0.19	< 0.19	< 0.19
trans-1,3-Dichloropropene [1]	ug/l	8260	8.93	111	< 0.15	< 0.15	< 0.15	< 0.15	< 0.15	< 0.15	< 0.15	< 0.15	< 0.15
1,3-Dichlorobenzene [1]	ug/l	8260	5.57	243	< 0.11	< 0.11	< 0.11	< 0.11	< 0.11	< 0.11	< 0.11	< 0.11	< 0.11
1,4-Dichlorobenzene	ug/l	8260	5.57	243	< 0.21	< 0.21	< 0.21	< 0.21	< 0.21	< 0.21	< 0.21	< 0.21	< 0.21
2-Butanone (MEK)	ug/l	8260	389000	1640000	< 0.55	< 0.55	< 0.55	< 0.55	< 0.55	< 0.55	< 0.55	< 0.55	< 0.55
2-Hexanone	ug/l	8260	1650	6950	< 0.16	< 0.16	< 0.16	< 0.16	< 0.16	< 0.16	< 0.16	< 0.16	< 0.16
4-Methyl-2-pentanone (MIBK)	ug/l	8260	106000	447000	< 0.53	< 0.53	< 0.53	< 0.53	< 0.53	< 0.53	< 0.53	< 0.53	< 0.53
Acetone	ug/l	8260	3680000	15500000	< 2.5	< 2.5	< 2.5	< 2.5	< 2.5	< 2.5	< 2.5	< 2.5	< 2.5
Benzene	ug/l	8260	2.7	98.6	< 0.11	< 0.11	< 0.11	< 0.11	< 0.11	< 0.11	< 0.11	< 0.11	< 0.11
Bromoform	ug/l	8260	243	10600	< 0.19	< 0.19	< 0.19	< 0.19	< 0.19	< 0.19	< 0.19	< 0.19	< 0.19
Bromomethane	ug/l	8260	2.48	10.4	< 0.31	< 0.31	< 0.31	< 0.31	< 0.31	< 0.31	< 0.31	< 0.31	< 0.31
Carbon disulfide	ug/l	8260	191	801	< 0.21	< 0.21	< 0.21	< 0.21	< 0.21	< 0.21	< 0.21	< 0.21	< 0.21
Carbon tetrachloride	ug/l	8260	0.693	30.3	< 0.14	< 0.14	< 0.14	< 0.14	< 0.14	< 0.14	< 0.14	< 0.14	< 0.14
Chlorobenzene	ug/l	8260	78.6	330	< 0.14	< 0.14	< 0.14	< 0.14	< 0.14	< 0.14	< 0.14	< 0.14	< 0.14
Chlorodibromomethane	ug/l	8260	- -	- -	< 0.14	< 0.14	< 0.14	< 0.14	< 0.14	< 0.14	< 0.14	< 0.14	< 0.14
Chloroethane	ug/l	8260	3350	14000	< 0.21	< 0.21	< 0.21	< 0.21	< 0.21	< 0.21	< 0.21	< 0.21	< 0.21
Chloroform	ug/l	8260	1.33	58.1	0.64 B	1.5 B	3.7	0.21 B	1.5	0.25 B	0.19 B	1.2 B	< 0.17
Chloromethane	ug/l	8260	34.9	146	< 0.28	< 0.28	< 0.28	< 0.28	< 0.28	< 0.28	< 0.28	< 0.28	< 0.28
Cyclohexane	ug/l	8260	172	722	< 0.25	< 0.25	< 0.25	< 0.25	< 0.25	< 0.25	< 0.25	< 0.25	< 0.25
Dichlorobromomethane	ug/l	8260	1.55	67.6	< 0.13	< 0.13	1.1	< 0.13	< 0.13	< 0.13	< 0.13	< 0.13	< 0.13
Dichlorodifluoromethane	ug/l	8260	0.963	4.05	< 0.19	< 0.19	< 0.19	< 0.19	< 0.19	< 0.19	< 0.19	< 0.19	< 0.19
Ethylbenzene	ug/l	8260	6.85	299	< 0.23	< 0.23	< 0.23	< 0.23	< 0.23	< 0.23	< 0.23	< 0.23	< 0.23
Isopropylbenzene	ug/l	8260	208	873	< 0.16	< 0.16	< 0.16	< 0.16	< 0.16	< 0.16	< 0.16	< 0.16	< 0.16
Methyl acetate	ug/l	8260	- -	- -	< 0.14	< 0.14	< 0.14	< 0.14	< 0.14	< 0.14	< 0.14	< 0.14	< 0.14
Methyl tert-butyl ether	ug/l	8260	722	31500	< 0.18	< 0.18	< 0.18	< 0.18	< 0.18	< 0.18	< 0.18	< 0.18	< 0.18
Methylcyclohexane [1]	ug/l	8260	172	722	< 0.26	< 0.26	< 0.26	< 0.26	< 0.26	< 0.26	< 0.26	< 0.26	< 0.26
Methylene Chloride	ug/l	8260	742	3120	< 0.13	< 0.13	< 0.13	< 0.13	< 0.13	< 0.13	< 0.13	< 0.13	< 0.13
Naphthalene	ug/l	8260	11	174	NA	NA	NA	NA	NA	NA	NA	NA	NA
Styrene	ug/l	8260	1860	7820	< 0.097	< 0.097	< 0.097	< 0.097	< 0.097	< 0.097	< 0.097	< 0.097	< 0.097
Tetrachloroethene	ug/l	8260	10.9	45.6	0.17 J	0.29 J	0.23 J	0.2 J	< 0.15	4.1	3.5	2.4	0.32 J
Toluene	ug/l	8260	3520	14800	< 0.15	< 0.15	< 0.15	< 0.15	< 0.15	< 0.15	< 0.15	< 0.15	< 0.15
Trichloroethene	ug/l	8260	0.897	3.77	0.39 J	0.46 J	< 0.14	0.4 J	0.57 J	1.4	1.3	1	0.84 J
Trichlorofluoromethane	ug/l	8260	- -	- -	< 0.2	< 0.2	< 0.2	< 0.2	< 0.2	< 0.2	< 0.2	< 0.2	< 0.2
Vinyl chloride	ug/l	8260	0.197	32.8	< 0.23	< 0.23	< 0.23	< 0.23	< 0.23	< 0.23	0.25 J	< 0.23	< 0.23
Xylenes, Total	ug/l	8260	75.9	319	< 0.49	< 0.49	< 0.49	< 0.49	< 0.49	< 0.49	< 0.49	< 0.49	< 0.49
Semi-Volatile Organics													
1,1'-Biphenyl	ug/l	8270	8.73	36.7	< 0.11	< 0.1	< 0.1	< 0.11	< 0.11	< 0.11	< 0.11	< 0.11	< 0.1
2,4,5-Trichlorophenol	ug/l	8270	- -	- -	< 0.12	< 0.12	< 0.12	< 0.12	< 0.13	< 0.12	< 0.12	< 0.13	< 0.12
2,4,6-Trichlorophenol	ug/l	8270	- -	- -	< 0.3	< 0.29	< 0.29	< 0.3	< 0.31	< 0.3	< 0.3	< 0.31	< 0.29
2,4-Dichlorophenol	ug/l	8270	- -	- -	< 0.067	< 0.065	< 0.065	< 0.067	< 0.07	< 0.067	< 0.067	< 0.07	< 0.065
2,4-Dimethylphenol	ug/l	8270	- -	- -	< 0.17	< 0.16	< 0.16	< 0.17	< 0.18	< 0.17	< 0.17	< 0.18	< 0.16

TABLE A-6
ANALYTICAL AND VAPOR INTRUSTION SCREENING RESULTS
GROUNDWATER SAMPLES
CAA VIM AND VIIM
MINGO JUNCTION STEEL WORK LLC - WEIRTON FACILITY

	Units	Analytical Method	Screening Criteria (1)		Sample Information (2)								
			Residential	*Commercial*	MA-MW-07A 11/15/2013	MA-MW-07D 11/15/2013	VI-MW-01A 11/19/2013	VI-MW-02AR 11/14/2013	VI-MW-01P 11/18/2013	VII-MW-01A 11/18/2013	VII-MW-01A DUP 11/18/2013 Duplicate	VII-MW-02A 11/18/2013	VII-MW-03A 11/04/2013
2,4-Dinitrophenol	ug/l	8270	- -	- -	< 2.5	< 2.4	< 2.4	< 2.5	< 2.6	< 2.5	< 2.5	< 2.6	< 2.4
2,4-Dinitrotoluene	ug/l	8270	- -	- -	< 0.21	< 0.21	< 0.21	< 0.21	< 0.22	< 0.21	< 0.21	< 0.22	< 0.21
2,6-Dinitrotoluene	ug/l	8270	- -	- -	< 0.14	< 0.13	< 0.13	< 0.14	< 0.14	< 0.14	< 0.14	< 0.14	< 0.13
2-Chloronaphthalene	ug/l	8270	- -	- -	< 0.031	< 0.03	< 0.03	< 0.031	< 0.032	< 0.031	< 0.031	< 0.032	< 0.03
2-Chlorophenol	ug/l	8270	- -	- -	< 0.23	< 0.22	< 0.22	< 0.23	< 0.23	< 0.23	< 0.23	< 0.23	< 0.22
2-Methylnaphthalene	ug/l	8270	- -	- -	< 0.019	< 0.018	< 0.018	< 0.019	< 0.02	< 0.019	< 0.019	< 0.02	< 0.018
2-Methylphenol	ug/l	8270	- -	- -	< 0.19	< 0.18	< 0.18	< 0.19	< 0.19	< 0.19	< 0.19	< 0.19	< 0.18
2-Nitroaniline	ug/l	8270	- -	- -	< 0.67	< 0.65	< 0.65	< 0.67	< 0.7	< 0.67	< 0.67	< 0.7	< 0.65
2-Nitrophenol	ug/l	8270	- -	- -	< 0.11	< 0.11	< 0.11	< 0.11	< 0.12	< 0.11	< 0.11	< 0.12	< 0.11
3,3'-Dichlorobenzidine	ug/l	8270	- -	- -	< 0.15	< 0.14	< 0.14	< 0.15	< 0.15	< 0.15	< 0.15	< 0.15	< 0.14
3-Nitroaniline	ug/l	8270	- -	- -	< 0.81	< 0.77	< 0.77	< 0.81	< 0.84	< 0.81	< 0.81	< 0.84	< 0.77
4,6-Dinitro-2-methylphenol	ug/l	8270	- -	- -	< 1.6	< 1.5	< 1.5	< 1.6	< 1.6	< 1.6	< 1.6	< 1.6	< 1.5
4-Bromophenyl phenyl ether	ug/l	8270	- -	- -	< 0.12	< 0.11	< 0.11	< 0.12	< 0.12	< 0.12	< 0.12	< 0.12	< 0.11
4-Chloro-3-methylphenol	ug/l	8270	- -	- -	< 0.17	< 0.16	< 0.16	< 0.17	< 0.18	< 0.17	< 0.17	< 0.18	< 0.16
4-Chloroaniline	ug/l	8270	- -	- -	< 0.29	< 0.28	0.31 J	< 0.29	< 0.3	< 0.29	< 0.29	< 0.3	< 0.28
4-Chlorophenyl phenyl ether	ug/l	8270	- -	- -	< 0.08	< 0.077	< 0.077	< 0.08	< 0.083	< 0.08	< 0.08	< 0.083	< 0.077
4-Nitroaniline	ug/l	8270	- -	- -	< 0.77	< 0.74	< 0.74	< 0.77	< 0.81	< 0.77	< 0.77	< 0.81	< 0.74
4-Nitrophenol	ug/l	8270	- -	- -	< 0.8	< 0.77	< 0.77	< 0.8	< 0.84	0.85 J	< 0.8	< 0.84	< 0.77
Acenaphthene	ug/l	8270	- -	- -	< 0.029	< 0.028	< 0.028	< 0.029	0.66	< 0.029	< 0.029	< 0.03	< 0.028
Acenaphthylene	ug/l	8270	- -	- -	< 0.022	< 0.021	< 0.021	< 0.022	< 0.022	< 0.022	< 0.022	< 0.022	< 0.021
Acetophenone	ug/l	8270	- -	- -	< 0.11	< 0.11	< 0.11	< 0.11	< 0.12	< 0.11	< 0.11	< 0.12	< 0.11
Anthracene	ug/l	8270	- -	- -	< 0.019	< 0.018	0.027 J	< 0.019	0.23	0.034 J	< 0.019	< 0.02	< 0.018
Atrazine	ug/l	8270	- -	- -	< 0.22	< 0.21	< 0.21	< 0.22	< 0.23	< 0.22	< 0.22	< 0.23	< 0.21
Benzaldehyde	ug/l	8270	- -	- -	< 0.11	< 0.1	< 0.1	< 0.11	< 0.11	< 0.11	< 0.11	< 0.11	< 0.1
Benzo[a]anthracene	ug/l	8270	176	- -	< 0.037	0.22	< 0.035	< 0.037	< 0.038	< 0.037	< 0.037	0.24	< 0.035
Benzo[a]pyrene	ug/l	8270	- -	- -	< 0.028	0.14 J	< 0.027	< 0.028	< 0.029	< 0.028	< 0.028	0.21	< 0.027
Benzo[b]fluoranthene	ug/l	8270	- -	- -	< 0.049	0.2	< 0.047	< 0.049	< 0.051	< 0.049	< 0.049	0.34	< 0.047
Benzo[g,h,i]perylene	ug/l	8270	- -	- -	< 0.029	0.15 J	< 0.028	< 0.029	< 0.03	< 0.029	< 0.029	0.37	< 0.028
Benzo[k]fluoranthene	ug/l	8270	- -	- -	< 0.03	0.22	< 0.029	< 0.03	< 0.031	< 0.03	< 0.03	0.36	< 0.029
Bis(2-chloroisopropyl)ether	ug/l	8270	- -	- -	< 0.024	< 0.023	< 0.023	< 0.024	< 0.025	< 0.024	< 0.024	< 0.025	< 0.023
Bis(2-chloroethoxy)methane	ug/l	8270	- -	- -	< 0.13	< 0.13	< 0.13	< 0.13	< 0.14	< 0.13	< 0.13	< 0.14	< 0.13
Bis(2-chloroethyl)ether	ug/l	8270	30.5	1330	< 0.032	< 0.03	< 0.03	< 0.032	< 0.033	< 0.032	< 0.032	< 0.033	< 0.03
Bis(2-ethylhexyl) phthalate	ug/l	8270	- -	- -	6.6	1 J	1.1 J	0.51 J	0.63 J	1.1 J	0.51 J	0.62 J	13
Butyl benzyl phthalate	ug/l	8270	- -	- -	< 0.21	0.42 J	0.78 J	< 0.21	0.83 J	1.8	0.56 J	0.69 J	0.51 J
Caprolactam	ug/l	8270	- -	- -	< 1.5	< 1.4	< 1.4	36	< 1.5	< 1.5	< 1.5	< 1.5	< 1.4
Carbazole	ug/l	8270	- -	- -	< 0.027	< 0.026	< 0.026	< 0.027	< 0.028	< 0.027	< 0.027	< 0.028	< 0.026
Chrysene	ug/l	8270	- -	- -	< 0.031	0.26	< 0.03	< 0.031	< 0.032	< 0.031	< 0.031	0.35	< 0.03
Dibenz(a,h)anthracene	ug/l	8270	- -	- -	< 0.027	0.18 J	< 0.026	< 0.027	< 0.028	< 0.027	< 0.027	0.41	< 0.026
Dibenzofuran	ug/l	8270	- -	- -	< 0.097	< 0.093	< 0.093	< 0.097	< 0.1	< 0.097	< 0.097	< 0.1	< 0.093
Diethyl phthalate	ug/l	8270	- -	- -	< 0.3	< 0.29	< 0.29	< 0.3	< 0.31	< 0.3	< 0.3	< 0.31	< 0.29
Dimethyl phthalate	ug/l	8270	- -	- -	< 0.18	< 0.18	< 0.18	< 0.18	< 0.19	< 0.18	< 0.18	< 0.19	< 0.18
Di-n-butyl phthalate	ug/l	8270	- -	- -	< 0.24	< 0.23	< 0.23	< 0.24	< 0.25	< 0.24	< 0.24	< 0.25	< 0.23
Di-n-octyl phthalate	ug/l	8270	- -	- -	< 0.2	< 0.2	< 0.2	< 0.2	< 0.21	< 0.2	< 0.2	0.23 J	< 0.2
Fluoranthene	ug/l	8270	- -	- -	< 0.021	< 0.02	0.027 J	< 0.021	0.44	< 0.021	< 0.021	< 0.022	< 0.02
Fluorene	ug/l	8270	- -	- -	< 0.024	< 0.023	< 0.023	< 0.024	0.86	< 0.024	< 0.024	< 0.025	< 0.023
Hexachlorobenzene	ug/l	8270	0.275	12	< 0.061	< 0.059	< 0.059	< 0.061	< 0.064	< 0.061	< 0.061	< 0.064	< 0.059
Hexachlorobutadiene	ug/l	8270	0.716	31.3	< 0.094	< 0.09	< 0.09	< 0.094	< 0.098	< 0.094	< 0.094	< 0.098	< 0.09
Hexachlorocyclopentadiene	ug/l	8270	0.958	4.02	< 0.14	< 0.13	< 0.13	< 0.14	< 0.14	< 0.14	< 0.14	< 0.14	< 0.13
Hexachloroethane	ug/l	8270	4.26	186	< 0.14	< 0.13	< 0.13	< 0.14	< 0.14	< 0.14	< 0.14	< 0.14	< 0.13
Indeno[1,2,3-cd]pyrene	ug/l	8270	- -	- -	< 0.043	0.15 J	< 0.042	< 0.043	< 0.045	< 0.043	< 0.043	0.37	< 0.042
Isophorone	ug/l	8270	- -	- -	< 0.074	< 0.071	< 0.071	< 0.074	< 0.077	< 0.074	< 0.074	< 0.077	< 0.071
Methylphenol, 3 & 4	ug/l	8270	- -	- -	< 0.21	< 0.2	< 0.2	< 0.21	< 0.22	< 0.21	< 0.21	< 0.22	< 0.2
Naphthalene	ug/l	8270	11	174	< 0.023	< 0.022	0.046 J	< 0.023	< 0.024	< 0.023	< 0.023	< 0.024	< 0.022
Nitrobenzene	ug/l	8270	177	7710	< 0.15	< 0.14	< 0.14	< 0.15	< 0.16	< 0.15	< 0.15	< 0.16	< 0.14
N-Nitrosodi-n-propylamine	ug/l	8270	- -	- -	< 0.05	< 0.048	< 0.048	< 0.05	< 0.052	< 0.05	< 0.05	< 0.052	< 0.048
N-Nitrosodiphenylamine	ug/l	8270	- -	- -	< 0.12	< 0.12	< 0.12	< 0.12	< 0.13	< 0.12	< 0.12	< 0.13	< 0.12
Pentachlorophenol	ug/l	8270	- -	- -	< 0.5	< 0.48	< 0.48	< 0.5	< 0.52	< 0.5	< 0.5	< 0.52	< 0.48

TABLE A-6
ANALYTICAL AND VAPOR INTRUSTION SCREENING RESULTS
GROUNDWATER SAMPLES
CAA VIM AND VIIM
MINGO JUNCTION STEEL WORK LLC - WEIRTON FACILITY

			Screening Criteria (1)		Sample Information (2)																							
	Units	Analytical Method	Residential	*Commercial*	MA-MW-07A 11/15/2013		MA-MW-07D 11/15/2013		VI-MW-01A 11/19/2013		VI-MW-02AR 11/14/2013		VI-MW-01P 11/18/2013		VII-MW-01A 11/18/2013		VII-MW-01A DUP 11/18/2013 Duplicate		VII-MW-02A 11/18/2013		VII-MW-03A 11/04/2013	
Phenanthrene	ug/l	8270	- -	- -	< 0.042		< 0.04		0.075	J	< 0.042		0.082	J	0.077	J	< 0.042		< 0.043		< 0.04	
Phenol	ug/l	8270	- -	- -	< 0.055		< 0.053		< 0.053		< 0.055		0.2	J	< 0.055		< 0.055		< 0.058		< 0.053	
Pyrene	ug/l	8270	- -	- -	< 0.023		< 0.022		< 0.022		< 0.023		0.28		< 0.023		< 0.023		< 0.024		< 0.022	
Inorganics (3)																						
Aluminum	ug/l	6020	- -	- -	8.6	K	56	K	1400	K	310	K	18	K	5300	K	6300	K	1100	K	7000	
Antimony	ug/l	6020	- -	- -	0.081	B	0.052	B	0.32	J	0.077	B	0.24	J	0.35	J	0.29	J	0.12	B	0.053	J
Arsenic	ug/l	6020	- -	- -	< 0.29		< 0.29		0.47	J	< 0.29		1.8		1.6		1.7		< 0.29		1.5	
Barium	ug/l	6020	- -	- -	25		19		39		23		46		69		67		43		110	
Beryllium	ug/l	6020	- -	- -	< 0.037		< 0.037		0.092	K	< 0.037		< 0.037		0.19	J	0.21	K	0.077	K	1.6	
Cadmium	ug/l	6020	- -	- -	< 0.11		< 0.11		< 0.11		< 0.11		< 0.11		0.12	J	0.12	J	< 0.11		1.4	
Calcium	ug/l	6020	- -	- -	82000		85000		93000		160000		34000		130000		130000		85000		180000	B
Chromium	ug/l	6020	- -	- -	1.6	J	2.2		3.8		2.5		1.7	J	7		7.5		3.9		14	B
Cobalt	ug/l	6020	- -	- -	0.17	J	0.25	J	2.3		1.2		3.5		3.8		3.5		1.2		60	B
Copper	ug/l	6020	- -	- -	0.39	K	0.88	K	3.3		1.6	K	0.48	J	7.3		7.1		1.7	J	26	
Iron	ug/l	6020	- -	- -	36	J	200		2900		990		7900		5900		6100		2400		29000	B
Lead	ug/l	6020	- -	- -	0.051	B	0.2	B	1.5		0.55	B	0.052	B	4		3.7		1.1		31	B
Magnesium	ug/l	6020	- -	- -	26000		28000		29000		62000		9600		27000		28000		23000		19000	
Manganese	ug/l	6020	- -	- -	1.4	J	30		1100		920		5900		1300		1200		350		19000	B
Mercury	ug/l	7470	0.252	1.06	< 0.038		< 0.038		< 0.038		0.067	J	< 0.038		< 0.038		< 0.038		0.044	J	< 0.038	
Nickel	ug/l	6020	- -	- -	0.65	K	0.65	K	5.7	K	4.6	K	1.2	K	9.3		9.4	K	3.4	K	39	
Potassium	ug/l	6020	- -	- -	9000		8600		2400		2300		4800		3900		4200		3700		20000	B
Selenium	ug/l	6020	- -	- -	2.8	B	2.6	B	1.1	J	0.99	B	1.1	J	< 0.42		< 0.42		0.87	J	2.1	J
Silver	ug/l	6020	- -	- -	< 0.036		< 0.036		< 0.036		< 0.036		< 0.036		< 0.036		< 0.036		< 0.036		0.7	J
Sodium	ug/l	6020	- -	- -	110000		110000		21000		88000		84000		55000	K	54000		65000		53000	B
Thallium	ug/l	6020	- -	- -	< 0.015		< 0.015		0.084	J	0.017	J	< 0.015		0.069	J	0.075	J	0.041	J	0.15	J
Vanadium	ug/l	6020	- -	- -	0.57	B	0.8	B	2.2	L	1.4		< 0.082	UL	5.8		7	L	1.9	L	2.2	B
Zinc	ug/l	6020	- -	- -	2.6	B	6.5	K	23	K	4.8	B	5	K	23	K	29	K	6.4	K	130	B
Other Parameters																						
Cyanide, Total	ug/l	9012	20.1	84.4	60		60		1.5	J	< 1.5		3.9	J	< 1.5		1.9	J	1.6	J	< 1.5	

TABLE A-6
ANALYTICAL AND VAPOR INTRUSTION SCREENING RESULTS
GROUNDWATER SAMPLES
CAA VIM AND VIIM
MINGO JUNCTION STEEL WORK LLC - WEIRTON FACILITY

	Units	Analytical Method	Screening Criteria [1] Residential	Screening Criteria [1] *Commercial*	Sample Information [2] VII-MW-01P 11/18/2013	VII-MW-02P 11/18/2013	VII-MW-03P 11/18/2013	MA-MW-07A 02/17/2014	MA-MW-07D 02/17/2014	VI-MW-01A 02/13/2014	VI-MW-02AR 02/13/2014	VI-MW-01P 02/13/2014	VII-MW-01A 02/19/2014
Volatile Organic Compounds													
1,1,1-Trichloroethane	ug/l	8260	1240	5210	< 0.29	< 0.29	< 0.29 UJ	< 0.29	< 0.29	< 0.29	< 0.29	< 0.29	< 0.29
1,1,2,2-Tetrachloroethane	ug/l	8260	6.59	288	< 0.2	< 0.2	< 0.2 UJ	< 0.2	< 0.2	< 0.2	< 0.2	< 0.2	< 0.2
1,1,2-Trichloro-1,2,2-trifluoroethane	ug/l	8260	38	160	< 0.32	< 0.32	< 0.32 UJ	< 0.32	< 0.32	< 0.32	< 0.32	< 0.32	< 0.32
1,1,2-Trichloroethane	ug/l	8260	1.17	4.91	< 0.2	< 0.2	< 0.2 UJ	< 0.2	< 0.2	< 0.2	< 0.2	< 0.2	< 0.2
1,1-Dichloroethane	ug/l	8260	12.4	541	0.24 J	< 0.12	< 0.12 UJ	< 0.12	< 0.12	< 0.12	0.24 J	0.36 J	6.7
1,1-Dichloroethene	ug/l	8260	29.7	125	< 0.3	< 0.3	< 0.3 UJ	0.34 J	1.2	< 0.3	0.53 J	< 0.3	< 0.3
1,2,4-Trichlorobenzene	ug/l	8260	8.78	36.9	< 0.27	< 0.27	< 0.27 UJ	< 0.27	< 0.27	< 0.27	< 0.27	< 0.27	< 0.27
1,2-Dibromo-3-Chloropropane	ug/l	8260	0.0648	7.84	< 0.14	< 0.14	< 0.14 UJ	< 0.14	< 0.14	< 0.14	< 0.14	< 0.14	< 0.14
1,2-Dibromoethane (EDB)	ug/l	8260	0.332	14.5	< 0.18	< 0.18	< 0.18 UJ	< 0.18	< 0.18	< 0.18	< 0.18	< 0.18	< 0.18
1,2-Dichlorobenzene	ug/l	8260	571	2400	< 0.15	< 0.15	37 J	< 0.15	< 0.15	< 0.15	< 0.15	0.34 J	< 0.15
1,2-Dichloroethane	ug/l	8260	3.92	111	< 0.21	< 0.21	< 0.21 UJ	< 0.21	< 0.21	< 0.21	< 0.21	< 0.21	< 0.21
1,2-Dichloroethene, Total	ug/l	8260	- -	- -	1	< 0.51	4.7 J	< 0.51	< 0.51	< 0.51	< 0.51	3.5	10
cis-1,2-Dichloroethene	ug/l	8260	- -	- -	1	< 0.24	2.7 J	< 0.24	< 0.24	< 0.24	< 0.24	3.5	9.7
trans-1,2-Dichloroethene	ug/l	8260	- -	- -	< 0.17	< 0.17	2 J	< 0.17	< 0.17	< 0.17	< 0.17	< 0.17	< 0.17
1,2-Dichloropropane	ug/l	8260	6.38	26.8	< 0.095	< 0.095	< 0.095 UJ	< 0.095	< 0.095	< 0.095	< 0.095	< 0.095	< 0.095
cis-1,3-Dichloropropene [1]	ug/l	8260	8.93	111	< 0.19	< 0.19	< 0.19 UJ	< 0.19	< 0.19	< 0.19	< 0.19	< 0.19	< 0.19
trans-1,3-Dichloropropene [1]	ug/l	8260	8.93	111	< 0.15	< 0.15	< 0.15 UJ	< 0.15	< 0.15	< 0.15	< 0.15	< 0.15	< 0.15
1,3-Dichlorobenzene [1]	ug/l	8260	5.57	243	< 0.11	< 0.11	< 0.11 UJ	< 0.11	< 0.11	< 0.11	< 0.11	< 0.11	< 0.11
1,4-Dichlorobenzene	ug/l	8260	5.57	243	< 0.21	< 0.21	0.54 J	< 0.21	< 0.21	< 0.21	< 0.21	< 0.21	< 0.21
2-Butanone (MEK)	ug/l	8260	389000	1640000	< 0.55	< 0.55	4.7 J	< 0.55	< 0.55	< 0.55	< 0.55	< 0.55	< 0.55
2-Hexanone	ug/l	8260	1650	6950	< 0.16	< 0.16	0.66 J	< 0.16	< 0.16	< 0.16	< 0.16	< 0.16	< 0.16
4-Methyl-2-pentanone (MIBK)	ug/l	8260	106000	447000	< 0.53	< 0.53	0.53 J	< 0.53	< 0.53	< 0.53	< 0.53	< 0.53	< 0.53
Acetone	ug/l	8260	3680000	15500000	3.1 J	8.8	8.8 J	< 2.5	< 2.5	< 2.5	< 2.5	< 2.5	< 2.5
Benzene	ug/l	8260	2.7	98.6	0.13 J	< 0.11	0.54 J	< 0.11	< 0.11	< 0.11	< 0.11	< 0.11	< 0.11
Bromoform	ug/l	8260	243	10600	< 0.19	< 0.19	< 0.19 UJ	< 0.19	< 0.19	< 0.19	< 0.19	< 0.19	< 0.19
Bromomethane	ug/l	8260	2.48	10.4	< 0.31	< 0.31	< 0.31 UJ	< 0.31	< 0.31	< 0.31	< 0.31	< 0.31	< 0.31
Carbon disulfide	ug/l	8260	191	801	< 0.21	< 0.21	< 0.21 UJ	< 0.21	< 0.21	< 0.21	< 0.21	< 0.21	< 0.21
Carbon tetrachloride	ug/l	8260	0.693	30.3	< 0.14	< 0.14	< 0.14 UJ	< 0.14	< 0.14	< 0.14	< 0.14	< 0.14	< 0.14
Chlorobenzene	ug/l	8260	78.6	330	< 0.14	< 0.14	0.96 J	< 0.14	< 0.14	< 0.14	< 0.14	< 0.14	< 0.14
Chlorodibromomethane	ug/l	8260	- -	- -	< 0.14	< 0.14	< 0.14 UJ	< 0.14	< 0.14	0.19 J	< 0.14	< 0.14	< 0.14
Chloroethane	ug/l	8260	3350	14000	< 0.21	< 0.21	< 0.21 UJ	< 0.21	< 0.21	< 0.21	< 0.21	< 0.21	< 0.21
Chloroform	ug/l	8260	1.33	58.1	< 0.17	< 0.17	< 0.17 UJ	0.67 J	1.8	4.1	0.25 J	2.6	< 0.17
Chloromethane	ug/l	8260	34.9	146	< 0.28	< 0.28	< 0.28 UJ	< 0.28	< 0.28	< 0.28	< 0.28	< 0.28	< 0.28
Cyclohexane	ug/l	8260	172	722	0.58 J	< 0.25	0.41 J	< 0.25	< 0.25	< 0.25	< 0.25	< 0.25	< 0.25
Dichlorobromomethane	ug/l	8260	1.55	67.6	< 0.13	< 0.13	< 0.13 UJ	< 0.13	< 0.13	1.4	< 0.13	< 0.13	< 0.13
Dichlorodifluoromethane	ug/l	8260	0.963	4.05	< 0.19	< 0.19	< 0.19 UJ	< 0.19	< 0.19	< 0.19	< 0.19	< 0.19	< 0.19
Ethylbenzene	ug/l	8260	6.85	299	3.5	< 0.23	16 J	< 0.23	< 0.23	< 0.23	< 0.23	< 0.23	< 0.23
Isopropylbenzene	ug/l	8260	208	873	1.8	< 0.16	4.8 J	< 0.16	< 0.16	< 0.16	< 0.16	< 0.16	< 0.16
Methyl acetate	ug/l	8260	- -	- -	< 0.14	< 0.14	< 0.14 UJ	< 0.14	< 0.14	< 0.14	< 0.14	< 0.14	< 0.14
Methyl tert-butyl ether	ug/l	8260	722	31500	< 0.18	< 0.18	< 0.18 UJ	< 0.18	< 0.18	< 0.18	< 0.18	< 0.18	< 0.18
Methylcyclohexane [1]	ug/l	8260	172	722	1.1	< 0.26	1 J	< 0.26	< 0.26	< 0.26	< 0.26	< 0.26	< 0.26
Methylene Chloride	ug/l	8260	742	3120	< 0.13	< 0.13	< 0.13 UJ	< 0.13	< 0.13	< 0.13	< 0.13	< 0.13	< 0.13
Naphthalene	ug/l	8260	11	174	NA	NA	NA	NA	NA	NA	NA	NA	NA
Styrene	ug/l	8260	1860	7820	< 0.097	< 0.097	< 0.097 UJ	< 0.097	< 0.097	< 0.097	< 0.097	< 0.097	< 0.097
Tetrachloroethene	ug/l	8260	10.9	45.6	2.5	< 0.15	2.9 J	0.23 J	0.34 J	0.41 J	0.23 J	< 0.15	3.6
Toluene	ug/l	8260	3520	14800	0.96 J	< 0.15	5 J	< 0.15	< 0.15	< 0.15	< 0.15	< 0.15	< 0.15
Trichloroethene	ug/l	8260	0.897	3.77	0.51 J	< 0.14	1.3 J	0.38 J	0.43 J	0.15 J	0.4 J	0.75 J	1.3
Trichlorofluoromethane	ug/l	8260	- -	- -	< 0.2	< 0.2	< 0.2 UJ	< 0.2	< 0.2	< 0.2	< 0.2	< 0.2	< 0.2
Vinyl chloride	ug/l	8260	0.197	32.8	< 0.23	< 0.23	0.49 J	< 0.23	< 0.23	< 0.23	< 0.23	< 0.23	< 0.23
Xylenes, Total	ug/l	8260	75.9	319	16	0.78 J	61 J	< 0.49	< 0.49	< 0.49	< 0.49	< 0.49	< 0.49
Semi-Volatile Organics													
1,1'-Biphenyl	ug/l	8270	8.73	36.7	0.78 J	< 0.11	1.6	< 0.097	< 0.1	< 0.13	< 0.13	< 0.11	< 0.11
2,4,5-Trichlorophenol	ug/l	8270	- -	- -	< 0.13	< 0.12	< 0.12	< 0.11	< 0.12	< 0.15	< 0.15	< 0.13	< 0.13
2,4,6-Trichlorophenol	ug/l	8270	- -	- -	< 0.31	< 0.3	< 0.3	< 0.28	< 0.29	< 0.36	< 0.36	< 0.31	< 0.31
2,4-Dichlorophenol	ug/l	8270	- -	- -	< 0.07	< 0.067	< 0.067	< 0.062	< 0.065	< 0.08	< 0.08	< 0.07	< 0.07
2,4-Dimethylphenol	ug/l	8270	- -	- -	< 0.18	< 0.17	< 0.17	< 0.16	< 0.16	< 0.2	< 0.2	< 0.18	< 0.18

TABLE A-6
ANALYTICAL AND VAPOR INTRUSTION SCREENING RESULTS
GROUNDWATER SAMPLES
CAA VIM AND VIIM
MINGO JUNCTION STEEL WORK LLC - WEIRTON FACILITY

			Screening Criteria (1)		Sample Information (2)								
	Units	Analytical Method	Residential	*Commercial*	VII-MW-01P 11/18/2013	VII-MW-02P 11/18/2013	VII-MW-03P 11/18/2013	MA-MW-07A 02/17/2014	MA-MW-07D 02/17/2014	VI-MW-01A 02/13/2014	VI-MW-02AR 02/13/2014	VI-MW-01P 02/13/2014	VII-MW-01A 02/19/2014
2,4-Dinitrophenol	ug/l	8270	- -	- -	< 2.6	< 2.5	< 2.5	< 2.3	< 2.4	< 3	< 3	< 2.6	< 2.6
2,4-Dinitrotoluene	ug/l	8270	- -	- -	< 0.22	< 0.21	< 0.21	< 0.2	< 0.21	< 0.25	< 0.25	< 0.22	< 0.22
2,6-Dinitrotoluene	ug/l	8270	- -	- -	< 0.14	< 0.14	< 0.14	< 0.13	< 0.13	< 0.16	< 0.16	< 0.14	< 0.14
2-Chloronaphthalene	ug/l	8270	- -	- -	< 0.032	< 0.031	< 0.031	< 0.028	< 0.03	< 0.037	< 0.037	< 0.032	< 0.032
2-Chlorophenol	ug/l	8270	- -	- -	< 0.23	< 0.23	< 0.23	< 0.21	< 0.22	< 0.27	< 0.27	< 0.23	< 0.23
2-Methylnaphthalene	ug/l	8270	- -	- -	13	0.26	30	< 0.018	< 0.018	< 0.023	0.024 J	< 0.02	< 0.02
2-Methylphenol	ug/l	8270	- -	- -	< 0.19	< 0.19	0.23 J	< 0.17	< 0.18	< 0.22	< 0.22	< 0.19	< 0.19
2-Nitroaniline	ug/l	8270	- -	- -	< 0.7	< 0.67	< 0.67	< 0.62	< 0.65	< 0.8	< 0.8	< 0.7	< 0.7
2-Nitrophenol	ug/l	8270	- -	- -	< 0.12	< 0.11	< 0.11	< 0.1	< 0.11	< 0.13	< 0.13	< 0.12	< 0.12
3,3'-Dichlorobenzidine	ug/l	8270	- -	- -	< 0.15	< 0.15	< 0.15	< 0.14	< 0.14	< 0.17	< 0.17	< 0.15	< 0.15
3-Nitroaniline	ug/l	8270	- -	- -	< 0.84	< 0.81	< 0.81	< 0.75	< 0.77	< 0.96	< 0.96	< 0.84	< 0.84
4,6-Dinitro-2-methylphenol	ug/l	8270	- -	- -	< 1.6	< 1.6	< 1.6	< 1.4	< 1.5	< 1.9	< 1.9	< 1.6	< 1.6
4-Bromophenyl phenyl ether	ug/l	8270	- -	- -	< 0.12	< 0.12	< 0.12	< 0.11	< 0.11	< 0.14	< 0.14	< 0.12	< 0.12
4-Chloro-3-methylphenol	ug/l	8270	- -	- -	< 0.18	< 0.17	< 0.17	< 0.16	< 0.16	< 0.2	< 0.2	< 0.18	< 0.18
4-Chloroaniline	ug/l	8270	- -	- -	< 0.3	< 0.29	< 0.29	< 0.27	< 0.28	< 0.35	< 0.35	< 0.3	< 0.3
4-Chlorophenyl phenyl ether	ug/l	8270	- -	- -	< 0.083	< 0.08	< 0.08	< 0.074	< 0.077	< 0.095	< 0.095	< 0.083	< 0.083
4-Nitroaniline	ug/l	8270	- -	- -	< 0.81	< 0.77	< 0.77	< 0.72	< 0.74	< 0.92	< 0.92	< 0.81	< 0.81
4-Nitrophenol	ug/l	8270	- -	- -	< 0.84	< 0.8	< 0.8	< 0.74	< 0.77	< 0.96	< 0.96	< 0.84	< 0.84
Acenaphthene	ug/l	8270	- -	- -	< 0.03	0.091 J	1.8	< 0.027	< 0.028	< 0.035	< 0.035	0.38	< 0.03
Acenaphthylene	ug/l	8270	- -	- -	< 0.022	< 0.022	< 0.022	< 0.02	< 0.021	< 0.026	< 0.026	< 0.022	< 0.022
Acetophenone	ug/l	8270	- -	- -	< 0.12	0.13 J	< 0.11	< 0.1	< 0.11	< 0.13	< 0.13	< 0.12	< 0.12
Anthracene	ug/l	8270	- -	- -	< 0.02	0.042 J	0.23	< 0.018	< 0.018	< 0.023	0.025 J	< 0.02	< 0.02
Atrazine	ug/l	8270	- -	- -	< 0.23	< 0.22	< 0.22	< 0.21	< 0.21	< 0.27	< 0.27	< 0.23	< 0.23
Benzaldehyde	ug/l	8270	- -	- -	< 0.11	< 0.11	< 0.11	< 0.098	< 0.1	< 0.13	< 0.13	< 0.11	< 0.11
Benzo[a]anthracene	ug/l	8270	176	- -	< 0.038	< 0.037	< 0.037	< 0.034	< 0.035	< 0.044	< 0.044	< 0.038	< 0.038
Benzo[a]pyrene	ug/l	8270	- -	- -	< 0.029	< 0.028	< 0.028	< 0.026	< 0.027	< 0.034	< 0.034	< 0.029	< 0.029
Benzo[b]fluoranthene	ug/l	8270	- -	- -	< 0.051	< 0.049	< 0.049	< 0.045	< 0.047	< 0.058	< 0.058	< 0.051	< 0.051
Benzo[g,h,i]perylene	ug/l	8270	- -	- -	< 0.03	< 0.029	< 0.029	< 0.027	< 0.028	< 0.035	< 0.035	< 0.03	< 0.03
Benzo[k]fluoranthene	ug/l	8270	- -	- -	< 0.031	< 0.03	< 0.03	< 0.028	< 0.029	< 0.036	< 0.036	< 0.031	< 0.031
Bis(2-chloroisopropyl)ether	ug/l	8270	- -	- -	< 0.025	< 0.024	< 0.024	< 0.022	< 0.023	< 0.028	< 0.028	< 0.025	< 0.025
Bis(2-chloroethoxy)methane	ug/l	8270	- -	- -	< 0.14	< 0.13	< 0.13	< 0.12	< 0.13	< 0.16	< 0.16	< 0.14	< 0.14
Bis(2-chloroethyl)ether	ug/l	8270	30.5	1330	< 0.033	< 0.032	< 0.032	< 0.029	< 0.03	< 0.038	< 0.038	< 0.033	< 0.033
Bis(2-ethylhexyl) phthalate	ug/l	8270	- -	- -	0.67 J	0.61 J	0.52 J	< 0.41	< 0.42	2.4	1.2 J	1 J	< 0.46
Butyl benzyl phthalate	ug/l	8270	- -	- -	0.62 J	0.84 J	0.62 J	0.21 J	0.32 J	4.1	2.8	2.1	< 0.22
Caprolactam	ug/l	8270	- -	- -	< 1.5	< 1.5	< 1.5	< 1.4	< 1.4	< 1.8	< 1.8	< 1.5	< 1.5
Carbazole	ug/l	8270	- -	- -	< 0.028	0.036 J	2	< 0.025	< 0.026	< 0.032	< 0.032	< 0.028	< 0.028
Chrysene	ug/l	8270	- -	- -	< 0.032	< 0.031	< 0.031	0.034 J	< 0.03	< 0.037	< 0.037	< 0.032	< 0.032
Dibenz(a,h)anthracene	ug/l	8270	- -	- -	< 0.028	< 0.027	< 0.027	< 0.025	< 0.026	< 0.032	< 0.032	< 0.028	< 0.028
Dibenzofuran	ug/l	8270	- -	- -	0.6 J	< 0.097	1.5	< 0.089	< 0.093	< 0.11	< 0.11	< 0.1	< 0.1
Diethyl phthalate	ug/l	8270	- -	- -	< 0.31	< 0.3	< 0.3	< 0.27	< 0.29	0.56 B	0.36 B	0.37 B	< 0.31
Dimethyl phthalate	ug/l	8270	- -	- -	< 0.19	< 0.18	< 0.18	< 0.17	< 0.18	< 0.22	< 0.22	< 0.19	< 0.19
Di-n-butyl phthalate	ug/l	8270	- -	- -	< 0.25	< 0.24	< 0.24	< 0.22	< 0.23	< 0.29	< 0.29	< 0.25	< 0.25
Di-n-octyl phthalate	ug/l	8270	- -	- -	< 0.21	< 0.2	< 0.2	< 0.19	< 0.2	0.3 J	< 0.24	< 0.21	< 0.21
Fluoranthene	ug/l	8270	- -	- -	0.038 J	0.026 J	0.17 J	0.021 J	0.035 J	0.035 J	0.04 J	0.26	< 0.022
Fluorene	ug/l	8270	- -	- -	0.94	0.079 J	2.2	< 0.022	< 0.023	< 0.029	< 0.029	0.19 J	< 0.025
Hexachlorobenzene	ug/l	8270	0.275	12	< 0.064	< 0.061	< 0.061	< 0.056	< 0.059	< 0.073	< 0.073	< 0.064	< 0.064
Hexachlorobutadiene	ug/l	8270	0.716	31.3	< 0.098	< 0.094	< 0.094	< 0.087	< 0.09	< 0.11	< 0.11	< 0.098	< 0.098
Hexachlorocyclopentadiene	ug/l	8270	0.958	4.02	< 0.14	< 0.14	< 0.14	< 0.13	< 0.13	< 0.16 UJ	< 0.16	< 0.14	< 0.14
Hexachloroethane	ug/l	8270	4.26	186	< 0.14	< 0.14	< 0.14	< 0.13	< 0.13	< 0.16	< 0.16	< 0.14	< 0.14
Indeno[1,2,3-cd]pyrene	ug/l	8270	- -	- -	< 0.045	< 0.043	< 0.043	< 0.04	< 0.042	< 0.052	< 0.052	< 0.045	< 0.045
Isophorone	ug/l	8270	- -	- -	< 0.077	< 0.074	< 0.074	< 0.068	< 0.071	< 0.088	< 0.088	< 0.077	< 0.077
Methylphenol, 3 & 4	ug/l	8270	- -	- -	< 0.22	< 0.21	0.35 J	< 0.19	< 0.2	< 0.25	< 0.25	< 0.22	< 0.22
Naphthalene	ug/l	8270	11	174	4.7	0.21	23	< 0.021	< 0.022	0.044 J	0.047 J	< 0.024	< 0.024
Nitrobenzene	ug/l	8270	177	7710	< 0.16	< 0.15	< 0.15	< 0.14	< 0.14	< 0.18	< 0.18	< 0.16	< 0.16
N-Nitrosodi-n-propylamine	ug/l	8270	- -	- -	< 0.052	< 0.05	< 0.05	< 0.046	< 0.048	< 0.06	< 0.06	< 0.052	< 0.052
N-Nitrosodiphenylamine	ug/l	8270	- -	- -	< 0.13	< 0.12	< 0.12	< 0.11	< 0.12	< 0.14	< 0.14	< 0.13	< 0.13
Pentachlorophenol	ug/l	8270	- -	- -	< 0.52	< 0.5	< 0.5	< 0.46	< 0.48	< 0.6	< 0.6	< 0.52	< 0.52

TABLE A-6
ANALYTICAL AND VAPOR INTRUSTION SCREENING RESULTS
GROUNDWATER SAMPLES
CAA VIM AND VIIM
MINGO JUNCTION STEEL WORK LLC - WEIRTON FACILITY

			Screening Criteria (1)		Sample Information (2)																							
	Units	Analytical Method	Residential	*Commercial*	VII-MW-01P 11/18/2013		VII-MW-02P 11/18/2013		VII-MW-03P 11/18/2013		MA-MW-07A 02/17/2014		MA-MW-07D 02/17/2014		VI-MW-01A 02/13/2014		VI-MW-02AR 02/13/2014		VI-MW-01P 02/13/2014		VII-MW-01A 02/19/2014	
Phenanthrene	ug/l	8270	- -	- -	1.6		0.09	J	2.6		0.039	J	0.067	J	0.056	J	0.075	J	< 0.043		< 0.043	
Phenol	ug/l	8270	- -	- -	< 0.058		< 0.055		0.42	J	< 0.051		< 0.053		< 0.066		< 0.066		< 0.058		< 0.058	
Pyrene	ug/l	8270	- -	- -	< 0.024		0.037	J	0.14	J	< 0.021		0.024	J	< 0.027		< 0.027		0.2	J	< 0.024	
Inorganics (3)																						
Aluminum	ug/l	6020	- -	- -	920	K	140	K	52	K	< 2.6		< 2.6		34	K	7.1	J	17	J	3.6	J
Antimony	ug/l	6020	- -	- -	0.094	B	0.94	J	0.12	B	0.061	J	0.052	J	< 0.019	UL	< 0.019	UL	< 0.019	UL	0.047	J
Arsenic	ug/l	6020	- -	- -	< 0.29		1.6		1.4		< 0.29		< 0.29		0.41	K	< 0.29	UJ	1.2	K	< 0.29	UJ
Barium	ug/l	6020	- -	- -	110		22		39		26		19		28		16	J	44	J	30	J
Beryllium	ug/l	6020	- -	- -	1.2	K	< 0.037		< 0.037		< 0.037		< 0.037		< 0.037		< 0.037	UJ	< 0.037	UJ	0.048	J
Cadmium	ug/l	6020	- -	- -	0.84	J	< 0.11		< 0.11		< 0.11		< 0.11		< 0.11		< 0.11	UJ	< 0.11	UJ	< 0.11	UJ
Calcium	ug/l	6020	- -	- -	760000		25000		310000		77000	K	81000	K	98000		170000	J	38000	J	140000	K
Chromium	ug/l	6020	- -	- -	1.9	J	2.4		1.5	J	1.5	J	1.8	J	2.1		2.8	J	0.75	J	1.4	J
Cobalt	ug/l	6020	- -	- -	98		0.13	J	0.42	J	0.17	J	0.17	J	0.21	J	0.43	J	3.8	J	1.1	J
Copper	ug/l	6020	- -	- -	2.6		2.4		1.4	J	0.56	K	0.5	K	1.2	K	1.7	K	0.95	K	0.57	K
Iron	ug/l	6020	- -	- -	60000		200		65		33	B	31	B	15	J	16	J	7500	J	7.4	B
Lead	ug/l	6020	- -	- -	1	B	2.8		0.052	B	1.5		< 0.019		0.15	J	0.13	J	0.057	B	0.029	B
Magnesium	ug/l	6020	- -	- -	5900		4000		22000		27000		29000		27000	L	54000	L	10000	L	31000	J
Manganese	ug/l	6020	- -	- -	30000		93		48		0.65	B	1.3	B	94		61	J	6000	J	1100	J
Mercury	ug/l	7470	0.252	1.06	< 0.038		< 0.038		< 0.038		< 0.038	UL	< 0.038	UL	< 0.038	UL	< 0.038		< 0.038		< 0.038	
Nickel	ug/l	6020	- -	- -	110	K	0.46	K	0.21	K	0.86	J	0.66	J	2.1		2.5	J	1.7	J	4.7	J
Potassium	ug/l	6020	- -	- -	43000		3100		33000		8500		8200		1500	J	2100	J	3600	J	2700	J
Selenium	ug/l	6020	- -	- -	7.2		0.48	J	2	J	2.9	B	3	B	1.8	J	1.3	J	< 0.42	UJ	< 0.42	UJ
Silver	ug/l	6020	- -	- -	< 0.036		< 0.036		< 0.036		< 0.036		< 0.036		< 0.036		< 0.036	UJ	< 0.036	UJ	< 0.036	UJ
Sodium	ug/l	6020	- -	- -	48000		5600		59000		93000	K	95000	K	20000		79000	J	66000	J	48000	K
Thallium	ug/l	6020	- -	- -	0.11	J	0.034	J	< 0.015		< 0.015		< 0.015		0.052	B	0.084	B	0.13	J	< 0.015	UJ
Vanadium	ug/l	6020	- -	- -	0.33	L	10	L	1.3	L	0.11	B	0.4	B	1.5		1.8	J	< 0.082	UJ	0.46	B
Zinc	ug/l	6020	- -	- -	160	K	6.9	K	2.3	K	4.4	K	3.3	K	8.4		8.6	J	15	J	6.3	K
Other Parameters																						
Cyanide, Total	ug/l	9012	20.1	84.4	< 1.5		3.5	J	< 1.5		50		54		< 1.5		< 1.5		< 1.5		< 1.5	

TABLE A-6
ANALYTICAL AND VAPOR INTRUSTION SCREENING RESULTS
GROUNDWATER SAMPLES
CAA VIM AND VIIM
MINGO JUNCTION STEEL WORK LLC - WEIRTON FACILITY

			Screening Criteria [1]		Sample Information [2]							
	Units	Analytical Method	Residential	*Commercial*	VII-MW-01A DUP 02/19/2014 Duplicate	VII-MW-02A 02/19/2014	VII-MW-03A 02/19/2014	VII-MW-01P 02/14/2014	VII-MW-02P 02/13/2014	VII-MW-03P 02/14/2014	VI-MW-03A 01/17/2019	VI-MW-03A DUP 01/17/2019 Duplicate	VI-MW-04A 01/17/2019
Volatile Organic Compounds													
1,1,1-Trichloroethane	ug/l	8260	1240	5210	< 0.29	< 0.29	< 0.29	< 0.29	< 0.29	< 0.29	NA	NA	NA
1,1,2,2-Tetrachloroethane	ug/l	8260	6.59	288	< 0.2	< 0.2	< 0.2	< 0.2	< 0.2	< 0.2	NA	NA	NA
1,1,2-Trichloro-1,2,2-trifluoroethane	ug/l	8260	38	160	< 0.32	< 0.32	< 0.32	< 0.32	< 0.32	< 0.32	NA	NA	NA
1,1,2-Trichloroethane	ug/l	8260	1.17	4.91	< 0.2	< 0.2	< 0.2	< 0.2	< 0.2	< 0.2	NA	NA	NA
1,1-Dichloroethane	ug/l	8260	12.4	541	6.9	< 0.12	0.54 J	0.25 J	< 0.12	< 0.12	NA	NA	NA
1,1-Dichloroethene	ug/l	8260	29.7	125	< 0.3	< 0.3	< 0.3	< 0.3	< 0.3	< 0.3	NA	NA	NA
1,2,4-Trichlorobenzene	ug/l	8260	8.78	36.9	< 0.27	< 0.27	< 0.27	< 0.27	< 0.27	< 0.27	NA	NA	NA
1,2-Dibromo-3-Chloropropane	ug/l	8260	0.0648	7.84	< 0.14	< 0.14	< 0.14	< 0.14	< 0.14	< 0.14	NA	NA	NA
1,2-Dibromoethane (EDB)	ug/l	8260	0.332	14.5	< 0.18	< 0.18	< 0.18	< 0.18	< 0.18	< 0.18	NA	NA	NA
1,2-Dichlorobenzene	ug/l	8260	571	2400	< 0.15	< 0.15	< 0.15	< 0.15	< 0.15	34	NA	NA	NA
1,2-Dichloroethane	ug/l	8260	3.92	111	< 0.21	< 0.21	< 0.21	< 0.21	< 0.21	< 0.21	NA	NA	NA
1,2-Dichloroethene, Total	ug/l	8260	- -	- -	10	1.3	1.9	0.55 J	< 0.51	6.5	NA	NA	NA
cis-1,2-Dichloroethene	ug/l	8260	- -	- -	9.8	1.3	1.8	0.54 J	< 0.24	4.3	NA	NA	NA
trans-1,2-Dichloroethene	ug/l	8260	- -	- -	< 0.17	< 0.17	< 0.17	< 0.17	< 0.17	2.2	NA	NA	NA
1,2-Dichloropropane	ug/l	8260	6.38	26.8	< 0.095	< 0.095	< 0.095	< 0.095	< 0.095	< 0.095	NA	NA	NA
cis-1,3-Dichloropropene [1]	ug/l	8260	8.93	111	< 0.19	< 0.19	< 0.19	< 0.19	< 0.19	< 0.19	NA	NA	NA
trans-1,3-Dichloropropene [1]	ug/l	8260	8.93	111	< 0.15	< 0.15	< 0.15	< 0.15	< 0.15	< 0.15	NA	NA	NA
1,3-Dichlorobenzene [1]	ug/l	8260	5.57	243	< 0.11	< 0.11	< 0.11	< 0.11	< 0.11	< 0.11	NA	NA	NA
1,4-Dichlorobenzene	ug/l	8260	5.57	243	< 0.21	< 0.21	< 0.21	< 0.21	< 0.21	0.59 J	NA	NA	NA
2-Butanone (MEK)	ug/l	8260	389000	1640000	< 0.55	< 0.55	< 0.55	< 0.55	< 0.55	3.9 J	NA	NA	NA
2-Hexanone	ug/l	8260	1650	6950	< 0.16	< 0.16	< 0.16	< 0.16	< 0.16	< 0.16	NA	NA	NA
4-Methyl-2-pentanone (MIBK)	ug/l	8260	106000	447000	< 0.53	< 0.53	< 0.53	< 0.53	< 0.53	< 0.53	NA	NA	NA
Acetone	ug/l	8260	3680000	15500000	< 2.5	< 2.5	< 2.5	< 2.5	4.9 J	5.2	NA	NA	NA
Benzene	ug/l	8260	2.7	98.6	< 0.11	< 0.11	< 0.11	0.19 J	< 0.11	0.35 J	NA	NA	NA
Bromoform	ug/l	8260	243	10600	< 0.19	< 0.19	< 0.19	< 0.19	< 0.19	< 0.19	NA	NA	NA
Bromomethane	ug/l	8260	2.48	10.4	< 0.31	< 0.31	< 0.31	< 0.31	< 0.31	< 0.31	NA	NA	NA
Carbon disulfide	ug/l	8260	191	801	< 0.21	< 0.21	< 0.21	0.58 J	< 0.21	< 0.21	NA	NA	NA
Carbon tetrachloride	ug/l	8260	0.693	30.3	< 0.14	< 0.14	< 0.14	< 0.14	< 0.14	< 0.14	NA	NA	NA
Chlorobenzene	ug/l	8260	78.6	330	< 0.14	< 0.14	< 0.14	< 0.14	< 0.14	0.6 J	NA	NA	NA
Chlorodibromomethane	ug/l	8260	- -	- -	< 0.14	< 0.14	< 0.14	< 0.14	< 0.14	< 0.14	NA	NA	NA
Chloroethane	ug/l	8260	3350	14000	< 0.21	< 0.21	< 0.21	< 0.21	< 0.21	< 0.21	NA	NA	NA
Chloroform	ug/l	8260	1.33	58.1	< 0.17	4.3	< 0.17	< 0.17	< 0.17	< 0.17	NA	NA	NA
Chloromethane	ug/l	8260	34.9	146	< 0.28	< 0.28	< 0.28	< 0.28	< 0.28	< 0.28	NA	NA	NA
Cyclohexane	ug/l	8260	172	722	< 0.25	< 0.25	< 0.25	1	< 0.25	0.4 J	NA	NA	NA
Dichlorobromomethane	ug/l	8260	1.55	67.6	< 0.13	< 0.13	< 0.13	< 0.13	< 0.13	< 0.13	NA	NA	NA
Dichlorodifluoromethane	ug/l	8260	0.963	4.05	< 0.19	< 0.19	< 0.19	< 0.19	< 0.19	< 0.19	NA	NA	NA
Ethylbenzene	ug/l	8260	6.85	299	< 0.23	< 0.23	< 0.23	7	0.23 J	12	NA	NA	NA
Isopropylbenzene	ug/l	8260	208	873	< 0.16	< 0.16	< 0.16	3.5	< 0.16	4.4	NA	NA	NA
Methyl acetate	ug/l	8260	- -	- -	< 0.14	< 0.14	< 0.14	< 0.14	< 0.14	< 0.14	NA	NA	NA
Methyl tert-butyl ether	ug/l	8260	722	31500	< 0.18	< 0.18	< 0.18	< 0.18	< 0.18	< 0.18	NA	NA	NA
Methylcyclohexane [1]	ug/l	8260	172	722	< 0.26	< 0.26	< 0.26	2.2	< 0.26	1.3	NA	NA	NA
Methylene Chloride	ug/l	8260	742	3120	< 0.13	< 0.13	< 0.13	< 0.13	< 0.13	< 0.13	NA	NA	NA
Naphthalene	ug/l	8260	11	174	NA	NA	NA	NA	NA	NA	NA	NA	NA
Styrene	ug/l	8260	1860	7820	< 0.097	< 0.097	< 0.097	< 0.097	< 0.097	1.1	NA	NA	NA
Tetrachloroethene	ug/l	8260	10.9	45.6	3.7	1.8	0.46 J	4.2	< 0.15	10	NA	NA	NA
Toluene	ug/l	8260	3520	14800	< 0.15	< 0.15	< 0.15	2.1	< 0.15	4.2	NA	NA	NA
Trichloroethene	ug/l	8260	0.897	3.77	1.4	0.42 J	0.79 J	0.31 J	< 0.14	1.8	NA	NA	NA
Trichlorofluoromethane	ug/l	8260	- -	- -	< 0.2	< 0.2	< 0.2	< 0.2	< 0.2	< 0.2	NA	NA	NA
Vinyl chloride	ug/l	8260	0.197	32.8	0.24 J	< 0.23	< 0.23	< 0.23	< 0.23	< 0.23	NA	NA	NA
Xylenes, Total	ug/l	8260	75.9	319	< 0.49	< 0.49	< 0.49	31	0.92 J	50	NA	NA	NA
Semi-Volatile Organics													
1,1'-Biphenyl	ug/l	8270	8.73	36.7	< 0.11	< 0.1	< 0.13	1.3	< 0.11	2.6	< 0.057	< 0.057	< 0.059
2,4,5-Trichlorophenol	ug/l	8270	- -	- -	< 0.13	< 0.12	< 0.15	< 0.12 R	< 0.13	< 0.12	< 0.059	< 0.059	< 0.061
2,4,6-Trichlorophenol	ug/l	8270	- -	- -	< 0.31	< 0.29	< 0.36	< 0.29 R	< 0.31	< 0.3	< 0.065	< 0.065	< 0.068
2,4-Dichlorophenol	ug/l	8270	- -	- -	< 0.07	< 0.065	< 0.08	< 0.065 R	< 0.07	< 0.067	< 0.049	< 0.049	< 0.051
2,4-Dimethylphenol	ug/l	8270	- -	- -	< 0.18	< 0.16	< 0.2	< 0.16 R	< 0.18	< 0.17	< 0.039	< 0.039	< 0.041

TABLE A-6
ANALYTICAL AND VAPOR INTRUSTION SCREENING RESULTS
GROUNDWATER SAMPLES
CAA VIM AND VIIM
MINGO JUNCTION STEEL WORK LLC - WEIRTON FACILITY

	Units	Analytical Method	Screening Criteria [1]		Sample Information [2]								
			Residential	*Commercial*	VII-MW-01A DUP 02/19/2014 Duplicate	VII-MW-02A 02/19/2014	VII-MW-03A 02/19/2014	VII-MW-01P 02/14/2014	VII-MW-02P 02/13/2014	VII-MW-03P 02/14/2014	VI-MW-03A 01/17/2019	VI-MW-03A DUP 01/17/2019 Duplicate	VI-MW-04A 01/17/2019
2,4-Dinitrophenol	ug/l	8270	- -	- -	< 2.6	< 2.4	< 3	< 2.4 R	< 2.6	< 2.5	< 1.5	< 1.5	< 1.5
2,4-Dinitrotoluene	ug/l	8270	- -	- -	< 0.22	< 0.21	< 0.25	< 0.21	< 0.22	< 0.21	< 0.049	< 0.049	< 0.051
2,6-Dinitrotoluene	ug/l	8270	- -	- -	< 0.14	< 0.13	< 0.16	< 0.13	< 0.14	< 0.14	< 0.058	< 0.058	< 0.06
2-Chloronaphthalene	ug/l	8270	- -	- -	< 0.032	< 0.03	< 0.037	< 0.03	< 0.032	< 0.031	< 0.057	< 0.057	< 0.059
2-Chlorophenol	ug/l	8270	- -	- -	< 0.23	< 0.22	< 0.27	< 0.22 R	< 0.23	< 0.23	< 0.062	< 0.062	< 0.064
2-Methylnaphthalene	ug/l	8270	- -	- -	< 0.02	< 0.018	< 0.023	22	0.12 J	29	< 0.06	< 0.06	< 0.062
2-Methylphenol	ug/l	8270	- -	- -	< 0.19	< 0.18	< 0.22	< 0.18 R	< 0.19	< 0.19	< 0.1	< 0.1	< 0.11
2-Nitroaniline	ug/l	8270	- -	- -	< 0.7	< 0.65	< 0.8	< 0.65	< 0.7	< 0.67	< 0.2	< 0.2	< 0.21
2-Nitrophenol	ug/l	8270	- -	- -	< 0.12	< 0.11	< 0.13	< 0.11 R	< 0.12	< 0.11	< 0.059	< 0.059	< 0.061
3,3'-Dichlorobenzidine	ug/l	8270	- -	- -	< 0.15	< 0.14	< 0.17	< 0.14	< 0.15	< 0.15	< 0.56	< 0.56	< 0.58
3-Nitroaniline	ug/l	8270	- -	- -	< 0.84	< 0.77	< 0.96	< 0.77	< 0.84	< 0.81	< 0.064	< 0.064	< 0.067
4,6-Dinitro-2-methylphenol	ug/l	8270	- -	- -	< 1.6	< 1.5	< 1.9	< 1.5 R	< 1.6	< 1.6	< 1.4	< 1.4	< 1.5
4-Bromophenyl phenyl ether	ug/l	8270	- -	- -	< 0.12	< 0.11	< 0.14	< 0.11	< 0.12	< 0.12	< 0.061	< 0.061	< 0.063
4-Chloro-3-methylphenol	ug/l	8270	- -	- -	< 0.18	< 0.16	< 0.2	< 0.16 R	< 0.18	< 0.17	< 0.059	< 0.059	< 0.061
4-Chloroaniline	ug/l	8270	- -	- -	< 0.3	< 0.28	< 0.35	< 0.28	< 0.3	< 0.29	< 0.042	< 0.042	< 0.044
4-Chlorophenyl phenyl ether	ug/l	8270	- -	- -	< 0.083	< 0.077	< 0.095	< 0.077	< 0.083	< 0.08	< 0.059	< 0.059	< 0.061
4-Nitroaniline	ug/l	8270	- -	- -	< 0.81	< 0.74	< 0.92	< 0.74	< 0.81	< 0.77	< 0.056	< 0.056	< 0.058
4-Nitrophenol	ug/l	8270	- -	- -	< 0.84	< 0.77	< 0.96	< 0.77 R	< 0.84	< 0.8	< 0.14	< 0.14	< 0.14
Acenaphthene	ug/l	8270	- -	- -	< 0.03	< 0.028	< 0.035	< 0.028	0.082 J	2.1	< 0.063	< 0.063	< 0.065
Acenaphthylene	ug/l	8270	- -	- -	< 0.022	< 0.021	< 0.026	< 0.021	< 0.022	< 0.022	< 0.063	< 0.063	< 0.065
Acetophenone	ug/l	8270	- -	- -	< 0.12	< 0.11	< 0.13	< 0.11	< 0.12	< 0.11	< 0.06	< 0.06	< 0.062
Anthracene	ug/l	8270	- -	- -	< 0.02	< 0.018	< 0.023	< 0.018	0.058 J	0.29	< 0.047	< 0.047	< 0.049
Atrazine	ug/l	8270	- -	- -	< 0.23	< 0.21	< 0.27	< 0.21	< 0.23	< 0.22	< 0.18	< 0.18	< 0.18
Benzaldehyde	ug/l	8270	- -	- -	< 0.11	< 0.1	< 0.13	< 0.1	< 0.11	< 0.11	< 0.11	< 0.11	< 0.11
Benzo[a]anthracene	ug/l	8270	176	- -	< 0.038	< 0.035	< 0.044	< 0.035	< 0.038	< 0.037	< 0.072	< 0.072	< 0.075
Benzo[a]pyrene	ug/l	8270	- -	- -	< 0.029	< 0.027	< 0.034	< 0.027	< 0.029	< 0.028	< 0.051	< 0.051	< 0.053
Benzo[b]fluoranthene	ug/l	8270	- -	- -	< 0.051	< 0.047	< 0.058	< 0.047	< 0.051	< 0.049	< 0.093	< 0.093	< 0.097
Benzo[g,h,i]perylene	ug/l	8270	- -	- -	< 0.03	< 0.028	< 0.035	< 0.028	< 0.03	< 0.029	< 0.066	< 0.066	< 0.069
Benzo[k]fluoranthene	ug/l	8270	- -	- -	< 0.031	< 0.029	< 0.036	< 0.029	< 0.031	< 0.03	< 0.085	< 0.085	< 0.088
Bis(2-chloroisopropyl)ether	ug/l	8270	- -	- -	< 0.025	< 0.023	< 0.028	< 0.023	< 0.025	< 0.024	< 0.056 UJ	< 0.056 UJ	< 0.058 UJ
Bis(2-chloroethoxy)methane	ug/l	8270	- -	- -	< 0.14	< 0.13	< 0.16	< 0.13	< 0.14	< 0.13	< 0.064	< 0.064	< 0.067
Bis(2-chloroethyl)ether	ug/l	8270	30.5	1330	< 0.033	< 0.03	< 0.038	< 0.03	< 0.033	< 0.032	< 0.038	< 0.038	< 0.04
Bis(2-ethylhexyl) phthalate	ug/l	8270	- -	- -	0.61 J	0.8 J	0.6 J	1.6 J	1 J	1.6 J	< 4.4	< 4.4	< 4.6
Butyl benzyl phthalate	ug/l	8270	- -	- -	< 0.22	0.29 J	< 0.25	3.6	3.3	1.6	0.44 J	< 0.44	< 0.46
Caprolactam	ug/l	8270	- -	- -	< 1.5	< 1.4	< 1.8	< 1.4	< 1.5	< 1.5	< 0.45	< 0.45	< 0.47
Carbazole	ug/l	8270	- -	- -	< 0.028	< 0.026	< 0.032	< 0.026	< 0.028	1.3	< 0.049	< 0.049	< 0.051
Chrysene	ug/l	8270	- -	- -	< 0.032	< 0.03	< 0.037	< 0.03	< 0.032	< 0.031	< 0.078	< 0.078	< 0.081
Dibenz(a,h)anthracene	ug/l	8270	- -	- -	< 0.028	< 0.026	< 0.032	< 0.026	< 0.028	< 0.027	< 0.069	< 0.069	< 0.072
Dibenzofuran	ug/l	8270	- -	- -	< 0.1	< 0.093	< 0.11	1.1	< 0.1	1.5	< 0.07	< 0.07	< 0.073
Diethyl phthalate	ug/l	8270	- -	- -	< 0.31	< 0.29	< 0.35	< 0.29	0.34 B	< 0.3	< 0.55	< 0.55	< 0.57
Dimethyl phthalate	ug/l	8270	- -	- -	< 0.19	< 0.18	< 0.22	< 0.18	< 0.19	< 0.18	< 0.054	< 0.054	< 0.056
Di-n-butyl phthalate	ug/l	8270	- -	- -	< 0.25	< 0.23	< 0.29	0.23 J	< 0.25	< 0.24	< 0.71	< 0.71	< 0.74
Di-n-octyl phthalate	ug/l	8270	- -	- -	< 0.21	< 0.2	< 0.24	< 0.2	< 0.21	< 0.2	< 0.66	< 0.66	< 0.69
Fluoranthene	ug/l	8270	- -	- -	< 0.022	< 0.02	< 0.025	0.11 J	0.023 J	0.16 J	< 0.058	< 0.058	< 0.06
Fluorene	ug/l	8270	- -	- -	< 0.025	< 0.023	< 0.029	1.7	0.04 J	2.4	< 0.066	< 0.066	< 0.069
Hexachlorobenzene	ug/l	8270	0.275	12	< 0.064	< 0.059	< 0.073	< 0.059	< 0.064	< 0.061	< 0.054	< 0.054	< 0.056
Hexachlorobutadiene	ug/l	8270	0.716	31.3	< 0.098	< 0.09	< 0.11	< 0.09	< 0.098	< 0.094	< 0.066	< 0.066	< 0.069
Hexachlorocyclopentadiene	ug/l	8270	0.958	4.02	< 0.14	< 0.13	< 0.16	< 0.13	< 0.14	< 0.14	< 0.48	< 0.48	< 0.5
Hexachloroethane	ug/l	8270	4.26	186	< 0.14	< 0.13	< 0.16	< 0.13	< 0.14	< 0.14	< 0.06	< 0.06	< 0.062
Indeno[1,2,3-cd]pyrene	ug/l	8270	- -	- -	< 0.045	< 0.042	< 0.052	< 0.042	< 0.045	< 0.043	< 0.082	< 0.082	< 0.085
Isophorone	ug/l	8270	- -	- -	< 0.077	< 0.071	< 0.088	< 0.071	< 0.077	< 0.074	< 0.052	< 0.052	< 0.054
Methylphenol, 3 & 4	ug/l	8270	- -	- -	< 0.22	< 0.2	< 0.25	< 0.2 R	< 0.22	< 0.21	< 0.4	< 0.4	< 0.42
Naphthalene	ug/l	8270	11	174	< 0.024	< 0.022	< 0.027	9.1	0.16 J	17	< 0.057	< 0.057	< 0.059
Nitrobenzene	ug/l	8270	177	7710	< 0.16	< 0.14	< 0.18	< 0.14	< 0.16	< 0.15	< 0.16	< 0.16	< 0.17
N-Nitrosodi-n-propylamine	ug/l	8270	- -	- -	< 0.052	< 0.048	< 0.06	< 0.048	< 0.052	< 0.05	< 0.068	< 0.068	< 0.071
N-Nitrosodiphenylamine	ug/l	8270	- -	- -	< 0.13	< 0.12	< 0.14	< 0.12	< 0.13	< 0.12	< 0.11	< 0.11	< 0.12
Pentachlorophenol	ug/l	8270	- -	- -	< 0.52	< 0.48	< 0.6	< 0.48 R	< 0.52	< 0.5	< 0.23	< 0.23	< 0.24

TABLE A-6
ANALYTICAL AND VAPOR INTRUSION SCREENING RESULTS
GROUNDWATER SAMPLES
CAA VIM AND VIIM
MINGO JUNCTION STEEL WORK LLC - WEIRTON FACILITY

	Units	Analytical Method	Screening Criteria [1] Residential	Screening Criteria [1] *Commercial*	Sample Information [2] VII-MW-01A DUP 02/19/2014 Duplicate	VII-MW-02A 02/19/2014	VII-MW-03A 02/19/2014	VII-MW-01P 02/14/2014	VII-MW-02P 02/13/2014	VII-MW-03P 02/14/2014	VI-MW-03A 01/17/2019	VI-MW-03A DUP 01/17/2019 Duplicate	VI-MW-04A 01/17/2019
Phenanthrene	ug/l	8270	- -	- -	< 0.043	< 0.04	0.054 J	2.6	0.051 J	2.5	< 0.053	< 0.053	< 0.055
Phenol	ug/l	8270	- -	- -	< 0.058	< 0.053	< 0.066	< 0.053 R	< 0.058	0.33 J	< 0.094	< 0.094	< 0.098
Pyrene	ug/l	8270	- -	- -	< 0.024	< 0.022	< 0.027	< 0.022	0.036 J	0.15 J	< 0.052	< 0.052	< 0.054
Inorganics [3]													
Aluminum	ug/l	6020	- -	- -	< 2.6 UJ	< 2.6 UJ	2600 J	5.5 J	24 J	50 J	NA	NA	NA
Antimony	ug/l	6020	- -	- -	0.082 J	0.079 J	0.1 J	< 0.019 UL	0.047 L	< 0.019 UL	NA	NA	NA
Arsenic	ug/l	6020	- -	- -	< 0.29 UJ	< 0.29 UJ	< 0.29 UJ	1.2 K	2.3 K	1.9 K	NA	NA	NA
Barium	ug/l	6020	- -	- -	29 J	23 J	41 J	94 J	20 J	26 J	NA	NA	NA
Beryllium	ug/l	6020	- -	- -	< 0.037 UJ	< 0.037 UJ	0.85 J	< 0.037 UJ	< 0.037 UJ	< 0.037 UJ	NA	NA	NA
Cadmium	ug/l	6020	- -	- -	< 0.11 UJ	< 0.11 UJ	1.4 J	< 0.11 UJ	< 0.11 UJ	< 0.11 UJ	NA	NA	NA
Calcium	ug/l	6020	- -	- -	140000 K	56000 K	140000 K	1000000 J	31000 J	220000 J	NA	NA	NA
Chromium	ug/l	6020	- -	- -	1.1 J	2.1 J	3.4 J	1.5 J	0.95 J	0.98 J	NA	NA	NA
Cobalt	ug/l	6020	- -	- -	1.1 J	0.1 J	47 J	0.71 J	0.11 J	0.14 J	NA	NA	NA
Copper	ug/l	6020	- -	- -	0.43 K	1 K	7.3 K	1.8 K	0.74 K	0.75 K	NA	NA	NA
Iron	ug/l	6020	- -	- -	< 6.1 UJ	< 6.1 UJ	1400 J	42 J	10 J	20 J	NA	NA	NA
Lead	ug/l	6020	- -	- -	0.033 B	0.031 B	4.4 J	0.056 B	0.072 B	0.073 B	NA	NA	NA
Magnesium	ug/l	6020	- -	- -	32000 J	16000 J	13000 J	690 L	4400 L	16000 L	NA	NA	NA
Manganese	ug/l	6020	- -	- -	1100 J	24 J	19000 J	25 J	260 J	8.6 J	NA	NA	NA
Mercury	ug/l	7470	0.252	1.06	< 0.038	0.043 J	< 0.038	0.05 J	< 0.038	< 0.038	NA	NA	NA
Nickel	ug/l	6020	- -	- -	4.1 J	1.7 J	46 J	< 1.7 UJ	0.95 J	< 0.17 UJ	NA	NA	NA
Potassium	ug/l	6020	- -	- -	2700 J	4100 J	15000 J	49000 J	2600 J	22000 J	NA	NA	NA
Selenium	ug/l	6020	- -	- -	< 0.42 UJ	0.72 B	1 B	15 J	0.45 J	1.1 J	NA	NA	NA
Silver	ug/l	6020	- -	- -	< 0.036 UJ	< 0.036 UJ	0.092 J	< 0.036 UJ	< 0.036 UJ	< 0.036 UJ	NA	NA	NA
Sodium	ug/l	6020	- -	- -	47000 K	52000 K	47000 K	42000 J	7400 J	35000 J	NA	NA	NA
Thallium	ug/l	6020	- -	- -	< 0.015 UJ	< 0.015 UJ	0.093 B	0.043 B	0.035 B	< 0.015 UJ	NA	NA	NA
Vanadium	ug/l	6020	- -	- -	0.34 B	0.39 B	0.13 B	< 0.082 UJ	1.8 J	1.5 J	NA	NA	NA
Zinc	ug/l	6020	- -	- -	4.7 K	7.2 K	100 K	4.7 J	5.7 J	8.1 J	NA	NA	NA
Other Parameters													
Cyanide, Total	ug/l	9012	20.1	84.4	< 1.5	< 1.5	< 1.5	< 1.5	< 1.5	< 1.5	NA	NA	NA

TABLE A-6
ANALYTICAL AND VAPOR INTRUSTION SCREENING RESULTS
GROUNDWATER SAMPLES
CAA VIM AND VIIM
MINGO JUNCTION STEEL WORK LLC - WEIRTON FACILITY

	Units	Analytical Method	Screening Criteria [1]		Sample Information [2]								
			Residential	*Commercial*	VII-MW-04P 01/17/2019	VII-MW-05P 01/17/2019	VII-MW-06P 01/17/2019	VII-MW-07P 01/17/2019	MA-MW-07A 04/04/2019	MA-MW-07D 04/04/2019	VI-MW-01A 04/01/2019	VI-MW-01P 04/01/2019	VI-MW-02AR 04/01/2019
Volatile Organic Compounds													
1,1,1-Trichloroethane	ug/l	8260	1240	5210	< 0.6	< 0.6	< 0.6	< 0.6	< 0.6	< 0.6	< 0.6	< 0.6	< 0.6
1,1,2,2-Tetrachloroethane	ug/l	8260	6.59	288	< 0.6	< 0.6	< 0.6	< 0.6	< 0.6	< 0.6	< 0.6	< 0.6	< 0.6
1,1,2-Trichloro-1,2,2-trifluoroethane	ug/l	8260	38	160	NA	NA	NA	NA	NA	NA	NA	NA	NA
1,1,2-Trichloroethane	ug/l	8260	1.17	4.91	< 0.45	< 0.45	< 0.45	< 0.45	< 0.45	< 0.45	< 0.45	< 0.45	< 0.45
1,1-Dichloroethane	ug/l	8260	12.4	541	< 0.63	< 0.63	< 0.63	< 0.63	< 0.63	< 0.63	< 0.63	< 0.63	< 0.63
1,1-Dichloroethene	ug/l	8260	29.7	125	< 0.55	< 0.55	< 0.55	< 0.55	< 0.55	0.96 J	< 0.55	< 0.55	< 0.55
1,2,4-Trichlorobenzene	ug/l	8260	8.78	36.9	NA	NA	NA	NA	NA	NA	NA	NA	NA
1,2-Dibromo-3-Chloropropane	ug/l	8260	0.0648	7.84	NA	NA	NA	NA	NA	NA	NA	NA	NA
1,2-Dibromoethane (EDB)	ug/l	8260	0.332	14.5	NA	NA	NA	NA	NA	NA	NA	NA	NA
1,2-Dichlorobenzene	ug/l	8260	571	2400	NA	NA	NA	NA	NA	NA	NA	NA	NA
1,2-Dichloroethane	ug/l	8260	3.92	111	< 0.57	< 0.57	< 0.57	< 0.57	< 0.57	< 0.57	< 0.57	< 0.57	< 0.57
1,2-Dichloroethene, Total	ug/l	8260	- -	- -	< 1.3	< 1.3	< 1.3	< 1.3	< 1.3	< 1.3	< 1.3	< 1.3	< 1.3
cis-1,2-Dichloroethene	ug/l	8260	- -	- -	< 0.71	< 0.71	< 0.71	< 0.71	< 0.71	< 0.71	1.2	< 0.71	< 0.71
trans-1,2-Dichloroethene	ug/l	8260	- -	- -	< 0.67	< 0.67	< 0.67	< 0.67	< 0.67	< 0.67	< 0.67	< 0.67	< 0.67
1,2-Dichloropropane	ug/l	8260	6.38	26.8	< 0.66	< 0.66	< 0.66	< 0.66	< 0.66	< 0.66	< 0.66	< 0.66	< 0.66
cis-1,3-Dichloropropene [1]	ug/l	8260	8.93	111	< 0.59	< 0.59	< 0.59	< 0.59	< 0.59	< 0.59	< 0.59	< 0.59	< 0.59
trans-1,3-Dichloropropene [1]	ug/l	8260	8.93	111	< 0.58	< 0.58	< 0.58	< 0.58	< 0.58	< 0.58	< 0.58	< 0.58	< 0.58
1,3-Dichlorobenzene [1]	ug/l	8260	5.57	243	NA	NA	NA	NA	NA	NA	NA	NA	NA
1,4-Dichlorobenzene	ug/l	8260	5.57	243	NA	NA	NA	NA	NA	NA	NA	NA	NA
2-Butanone (MEK)	ug/l	8260	389000	1640000	< 2.6	< 2.6	< 2.6	< 2.6	< 2.6	< 2.6	< 2.6	< 2.6	< 2.6
2-Hexanone	ug/l	8260	1650	6950	< 3.3	< 3.3	< 3.3	< 3.3	< 3.3	< 3.3	< 3.3	< 3.3	< 3.3
4-Methyl-2-pentanone (MIBK)	ug/l	8260	106000	447000	< 3.1	< 3.1	< 3.1	< 3.1	< 3.1	< 3.1	< 3.1	< 3.1	< 3.1
Acetone	ug/l	8260	3680000	15500000	< 3.4	< 3.4	< 3.4	< 3.4	< 3.4	5.8	4 J	5.7 J	5.2 J
Benzene	ug/l	8260	2.7	98.6	< 0.6	< 0.6	< 0.6	< 0.6	< 0.6	< 0.6	< 0.6	< 0.6	< 0.6
Bromoform	ug/l	8260	243	10600	< 0.98	< 0.98	< 0.98	< 0.98	< 0.98	< 0.98	< 0.98	< 0.98	< 0.98
Bromomethane	ug/l	8260	2.48	10.4	< 0.89	< 0.89 UJ	< 0.89 UJ	< 0.89 UJ	< 0.89	< 0.89	< 0.89	< 0.89	< 0.89
Carbon disulfide	ug/l	8260	191	801	< 0.88	< 0.88	< 0.88	< 0.88	< 0.88	< 0.88	< 0.88	< 0.88	< 0.88
Carbon tetrachloride	ug/l	8260	0.693	30.3	< 0.88	< 0.88 UJ	< 0.88 UJ	< 0.88 UJ	< 0.88	< 0.88	< 0.88	< 0.88	< 0.88
Chlorobenzene	ug/l	8260	78.6	330	< 0.5	< 0.5	< 0.5	< 0.5	< 0.5	< 0.5	< 0.5	< 0.5	< 0.5
Chlorodibromomethane	ug/l	8260	- -	- -	< 0.84	< 0.84	< 0.84	< 0.84	< 0.84	< 0.84	< 0.84	< 0.84	< 0.84
Chloroethane	ug/l	8260	3350	14000	< 0.9	< 0.9	< 0.9	< 0.9	< 0.9	< 0.9	< 0.9	< 0.9	< 0.9
Chloroform	ug/l	8260	1.33	58.1	< 0.6	< 0.6	< 0.6	< 0.6	< 0.6	< 0.6	4.3	< 0.6	< 0.6
Chloromethane	ug/l	8260	34.9	146	< 0.9	< 0.9	< 0.9	< 0.9	< 0.9	< 0.9	< 0.9	< 0.9	< 0.9
Cyclohexane	ug/l	8260	172	722	NA	NA	NA	NA	NA	NA	NA	NA	NA
Dichlorobromomethane	ug/l	8260	1.55	67.6	< 0.64	< 0.64	< 0.64	< 0.64	< 0.64	< 0.64	< 0.64	< 0.64	< 0.64
Dichlorodifluoromethane	ug/l	8260	0.963	4.05	NA	NA	NA	NA	NA	NA	NA	NA	NA
Ethylbenzene	ug/l	8260	6.85	299	0.54 J	< 0.51	< 0.51	< 0.51	< 0.51	< 0.51	< 0.51	< 0.51	< 0.51
Isopropylbenzene	ug/l	8260	208	873	NA	NA	NA	NA	NA	NA	NA	NA	NA
Methyl acetate	ug/l	8260	- -	- -	NA	NA	NA	NA	NA	NA	NA	NA	NA
Methyl tert-butyl ether	ug/l	8260	722	31500	< 0.59	< 0.59	< 0.59	< 0.59	< 0.59	< 0.59	< 0.59	< 0.59	< 0.59
Methylcyclohexane [1]	ug/l	8260	172	722	NA	NA	NA	NA	NA	NA	NA	NA	NA
Methylene Chloride	ug/l	8260	742	3120	< 0.89	< 0.89	< 0.89	< 0.89	< 0.89	< 0.89	< 0.89	< 0.89	< 0.89
Naphthalene	ug/l	8260	11	174	2.4	< 0.79	< 0.79	< 0.79	< 0.79 UJ	< 0.79 UJ	< 0.79	< 0.79	< 0.79
Styrene	ug/l	8260	1860	7820	< 0.47	< 0.47	< 0.47	< 0.47	< 0.47	< 0.47	< 0.47	< 0.47	< 0.47
Tetrachloroethene	ug/l	8260	10.9	45.6	2.4	< 0.47	0.9 J	< 0.47	< 0.47	< 0.47	1.4	< 0.47	< 0.47
Toluene	ug/l	8260	3520	14800	< 0.46	< 0.46	< 0.46	< 0.46	< 0.46	< 0.46	< 0.46	< 0.46	< 0.46
Trichloroethene	ug/l	8260	0.897	3.77	< 0.69	< 0.69	< 0.69	< 0.69	< 0.69	< 0.69	0.84 J	< 0.69	< 0.69
Trichlorofluoromethane	ug/l	8260	- -	- -	NA	NA	NA	NA	NA	NA	NA	NA	NA
Vinyl chloride	ug/l	8260	0.197	32.8	< 0.88	< 0.88	< 0.88	< 0.88	< 0.88	< 0.88	< 0.88	< 0.88	< 0.88
Xylenes, Total	ug/l	8260	75.9	319	1.3 J	< 0.89	< 0.89	< 0.89	< 0.89	< 0.89	< 0.89	< 0.89	< 0.89
Semi-Volatile Organics													
1,1'-Biphenyl	ug/l	8270	8.73	36.7	NA	NA	NA	NA	< 0.055	< 0.057	< 0.055	< 0.061	< 0.057
2,4,5-Trichlorophenol	ug/l	8270	- -	- -	NA	NA	NA	NA	< 0.056	< 0.059	< 0.056	< 0.064	< 0.059
2,4,6-Trichlorophenol	ug/l	8270	- -	- -	NA	NA	NA	NA	< 0.063	< 0.065	< 0.063	< 0.071	< 0.065
2,4-Dichlorophenol	ug/l	8270	- -	- -	NA	NA	NA	NA	< 0.047	< 0.049	< 0.047	< 0.053	< 0.049
2,4-Dimethylphenol	ug/l	8270	- -	- -	NA	NA	NA	NA	< 0.038	< 0.039	< 0.038	< 0.043	< 0.039

TABLE A-6
ANALYTICAL AND VAPOR INTRUSTION SCREENING RESULTS
GROUNDWATER SAMPLES
CAA VIM AND VIIM
MINGO JUNCTION STEEL WORK LLC - WEIRTON FACILITY

			Screening Criteria [1]		Sample Information [2]																			
	Units	Analytical Method	Residential	*Commercial*	VII-MW-04P 01/17/2019	VII-MW-05P 01/17/2019	VII-MW-06P 01/17/2019	VII-MW-07P 01/17/2019	MA-MW-07A 04/04/2019		MA-MW-07D 04/04/2019		VI-MW-01A 04/01/2019		VI-MW-01P 04/01/2019		VI-MW-02AR 04/01/2019	
2,4-Dinitrophenol	ug/l	8270	- -	- -	NA	NA	NA	NA	< 1.4		< 1.5		< 1.4		< 1.6		< 1.5	
2,4-Dinitrotoluene	ug/l	8270	- -	- -	NA	NA	NA	NA	< 0.047		< 0.049		< 0.047		< 0.053		< 0.049	
2,6-Dinitrotoluene	ug/l	8270	- -	- -	NA	NA	NA	NA	< 0.056		< 0.058		< 0.056		< 0.063		< 0.058	
2-Chloronaphthalene	ug/l	8270	- -	- -	NA	NA	NA	NA	< 0.055		< 0.057		< 0.055		< 0.061		< 0.057	
2-Chlorophenol	ug/l	8270	- -	- -	NA	NA	NA	NA	< 0.059		< 0.062		< 0.059		< 0.067		< 0.062	
2-Methylnaphthalene	ug/l	8270	- -	- -	NA	NA	NA	NA	< 0.057		< 0.06		< 0.057		< 0.065		< 0.06	
2-Methylphenol	ug/l	8270	- -	- -	NA	NA	NA	NA	< 0.28		< 0.29		< 0.28		< 0.31		< 0.29	
2-Nitroaniline	ug/l	8270	- -	- -	NA	NA	NA	NA	< 0.51		< 0.53		< 0.51		< 0.57		< 0.53	
2-Nitrophenol	ug/l	8270	- -	- -	NA	NA	NA	NA	< 0.056		< 0.059		< 0.056		< 0.064		< 0.059	
3,3'-Dichlorobenzidine	ug/l	8270	- -	- -	NA	NA	NA	NA	< 0.54		< 0.56		< 0.54		< 0.61		< 0.56	
3-Nitroaniline	ug/l	8270	- -	- -	NA	NA	NA	NA	< 0.062		< 0.064		< 0.062		< 0.07		< 0.064	
4,6-Dinitro-2-methylphenol	ug/l	8270	- -	- -	NA	NA	NA	NA	< 1.4		< 1.4		< 1.4		< 1.5		< 1.4	
4-Bromophenyl phenyl ether	ug/l	8270	- -	- -	NA	NA	NA	NA	< 0.058		< 0.061		< 0.058		< 0.066		< 0.061	
4-Chloro-3-methylphenol	ug/l	8270	- -	- -	NA	NA	NA	NA	< 0.056		< 0.059		< 0.056		< 0.064		< 0.059	
4-Chloroaniline	ug/l	8270	- -	- -	NA	NA	NA	NA	< 0.041		< 0.042		< 0.041		< 0.046		< 0.042	
4-Chlorophenyl phenyl ether	ug/l	8270	- -	- -	NA	NA	NA	NA	< 0.056		< 0.059		< 0.056		< 0.064		< 0.059	
4-Nitroaniline	ug/l	8270	- -	- -	NA	NA	NA	NA	< 0.054		< 0.056		< 0.054		< 0.06		< 0.056	
4-Nitrophenol	ug/l	8270	- -	- -	NA	NA	NA	NA	< 0.13		< 0.14		< 0.13		< 0.15		< 0.14	
Acenaphthene	ug/l	8270	- -	- -	NA	NA	NA	NA	< 0.06		< 0.063		< 0.06		0.073	J	< 0.063	
Acenaphthylene	ug/l	8270	- -	- -	NA	NA	NA	NA	< 0.06		< 0.063		< 0.06		< 0.068		< 0.063	
Acetophenone	ug/l	8270	- -	- -	NA	NA	NA	NA	< 0.057		< 0.06		< 0.057		< 0.065		< 0.06	
Anthracene	ug/l	8270	- -	- -	NA	NA	NA	NA	< 0.045		< 0.047		< 0.045		< 0.051		< 0.047	
Atrazine	ug/l	8270	- -	- -	NA	NA	NA	NA	< 0.59		< 0.61		< 0.59	UJ	< 0.66	UJ	< 0.61	UJ
Benzaldehyde	ug/l	8270	- -	- -	NA	NA	NA	NA	< 0.1		< 0.11		< 0.1		< 0.12		< 0.11	
Benzo[a]anthracene	ug/l	8270	176	- -	NA	NA	NA	NA	< 0.069		< 0.072		< 0.069		< 0.078		< 0.072	
Benzo[a]pyrene	ug/l	8270	- -	- -	NA	NA	NA	NA	< 0.049		< 0.051		< 0.049		< 0.055		< 0.051	
Benzo[b]fluoranthene	ug/l	8270	- -	- -	NA	NA	NA	NA	< 0.09		< 0.093		< 0.09		< 0.1		< 0.093	
Benzo[g,h,i]perylene	ug/l	8270	- -	- -	NA	NA	NA	NA	< 0.064		< 0.066		< 0.064		< 0.072		< 0.066	
Benzo[k]fluoranthene	ug/l	8270	- -	- -	NA	NA	NA	NA	< 0.081		< 0.085		< 0.081		< 0.092		< 0.085	
Bis(2-chloroisopropyl)ether	ug/l	8270	- -	- -	NA	NA	NA	NA	< 0.054		< 0.056		< 0.054		< 0.06		< 0.056	
Bis(2-chloroethoxy)methane	ug/l	8270	- -	- -	NA	NA	NA	NA	< 0.062		< 0.064		< 0.062		< 0.07		< 0.064	
Bis(2-chloroethyl)ether	ug/l	8270	30.5	1330	NA	NA	NA	NA	< 0.037		< 0.038		< 0.037		< 0.042		< 0.038	
Bis(2-ethylhexyl) phthalate	ug/l	8270	- -	- -	NA	NA	NA	NA	< 5.8		< 6		< 5.8		< 6.5		< 6	
Butyl benzyl phthalate	ug/l	8270	- -	- -	NA	NA	NA	NA	0.46	J	< 0.44		0.49	J	0.61	J	0.56	J
Caprolactam	ug/l	8270	- -	- -	NA	NA	NA	NA	0.8	J	0.76	J	< 0.44		1.1	J	1.6	J
Carbazole	ug/l	8270	- -	- -	NA	NA	NA	NA	< 0.047		< 0.049		< 0.047		< 0.053		< 0.049	
Chrysene	ug/l	8270	- -	- -	NA	NA	NA	NA	< 0.075		< 0.078		< 0.075		< 0.084		< 0.078	
Dibenz(a,h)anthracene	ug/l	8270	- -	- -	NA	NA	NA	NA	< 0.067		< 0.069		< 0.067		< 0.075		< 0.069	
Dibenzofuran	ug/l	8270	- -	- -	NA	NA	NA	NA	< 0.068		< 0.07		< 0.068		< 0.076		< 0.07	
Diethyl phthalate	ug/l	8270	- -	- -	NA	NA	NA	NA	< 0.53		< 0.55		< 0.53		< 0.59		< 0.55	
Dimethyl phthalate	ug/l	8270	- -	- -	NA	NA	NA	NA	< 0.052		< 0.054		< 0.052		< 0.058		< 0.054	
Di-n-butyl phthalate	ug/l	8270	- -	- -	NA	NA	NA	NA	< 0.69		0.72	J	< 0.69		< 0.77		< 0.71	
Di-n-octyl phthalate	ug/l	8270	- -	- -	NA	NA	NA	NA	< 0.63		< 0.66		< 0.63		< 0.71		< 0.66	
Fluoranthene	ug/l	8270	- -	- -	NA	NA	NA	NA	< 0.056		< 0.058		< 0.056		0.086	J	< 0.058	
Fluorene	ug/l	8270	- -	- -	NA	NA	NA	NA	< 0.064		< 0.066		< 0.064		< 0.072		< 0.066	
Hexachlorobenzene	ug/l	8270	0.275	12	NA	NA	NA	NA	< 0.052		< 0.054		< 0.052		< 0.058		< 0.054	
Hexachlorobutadiene	ug/l	8270	0.716	31.3	NA	NA	NA	NA	< 0.064		< 0.066		< 0.064		< 0.072		< 0.066	
Hexachlorocyclopentadiene	ug/l	8270	0.958	4.02	NA	NA	NA	NA	< 0.46		< 0.48		< 0.46		< 0.52		< 0.48	
Hexachloroethane	ug/l	8270	4.26	186	NA	NA	NA	NA	< 0.057		< 0.06		< 0.057		< 0.065		< 0.06	
Indeno[1,2,3-cd]pyrene	ug/l	8270	- -	- -	NA	NA	NA	NA	< 0.079		< 0.082		< 0.079		< 0.089		< 0.082	
Isophorone	ug/l	8270	- -	- -	NA	NA	NA	NA	< 0.05		< 0.052		< 0.05		< 0.056		< 0.052	
Methylphenol, 3 & 4	ug/l	8270	- -	- -	NA	NA	NA	NA	< 0.34		< 0.36		< 0.34		< 0.39		< 0.36	
Naphthalene	ug/l	8270	11	174	NA	NA	NA	NA	< 0.055		< 0.057		< 0.055		< 0.061		< 0.057	
Nitrobenzene	ug/l	8270	177	7710	NA	NA	NA	NA	< 0.46		< 0.48		< 0.46		< 0.52		< 0.48	
N-Nitrosodi-n-propylamine	ug/l	8270	- -	- -	NA	NA	NA	NA	< 0.066		< 0.068		< 0.066		< 0.074		< 0.068	
N-Nitrosodiphenylamine	ug/l	8270	- -	- -	NA	NA	NA	NA	< 0.11		< 0.11		< 0.11		< 0.12		< 0.11	
Pentachlorophenol	ug/l	8270	- -	- -	NA	NA	NA	NA	< 0.78		< 0.81		< 0.78		< 0.88		< 0.81	

TABLE A-6
ANALYTICAL AND VAPOR INTRUSTION SCREENING RESULTS
GROUNDWATER SAMPLES
CAA VIM AND VIIM
MINGO JUNCTION STEEL WORK LLC - WEIRTON FACILITY

			Screening Criteria (1)		Sample Information (2)								
	Units	Analytical Method	Residential	*Commercial*	VII-MW-04P 01/17/2019	VII-MW-05P 01/17/2019	VII-MW-06P 01/17/2019	VII-MW-07P 01/17/2019	MA-MW-07A 04/04/2019	MA-MW-07D 04/04/2019	VI-MW-01A 04/01/2019	VI-MW-01P 04/01/2019	VI-MW-02AR 04/01/2019
Phenanthrene	ug/l	8270	- -	- -	NA	NA	NA	NA	0.059 J	0.096 J	0.06 J	0.1 J	0.079 J
Phenol	ug/l	8270	- -	- -	NA	NA	NA	NA	< 0.45	< 0.47	< 0.45	< 0.51	< 0.47
Pyrene	ug/l	8270	- -	- -	NA	NA	NA	NA	< 0.05	< 0.052	< 0.05	0.094 J	< 0.052
Inorganics (3)													
Aluminum	ug/l	6020	- -	- -	NA	NA	NA	NA	< 13	< 13	< 13	< 13	< 13
Antimony	ug/l	6020	- -	- -	NA	NA	NA	NA	< 0.38	< 0.38	< 0.38	< 0.38	< 0.38
Arsenic	ug/l	6020	- -	- -	NA	NA	NA	NA	0.48 J	< 0.32	< 0.32	1.1	< 0.32
Barium	ug/l	6020	- -	- -	NA	NA	NA	NA	23	19	22	34	13
Beryllium	ug/l	6020	- -	- -	NA	NA	NA	NA	< 0.16	< 0.16	< 0.16	< 0.16	< 0.16
Cadmium	ug/l	6020	- -	- -	NA	NA	NA	NA	< 0.13	< 0.13	< 0.13	< 0.13	< 0.13
Calcium	ug/l	6020	- -	- -	NA	NA	NA	NA	54000	63000	140000	77000	160000
Chromium	ug/l	6020	- -	- -	NA	NA	NA	NA	3	2.2	< 1.5	1.7 J	1.7 J
Cobalt	ug/l	6020	- -	- -	NA	NA	NA	NA	0.11 J	0.099 J	0.1 J	1.6	0.13 J
Copper	ug/l	6020	- -	- -	NA	NA	NA	NA	0.82 J	0.69 J	1.6 J	0.84 J	0.8 J
Iron	ug/l	6020	- -	- -	NA	NA	NA	NA	77	17 J	< 14	2000	< 14
Lead	ug/l	6020	- -	- -	NA	NA	NA	NA	< 0.13	< 0.13	< 0.13	< 0.13	< 0.13
Magnesium	ug/l	6020	- -	- -	NA	NA	NA	NA	17000	21000	43000	33000	57000
Manganese	ug/l	6020	- -	- -	NA	NA	NA	NA	< 1.4	< 1.4	4 J	1400	1.9 J
Mercury	ug/l	7470	0.252	1.06	NA	NA	NA	NA	< 0.1	< 0.1	< 0.1	< 0.1	< 0.1
Nickel	ug/l	6020	- -	- -	NA	NA	NA	NA	0.45 J	0.45 J	1.4	5.1	1.4
Potassium	ug/l	6020	- -	- -	NA	NA	NA	NA	9300	7500	2200	5000	2100
Selenium	ug/l	6020	- -	- -	NA	NA	NA	NA	3.2 J	< 2.6	< 2.6	< 2.6	2.7 J
Silver	ug/l	6020	- -	- -	NA	NA	NA	NA	< 0.12	< 0.12	< 0.12	< 0.12	< 0.12
Sodium	ug/l	6020	- -	- -	NA	NA	NA	NA	110000	100000	170000	94000	72000
Thallium	ug/l	6020	- -	- -	NA	NA	NA	NA	< 0.13	< 0.13	< 0.13	< 0.13	< 0.13
Vanadium	ug/l	6020	- -	- -	NA	NA	NA	NA	2	1.2	1.4	1.7	1.2
Zinc	ug/l	6020	- -	- -	NA	NA	NA	NA	< 3.2	5.6	< 3.2	6.2	< 3.2
Other Parameters													
Cyanide, Total	ug/l	9012	20.1	84.4	NA	NA	NA	NA	37	31	< 4.4	4.7 J	< 4.4

TABLE A-6
ANALYTICAL AND VAPOR INTRUSTION SCREENING RESULTS
GROUNDWATER SAMPLES
CAA VIM AND VIIM
MINGO JUNCTION STEEL WORK LLC - WEIRTON FACILITY

			Screening Criteria [1]		Sample Information [2]								
	Units	Analytical Method	Residential	*Commercial*	VI-MW-03A 03/28/2019	VI-MW-04A 03/28/2019	VI-MW-04A DUP 03/28/2019 Duplicate	VII-MW-01A 03/28/2019	VII-MW-01P 04/03/2019	VII-MW-02A 03/28/2019	VII-MW-02P 03/28/2019	VII-MW-03A 03/29/2019	VII-MW-03P 04/03/2019
Volatile Organic Compounds													
1,1,1-Trichloroethane	ug/l	8260	1240	5210	NA	NA	NA	< 0.6	< 0.6	< 0.6	< 0.6	< 0.6	< 0.6
1,1,2,2-Tetrachloroethane	ug/l	8260	6.59	288	NA	NA	NA	< 0.6	< 0.6	< 0.6	< 0.6	< 0.6	< 0.6
1,1,2-Trichloro-1,2,2-trifluoroethane	ug/l	8260	38	160	NA	NA	NA	NA	NA	NA	NA	NA	NA
1,1,2-Trichloroethane	ug/l	8260	1.17	4.91	NA	NA	NA	< 0.45	< 0.45	< 0.45	< 0.45	< 0.45	< 0.45
1,1-Dichloroethane	ug/l	8260	12.4	541	NA	NA	NA	6	< 0.63	< 0.63	< 0.63	< 0.63	< 0.63
1,1-Dichloroethene	ug/l	8260	29.7	125	NA	NA	NA	< 0.55	< 0.55	< 0.55	< 0.55	< 0.55	< 0.55
1,2,4-Trichlorobenzene	ug/l	8260	8.78	36.9	NA	NA	NA	NA	NA	NA	NA	NA	NA
1,2-Dibromo-3-Chloropropane	ug/l	8260	0.0648	7.84	NA	NA	NA	NA	NA	NA	NA	NA	NA
1,2-Dibromoethane (EDB)	ug/l	8260	0.332	14.5	NA	NA	NA	NA	NA	NA	NA	NA	NA
1,2-Dichlorobenzene	ug/l	8260	571	2400	NA	NA	NA	NA	NA	NA	NA	NA	NA
1,2-Dichloroethane	ug/l	8260	3.92	111	NA	NA	NA	< 0.57	< 0.57	< 0.57	< 0.57	< 0.57	< 0.57
1,2-Dichloroethene, Total	ug/l	8260	- -	- -	NA	NA	NA	4.9	< 1.3	< 1.3	< 1.3	1.9 J	3.3
cis-1,2-Dichloroethene	ug/l	8260	- -	- -	NA	NA	NA	4.9	< 0.71	1	< 0.71	1.9	2.6
trans-1,2-Dichloroethene	ug/l	8260	- -	- -	NA	NA	NA	< 0.67	< 0.67	< 0.67	< 0.67	< 0.67	0.68 J
1,2-Dichloropropane	ug/l	8260	6.38	26.8	NA	NA	NA	< 0.66	< 0.66	< 0.66	< 0.66	< 0.66	< 0.66
cis-1,3-Dichloropropene [1]	ug/l	8260	8.93	111	NA	NA	NA	< 0.59	< 0.59	< 0.59	< 0.59	< 0.59	< 0.59
trans-1,3-Dichloropropene [1]	ug/l	8260	8.93	111	NA	NA	NA	< 0.58	< 0.58	< 0.58	< 0.58	< 0.58	< 0.58
1,3-Dichlorobenzene [1]	ug/l	8260	5.57	243	NA	NA	NA	NA	NA	NA	NA	NA	NA
1,4-Dichlorobenzene	ug/l	8260	5.57	243	NA	NA	NA	NA	NA	NA	NA	NA	NA
2-Butanone (MEK)	ug/l	8260	389000	1640000	NA	NA	NA	< 2.6	< 2.6	< 2.6	< 2.6	< 2.6	< 2.6
2-Hexanone	ug/l	8260	1650	6950	NA	NA	NA	< 3.3	< 3.3	< 3.3	< 3.3	< 3.3	< 3.3
4-Methyl-2-pentanone (MIBK)	ug/l	8260	106000	447000	NA	NA	NA	< 3.1	< 3.1	< 3.1	< 3.1	< 3.1	< 3.1
Acetone	ug/l	8260	3680000	15500000	NA	NA	NA	4.8 J	5.8	7.9	3.6 J	6.3	6.6
Benzene	ug/l	8260	2.7	98.6	NA	NA	NA	< 0.6	< 0.6	< 0.6	< 0.6	< 0.6	< 0.6
Bromoform	ug/l	8260	243	10600	NA	NA	NA	< 0.98	< 0.98	< 0.98	< 0.98	< 0.98	< 0.98
Bromomethane	ug/l	8260	2.48	10.4	NA	NA	NA	< 0.89	< 0.89	< 0.89	< 0.89	< 0.89	< 0.89
Carbon disulfide	ug/l	8260	191	801	NA	NA	NA	< 0.88	< 0.88	< 0.88	< 0.88	< 0.88	< 0.88
Carbon tetrachloride	ug/l	8260	0.693	30.3	NA	NA	NA	< 0.88	< 0.88	< 0.88	< 0.88	< 0.88	< 0.88
Chlorobenzene	ug/l	8260	78.6	330	NA	NA	NA	< 0.5	< 0.5	< 0.5	< 0.5	< 0.5	< 0.5
Chlorodibromomethane	ug/l	8260	- -	- -	NA	NA	NA	< 0.84	< 0.84	< 0.84	< 0.84	< 0.84	< 0.84
Chloroethane	ug/l	8260	3350	14000	NA	NA	NA	< 0.9	< 0.9	< 0.9	< 0.9	< 0.9	< 0.9
Chloroform	ug/l	8260	1.33	58.1	NA	NA	NA	< 0.6	< 0.6	< 0.6	< 0.6	< 0.6	< 0.6
Chloromethane	ug/l	8260	34.9	146	NA	NA	NA	< 0.9	< 0.9	< 0.9	< 0.9	< 0.9	< 0.9
Cyclohexane	ug/l	8260	172	722	NA	NA	NA	NA	NA	NA	NA	NA	NA
Dichlorobromomethane	ug/l	8260	1.55	67.6	NA	NA	NA	< 0.64	< 0.64	< 0.64	< 0.64	< 0.64	< 0.64
Dichlorodifluoromethane	ug/l	8260	0.963	4.05	NA	NA	NA	NA	NA	NA	NA	NA	NA
Ethylbenzene	ug/l	8260	6.85	299	NA	NA	NA	< 0.51	3.4	< 0.51	< 0.51	< 0.51	0.78 J
Isopropylbenzene	ug/l	8260	208	873	NA	NA	NA	NA	NA	NA	NA	NA	NA
Methyl acetate	ug/l	8260	- -	- -	NA	NA	NA	NA	NA	NA	NA	NA	NA
Methyl tert-butyl ether	ug/l	8260	722	31500	NA	NA	NA	< 0.59	< 0.59	< 0.59	< 0.59	< 0.59	< 0.59
Methylcyclohexane [1]	ug/l	8260	172	722	NA	NA	NA	NA	NA	NA	NA	NA	NA
Methylene Chloride	ug/l	8260	742	3120	NA	NA	NA	< 0.89	< 0.89	< 0.89	< 0.89	< 0.89	< 0.89
Naphthalene	ug/l	8260	11	174	NA	NA	NA	< 0.79	24 J	< 0.79	< 0.79	< 0.79	6.2 J
Styrene	ug/l	8260	1860	7820	NA	NA	NA	< 0.47	< 0.47	< 0.47	< 0.47	< 0.47	< 0.47
Tetrachloroethene	ug/l	8260	10.9	45.6	NA	NA	NA	3.3	3.2	2	< 0.47	< 0.47	2.6
Toluene	ug/l	8260	3520	14800	NA	NA	NA	< 0.46	0.99 J	< 0.46	< 0.46	< 0.46	< 0.46
Trichloroethene	ug/l	8260	0.897	3.77	NA	NA	NA	1	< 0.69	0.85 J	< 0.69	1	1.2
Trichlorofluoromethane	ug/l	8260	- -	- -	NA	NA	NA	NA	NA	NA	NA	NA	NA
Vinyl chloride	ug/l	8260	0.197	32.8	NA	NA	NA	< 0.88	< 0.88	< 0.88	< 0.88	< 0.88	< 0.88
Xylenes, Total	ug/l	8260	75.9	319	NA	NA	NA	< 0.89	16	< 0.89	< 0.89	< 0.89	3
Semi-Volatile Organics													
1,1'-Biphenyl	ug/l	8270	8.73	36.7	NA	NA	NA	< 0.057	2 J	< 0.059	< 0.057 UJ	< 0.064	< 0.28
2,4,5-Trichlorophenol	ug/l	8270	- -	- -	NA	NA	NA	< 0.059	< 0.31	< 0.061	< 0.059 UJ	< 0.066	< 0.29
2,4,6-Trichlorophenol	ug/l	8270	- -	- -	NA	NA	NA	< 0.065	< 0.34	< 0.068	< 0.065 UJ	< 0.074	< 0.33
2,4-Dichlorophenol	ug/l	8270	- -	- -	NA	NA	NA	< 0.049	< 0.26	< 0.051	< 0.049 UJ	< 0.055	< 0.25
2,4-Dimethylphenol	ug/l	8270	- -	- -	NA	NA	NA	< 0.039	< 0.21	< 0.041	< 0.039 UJ	< 0.045	< 0.2

TABLE A-6
ANALYTICAL AND VAPOR INTRUSTION SCREENING RESULTS
GROUNDWATER SAMPLES
CAA VIM AND VIIM
MINGO JUNCTION STEEL WORK LLC - WEIRTON FACILITY

			Screening Criteria [1]		Sample Information [2]								
	Units	Analytical Method	Residential	*Commercial*	VI-MW-03A 03/28/2019	VI-MW-04A 03/28/2019	VI-MW-04A DUP 03/28/2019 Duplicate	VII-MW-01A 03/28/2019	VII-MW-01P 04/03/2019	VII-MW-02A 03/28/2019	VII-MW-02P 03/28/2019	VII-MW-03A 03/29/2019	VII-MW-03P 04/03/2019
2,4-Dinitrophenol	ug/l	8270	- -	- -	NA	NA	NA	< 1.5	< 7.7	< 1.5	< 1.5	< 1.7	< 7.4
2,4-Dinitrotoluene	ug/l	8270	- -	- -	NA	NA	NA	< 0.049	< 0.26	< 0.051	< 0.049	< 0.055	< 0.25
2,6-Dinitrotoluene	ug/l	8270	- -	- -	NA	NA	NA	< 0.058	< 0.3	< 0.06	< 0.058	< 0.065	< 0.29
2-Chloronaphthalene	ug/l	8270	- -	- -	NA	NA	NA	< 0.057	< 0.3	< 0.059	< 0.057 UJ	< 0.064	< 0.28
2-Chlorophenol	ug/l	8270	- -	- -	NA	NA	NA	< 0.062	< 0.32	< 0.064	< 0.062 UJ	< 0.07	< 0.31
2-Methylnaphthalene	ug/l	8270	- -	- -	NA	NA	NA	< 0.06	21	< 0.062	< 0.06 UJ	< 0.067	< 0.3
2-Methylphenol	ug/l	8270	- -	- -	NA	NA	NA	< 0.29	< 1.5	< 0.3	< 0.29 UJ	< 0.33	< 1.4
2-Nitroaniline	ug/l	8270	- -	- -	NA	NA	NA	< 0.53	< 2.7	< 0.55	< 0.53	< 0.6	< 2.6
2-Nitrophenol	ug/l	8270	- -	- -	NA	NA	NA	< 0.059	< 0.31	< 0.061	< 0.059 UJ	< 0.066	< 0.29
3,3'-Dichlorobenzidine	ug/l	8270	- -	- -	NA	NA	NA	< 0.56	< 2.9	< 0.58	< 0.56 UR	< 0.63	< 2.8
3-Nitroaniline	ug/l	8270	- -	- -	NA	NA	NA	< 0.064	< 0.34	< 0.067	< 0.064 UJ	< 0.073	< 0.32
4,6-Dinitro-2-methylphenol	ug/l	8270	- -	- -	NA	NA	NA	< 1.4	< 7.4	< 1.5	< 1.4	< 1.6	< 7.1
4-Bromophenyl phenyl ether	ug/l	8270	- -	- -	NA	NA	NA	< 0.061	< 0.32	< 0.063	< 0.061	< 0.068	< 0.3
4-Chloro-3-methylphenol	ug/l	8270	- -	- -	NA	NA	NA	< 0.059	< 0.31	< 0.061	< 0.059 UJ	< 0.066	< 0.29
4-Chloroaniline	ug/l	8270	- -	- -	NA	NA	NA	< 0.042	< 0.22	< 0.044	< 0.042 UJ	< 0.048	< 0.21
4-Chlorophenyl phenyl ether	ug/l	8270	- -	- -	NA	NA	NA	< 0.059	< 0.31	< 0.061	< 0.059 UJ	< 0.066	< 0.29
4-Nitroaniline	ug/l	8270	- -	- -	NA	NA	NA	< 0.056	< 0.29	< 0.058	< 0.056	< 0.063	< 0.28
4-Nitrophenol	ug/l	8270	- -	- -	NA	NA	NA	< 0.14	< 0.71	< 0.14	< 0.14	< 0.15	< 0.68
Acenaphthene	ug/l	8270	- -	- -	< 0.065	< 0.065	< 0.065	< 0.063	1.8	< 0.065	< 0.063 UJ	< 0.071	< 0.31
Acenaphthylene	ug/l	8270	- -	- -	< 0.065	< 0.065	< 0.065	< 0.063	< 0.33	< 0.065	< 0.063 UJ	< 0.071	< 0.31
Acetophenone	ug/l	8270	- -	- -	NA	NA	NA	< 0.06	< 0.31	< 0.062	< 0.06 UJ	< 0.067	< 0.3
Anthracene	ug/l	8270	- -	- -	< 0.049	< 0.049	< 0.049	< 0.047	< 0.25	0.072 J	0.053 J	< 0.053	< 0.24
Atrazine	ug/l	8270	- -	- -	NA	NA	NA	< 0.61	< 3.2	< 0.63	< 0.61	< 0.69 UJ	< 3
Benzaldehyde	ug/l	8270	- -	- -	NA	NA	NA	< 0.11	< 0.56	< 0.11	< 0.11	< 0.12	< 0.53
Benzo[a]anthracene	ug/l	8270	176	- -	< 0.075	< 0.075	< 0.075	< 0.072	< 0.38	0.1 J	< 0.072	< 0.082	< 0.36
Benzo[a]pyrene	ug/l	8270	- -	- -	< 0.053	< 0.053	< 0.053	< 0.051	< 0.27	0.07 J	< 0.051	< 0.058	< 0.25
Benzo[b]fluoranthene	ug/l	8270	- -	- -	< 0.097	< 0.097	< 0.097	< 0.093	< 0.49	0.11 J	< 0.093	< 0.11	< 0.47
Benzo[g,h,i]perylene	ug/l	8270	- -	- -	< 0.069	< 0.069	< 0.069	< 0.066	< 0.35	0.12 J	< 0.066	< 0.075	< 0.33
Benzo[k]fluoranthene	ug/l	8270	- -	- -	< 0.088	< 0.088	< 0.088	< 0.085	< 0.44	0.14 J	< 0.085	< 0.096	< 0.42
Bis(2-chloroisopropyl)ether	ug/l	8270	- -	- -	NA	NA	NA	< 0.056	< 0.29	< 0.058	< 0.056 UJ	< 0.063	< 0.28
Bis(2-chloroethoxy)methane	ug/l	8270	- -	- -	NA	NA	NA	< 0.064	< 0.34	< 0.067	< 0.064 UJ	< 0.073	< 0.32
Bis(2-chloroethyl)ether	ug/l	8270	30.5	1330	NA	NA	NA	< 0.038	< 0.2	< 0.04	< 0.038 UJ	< 0.043	< 0.19
Bis(2-ethylhexyl) phthalate	ug/l	8270	- -	- -	NA	NA	NA	< 6	< 31	< 6.2	< 6	< 6.8	< 30
Butyl benzyl phthalate	ug/l	8270	- -	- -	NA	NA	NA	< 0.44	< 2.3	< 0.46	< 0.44	0.53 J	< 2.2
Caprolactam	ug/l	8270	- -	- -	NA	NA	NA	0.95 J	< 2.4	< 0.47	0.46 J	< 0.51	< 2.3
Carbazole	ug/l	8270	- -	- -	NA	NA	NA	< 0.049	0.48 J	0.091 J	< 0.049	< 0.055	< 0.25
Chrysene	ug/l	8270	- -	- -	< 0.081	< 0.081	< 0.081	< 0.078	< 0.41	0.098 J	< 0.078	< 0.088	< 0.39
Dibenz(a,h)anthracene	ug/l	8270	- -	- -	< 0.072	< 0.072	< 0.072	< 0.069	< 0.36	0.12 J	< 0.069	< 0.078	< 0.35
Dibenzofuran	ug/l	8270	- -	- -	NA	NA	NA	< 0.07	1.5 J	< 0.073	< 0.07 UJ	< 0.079	< 0.35
Diethyl phthalate	ug/l	8270	- -	- -	NA	NA	NA	< 0.55	< 2.8	< 0.57	0.75 J	< 0.62	< 2.7
Dimethyl phthalate	ug/l	8270	- -	- -	NA	NA	NA	< 0.054	< 0.28	< 0.056	< 0.054	< 0.061	< 0.27
Di-n-butyl phthalate	ug/l	8270	- -	- -	NA	NA	NA	< 0.71	< 3.7	< 0.74	< 0.71	< 0.81	< 3.6
Di-n-octyl phthalate	ug/l	8270	- -	- -	NA	NA	NA	< 0.66	< 3.4	< 0.69	< 0.66	< 0.74	< 3.3
Fluoranthene	ug/l	8270	- -	- -	< 0.06	< 0.06	< 0.06	< 0.058	< 0.3	0.12 J	< 0.058	< 0.065	< 0.29
Fluorene	ug/l	8270	- -	- -	< 0.069	< 0.069	< 0.069	< 0.066	2.6	< 0.069	< 0.066 UJ	< 0.075	< 0.33
Hexachlorobenzene	ug/l	8270	0.275	12	NA	NA	NA	< 0.054	< 0.28	< 0.056	< 0.054 UJ	< 0.061	< 0.27
Hexachlorobutadiene	ug/l	8270	0.716	31.3	NA	NA	NA	< 0.066	< 0.35	< 0.069	< 0.066 UJ	< 0.075	< 0.33
Hexachlorocyclopentadiene	ug/l	8270	0.958	4.02	NA	NA	NA	< 0.48	< 2.5	< 0.5	< 0.48 UR	< 0.54	< 2.4
Hexachloroethane	ug/l	8270	4.26	186	NA	NA	NA	< 0.06	< 0.31	< 0.062	< 0.06 UJ	< 0.067	< 0.3
Indeno[1,2,3-cd]pyrene	ug/l	8270	- -	- -	< 0.085	< 0.085	< 0.085	< 0.082	< 0.43	0.11 J	< 0.082	< 0.092	< 0.41
Isophorone	ug/l	8270	- -	- -	NA	NA	NA	< 0.052	< 0.27	< 0.054	< 0.052 UJ	< 0.059	< 0.26
Methylphenol, 3 & 4	ug/l	8270	- -	- -	NA	NA	NA	< 0.36	< 1.9	< 0.37	< 0.36 UJ	< 0.4	< 1.8
Naphthalene	ug/l	8270	11	174	< 0.059	< 0.059	< 0.059	< 0.057	7	< 0.059	< 0.057 UJ	< 0.064	< 0.28
Nitrobenzene	ug/l	8270	177	7710	NA	NA	NA	< 0.48	< 2.5	< 0.5	< 0.48 UJ	< 0.54	< 2.4
N-Nitrosodi-n-propylamine	ug/l	8270	- -	- -	NA	NA	NA	< 0.068	< 0.36	< 0.071	< 0.068 UJ	< 0.077	< 0.34
N-Nitrosodiphenylamine	ug/l	8270	- -	- -	NA	NA	NA	< 0.11	< 0.6	< 0.12	< 0.11 UJ	< 0.13	< 0.57
Pentachlorophenol	ug/l	8270	- -	- -	NA	NA	NA	< 0.81 UJ	< 4.2	< 0.85 UJ	< 0.81	< 0.92 UJ	< 4.1

TABLE A-6
ANALYTICAL AND VAPOR INTRUSTION SCREENING RESULTS
GROUNDWATER SAMPLES
CAA VIM AND VIIM
MINGO JUNCTION STEEL WORK LLC - WEIRTON FACILITY

			Screening Criteria (1)		Sample Information (2)								
	Units	Analytical Method	Residential	*Commercial*	VI-MW-03A 03/28/2019	VI-MW-04A 03/28/2019	VI-MW-04A DUP 03/28/2019 Duplicate	VII-MW-01A 03/28/2019	VII-MW-01P 04/03/2019	VII-MW-02A 03/28/2019	VII-MW-02P 03/28/2019	VII-MW-03A 03/29/2019	VII-MW-03P 04/03/2019
Phenanthrene	ug/l	8270	- -	- -	0.094 J	< 0.055	0.073 J	0.07 J	3	0.18 J	0.14 J	0.089 J	< 0.26
Phenol	ug/l	8270	- -	- -	NA	NA	NA	< 0.47	< 2.4	< 0.49	< 0.47 UJ	< 0.53	< 2.3
Pyrene	ug/l	8270	- -	- -	< 0.054	< 0.054	< 0.054	< 0.052	< 0.27	0.11 J	< 0.052	< 0.059	< 0.26
Inorganics (3)													
Aluminum	ug/l	6020	- -	- -	NA	NA	NA	< 13	< 13	< 13	24 J	140	< 13
Antimony	ug/l	6020	- -	- -	NA	NA	NA	< 0.38	< 0.38	< 0.38	0.47 J	< 0.38	< 0.38
Arsenic	ug/l	6020	- -	- -	NA	NA	NA	0.35 J	0.59 J	0.34 J	2.4	2.1	1.4
Barium	ug/l	6020	- -	- -	NA	NA	NA	34	29	33	22	38	20
Beryllium	ug/l	6020	- -	- -	NA	NA	NA	< 0.16	< 0.16	< 0.16	< 0.16	< 0.16	< 0.16
Cadmium	ug/l	6020	- -	- -	NA	NA	NA	0.14 J	< 0.13	0.26 J	< 0.13	0.57 J	< 0.13
Calcium	ug/l	6020	- -	- -	NA	NA	NA	140000	450000	65000	38000	130000	100000
Chromium	ug/l	6020	- -	- -	NA	NA	NA	1.7 J	< 1.5	1.5 J	< 1.5	2.6	1.5 J
Cobalt	ug/l	6020	- -	- -	NA	NA	NA	0.52	0.31 J	0.24 J	< 0.075	39	0.077 J
Copper	ug/l	6020	- -	- -	NA	NA	NA	2.2	1 J	2.1	< 0.63	2.4	0.88 J
Iron	ug/l	6020	- -	- -	NA	NA	NA	14 J	< 14	< 14	25 J	74000	18 J
Lead	ug/l	6020	- -	- -	NA	NA	NA	0.14 J	< 0.13	< 0.13	< 0.13	0.17 J	< 0.13
Magnesium	ug/l	6020	- -	- -	NA	NA	NA	28000	< 83	18000	6300	13000	19000
Manganese	ug/l	6020	- -	- -	NA	NA	NA	450	< 1.4	940	150	9800	35
Mercury	ug/l	7470	0.252	1.06	NA	NA	NA	< 0.1	< 0.1	< 0.1	< 0.1	< 0.1	< 0.1
Nickel	ug/l	6020	- -	- -	NA	NA	NA	3.7	0.54 J	9.2	0.67 J	31	< 0.31
Potassium	ug/l	6020	- -	- -	NA	NA	NA	4100	30000	4300	5000	16000	10000
Selenium	ug/l	6020	- -	- -	NA	NA	NA	< 2.6	4 J	< 2.6	< 2.6	< 2.6	< 2.6
Silver	ug/l	6020	- -	- -	NA	NA	NA	< 0.12	< 0.12	< 0.12	< 0.12	< 0.12	< 0.12
Sodium	ug/l	6020	- -	- -	NA	NA	NA	69000	16000	60000	30000	68000	23000
Thallium	ug/l	6020	- -	- -	NA	NA	NA	< 0.13	< 0.13	< 0.13	< 0.13	< 0.13	< 0.13
Vanadium	ug/l	6020	- -	- -	NA	NA	NA	1.3	2.2	1.2	8	0.97 J	5.7
Zinc	ug/l	6020	- -	- -	NA	NA	NA	6.1	< 3.2	14	< 3.2	110	< 3.2
Other Parameters													
Cyanide, Total	ug/l	9012	20.1	84.4	NA	NA	NA	< 4.4	< 4.4	< 4.4	7.3 J	< 4.4	< 4.4

TABLE A-6
ANALYTICAL AND VAPOR INTRUSTION SCREENING RESULTS
GROUNDWATER SAMPLES
CAA VIM AND VIIM
MINGO JUNCTION STEEL WORK LLC - WEIRTON FACILITY

	Units	Analytical Method	Screening Criteria (1)		Sample Information (2)									
			Residential	*Commercial*	VII-MW-04P 04/03/2019		VII-MW-05P 04/03/2019		VII-MW-06P 04/01/2019		VII-MW-07P 04/01/2019	
Volatile Organic Compounds												
1,1,1-Trichloroethane	ug/l	8260	1240	5210	< 0.6		< 0.6		< 0.6		< 0.6	
1,1,2,2-Tetrachloroethane	ug/l	8260	6.59	288	< 0.6		< 0.6		< 0.6		< 0.6	
1,1,2-Trichloro-1,2,2-trifluoroethane	ug/l	8260	38	160	NA		NA		NA		NA	
1,1,2-Trichloroethane	ug/l	8260	1.17	4.91	< 0.45		< 0.45		< 0.45		< 0.45	
1,1-Dichloroethane	ug/l	8260	12.4	541	< 0.63		< 0.63		< 0.63		< 0.63	
1,1-Dichloroethene	ug/l	8260	29.7	125	< 0.55		< 0.55		< 0.55		< 0.55	
1,2,4-Trichlorobenzene	ug/l	8260	8.78	36.9	NA		NA		NA		NA	
1,2-Dibromo-3-Chloropropane	ug/l	8260	0.0648	7.84	NA		NA		NA		NA	
1,2-Dibromoethane (EDB)	ug/l	8260	0.332	14.5	NA		NA		NA		NA	
1,2-Dichlorobenzene	ug/l	8260	571	2400	NA		NA		NA		NA	
1,2-Dichloroethane	ug/l	8260	3.92	111	< 0.57		< 0.57		< 0.57		< 0.57	
1,2-Dichloroethene, Total	ug/l	8260	- -	- -	< 1.3		< 1.3		< 1.3		< 1.3	
cis-1,2-Dichloroethene	ug/l	8260	- -	- -	0.76	J	< 0.71		< 0.71		< 0.71	
trans-1,2-Dichloroethene	ug/l	8260	- -	- -	< 0.67		< 0.67		< 0.67		< 0.67	
1,2-Dichloropropane	ug/l	8260	6.38	26.8	< 0.66		< 0.66		< 0.66		< 0.66	
cis-1,3-Dichloropropene (1)	ug/l	8260	8.93	111	< 0.59		< 0.59		< 0.59		< 0.59	
trans-1,3-Dichloropropene (1)	ug/l	8260	8.93	111	< 0.58		< 0.58		< 0.58		< 0.58	
1,3-Dichlorobenzene (1)	ug/l	8260	5.57	243	NA		NA		NA		NA	
1,4-Dichlorobenzene	ug/l	8260	5.57	243	NA		NA		NA		NA	
2-Butanone (MEK)	ug/l	8260	389000	1640000	< 2.6		< 2.6		< 2.6		< 2.6	
2-Hexanone	ug/l	8260	1650	6950	< 3.3		< 3.3		< 3.3		< 3.3	
4-Methyl-2-pentanone (MIBK)	ug/l	8260	106000	447000	< 3.1		< 3.1		< 3.1		< 3.1	
Acetone	ug/l	8260	3680000	15500000	6.3		< 3.4		4.6	J	5.5	J
Benzene	ug/l	8260	2.7	98.6	< 0.6		< 0.6		< 0.6		< 0.6	
Bromoform	ug/l	8260	243	10600	< 0.98		< 0.98		< 0.98		< 0.98	
Bromomethane	ug/l	8260	2.48	10.4	< 0.89		< 0.89		< 0.89		< 0.89	
Carbon disulfide	ug/l	8260	191	801	< 0.88		< 0.88		< 0.88		< 0.88	
Carbon tetrachloride	ug/l	8260	0.693	30.3	< 0.88		< 0.88		< 0.88		< 0.88	
Chlorobenzene	ug/l	8260	78.6	330	0.54	J	< 0.5		< 0.5		< 0.5	
Chlorodibromomethane	ug/l	8260	- -	- -	< 0.84		< 0.84		< 0.84		< 0.84	
Chloroethane	ug/l	8260	3350	14000	< 0.9		< 0.9		< 0.9		< 0.9	
Chloroform	ug/l	8260	1.33	58.1	< 0.6		< 0.6		< 0.6		3.5	
Chloromethane	ug/l	8260	34.9	146	< 0.9		< 0.9		< 0.9		< 0.9	
Cyclohexane	ug/l	8260	172	722	NA		NA		NA		NA	
Dichlorobromomethane	ug/l	8260	1.55	67.6	< 0.64		< 0.64		< 0.64		1.3	
Dichlorodifluoromethane	ug/l	8260	0.963	4.05	NA		NA		NA		NA	
Ethylbenzene	ug/l	8260	6.85	299	1.1		< 0.51		< 0.51		< 0.51	
Isopropylbenzene	ug/l	8260	208	873	NA		NA		NA		NA	
Methyl acetate	ug/l	8260	- -	- -	NA		NA		NA		NA	
Methyl tert-butyl ether	ug/l	8260	722	31500	< 0.59		< 0.59		< 0.59		< 0.59	
Methylcyclohexane (1)	ug/l	8260	172	722	NA		NA		NA		NA	
Methylene Chloride	ug/l	8260	742	3120	< 0.89		< 0.89		< 0.89		< 0.89	
Naphthalene	ug/l	8260	11	174	13	J	< 0.79	UJ	< 0.79		< 0.79	
Styrene	ug/l	8260	1860	7820	< 0.47		< 0.47		< 0.47		< 0.47	
Tetrachloroethene	ug/l	8260	10.9	45.6	3.4		< 0.47		0.88	J	< 0.47	
Toluene	ug/l	8260	3520	14800	< 0.46		< 0.46		< 0.46		< 0.46	
Trichloroethene	ug/l	8260	0.897	3.77	< 0.69		< 0.69		< 0.69		< 0.69	
Trichlorofluoromethane	ug/l	8260	- -	- -	NA		NA		NA		NA	
Vinyl chloride	ug/l	8260	0.197	32.8	< 0.88		< 0.88		< 0.88		< 0.88	
Xylenes, Total	ug/l	8260	75.9	319	3.3		< 0.89		< 0.89		< 0.89	
Semi-Volatile Organics												
1,1'-Biphenyl	ug/l	8270	8.73	36.7	NA		NA		NA		NA	
2,4,5-Trichlorophenol	ug/l	8270	- -	- -	NA		NA		NA		NA	
2,4,6-Trichlorophenol	ug/l	8270	- -	- -	NA		NA		NA		NA	
2,4-Dichlorophenol	ug/l	8270	- -	- -	NA		NA		NA		NA	
2,4-Dimethylphenol	ug/l	8270	- -	- -	NA		NA		NA		NA	

TABLE A-6
ANALYTICAL AND VAPOR INTRUSTION SCREENING RESULTS
GROUNDWATER SAMPLES
CAA VIM AND VIIM
MINGO JUNCTION STEEL WORK LLC - WEIRTON FACILITY

	Units	Analytical Method	Screening Criteria [1]		Sample Information [2]			
			Residential	*Commercial*	VII-MW-04P 04/03/2019	VII-MW-05P 04/03/2019	VII-MW-06P 04/01/2019	VII-MW-07P 04/01/2019
2,4-Dinitrophenol	ug/l	8270	- -	- -	NA	NA	NA	NA
2,4-Dinitrotoluene	ug/l	8270	- -	- -	NA	NA	NA	NA
2,6-Dinitrotoluene	ug/l	8270	- -	- -	NA	NA	NA	NA
2-Chloronaphthalene	ug/l	8270	- -	- -	NA	NA	NA	NA
2-Chlorophenol	ug/l	8270	- -	- -	NA	NA	NA	NA
2-Methylnaphthalene	ug/l	8270	- -	- -	NA	NA	NA	NA
2-Methylphenol	ug/l	8270	- -	- -	NA	NA	NA	NA
2-Nitroaniline	ug/l	8270	- -	- -	NA	NA	NA	NA
2-Nitrophenol	ug/l	8270	- -	- -	NA	NA	NA	NA
3,3'-Dichlorobenzidine	ug/l	8270	- -	- -	NA	NA	NA	NA
3-Nitroaniline	ug/l	8270	- -	- -	NA	NA	NA	NA
4,6-Dinitro-2-methylphenol	ug/l	8270	- -	- -	NA	NA	NA	NA
4-Bromophenyl phenyl ether	ug/l	8270	- -	- -	NA	NA	NA	NA
4-Chloro-3-methylphenol	ug/l	8270	- -	- -	NA	NA	NA	NA
4-Chloroaniline	ug/l	8270	- -	- -	NA	NA	NA	NA
4-Chlorophenyl phenyl ether	ug/l	8270	- -	- -	NA	NA	NA	NA
4-Nitroaniline	ug/l	8270	- -	- -	NA	NA	NA	NA
4-Nitrophenol	ug/l	8270	- -	- -	NA	NA	NA	NA
Acenaphthene	ug/l	8270	- -	- -	NA	NA	NA	NA
Acenaphthylene	ug/l	8270	- -	- -	NA	NA	NA	NA
Acetophenone	ug/l	8270	- -	- -	NA	NA	NA	NA
Anthracene	ug/l	8270	- -	- -	NA	NA	NA	NA
Atrazine	ug/l	8270	- -	- -	NA	NA	NA	NA
Benzaldehyde	ug/l	8270	- -	- -	NA	NA	NA	NA
Benzo[a]anthracene	ug/l	8270	176	- -	NA	NA	NA	NA
Benzo[a]pyrene	ug/l	8270	- -	- -	NA	NA	NA	NA
Benzo[b]fluoranthene	ug/l	8270	- -	- -	NA	NA	NA	NA
Benzo[g,h,i]perylene	ug/l	8270	- -	- -	NA	NA	NA	NA
Benzo[k]fluoranthene	ug/l	8270	- -	- -	NA	NA	NA	NA
Bis(2-chloroisopropyl)ether	ug/l	8270	- -	- -	NA	NA	NA	NA
Bis(2-chloroethoxy)methane	ug/l	8270	- -	- -	NA	NA	NA	NA
Bis(2-chloroethyl)ether	ug/l	8270	30.5	1330	NA	NA	NA	NA
Bis(2-ethylhexyl) phthalate	ug/l	8270	- -	- -	NA	NA	NA	NA
Butyl benzyl phthalate	ug/l	8270	- -	- -	NA	NA	NA	NA
Caprolactam	ug/l	8270	- -	- -	NA	NA	NA	NA
Carbazole	ug/l	8270	- -	- -	NA	NA	NA	NA
Chrysene	ug/l	8270	- -	- -	NA	NA	NA	NA
Dibenz(a,h)anthracene	ug/l	8270	- -	- -	NA	NA	NA	NA
Dibenzofuran	ug/l	8270	- -	- -	NA	NA	NA	NA
Diethyl phthalate	ug/l	8270	- -	- -	NA	NA	NA	NA
Dimethyl phthalate	ug/l	8270	- -	- -	NA	NA	NA	NA
Di-n-butyl phthalate	ug/l	8270	- -	- -	NA	NA	NA	NA
Di-n-octyl phthalate	ug/l	8270	- -	- -	NA	NA	NA	NA
Fluoranthene	ug/l	8270	- -	- -	NA	NA	NA	NA
Fluorene	ug/l	8270	- -	- -	NA	NA	NA	NA
Hexachlorobenzene	ug/l	8270	0.275	12	NA	NA	NA	NA
Hexachlorobutadiene	ug/l	8270	0.716	31.3	NA	NA	NA	NA
Hexachlorocyclopentadiene	ug/l	8270	0.958	4.02	NA	NA	NA	NA
Hexachloroethane	ug/l	8270	4.26	186	NA	NA	NA	NA
Indeno[1,2,3-cd]pyrene	ug/l	8270	- -	- -	NA	NA	NA	NA
Isophorone	ug/l	8270	- -	- -	NA	NA	NA	NA
Methylphenol, 3 & 4	ug/l	8270	- -	- -	NA	NA	NA	NA
Naphthalene	ug/l	8270	11	174	NA	NA	NA	NA
Nitrobenzene	ug/l	8270	177	7710	NA	NA	NA	NA
N-Nitrosodi-n-propylamine	ug/l	8270	- -	- -	NA	NA	NA	NA
N-Nitrosodiphenylamine	ug/l	8270	- -	- -	NA	NA	NA	NA
Pentachlorophenol	ug/l	8270	- -	- -	NA	NA	NA	NA

TABLE A-6
ANALYTICAL AND VAPOR INTRUSTION SCREENING RESULTS
GROUNDWATER SAMPLES
CAA VIM AND VIIM
MINGO JUNCTION STEEL WORK LLC - WEIRTON FACILITY

			Screening Criteria [1]		Sample Information [2]			
	Units	Analytical Method	Residential	*Commercial*	VII-MW-04P 04/03/2019	VII-MW-05P 04/03/2019	VII-MW-06P 04/01/2019	VII-MW-07P 04/01/2019
Phenanthrene	ug/l	8270	- -	- -	NA	NA	NA	NA
Phenol	ug/l	8270	- -	- -	NA	NA	NA	NA
Pyrene	ug/l	8270	- -	- -	NA	NA	NA	NA
Inorganics [3]								
Aluminum	ug/l	6020	- -	- -	NA	NA	NA	NA
Antimony	ug/l	6020	- -	- -	NA	NA	NA	NA
Arsenic	ug/l	6020	- -	- -	NA	NA	NA	NA
Barium	ug/l	6020	- -	- -	NA	NA	NA	NA
Beryllium	ug/l	6020	- -	- -	NA	NA	NA	NA
Cadmium	ug/l	6020	- -	- -	NA	NA	NA	NA
Calcium	ug/l	6020	- -	- -	NA	NA	NA	NA
Chromium	ug/l	6020	- -	- -	NA	NA	NA	NA
Cobalt	ug/l	6020	- -	- -	NA	NA	NA	NA
Copper	ug/l	6020	- -	- -	NA	NA	NA	NA
Iron	ug/l	6020	- -	- -	NA	NA	NA	NA
Lead	ug/l	6020	- -	- -	NA	NA	NA	NA
Magnesium	ug/l	6020	- -	- -	NA	NA	NA	NA
Manganese	ug/l	6020	- -	- -	NA	NA	NA	NA
Mercury	ug/l	7470	0.252	1.06	NA	NA	NA	NA
Nickel	ug/l	6020	- -	- -	NA	NA	NA	NA
Potassium	ug/l	6020	- -	- -	NA	NA	NA	NA
Selenium	ug/l	6020	- -	- -	NA	NA	NA	NA
Silver	ug/l	6020	- -	- -	NA	NA	NA	NA
Sodium	ug/l	6020	- -	- -	NA	NA	NA	NA
Thallium	ug/l	6020	- -	- -	NA	NA	NA	NA
Vanadium	ug/l	6020	- -	- -	NA	NA	NA	NA
Zinc	ug/l	6020	- -	- -	NA	NA	NA	NA
Other Parameters								
Cyanide, Total	ug/l	9012	20.1	84.4	NA	NA	NA	NA

TABLE A-6
ANALYTICAL AND VAPOR INTRUSION SCREENING RESULTS
GROUNDWATER SAMPLES
CAA VIM AND VIIM
MINGO JUNCTION STEEL WORK LLC - WEIRTON FACILITY

1 - Screening criteria based on the May 2021 USEPA Vapor Intrusion Screening Levels (VISL) for residential and commercial scenarios. The residential scenario is based on a Target Risk Level of 1E-6, a Hazard Quotient of 0.1, and the default West Virginia groundwater temperature of 13°C. The commercial scenario is based on a Target Risk Level of 1E-5, a Hazard Quotient of 0.1, and the default West Virginia groundwater temperature of 13°C. Double dashes indicate that an RSL is not available for a given constituent. Notes regarding specific values for various chemicals (e.g., surrogates used, effects basis, etc.) are as follows:

Criteria for cis-1,3-dichloropropene and trans-1,3-dichloropropene are based on the criteria for total 1,3-dichloropropene.
Criteria for 1,3-dichlorobenzene is based on the criteria for 1,4-dichlorobenzene.
Criteria for methylcyclohexane is based on the criteria for cyclohexane.

Shading indicates an exceedance of the Residential VISL criterion.
Bold italics numbers indicate exceedance of the Commercial VISL criterion.

2 - General sample information provided in column headings includes sample identification number and sampling date. Table qualifier codes are consistent with Region 3 data qualifiers related to identification and quantitation and are as follows:

Data Qualifiers
NA - Not Analyzed
- - - Screening Criterion not available for this chemical constituent.
* - LCS or LCSD exceeds the control limits.
B - Compound was found in the blank and sample.
F1 - MS and/or MSD Recovery is outside acceptance limits.
J - Result is less than the reporting limit but greater than or equal to the method detection limit and the concentration is an approximate value.
K - Analyte present. Reported value may be biased high. Actual value is expected to be lower.
L - Analyte present. Reported value may be biased low. Actual value is expected to be higher.
R - Unusable result. Analyte may or may not be present in the sample.
UJ - Not Detected. Quantitation limit may be inaccurate or imprecise.

3 - Groundwater samples were collected for total inorganic analysis during the November 2013 event and dissolved inorganic analysis during the February 2014 and March/April 2019 events.

TABLE A-7
DOWNGRADIENT GROUNDWATER ANALYTICAL AND ECOLOGICAL SCREENING RESULTS
CAA VIM AND VIIM
MINGO JUNCTION STEEL WORKS LLC - WEIRTON FACILITY

Constituent	Units	Method	Human Health		WVDEP Aquatic Life Criteria (B1, B4)	Sample ID [1]							
			Category C Fish Consumption	Category A Drinking Water+Fish Consumption		VII-MW-03A		CA-MW-02A		CA-MW-02A			
						03/29/2019		12/17/2018		12/18/2019			
								180-85057-1		180-100222-3			
								C&E Outfall		C&E Outfall			
Volatile Organic Compounds													
Acetone	ug/L	8260D	- -	- -	- -		6.3	<	3.4		3.7	J	
1,2-Dichloroethene, Total	ug/L	8260B	- -	- -	- -		1.9	J	<	1.3	<	1.3	
cis-1,2-Dichloroethene	ug/L	8260B	- -	- -	- -		1.9		<	0.71	<	0.71	
Trichloroethene	ug/L	8260B	81	2.7	2.7		1		<	0.69	<	0.69	
Butyl benzyl phthalate	ug/L	8270	- -	- -	3		0.53	J		na		na	
Phenanthrene	ug/L	8270	- -	- -	- -		0.089	J		na		na	
Dissolved Inorganics													
Aluminum	ug/L	6020B	- -	- -	750		140		<	12		19	B
Antimony	ug/L	6020B	4300	14	- -	<	0.38		<	1.1	<	0.38	
Arsenic	ug/L	6020B	10	10	- -		2.1			5.3		8.2	
Barium	ug/L	6020B	- -	1000	- -		38			66		130	
Beryllium	ug/L	6020B	- -	4	- -	<	0.16		<	0.057		0.21	B
Cadmium [2]	ug/L	6020B	- -	5	0.25		0.57	J	<	0.13	<	0.13	
Calcium	ug/L	6020B	- -	- -	- -		130000			51000		57000	
Chromium	ug/L	6020B	- -	50	11		2.6		<	0.63	<	1.5	
Cobalt	ug/L	6020B	- -	- -	- -		39		<	0.075		0.13	B
Copper [2]	ug/L	6020B	- -	1000	8.96		2.4			2.3		1.2	J
Iron	ug/L	6020B	- -	1500	1500		74000		<	14		51	B
Lead [2]	ug/L	6020B	- -	50	2.52		0.17	J	<	0.094	<	0.13	
Magnesium	ug/L	6020B	- -	- -	- -		13000			4000		6600	
Manganese	ug/L	6020B	- -	1000	- -		9800			270		380	
Nickel [2]	ug/L	6020B	4600	510	52.01		31			1.2		1.2	
Potassium	ug/L	6020B	- -	- -	- -		16000			8300		11000	
Selenium	ug/L	6020B	- -	50	5	<	2.6		<	0.81	<	1.5	
Silver	ug/L	6020B	- -	4	4	<	0.12		<	0.12	<	0.18	
Sodium	ug/L	6020B	- -	- -	- -		68000			18000		28000	
Thallium	ug/L	6020B	6.3	1.7	- -	<	0.13		<	0.063		0.27	B
Vanadium	ug/L	6020B	- -	- -	- -		0.97	J		2.3		3.6	
Zinc [2]	ug/L	6020B	- -	- -	118.14		110			7.5		18	
Other Parameters													
Cyanide	ug/L	9014	5	5	5	<	4.4		<	4.4		***8.7***	J

TABLE A-7
DOWNGRADIENT GROUNDWATER ANALYTICAL AND ECOLOGICAL SCREENING RESULTS
CAA VIM AND VIIM
MINGO JUNCTION STEEL WORKS LLC - WEIRTON FACILITY

Constituent	Units	Method	Human Health		WVDEP Aquatic Life Criteria (B1, B4)	Sample ID [1]			
			Category C Fish Consumption	Category A Drinking Water+Fish Consumption		CA-MW-02A	CA-MW-04AR	CA-MW-04AR	CA-MW-04AR
						12/28/2020	12/19/2018	12/18/2019	12/28/2020
						180-115360-3	180-85057-2	180-100222-4	180-115360-4
						C&E Outfall	C&E Outfall	C&E Outfall	C&E Outfall
Volatile Organic Compounds									
Acetone	ug/L	8260D	- -	- -	- -	na	< 3.4	< 3.4	na
1,2-Dichloroethene, Total	ug/L	8260B	- -	- -	- -	na	< 1.3	< 1.3	na
cis-1,2-Dichloroethene	ug/L	8260B	- -	- -	- -	na	< 0.71	< 0.71	na
Trichloroethene	ug/L	8260B	81	2.7	2.7	na	< 0.69	< 0.69 UJ	na
Butyl benzyl phthalate	ug/L	8270	- -	- -	3	na	na	na	na
Phenanthrene	ug/L	8270	- -	- -	- -	na	na	na	na
Dissolved Inorganics									
Aluminum	ug/L	6020B	- -	- -	750	< 13	< 12	14 B	< 13
Antimony	ug/L	6020B	4300	14	- -	< 0.38	< 1.1	< 0.38	< 0.38
Arsenic	ug/L	6020B	10	10	- -	7.4	0.57 J	< 0.32	< 0.31
Barium	ug/L	6020B	- -	1000	- -	120	66	100	91
Beryllium	ug/L	6020B	- -	4	- -	< 0.18	< 0.057	< 0.18	< 0.18
Cadmium [2]	ug/L	6020B	- -	5	0.25	< 0.22	< 0.13	< 0.13	< 0.22
Calcium	ug/L	6020B	- -	- -	- -	57000	140000	130000	140000
Chromium	ug/L	6020B	- -	50	11	< 1.5	< 0.63	< 1.5	< 1.5
Cobalt	ug/L	6020B	- -	- -	- -	< 0.13	< 0.075	< 0.075	< 0.13
Copper [2]	ug/L	6020B	- -	1000	8.96	< 0.63	< 1.3	0.96 J	< 0.63
Iron	ug/L	6020B	- -	1500	1500	120	< 14	< 20	< 20
Lead [2]	ug/L	6020B	- -	50	2.52	< 0.13	< 0.094	< 0.13	0.47 J
Magnesium	ug/L	6020B	- -	- -	- -	6700	34000	39000	41000
Manganese	ug/L	6020B	- -	1000	- -	570	47	560	930
Nickel [2]	ug/L	6020B	4600	510	52.01	0.73 J	< 0.31	1.3	0.71 J
Potassium	ug/L	6020B	- -	- -	- -	9100	5200	6700	5400
Selenium	ug/L	6020B	- -	50	5	< 1.5	3.1 J	4.2 J	6.2
Silver	ug/L	6020B	- -	4	4	< 0.18	< 0.12	< 0.18	< 0.18
Sodium	ug/L	6020B	- -	- -	- -	23000	15000	18000	15000
Thallium	ug/L	6020B	6.3	1.7	- -	< 0.15	< 0.063	< 0.15	< 0.15
Vanadium	ug/L	6020B	- -	- -	- -	2.1	< 0.9	< 0.99	< 0.99
Zinc [2]	ug/L	6020B	- -	- -	118.14	7.8	6.4	7.4	< 3.2
Other Parameters									
Cyanide	ug/L	9014	5	5	5	< 8	< 4.4	7 J	< 8

TABLE A-7
DOWNGRADIENT GROUNDWATER ANALYTICAL AND ECOLOGICAL SCREENING RESULTS
CAA VIM AND VIIM
MINGO JUNCTION STEEL WORKS LLC - WEIRTON FACILITY

1 - General sample information provided in column headings includes sample identification number and sampling date. Table qualifier codes are consistent with Region III data qualifiers related to identification and quantitation and are as follows:

Data Qualifiers

- - - Screening criterion not available for this chemical constituent.
- n/a - Parameter analyzed in field, no method associated with it.
- UJ - Not detected. Quantitation limit may be inaccurate or imprecise.
- J - Analyte present. Reported value may not be accurate or precise.
- J+ - Analyte present. Reported value may be biased high.
- B - Not detected. Not detected substantially above the level reported in the laboratory or field blanks.
- ^c - CCV recovery is outside acceptance limits.
- *+ - LCS and/or LCSD is outside acceptance limits, biased high.

2 - Screening values are from Appendix E, Table 1 of WVDEP Title 47: Requirements Governing Water Quality Standards (WQS),chronic values Aquatic Life standards for cadmium, copper, lead, nickel, and zinc are calculated assuming a hardness of 100 mg/L.

Shaded bold numbers indicate exceedance of the Screening Criteria for Surface Water.

APPENDIX B

APPROVED DE MINIMIS ECOLOGICAL SCREENING CHECKLIST

Checklist to Determine Applicable Remediation Standards

Part 1: Ecological Standards

STEP 1: Determine Whether a De Minimis Ecological Screening Evaluation is Appropriate for the Site		
1.1	Are there any undeveloped terrestrial areas on or adjacent to the site (e.g., areas that are not under intensive landscape or agricultural control)?	**X** Yes ☐ No
1.2	Are there any potential wetlands (including vernal pools) on or adjacent to the site?	**X** Yes ☐ No
1.3	Are there any surface water bodies (i.e., lotic or lentic habitat) on or adjacent to the site?	**X** Yes ☐ No
1.4	Are there any terrestrial, wetland, or aquatic habitats off-site, but situated downstream, downwind, or downgradient from the site that may be affected by site-related stressors?	☐ Yes **X** No
1.5	Are there any projected land uses for the site that would result in undeveloped areas, wetland habitat, lotic habitat, or lentic habitat?	☐ Yes **X** No
If "Yes" to any: A complete exposure pathway may exist for potential ecological receptors of concern. Proceed to Step 2. *If "No" to all: No further ecological evaluation is required. File this completed form with the Risk Assessment Report.*		

STEP 2: Identify any Readily Apparent Harm or Exceedances of Surface Water Quality Standards		
2.1	Have there been any incidents where harm to wildlife attributable to contaminants originating from the site has been readily apparent?	☐ Yes **X** No
	If "Yes": Proceed to Question 2.2. *If "No": Skip to Question 2.3.*	
2.2	Has the cause of such harm been eliminated?	☐ Yes ☐ No
	If "Yes": Briefly describe the action taken and complete the rest of the checklist. *If "No": Proceed directly to the remedy evaluation or, alternately, proceed with a determination of a Uniform or Site-Specific Ecological Standard, as described in the VRP Guidance Manual, prior to implementation of the remedy. File this form with the Risk Assessment Report.*	
	Action Taken:	
2.3	Is the site contributing to exceedances of surface water quality standards established for the protection of aquatic life (see W. Va. Legislative Rule 47CSR2)?	☐ Yes **X** No
	If "Yes": Proceed directly to the remedy evaluation or, alternately, proceed with a determination of a Uniform or Site-Specific Ecological Standard, as described in the VRP Guidance Manual, prior to implementation of the remedy. *If "No": Proceed to Step 3.*	

STEP 3: Identify Contamination Associated with Ecological Habitats		
3.1	Have the environmental media (e.g., soil, surface water, sediment, biota) associated with the ecological habitat(s) identified in Questions 1.2 through 1.5 been sampled and analyzed with regard to potential site-related contaminants of concern?	X Yes ☐ No
	If "Yes": Proceed to Question 3.2. *If "No": Skip to Step 4.*	
3.2	Have any site-related contaminants been detected above natural background concentrations in environmental media collected from terrestrial habitat?	X Yes ☐ No ☐ Unknown ☐ n/a
3.3	Have any site-related contaminants been detected above natural background concentrations in environmental media collected from wetland or aquatic habitats (lotic or lentic habitats)?	☐ Yes ☐ No ☐ Unknown ☐ n/a
	If "Yes" or "Unknown" to 3.2 and/or 3.3: Proceed to Question 3.4. *If "No" or "n/a" to both 3.2 and 3.3: Skip to Question 3.6.*	
3.4	Are site-related contaminants presenting an ecological risk over and above "local" condition?	☐ Yes X No ☐ Unknown
	If "Yes": Skip to Step 4. *If "No" or "Unknown": Proceed to Question 3.5.*	
3.5	Have site-related releases of contaminants been stopped?	X Yes ☐ No
	If "Yes": Proceed to Question 3.6. *If "No": Skip to Part 4.*	
3.6	Are site-related contaminants currently or likely to be migrating to aquatic habitat (e.g., lotic, lentic, or wetland habitat)?	☐ Yes X No ☐ n/a
	If "Yes": Proceed to Step 4. *If "No" or "n/a": No further ecological evaluation is required. File this completed form with the Risk Assessment Report.*	

STEP 4: Characterize the Potential Ecological Habitat		
4.1	Describe the general land use in the immediate vicinity of the site.	
	☐ **X** Commercial/Industrial **X** Residential ☐ Rural/Agricultural ☐ Rural/Undeveloped ☐ Urban	
4.2	For all affected areas that fulfill the descriptions in Step 1, answer the following and attach a site map identifying the potential ecological habitat.	
	4.2.1 Outline characteristics for potential terrestrial habitats.	
	Location:	Mature Forest Area (Green shaded Area on Figure 1 of the Habitat Assessment Report)
	Contiguous Area:	77 acres
	General Topography:	Steeply sloping hillside that is higher in elevation than the facility.
	Primary Soil Type:	unknown
	Predominant Vegetation Species:	Dominant canopy tree species include black cherry, American sycamore, black walnut, American elm, tulip poplar, and red oak. The subcanopy layer includes spicebush and common privet.
	4.2.2 Outline characteristics for potential wetland habitats (e.g., vernal pools, marshes, etc.).	
	Location:	Located within immature forest area of CAA VIIM (Red shaded areas on Figure 1 of the Habitat Assessment Report)
	Contiguous Area:	0.2 acres
	General Topography:	Generally flat
	Primary Soil Type:	unknown
	Predominant Vegetation Species:	Narrow-leaf cattail, common reed, and black willow.
	4.2.3 Outline characteristics for potential lotic habitats (e.g., flowing water habitat such as rivers and streams).	
	Location:	Perennial stream located at the southern end of the Mature Forest Area (see Figure 1 of Habitat Assessment Report). Stream originates from the Williams Country Club and flows in a southward direction on the site for approximately 330 feet.
	Typical Width and Depth:	<5 foot width and <2 foot depth
	Typical Flow Rate:	unknown
	Typical Gradient (m/km):	unknown
	Type of River/Creek Bottom:	unknown
	Types of Aquatic Vegetation Present:	unknown
	Topography of the Riparian Zone:	Steeply sloping
	Predominant Riparian Vegetation:	Dominant canopy tree species include black cherry, American sycamore, black walnut, American elm, tulip poplar, and red oak. The subcanopy layer includes spicebush and common privet.
	Human Utilization of Lotic Habitat:	none
	Local Conditions:	

	4.2.4 Outline characteristics for potential lentic habitats (e.g., standing water habitats such as lakes and ponds).	
	Location:	Not Applicable
	Is the lentic habitat…?	☐ Natural ☐ Man-made
	Area of Lentic Habitat	
	Typical and Maximum Depth:	
	Description of Sources & Drainage:	
	Predominant Aquatic Vegetation:	
	Topography of Littoral Zone:	
	Predominant Littoral Zone Vegetation:	
	Human Utilization of Lentic Habitat:	

	Local Conditions:	
4.3	Indicate if the site contains or is adjacent to any of the following types of valued terrestrial habitats:	
	☐ Climax Community (e.g., old growth forest) ☐ Federal Wilderness Area (designated or administratively proposed) ☐ National or State Forest ☐ National or State Park ☐ National or State Wildlife Refuge ☐ National Preserve Area ☐ State designated natural area ☐ Federal land designated for protection of natural ecosystems ☐ Federal or State land designated for wildlife or game management ☐ Area utilized for breeding by large or dense aggregations of wildlife ☐ Feeding, breeding, nesting, cover, or wintering habitat for migratory birds ☐ Area important to the maintenance of unique biotic communities (e.g., high proportion of endemic species) *Threatened or Endangered Species* ☐ Critical habitat for federally designated threatened or endangered species ☐ Habitat known to be used or potentially used by Federal or State designated threatened or endangered species, or species in the State Wildlife Action Plan	
4.4	Indicate if the site contains or is adjacent to any of the following types of valued wetlands:	
	☐ Area important to the maintenance of unique biotic communities (e.g., high proportion of endemic species) ☐ Area utilized for breeding by large or dense aggregations of wildlife ☐ Spawning or nursery areas critical to the maintenance of fish/shellfish species ☐ Feeding, breeding, nesting, cover, or wintering habitat for migratory waterfowl or other aquatic birds ☐ Area important to the maintenance of unique biotic communities (e.g., high proportion of endemic species) *Threatened or Endangered Species* ☐ Critical habitat for federally designated threatened or endangered species ☐ Habitat known to be used or potentially used by Federal or State designated threatened or endangered species, or species in the State Wildlife Action Plan	
4.5	Indicate if the site is within or adjacent to any of the following valued aquatic habitats:	
	☐ Federal or State Fish Hatchery ☐ Federal or State designated Scenic or Wild River ☐ National River Reach designated as recreational ☐ Critical areas identified under the Clean Lakes Program ☐ Trout-stocked streams or wild trout streams with verified trout production ☐ Spawning or nursery areas critical the maintenance of fish/shellfish species ☐ Feeding, breeding, nesting, cover, or wintering habitat for migratory waterfowl or other aquatic birds ☐ Area important to the maintenance of unique biotic communities (e.g., high proportion of endemic species) *Threatened or Endangered Species* ☐ Critical habitat for federally designated threatened or endangered species ☐ Habitat known to be used or potentially used by Federal or State designated threatened or endangered species, or species in the State Wildlife Action Plan	
4.6	Have valued terrestrial, wetland, or aquatic habitats been identified within or adjacent to this site? *(A list of agencies that can provide information that should assist in determining whether the site is located within or adjacent to the areas listed in 4.3, 4.4, and 4.5 is provided at the end of this checklist.)*	☐ Yes **X** No

STEP 5: Identify Any Potential Ecological Receptors of Concern		
5.1	Threatened and Endangered Species Were any potential habitats within or adjacent to the site identified as critical habitat for federally designated threatened or endangered species listed in 50CFS17.95 or 17.96, or areas known to be used by federal or state designated threatened or endangered species?	☐ Yes **X** No
	If "Yes", indicate which species*: *Amphibians* ☐ Cheat Mountain salamander (Plethodon nettingi) *Birds* ☐ Bald eagle (Haliaeetus leucocephalus) *Clams* ☐ Clubshell (Pleurobema clava) ☐ Fanshell (Cyprogenia stegaria) ☐ James spinymussel (Pleurobeam collina) ☐ Northern riffleshell (Epioblasma torulosa rangiana) ☐ Pink mucket pearlymussel (Lampsilis abrupta) ☐ Tubercled blossom pearlymussel (Epioblasma torulosa torulosa) *Flowering Plants* ☐ Harperella (Ptilimnium nodosum) ☐ Northeastern bulrush (Scirpus ancistrochaetus) ☐ Running buffalo cover (Trifolium stoloniferum) ☐ Shale barren rock cress (Arabis perstellata) ☐ Small whorled pogonia (Isotria medeoloides) ☐ Virginia spiraea (Spiraea virginiana) *Mammals* ☐ Eastern cougar (Felis concolor couguar) ☐ Gray bat (Myotis grisescens) ☐ Indiana bat (Myotis sodalis) ☐ Virginia big-eared bat (Corynorhinus towsendii virgniaus) ☐ Virginia northern flying squirrel (Glaucomys sabrinus fuscus) *Snails* ☐ Flat-spired three-toothed land snail (Triodopsis platysayoides)	
5.2	Local Populations Providing Important Natural or Economic Resources, Functions, and Values Were any valued terrestrial, wetland, or aquatic habitats listed in 4.3, 4.4, or 4.5 identified within or adjacent to the site?	☐ Yes **X** No
If "Yes" to 5.1 and/or 5.2 and/or surface water bodies are not in compliance with applicable water quality standards: The site does not pass the De Minimis ecological risk screening, since a complete exposure pathway may exist for potential ecological receptors of concern. Further evaluation of the site is required using either the Uniform Ecological Standard or the Site-Specific Ecological Standard. *If "No" to 5.1 and 5.2 and surface water bodes are in compliance with applicable water quality standards: No further ecological evaluation is required. File this completed form with the Risk Assessment Report.*		

*The list contains those federally designated threatened and endangered species that are indigenous to WV. WVDNR, Wildlife Resources Section should be consulted to ensure the list is correct. WV has not established a list of state designated threatened or endangered species; however, the WVDNR has developed a "Species of Greatest Conservation Need" list in the State Wildlife Action Plan. Species listed in the in the State Wildlife Action Plan should also be considered in any Ecological Risk Assessment.

ATTACHMENT 2

Federal and State Agencies for Ecological Review Consultation

U.S. Department of Agricultural – Natural Resources and Conservation Service
1550 Earl L. Core Road, Suite 200
Morgantown, WV 26505
304-284-7540
https://www.nrcs.usda.gov/wps/portal/nrcs/site/wv/home

U.S. Fish and Wildlife Service – WV Field Office
Ecological Services
90 Vance Drive
Elkins, WV 26241
304-636-6586
https://www.fws.gov/northeast/ecologicalservices/index.html

WV Division of Forestry
7 Players Club Drive
Charleston, WV 25311
304-558-2788
https://wvforestry.com/

WV Division of Natural Resources
Building 74
324 Fourth Avenue
South Charleston, WV 25303
304-558-2754
http://www.wvdnr.gov/

WV Division of Natural Resources – Wildlife Resources Section
Building 74
324 Fourth Avenue
South Charleston, WV 25303
304-558-2771
http://www.wvdnr.gov/

APPENDIX C

PROUCL STATISTICAL OUTPUT

	A	B	C	D	E	F	G	H	I	J	K	L
1	UCL Statistics for Data Sets with Non-Detects											
2												
3	User Selected Options											
4	Date/Time of Computation			ProUCL 5.15/13/2021 10:12:47 AM								
5	From File			SurfSoilProUCL.xls								
6	Full Precision			OFF								
7	Confidence Coefficient			95%								
8	Number of Bootstrap Operations			2000								
9												
10	Benzo[a]anthracene											
11												
12	General Statistics											
13	Total Number of Observations					78	Number of Distinct Observations					66
14	Number of Detects					66	Number of Non-Detects					12
15	Number of Distinct Detects					59	Number of Distinct Non-Detects					9
16	Minimum Detect					0.009	Minimum Non-Detect					0.0088
17	Maximum Detect					48	Maximum Non-Detect					0.95
18	Variance Detects					50.26	Percent Non-Detects					15.38%
19	Mean Detects					2.281	SD Detects					7.09
20	Median Detects					0.115	CV Detects					3.108
21	Skewness Detects					4.915	Kurtosis Detects					27.82
22	Mean of Logged Detects					-1.544	SD of Logged Detects					2.015
23												
24	Normal GOF Test on Detects Only											
25	Shapiro Wilk Test Statistic					0.375	Normal GOF Test on Detected Observations Only					
26	5% Shapiro Wilk P Value					0	Detected Data Not Normal at 5% Significance Level					
27	Lilliefors Test Statistic					0.379	Lilliefors GOF Test					
28	5% Lilliefors Critical Value					0.109	Detected Data Not Normal at 5% Significance Level					
29	Detected Data Not Normal at 5% Significance Level											
30												
31	Kaplan-Meier (KM) Statistics using Normal Critical Values and other Nonparametric UCLs											
32	KM Mean					1.935	KM Standard Error of Mean					0.744
33	KM SD					6.523	95% KM (BCA) UCL					3.247
34	95% KM (t) UCL					3.174	95% KM (Percentile Bootstrap) UCL					3.231
35	95% KM (z) UCL					3.159	95% KM Bootstrap t UCL					4.438
36	90% KM Chebyshev UCL					4.167	95% KM Chebyshev UCL					5.179
37	97.5% KM Chebyshev UCL					6.582	99% KM Chebyshev UCL					9.34
38												
39	Gamma GOF Tests on Detected Observations Only											
40	A-D Test Statistic					6.807	Anderson-Darling GOF Test					
41	5% A-D Critical Value					0.869	Detected Data Not Gamma Distributed at 5% Significance Level					
42	K-S Test Statistic					0.244	Kolmogorov-Smirnov GOF					
43	5% K-S Critical Value					0.119	Detected Data Not Gamma Distributed at 5% Significance Level					
44	Detected Data Not Gamma Distributed at 5% Significance Level											
45												
46	Gamma Statistics on Detected Data Only											
47	k hat (MLE)					0.292	k star (bias corrected MLE)					0.289
48	Theta hat (MLE)					7.804	Theta star (bias corrected MLE)					7.89
49	nu hat (MLE)					38.59	nu star (bias corrected)					38.17
50	Mean (detects)					2.281						
51												

	A	B	C	D	E	F	G	H	I	J	K	L
52	**Gamma ROS Statistics using Imputed Non-Detects**											
53	GROS may not be used when data set has > 50% NDs with many tied observations at multiple DLs											
54	GROS may not be used when kstar of detects is small such as <1.0, especially when the sample size is small (e.g., <15-20)											
55	For such situations, GROS method may yield incorrect values of UCLs and BTVs											
56	This is especially true when the sample size is small.											
57	For gamma distributed detected data, BTVs and UCLs may be computed using gamma distribution on KM estimates											
58					Minimum	0.009				Mean		1.932
59					Maximum	48				Median		0.0895
60					SD	6.566				CV		3.399
61					k hat (MLE)	0.263				k star (bias corrected MLE)		0.262
62					Theta hat (MLE)	7.334				Theta star (bias corrected MLE)		7.378
63					nu hat (MLE)	41.1				nu star (bias corrected)		40.85
64					Adjusted Level of Significance (β)	0.0469						
65					Approximate Chi Square Value (40.85, α)	27.2				Adjusted Chi Square Value (40.85, β)		26.99
66					95% Gamma Approximate UCL (use when n>=50)	2.901				95% Gamma Adjusted UCL (use when n<50)		2.924
67												
68	**Estimates of Gamma Parameters using KM Estimates**											
69					Mean (KM)	1.935				SD (KM)		6.523
70					Variance (KM)	42.55				SE of Mean (KM)		0.744
71					k hat (KM)	0.088				k star (KM)		0.0931
72					nu hat (KM)	13.72				nu star (KM)		14.53
73					theta hat (KM)	21.99				theta star (KM)		20.77
74					80% gamma percentile (KM)	1.204				90% gamma percentile (KM)		4.988
75					95% gamma percentile (KM)	11.26				99% gamma percentile (KM)		31.84
76												
77	**Gamma Kaplan-Meier (KM) Statistics**											
78					Approximate Chi Square Value (14.53, α)	6.934				Adjusted Chi Square Value (14.53, β)		6.835
79					95% Gamma Approximate KM-UCL (use when n>=50)	4.053				95% Gamma Adjusted KM-UCL (use when n<50)		4.112
80												
81	**Lognormal GOF Test on Detected Observations Only**											
82					Shapiro Wilk Approximate Test Statistic	0.914				**Shapiro Wilk GOF Test**		
83					5% Shapiro Wilk P Value	1.1035E-4				Detected Data Not Lognormal at 5% Significance Level		
84					Lilliefors Test Statistic	0.158				**Lilliefors GOF Test**		
85					5% Lilliefors Critical Value	0.109				Detected Data Not Lognormal at 5% Significance Level		
86	**Detected Data Not Lognormal at 5% Significance Level**											
87												
88	**Lognormal ROS Statistics Using Imputed Non-Detects**											
89					Mean in Original Scale	1.932				Mean in Log Scale		-2.089
90					SD in Original Scale	6.566				SD in Log Scale		2.304
91					95% t UCL (assumes normality of ROS data)	3.17				95% Percentile Bootstrap UCL		3.334
92					95% BCA Bootstrap UCL	3.712				95% Bootstrap t UCL		4.6
93					95% H-UCL (Log ROS)	4.814						
94												
95	**Statistics using KM estimates on Logged Data and Assuming Lognormal Distribution**											
96					KM Mean (logged)	-1.955				KM Geo Mean		0.142
97					KM SD (logged)	2.103				95% Critical H Value (KM-Log)		3.567
98					KM Standard Error of Mean (logged)	0.241				95% H-UCL (KM -Log)		3.035
99					KM SD (logged)	2.103				95% Critical H Value (KM-Log)		3.567
100					KM Standard Error of Mean (logged)	0.241						
101												

	A	B	C	D	E	F	G	H	I	J	K	L
102	DL/2 Statistics											
103	DL/2 Normal						DL/2 Log-Transformed					
104					Mean in Original Scale	1.939				Mean in Log Scale		-1.96
105					SD in Original Scale	6.564				SD in Log Scale		2.163
106					95% t UCL (Assumes normality)	3.176				95% H-Stat UCL		3.596
107	DL/2 is not a recommended method, provided for comparisons and historical reasons											
108												
109	Nonparametric Distribution Free UCL Statistics											
110	Data do not follow a Discernible Distribution at 5% Significance Level											
111												
112	Suggested UCL to Use											
113					95% KM (Chebyshev) UCL	5.179						
114												
115	Note: Suggestions regarding the selection of a 95% UCL are provided to help the user to select the most appropriate 95% UCL.											
116	Recommendations are based upon data size, data distribution, and skewness.											
117	These recommendations are based upon the results of the simulation studies summarized in Singh, Maichle, and Lee (2006).											
118	However, simulations results will not cover all Real World data sets; for additional insight the user may want to consult a statistician.											
119												
120	Benzo[a]pyrene											
121												
122	General Statistics											
123					Total Number of Observations	78				Number of Distinct Observations		63
124					Number of Detects	55				Number of Non-Detects		23
125					Number of Distinct Detects	50				Number of Distinct Non-Detects		16
126					Minimum Detect	0.01				Minimum Non-Detect		0.0071
127					Maximum Detect	28				Maximum Non-Detect		0.76
128					Variance Detects	31.56				Percent Non-Detects		29.49%
129					Mean Detects	2.291				SD Detects		5.617
130					Median Detects	0.15				CV Detects		2.452
131					Skewness Detects	3.351				Kurtosis Detects		11.52
132					Mean of Logged Detects	-1.296				SD of Logged Detects		2.015
133												
134	Normal GOF Test on Detects Only											
135					Shapiro Wilk Test Statistic	0.469	Normal GOF Test on Detected Observations Only					
136					5% Shapiro Wilk P Value	0	Detected Data Not Normal at 5% Significance Level					
137					Lilliefors Test Statistic	0.373	Lilliefors GOF Test					
138					5% Lilliefors Critical Value	0.119	Detected Data Not Normal at 5% Significance Level					
139	Detected Data Not Normal at 5% Significance Level											
140												
141	Kaplan-Meier (KM) Statistics using Normal Critical Values and other Nonparametric UCLs											
142					KM Mean	1.62				KM Standard Error of Mean		0.547
143					KM SD	4.788				95% KM (BCA) UCL		2.712
144					95% KM (t) UCL	2.531				95% KM (Percentile Bootstrap) UCL		2.656
145					95% KM (z) UCL	2.52				95% KM Bootstrap t UCL		3.232
146					90% KM Chebyshev UCL	3.262				95% KM Chebyshev UCL		4.005
147					97.5% KM Chebyshev UCL	5.037				99% KM Chebyshev UCL		7.064
148												
149	Gamma GOF Tests on Detected Observations Only											
150					A-D Test Statistic	4.804	Anderson-Darling GOF Test					
151					5% A-D Critical Value	0.858	Detected Data Not Gamma Distributed at 5% Significance Level					
152					K-S Test Statistic	0.235	Kolmogorov-Smirnov GOF					
153					5% K-S Critical Value	0.13	Detected Data Not Gamma Distributed at 5% Significance Level					

	A	B	C	D	E	F	G	H	I	J	K	L
154	Detected Data Not Gamma Distributed at 5% Significance Level											
155												
156	Gamma Statistics on Detected Data Only											
157					k hat (MLE)	0.321			k star (bias corrected MLE)			0.316
158					Theta hat (MLE)	7.139			Theta star (bias corrected MLE)			7.261
159					nu hat (MLE)	35.3			nu star (bias corrected)			34.71
160					Mean (detects)	2.291						
161												
162	Gamma ROS Statistics using Imputed Non-Detects											
163	GROS may not be used when data set has > 50% NDs with many tied observations at multiple DLs											
164	GROS may not be used when kstar of detects is small such as <1.0, especially when the sample size is small (e.g., <15-20)											
165	For such situations, GROS method may yield incorrect values of UCLs and BTVs											
166	This is especially true when the sample size is small.											
167	For gamma distributed detected data, BTVs and UCLs may be computed using gamma distribution on KM estimates											
168					Minimum	0.01			Mean			1.619
169					Maximum	28			Median			0.085
170					SD	4.819			CV			2.978
171					k hat (MLE)	0.257			k star (bias corrected MLE)			0.256
172					Theta hat (MLE)	6.301			Theta star (bias corrected MLE)			6.334
173					nu hat (MLE)	40.07			nu star (bias corrected)			39.86
174					Adjusted Level of Significance (β)	0.0469						
175					Approximate Chi Square Value (39.86, α)	26.4			Adjusted Chi Square Value (39.86, β)			26.19
176					95% Gamma Approximate UCL (use when n>=50)	2.444			95% Gamma Adjusted UCL (use when n<50)			2.463
177												
178	Estimates of Gamma Parameters using KM Estimates											
179					Mean (KM)	1.62			SD (KM)			4.788
180					Variance (KM)	22.92			SE of Mean (KM)			0.547
181					k hat (KM)	0.115			k star (KM)			0.119
182					nu hat (KM)	17.87			nu star (KM)			18.52
183					theta hat (KM)	14.15			theta star (KM)			13.65
184					80% gamma percentile (KM)	1.404			90% gamma percentile (KM)			4.577
185					95% gamma percentile (KM)	9.26			99% gamma percentile (KM)			23.59
186												
187	Gamma Kaplan-Meier (KM) Statistics											
188					Approximate Chi Square Value (18.52, α)	9.766			Adjusted Chi Square Value (18.52, β)			9.646
189					95% Gamma Approximate KM-UCL (use when n>=50)	3.073			95% Gamma Adjusted KM-UCL (use when n<50)			3.111
190												
191	Lognormal GOF Test on Detected Observations Only											
192					Shapiro Wilk Approximate Test Statistic	0.921			Shapiro Wilk GOF Test			
193					5% Shapiro Wilk P Value	0.0014			Detected Data Not Lognormal at 5% Significance Level			
194					Lilliefors Test Statistic	0.146			Lilliefors GOF Test			
195					5% Lilliefors Critical Value	0.119			Detected Data Not Lognormal at 5% Significance Level			
196	Detected Data Not Lognormal at 5% Significance Level											
197												
198	Lognormal ROS Statistics Using Imputed Non-Detects											
199					Mean in Original Scale	1.618			Mean in Log Scale			-2.512
200					SD in Original Scale	4.82			SD in Log Scale			2.583
201					95% t UCL (assumes normality of ROS data)	2.526			95% Percentile Bootstrap UCL			2.528
202					95% BCA Bootstrap UCL	2.927			95% Bootstrap t UCL			3.237
203					95% H-UCL (Log ROS)	7.876						
204												

	A	B	C	D	E	F	G	H	I	J	K	L
205	Statistics using KM estimates on Logged Data and Assuming Lognormal Distribution											
206					KM Mean (logged)	-2.29					KM Geo Mean	0.101
207					KM SD (logged)	2.308					95% Critical H Value (KM-Log)	3.839
208					KM Standard Error of Mean (logged)	0.266					95% H-UCL (KM -Log)	3.989
209					KM SD (logged)	2.308					95% Critical H Value (KM-Log)	3.839
210					KM Standard Error of Mean (logged)	0.266						
211												
212	DL/2 Statistics											
213			DL/2 Normal				DL/2 Log-Transformed					
214					Mean in Original Scale	1.625					Mean in Log Scale	-2.288
215					SD in Original Scale	4.817					SD in Log Scale	2.391
216					95% t UCL (Assumes normality)	2.533					95% H-Stat UCL	5.185
217	DL/2 is not a recommended method, provided for comparisons and historical reasons											
218												
219	Nonparametric Distribution Free UCL Statistics											
220	Data do not follow a Discernible Distribution at 5% Significance Level											
221												
222	Suggested UCL to Use											
223					95% KM (Chebyshev) UCL	4.005						
224												
225	Note: Suggestions regarding the selection of a 95% UCL are provided to help the user to select the most appropriate 95% UCL.											
226	Recommendations are based upon data size, data distribution, and skewness.											
227	These recommendations are based upon the results of the simulation studies summarized in Singh, Maichle, and Lee (2006).											
228	However, simulations results will not cover all Real World data sets; for additional insight the user may want to consult a statistician.											
229												
230	Benzo[b]fluoranthene											
231												
232	General Statistics											
233					Total Number of Observations	78					Number of Distinct Observations	54
234					Number of Detects	58					Number of Non-Detects	20
235					Number of Distinct Detects	44					Number of Distinct Non-Detects	11
236					Minimum Detect	0.021					Minimum Non-Detect	0.011
237					Maximum Detect	31					Maximum Non-Detect	1.2
238					Variance Detects	27.03					Percent Non-Detects	25.64%
239					Mean Detects	2.047					SD Detects	5.199
240					Median Detects	0.195					CV Detects	2.541
241					Skewness Detects	4.156					Kurtosis Detects	19.3
242					Mean of Logged Detects	-1.124					SD of Logged Detects	1.857
243												
244	Normal GOF Test on Detects Only											
245					Shapiro Wilk Test Statistic	0.445	Normal GOF Test on Detected Observations Only					
246					5% Shapiro Wilk P Value	0	Detected Data Not Normal at 5% Significance Level					
247					Lilliefors Test Statistic	0.348	Lilliefors GOF Test					
248					5% Lilliefors Critical Value	0.116	Detected Data Not Normal at 5% Significance Level					
249	Detected Data Not Normal at 5% Significance Level											
250												
251	Kaplan-Meier (KM) Statistics using Normal Critical Values and other Nonparametric UCLs											
252					KM Mean	1.529					KM Standard Error of Mean	0.518
253					KM SD	4.531					95% KM (BCA) UCL	2.404
254					95% KM (t) UCL	2.39					95% KM (Percentile Bootstrap) UCL	2.457
255					95% KM (z) UCL	2.38					95% KM Bootstrap t UCL	3.329

	A	B	C	D	E	F	G	H	I	J	K	L
256					90% KM Chebyshev UCL	3.081				95% KM Chebyshev UCL		3.785
257					97.5% KM Chebyshev UCL	4.761				99% KM Chebyshev UCL		6.679
258												
259					**Gamma GOF Tests on Detected Observations Only**							
260					A-D Test Statistic	4.38	**Anderson-Darling GOF Test**					
261					5% A-D Critical Value	0.848	Detected Data Not Gamma Distributed at 5% Significance Level					
262					K-S Test Statistic	0.248	**Kolmogorov-Smirnov GOF**					
263					5% K-S Critical Value	0.126	Detected Data Not Gamma Distributed at 5% Significance Level					
264					**Detected Data Not Gamma Distributed at 5% Significance Level**							
265												
266					**Gamma Statistics on Detected Data Only**							
267					k hat (MLE)	0.363	k star (bias corrected MLE)					0.356
268					Theta hat (MLE)	5.634	Theta star (bias corrected MLE)					5.749
269					nu hat (MLE)	42.14	nu star (bias corrected)					41.29
270					Mean (detects)	2.047						
271												
272					**Gamma ROS Statistics using Imputed Non-Detects**							
273					GROS may not be used when data set has > 50% NDs with many tied observations at multiple DLs							
274					GROS may not be used when kstar of detects is small such as <1.0, especially when the sample size is small (e.g., <15-20)							
275					For such situations, GROS method may yield incorrect values of UCLs and BTVs							
276					This is especially true when the sample size is small.							
277					For gamma distributed detected data, BTVs and UCLs may be computed using gamma distribution on KM estimates							
278					Minimum	0.01	Mean					1.524
279					Maximum	31	Median					0.115
280					SD	4.562	CV					2.993
281					k hat (MLE)	0.285	k star (bias corrected MLE)					0.283
282					Theta hat (MLE)	5.345	Theta star (bias corrected MLE)					5.391
283					nu hat (MLE)	44.49	nu star (bias corrected)					44.11
284					Adjusted Level of Significance (β)	0.0469						
285					Approximate Chi Square Value (44.11, α)	29.88	Adjusted Chi Square Value (44.11, β)					29.66
286					95% Gamma Approximate UCL (use when n>=50)	2.25	95% Gamma Adjusted UCL (use when n<50)					2.267
287												
288					**Estimates of Gamma Parameters using KM Estimates**							
289					Mean (KM)	1.529	SD (KM)					4.531
290					Variance (KM)	20.53	SE of Mean (KM)					0.518
291					k hat (KM)	0.114	k star (KM)					0.118
292					nu hat (KM)	17.75	nu star (KM)					18.4
293					theta hat (KM)	13.43	theta star (KM)					12.96
294					80% gamma percentile (KM)	1.315	90% gamma percentile (KM)					4.311
295					95% gamma percentile (KM)	8.742	99% gamma percentile (KM)					22.32
296												
297					**Gamma Kaplan-Meier (KM) Statistics**							
298					Approximate Chi Square Value (18.40, α)	9.684	Adjusted Chi Square Value (18.40, β)					9.564
299					95% Gamma Approximate KM-UCL (use when n>=50)	2.905	95% Gamma Adjusted KM-UCL (use when n<50)					2.942
300												
301					**Lognormal GOF Test on Detected Observations Only**							
302					Shapiro Wilk Approximate Test Statistic	0.928	**Shapiro Wilk GOF Test**					
303					5% Shapiro Wilk P Value	0.0021	Detected Data Not Lognormal at 5% Significance Level					
304					Lilliefors Test Statistic	0.162	**Lilliefors GOF Test**					
305					5% Lilliefors Critical Value	0.116	Detected Data Not Lognormal at 5% Significance Level					
306					**Detected Data Not Lognormal at 5% Significance Level**							
307												

	A	B	C	D	E	F	G	H	I	J	K	L
308	**Lognormal ROS Statistics Using Imputed Non-Detects**											
309					Mean in Original Scale	1.525					Mean in Log Scale	-2.073
310					SD in Original Scale	4.562					SD in Log Scale	2.338
311				95% t UCL (assumes normality of ROS data)		2.385					95% Percentile Bootstrap UCL	2.445
312					95% BCA Bootstrap UCL	2.737					95% Bootstrap t UCL	3.366
313					95% H-UCL (Log ROS)	5.443						
314												
315	**Statistics using KM estimates on Logged Data and Assuming Lognormal Distribution**											
316					KM Mean (logged)	-1.905					KM Geo Mean	0.149
317					KM SD (logged)	2.105					95% Critical H Value (KM-Log)	3.571
318					KM Standard Error of Mean (logged)	0.243					95% H-UCL (KM -Log)	3.216
319					KM SD (logged)	2.105					95% Critical H Value (KM-Log)	3.571
320					KM Standard Error of Mean (logged)	0.243						
321												
322	**DL/2 Statistics**											
323				**DL/2 Normal**						**DL/2 Log-Transformed**		
324					Mean in Original Scale	1.535					Mean in Log Scale	-1.909
325					SD in Original Scale	4.559					SD in Log Scale	2.193
326					95% t UCL (Assumes normality)	2.395					95% H-Stat UCL	4.118
327	**DL/2 is not a recommended method, provided for comparisons and historical reasons**											
328												
329	**Nonparametric Distribution Free UCL Statistics**											
330	**Data do not follow a Discernible Distribution at 5% Significance Level**											
331												
332	**Suggested UCL to Use**											
333					95% KM (Chebyshev) UCL	3.785						
334												
335	Note: Suggestions regarding the selection of a 95% UCL are provided to help the user to select the most appropriate 95% UCL.											
336	Recommendations are based upon data size, data distribution, and skewness.											
337	These recommendations are based upon the results of the simulation studies summarized in Singh, Maichle, and Lee (2006).											
338	However, simulations results will not cover all Real World data sets; for additional insight the user may want to consult a statistician.											
339												
340	**Benzo[k]fluoranthene**											
341												
342	**General Statistics**											
343					Total Number of Observations	78					Number of Distinct Observations	57
344					Number of Detects	45					Number of Non-Detects	33
345					Number of Distinct Detects	42					Number of Distinct Non-Detects	16
346					Minimum Detect	0.0061					Minimum Non-Detect	0.014
347					Maximum Detect	14					Maximum Non-Detect	1.5
348					Variance Detects	5.286					Percent Non-Detects	42.31%
349					Mean Detects	0.811					SD Detects	2.299
350					Median Detects	0.08					CV Detects	2.834
351					Skewness Detects	4.793					Kurtosis Detects	25.69
352					Mean of Logged Detects	-1.944					SD of Logged Detects	1.709
353												
354	**Normal GOF Test on Detects Only**											
355					Shapiro Wilk Test Statistic	0.39					**Shapiro Wilk GOF Test**	
356					5% Shapiro Wilk Critical Value	0.945					Detected Data Not Normal at 5% Significance Level	
357					Lilliefors Test Statistic	0.374					**Lilliefors GOF Test**	
358					5% Lilliefors Critical Value	0.131					Detected Data Not Normal at 5% Significance Level	
359	**Detected Data Not Normal at 5% Significance Level**											

	A	B	C	D	E	F	G	H	I	J	K	L
360												
361	**Kaplan-Meier (KM) Statistics using Normal Critical Values and other Nonparametric UCLs**											
362					KM Mean	0.479				KM Standard Error of Mean		0.203
363					KM SD	1.77				95% KM (BCA) UCL		0.846
364					95% KM (t) UCL	0.817				95% KM (Percentile Bootstrap) UCL		0.831
365					95% KM (z) UCL	0.813				95% KM Bootstrap t UCL		1.39
366					90% KM Chebyshev UCL	1.088				95% KM Chebyshev UCL		1.363
367					97.5% KM Chebyshev UCL	1.746				99% KM Chebyshev UCL		2.497
368												
369	**Gamma GOF Tests on Detected Observations Only**											
370					A-D Test Statistic	3.916	**Anderson-Darling GOF Test**					
371					5% A-D Critical Value	0.842	Detected Data Not Gamma Distributed at 5% Significance Level					
372					K-S Test Statistic	0.23	**Kolmogorov-Smirnov GOF**					
373					5% K-S Critical Value	0.142	Detected Data Not Gamma Distributed at 5% Significance Level					
374	**Detected Data Not Gamma Distributed at 5% Significance Level**											
375												
376	**Gamma Statistics on Detected Data Only**											
377					k hat (MLE)	0.382				k star (bias corrected MLE)		0.371
378					Theta hat (MLE)	2.123				Theta star (bias corrected MLE)		2.184
379					nu hat (MLE)	34.39				nu star (bias corrected)		33.43
380					Mean (detects)	0.811						
381												
382	**Gamma ROS Statistics using Imputed Non-Detects**											
383	GROS may not be used when data set has > 50% NDs with many tied observations at multiple DLs											
384	GROS may not be used when kstar of detects is small such as <1.0, especially when the sample size is small (e.g., <15-20)											
385	For such situations, GROS method may yield incorrect values of UCLs and BTVs											
386	This is especially true when the sample size is small.											
387	For gamma distributed detected data, BTVs and UCLs may be computed using gamma distribution on KM estimates											
388					Minimum	0.0061				Mean		0.472
389					Maximum	14				Median		0.027
390					SD	1.783				CV		3.775
391					k hat (MLE)	0.298				k star (bias corrected MLE)		0.295
392					Theta hat (MLE)	1.587				Theta star (bias corrected MLE)		1.602
393					nu hat (MLE)	46.43				nu star (bias corrected)		45.98
394					Adjusted Level of Significance (β)	0.0469						
395					Approximate Chi Square Value (45.98, α)	31.42				Adjusted Chi Square Value (45.98, β)		31.2
396					95% Gamma Approximate UCL (use when n>=50)	0.691				95% Gamma Adjusted UCL (use when n<50)		0.696
397												
398	**Estimates of Gamma Parameters using KM Estimates**											
399					Mean (KM)	0.479				SD (KM)		1.77
400					Variance (KM)	3.135				SE of Mean (KM)		0.203
401					k hat (KM)	0.0732				k star (KM)		0.079
402					nu hat (KM)	11.43				nu star (KM)		12.32
403					theta hat (KM)	6.542				theta star (KM)		6.067
404					80% gamma percentile (KM)	0.222				90% gamma percentile (KM)		1.127
405					95% gamma percentile (KM)	2.785				99% gamma percentile (KM)		8.538
406												
407	**Gamma Kaplan-Meier (KM) Statistics**											
408					Approximate Chi Square Value (12.32, α)	5.439				Adjusted Chi Square Value (12.32, β)		5.352
409					95% Gamma Approximate KM-UCL (use when n>=50)	1.085				95% Gamma Adjusted KM-UCL (use when n<50)		1.103
410												

	A	B	C	D	E	F	G	H	I	J	K	L
411	Lognormal GOF Test on Detected Observations Only											
412					Shapiro Wilk Test Statistic	0.935	Shapiro Wilk GOF Test					
413					5% Shapiro Wilk Critical Value	0.945	Detected Data Not Lognormal at 5% Significance Level					
414					Lilliefors Test Statistic	0.164	Lilliefors GOF Test					
415					5% Lilliefors Critical Value	0.131	Detected Data Not Lognormal at 5% Significance Level					
416	Detected Data Not Lognormal at 5% Significance Level											
417												
418	Lognormal ROS Statistics Using Imputed Non-Detects											
419					Mean in Original Scale	0.474	Mean in Log Scale					-3.174
420					SD in Original Scale	1.783	SD in Log Scale					2.072
421					95% t UCL (assumes normality of ROS data)	0.81	95% Percentile Bootstrap UCL					0.858
422					95% BCA Bootstrap UCL	0.975	95% Bootstrap t UCL					1.339
423					95% H-UCL (Log ROS)	0.823						
424												
425	Statistics using KM estimates on Logged Data and Assuming Lognormal Distribution											
426					KM Mean (logged)	-3.022	KM Geo Mean					0.0487
427					KM SD (logged)	1.92	95% Critical H Value (KM-Log)					3.33
428					KM Standard Error of Mean (logged)	0.23	95% H-UCL (KM -Log)					0.637
429					KM SD (logged)	1.92	95% Critical H Value (KM-Log)					3.33
430					KM Standard Error of Mean (logged)	0.23						
431												
432	DL/2 Statistics											
433	DL/2 Normal						DL/2 Log-Transformed					
434					Mean in Original Scale	0.507	Mean in Log Scale					-2.67
435					SD in Original Scale	1.779	SD in Log Scale					1.812
436					95% t UCL (Assumes normality)	0.842	95% H-Stat UCL					0.692
437	DL/2 is not a recommended method, provided for comparisons and historical reasons											
438												
439	Nonparametric Distribution Free UCL Statistics											
440	Data do not follow a Discernible Distribution at 5% Significance Level											
441												
442	Suggested UCL to Use											
443					95% KM (Chebyshev) UCL	1.363						
444												
445	Note: Suggestions regarding the selection of a 95% UCL are provided to help the user to select the most appropriate 95% UCL.											
446	Recommendations are based upon data size, data distribution, and skewness.											
447	These recommendations are based upon the results of the simulation studies summarized in Singh, Maichle, and Lee (2006).											
448	However, simulations results will not cover all Real World data sets; for additional insight the user may want to consult a statistician.											
449												
450	Chrysene											
451												
452	General Statistics											
453					Total Number of Observations	78	Number of Distinct Observations					62
454					Number of Detects	66	Number of Non-Detects					12
455					Number of Distinct Detects	54	Number of Distinct Non-Detects					9
456					Minimum Detect	0.019	Minimum Non-Detect					0.0084
457					Maximum Detect	87	Maximum Non-Detect					0.9
458					Variance Detects	169	Percent Non-Detects					15.38%
459					Mean Detects	4.129	SD Detects					13
460					Median Detects	0.145	CV Detects					3.149
461					Skewness Detects	4.769	Kurtosis Detects					26.4
462					Mean of Logged Detects	-1.152	SD of Logged Detects					2.086

	A	B	C	D	E	F	G	H	I	J	K	L
463												
464						Normal GOF Test on Detects Only						
465					Shapiro Wilk Test Statistic	0.372	Normal GOF Test on Detected Observations Only					
466					5% Shapiro Wilk P Value	0	Detected Data Not Normal at 5% Significance Level					
467					Lilliefors Test Statistic	0.41	Lilliefors GOF Test					
468					5% Lilliefors Critical Value	0.109	Detected Data Not Normal at 5% Significance Level					
469						Detected Data Not Normal at 5% Significance Level						
470												
471						Kaplan-Meier (KM) Statistics using Normal Critical Values and other Nonparametric UCLs						
472					KM Mean	3.498	KM Standard Error of Mean					1.365
473					KM SD	11.96	95% KM (BCA) UCL					5.926
474					95% KM (t) UCL	5.77	95% KM (Percentile Bootstrap) UCL					5.935
475					95% KM (z) UCL	5.743	95% KM Bootstrap t UCL					7.716
476					90% KM Chebyshev UCL	7.592	95% KM Chebyshev UCL					9.447
477					97.5% KM Chebyshev UCL	12.02	99% KM Chebyshev UCL					17.08
478												
479						Gamma GOF Tests on Detected Observations Only						
480					A-D Test Statistic	7.475	Anderson-Darling GOF Test					
481					5% A-D Critical Value	0.878	Detected Data Not Gamma Distributed at 5% Significance Level					
482					K-S Test Statistic	0.254	Kolmogorov-Smirnov GOF					
483					5% K-S Critical Value	0.12	Detected Data Not Gamma Distributed at 5% Significance Level					
484						Detected Data Not Gamma Distributed at 5% Significance Level						
485												
486						Gamma Statistics on Detected Data Only						
487					k hat (MLE)	0.272	k star (bias corrected MLE)					0.27
488					Theta hat (MLE)	15.15	Theta star (bias corrected MLE)					15.28
489					nu hat (MLE)	35.97	nu star (bias corrected)					35.67
490					Mean (detects)	4.129						
491												
492						Gamma ROS Statistics using Imputed Non-Detects						
493						GROS may not be used when data set has > 50% NDs with many tied observations at multiple DLs						
494						GROS may not be used when kstar of detects is small such as <1.0, especially when the sample size is small (e.g., <15-20)						
495						For such situations, GROS method may yield incorrect values of UCLs and BTVs						
496						This is especially true when the sample size is small.						
497						For gamma distributed detected data, BTVs and UCLs may be computed using gamma distribution on KM estimates						
498					Minimum	0.01	Mean					3.496
499					Maximum	87	Median					0.12
500					SD	12.04	CV					3.444
501					k hat (MLE)	0.243	k star (bias corrected MLE)					0.242
502					Theta hat (MLE)	14.38	Theta star (bias corrected MLE)					14.43
503					nu hat (MLE)	37.92	nu star (bias corrected)					37.8
504					Adjusted Level of Significance (β)	0.0469						
505					Approximate Chi Square Value (37.80, α)	24.72	Adjusted Chi Square Value (37.80, β)					24.52
506					95% Gamma Approximate UCL (use when n>=50)	5.345	95% Gamma Adjusted UCL (use when n<50)					5.388
507												
508						Estimates of Gamma Parameters using KM Estimates						
509					Mean (KM)	3.498	SD (KM)					11.96
510					Variance (KM)	143.1	SE of Mean (KM)					1.365
511					k hat (KM)	0.0855	k star (KM)					0.0908
512					nu hat (KM)	13.35	nu star (KM)					14.17
513					theta hat (KM)	40.89	theta star (KM)					38.53

	A	B	C	D	E	F	G	H	I	J	K	L
514					80% gamma percentile (KM)	2.091					90% gamma percentile (KM)	8.909
515					95% gamma percentile (KM)	20.38					99% gamma percentile (KM)	58.29
516												
517					Gamma Kaplan-Meier (KM) Statistics							
518					Approximate Chi Square Value (14.17, α)	6.685					Adjusted Chi Square Value (14.17, β)	6.588
519					95% Gamma Approximate KM-UCL (use when n>=50)	7.413					95% Gamma Adjusted KM-UCL (use when n<50)	7.522
520												
521					Lognormal GOF Test on Detected Observations Only							
522					Shapiro Wilk Approximate Test Statistic	0.894					Shapiro Wilk GOF Test	
523					5% Shapiro Wilk P Value	4.8357E-6					Detected Data Not Lognormal at 5% Significance Level	
524					Lilliefors Test Statistic	0.17					Lilliefors GOF Test	
525					5% Lilliefors Critical Value	0.109					Detected Data Not Lognormal at 5% Significance Level	
526					Detected Data Not Lognormal at 5% Significance Level							
527												
528					Lognormal ROS Statistics Using Imputed Non-Detects							
529					Mean in Original Scale	3.496					Mean in Log Scale	-1.746
530					SD in Original Scale	12.04					SD in Log Scale	2.414
531					95% t UCL (assumes normality of ROS data)	5.766					95% Percentile Bootstrap UCL	5.873
532					95% BCA Bootstrap UCL	6.871					95% Bootstrap t UCL	7.841
533					95% H-UCL (Log ROS)	9.6						
534												
535					Statistics using KM estimates on Logged Data and Assuming Lognormal Distribution							
536					KM Mean (logged)	-1.626					KM Geo Mean	0.197
537					KM SD (logged)	2.231					95% Critical H Value (KM-Log)	3.737
538					KM Standard Error of Mean (logged)	0.256					95% H-UCL (KM -Log)	6.132
539					KM SD (logged)	2.231					95% Critical H Value (KM-Log)	3.737
540					KM Standard Error of Mean (logged)	0.256						
541												
542					DL/2 Statistics							
543					DL/2 Normal						DL/2 Log-Transformed	
544					Mean in Original Scale	3.502					Mean in Log Scale	-1.636
545					SD in Original Scale	12.04					SD in Log Scale	2.295
546					95% t UCL (Assumes normality)	5.771					95% H-Stat UCL	7.369
547					DL/2 is not a recommended method, provided for comparisons and historical reasons							
548												
549					Nonparametric Distribution Free UCL Statistics							
550					Data do not follow a Discernible Distribution at 5% Significance Level							
551												
552					Suggested UCL to Use							
553					95% KM (Chebyshev) UCL	9.447						
554												
555					Note: Suggestions regarding the selection of a 95% UCL are provided to help the user to select the most appropriate 95% UCL.							
556					Recommendations are based upon data size, data distribution, and skewness.							
557					These recommendations are based upon the results of the simulation studies summarized in Singh, Maichle, and Lee (2006).							
558					However, simulations results will not cover all Real World data sets; for additional insight the user may want to consult a statistician.							
559												
560	Dibenz(a,h)anthracene											
561												
562					General Statistics							
563					Total Number of Observations	78					Number of Distinct Observations	60
564					Number of Detects	40					Number of Non-Detects	38
565					Number of Distinct Detects	37					Number of Distinct Non-Detects	27

	A	B	C	D	E	F	G	H	I	J	K	L
566					Minimum Detect	0.0099					Minimum Non-Detect	0.0066
567					Maximum Detect	5.9					Maximum Non-Detect	0.84
568					Variance Detects	2.016					Percent Non-Detects	48.72%
569					Mean Detects	0.726					SD Detects	1.42
570					Median Detects	0.115					CV Detects	1.955
571					Skewness Detects	2.547					Kurtosis Detects	6.102
572					Mean of Logged Detects	-1.952					SD of Logged Detects	1.832
573												
574					**Normal GOF Test on Detects Only**							
575					Shapiro Wilk Test Statistic	0.567			**Shapiro Wilk GOF Test**			
576					5% Shapiro Wilk Critical Value	0.94			Detected Data Not Normal at 5% Significance Level			
577					Lilliefors Test Statistic	0.343			**Lilliefors GOF Test**			
578					5% Lilliefors Critical Value	0.139			Detected Data Not Normal at 5% Significance Level			
579					**Detected Data Not Normal at 5% Significance Level**							
580												
581					**Kaplan-Meier (KM) Statistics using Normal Critical Values and other Nonparametric UCLs**							
582					KM Mean	0.378					KM Standard Error of Mean	0.122
583					KM SD	1.066					95% KM (BCA) UCL	0.601
584					95% KM (t) UCL	0.581					95% KM (Percentile Bootstrap) UCL	0.581
585					95% KM (z) UCL	0.579					95% KM Bootstrap t UCL	0.686
586					90% KM Chebyshev UCL	0.745					95% KM Chebyshev UCL	0.911
587					97.5% KM Chebyshev UCL	1.141					99% KM Chebyshev UCL	1.594
588												
589					**Gamma GOF Tests on Detected Observations Only**							
590					A-D Test Statistic	2.649			**Anderson-Darling GOF Test**			
591					5% A-D Critical Value	0.835			Detected Data Not Gamma Distributed at 5% Significance Level			
592					K-S Test Statistic	0.236			**Kolmogorov-Smirnov GOF**			
593					5% K-S Critical Value	0.149			Detected Data Not Gamma Distributed at 5% Significance Level			
594					**Detected Data Not Gamma Distributed at 5% Significance Level**							
595												
596					**Gamma Statistics on Detected Data Only**							
597					k hat (MLE)	0.403					k star (bias corrected MLE)	0.389
598					Theta hat (MLE)	1.803					Theta star (bias corrected MLE)	1.866
599					nu hat (MLE)	32.22					nu star (bias corrected)	31.14
600					Mean (detects)	0.726						
601												
602					**Gamma ROS Statistics using Imputed Non-Detects**							
603					GROS may not be used when data set has > 50% NDs with many tied observations at multiple DLs							
604					GROS may not be used when kstar of detects is small such as <1.0, especially when the sample size is small (e.g., <15-20)							
605					For such situations, GROS method may yield incorrect values of UCLs and BTVs							
606					This is especially true when the sample size is small.							
607					For gamma distributed detected data, BTVs and UCLs may be computed using gamma distribution on KM estimates							
608					Minimum	0.0099					Mean	0.377
609					Maximum	5.9					Median	0.012
610					SD	1.073					CV	2.843
611					k hat (MLE)	0.303					k star (bias corrected MLE)	0.3
612					Theta hat (MLE)	1.244					Theta star (bias corrected MLE)	1.257
613					nu hat (MLE)	47.31					nu star (bias corrected)	46.82
614					Adjusted Level of Significance (β)	0.0469						
615					Approximate Chi Square Value (46.82, α)	32.12					Adjusted Chi Square Value (46.82, β)	31.89
616					95% Gamma Approximate UCL (use when n>=50)	0.55					95% Gamma Adjusted UCL (use when n<50)	0.554
617												

	A	B	C	D	E	F	G	H	I	J	K	L
618	**Estimates of Gamma Parameters using KM Estimates**											
619					Mean (KM)	0.378					SD (KM)	1.066
620					Variance (KM)	1.136					SE of Mean (KM)	0.122
621					k hat (KM)	0.126					k star (KM)	0.129
622					nu hat (KM)	19.61					nu star (KM)	20.19
623					theta hat (KM)	3.006					theta star (KM)	2.92
624					80% gamma percentile (KM)	0.359					90% gamma percentile (KM)	1.091
625					95% gamma percentile (KM)	2.134					99% gamma percentile (KM)	5.26
626												
627	**Gamma Kaplan-Meier (KM) Statistics**											
628					Approximate Chi Square Value (20.19, α)	10.99					Adjusted Chi Square Value (20.19, β)	10.86
629					95% Gamma Approximate KM-UCL (use when n>=50)	0.694					95% Gamma Adjusted KM-UCL (use when n<50)	0.702
630												
631	**Lognormal GOF Test on Detected Observations Only**											
632					Shapiro Wilk Test Statistic	0.921					**Shapiro Wilk GOF Test**	
633					5% Shapiro Wilk Critical Value	0.94					Detected Data Not Lognormal at 5% Significance Level	
634					Lilliefors Test Statistic	0.124					**Lilliefors GOF Test**	
635					5% Lilliefors Critical Value	0.139					Detected Data appear Lognormal at 5% Significance Level	
636	**Detected Data appear Approximate Lognormal at 5% Significance Level**											
637												
638	**Lognormal ROS Statistics Using Imputed Non-Detects**											
639					Mean in Original Scale	0.374					Mean in Log Scale	-3.953
640					SD in Original Scale	1.074					SD in Log Scale	2.521
641					95% t UCL (assumes normality of ROS data)	0.577					95% Percentile Bootstrap UCL	0.586
642					95% BCA Bootstrap UCL	0.628					95% Bootstrap t UCL	0.669
643					95% H-UCL (Log ROS)	1.505						
644												
645	**Statistics using KM estimates on Logged Data and Assuming Lognormal Distribution**											
646					KM Mean (logged)	-3.353					KM Geo Mean	0.035
647					KM SD (logged)	1.973					95% Critical H Value (KM-Log)	3.398
648					KM Standard Error of Mean (logged)	0.23					95% H-UCL (KM -Log)	0.526
649					KM SD (logged)	1.973					95% Critical H Value (KM-Log)	3.398
650					KM Standard Error of Mean (logged)	0.23						
651												
652	**DL/2 Statistics**											
653	**DL/2 Normal**						**DL/2 Log-Transformed**					
654					Mean in Original Scale	0.385					Mean in Log Scale	-3.3
655					SD in Original Scale	1.071					SD in Log Scale	2.071
656					95% t UCL (Assumes normality)	0.587					95% H-Stat UCL	0.724
657	**DL/2 is not a recommended method, provided for comparisons and historical reasons**											
658												
659	**Nonparametric Distribution Free UCL Statistics**											
660	**Detected Data appear Approximate Lognormal Distributed at 5% Significance Level**											
661												
662	**Suggested UCL to Use**											
663					KM H-UCL	0.526						
664												
665	Note: Suggestions regarding the selection of a 95% UCL are provided to help the user to select the most appropriate 95% UCL.											
666	Recommendations are based upon data size, data distribution, and skewness.											
667	These recommendations are based upon the results of the simulation studies summarized in Singh, Maichle, and Lee (2006).											
668	However, simulations results will not cover all Real World data sets; for additional insight the user may want to consult a statistician.											
669												

	A	B	C	D	E	F	G	H	I	J	K	L
670	Indeno[1,2,3-cd]pyrene											
671												
672	**General Statistics**											
673	Total Number of Observations					78	Number of Distinct Observations					64
674	Number of Detects					55	Number of Non-Detects					23
675	Number of Distinct Detects					48	Number of Distinct Non-Detects					17
676	Minimum Detect					0.014	Minimum Non-Detect					0.0072
677	Maximum Detect					18	Maximum Non-Detect					0.78
678	Variance Detects					7.674	Percent Non-Detects					29.49%
679	Mean Detects					1.064	SD Detects					2.77
680	Median Detects					0.13	CV Detects					2.604
681	Skewness Detects					4.808	Kurtosis Detects					26.77
682	Mean of Logged Detects					-1.55	SD of Logged Detects					1.695
683												
684	**Normal GOF Test on Detects Only**											
685	Shapiro Wilk Test Statistic					0.423	**Normal GOF Test on Detected Observations Only**					
686	5% Shapiro Wilk P Value					0	Detected Data Not Normal at 5% Significance Level					
687	Lilliefors Test Statistic					0.352	**Lilliefors GOF Test**					
688	5% Lilliefors Critical Value					0.119	Detected Data Not Normal at 5% Significance Level					
689	**Detected Data Not Normal at 5% Significance Level**											
690												
691	**Kaplan-Meier (KM) Statistics using Normal Critical Values and other Nonparametric UCLs**											
692	KM Mean					0.755	KM Standard Error of Mean					0.269
693	KM SD					2.354	95% KM (BCA) UCL					1.278
694	95% KM (t) UCL					1.203	95% KM (Percentile Bootstrap) UCL					1.248
695	95% KM (z) UCL					1.197	95% KM Bootstrap t UCL					1.718
696	90% KM Chebyshev UCL					1.562	95% KM Chebyshev UCL					1.927
697	97.5% KM Chebyshev UCL					2.435	99% KM Chebyshev UCL					3.431
698												
699	**Gamma GOF Tests on Detected Observations Only**											
700	A-D Test Statistic					4.069	**Anderson-Darling GOF Test**					
701	5% A-D Critical Value					0.837	Detected Data Not Gamma Distributed at 5% Significance Level					
702	K-S Test Statistic					0.246	**Kolmogorov-Smirnov GOF**					
703	5% K-S Critical Value					0.128	Detected Data Not Gamma Distributed at 5% Significance Level					
704	**Detected Data Not Gamma Distributed at 5% Significance Level**											
705												
706	**Gamma Statistics on Detected Data Only**											
707	k hat (MLE)					0.407	k star (bias corrected MLE)					0.397
708	Theta hat (MLE)					2.612	Theta star (bias corrected MLE)					2.678
709	nu hat (MLE)					44.79	nu star (bias corrected)					43.68
710	Mean (detects)					1.064						
711												
712	**Gamma ROS Statistics using Imputed Non-Detects**											
713	GROS may not be used when data set has > 50% NDs with many tied observations at multiple DLs											
714	GROS may not be used when kstar of detects is small such as <1.0, especially when the sample size is small (e.g., <15-20)											
715	For such situations, GROS method may yield incorrect values of UCLs and BTVs											
716	This is especially true when the sample size is small.											
717	For gamma distributed detected data, BTVs and UCLs may be computed using gamma distribution on KM estimates											
718	Minimum					0.01	Mean					0.753
719	Maximum					18	Median					0.0715
720	SD					2.37	CV					3.147
721	k hat (MLE)					0.316	k star (bias corrected MLE)					0.312

	A–E	F	G–K	L
722	Theta hat (MLE)	2.386	Theta star (bias corrected MLE)	2.413
723	nu hat (MLE)	49.24	nu star (bias corrected)	48.68
724	Adjusted Level of Significance (β)	0.0469		
725	Approximate Chi Square Value (48.68, α)	33.66	Adjusted Chi Square Value (48.68, β)	33.43
726	95% Gamma Approximate UCL (use when n>=50)	1.089	95% Gamma Adjusted UCL (use when n<50)	1.096
727				
728	**Estimates of Gamma Parameters using KM Estimates**			
729	Mean (KM)	0.755	SD (KM)	2.354
730	Variance (KM)	5.541	SE of Mean (KM)	0.269
731	k hat (KM)	0.103	k star (KM)	0.107
732	nu hat (KM)	16.04	nu star (KM)	16.75
733	theta hat (KM)	7.342	theta star (KM)	7.028
734	80% gamma percentile (KM)	0.578	90% gamma percentile (KM)	2.065
735	95% gamma percentile (KM)	4.358	99% gamma percentile (KM)	11.57
736				
737	**Gamma Kaplan-Meier (KM) Statistics**			
738	Approximate Chi Square Value (16.75, α)	8.496	Adjusted Chi Square Value (16.75, β)	8.386
739	95% Gamma Approximate KM-UCL (use when n>=50)	1.488	95% Gamma Adjusted KM-UCL (use when n<50)	1.508
740				
741	**Lognormal GOF Test on Detected Observations Only**			
742	Shapiro Wilk Approximate Test Statistic	0.934	**Shapiro Wilk GOF Test**	
743	5% Shapiro Wilk P Value	0.00662	Detected Data Not Lognormal at 5% Significance Level	
744	Lilliefors Test Statistic	0.166	**Lilliefors GOF Test**	
745	5% Lilliefors Critical Value	0.119	Detected Data Not Lognormal at 5% Significance Level	
746	**Detected Data Not Lognormal at 5% Significance Level**			
747				
748	**Lognormal ROS Statistics Using Imputed Non-Detects**			
749	Mean in Original Scale	0.753	Mean in Log Scale	-2.577
750	SD in Original Scale	2.37	SD in Log Scale	2.177
751	95% t UCL (assumes normality of ROS data)	1.199	95% Percentile Bootstrap UCL	1.227
752	95% BCA Bootstrap UCL	1.433	95% Bootstrap t UCL	1.691
753	95% H-UCL (Log ROS)	2.018		
754				
755	**Statistics using KM estimates on Logged Data and Assuming Lognormal Distribution**			
756	KM Mean (logged)	-2.47	KM Geo Mean	0.0846
757	KM SD (logged)	2.04	95% Critical H Value (KM-Log)	3.486
758	KM Standard Error of Mean (logged)	0.236	95% H-UCL (KM -Log)	1.524
759	KM SD (logged)	2.04	95% Critical H Value (KM-Log)	3.486
760	KM Standard Error of Mean (logged)	0.236		
761				
762	**DL/2 Statistics**			
763	**DL/2 Normal**		**DL/2 Log-Transformed**	
764	Mean in Original Scale	0.759	Mean in Log Scale	-2.487
765	SD in Original Scale	2.368	SD in Log Scale	2.148
766	95% t UCL (Assumes normality)	1.205	95% H-Stat UCL	2.03
767	**DL/2 is not a recommended method, provided for comparisons and historical reasons**			
768				
769	**Nonparametric Distribution Free UCL Statistics**			
770	**Data do not follow a Discernible Distribution at 5% Significance Level**			
771				
772	**Suggested UCL to Use**			
773	95% KM (Chebyshev) UCL	1.927		

	A	B	C	D	E	F	G	H	I	J	K	L
774												
775	Note: Suggestions regarding the selection of a 95% UCL are provided to help the user to select the most appropriate 95% UCL.											
776	Recommendations are based upon data size, data distribution, and skewness.											
777	These recommendations are based upon the results of the simulation studies summarized in Singh, Maichle, and Lee (2006).											
778	However, simulations results will not cover all Real World data sets; for additional insight the user may want to consult a statistician.											
779												
780	**Naphthalene**											
781												
782	**General Statistics**											
783	Total Number of Observations					78	Number of Distinct Observations					51
784	Number of Detects					28	Number of Non-Detects					50
785	Number of Distinct Detects					23	Number of Distinct Non-Detects					32
786	Minimum Detect					0.0076	Minimum Non-Detect					0.0057
787	Maximum Detect					32	Maximum Non-Detect					0.65
788	Variance Detects					36.4	Percent Non-Detects					64.1%
789	Mean Detects					1.383	SD Detects					6.033
790	Median Detects					0.0445	CV Detects					4.361
791	Skewness Detects					5.204	Kurtosis Detects					27.32
792	Mean of Logged Detects					-2.505	SD of Logged Detects					1.804
793												
794	**Normal GOF Test on Detects Only**											
795	Shapiro Wilk Test Statistic					0.24	**Shapiro Wilk GOF Test**					
796	5% Shapiro Wilk Critical Value					0.924	Detected Data Not Normal at 5% Significance Level					
797	Lilliefors Test Statistic					0.45	**Lilliefors GOF Test**					
798	5% Lilliefors Critical Value					0.164	Detected Data Not Normal at 5% Significance Level					
799	**Detected Data Not Normal at 5% Significance Level**											
800												
801	**Kaplan-Meier (KM) Statistics using Normal Critical Values and other Nonparametric UCLs**											
802	KM Mean					0.503	KM Standard Error of Mean					0.416
803	KM SD					3.61	95% KM (BCA) UCL					1.334
804	95% KM (t) UCL					1.196	95% KM (Percentile Bootstrap) UCL					1.325
805	95% KM (z) UCL					1.188	95% KM Bootstrap t UCL					12.47
806	90% KM Chebyshev UCL					1.752	95% KM Chebyshev UCL					2.318
807	97.5% KM Chebyshev UCL					3.103	99% KM Chebyshev UCL					4.645
808												
809	**Gamma GOF Tests on Detected Observations Only**											
810	A-D Test Statistic					5.281	**Anderson-Darling GOF Test**					
811	5% A-D Critical Value					0.878	Detected Data Not Gamma Distributed at 5% Significance Level					
812	K-S Test Statistic					0.374	**Kolmogorov-Smirnov GOF**					
813	5% K-S Critical Value					0.182	Detected Data Not Gamma Distributed at 5% Significance Level					
814	**Detected Data Not Gamma Distributed at 5% Significance Level**											
815												
816	**Gamma Statistics on Detected Data Only**											
817	k hat (MLE)					0.251	k star (bias corrected MLE)					0.248
818	Theta hat (MLE)					5.513	Theta star (bias corrected MLE)					5.582
819	nu hat (MLE)					14.05	nu star (bias corrected)					13.88
820	Mean (detects)					1.383						
821												
822	**Gamma ROS Statistics using Imputed Non-Detects**											
823	GROS may not be used when data set has > 50% NDs with many tied observations at multiple DLs											
824	GROS may not be used when kstar of detects is small such as <1.0, especially when the sample size is small (e.g., <15-20)											
825	For such situations, GROS method may yield incorrect values of UCLs and BTVs											

	A	B	C	D	E	F	G	H	I	J	K	L
826	This is especially true when the sample size is small.											
827	For gamma distributed detected data, BTVs and UCLs may be computed using gamma distribution on KM estimates											
828					Minimum	0.0076				Mean		0.503
829					Maximum	32				Median		0.01
830					SD	3.634				CV		7.224
831					k hat (MLE)	0.228				k star (bias corrected MLE)		0.228
832					Theta hat (MLE)	2.207				Theta star (bias corrected MLE)		2.21
833					nu hat (MLE)	35.55				nu star (bias corrected)		35.51
834					Adjusted Level of Significance (β)	0.0469						
835					Approximate Chi Square Value (35.51, α)	22.88				Adjusted Chi Square Value (35.51, β)		22.69
836					95% Gamma Approximate UCL (use when n>=50)	0.781				95% Gamma Adjusted UCL (use when n<50)		0.787
837												
838	**Estimates of Gamma Parameters using KM Estimates**											
839					Mean (KM)	0.503				SD (KM)		3.61
840					Variance (KM)	13.03				SE of Mean (KM)		0.416
841					k hat (KM)	0.0194				k star (KM)		0.0272
842					nu hat (KM)	3.028				nu star (KM)		4.245
843					theta hat (KM)	25.91				theta star (KM)		18.48
844					80% gamma percentile (KM)	0.00291				90% gamma percentile (KM)		0.224
845					95% gamma percentile (KM)	1.764				99% gamma percentile (KM)		13.31
846												
847	**Gamma Kaplan-Meier (KM) Statistics**											
848					Approximate Chi Square Value (4.25, α)	0.821				Adjusted Chi Square Value (4.25, β)		0.794
849					95% Gamma Approximate KM-UCL (use when n>=50)	2.601				95% Gamma Adjusted KM-UCL (use when n<50)		2.689
850												
851	**Lognormal GOF Test on Detected Observations Only**											
852					Shapiro Wilk Test Statistic	0.822				**Shapiro Wilk GOF Test**		
853					5% Shapiro Wilk Critical Value	0.924				Detected Data Not Lognormal at 5% Significance Level		
854					Lilliefors Test Statistic	0.22				**Lilliefors GOF Test**		
855					5% Lilliefors Critical Value	0.164				Detected Data Not Lognormal at 5% Significance Level		
856	**Detected Data Not Lognormal at 5% Significance Level**											
857												
858	**Lognormal ROS Statistics Using Imputed Non-Detects**											
859					Mean in Original Scale	0.498				Mean in Log Scale		-5.153
860					SD in Original Scale	3.634				SD in Log Scale		2.407
861					95% t UCL (assumes normality of ROS data)	1.183				95% Percentile Bootstrap UCL		1.301
862					95% BCA Bootstrap UCL	1.784				95% Bootstrap t UCL		15.19
863					95% H-UCL (Log ROS)	0.312						
864												
865	**Statistics using KM estimates on Logged Data and Assuming Lognormal Distribution**											
866					KM Mean (logged)	-4.067				KM Geo Mean		0.0171
867					KM SD (logged)	1.651				95% Critical H Value (KM-Log)		2.992
868					KM Standard Error of Mean (logged)	0.199				95% H-UCL (KM -Log)		0.117
869					KM SD (logged)	1.651				95% Critical H Value (KM-Log)		2.992
870					KM Standard Error of Mean (logged)	0.199						
871												
872	**DL/2 Statistics**											
873	**DL/2 Normal**						**DL/2 Log-Transformed**					
874					Mean in Original Scale	0.517				Mean in Log Scale		-3.861
875					SD in Original Scale	3.632				SD in Log Scale		1.833
876					95% t UCL (Assumes normality)	1.201				95% H-Stat UCL		0.221
877	**DL/2 is not a recommended method, provided for comparisons and historical reasons**											

	A	B	C	D	E	F	G	H	I	J	K	L
878												
879	**Nonparametric Distribution Free UCL Statistics**											
880	**Data do not follow a Discernible Distribution at 5% Significance Level**											
881												
882	**Suggested UCL to Use**											
883					95% KM (Chebyshev) UCL	2.318						
884												
885	Note: Suggestions regarding the selection of a 95% UCL are provided to help the user to select the most appropriate 95% UCL.											
886	Recommendations are based upon data size, data distribution, and skewness.											
887	These recommendations are based upon the results of the simulation studies summarized in Singh, Maichle, and Lee (2006).											
888	However, simulations results will not cover all Real World data sets; for additional insight the user may want to consult a statistician.											
889												
890	**1,1'-Biphenyl**											
891												
892	**General Statistics**											
893					Total Number of Observations	71			Number of Distinct Observations		31	
894					Number of Detects	9			Number of Non-Detects		62	
895					Number of Distinct Detects	9			Number of Distinct Non-Detects		23	
896					Minimum Detect	0.013			Minimum Non-Detect		0.03	
897					Maximum Detect	6.3			Maximum Non-Detect		3.4	
898					Variance Detects	4.329			Percent Non-Detects		87.32%	
899					Mean Detects	0.754			SD Detects		2.081	
900					Median Detects	0.066			CV Detects		2.761	
901					Skewness Detects	2.996			Kurtosis Detects		8.984	
902					Mean of Logged Detects	-2.666			SD of Logged Detects		1.937	
903												
904	**Normal GOF Test on Detects Only**											
905					Shapiro Wilk Test Statistic	0.411			**Shapiro Wilk GOF Test**			
906					5% Shapiro Wilk Critical Value	0.829			Detected Data Not Normal at 5% Significance Level			
907					Lilliefors Test Statistic	0.499			**Lilliefors GOF Test**			
908					5% Lilliefors Critical Value	0.274			Detected Data Not Normal at 5% Significance Level			
909	**Detected Data Not Normal at 5% Significance Level**											
910												
911	**Kaplan-Meier (KM) Statistics using Normal Critical Values and other Nonparametric UCLs**											
912					KM Mean	0.111			KM Standard Error of Mean		0.0932	
913					KM SD	0.74			95% KM (BCA) UCL		0.292	
914					95% KM (t) UCL	0.267			95% KM (Percentile Bootstrap) UCL		0.288	
915					95% KM (z) UCL	0.265			95% KM Bootstrap t UCL		3.229	
916					90% KM Chebyshev UCL	0.391			95% KM Chebyshev UCL		0.518	
917					97.5% KM Chebyshev UCL	0.693			99% KM Chebyshev UCL		1.039	
918												
919	**Gamma GOF Tests on Detected Observations Only**											
920					A-D Test Statistic	1.6			**Anderson-Darling GOF Test**			
921					5% A-D Critical Value	0.811			Detected Data Not Gamma Distributed at 5% Significance Level			
922					K-S Test Statistic	0.392			**Kolmogorov-Smirnov GOF**			
923					5% K-S Critical Value	0.302			Detected Data Not Gamma Distributed at 5% Significance Level			
924	**Detected Data Not Gamma Distributed at 5% Significance Level**											
925												
926	**Gamma Statistics on Detected Data Only**											
927					k hat (MLE)	0.291			k star (bias corrected MLE)		0.268	
928					Theta hat (MLE)	2.591			Theta star (bias corrected MLE)		2.812	

	A	B	C	D	E	F	G	H	I	J	K	L
929					nu hat (MLE)	5.234				nu star (bias corrected)		4.823
930					Mean (detects)	0.754						
931												
932					**Gamma ROS Statistics using Imputed Non-Detects**							
933					GROS may not be used when data set has > 50% NDs with many tied observations at multiple DLs							
934					GROS may not be used when kstar of detects is small such as <1.0, especially when the sample size is small (e.g., <15-20)							
935					For such situations, GROS method may yield incorrect values of UCLs and BTVs							
936					This is especially true when the sample size is small.							
937					For gamma distributed detected data, BTVs and UCLs may be computed using gamma distribution on KM estimates							
938					Minimum	0.01				Mean		0.104
939					Maximum	6.3				Median		0.01
940					SD	0.746				CV		7.157
941					k hat (MLE)	0.324				k star (bias corrected MLE)		0.32
942					Theta hat (MLE)	0.321				Theta star (bias corrected MLE)		0.326
943					nu hat (MLE)	46.07				nu star (bias corrected)		45.46
944					Adjusted Level of Significance (β)	0.0466						
945					Approximate Chi Square Value (45.46, α)	30.99				Adjusted Chi Square Value (45.46, β)		30.74
946					95% Gamma Approximate UCL (use when n>=50)	0.153				95% Gamma Adjusted UCL (use when n<50)		0.154
947												
948					**Estimates of Gamma Parameters using KM Estimates**							
949					Mean (KM)	0.111				SD (KM)		0.74
950					Variance (KM)	0.548				SE of Mean (KM)		0.0932
951					k hat (KM)	0.0227				k star (KM)		0.0311
952					nu hat (KM)	3.22				nu star (KM)		4.418
953					theta hat (KM)	4.915				theta star (KM)		3.583
954					80% gamma percentile (KM)	0.00158				90% gamma percentile (KM)		0.0711
955					95% gamma percentile (KM)	0.446				99% gamma percentile (KM)		2.849
956												
957					**Gamma Kaplan-Meier (KM) Statistics**							
958					Approximate Chi Square Value (4.42, α)	0.893				Adjusted Chi Square Value (4.42, β)		0.862
959					95% Gamma Approximate KM-UCL (use when n>=50)	0.551				95% Gamma Adjusted KM-UCL (use when n<50)		0.571
960												
961					**Lognormal GOF Test on Detected Observations Only**							
962					Shapiro Wilk Test Statistic	0.805				**Shapiro Wilk GOF Test**		
963					5% Shapiro Wilk Critical Value	0.829				Detected Data Not Lognormal at 5% Significance Level		
964					Lilliefors Test Statistic	0.216				**Lilliefors GOF Test**		
965					5% Lilliefors Critical Value	0.274				Detected Data appear Lognormal at 5% Significance Level		
966					**Detected Data appear Approximate Lognormal at 5% Significance Level**							
967												
968					**Lognormal ROS Statistics Using Imputed Non-Detects**							
969					Mean in Original Scale	0.114				Mean in Log Scale		-3.97
970					SD in Original Scale	0.745				SD in Log Scale		1.104
971					95% t UCL (assumes normality of ROS data)	0.261				95% Percentile Bootstrap UCL		0.29
972					95% BCA Bootstrap UCL	0.466				95% Bootstrap t UCL		3.782
973					95% H-UCL (Log ROS)	0.0474						
974												
975					**Statistics using KM estimates on Logged Data and Assuming Lognormal Distribution**							
976					KM Mean (logged)	-3.91				KM Geo Mean		0.02
977					KM SD (logged)	0.861				95% Critical H Value (KM-Log)		2.122
978					KM Standard Error of Mean (logged)	0.141				95% H-UCL (KM -Log)		0.0361
979					KM SD (logged)	0.861				95% Critical H Value (KM-Log)		2.122
980					KM Standard Error of Mean (logged)	0.141						

	A	B	C	D	E	F	G	H	I	J	K	L
981												
982						DL/2 Statistics						
983				DL/2 Normal					DL/2 Log-Transformed			
984					Mean in Original Scale	0.215					Mean in Log Scale	-3.147
985					SD in Original Scale	0.795					SD in Log Scale	1.407
986					95% t UCL (Assumes normality)	0.372					95% H-Stat UCL	0.182
987						DL/2 is not a recommended method, provided for comparisons and historical reasons						
988												
989						Nonparametric Distribution Free UCL Statistics						
990						Detected Data appear Approximate Lognormal Distributed at 5% Significance Level						
991												
992						Suggested UCL to Use						
993						KM H-UCL	0.0361					
994												
995						Note: Suggestions regarding the selection of a 95% UCL are provided to help the user to select the most appropriate 95% UCL.						
996						Recommendations are based upon data size, data distribution, and skewness.						
997						These recommendations are based upon the results of the simulation studies summarized in Singh, Maichle, and Lee (2006).						
998						However, simulations results will not cover all Real World data sets; for additional insight the user may want to consult a statistician.						
999												
1000	2-Methylnaphthalene											
1001												
1002						General Statistics						
1003					Total Number of Observations	71					Number of Distinct Observations	52
1004					Number of Detects	47					Number of Non-Detects	24
1005					Number of Distinct Detects	38					Number of Distinct Non-Detects	18
1006					Minimum Detect	0.0081					Minimum Non-Detect	0.0061
1007					Maximum Detect	76					Maximum Non-Detect	0.68
1008					Variance Detects	130.6					Percent Non-Detects	33.8%
1009					Mean Detects	2.307					SD Detects	11.43
1010					Median Detects	0.049					CV Detects	4.954
1011					Skewness Detects	6.181					Kurtosis Detects	39.8
1012					Mean of Logged Detects	-2.535					SD of Logged Detects	1.854
1013												
1014						Normal GOF Test on Detects Only						
1015					Shapiro Wilk Test Statistic	0.222					Shapiro Wilk GOF Test	
1016					5% Shapiro Wilk Critical Value	0.946					Detected Data Not Normal at 5% Significance Level	
1017					Lilliefors Test Statistic	0.482					Lilliefors GOF Test	
1018					5% Lilliefors Critical Value	0.128					Detected Data Not Normal at 5% Significance Level	
1019						Detected Data Not Normal at 5% Significance Level						
1020												
1021						Kaplan-Meier (KM) Statistics using Normal Critical Values and other Nonparametric UCLs						
1022					KM Mean	1.532					KM Standard Error of Mean	1.111
1023					KM SD	9.262					95% KM (BCA) UCL	3.365
1024					95% KM (t) UCL	3.384					95% KM (Percentile Bootstrap) UCL	3.715
1025					95% KM (z) UCL	3.36					95% KM Bootstrap t UCL	58.3
1026					90% KM Chebyshev UCL	4.866					95% KM Chebyshev UCL	6.376
1027					97.5% KM Chebyshev UCL	8.471					99% KM Chebyshev UCL	12.59
1028												
1029						Gamma GOF Tests on Detected Observations Only						
1030					A-D Test Statistic	9.976					Anderson-Darling GOF Test	
1031					5% A-D Critical Value	0.904					Detected Data Not Gamma Distributed at 5% Significance Level	
1032					K-S Test Statistic	0.384					Kolmogorov-Smirnov GOF	

	A	B	C	D	E	F	G	H	I	J	K	L
1033					5% K-S Critical Value	0.143	Detected Data Not Gamma Distributed at 5% Significance Level					
1034					Detected Data Not Gamma Distributed at 5% Significance Level							
1035												
1036					Gamma Statistics on Detected Data Only							
1037					k hat (MLE)	0.216				k star (bias corrected MLE)		0.216
1038					Theta hat (MLE)	10.69				Theta star (bias corrected MLE)		10.67
1039					nu hat (MLE)	20.28				nu star (bias corrected)		20.32
1040					Mean (detects)	2.307						
1041												
1042					Gamma ROS Statistics using Imputed Non-Detects							
1043					GROS may not be used when data set has > 50% NDs with many tied observations at multiple DLs							
1044					GROS may not be used when kstar of detects is small such as <1.0, especially when the sample size is small (e.g., <15-20)							
1045					For such situations, GROS method may yield incorrect values of UCLs and BTVs							
1046					This is especially true when the sample size is small.							
1047					For gamma distributed detected data, BTVs and UCLs may be computed using gamma distribution on KM estimates							
1048					Minimum	0.0081				Mean		1.53
1049					Maximum	76				Median		0.022
1050					SD	9.329				CV		6.096
1051					k hat (MLE)	0.201				k star (bias corrected MLE)		0.202
1052					Theta hat (MLE)	7.617				Theta star (bias corrected MLE)		7.583
1053					nu hat (MLE)	28.53				nu star (bias corrected)		28.66
1054					Adjusted Level of Significance (β)	0.0466						
1055					Approximate Chi Square Value (28.66, α)	17.44				Adjusted Chi Square Value (28.66, β)		17.26
1056					95% Gamma Approximate UCL (use when n>=50)	2.515				95% Gamma Adjusted UCL (use when n<50)		2.541
1057												
1058					Estimates of Gamma Parameters using KM Estimates							
1059					Mean (KM)	1.532				SD (KM)		9.262
1060					Variance (KM)	85.79				SE of Mean (KM)		1.111
1061					k hat (KM)	0.0274				k star (KM)		0.0356
1062					nu hat (KM)	3.885				nu star (KM)		5.055
1063					theta hat (KM)	56				theta star (KM)		43.04
1064					80% gamma percentile (KM)	0.0472				90% gamma percentile (KM)		1.328
1065					95% gamma percentile (KM)	6.823				99% gamma percentile (KM)		37.63
1066												
1067					Gamma Kaplan-Meier (KM) Statistics							
1068					Approximate Chi Square Value (5.05, α)	1.178				Adjusted Chi Square Value (5.05, β)		1.14
1069					95% Gamma Approximate KM-UCL (use when n>=50)	6.577				95% Gamma Adjusted KM-UCL (use when n<50)		6.793
1070												
1071					Lognormal GOF Test on Detected Observations Only							
1072					Shapiro Wilk Test Statistic	0.8				Shapiro Wilk GOF Test		
1073					5% Shapiro Wilk Critical Value	0.946				Detected Data Not Lognormal at 5% Significance Level		
1074					Lilliefors Test Statistic	0.182				Lilliefors GOF Test		
1075					5% Lilliefors Critical Value	0.128				Detected Data Not Lognormal at 5% Significance Level		
1076					Detected Data Not Lognormal at 5% Significance Level							
1077												
1078					Lognormal ROS Statistics Using Imputed Non-Detects							
1079					Mean in Original Scale	1.53				Mean in Log Scale		-3.534
1080					SD in Original Scale	9.329				SD in Log Scale		2.158
1081					95% t UCL (assumes normality of ROS data)	3.375				95% Percentile Bootstrap UCL		3.653
1082					95% BCA Bootstrap UCL	5.495				95% Bootstrap t UCL		56.16
1083					95% H-UCL (Log ROS)	0.759						
1084												

	A	B	C	D	E	F	G	H	I	J	K	L
1085	Statistics using KM estimates on Logged Data and Assuming Lognormal Distribution											
1086					KM Mean (logged)	-3.239					KM Geo Mean	0.0392
1087					KM SD (logged)	1.845					95% Critical H Value (KM-Log)	3.206
1088					KM Standard Error of Mean (logged)	0.226					95% H-UCL (KM -Log)	0.436
1089					KM SD (logged)	1.845					95% Critical H Value (KM-Log)	3.206
1090					KM Standard Error of Mean (logged)	0.226						
1091												
1092	DL/2 Statistics											
1093	DL/2 Normal						DL/2 Log-Transformed					
1094					Mean in Original Scale	1.542					Mean in Log Scale	-3.181
1095					SD in Original Scale	9.327					SD in Log Scale	1.955
1096					95% t UCL (Assumes normality)	3.387					95% H-Stat UCL	0.614
1097	DL/2 is not a recommended method, provided for comparisons and historical reasons											
1098												
1099	Nonparametric Distribution Free UCL Statistics											
1100	Data do not follow a Discernible Distribution at 5% Significance Level											
1101												
1102	Suggested UCL to Use											
1103					95% KM (Chebyshev) UCL	6.376						
1104												
1105	Note: Suggestions regarding the selection of a 95% UCL are provided to help the user to select the most appropriate 95% UCL.											
1106	Recommendations are based upon data size, data distribution, and skewness.											
1107	These recommendations are based upon the results of the simulation studies summarized in Singh, Maichle, and Lee (2006).											
1108	However, simulations results will not cover all Real World data sets; for additional insight the user may want to consult a statistician.											
1109												
1110	Dibenzofuran											
1111												
1112	General Statistics											
1113					Total Number of Observations	71					Number of Distinct Observations	31
1114					Number of Detects	11					Number of Non-Detects	60
1115					Number of Distinct Detects	9					Number of Distinct Non-Detects	23
1116					Minimum Detect	0.055					Minimum Non-Detect	0.034
1117					Maximum Detect	13					Maximum Non-Detect	3.7
1118					Variance Detects	14.86					Percent Non-Detects	84.51%
1119					Mean Detects	1.455					SD Detects	3.854
1120					Median Detects	0.13					CV Detects	2.649
1121					Skewness Detects	3.242					Kurtosis Detects	10.61
1122					Mean of Logged Detects	-1.364					SD of Logged Detects	1.588
1123												
1124	Normal GOF Test on Detects Only											
1125					Shapiro Wilk Test Statistic	0.413	Shapiro Wilk GOF Test					
1126					5% Shapiro Wilk Critical Value	0.85	Detected Data Not Normal at 5% Significance Level					
1127					Lilliefors Test Statistic	0.437	Lilliefors GOF Test					
1128					5% Lilliefors Critical Value	0.251	Detected Data Not Normal at 5% Significance Level					
1129	Detected Data Not Normal at 5% Significance Level											
1130												
1131	Kaplan-Meier (KM) Statistics using Normal Critical Values and other Nonparametric UCLs											
1132					KM Mean	0.26					KM Standard Error of Mean	0.191
1133					KM SD	1.535					95% KM (BCA) UCL	0.627
1134					95% KM (t) UCL	0.579					95% KM (Percentile Bootstrap) UCL	0.624
1135					95% KM (z) UCL	0.574					95% KM Bootstrap t UCL	5.844

	A	B	C	D	E	F	G	H	I	J	K	L
1136					90% KM Chebyshev UCL	0.833				95% KM Chebyshev UCL		1.093
1137					97.5% KM Chebyshev UCL	1.454				99% KM Chebyshev UCL		2.162
1138												
1139					Gamma GOF Tests on Detected Observations Only							
1140					A-D Test Statistic	1.874	Anderson-Darling GOF Test					
1141					5% A-D Critical Value	0.804	Detected Data Not Gamma Distributed at 5% Significance Level					
1142					K-S Test Statistic	0.406	Kolmogorov-Smirnov GOF					
1143					5% K-S Critical Value	0.273	Detected Data Not Gamma Distributed at 5% Significance Level					
1144					Detected Data Not Gamma Distributed at 5% Significance Level							
1145												
1146					Gamma Statistics on Detected Data Only							
1147					k hat (MLE)	0.381	k star (bias corrected MLE)					0.338
1148					Theta hat (MLE)	3.815	Theta star (bias corrected MLE)					4.305
1149					nu hat (MLE)	8.39	nu star (bias corrected)					7.435
1150					Mean (detects)	1.455						
1151												
1152					Gamma ROS Statistics using Imputed Non-Detects							
1153					GROS may not be used when data set has > 50% NDs with many tied observations at multiple DLs							
1154					GROS may not be used when kstar of detects is small such as <1.0, especially when the sample size is small (e.g., <15-20)							
1155					For such situations, GROS method may yield incorrect values of UCLs and BTVs							
1156					This is especially true when the sample size is small.							
1157					For gamma distributed detected data, BTVs and UCLs may be computed using gamma distribution on KM estimates							
1158					Minimum	0.01	Mean					0.234
1159					Maximum	13	Median					0.01
1160					SD	1.549	CV					6.623
1161					k hat (MLE)	0.265	k star (bias corrected MLE)					0.264
1162					Theta hat (MLE)	0.881	Theta star (bias corrected MLE)					0.887
1163					nu hat (MLE)	37.69	nu star (bias corrected)					37.43
1164					Adjusted Level of Significance (β)	0.0466						
1165					Approximate Chi Square Value (37.43, α)	24.43	Adjusted Chi Square Value (37.43, β)					24.21
1166					95% Gamma Approximate UCL (use when n>=50)	0.358	95% Gamma Adjusted UCL (use when n<50)					0.362
1167												
1168					Estimates of Gamma Parameters using KM Estimates							
1169					Mean (KM)	0.26	SD (KM)					1.535
1170					Variance (KM)	2.356	SE of Mean (KM)					0.191
1171					k hat (KM)	0.0287	k star (KM)					0.0368
1172					nu hat (KM)	4.069	nu star (KM)					5.23
1173					theta hat (KM)	9.068	theta star (KM)					7.055
1174					80% gamma percentile (KM)	0.00956	90% gamma percentile (KM)					0.241
1175					95% gamma percentile (KM)	1.185	99% gamma percentile (KM)					6.313
1176												
1177					Gamma Kaplan-Meier (KM) Statistics							
1178					Approximate Chi Square Value (5.23, α)	1.26	Adjusted Chi Square Value (5.23, β)					1.221
1179					95% Gamma Approximate KM-UCL (use when n>=50)	1.079	95% Gamma Adjusted KM-UCL (use when n<50)					1.113
1180												
1181					Lognormal GOF Test on Detected Observations Only							
1182					Shapiro Wilk Test Statistic	0.798	Shapiro Wilk GOF Test					
1183					5% Shapiro Wilk Critical Value	0.85	Detected Data Not Lognormal at 5% Significance Level					
1184					Lilliefors Test Statistic	0.287	Lilliefors GOF Test					
1185					5% Lilliefors Critical Value	0.251	Detected Data Not Lognormal at 5% Significance Level					
1186					Detected Data Not Lognormal at 5% Significance Level							
1187												

	A	B	C	D	E	F	G	H	I	J	K	L
1188	Lognormal ROS Statistics Using Imputed Non-Detects											
1189					Mean in Original Scale	0.229					Mean in Log Scale	-5.735
1190					SD in Original Scale	1.55					SD in Log Scale	2.454
1191				95% t UCL (assumes normality of ROS data)		0.535					95% Percentile Bootstrap UCL	0.594
1192					95% BCA Bootstrap UCL	0.924					95% Bootstrap t UCL	5.933
1193					95% H-UCL (Log ROS)	0.212						
1194												
1195	Statistics using KM estimates on Logged Data and Assuming Lognormal Distribution											
1196					KM Mean (logged)	-3.007					KM Geo Mean	0.0495
1197					KM SD (logged)	0.969					95% Critical H Value (KM-Log)	2.221
1198					KM Standard Error of Mean (logged)	0.127					95% H-UCL (KM -Log)	0.102
1199					KM SD (logged)	0.969					95% Critical H Value (KM-Log)	2.221
1200					KM Standard Error of Mean (logged)	0.127						
1201												
1202	DL/2 Statistics											
1203				DL/2 Normal						DL/2 Log-Transformed		
1204					Mean in Original Scale	0.357					Mean in Log Scale	-2.82
1205					SD in Original Scale	1.568					SD in Log Scale	1.499
1206					95% t UCL (Assumes normality)	0.667					95% H-Stat UCL	0.302
1207	DL/2 is not a recommended method, provided for comparisons and historical reasons											
1208												
1209	Nonparametric Distribution Free UCL Statistics											
1210	Data do not follow a Discernible Distribution at 5% Significance Level											
1211												
1212	Suggested UCL to Use											
1213					95% KM (Chebyshev) UCL	1.093						
1214												
1215	Note: Suggestions regarding the selection of a 95% UCL are provided to help the user to select the most appropriate 95% UCL.											
1216	Recommendations are based upon data size, data distribution, and skewness.											
1217	These recommendations are based upon the results of the simulation studies summarized in Singh, Maichle, and Lee (2006).											
1218	However, simulations results will not cover all Real World data sets; for additional insight the user may want to consult a statistician.											
1219												
1220	PCB-1254											
1221												
1222	General Statistics											
1223					Total Number of Observations	69					Number of Distinct Observations	22
1224					Number of Detects	11					Number of Non-Detects	58
1225					Number of Distinct Detects	11					Number of Distinct Non-Detects	11
1226					Minimum Detect	0.011					Minimum Non-Detect	6.5000E-4
1227					Maximum Detect	0.58					Maximum Non-Detect	0.064
1228					Variance Detects	0.0409					Percent Non-Detects	84.06%
1229					Mean Detects	0.155					SD Detects	0.202
1230					Median Detects	0.035					CV Detects	1.309
1231					Skewness Detects	1.323					Kurtosis Detects	0.52
1232					Mean of Logged Detects	-2.81					SD of Logged Detects	1.481
1233												
1234	Normal GOF Test on Detects Only											
1235					Shapiro Wilk Test Statistic	0.746					Shapiro Wilk GOF Test	
1236					5% Shapiro Wilk Critical Value	0.85					Detected Data Not Normal at 5% Significance Level	
1237					Lilliefors Test Statistic	0.349					Lilliefors GOF Test	
1238					5% Lilliefors Critical Value	0.251					Detected Data Not Normal at 5% Significance Level	
1239	Detected Data Not Normal at 5% Significance Level											

	A	B	C	D	E	F	G	H	I	J	K	L
1240												
1241	**Kaplan-Meier (KM) Statistics using Normal Critical Values and other Nonparametric UCLs**											
1242					KM Mean	0.0252				KM Standard Error of Mean		0.012
1243					KM SD	0.0954				95% KM (BCA) UCL		0.0494
1244					95% KM (t) UCL	0.0453				95% KM (Percentile Bootstrap) UCL		0.0455
1245					95% KM (z) UCL	0.045				95% KM Bootstrap t UCL		0.0672
1246					90% KM Chebyshev UCL	0.0614				95% KM Chebyshev UCL		0.0777
1247					97.5% KM Chebyshev UCL	0.1				99% KM Chebyshev UCL		0.145
1248												
1249	**Gamma GOF Tests on Detected Observations Only**											
1250					A-D Test Statistic	0.869	**Anderson-Darling GOF Test**					
1251					5% A-D Critical Value	0.77	Detected Data Not Gamma Distributed at 5% Significance Level					
1252					K-S Test Statistic	0.304	**Kolmogorov-Smirnov GOF**					
1253					5% K-S Critical Value	0.267	Detected Data Not Gamma Distributed at 5% Significance Level					
1254	**Detected Data Not Gamma Distributed at 5% Significance Level**											
1255												
1256	**Gamma Statistics on Detected Data Only**											
1257					k hat (MLE)	0.648				k star (bias corrected MLE)		0.532
1258					Theta hat (MLE)	0.238				Theta star (bias corrected MLE)		0.29
1259					nu hat (MLE)	14.26				nu star (bias corrected)		11.7
1260					Mean (detects)	0.155						
1261												
1262	**Gamma ROS Statistics using Imputed Non-Detects**											
1263	GROS may not be used when data set has > 50% NDs with many tied observations at multiple DLs											
1264	GROS may not be used when kstar of detects is small such as <1.0, especially when the sample size is small (e.g., <15-20)											
1265	For such situations, GROS method may yield incorrect values of UCLs and BTVs											
1266	This is especially true when the sample size is small.											
1267	For gamma distributed detected data, BTVs and UCLs may be computed using gamma distribution on KM estimates											
1268					Minimum	0.01				Mean		0.033
1269					Maximum	0.58				Median		0.01
1270					SD	0.0941				CV		2.849
1271					k hat (MLE)	0.669				k star (bias corrected MLE)		0.65
1272					Theta hat (MLE)	0.0494				Theta star (bias corrected MLE)		0.0509
1273					nu hat (MLE)	92.33				nu star (bias corrected)		89.65
1274					Adjusted Level of Significance (β)	0.0465						
1275					Approximate Chi Square Value (89.65, α)	68.82				Adjusted Chi Square Value (89.65, β)		68.43
1276					95% Gamma Approximate UCL (use when n>=50)	0.043				95% Gamma Adjusted UCL (use when n<50)		0.0433
1277												
1278	**Estimates of Gamma Parameters using KM Estimates**											
1279					Mean (KM)	0.0252				SD (KM)		0.0954
1280					Variance (KM)	0.00911				SE of Mean (KM)		0.012
1281					k hat (KM)	0.0699				k star (KM)		0.0765
1282					nu hat (KM)	9.645				nu star (KM)		10.56
1283					theta hat (KM)	0.361				theta star (KM)		0.33
1284					80% gamma percentile (KM)	0.011				90% gamma percentile (KM)		0.0581
1285					95% gamma percentile (KM)	0.146				99% gamma percentile (KM)		0.456
1286												
1287	**Gamma Kaplan-Meier (KM) Statistics**											
1288					Approximate Chi Square Value (10.56, α)	4.294				Adjusted Chi Square Value (10.56, β)		4.209
1289					95% Gamma Approximate KM-UCL (use when n>=50)	0.062				95% Gamma Adjusted KM-UCL (use when n<50)		0.0633
1290												

	A	B	C	D	E	F	G	H	I	J	K	L
1291	Lognormal GOF Test on Detected Observations Only											
1292					Shapiro Wilk Test Statistic	0.868	Shapiro Wilk GOF Test					
1293					5% Shapiro Wilk Critical Value	0.85	Detected Data appear Lognormal at 5% Significance Level					
1294					Lilliefors Test Statistic	0.239	Lilliefors GOF Test					
1295					5% Lilliefors Critical Value	0.251	Detected Data appear Lognormal at 5% Significance Level					
1296	Detected Data appear Lognormal at 5% Significance Level											
1297												
1298	Lognormal ROS Statistics Using Imputed Non-Detects											
1299					Mean in Original Scale	0.0251	Mean in Log Scale					-8.137
1300					SD in Original Scale	0.0961	SD in Log Scale					3.169
1301					95% t UCL (assumes normality of ROS data)	0.0444	95% Percentile Bootstrap UCL					0.0457
1302					95% BCA Bootstrap UCL	0.0525	95% Bootstrap t UCL					0.0704
1303					95% H-UCL (Log ROS)	0.196						
1304												
1305	Statistics using KM estimates on Logged Data and Assuming Lognormal Distribution											
1306					KM Mean (logged)	-6.61	KM Geo Mean					0.00135
1307					KM SD (logged)	1.755	95% Critical H Value (KM-Log)					2.625
1308					KM Standard Error of Mean (logged)	0.222	95% H-UCL (KM -Log)					0.011
1309					KM SD (logged)	1.755	95% Critical H Value (KM-Log)					2.625
1310					KM Standard Error of Mean (logged)	0.222						
1311												
1312	DL/2 Statistics											
1313			DL/2 Normal				DL/2 Log-Transformed					
1314					Mean in Original Scale	0.0264	Mean in Log Scale					-5.93
1315					SD in Original Scale	0.0959	SD in Log Scale					1.563
1316					95% t UCL (Assumes normality)	0.0456	95% H-Stat UCL					0.0142
1317	DL/2 is not a recommended method, provided for comparisons and historical reasons											
1318												
1319	Nonparametric Distribution Free UCL Statistics											
1320	Detected Data appear Lognormal Distributed at 5% Significance Level											
1321												
1322	Suggested UCL to Use											
1323					KM H-UCL	0.011						
1324												
1325	Note: Suggestions regarding the selection of a 95% UCL are provided to help the user to select the most appropriate 95% UCL.											
1326	Recommendations are based upon data size, data distribution, and skewness.											
1327	These recommendations are based upon the results of the simulation studies summarized in Singh, Maichle, and Lee (2006).											
1328	However, simulations results will not cover all Real World data sets; for additional insight the user may want to consult a statistician.											
1329												
1330	PCB-1260											
1331												
1332	General Statistics											
1333					Total Number of Observations	69	Number of Distinct Observations					36
1334					Number of Detects	33	Number of Non-Detects					36
1335					Number of Distinct Detects	29	Number of Distinct Non-Detects					8
1336					Minimum Detect	0.0031	Minimum Non-Detect					0.0024
1337					Maximum Detect	4.3	Maximum Non-Detect					0.0035
1338					Variance Detects	1.544	Percent Non-Detects					52.17%
1339					Mean Detects	0.66	SD Detects					1.242
1340					Median Detects	0.019	CV Detects					1.882
1341					Skewness Detects	1.823	Kurtosis Detects					1.983
1342					Mean of Logged Detects	-2.871	SD of Logged Detects					2.404

	A	B	C	D	E	F	G	H	I	J	K	L
1343												
1344						Normal GOF Test on Detects Only						
1345					Shapiro Wilk Test Statistic	0.591			Shapiro Wilk GOF Test			
1346					5% Shapiro Wilk Critical Value	0.931			Detected Data Not Normal at 5% Significance Level			
1347					Lilliefors Test Statistic	0.375			Lilliefors GOF Test			
1348					5% Lilliefors Critical Value	0.152			Detected Data Not Normal at 5% Significance Level			
1349						Detected Data Not Normal at 5% Significance Level						
1350												
1351						Kaplan-Meier (KM) Statistics using Normal Critical Values and other Nonparametric UCLs						
1352					KM Mean	0.317			KM Standard Error of Mean			0.111
1353					KM SD	0.908			95% KM (BCA) UCL			0.513
1354					95% KM (t) UCL	0.502			95% KM (Percentile Bootstrap) UCL			0.493
1355					95% KM (z) UCL	0.5			95% KM Bootstrap t UCL			0.559
1356					90% KM Chebyshev UCL	0.65			95% KM Chebyshev UCL			0.801
1357					97.5% KM Chebyshev UCL	1.01			99% KM Chebyshev UCL			1.421
1358												
1359						Gamma GOF Tests on Detected Observations Only						
1360					A-D Test Statistic	3.06			Anderson-Darling GOF Test			
1361					5% A-D Critical Value	0.864			Detected Data Not Gamma Distributed at 5% Significance Level			
1362					K-S Test Statistic	0.269			Kolmogorov-Smirnov GOF			
1363					5% K-S Critical Value	0.167			Detected Data Not Gamma Distributed at 5% Significance Level			
1364						Detected Data Not Gamma Distributed at 5% Significance Level						
1365												
1366						Gamma Statistics on Detected Data Only						
1367					k hat (MLE)	0.283			k star (bias corrected MLE)			0.278
1368					Theta hat (MLE)	2.33			Theta star (bias corrected MLE)			2.377
1369					nu hat (MLE)	18.7			nu star (bias corrected)			18.34
1370					Mean (detects)	0.66						
1371												
1372						Gamma ROS Statistics using Imputed Non-Detects						
1373						GROS may not be used when data set has > 50% NDs with many tied observations at multiple DLs						
1374						GROS may not be used when kstar of detects is small such as <1.0, especially when the sample size is small (e.g., <15-20)						
1375						For such situations, GROS method may yield incorrect values of UCLs and BTVs						
1376						This is especially true when the sample size is small.						
1377						For gamma distributed detected data, BTVs and UCLs may be computed using gamma distribution on KM estimates						
1378					Minimum	0.0031			Mean			0.321
1379					Maximum	4.3			Median			0.01
1380					SD	0.913			CV			2.844
1381					k hat (MLE)	0.266			k star (bias corrected MLE)			0.264
1382					Theta hat (MLE)	1.205			Theta star (bias corrected MLE)			1.214
1383					nu hat (MLE)	36.75			nu star (bias corrected)			36.49
1384					Adjusted Level of Significance (β)	0.0465						
1385					Approximate Chi Square Value (36.49, α)	23.66			Adjusted Chi Square Value (36.49, β)			23.44
1386					95% Gamma Approximate UCL (use when n>=50)	0.495			95% Gamma Adjusted UCL (use when n<50)			0.5
1387												
1388						Estimates of Gamma Parameters using KM Estimates						
1389					Mean (KM)	0.317			SD (KM)			0.908
1390					Variance (KM)	0.824			SE of Mean (KM)			0.111
1391					k hat (KM)	0.122			k star (KM)			0.126
1392					nu hat (KM)	16.84			nu star (KM)			17.44
1393					theta hat (KM)	2.599			theta star (KM)			2.509

	A	B	C	D	E	F	G	H	I	J	K	L
1394					80% gamma percentile (KM)	0.294					90% gamma percentile (KM)	0.91
1395					95% gamma percentile (KM)	1.797					99% gamma percentile (KM)	4.468
1396												
1397					Gamma Kaplan-Meier (KM) Statistics							
1398					Approximate Chi Square Value (17.44, α)	8.987					Adjusted Chi Square Value (17.44, β)	8.857
1399					95% Gamma Approximate KM-UCL (use when n>=50)	0.615					95% Gamma Adjusted KM-UCL (use when n<50)	0.624
1400												
1401					Lognormal GOF Test on Detected Observations Only							
1402					Shapiro Wilk Test Statistic	0.859			Shapiro Wilk GOF Test			
1403					5% Shapiro Wilk Critical Value	0.931			Detected Data Not Lognormal at 5% Significance Level			
1404					Lilliefors Test Statistic	0.197			Lilliefors GOF Test			
1405					5% Lilliefors Critical Value	0.152			Detected Data Not Lognormal at 5% Significance Level			
1406					Detected Data Not Lognormal at 5% Significance Level							
1407												
1408					Lognormal ROS Statistics Using Imputed Non-Detects							
1409					Mean in Original Scale	0.316			Mean in Log Scale			-6.236
1410					SD in Original Scale	0.915			SD in Log Scale			3.883
1411					95% t UCL (assumes normality of ROS data)	0.5			95% Percentile Bootstrap UCL			0.513
1412					95% BCA Bootstrap UCL	0.555			95% Bootstrap t UCL			0.58
1413					95% H-UCL (Log ROS)	36.75						
1414												
1415					Statistics using KM estimates on Logged Data and Assuming Lognormal Distribution							
1416					KM Mean (logged)	-4.52			KM Geo Mean			0.0109
1417					KM SD (logged)	2.274			95% Critical H Value (KM-Log)			3.044
1418					KM Standard Error of Mean (logged)	0.278			95% H-UCL (KM -Log)			0.335
1419					KM SD (logged)	2.274			95% Critical H Value (KM-Log)			3.044
1420					KM Standard Error of Mean (logged)	0.278						
1421												
1422					DL/2 Statistics							
1423					DL/2 Normal				DL/2 Log-Transformed			
1424					Mean in Original Scale	0.317			Mean in Log Scale			-4.823
1425					SD in Original Scale	0.915			SD in Log Scale			2.503
1426					95% t UCL (Assumes normality)	0.5			95% H-Stat UCL			0.456
1427					DL/2 is not a recommended method, provided for comparisons and historical reasons							
1428												
1429					Nonparametric Distribution Free UCL Statistics							
1430					Data do not follow a Discernible Distribution at 5% Significance Level							
1431												
1432					Suggested UCL to Use							
1433					95% KM (Chebyshev) UCL	0.801						
1434												
1435					Note: Suggestions regarding the selection of a 95% UCL are provided to help the user to select the most appropriate 95% UCL.							
1436					Recommendations are based upon data size, data distribution, and skewness.							
1437					These recommendations are based upon the results of the simulation studies summarized in Singh, Maichle, and Lee (2006).							
1438					However, simulations results will not cover all Real World data sets; for additional insight the user may want to consult a statistician.							
1439												
1440	Antimony											
1441												
1442					General Statistics							
1443					Total Number of Observations	65			Number of Distinct Observations			50
1444					Number of Detects	62			Number of Non-Detects			3
1445					Number of Distinct Detects	48			Number of Distinct Non-Detects			2

	A	B	C	D	E	F	G	H	I	J	K	L
1446					Minimum Detect	0.055					Minimum Non-Detect	0.027
1447					Maximum Detect	6.9					Maximum Non-Detect	0.028
1448					Variance Detects	1.309					Percent Non-Detects	4.615%
1449					Mean Detects	0.888					SD Detects	1.144
1450					Median Detects	0.465					CV Detects	1.288
1451					Skewness Detects	3.076					Kurtosis Detects	12.24
1452					Mean of Logged Detects	-0.668					SD of Logged Detects	1.036
1453												
1454					**Normal GOF Test on Detects Only**							
1455					Shapiro Wilk Test Statistic	0.665			**Normal GOF Test on Detected Observations Only**			
1456					5% Shapiro Wilk P Value	0			Detected Data Not Normal at 5% Significance Level			
1457					Lilliefors Test Statistic	0.234			**Lilliefors GOF Test**			
1458					5% Lilliefors Critical Value	0.112			Detected Data Not Normal at 5% Significance Level			
1459					**Detected Data Not Normal at 5% Significance Level**							
1460												
1461					**Kaplan-Meier (KM) Statistics using Normal Critical Values and other Nonparametric UCLs**							
1462					KM Mean	0.849					KM Standard Error of Mean	0.14
1463					KM SD	1.123					95% KM (BCA) UCL	1.106
1464					95% KM (t) UCL	1.083					95% KM (Percentile Bootstrap) UCL	1.092
1465					95% KM (z) UCL	1.08					95% KM Bootstrap t UCL	1.193
1466					90% KM Chebyshev UCL	1.27					95% KM Chebyshev UCL	1.461
1467					97.5% KM Chebyshev UCL	1.725					99% KM Chebyshev UCL	2.246
1468												
1469					**Gamma GOF Tests on Detected Observations Only**							
1470					A-D Test Statistic	1.434			**Anderson-Darling GOF Test**			
1471					5% A-D Critical Value	0.778			Detected Data Not Gamma Distributed at 5% Significance Level			
1472					K-S Test Statistic	0.13			**Kolmogorov-Smirnov GOF**			
1473					5% K-S Critical Value	0.116			Detected Data Not Gamma Distributed at 5% Significance Level			
1474					**Detected Data Not Gamma Distributed at 5% Significance Level**							
1475												
1476					**Gamma Statistics on Detected Data Only**							
1477					k hat (MLE)	1.045					k star (bias corrected MLE)	1.005
1478					Theta hat (MLE)	0.85					Theta star (bias corrected MLE)	0.884
1479					nu hat (MLE)	129.6					nu star (bias corrected)	124.6
1480					Mean (detects)	0.888						
1481												
1482					**Gamma ROS Statistics using Imputed Non-Detects**							
1483					GROS may not be used when data set has > 50% NDs with many tied observations at multiple DLs							
1484					GROS may not be used when kstar of detects is small such as <1.0, especially when the sample size is small (e.g., <15-20)							
1485					For such situations, GROS method may yield incorrect values of UCLs and BTVs							
1486					This is especially true when the sample size is small.							
1487					For gamma distributed detected data, BTVs and UCLs may be computed using gamma distribution on KM estimates							
1488					Minimum	0.01					Mean	0.848
1489					Maximum	6.9					Median	0.44
1490					SD	1.132					CV	1.335
1491					k hat (MLE)	0.859					k star (bias corrected MLE)	0.83
1492					Theta hat (MLE)	0.987					Theta star (bias corrected MLE)	1.022
1493					nu hat (MLE)	111.7					nu star (bias corrected)	107.8
1494					Adjusted Level of Significance (β)	0.0463						
1495					Approximate Chi Square Value (107.84, α)	84.88					Adjusted Chi Square Value (107.84, β)	84.41
1496					95% Gamma Approximate UCL (use when n>=50)	1.077					95% Gamma Adjusted UCL (use when n<50)	1.083
1497												

	A	B	C	D	E	F	G	H	I	J	K	L
1498	**Estimates of Gamma Parameters using KM Estimates**											
1499					Mean (KM)	0.849					SD (KM)	1.123
1500					Variance (KM)	1.261					SE of Mean (KM)	0.14
1501					k hat (KM)	0.571					k star (KM)	0.555
1502					nu hat (KM)	74.26					nu star (KM)	72.16
1503					theta hat (KM)	1.486					theta star (KM)	1.529
1504					80% gamma percentile (KM)	1.398					90% gamma percentile (KM)	2.245
1505					95% gamma percentile (KM)	3.14					99% gamma percentile (KM)	5.319
1506												
1507	**Gamma Kaplan-Meier (KM) Statistics**											
1508					Approximate Chi Square Value (72.16, α)	53.6					Adjusted Chi Square Value (72.16, β)	53.24
1509					95% Gamma Approximate KM-UCL (use when n>=50)	1.142					95% Gamma Adjusted KM-UCL (use when n<50)	1.15
1510												
1511	**Lognormal GOF Test on Detected Observations Only**											
1512					Shapiro Wilk Approximate Test Statistic	0.983	**Shapiro Wilk GOF Test**					
1513					5% Shapiro Wilk P Value	0.786	Detected Data appear Lognormal at 5% Significance Level					
1514					Lilliefors Test Statistic	0.0561	**Lilliefors GOF Test**					
1515					5% Lilliefors Critical Value	0.112	Detected Data appear Lognormal at 5% Significance Level					
1516	**Detected Data appear Lognormal at 5% Significance Level**											
1517												
1518	**Lognormal ROS Statistics Using Imputed Non-Detects**											
1519					Mean in Original Scale	0.849					Mean in Log Scale	-0.783
1520					SD in Original Scale	1.131					SD in Log Scale	1.14
1521					95% t UCL (assumes normality of ROS data)	1.083					95% Percentile Bootstrap UCL	1.098
1522					95% BCA Bootstrap UCL	1.156					95% Bootstrap t UCL	1.206
1523					95% H-UCL (Log ROS)	1.208						
1524												
1525	**Statistics using KM estimates on Logged Data and Assuming Lognormal Distribution**											
1526					KM Mean (logged)	-0.804					KM Geo Mean	0.448
1527					KM SD (logged)	1.178					95% Critical H Value (KM-Log)	2.237
1528					KM Standard Error of Mean (logged)	0.147					95% H-UCL (KM -Log)	1.246
1529					KM SD (logged)	1.178					95% Critical H Value (KM-Log)	2.237
1530					KM Standard Error of Mean (logged)	0.147						
1531												
1532	**DL/2 Statistics**											
1533				**DL/2 Normal**			**DL/2 Log-Transformed**					
1534					Mean in Original Scale	0.848					Mean in Log Scale	-0.835
1535					SD in Original Scale	1.132					SD in Log Scale	1.269
1536					95% t UCL (Assumes normality)	1.082					95% H-Stat UCL	1.373
1537	**DL/2 is not a recommended method, provided for comparisons and historical reasons**											
1538												
1539	**Nonparametric Distribution Free UCL Statistics**											
1540	**Detected Data appear Lognormal Distributed at 5% Significance Level**											
1541												
1542	**Suggested UCL to Use**											
1543					KM H-UCL	1.246						
1544												
1545	Note: Suggestions regarding the selection of a 95% UCL are provided to help the user to select the most appropriate 95% UCL.											
1546	Recommendations are based upon data size, data distribution, and skewness.											
1547	These recommendations are based upon the results of the simulation studies summarized in Singh, Maichle, and Lee (2006).											
1548	However, simulations results will not cover all Real World data sets; for additional insight the user may want to consult a statistician.											
1549												

	A	B	C	D	E	F	G	H	I	J	K	L
1550	Arsenic											
1551												
1552						General Statistics						
1553					Total Number of Observations	65				Number of Distinct Observations		43
1554					Number of Detects	62				Number of Non-Detects		3
1555					Number of Distinct Detects	41				Number of Distinct Non-Detects		2
1556					Minimum Detect	0.35				Minimum Non-Detect		0.2
1557					Maximum Detect	17				Maximum Non-Detect		0.22
1558					Variance Detects	13.78				Percent Non-Detects		4.615%
1559					Mean Detects	3.986				SD Detects		3.712
1560					Median Detects	2.8				CV Detects		0.931
1561					Skewness Detects	1.962				Kurtosis Detects		3.722
1562					Mean of Logged Detects	1.027				SD of Logged Detects		0.861
1563												
1564						Normal GOF Test on Detects Only						
1565					Shapiro Wilk Test Statistic	0.766				Normal GOF Test on Detected Observations Only		
1566					5% Shapiro Wilk P Value	5.076E-13				Detected Data Not Normal at 5% Significance Level		
1567					Lilliefors Test Statistic	0.185				Lilliefors GOF Test		
1568					5% Lilliefors Critical Value	0.112				Detected Data Not Normal at 5% Significance Level		
1569						Detected Data Not Normal at 5% Significance Level						
1570												
1571						Kaplan-Meier (KM) Statistics using Normal Critical Values and other Nonparametric UCLs						
1572					KM Mean	3.811				KM Standard Error of Mean		0.461
1573					KM SD	3.683				95% KM (BCA) UCL		4.647
1574					95% KM (t) UCL	4.58				95% KM (Percentile Bootstrap) UCL		4.642
1575					95% KM (z) UCL	4.569				95% KM Bootstrap t UCL		4.714
1576					90% KM Chebyshev UCL	5.193				95% KM Chebyshev UCL		5.819
1577					97.5% KM Chebyshev UCL	6.687				99% KM Chebyshev UCL		8.394
1578												
1579						Gamma GOF Tests on Detected Observations Only						
1580					A-D Test Statistic	0.789				Anderson-Darling GOF Test		
1581					5% A-D Critical Value	0.768				Detected Data Not Gamma Distributed at 5% Significance Level		
1582					K-S Test Statistic	0.105				Kolmogorov-Smirnov GOF		
1583					5% K-S Critical Value	0.115				Detected data appear Gamma Distributed at 5% Significance Level		
1584						Detected data follow Appr. Gamma Distribution at 5% Significance Level						
1585												
1586						Gamma Statistics on Detected Data Only						
1587					k hat (MLE)	1.549				k star (bias corrected MLE)		1.485
1588					Theta hat (MLE)	2.573				Theta star (bias corrected MLE)		2.684
1589					nu hat (MLE)	192.1				nu star (bias corrected)		184.1
1590					Mean (detects)	3.986						
1591												
1592						Gamma ROS Statistics using Imputed Non-Detects						
1593						GROS may not be used when data set has > 50% NDs with many tied observations at multiple DLs						
1594						GROS may not be used when kstar of detects is small such as <1.0, especially when the sample size is small (e.g., <15-20)						
1595						For such situations, GROS method may yield incorrect values of UCLs and BTVs						
1596						This is especially true when the sample size is small.						
1597						For gamma distributed detected data, BTVs and UCLs may be computed using gamma distribution on KM estimates						
1598					Minimum	0.01				Mean		3.802
1599					Maximum	17				Median		2.8
1600					SD	3.721				CV		0.978
1601					k hat (MLE)	1.013				k star (bias corrected MLE)		0.976

	A	B	C	D	E	F	G	H	I	J	K	L
1602					Theta hat (MLE)	3.754					Theta star (bias corrected MLE)	3.895
1603					nu hat (MLE)	131.7					nu star (bias corrected)	126.9
1604					Adjusted Level of Significance (β)	0.0463						
1605					Approximate Chi Square Value (126.93, α)	101.9					Adjusted Chi Square Value (126.93, β)	101.4
1606					95% Gamma Approximate UCL (use when n>=50)	4.736					95% Gamma Adjusted UCL (use when n<50)	4.76
1607												
1608					**Estimates of Gamma Parameters using KM Estimates**							
1609					Mean (KM)	3.811					SD (KM)	3.683
1610					Variance (KM)	13.57					SE of Mean (KM)	0.461
1611					k hat (KM)	1.071					k star (KM)	1.032
1612					nu hat (KM)	139.2					nu star (KM)	134.1
1613					theta hat (KM)	3.559					theta star (KM)	3.694
1614					80% gamma percentile (KM)	6.118					90% gamma percentile (KM)	8.709
1615					95% gamma percentile (KM)	11.29					99% gamma percentile (KM)	17.28
1616												
1617					**Gamma Kaplan-Meier (KM) Statistics**							
1618					Approximate Chi Square Value (134.11, α)	108.4					Adjusted Chi Square Value (134.11, β)	107.8
1619					95% Gamma Approximate KM-UCL (use when n>=50)	4.717					95% Gamma Adjusted KM-UCL (use when n<50)	4.74
1620												
1621					**Lognormal GOF Test on Detected Observations Only**							
1622					Shapiro Wilk Approximate Test Statistic	0.979					**Shapiro Wilk GOF Test**	
1623					5% Shapiro Wilk P Value	0.635					Detected Data appear Lognormal at 5% Significance Level	
1624					Lilliefors Test Statistic	0.0521					**Lilliefors GOF Test**	
1625					5% Lilliefors Critical Value	0.112					Detected Data appear Lognormal at 5% Significance Level	
1626					**Detected Data appear Lognormal at 5% Significance Level**							
1627												
1628					**Lognormal ROS Statistics Using Imputed Non-Detects**							
1629					Mean in Original Scale	3.819					Mean in Log Scale	0.932
1630					SD in Original Scale	3.705					SD in Log Scale	0.947
1631					95% t UCL (assumes normality of ROS data)	4.585					95% Percentile Bootstrap UCL	4.602
1632					95% BCA Bootstrap UCL	4.736					95% Bootstrap t UCL	4.806
1633					95% H-UCL (Log ROS)	5.169						
1634												
1635					**Statistics using KM estimates on Logged Data and Assuming Lognormal Distribution**							
1636					KM Mean (logged)	0.905					KM Geo Mean	2.472
1637					KM SD (logged)	1.001					95% Critical H Value (KM-Log)	2.253
1638					KM Standard Error of Mean (logged)	0.125					95% H-UCL (KM -Log)	5.406
1639					KM SD (logged)	1.001					95% Critical H Value (KM-Log)	2.253
1640					KM Standard Error of Mean (logged)	0.125						
1641												
1642					**DL/2 Statistics**							
1643					**DL/2 Normal**						**DL/2 Log-Transformed**	
1644					Mean in Original Scale	3.807					Mean in Log Scale	0.876
1645					SD in Original Scale	3.716					SD in Log Scale	1.088
1646					95% t UCL (Assumes normality)	4.576					95% H-Stat UCL	5.905
1647					**DL/2 is not a recommended method, provided for comparisons and historical reasons**							
1648												
1649					**Nonparametric Distribution Free UCL Statistics**							
1650					**Detected Data appear Approximate Gamma Distributed at 5% Significance Level**							
1651												
1652					**Suggested UCL to Use**							
1653					95% KM Approximate Gamma UCL	4.717					95% GROS Approximate Gamma UCL	4.736

When a data set follows an approximate (e.g., normal) distribution passing one of the GOF test

When applicable, it is suggested to use a UCL based upon a distribution (e.g., gamma) passing both GOF tests in ProUCL

Note: Suggestions regarding the selection of a 95% UCL are provided to help the user to select the most appropriate 95% UCL.

Recommendations are based upon data size, data distribution, and skewness.

These recommendations are based upon the results of the simulation studies summarized in Singh, Maichle, and Lee (2006).

However, simulations results will not cover all Real World data sets; for additional insight the user may want to consult a statistician.

Cadmium

General Statistics

Total Number of Observations	65	Number of Distinct Observations	49
		Number of Missing Observations	0
Minimum	0.13	Mean	1.975
Maximum	8	Median	1.1
SD	2.002	Std. Error of Mean	0.248
Coefficient of Variation	1.013	Skewness	1.729

Normal GOF Test

Shapiro Wilk Test Statistic	0.74	**Shapiro Wilk GOF Test**
5% Shapiro Wilk P Value	2.776E-15	Data Not Normal at 5% Significance Level
Lilliefors Test Statistic	0.223	**Lilliefors GOF Test**
5% Lilliefors Critical Value	0.11	Data Not Normal at 5% Significance Level

Data Not Normal at 5% Significance Level

Assuming Normal Distribution

95% Normal UCL		**95% UCLs (Adjusted for Skewness)**	
95% Student's-t UCL	2.39	95% Adjusted-CLT UCL (Chen-1995)	2.441
		95% Modified-t UCL (Johnson-1978)	2.399

Gamma GOF Test

A-D Test Statistic	2.154	**Anderson-Darling Gamma GOF Test**
5% A-D Critical Value	0.772	Data Not Gamma Distributed at 5% Significance Level
K-S Test Statistic	0.179	**Kolmogorov-Smirnov Gamma GOF Test**
5% K-S Critical Value	0.113	Data Not Gamma Distributed at 5% Significance Level

Data Not Gamma Distributed at 5% Significance Level

Gamma Statistics

k hat (MLE)	1.349	k star (bias corrected MLE)	1.297
Theta hat (MLE)	1.464	Theta star (bias corrected MLE)	1.523
nu hat (MLE)	175.4	nu star (bias corrected)	168.6
MLE Mean (bias corrected)	1.975	MLE Sd (bias corrected)	1.734
		Approximate Chi Square Value (0.05)	139.6
Adjusted Level of Significance	0.0463	Adjusted Chi Square Value	139

Assuming Gamma Distribution

95% Approximate Gamma UCL (use when n>=50))	2.386	95% Adjusted Gamma UCL (use when n<50)	2.396

Lognormal GOF Test

Shapiro Wilk Test Statistic	0.957	**Shapiro Wilk Lognormal GOF Test**

	A	B	C	D	E	F	G	H	I	J	K	L
1706					5% Shapiro Wilk P Value	0.0624	Data appear Lognormal at 5% Significance Level					
1707					Lilliefors Test Statistic	0.129	**Lilliefors Lognormal GOF Test**					
1708					5% Lilliefors Critical Value	0.11	Data Not Lognormal at 5% Significance Level					
1709	**Data appear Approximate Lognormal at 5% Significance Level**											
1710												
1711	**Lognormal Statistics**											
1712					Minimum of Logged Data	-2.04			Mean of logged Data			0.266
1713					Maximum of Logged Data	2.079			SD of logged Data			0.907
1714												
1715	**Assuming Lognormal Distribution**											
1716					95% H-UCL	2.524			90% Chebyshev (MVUE) UCL			2.714
1717					95% Chebyshev (MVUE) UCL	3.059			97.5% Chebyshev (MVUE) UCL			3.538
1718					99% Chebyshev (MVUE) UCL	4.48						
1719												
1720	**Nonparametric Distribution Free UCL Statistics**											
1721	**Data appear to follow a Discernible Distribution at 5% Significance Level**											
1722												
1723	**Nonparametric Distribution Free UCLs**											
1724					95% CLT UCL	2.384			95% Jackknife UCL			2.39
1725					95% Standard Bootstrap UCL	2.385			95% Bootstrap-t UCL			2.451
1726					95% Hall's Bootstrap UCL	2.452			95% Percentile Bootstrap UCL			2.369
1727					95% BCA Bootstrap UCL	2.412						
1728					90% Chebyshev(Mean, Sd) UCL	2.72			95% Chebyshev(Mean, Sd) UCL			3.058
1729					97.5% Chebyshev(Mean, Sd) UCL	3.526			99% Chebyshev(Mean, Sd) UCL			4.446
1730												
1731	**Suggested UCL to Use**											
1732					95% H-UCL	2.524						
1733												
1734	Note: Suggestions regarding the selection of a 95% UCL are provided to help the user to select the most appropriate 95% UCL.											
1735	Recommendations are based upon data size, data distribution, and skewness.											
1736	These recommendations are based upon the results of the simulation studies summarized in Singh, Maichle, and Lee (2006).											
1737	However, simulations results will not cover all Real World data sets; for additional insight the user may want to consult a statistician.											
1738												
1739	**ProUCL computes and outputs H-statistic based UCLs for historical reasons only.**											
1740	**H-statistic often results in unstable (both high and low) values of UCL95 as shown in examples in the Technical Guide.**											
1741	**It is therefore recommended to avoid the use of H-statistic based 95% UCLs.**											
1742	**Use of nonparametric methods are preferred to compute UCL95 for skewed data sets which do not follow a gamma distribution.**											
1743												
1744												
1745	**Cobalt**											
1746												
1747	**General Statistics**											
1748					Total Number of Observations	65			Number of Distinct Observations			47
1749									Number of Missing Observations			0
1750					Minimum	0.53			Mean			8.415
1751					Maximum	100			Median			3.5
1752					SD	15.14			Std. Error of Mean			1.878
1753					Coefficient of Variation	1.799			Skewness			4.42
1754												
1755	**Normal GOF Test**											
1756					Shapiro Wilk Test Statistic	0.473	**Shapiro Wilk GOF Test**					
1757					5% Shapiro Wilk P Value	0	Data Not Normal at 5% Significance Level					

	A	B	C	D	E	F	G	H	I	J	K	L
1758					Lilliefors Test Statistic	0.314	**Lilliefors GOF Test**					
1759					5% Lilliefors Critical Value	0.11	Data Not Normal at 5% Significance Level					
1760	**Data Not Normal at 5% Significance Level**											
1761												
1762	**Assuming Normal Distribution**											
1763	**95% Normal UCL**						**95% UCLs (Adjusted for Skewness)**					
1764					95% Student's-t UCL	11.55				95% Adjusted-CLT UCL (Chen-1995)		12.6
1765										95% Modified-t UCL (Johnson-1978)		11.72
1766												
1767	**Gamma GOF Test**											
1768					A-D Test Statistic	3.986	**Anderson-Darling Gamma GOF Test**					
1769					5% A-D Critical Value	0.784	Data Not Gamma Distributed at 5% Significance Level					
1770					K-S Test Statistic	0.184	**Kolmogorov-Smirnov Gamma GOF Test**					
1771					5% K-S Critical Value	0.114	Data Not Gamma Distributed at 5% Significance Level					
1772	**Data Not Gamma Distributed at 5% Significance Level**											
1773												
1774	**Gamma Statistics**											
1775					k hat (MLE)	0.922				k star (bias corrected MLE)		0.89
1776					Theta hat (MLE)	9.124				Theta star (bias corrected MLE)		9.455
1777					nu hat (MLE)	119.9				nu star (bias corrected)		115.7
1778					MLE Mean (bias corrected)	8.415				MLE Sd (bias corrected)		8.92
1779										Approximate Chi Square Value (0.05)		91.87
1780					Adjusted Level of Significance	0.0463				Adjusted Chi Square Value		91.39
1781												
1782	**Assuming Gamma Distribution**											
1783					95% Approximate Gamma UCL (use when n>=50))	10.6				95% Adjusted Gamma UCL (use when n<50)		10.65
1784												
1785	**Lognormal GOF Test**											
1786					Shapiro Wilk Test Statistic	0.948	**Shapiro Wilk Lognormal GOF Test**					
1787					5% Shapiro Wilk P Value	0.0183	Data Not Lognormal at 5% Significance Level					
1788					Lilliefors Test Statistic	0.124	**Lilliefors Lognormal GOF Test**					
1789					5% Lilliefors Critical Value	0.11	Data Not Lognormal at 5% Significance Level					
1790	**Data Not Lognormal at 5% Significance Level**											
1791												
1792	**Lognormal Statistics**											
1793					Minimum of Logged Data	-0.635				Mean of logged Data		1.498
1794					Maximum of Logged Data	4.605				SD of logged Data		0.989
1795												
1796	**Assuming Lognormal Distribution**											
1797					95% H-UCL	9.628				90% Chebyshev (MVUE) UCL		10.35
1798					95% Chebyshev (MVUE) UCL	11.78				97.5% Chebyshev (MVUE) UCL		13.75
1799					99% Chebyshev (MVUE) UCL	17.63						
1800												
1801	**Nonparametric Distribution Free UCL Statistics**											
1802	**Data do not follow a Discernible Distribution (0.05)**											
1803												
1804	**Nonparametric Distribution Free UCLs**											
1805					95% CLT UCL	11.5				95% Jackknife UCL		11.55
1806					95% Standard Bootstrap UCL	11.49				95% Bootstrap-t UCL		14.18
1807					95% Hall's Bootstrap UCL	14.16				95% Percentile Bootstrap UCL		11.83
1808					95% BCA Bootstrap UCL	13.26						

	A	B	C	D	E	F	G	H	I	J	K	L
1809					90% Chebyshev(Mean, Sd) UCL	14.05					95% Chebyshev(Mean, Sd) UCL	16.6
1810					97.5% Chebyshev(Mean, Sd) UCL	20.14					99% Chebyshev(Mean, Sd) UCL	27.1
1811												
1812						**Suggested UCL to Use**						
1813					95% Chebyshev (Mean, Sd) UCL	16.6						
1814												
1815					Note: Suggestions regarding the selection of a 95% UCL are provided to help the user to select the most appropriate 95% UCL.							
1816					Recommendations are based upon data size, data distribution, and skewness.							
1817					These recommendations are based upon the results of the simulation studies summarized in Singh, Maichle, and Lee (2006).							
1818					However, simulations results will not cover all Real World data sets; for additional insight the user may want to consult a statistician.							
1819												
1820												
1821	**Copper**											
1822												
1823						**General Statistics**						
1824					Total Number of Observations	65					Number of Distinct Observations	40
1825											Number of Missing Observations	0
1826					Minimum	6.1					Mean	52.85
1827					Maximum	490					Median	34
1828					SD	66.67					Std. Error of Mean	8.269
1829					Coefficient of Variation	1.261					Skewness	4.781
1830												
1831						**Normal GOF Test**						
1832					Shapiro Wilk Test Statistic	0.552					**Shapiro Wilk GOF Test**	
1833					5% Shapiro Wilk P Value	0					Data Not Normal at 5% Significance Level	
1834					Lilliefors Test Statistic	0.253					**Lilliefors GOF Test**	
1835					5% Lilliefors Critical Value	0.11					Data Not Normal at 5% Significance Level	
1836						**Data Not Normal at 5% Significance Level**						
1837												
1838						**Assuming Normal Distribution**						
1839					**95% Normal UCL**						**95% UCLs (Adjusted for Skewness)**	
1840					95% Student's-t UCL	66.65					95% Adjusted-CLT UCL (Chen-1995)	71.69
1841											95% Modified-t UCL (Johnson-1978)	67.47
1842												
1843						**Gamma GOF Test**						
1844					A-D Test Statistic	2.145					**Anderson-Darling Gamma GOF Test**	
1845					5% A-D Critical Value	0.769					Data Not Gamma Distributed at 5% Significance Level	
1846					K-S Test Statistic	0.149					**Kolmogorov-Smirnov Gamma GOF Test**	
1847					5% K-S Critical Value	0.113					Data Not Gamma Distributed at 5% Significance Level	
1848						**Data Not Gamma Distributed at 5% Significance Level**						
1849												
1850						**Gamma Statistics**						
1851					k hat (MLE)	1.526					k star (bias corrected MLE)	1.466
1852					Theta hat (MLE)	34.62					Theta star (bias corrected MLE)	36.05
1853					nu hat (MLE)	198.4					nu star (bias corrected)	190.6
1854					MLE Mean (bias corrected)	52.85					MLE Sd (bias corrected)	43.65
1855											Approximate Chi Square Value (0.05)	159.7
1856					Adjusted Level of Significance	0.0463					Adjusted Chi Square Value	159
1857												
1858						**Assuming Gamma Distribution**						
1859					95% Approximate Gamma UCL (use when n>=50))	63.09					95% Adjusted Gamma UCL (use when n<50)	63.34
1860												

	A	B	C	D	E	F	G	H	I	J	K	L
1861					Lognormal GOF Test							
1862					Shapiro Wilk Test Statistic	0.972	Shapiro Wilk Lognormal GOF Test					
1863					5% Shapiro Wilk P Value	0.335	Data appear Lognormal at 5% Significance Level					
1864					Lilliefors Test Statistic	0.0825	Lilliefors Lognormal GOF Test					
1865					5% Lilliefors Critical Value	0.11	Data appear Lognormal at 5% Significance Level					
1866					Data appear Lognormal at 5% Significance Level							
1867												
1868					Lognormal Statistics							
1869					Minimum of Logged Data	1.808	Mean of logged Data					3.605
1870					Maximum of Logged Data	6.194	SD of logged Data					0.782
1871												
1872					Assuming Lognormal Distribution							
1873					95% H-UCL	61.19	90% Chebyshev (MVUE) UCL					65.82
1874					95% Chebyshev (MVUE) UCL	73.15	97.5% Chebyshev (MVUE) UCL					83.33
1875					99% Chebyshev (MVUE) UCL	103.3						
1876												
1877					Nonparametric Distribution Free UCL Statistics							
1878					Data appear to follow a Discernible Distribution at 5% Significance Level							
1879												
1880					Nonparametric Distribution Free UCLs							
1881					95% CLT UCL	66.45	95% Jackknife UCL					66.65
1882					95% Standard Bootstrap UCL	66	95% Bootstrap-t UCL					77.51
1883					95% Hall's Bootstrap UCL	126.5	95% Percentile Bootstrap UCL					68.25
1884					95% BCA Bootstrap UCL	72.46						
1885					90% Chebyshev(Mean, Sd) UCL	77.65	95% Chebyshev(Mean, Sd) UCL					88.89
1886					97.5% Chebyshev(Mean, Sd) UCL	104.5	99% Chebyshev(Mean, Sd) UCL					135.1
1887												
1888					Suggested UCL to Use							
1889					95% H-UCL	61.19						
1890												
1891					Note: Suggestions regarding the selection of a 95% UCL are provided to help the user to select the most appropriate 95% UCL.							
1892					Recommendations are based upon data size, data distribution, and skewness.							
1893					These recommendations are based upon the results of the simulation studies summarized in Singh, Maichle, and Lee (2006).							
1894					However, simulations results will not cover all Real World data sets; for additional insight the user may want to consult a statistician.							
1895												
1896					ProUCL computes and outputs H-statistic based UCLs for historical reasons only.							
1897					H-statistic often results in unstable (both high and low) values of UCL95 as shown in examples in the Technical Guide.							
1898					It is therefore recommended to avoid the use of H-statistic based 95% UCLs.							
1899					Use of nonparametric methods are preferred to compute UCL95 for skewed data sets which do not follow a gamma distribution.							
1900												
1901												
1902	Iron											
1903												
1904					General Statistics							
1905					Total Number of Observations	65	Number of Distinct Observations					38
1906							Number of Missing Observations					0
1907					Minimum	8200	Mean					107449
1908					Maximum	430000	Median					95000
1909					SD	74753	Std. Error of Mean					9272
1910					Coefficient of Variation	0.696	Skewness					1.526
1911												

	A	B	C	D	E	F	G	H	I	J	K	L
1912	**Normal GOF Test**											
1913					Shapiro Wilk Test Statistic	0.894	**Shapiro Wilk GOF Test**					
1914					5% Shapiro Wilk P Value	6.2227E-6	Data Not Normal at 5% Significance Level					
1915					Lilliefors Test Statistic	0.102	**Lilliefors GOF Test**					
1916					5% Lilliefors Critical Value	0.11	Data appear Normal at 5% Significance Level					
1917	**Data appear Approximate Normal at 5% Significance Level**											
1918												
1919	**Assuming Normal Distribution**											
1920	**95% Normal UCL**						**95% UCLs (Adjusted for Skewness)**					
1921					95% Student's-t UCL	122924			95% Adjusted-CLT UCL (Chen-1995)			124576
1922									95% Modified-t UCL (Johnson-1978)			123217
1923												
1924	**Gamma GOF Test**											
1925					A-D Test Statistic	0.446	**Anderson-Darling Gamma GOF Test**					
1926					5% A-D Critical Value	0.763	Detected data appear Gamma Distributed at 5% Significance Level					
1927					K-S Test Statistic	0.0738	**Kolmogorov-Smirnov Gamma GOF Test**					
1928					5% K-S Critical Value	0.112	Detected data appear Gamma Distributed at 5% Significance Level					
1929	**Detected data appear Gamma Distributed at 5% Significance Level**											
1930												
1931	**Gamma Statistics**											
1932					k hat (MLE)	2.055			k star (bias corrected MLE)			1.971
1933					Theta hat (MLE)	52279			Theta star (bias corrected MLE)			54523
1934					nu hat (MLE)	267.2			nu star (bias corrected)			256.2
1935					MLE Mean (bias corrected)	107449			MLE Sd (bias corrected)			76541
1936									Approximate Chi Square Value (0.05)			220.1
1937					Adjusted Level of Significance	0.0463			Adjusted Chi Square Value			219.4
1938												
1939	**Assuming Gamma Distribution**											
1940			95% Approximate Gamma UCL (use when n>=50))			125051			95% Adjusted Gamma UCL (use when n<50)			125481
1941												
1942	**Lognormal GOF Test**											
1943					Shapiro Wilk Test Statistic	0.956	**Shapiro Wilk Lognormal GOF Test**					
1944					5% Shapiro Wilk P Value	0.049	Data Not Lognormal at 5% Significance Level					
1945					Lilliefors Test Statistic	0.102	**Lilliefors Lognormal GOF Test**					
1946					5% Lilliefors Critical Value	0.11	Data appear Lognormal at 5% Significance Level					
1947	**Data appear Approximate Lognormal at 5% Significance Level**											
1948												
1949	**Lognormal Statistics**											
1950					Minimum of Logged Data	9.012			Mean of logged Data			11.32
1951					Maximum of Logged Data	12.97			SD of logged Data			0.793
1952												
1953	**Assuming Lognormal Distribution**											
1954					95% H-UCL	139244			90% Chebyshev (MVUE) UCL			149809
1955					95% Chebyshev (MVUE) UCL	166717			97.5% Chebyshev (MVUE) UCL			190186
1956					99% Chebyshev (MVUE) UCL	236284						
1957												
1958	**Nonparametric Distribution Free UCL Statistics**											
1959	**Data appear to follow a Discernible Distribution at 5% Significance Level**											
1960												
1961	**Nonparametric Distribution Free UCLs**											
1962					95% CLT UCL	122700			95% Jackknife UCL			122924
1963					95% Standard Bootstrap UCL	122983			95% Bootstrap-t UCL			124459

	A	B	C	D	E	F	G	H	I	J	K	L
1964					95% Hall's Bootstrap UCL	127644				95% Percentile Bootstrap UCL		122437
1965					95% BCA Bootstrap UCL	123615						
1966					90% Chebyshev(Mean, Sd) UCL	135265				95% Chebyshev(Mean, Sd) UCL		147865
1967					97.5% Chebyshev(Mean, Sd) UCL	165353				99% Chebyshev(Mean, Sd) UCL		199704
1968												
1969					**Suggested UCL to Use**							
1970					95% Student's-t UCL	122924						
1971												
1972	When a data set follows an approximate (e.g., normal) distribution passing one of the GOF test											
1973	When applicable, it is suggested to use a UCL based upon a distribution (e.g., gamma) passing both GOF tests in ProUCL											
1974												
1975	Note: Suggestions regarding the selection of a 95% UCL are provided to help the user to select the most appropriate 95% UCL.											
1976	Recommendations are based upon data size, data distribution, and skewness.											
1977	These recommendations are based upon the results of the simulation studies summarized in Singh, Maichle, and Lee (2006).											
1978	However, simulations results will not cover all Real World data sets; for additional insight the user may want to consult a statistician.											
1979												
1980												
1981	**Lead**											
1982												
1983					**General Statistics**							
1984					Total Number of Observations	65				Number of Distinct Observations		52
1985										Number of Missing Observations		0
1986					Minimum	2.8				Mean		107.1
1987					Maximum	830				Median		35
1988					SD	171.3				Std. Error of Mean		21.25
1989					Coefficient of Variation	1.6				Skewness		2.607
1990												
1991					**Normal GOF Test**							
1992					Shapiro Wilk Test Statistic	0.619				**Shapiro Wilk GOF Test**		
1993					5% Shapiro Wilk P Value	0				Data Not Normal at 5% Significance Level		
1994					Lilliefors Test Statistic	0.284				**Lilliefors GOF Test**		
1995					5% Lilliefors Critical Value	0.11				Data Not Normal at 5% Significance Level		
1996					**Data Not Normal at 5% Significance Level**							
1997												
1998					**Assuming Normal Distribution**							
1999					**95% Normal UCL**					**95% UCLs (Adjusted for Skewness)**		
2000					95% Student's-t UCL	142.6				95% Adjusted-CLT UCL (Chen-1995)		149.4
2001										95% Modified-t UCL (Johnson-1978)		143.7
2002												
2003					**Gamma GOF Test**							
2004					A-D Test Statistic	2.429				**Anderson-Darling Gamma GOF Test**		
2005					5% A-D Critical Value	0.801				Data Not Gamma Distributed at 5% Significance Level		
2006					K-S Test Statistic	0.156				**Kolmogorov-Smirnov Gamma GOF Test**		
2007					5% K-S Critical Value	0.116				Data Not Gamma Distributed at 5% Significance Level		
2008					**Data Not Gamma Distributed at 5% Significance Level**							
2009												
2010					**Gamma Statistics**							
2011					k hat (MLE)	0.659				k star (bias corrected MLE)		0.639
2012					Theta hat (MLE)	162.5				Theta star (bias corrected MLE)		167.6
2013					nu hat (MLE)	85.7				nu star (bias corrected)		83.07

	A	B	C	D	E	F	G	H	I	J	K	L
2014					MLE Mean (bias corrected)	107.1					MLE Sd (bias corrected)	134
2015											Approximate Chi Square Value (0.05)	63.07
2016					Adjusted Level of Significance	0.0463					Adjusted Chi Square Value	62.67
2017												
2018					**Assuming Gamma Distribution**							
2019					95% Approximate Gamma UCL (use when n>=50))	141.1					95% Adjusted Gamma UCL (use when n<50)	142
2020												
2021					**Lognormal GOF Test**							
2022					Shapiro Wilk Test Statistic	0.964			**Shapiro Wilk Lognormal GOF Test**			
2023					5% Shapiro Wilk P Value	0.142			Data appear Lognormal at 5% Significance Level			
2024					Lilliefors Test Statistic	0.0824			**Lilliefors Lognormal GOF Test**			
2025					5% Lilliefors Critical Value	0.11			Data appear Lognormal at 5% Significance Level			
2026					**Data appear Lognormal at 5% Significance Level**							
2027												
2028					**Lognormal Statistics**							
2029					Minimum of Logged Data	1.03			Mean of logged Data			3.749
2030					Maximum of Logged Data	6.721			SD of logged Data			1.355
2031												
2032					**Assuming Lognormal Distribution**							
2033					95% H-UCL	155.6			90% Chebyshev (MVUE) UCL			171.7
2034					95% Chebyshev (MVUE) UCL	202.6			97.5% Chebyshev (MVUE) UCL			245.4
2035					99% Chebyshev (MVUE) UCL	329.5						
2036												
2037					**Nonparametric Distribution Free UCL Statistics**							
2038					**Data appear to follow a Discernible Distribution at 5% Significance Level**							
2039												
2040					**Nonparametric Distribution Free UCLs**							
2041					95% CLT UCL	142.1			95% Jackknife UCL			142.6
2042					95% Standard Bootstrap UCL	141.8			95% Bootstrap-t UCL			158.3
2043					95% Hall's Bootstrap UCL	147.9			95% Percentile Bootstrap UCL			144.7
2044					95% BCA Bootstrap UCL	150.8						
2045					90% Chebyshev(Mean, Sd) UCL	170.9			95% Chebyshev(Mean, Sd) UCL			199.7
2046					97.5% Chebyshev(Mean, Sd) UCL	239.8			99% Chebyshev(Mean, Sd) UCL			318.5
2047												
2048					**Suggested UCL to Use**							
2049					95% H-UCL	155.6						
2050												
2051					Note: Suggestions regarding the selection of a 95% UCL are provided to help the user to select the most appropriate 95% UCL.							
2052					Recommendations are based upon data size, data distribution, and skewness.							
2053					These recommendations are based upon the results of the simulation studies summarized in Singh, Maichle, and Lee (2006).							
2054					However, simulations results will not cover all Real World data sets; for additional insight the user may want to consult a statistician.							
2055												
2056					**ProUCL computes and outputs H-statistic based UCLs for historical reasons only.**							
2057					**H-statistic often results in unstable (both high and low) values of UCL95 as shown in examples in the Technical Guide.**							
2058					**It is therefore recommended to avoid the use of H-statistic based 95% UCLs.**							
2059					**Use of nonparametric methods are preferred to compute UCL95 for skewed data sets which do not follow a gamma distribution.**							
2060												
2061												

	A	B	C	D	E	F	G	H	I	J	K	L
2062	Manganese											
2063												
2064					General Statistics							
2065					Total Number of Observations	65				Number of Distinct Observations		47
2066										Number of Missing Observations		0
2067					Minimum	520				Mean		10511
2068					Maximum	36000				Median		7600
2069					SD	8438				Std. Error of Mean		1047
2070					Coefficient of Variation	0.803				Skewness		1.088
2071												
2072					Normal GOF Test							
2073					Shapiro Wilk Test Statistic	0.872				Shapiro Wilk GOF Test		
2074					5% Shapiro Wilk P Value	2.3133E-7				Data Not Normal at 5% Significance Level		
2075					Lilliefors Test Statistic	0.182				Lilliefors GOF Test		
2076					5% Lilliefors Critical Value	0.11				Data Not Normal at 5% Significance Level		
2077					Data Not Normal at 5% Significance Level							
2078												
2079					Assuming Normal Distribution							
2080				95% Normal UCL						95% UCLs (Adjusted for Skewness)		
2081					95% Student's-t UCL	12258				95% Adjusted-CLT UCL (Chen-1995)		12384
2082										95% Modified-t UCL (Johnson-1978)		12281
2083												
2084					Gamma GOF Test							
2085					A-D Test Statistic	0.445				Anderson-Darling Gamma GOF Test		
2086					5% A-D Critical Value	0.768				Detected data appear Gamma Distributed at 5% Significance Level		
2087					K-S Test Statistic	0.0773				Kolmogorov-Smirnov Gamma GOF Test		
2088					5% K-S Critical Value	0.113				Detected data appear Gamma Distributed at 5% Significance Level		
2089					Detected data appear Gamma Distributed at 5% Significance Level							
2090												
2091					Gamma Statistics							
2092					k hat (MLE)	1.567				k star (bias corrected MLE)		1.505
2093					Theta hat (MLE)	6708				Theta star (bias corrected MLE)		6984
2094					nu hat (MLE)	203.7				nu star (bias corrected)		195.6
2095					MLE Mean (bias corrected)	10511				MLE Sd (bias corrected)		8568
2096										Approximate Chi Square Value (0.05)		164.3
2097					Adjusted Level of Significance	0.0463				Adjusted Chi Square Value		163.6
2098												
2099					Assuming Gamma Distribution							
2100					95% Approximate Gamma UCL (use when n>=50)	12518				95% Adjusted Gamma UCL (use when n<50)		12567
2101												
2102					Lognormal GOF Test							
2103					Shapiro Wilk Test Statistic	0.969				Shapiro Wilk Lognormal GOF Test		
2104					5% Shapiro Wilk P Value	0.256				Data appear Lognormal at 5% Significance Level		
2105					Lilliefors Test Statistic	0.079				Lilliefors Lognormal GOF Test		
2106					5% Lilliefors Critical Value	0.11				Data appear Lognormal at 5% Significance Level		
2107					Data appear Lognormal at 5% Significance Level							
2108												
2109					Lognormal Statistics							
2110					Minimum of Logged Data	6.254				Mean of logged Data		8.908
2111					Maximum of Logged Data	10.49				SD of logged Data		0.909
2112												

	A	B	C	D	E	F	G	H	I	J	K	L
2113	Assuming Lognormal Distribution											
2114					95% H-UCL	14343				90% Chebyshev (MVUE) UCL		15422
2115					95% Chebyshev (MVUE) UCL	17389				97.5% Chebyshev (MVUE) UCL		20119
2116					99% Chebyshev (MVUE) UCL	25482						
2117												
2118	Nonparametric Distribution Free UCL Statistics											
2119	Data appear to follow a Discernible Distribution at 5% Significance Level											
2120												
2121	Nonparametric Distribution Free UCLs											
2122					95% CLT UCL	12233				95% Jackknife UCL		12258
2123					95% Standard Bootstrap UCL	12246				95% Bootstrap-t UCL		12450
2124					95% Hall's Bootstrap UCL	12467				95% Percentile Bootstrap UCL		12291
2125					95% BCA Bootstrap UCL	12425						
2126					90% Chebyshev(Mean, Sd) UCL	13651				95% Chebyshev(Mean, Sd) UCL		15073
2127					97.5% Chebyshev(Mean, Sd) UCL	17047				99% Chebyshev(Mean, Sd) UCL		20925
2128												
2129	Suggested UCL to Use											
2130					95% Approximate Gamma UCL	12518						
2131												
2132	Note: Suggestions regarding the selection of a 95% UCL are provided to help the user to select the most appropriate 95% UCL.											
2133	Recommendations are based upon data size, data distribution, and skewness.											
2134	These recommendations are based upon the results of the simulation studies summarized in Singh, Maichle, and Lee (2006).											
2135	However, simulations results will not cover all Real World data sets; for additional insight the user may want to consult a statistician.											
2136												
2137	Mercury											
2138												
2139	General Statistics											
2140					Total Number of Observations	65				Number of Distinct Observations		41
2141					Number of Detects	53				Number of Non-Detects		12
2142					Number of Distinct Detects	40				Number of Distinct Non-Detects		3
2143					Minimum Detect	0.011				Minimum Non-Detect		0.011
2144					Maximum Detect	2.8				Maximum Non-Detect		0.013
2145					Variance Detects	0.163				Percent Non-Detects		18.46%
2146					Mean Detects	0.144				SD Detects		0.404
2147					Median Detects	0.036				CV Detects		2.8
2148					Skewness Detects	5.8				Kurtosis Detects		37.24
2149					Mean of Logged Detects	-2.983				SD of Logged Detects		1.159
2150												
2151	Normal GOF Test on Detects Only											
2152					Shapiro Wilk Test Statistic	0.341				Normal GOF Test on Detected Observations Only		
2153					5% Shapiro Wilk P Value	0				Detected Data Not Normal at 5% Significance Level		
2154					Lilliefors Test Statistic	0.374				Lilliefors GOF Test		
2155					5% Lilliefors Critical Value	0.121				Detected Data Not Normal at 5% Significance Level		
2156	Detected Data Not Normal at 5% Significance Level											
2157												
2158	Kaplan-Meier (KM) Statistics using Normal Critical Values and other Nonparametric UCLs											
2159					KM Mean	0.12				KM Standard Error of Mean		0.0457
2160					KM SD	0.365				95% KM (BCA) UCL		0.212
2161					95% KM (t) UCL	0.196				95% KM (Percentile Bootstrap) UCL		0.207
2162					95% KM (z) UCL	0.195				95% KM Bootstrap t UCL		0.337
2163					90% KM Chebyshev UCL	0.257				95% KM Chebyshev UCL		0.319
2164					97.5% KM Chebyshev UCL	0.405				99% KM Chebyshev UCL		0.575

	A	B	C	D	E	F	G	H	I	J	K	L
2165												
2166	**Gamma GOF Tests on Detected Observations Only**											
2167					A-D Test Statistic	5.849	**Anderson-Darling GOF Test**					
2168					5% A-D Critical Value	0.807	Detected Data Not Gamma Distributed at 5% Significance Level					
2169					K-S Test Statistic	0.274	**Kolmogorov-Smirnov GOF**					
2170					5% K-S Critical Value	0.128	Detected Data Not Gamma Distributed at 5% Significance Level					
2171	**Detected Data Not Gamma Distributed at 5% Significance Level**											
2172												
2173	**Gamma Statistics on Detected Data Only**											
2174					k hat (MLE)	0.591	k star (bias corrected MLE)					0.57
2175					Theta hat (MLE)	0.244	Theta star (bias corrected MLE)					0.253
2176					nu hat (MLE)	62.66	nu star (bias corrected)					60.45
2177					Mean (detects)	0.144						
2178												
2179	**Gamma ROS Statistics using Imputed Non-Detects**											
2180	GROS may not be used when data set has > 50% NDs with many tied observations at multiple DLs											
2181	GROS may not be used when kstar of detects is small such as <1.0, especially when the sample size is small (e.g., <15-20)											
2182	For such situations, GROS method may yield incorrect values of UCLs and BTVs											
2183	This is especially true when the sample size is small.											
2184	For gamma distributed detected data, BTVs and UCLs may be computed using gamma distribution on KM estimates											
2185					Minimum	0.01	Mean					0.12
2186					Maximum	2.8	Median					0.03
2187					SD	0.368	CV					3.079
2188					k hat (MLE)	0.542	k star (bias corrected MLE)					0.527
2189					Theta hat (MLE)	0.221	Theta star (bias corrected MLE)					0.227
2190					nu hat (MLE)	70.41	nu star (bias corrected)					68.49
2191					Adjusted Level of Significance (β)	0.0463						
2192					Approximate Chi Square Value (68.49, α)	50.44	Adjusted Chi Square Value (68.49, β)					50.09
2193					95% Gamma Approximate UCL (use when n>=50)	0.162	95% Gamma Adjusted UCL (use when n<50)					0.163
2194												
2195	**Estimates of Gamma Parameters using KM Estimates**											
2196					Mean (KM)	0.12	SD (KM)					0.365
2197					Variance (KM)	0.133	SE of Mean (KM)					0.0457
2198					k hat (KM)	0.107	k star (KM)					0.113
2199					nu hat (KM)	13.97	nu star (KM)					14.66
2200					theta hat (KM)	1.114	theta star (KM)					1.062
2201					80% gamma percentile (KM)	0.0976	90% gamma percentile (KM)					0.333
2202					95% gamma percentile (KM)	0.688	99% gamma percentile (KM)					1.79
2203												
2204	**Gamma Kaplan-Meier (KM) Statistics**											
2205					Approximate Chi Square Value (14.66, α)	7.025	Adjusted Chi Square Value (14.66, β)					6.905
2206					95% Gamma Approximate KM-UCL (use when n>=50)	0.25	95% Gamma Adjusted KM-UCL (use when n<50)					0.254
2207												
2208	**Lognormal GOF Test on Detected Observations Only**											
2209					Shapiro Wilk Approximate Test Statistic	0.882	**Shapiro Wilk GOF Test**					
2210					5% Shapiro Wilk P Value	1.9399E-5	Detected Data Not Lognormal at 5% Significance Level					
2211					Lilliefors Test Statistic	0.141	**Lilliefors GOF Test**					
2212					5% Lilliefors Critical Value	0.121	Detected Data Not Lognormal at 5% Significance Level					
2213	**Detected Data Not Lognormal at 5% Significance Level**											
2214												

	A	B	C	D	E	F	G	H	I	J	K	L
2215	**Lognormal ROS Statistics Using Imputed Non-Detects**											
2216					Mean in Original Scale	0.119					Mean in Log Scale	-3.449
2217					SD in Original Scale	0.369					SD in Log Scale	1.45
2218				95% t UCL (assumes normality of ROS data)		0.195					95% Percentile Bootstrap UCL	0.202
2219					95% BCA Bootstrap UCL	0.248					95% Bootstrap t UCL	0.349
2220					95% H-UCL (Log ROS)	0.14						
2221												
2222	**Statistics using KM estimates on Logged Data and Assuming Lognormal Distribution**											
2223					KM Mean (logged)	-3.265					KM Geo Mean	0.0382
2224					KM SD (logged)	1.194					95% Critical H Value (KM-Log)	2.227
2225					KM Standard Error of Mean (logged)	0.149					95% H-UCL (KM -Log)	0.109
2226					KM SD (logged)	1.194					95% Critical H Value (KM-Log)	2.227
2227					KM Standard Error of Mean (logged)	0.149						
2228												
2229	**DL/2 Statistics**											
2230				**DL/2 Normal**						**DL/2 Log-Transformed**		
2231					Mean in Original Scale	0.119					Mean in Log Scale	-3.382
2232					SD in Original Scale	0.368					SD in Log Scale	1.344
2233					95% t UCL (Assumes normality)	0.195					95% H-Stat UCL	0.122
2234	**DL/2 is not a recommended method, provided for comparisons and historical reasons**											
2235												
2236	**Nonparametric Distribution Free UCL Statistics**											
2237	**Data do not follow a Discernible Distribution at 5% Significance Level**											
2238												
2239	**Suggested UCL to Use**											
2240					95% KM (Chebyshev) UCL	0.319						
2241												
2242	Note: Suggestions regarding the selection of a 95% UCL are provided to help the user to select the most appropriate 95% UCL.											
2243	Recommendations are based upon data size, data distribution, and skewness.											
2244	These recommendations are based upon the results of the simulation studies summarized in Singh, Maichle, and Lee (2006).											
2245	However, simulations results will not cover all Real World data sets; for additional insight the user may want to consult a statistician.											
2246												
2247												
2248	**Nickel**											
2249												
2250	**General Statistics**											
2251					Total Number of Observations	65					Number of Distinct Observations	43
2252											Number of Missing Observations	0
2253					Minimum	2.9					Mean	92.24
2254					Maximum	4600					Median	15
2255					SD	568.2					Std. Error of Mean	70.47
2256					Coefficient of Variation	6.16					Skewness	8.048
2257												
2258	**Normal GOF Test**											
2259					Shapiro Wilk Test Statistic	0.145					**Shapiro Wilk GOF Test**	
2260					5% Shapiro Wilk P Value	0					Data Not Normal at 5% Significance Level	
2261					Lilliefors Test Statistic	0.488					**Lilliefors GOF Test**	
2262					5% Lilliefors Critical Value	0.11					Data Not Normal at 5% Significance Level	
2263	**Data Not Normal at 5% Significance Level**											
2264												

	A	B	C	D	E	F	G	H	I	J	K	L
2265	Assuming Normal Distribution											
2266	95% Normal UCL						95% UCLs (Adjusted for Skewness)					
2267					95% Student's-t UCL	209.9				95% Adjusted-CLT UCL (Chen-1995)		283.3
2268										95% Modified-t UCL (Johnson-1978)		221.6
2269												
2270	Gamma GOF Test											
2271					A-D Test Statistic	13.12	Anderson-Darling Gamma GOF Test					
2272					5% A-D Critical Value	0.842	Data Not Gamma Distributed at 5% Significance Level					
2273					K-S Test Statistic	0.338	Kolmogorov-Smirnov Gamma GOF Test					
2274					5% K-S Critical Value	0.119	Data Not Gamma Distributed at 5% Significance Level					
2275	Data Not Gamma Distributed at 5% Significance Level											
2276												
2277	Gamma Statistics											
2278					k hat (MLE)	0.395				k star (bias corrected MLE)		0.387
2279					Theta hat (MLE)	233.2				Theta star (bias corrected MLE)		238
2280					nu hat (MLE)	51.41				nu star (bias corrected)		50.37
2281					MLE Mean (bias corrected)	92.24				MLE Sd (bias corrected)		148.2
2282										Approximate Chi Square Value (0.05)		35.08
2283					Adjusted Level of Significance	0.0463				Adjusted Chi Square Value		34.79
2284												
2285	Assuming Gamma Distribution											
2286				95% Approximate Gamma UCL (use when n>=50))		132.5				95% Adjusted Gamma UCL (use when n<50)		133.6
2287												
2288	Lognormal GOF Test											
2289					Shapiro Wilk Test Statistic	0.846	Shapiro Wilk Lognormal GOF Test					
2290					5% Shapiro Wilk P Value	5.2354E-9	Data Not Lognormal at 5% Significance Level					
2291					Lilliefors Test Statistic	0.148	Lilliefors Lognormal GOF Test					
2292					5% Lilliefors Critical Value	0.11	Data Not Lognormal at 5% Significance Level					
2293	Data Not Lognormal at 5% Significance Level											
2294												
2295	Lognormal Statistics											
2296					Minimum of Logged Data	1.065				Mean of logged Data		2.858
2297					Maximum of Logged Data	8.434				SD of logged Data		1.052
2298												
2299	Assuming Lognormal Distribution											
2300					95% H-UCL	40.8				90% Chebyshev (MVUE) UCL		43.98
2301					95% Chebyshev (MVUE) UCL	50.36				97.5% Chebyshev (MVUE) UCL		59.22
2302					99% Chebyshev (MVUE) UCL	76.61						
2303												
2304	Nonparametric Distribution Free UCL Statistics											
2305	Data do not follow a Discernible Distribution (0.05)											
2306												
2307	Nonparametric Distribution Free UCLs											
2308					95% CLT UCL	208.2				95% Jackknife UCL		209.9
2309					95% Standard Bootstrap UCL	206.4				95% Bootstrap-t UCL		2663
2310					95% Hall's Bootstrap UCL	1026				95% Percentile Bootstrap UCL		232.8
2311					95% BCA Bootstrap UCL	373.2						
2312					90% Chebyshev(Mean, Sd) UCL	303.7				95% Chebyshev(Mean, Sd) UCL		399.4
2313					97.5% Chebyshev(Mean, Sd) UCL	532.3				99% Chebyshev(Mean, Sd) UCL		793.4
2314												

	A	B	C	D	E	F	G	H	I	J	K	L
2315						Suggested UCL to Use						
2316					95% Chebyshev (Mean, Sd) UCL	399.4						
2317												
2318					Note: Suggestions regarding the selection of a 95% UCL are provided to help the user to select the most appropriate 95% UCL.							
2319					Recommendations are based upon data size, data distribution, and skewness.							
2320					These recommendations are based upon the results of the simulation studies summarized in Singh, Maichle, and Lee (2006).							
2321					However, simulations results will not cover all Real World data sets; for additional insight the user may want to consult a statistician.							
2322												
2323	Thallium											
2324												
2325						General Statistics						
2326					Total Number of Observations	65			Number of Distinct Observations			51
2327					Number of Detects	56			Number of Non-Detects			9
2328					Number of Distinct Detects	48			Number of Distinct Non-Detects			5
2329					Minimum Detect	0.0064			Minimum Non-Detect			0.021
2330					Maximum Detect	0.81			Maximum Non-Detect			0.025
2331					Variance Detects	0.0248			Percent Non-Detects			13.85%
2332					Mean Detects	0.0977			SD Detects			0.158
2333					Median Detects	0.0435			CV Detects			1.612
2334					Skewness Detects	3.422			Kurtosis Detects			12.05
2335					Mean of Logged Detects	-2.958			SD of Logged Detects			1.04
2336												
2337						Normal GOF Test on Detects Only						
2338					Shapiro Wilk Test Statistic	0.527			Normal GOF Test on Detected Observations Only			
2339					5% Shapiro Wilk P Value	0			Detected Data Not Normal at 5% Significance Level			
2340					Lilliefors Test Statistic	0.302			Lilliefors GOF Test			
2341					5% Lilliefors Critical Value	0.118			Detected Data Not Normal at 5% Significance Level			
2342						Detected Data Not Normal at 5% Significance Level						
2343												
2344						Kaplan-Meier (KM) Statistics using Normal Critical Values and other Nonparametric UCLs						
2345					KM Mean	0.0858			KM Standard Error of Mean			0.0185
2346					KM SD	0.148			95% KM (BCA) UCL			0.118
2347					95% KM (t) UCL	0.117			95% KM (Percentile Bootstrap) UCL			0.118
2348					95% KM (z) UCL	0.116			95% KM Bootstrap t UCL			0.135
2349					90% KM Chebyshev UCL	0.141			95% KM Chebyshev UCL			0.167
2350					97.5% KM Chebyshev UCL	0.201			99% KM Chebyshev UCL			0.27
2351												
2352						Gamma GOF Tests on Detected Observations Only						
2353					A-D Test Statistic	3.05			Anderson-Darling GOF Test			
2354					5% A-D Critical Value	0.784			Detected Data Not Gamma Distributed at 5% Significance Level			
2355					K-S Test Statistic	0.2			Kolmogorov-Smirnov GOF			
2356					5% K-S Critical Value	0.123			Detected Data Not Gamma Distributed at 5% Significance Level			
2357						Detected Data Not Gamma Distributed at 5% Significance Level						
2358												
2359						Gamma Statistics on Detected Data Only						
2360					k hat (MLE)	0.922			k star (bias corrected MLE)			0.884
2361					Theta hat (MLE)	0.106			Theta star (bias corrected MLE)			0.111
2362					nu hat (MLE)	103.2			nu star (bias corrected)			99.02
2363					Mean (detects)	0.0977						
2364												

	A	B	C	D	E	F	G	H	I	J	K	L
2365	**Gamma ROS Statistics using Imputed Non-Detects**											
2366	GROS may not be used when data set has > 50% NDs with many tied observations at multiple DLs											
2367	GROS may not be used when kstar of detects is small such as <1.0, especially when the sample size is small (e.g., <15-20)											
2368	For such situations, GROS method may yield incorrect values of UCLs and BTVs											
2369	This is especially true when the sample size is small.											
2370	For gamma distributed detected data, BTVs and UCLs may be computed using gamma distribution on KM estimates											
2371					Minimum	0.0064				Mean		0.0856
2372					Maximum	0.81				Median		0.038
2373					SD	0.149				CV		1.744
2374					k hat (MLE)	0.814				k star (bias corrected MLE)		0.786
2375					Theta hat (MLE)	0.105				Theta star (bias corrected MLE)		0.109
2376					nu hat (MLE)	105.8				nu star (bias corrected)		102.2
2377					Adjusted Level of Significance (β)	0.0463						
2378					Approximate Chi Square Value (102.22, α)	79.89				Adjusted Chi Square Value (102.22, β)		79.44
2379					95% Gamma Approximate UCL (use when n>=50)	0.109				95% Gamma Adjusted UCL (use when n<50)		0.11
2380												
2381	**Estimates of Gamma Parameters using KM Estimates**											
2382					Mean (KM)	0.0858				SD (KM)		0.148
2383					Variance (KM)	0.0219				SE of Mean (KM)		0.0185
2384					k hat (KM)	0.336				k star (KM)		0.331
2385					nu hat (KM)	43.68				nu star (KM)		42.99
2386					theta hat (KM)	0.255				theta star (KM)		0.259
2387					80% gamma percentile (KM)	0.134				90% gamma percentile (KM)		0.25
2388					95% gamma percentile (KM)	0.38				99% gamma percentile (KM)		0.715
2389												
2390	**Gamma Kaplan-Meier (KM) Statistics**											
2391					Approximate Chi Square Value (42.99, α)	28.96				Adjusted Chi Square Value (42.99, β)		28.7
2392					95% Gamma Approximate KM-UCL (use when n>=50)	0.127				95% Gamma Adjusted KM-UCL (use when n<50)		0.128
2393												
2394	**Lognormal GOF Test on Detected Observations Only**											
2395					Shapiro Wilk Approximate Test Statistic	0.951				**Shapiro Wilk GOF Test**		
2396					5% Shapiro Wilk P Value	0.0462				Detected Data Not Lognormal at 5% Significance Level		
2397					Lilliefors Test Statistic	0.109				**Lilliefors GOF Test**		
2398					5% Lilliefors Critical Value	0.118				Detected Data appear Lognormal at 5% Significance Level		
2399	**Detected Data appear Approximate Lognormal at 5% Significance Level**											
2400												
2401	**Lognormal ROS Statistics Using Imputed Non-Detects**											
2402					Mean in Original Scale	0.0856				Mean in Log Scale		-3.186
2403					SD in Original Scale	0.149				SD in Log Scale		1.125
2404					95% t UCL (assumes normality of ROS data)	0.117				95% Percentile Bootstrap UCL		0.116
2405					95% BCA Bootstrap UCL	0.126				95% Bootstrap t UCL		0.139
2406					95% H-UCL (Log ROS)	0.107						
2407												
2408	**Statistics using KM estimates on Logged Data and Assuming Lognormal Distribution**											
2409					KM Mean (logged)	-3.18				KM Geo Mean		0.0416
2410					KM SD (logged)	1.116				95% Critical H Value (KM-Log)		2.262
2411					KM Standard Error of Mean (logged)	0.143				95% H-UCL (KM -Log)		0.106
2412					KM SD (logged)	1.116				95% Critical H Value (KM-Log)		2.262
2413					KM Standard Error of Mean (logged)	0.143						
2414												

	A	B	C	D	E	F	G	H	I	J	K	L
2415	DL/2 Statistics											
2416	DL/2 Normal						DL/2 Log-Transformed					
2417					Mean in Original Scale	0.0857				Mean in Log Scale		-3.17
2418					SD in Original Scale	0.149				SD in Log Scale		1.102
2419					95% t UCL (Assumes normality)	0.117				95% H-Stat UCL		0.105
2420	DL/2 is not a recommended method, provided for comparisons and historical reasons											
2421												
2422	Nonparametric Distribution Free UCL Statistics											
2423	Detected Data appear Approximate Lognormal Distributed at 5% Significance Level											
2424												
2425	Suggested UCL to Use											
2426					KM H-UCL	0.106						
2427												
2428	Note: Suggestions regarding the selection of a 95% UCL are provided to help the user to select the most appropriate 95% UCL.											
2429	Recommendations are based upon data size, data distribution, and skewness.											
2430	These recommendations are based upon the results of the simulation studies summarized in Singh, Maichle, and Lee (2006).											
2431	However, simulations results will not cover all Real World data sets; for additional insight the user may want to consult a statistician.											
2432												
2433												
2434	Vanadium											
2435												
2436	General Statistics											
2437					Total Number of Observations	65				Number of Distinct Observations		47
2438										Number of Missing Observations		0
2439					Minimum	1.3				Mean		173.1
2440					Maximum	620				Median		110
2441					SD	163.6				Std. Error of Mean		20.29
2442					Coefficient of Variation	0.945				Skewness		1.024
2443												
2444	Normal GOF Test											
2445					Shapiro Wilk Test Statistic	0.854	Shapiro Wilk GOF Test					
2446					5% Shapiro Wilk P Value	1.6341E-8	Data Not Normal at 5% Significance Level					
2447					Lilliefors Test Statistic	0.173	Lilliefors GOF Test					
2448					5% Lilliefors Critical Value	0.11	Data Not Normal at 5% Significance Level					
2449	Data Not Normal at 5% Significance Level											
2450												
2451	Assuming Normal Distribution											
2452	95% Normal UCL						95% UCLs (Adjusted for Skewness)					
2453					95% Student's-t UCL	207				95% Adjusted-CLT UCL (Chen-1995)		209.3
2454										95% Modified-t UCL (Johnson-1978)		207.4
2455												
2456	Gamma GOF Test											
2457					A-D Test Statistic	0.504	Anderson-Darling Gamma GOF Test					
2458					5% A-D Critical Value	0.782	Detected data appear Gamma Distributed at 5% Significance Level					
2459					K-S Test Statistic	0.0881	Kolmogorov-Smirnov Gamma GOF Test					
2460					5% K-S Critical Value	0.114	Detected data appear Gamma Distributed at 5% Significance Level					
2461	Detected data appear Gamma Distributed at 5% Significance Level											
2462												
2463	Gamma Statistics											
2464					k hat (MLE)	0.961				k star (bias corrected MLE)		0.927
2465					Theta hat (MLE)	180.2				Theta star (bias corrected MLE)		186.8
2466					nu hat (MLE)	124.9				nu star (bias corrected)		120.5

	A	B	C	D	E	F	G	H	I	J	K	L
2467					MLE Mean (bias corrected)	173.1					MLE Sd (bias corrected)	179.8
2468											Approximate Chi Square Value (0.05)	96.14
2469					Adjusted Level of Significance	0.0463					Adjusted Chi Square Value	95.65
2470												
2471					**Assuming Gamma Distribution**							
2472				95% Approximate Gamma UCL (use when n>=50)		217					95% Adjusted Gamma UCL (use when n<50)	218.1
2473												
2474					**Lognormal GOF Test**							
2475					Shapiro Wilk Test Statistic	0.943			**Shapiro Wilk Lognormal GOF Test**			
2476					5% Shapiro Wilk P Value	0.00907			Data Not Lognormal at 5% Significance Level			
2477					Lilliefors Test Statistic	0.1			**Lilliefors Lognormal GOF Test**			
2478					5% Lilliefors Critical Value	0.11			Data appear Lognormal at 5% Significance Level			
2479					**Data appear Approximate Lognormal at 5% Significance Level**							
2480												
2481					**Lognormal Statistics**							
2482					Minimum of Logged Data	0.262					Mean of logged Data	4.551
2483					Maximum of Logged Data	6.43					SD of logged Data	1.294
2484												
2485					**Assuming Lognormal Distribution**							
2486					95% H-UCL	312.3					90% Chebyshev (MVUE) UCL	345.8
2487					95% Chebyshev (MVUE) UCL	405.6					97.5% Chebyshev (MVUE) UCL	488.6
2488					99% Chebyshev (MVUE) UCL	651.7						
2489												
2490					**Nonparametric Distribution Free UCL Statistics**							
2491					**Data appear to follow a Discernible Distribution at 5% Significance Level**							
2492												
2493					**Nonparametric Distribution Free UCLs**							
2494					95% CLT UCL	206.5					95% Jackknife UCL	207
2495					95% Standard Bootstrap UCL	206.6					95% Bootstrap-t UCL	210.9
2496					95% Hall's Bootstrap UCL	209.8					95% Percentile Bootstrap UCL	207.5
2497					95% BCA Bootstrap UCL	210.4						
2498					90% Chebyshev(Mean, Sd) UCL	234					95% Chebyshev(Mean, Sd) UCL	261.6
2499					97.5% Chebyshev(Mean, Sd) UCL	299.9					99% Chebyshev(Mean, Sd) UCL	375.1
2500												
2501					**Suggested UCL to Use**							
2502					95% Approximate Gamma UCL	217						
2503												
2504					Note: Suggestions regarding the selection of a 95% UCL are provided to help the user to select the most appropriate 95% UCL.							
2505					Recommendations are based upon data size, data distribution, and skewness.							
2506					These recommendations are based upon the results of the simulation studies summarized in Singh, Maichle, and Lee (2006).							
2507					However, simulations results will not cover all Real World data sets; for additional insight the user may want to consult a statistician.							
2508												
2509												
2510	**Zinc**											
2511												
2512					**General Statistics**							
2513					Total Number of Observations	65					Number of Distinct Observations	54
2514											Number of Missing Observations	0
2515					Minimum	15					Mean	488
2516					Maximum	5100					Median	120
2517					SD	854.8					Std. Error of Mean	106
2518					Coefficient of Variation	1.752					Skewness	3.256

	A	B	C	D	E	F	G	H	I	J	K	L
2519												
2520						Normal GOF Test						
2521					Shapiro Wilk Test Statistic	0.588	Shapiro Wilk GOF Test					
2522					5% Shapiro Wilk P Value	0	Data Not Normal at 5% Significance Level					
2523					Lilliefors Test Statistic	0.29	Lilliefors GOF Test					
2524					5% Lilliefors Critical Value	0.11	Data Not Normal at 5% Significance Level					
2525					Data Not Normal at 5% Significance Level							
2526												
2527					Assuming Normal Distribution							
2528			95% Normal UCL				95% UCLs (Adjusted for Skewness)					
2529					95% Student's-t UCL	665	95% Adjusted-CLT UCL (Chen-1995)					708.2
2530							95% Modified-t UCL (Johnson-1978)					672.1
2531												
2532					Gamma GOF Test							
2533					A-D Test Statistic	4.041	Anderson-Darling Gamma GOF Test					
2534					5% A-D Critical Value	0.806	Data Not Gamma Distributed at 5% Significance Level					
2535					K-S Test Statistic	0.227	Kolmogorov-Smirnov Gamma GOF Test					
2536					5% K-S Critical Value	0.116	Data Not Gamma Distributed at 5% Significance Level					
2537					Data Not Gamma Distributed at 5% Significance Level							
2538												
2539					Gamma Statistics							
2540					k hat (MLE)	0.611	k star (bias corrected MLE)					0.593
2541					Theta hat (MLE)	799.3	Theta star (bias corrected MLE)					823.4
2542					nu hat (MLE)	79.38	nu star (bias corrected)					77.05
2543					MLE Mean (bias corrected)	488	MLE Sd (bias corrected)					633.9
2544							Approximate Chi Square Value (0.05)					57.83
2545					Adjusted Level of Significance	0.0463	Adjusted Chi Square Value					57.45
2546												
2547					Assuming Gamma Distribution							
2548					95% Approximate Gamma UCL (use when n>=50))	650.3	95% Adjusted Gamma UCL (use when n<50)					654.5
2549												
2550					Lognormal GOF Test							
2551					Shapiro Wilk Test Statistic	0.919	Shapiro Wilk Lognormal GOF Test					
2552					5% Shapiro Wilk P Value	2.7707E-4	Data Not Lognormal at 5% Significance Level					
2553					Lilliefors Test Statistic	0.15	Lilliefors Lognormal GOF Test					
2554					5% Lilliefors Critical Value	0.11	Data Not Lognormal at 5% Significance Level					
2555					Data Not Lognormal at 5% Significance Level							
2556												
2557					Lognormal Statistics							
2558					Minimum of Logged Data	2.708	Mean of logged Data					5.181
2559					Maximum of Logged Data	8.537	SD of logged Data					1.364
2560												
2561					Assuming Lognormal Distribution							
2562					95% H-UCL	662.2	90% Chebyshev (MVUE) UCL					730
2563					95% Chebyshev (MVUE) UCL	861.8	97.5% Chebyshev (MVUE) UCL					1045
2564					99% Chebyshev (MVUE) UCL	1404						
2565												
2566					Nonparametric Distribution Free UCL Statistics							
2567					Data do not follow a Discernible Distribution (0.05)							
2568												

	A	B	C	D	E	F	G	H	I	J	K	L
2569	**Nonparametric Distribution Free UCLs**											
2570					95% CLT UCL	662.4				95% Jackknife UCL		665
2571				95% Standard Bootstrap UCL		664.9				95% Bootstrap-t UCL		750.6
2572				95% Hall's Bootstrap UCL		777.5				95% Percentile Bootstrap UCL		668.6
2573				95% BCA Bootstrap UCL		713						
2574				90% Chebyshev(Mean, Sd) UCL		806.1				95% Chebyshev(Mean, Sd) UCL		950.2
2575				97.5% Chebyshev(Mean, Sd) UCL		1150				99% Chebyshev(Mean, Sd) UCL		1543
2576												
2577	**Suggested UCL to Use**											
2578				95% Chebyshev (Mean, Sd) UCL		950.2						
2579												
2580	Note: Suggestions regarding the selection of a 95% UCL are provided to help the user to select the most appropriate 95% UCL.											
2581	Recommendations are based upon data size, data distribution, and skewness.											
2582	These recommendations are based upon the results of the simulation studies summarized in Singh, Maichle, and Lee (2006).											
2583	However, simulations results will not cover all Real World data sets; for additional insight the user may want to consult a statistician.											
2584												
2585	**Cyanide, Total**											
2586												
2587	**General Statistics**											
2588					Total Number of Observations	65				Number of Distinct Observations		43
2589					Number of Detects	53				Number of Non-Detects		12
2590					Number of Distinct Detects	40				Number of Distinct Non-Detects		5
2591					Minimum Detect	0.11				Minimum Non-Detect		0.095
2592					Maximum Detect	26				Maximum Non-Detect		0.12
2593					Variance Detects	15.51				Percent Non-Detects		18.46%
2594					Mean Detects	2.049				SD Detects		3.938
2595					Median Detects	0.91				CV Detects		1.921
2596					Skewness Detects	4.822				Kurtosis Detects		27.1
2597					Mean of Logged Detects	0.0158				SD of Logged Detects		1.075
2598												
2599	**Normal GOF Test on Detects Only**											
2600					Shapiro Wilk Test Statistic	0.453				**Normal GOF Test on Detected Observations Only**		
2601					5% Shapiro Wilk P Value	0				Detected Data Not Normal at 5% Significance Level		
2602					Lilliefors Test Statistic	0.326				**Lilliefors GOF Test**		
2603					5% Lilliefors Critical Value	0.121				Detected Data Not Normal at 5% Significance Level		
2604	**Detected Data Not Normal at 5% Significance Level**											
2605												
2606	**Kaplan-Meier (KM) Statistics using Normal Critical Values and other Nonparametric UCLs**											
2607					KM Mean	1.689				KM Standard Error of Mean		0.451
2608					KM SD	3.603				95% KM (BCA) UCL		2.474
2609					95% KM (t) UCL	2.442				95% KM (Percentile Bootstrap) UCL		2.498
2610					95% KM (z) UCL	2.431				95% KM Bootstrap t UCL		3.254
2611					90% KM Chebyshev UCL	3.042				95% KM Chebyshev UCL		3.655
2612					97.5% KM Chebyshev UCL	4.506				99% KM Chebyshev UCL		6.178
2613												
2614	**Gamma GOF Tests on Detected Observations Only**											
2615					A-D Test Statistic	3.231				**Anderson-Darling GOF Test**		
2616					5% A-D Critical Value	0.788				Detected Data Not Gamma Distributed at 5% Significance Level		
2617					K-S Test Statistic	0.214				**Kolmogorov-Smirnov GOF**		
2618					5% K-S Critical Value	0.127				Detected Data Not Gamma Distributed at 5% Significance Level		
2619	**Detected Data Not Gamma Distributed at 5% Significance Level**											
2620												

	A	B	C	D	E	F	G	H	I	J	K	L
2621	**Gamma Statistics on Detected Data Only**											
2622					k hat (MLE)	0.84				k star (bias corrected MLE)		0.805
2623					Theta hat (MLE)	2.439				Theta star (bias corrected MLE)		2.545
2624					nu hat (MLE)	89.07				nu star (bias corrected)		85.37
2625					Mean (detects)	2.049						
2626												
2627	**Gamma ROS Statistics using Imputed Non-Detects**											
2628	GROS may not be used when data set has > 50% NDs with many tied observations at multiple DLs											
2629	GROS may not be used when kstar of detects is small such as <1.0, especially when the sample size is small (e.g., <15-20)											
2630	For such situations, GROS method may yield incorrect values of UCLs and BTVs											
2631	This is especially true when the sample size is small.											
2632	For gamma distributed detected data, BTVs and UCLs may be computed using gamma distribution on KM estimates											
2633					Minimum	0.01				Mean		1.673
2634					Maximum	26				Median		0.69
2635					SD	3.638				CV		2.175
2636					k hat (MLE)	0.474				k star (bias corrected MLE)		0.462
2637					Theta hat (MLE)	3.531				Theta star (bias corrected MLE)		3.619
2638					nu hat (MLE)	61.6				nu star (bias corrected)		60.09
2639					Adjusted Level of Significance (β)	0.0463						
2640					Approximate Chi Square Value (60.09, α)	43.26				Adjusted Chi Square Value (60.09, β)		42.94
2641					95% Gamma Approximate UCL (use when n>=50)	2.324				95% Gamma Adjusted UCL (use when n<50)		2.341
2642												
2643	**Estimates of Gamma Parameters using KM Estimates**											
2644					Mean (KM)	1.689				SD (KM)		3.603
2645					Variance (KM)	12.98				SE of Mean (KM)		0.451
2646					k hat (KM)	0.22				k star (KM)		0.22
2647					nu hat (KM)	28.56				nu star (KM)		28.58
2648					theta hat (KM)	7.686				theta star (KM)		7.682
2649					80% gamma percentile (KM)	2.33				90% gamma percentile (KM)		5.102
2650					95% gamma percentile (KM)	8.483				99% gamma percentile (KM)		17.65
2651												
2652	**Gamma Kaplan-Meier (KM) Statistics**											
2653					Approximate Chi Square Value (28.58, α)	17.38				Adjusted Chi Square Value (28.58, β)		17.18
2654					95% Gamma Approximate KM-UCL (use when n>=50)	2.777				95% Gamma Adjusted KM-UCL (use when n<50)		2.809
2655												
2656	**Lognormal GOF Test on Detected Observations Only**											
2657					Shapiro Wilk Approximate Test Statistic	0.952				**Shapiro Wilk GOF Test**		
2658					5% Shapiro Wilk P Value	0.059				Detected Data appear Lognormal at 5% Significance Level		
2659					Lilliefors Test Statistic	0.113				**Lilliefors GOF Test**		
2660					5% Lilliefors Critical Value	0.121				Detected Data appear Lognormal at 5% Significance Level		
2661	**Detected Data appear Lognormal at 5% Significance Level**											
2662												
2663	**Lognormal ROS Statistics Using Imputed Non-Detects**											
2664					Mean in Original Scale	1.69				Mean in Log Scale		-0.418
2665					SD in Original Scale	3.63				SD in Log Scale		1.344
2666					95% t UCL (assumes normality of ROS data)	2.441				95% Percentile Bootstrap UCL		2.508
2667					95% BCA Bootstrap UCL	2.783				95% Bootstrap t UCL		3.359
2668					95% H-UCL (Log ROS)	2.367						
2669												
2670	**Statistics using KM estimates on Logged Data and Assuming Lognormal Distribution**											
2671					KM Mean (logged)	-0.42				KM Geo Mean		0.657
2672					KM SD (logged)	1.328				95% Critical H Value (KM-Log)		2.227

	A	B	C	D	E	F	G	H	I	J	K	L
2673					KM Standard Error of Mean (logged)	0.166					95% H-UCL (KM -Log)	2.298
2674					KM SD (logged)	1.328					95% Critical H Value (KM-Log)	2.227
2675					KM Standard Error of Mean (logged)	0.166						
2676												
2677					**DL/2 Statistics**							
2678					**DL/2 Normal**				**DL/2 Log-Transformed**			
2679					Mean in Original Scale	1.681					Mean in Log Scale	-0.526
2680					SD in Original Scale	3.634					SD in Log Scale	1.501
2681					95% t UCL (Assumes normality)	2.433					95% H-Stat UCL	2.884
2682					**DL/2 is not a recommended method, provided for comparisons and historical reasons**							
2683												
2684					**Nonparametric Distribution Free UCL Statistics**							
2685					**Detected Data appear Lognormal Distributed at 5% Significance Level**							
2686												
2687					**Suggested UCL to Use**							
2688					KM H-UCL	2.298						
2689												
2690					Note: Suggestions regarding the selection of a 95% UCL are provided to help the user to select the most appropriate 95% UCL.							
2691					Recommendations are based upon data size, data distribution, and skewness.							
2692					These recommendations are based upon the results of the simulation studies summarized in Singh, Maichle, and Lee (2006).							
2693					However, simulations results will not cover all Real World data sets; for additional insight the user may want to consult a statistician.							
2694												

	A	B	C	D	E	F	G	H	I	J	K	L
1	UCL Statistics for Data Sets with Non-Detects											
2												
3	User Selected Options											
4	Date/Time of Computation			ProUCL 5.15/18/2021 11:03:22 AM								
5	From File			WoodedProUCL.xls								
6	Full Precision			OFF								
7	Confidence Coefficient			95%								
8	Number of Bootstrap Operations			2000								
9												
10												
11	Arsenic											
12												
13	General Statistics											
14	Total Number of Observations					5	Number of Distinct Observations					5
15							Number of Missing Observations					0
16	Minimum					9.5	Mean					14.9
17	Maximum					32	Median					11
18	SD					9.607	Std. Error of Mean					4.297
19	Coefficient of Variation					0.645	Skewness					2.181
20												
21	Note: Sample size is small (e.g., <10), if data are collected using ISM approach, you should use											
22	guidance provided in ITRC Tech Reg Guide on ISM (ITRC, 2012) to compute statistics of interest.											
23	For example, you may want to use Chebyshev UCL to estimate EPC (ITRC, 2012).											
24	Chebyshev UCL can be computed using the Nonparametric and All UCL Options of ProUCL 5.1											
25												
26	Normal GOF Test											
27	Shapiro Wilk Test Statistic					0.645	Shapiro Wilk GOF Test					
28	5% Shapiro Wilk Critical Value					0.762	Data Not Normal at 5% Significance Level					
29	Lilliefors Test Statistic					0.419	Lilliefors GOF Test					
30	5% Lilliefors Critical Value					0.343	Data Not Normal at 5% Significance Level					
31	Data Not Normal at 5% Significance Level											
32												
33	Assuming Normal Distribution											
34	95% Normal UCL						95% UCLs (Adjusted for Skewness)					
35	95% Student's-t UCL					24.06	95% Adjusted-CLT UCL (Chen-1995)					26.44
36							95% Modified-t UCL (Johnson-1978)					24.76
37												
38	Gamma GOF Test											
39	A-D Test Statistic					0.903	Anderson-Darling Gamma GOF Test					
40	5% A-D Critical Value					0.681	Data Not Gamma Distributed at 5% Significance Level					
41	K-S Test Statistic					0.406	Kolmogorov-Smirnov Gamma GOF Test					
42	5% K-S Critical Value					0.358	Data Not Gamma Distributed at 5% Significance Level					
43	Data Not Gamma Distributed at 5% Significance Level											
44												
45	Gamma Statistics											
46	k hat (MLE)					4.296	k star (bias corrected MLE)					1.852
47	Theta hat (MLE)					3.468	Theta star (bias corrected MLE)					8.046
48	nu hat (MLE)					42.96	nu star (bias corrected)					18.52
49	MLE Mean (bias corrected)					14.9	MLE Sd (bias corrected)					10.95
50							Approximate Chi Square Value (0.05)					9.766
51	Adjusted Level of Significance					0.0086	Adjusted Chi Square Value					7.156
52												

	A	B	C	D	E	F	G	H	I	J	K	L
53	Assuming Gamma Distribution											
54	95% Approximate Gamma UCL (use when n>=50))					28.25	95% Adjusted Gamma UCL (use when n<50)					38.56
55												
56	Lognormal GOF Test											
57	Shapiro Wilk Test Statistic					0.716	Shapiro Wilk Lognormal GOF Test					
58	5% Shapiro Wilk Critical Value					0.762	Data Not Lognormal at 5% Significance Level					
59	Lilliefors Test Statistic					0.375	Lilliefors Lognormal GOF Test					
60	5% Lilliefors Critical Value					0.343	Data Not Lognormal at 5% Significance Level					
61	Data Not Lognormal at 5% Significance Level											
62												
63	Lognormal Statistics											
64	Minimum of Logged Data					2.251	Mean of logged Data					2.58
65	Maximum of Logged Data					3.466	SD of logged Data					0.503
66												
67	Assuming Lognormal Distribution											
68	95% H-UCL					31.51	90% Chebyshev (MVUE) UCL					24.34
69	95% Chebyshev (MVUE) UCL					28.75	97.5% Chebyshev (MVUE) UCL					34.88
70	99% Chebyshev (MVUE) UCL					46.93						
71												
72	Nonparametric Distribution Free UCL Statistics											
73	Data do not follow a Discernible Distribution (0.05)											
74												
75	Nonparametric Distribution Free UCLs											
76	95% CLT UCL					21.97	95% Jackknife UCL					24.06
77	95% Standard Bootstrap UCL					21.11	95% Bootstrap-t UCL					80.78
78	95% Hall's Bootstrap UCL					72.11	95% Percentile Bootstrap UCL					23.2
79	95% BCA Bootstrap UCL					23.6						
80	90% Chebyshev(Mean, Sd) UCL					27.79	95% Chebyshev(Mean, Sd) UCL					33.63
81	97.5% Chebyshev(Mean, Sd) UCL					41.73	99% Chebyshev(Mean, Sd) UCL					57.65
82												
83	Suggested UCL to Use											
84	95% Chebyshev (Mean, Sd) UCL					33.63						
85												
86	Recommended UCL exceeds the maximum observation											
87												
88	Note: Suggestions regarding the selection of a 95% UCL are provided to help the user to select the most appropriate 95% UCL.											
89	Recommendations are based upon data size, data distribution, and skewness.											
90	These recommendations are based upon the results of the simulation studies summarized in Singh, Maichle, and Lee (2006).											
91	However, simulations results will not cover all Real World data sets; for additional insight the user may want to consult a statistician.											
92												
93												
94	Iron											
95												
96	General Statistics											
97	Total Number of Observations					5	Number of Distinct Observations					5
98							Number of Missing Observations					0
99	Minimum					19000	Mean					35200
100	Maximum					64000	Median					31000
101	SD					17152	Std. Error of Mean					7671
102	Coefficient of Variation					0.487	Skewness					1.57
103												

	A	B	C	D	E	F	G	H	I	J	K	L
104	Note: Sample size is small (e.g., <10), if data are collected using ISM approach, you should use											
105	guidance provided in ITRC Tech Reg Guide on ISM (ITRC, 2012) to compute statistics of interest.											
106	For example, you may want to use Chebyshev UCL to estimate EPC (ITRC, 2012).											
107	Chebyshev UCL can be computed using the Nonparametric and All UCL Options of ProUCL 5.1											
108												
109	Normal GOF Test											
110					Shapiro Wilk Test Statistic	0.861	Shapiro Wilk GOF Test					
111					5% Shapiro Wilk Critical Value	0.762	Data appear Normal at 5% Significance Level					
112					Lilliefors Test Statistic	0.305	Lilliefors GOF Test					
113					5% Lilliefors Critical Value	0.343	Data appear Normal at 5% Significance Level					
114	Data appear Normal at 5% Significance Level											
115												
116	Assuming Normal Distribution											
117	95% Normal UCL						95% UCLs (Adjusted for Skewness)					
118					95% Student's-t UCL	51553				95% Adjusted-CLT UCL (Chen-1995)		53571
119										95% Modified-t UCL (Johnson-1978)		52450
120												
121	Gamma GOF Test											
122					A-D Test Statistic	0.321	Anderson-Darling Gamma GOF Test					
123					5% A-D Critical Value	0.68	Detected data appear Gamma Distributed at 5% Significance Level					
124					K-S Test Statistic	0.252	Kolmogorov-Smirnov Gamma GOF Test					
125					5% K-S Critical Value	0.358	Detected data appear Gamma Distributed at 5% Significance Level					
126	Detected data appear Gamma Distributed at 5% Significance Level											
127												
128	Gamma Statistics											
129					k hat (MLE)	6.161				k star (bias corrected MLE)		2.598
130					Theta hat (MLE)	5713				Theta star (bias corrected MLE)		13551
131					nu hat (MLE)	61.61				nu star (bias corrected)		25.98
132					MLE Mean (bias corrected)	35200				MLE Sd (bias corrected)		21840
133										Approximate Chi Square Value (0.05)		15.36
134					Adjusted Level of Significance	0.0086				Adjusted Chi Square Value		11.94
135												
136	Assuming Gamma Distribution											
137					95% Approximate Gamma UCL (use when n>=50))	59524				95% Adjusted Gamma UCL (use when n<50)		76554
138												
139	Lognormal GOF Test											
140					Shapiro Wilk Test Statistic	0.958	Shapiro Wilk Lognormal GOF Test					
141					5% Shapiro Wilk Critical Value	0.762	Data appear Lognormal at 5% Significance Level					
142					Lilliefors Test Statistic	0.231	Lilliefors Lognormal GOF Test					
143					5% Lilliefors Critical Value	0.343	Data appear Lognormal at 5% Significance Level					
144	Data appear Lognormal at 5% Significance Level											
145												
146	Lognormal Statistics											
147					Minimum of Logged Data	9.852				Mean of logged Data		10.39
148					Maximum of Logged Data	11.07				SD of logged Data		0.444
149												
150	Assuming Lognormal Distribution											
151					95% H-UCL	66222				90% Chebyshev (MVUE) UCL		55729
152					95% Chebyshev (MVUE) UCL	65114				97.5% Chebyshev (MVUE) UCL		78141
153					99% Chebyshev (MVUE) UCL	103728						
154												

	A	B	C	D	E	F	G	H	I	J	K	L
155	Nonparametric Distribution Free UCL Statistics											
156	Data appear to follow a Discernible Distribution at 5% Significance Level											
157												
158	Nonparametric Distribution Free UCLs											
159					95% CLT UCL	47817				95% Jackknife UCL		51553
160					95% Standard Bootstrap UCL	46305				95% Bootstrap-t UCL		63910
161					95% Hall's Bootstrap UCL	109889				95% Percentile Bootstrap UCL		47600
162					95% BCA Bootstrap UCL	50000						
163					90% Chebyshev(Mean, Sd) UCL	58212				95% Chebyshev(Mean, Sd) UCL		68636
164					97.5% Chebyshev(Mean, Sd) UCL	83104				99% Chebyshev(Mean, Sd) UCL		111523
165												
166	Suggested UCL to Use											
167					95% Student's-t UCL	51553						
168												
169	Note: Suggestions regarding the selection of a 95% UCL are provided to help the user to select the most appropriate 95% UCL.											
170	Recommendations are based upon data size, data distribution, and skewness.											
171	These recommendations are based upon the results of the simulation studies summarized in Singh, Maichle, and Lee (2006).											
172	However, simulations results will not cover all Real World data sets; for additional insight the user may want to consult a statistician.											
173												
174												
175	Manganese											
176												
177	General Statistics											
178					Total Number of Observations	5				Number of Distinct Observations		4
179										Number of Missing Observations		0
180					Minimum	590				Mean		1358
181					Maximum	2100				Median		1100
182					SD	626				Std. Error of Mean		279.9
183					Coefficient of Variation	0.461				Skewness		0.137
184												
185	Note: Sample size is small (e.g., <10), if data are collected using ISM approach, you should use											
186	guidance provided in ITRC Tech Reg Guide on ISM (ITRC, 2012) to compute statistics of interest.											
187	For example, you may want to use Chebyshev UCL to estimate EPC (ITRC, 2012).											
188	Chebyshev UCL can be computed using the Nonparametric and All UCL Options of ProUCL 5.1											
189												
190	Normal GOF Test											
191					Shapiro Wilk Test Statistic	0.914				Shapiro Wilk GOF Test		
192					5% Shapiro Wilk Critical Value	0.762				Data appear Normal at 5% Significance Level		
193					Lilliefors Test Statistic	0.26				Lilliefors GOF Test		
194					5% Lilliefors Critical Value	0.343				Data appear Normal at 5% Significance Level		
195	Data appear Normal at 5% Significance Level											
196												
197	Assuming Normal Distribution											
198	95% Normal UCL						95% UCLs (Adjusted for Skewness)					
199					95% Student's-t UCL	1955				95% Adjusted-CLT UCL (Chen-1995)		1837
200										95% Modified-t UCL (Johnson-1978)		1958
201												
202	Gamma GOF Test											
203					A-D Test Statistic	0.348				Anderson-Darling Gamma GOF Test		
204					5% A-D Critical Value	0.681				Detected data appear Gamma Distributed at 5% Significance Level		

	A	B	C	D	E	F	G	H	I	J	K	L
205					K-S Test Statistic	0.232	**Kolmogorov-Smirnov Gamma GOF Test**					
206					5% K-S Critical Value	0.358	Detected data appear Gamma Distributed at 5% Significance Level					
207	**Detected data appear Gamma Distributed at 5% Significance Level**											
208												
209	**Gamma Statistics**											
210					k hat (MLE)	5.334				k star (bias corrected MLE)		2.267
211					Theta hat (MLE)	254.6				Theta star (bias corrected MLE)		599
212					nu hat (MLE)	53.34				nu star (bias corrected)		22.67
213					MLE Mean (bias corrected)	1358				MLE Sd (bias corrected)		901.9
214										Approximate Chi Square Value (0.05)		12.84
215					Adjusted Level of Significance	0.0086				Adjusted Chi Square Value		9.766
216												
217	**Assuming Gamma Distribution**											
218					95% Approximate Gamma UCL (use when n>=50))	2397				95% Adjusted Gamma UCL (use when n<50)		3152
219												
220	**Lognormal GOF Test**											
221					Shapiro Wilk Test Statistic	0.915	**Shapiro Wilk Lognormal GOF Test**					
222					5% Shapiro Wilk Critical Value	0.762	Data appear Lognormal at 5% Significance Level					
223					Lilliefors Test Statistic	0.212	**Lilliefors Lognormal GOF Test**					
224					5% Lilliefors Critical Value	0.343	Data appear Lognormal at 5% Significance Level					
225	**Data appear Lognormal at 5% Significance Level**											
226												
227	**Lognormal Statistics**											
228					Minimum of Logged Data	6.38				Mean of logged Data		7.117
229					Maximum of Logged Data	7.65				SD of logged Data		0.51
230												
231	**Assuming Lognormal Distribution**											
232					95% H-UCL	3000				90% Chebyshev (MVUE) UCL		2291
233					95% Chebyshev (MVUE) UCL	2710				97.5% Chebyshev (MVUE) UCL		3292
234					99% Chebyshev (MVUE) UCL	4435						
235												
236	**Nonparametric Distribution Free UCL Statistics**											
237	**Data appear to follow a Discernible Distribution at 5% Significance Level**											
238												
239	**Nonparametric Distribution Free UCLs**											
240					95% CLT UCL	1818				95% Jackknife UCL		1955
241					95% Standard Bootstrap UCL	N/A				95% Bootstrap-t UCL		N/A
242					95% Hall's Bootstrap UCL	N/A				95% Percentile Bootstrap UCL		N/A
243					95% BCA Bootstrap UCL	N/A						
244					90% Chebyshev(Mean, Sd) UCL	2198				95% Chebyshev(Mean, Sd) UCL		2578
245					97.5% Chebyshev(Mean, Sd) UCL	3106				99% Chebyshev(Mean, Sd) UCL		4143
246												
247	**Suggested UCL to Use**											
248					95% Student's-t UCL	1955						
249												
250	Note: Suggestions regarding the selection of a 95% UCL are provided to help the user to select the most appropriate 95% UCL.											
251	Recommendations are based upon data size, data distribution, and skewness.											
252	These recommendations are based upon the results of the simulation studies summarized in Singh, Maichle, and Lee (2006).											
253	However, simulations results will not cover all Real World data sets; for additional insight the user may want to consult a statistician.											
254												

	A	B	C	D	E	F	G	H	I	J	K	L
1	UCL Statistics for Data Sets with Non-Detects											
2												
3	User Selected Options											
4	Date/Time of Computation			ProUCL 5.15/13/2021 2:41:04 PM								
5	From File			ShallowProUCL.xls								
6	Full Precision			OFF								
7	Confidence Coefficient			95%								
8	Number of Bootstrap Operations			2000								
9												
10	Benzo[a]anthracene											
11												
12	General Statistics											
13	Total Number of Observations					147	Number of Distinct Observations					106
14	Number of Detects					129	Number of Non-Detects					18
15	Number of Distinct Detects					96	Number of Distinct Non-Detects					13
16	Minimum Detect					0.0012	Minimum Non-Detect					0.0011
17	Maximum Detect					48	Maximum Non-Detect					0.95
18	Variance Detects					27.07	Percent Non-Detects					12.24%
19	Mean Detects					1.411	SD Detects					5.203
20	Median Detects					0.15	CV Detects					3.687
21	Skewness Detects					6.721	Kurtosis Detects					53.23
22	Mean of Logged Detects					-1.708	SD of Logged Detects					1.831
23												
24	Normal GOF Test on Detects Only											
25	Shapiro Wilk Test Statistic					0.304	Normal GOF Test on Detected Observations Only					
26	5% Shapiro Wilk P Value					0	Detected Data Not Normal at 5% Significance Level					
27	Lilliefors Test Statistic					0.394	Lilliefors GOF Test					
28	5% Lilliefors Critical Value					0.0784	Detected Data Not Normal at 5% Significance Level					
29	Detected Data Not Normal at 5% Significance Level											
30												
31	Kaplan-Meier (KM) Statistics using Normal Critical Values and other Nonparametric UCLs											
32	KM Mean					1.241	KM Standard Error of Mean					0.404
33	KM SD					4.877	95% KM (BCA) UCL					2.004
34	95% KM (t) UCL					1.909	95% KM (Percentile Bootstrap) UCL					1.96
35	95% KM (z) UCL					1.905	95% KM Bootstrap t UCL					2.534
36	90% KM Chebyshev UCL					2.452	95% KM Chebyshev UCL					3.001
37	97.5% KM Chebyshev UCL					3.762	99% KM Chebyshev UCL					5.258
38												
39	Gamma GOF Tests on Detected Observations Only											
40	A-D Test Statistic					12.13	Anderson-Darling GOF Test					
41	5% A-D Critical Value					0.861	Detected Data Not Gamma Distributed at 5% Significance Level					
42	K-S Test Statistic					0.242	Kolmogorov-Smirnov GOF					
43	5% K-S Critical Value					0.0886	Detected Data Not Gamma Distributed at 5% Significance Level					
44	Detected Data Not Gamma Distributed at 5% Significance Level											
45												
46	Gamma Statistics on Detected Data Only											
47	k hat (MLE)					0.331	k star (bias corrected MLE)					0.328
48	Theta hat (MLE)					4.268	Theta star (bias corrected MLE)					4.301
49	nu hat (MLE)					85.31	nu star (bias corrected)					84.66
50	Mean (detects)					1.411						
51												

	A	B	C	D	E	F	G	H	I	J	K	L
52	**Gamma ROS Statistics using Imputed Non-Detects**											
53	GROS may not be used when data set has > 50% NDs with many tied observations at multiple DLs											
54	GROS may not be used when kstar of detects is small such as <1.0, especially when the sample size is small (e.g., <15-20)											
55	For such situations, GROS method may yield incorrect values of UCLs and BTVs											
56	This is especially true when the sample size is small.											
57	For gamma distributed detected data, BTVs and UCLs may be computed using gamma distribution on KM estimates											
58					Minimum	0.0012				Mean		1.24
59					Maximum	48				Median		0.11
60					SD	4.893				CV		3.947
61					k hat (MLE)	0.302				k star (bias corrected MLE)		0.301
62					Theta hat (MLE)	4.1				Theta star (bias corrected MLE)		4.123
63					nu hat (MLE)	88.89				nu star (bias corrected)		88.41
64					Adjusted Level of Significance (β)	0.0484						
65					Approximate Chi Square Value (88.41, α)	67.73				Adjusted Chi Square Value (88.41, β)		67.56
66					95% Gamma Approximate UCL (use when n>=50)	1.618				95% Gamma Adjusted UCL (use when n<50)		1.622
67												
68	**Estimates of Gamma Parameters using KM Estimates**											
69					Mean (KM)	1.241				SD (KM)		4.877
70					Variance (KM)	23.78				SE of Mean (KM)		0.404
71					k hat (KM)	0.0647				k star (KM)		0.0679
72					nu hat (KM)	19.03				nu star (KM)		19.97
73					theta hat (KM)	19.17				theta star (KM)		18.26
74					80% gamma percentile (KM)	0.414				90% gamma percentile (KM)		2.613
75					95% gamma percentile (KM)	7.108				99% gamma percentile (KM)		23.7
76												
77	**Gamma Kaplan-Meier (KM) Statistics**											
78					Approximate Chi Square Value (19.97, α)	10.83				Adjusted Chi Square Value (19.97, β)		10.76
79					95% Gamma Approximate KM-UCL (use when n>=50)	2.288				95% Gamma Adjusted KM-UCL (use when n<50)		2.302
80												
81	**Lognormal GOF Test on Detected Observations Only**											
82					Shapiro Wilk Approximate Test Statistic	0.968				**Shapiro Wilk GOF Test**		
83					5% Shapiro Wilk P Value	0.05				Detected Data Not Lognormal at 5% Significance Level		
84					Lilliefors Test Statistic	0.0849				**Lilliefors GOF Test**		
85					5% Lilliefors Critical Value	0.0784				Detected Data Not Lognormal at 5% Significance Level		
86	**Detected Data Not Lognormal at 5% Significance Level**											
87												
88	**Lognormal ROS Statistics Using Imputed Non-Detects**											
89					Mean in Original Scale	1.24				Mean in Log Scale		-2.122
90					SD in Original Scale	4.893				SD in Log Scale		2.072
91					95% t UCL (assumes normality of ROS data)	1.908				95% Percentile Bootstrap UCL		1.931
92					95% BCA Bootstrap UCL	2.241				95% Bootstrap t UCL		2.524
93					95% H-UCL (Log ROS)	1.83						
94												
95	**Statistics using KM estimates on Logged Data and Assuming Lognormal Distribution**											
96					KM Mean (logged)	-2.186				KM Geo Mean		0.112
97					KM SD (logged)	2.197				95% Critical H Value (KM-Log)		3.531
98					KM Standard Error of Mean (logged)	0.186				95% H-UCL (KM -Log)		2.383
99					KM SD (logged)	2.197				95% Critical H Value (KM-Log)		3.531
100					KM Standard Error of Mean (logged)	0.186						
101												

	A	B	C	D	E	F	G	H	I	J	K	L
102	DL/2 Statistics											
103	DL/2 Normal						DL/2 Log-Transformed					
104					Mean in Original Scale	1.243					Mean in Log Scale	-2.085
105					SD in Original Scale	4.893					SD in Log Scale	2.053
106					95% t UCL (Assumes normality)	1.911					95% H-Stat UCL	1.807
107	DL/2 is not a recommended method, provided for comparisons and historical reasons											
108												
109	Nonparametric Distribution Free UCL Statistics											
110	Data do not follow a Discernible Distribution at 5% Significance Level											
111												
112	Suggested UCL to Use											
113					95% KM (Chebyshev) UCL	3.001						
114												
115	Note: Suggestions regarding the selection of a 95% UCL are provided to help the user to select the most appropriate 95% UCL.											
116	Recommendations are based upon data size, data distribution, and skewness.											
117	These recommendations are based upon the results of the simulation studies summarized in Singh, Maichle, and Lee (2006).											
118	However, simulations results will not cover all Real World data sets; for additional insight the user may want to consult a statistician.											
119												
120	Benzo[a]pyrene											
121												
122	General Statistics											
123					Total Number of Observations	147					Number of Distinct Observations	105
124					Number of Detects	117					Number of Non-Detects	30
125					Number of Distinct Detects	90					Number of Distinct Non-Detects	21
126					Minimum Detect	0.0017					Minimum Non-Detect	0.0038
127					Maximum Detect	28					Maximum Non-Detect	0.76
128					Variance Detects	15.91					Percent Non-Detects	20.41%
129					Mean Detects	1.282					SD Detects	3.989
130					Median Detects	0.17					CV Detects	3.111
131					Skewness Detects	4.989					Kurtosis Detects	27.13
132					Mean of Logged Detects	-1.611					SD of Logged Detects	1.793
133												
134	Normal GOF Test on Detects Only											
135					Shapiro Wilk Test Statistic	0.353	Normal GOF Test on Detected Observations Only					
136					5% Shapiro Wilk P Value	0	Detected Data Not Normal at 5% Significance Level					
137					Lilliefors Test Statistic	0.408	Lilliefors GOF Test					
138					5% Lilliefors Critical Value	0.0822	Detected Data Not Normal at 5% Significance Level					
139	Detected Data Not Normal at 5% Significance Level											
140												
141	Kaplan-Meier (KM) Statistics using Normal Critical Values and other Nonparametric UCLs											
142					KM Mean	1.023					KM Standard Error of Mean	0.297
143					KM SD	3.58					95% KM (BCA) UCL	1.482
144					95% KM (t) UCL	1.514					95% KM (Percentile Bootstrap) UCL	1.518
145					95% KM (z) UCL	1.511					95% KM Bootstrap t UCL	1.823
146					90% KM Chebyshev UCL	1.913					95% KM Chebyshev UCL	2.316
147					97.5% KM Chebyshev UCL	2.875					99% KM Chebyshev UCL	3.974
148												
149	Gamma GOF Tests on Detected Observations Only											
150					A-D Test Statistic	10.17	Anderson-Darling GOF Test					
151					5% A-D Critical Value	0.853	Detected Data Not Gamma Distributed at 5% Significance Level					

	A	B	C	D	E	F	G	H	I	J	K	L
152					K-S Test Statistic	0.247	**Kolmogorov-Smirnov GOF**					
153					5% K-S Critical Value	0.0916	Detected Data Not Gamma Distributed at 5% Significance Level					
154	**Detected Data Not Gamma Distributed at 5% Significance Level**											
155												
156	**Gamma Statistics on Detected Data Only**											
157					k hat (MLE)	0.36			k star (bias corrected MLE)			0.356
158					Theta hat (MLE)	3.562			Theta star (bias corrected MLE)			3.597
159					nu hat (MLE)	84.24			nu star (bias corrected)			83.42
160					Mean (detects)	1.282						
161												
162	**Gamma ROS Statistics using Imputed Non-Detects**											
163	GROS may not be used when data set has > 50% NDs with many tied observations at multiple DLs											
164	GROS may not be used when kstar of detects is small such as <1.0, especially when the sample size is small (e.g., <15-20)											
165	For such situations, GROS method may yield incorrect values of UCLs and BTVs											
166	This is especially true when the sample size is small.											
167	For gamma distributed detected data, BTVs and UCLs may be computed using gamma distribution on KM estimates											
168					Minimum	0.0017			Mean			1.023
169					Maximum	28			Median			0.11
170					SD	3.593			CV			3.513
171					k hat (MLE)	0.306			k star (bias corrected MLE)			0.305
172					Theta hat (MLE)	3.339			Theta star (bias corrected MLE)			3.358
173					nu hat (MLE)	90.04			nu star (bias corrected)			89.53
174					Adjusted Level of Significance (β)	0.0484						
175					Approximate Chi Square Value (89.53, α)	68.72			Adjusted Chi Square Value (89.53, β)			68.54
176					95% Gamma Approximate UCL (use when n>=50)	1.332			95% Gamma Adjusted UCL (use when n<50)			1.336
177												
178	**Estimates of Gamma Parameters using KM Estimates**											
179					Mean (KM)	1.023			SD (KM)			3.58
180					Variance (KM)	12.82			SE of Mean (KM)			0.297
181					k hat (KM)	0.0817			k star (KM)			0.0845
182					nu hat (KM)	24.01			nu star (KM)			24.85
183					theta hat (KM)	12.53			theta star (KM)			12.1
184					80% gamma percentile (KM)	0.54			90% gamma percentile (KM)			2.507
185					95% gamma percentile (KM)	5.96			99% gamma percentile (KM)			17.65
186												
187	**Gamma Kaplan-Meier (KM) Statistics**											
188					Approximate Chi Square Value (24.85, α)	14.5			Adjusted Chi Square Value (24.85, β)			14.42
189					95% Gamma Approximate KM-UCL (use when n>=50)	1.754			95% Gamma Adjusted KM-UCL (use when n<50)			1.763
190												
191	**Lognormal GOF Test on Detected Observations Only**											
192					Shapiro Wilk Approximate Test Statistic	0.965	**Shapiro Wilk GOF Test**					
193					5% Shapiro Wilk P Value	0.0375	Detected Data Not Lognormal at 5% Significance Level					
194					Lilliefors Test Statistic	0.085	**Lilliefors GOF Test**					
195					5% Lilliefors Critical Value	0.0822	Detected Data Not Lognormal at 5% Significance Level					
196	**Detected Data Not Lognormal at 5% Significance Level**											
197												
198	**Lognormal ROS Statistics Using Imputed Non-Detects**											
199					Mean in Original Scale	1.023			Mean in Log Scale			-2.292
200					SD in Original Scale	3.593			SD in Log Scale			2.118
201					95% t UCL (assumes normality of ROS data)	1.513			95% Percentile Bootstrap UCL			1.508
202					95% BCA Bootstrap UCL	1.67			95% Bootstrap t UCL			1.816
203					95% H-UCL (Log ROS)	1.736						

	A	B	C	D	E	F	G	H	I	J	K	L
204												
205	**Statistics using KM estimates on Logged Data and Assuming Lognormal Distribution**											
206					KM Mean (logged)	-2.437				KM Geo Mean		0.0874
207					KM SD (logged)	2.332				95% Critical H Value (KM-Log)		3.7
208					KM Standard Error of Mean (logged)	0.197				95% H-UCL (KM -Log)		2.71
209					KM SD (logged)	2.332				95% Critical H Value (KM-Log)		3.7
210					KM Standard Error of Mean (logged)	0.197						
211												
212	**DL/2 Statistics**											
213			**DL/2 Normal**				**DL/2 Log-Transformed**					
214					Mean in Original Scale	1.026				Mean in Log Scale		-2.278
215					SD in Original Scale	3.592				SD in Log Scale		2.143
216					95% t UCL (Assumes normality)	1.516				95% H-Stat UCL		1.883
217	**DL/2 is not a recommended method, provided for comparisons and historical reasons**											
218												
219	**Nonparametric Distribution Free UCL Statistics**											
220	**Data do not follow a Discernible Distribution at 5% Significance Level**											
221												
222	**Suggested UCL to Use**											
223					95% KM (Chebyshev) UCL	2.316						
224												
225	Note: Suggestions regarding the selection of a 95% UCL are provided to help the user to select the most appropriate 95% UCL.											
226	Recommendations are based upon data size, data distribution, and skewness.											
227	These recommendations are based upon the results of the simulation studies summarized in Singh, Maichle, and Lee (2006).											
228	However, simulations results will not cover all Real World data sets; for additional insight the user may want to consult a statistician.											
229												
230	**Benzo[b]fluoranthene**											
231												
232	**General Statistics**											
233					Total Number of Observations	147				Number of Distinct Observations		95
234					Number of Detects	121				Number of Non-Detects		26
235					Number of Distinct Detects	83				Number of Distinct Non-Detects		13
236					Minimum Detect	0.0044				Minimum Non-Detect		0.004
237					Maximum Detect	31				Maximum Non-Detect		1.2
238					Variance Detects	14.24				Percent Non-Detects		17.69%
239					Mean Detects	1.397				SD Detects		3.774
240					Median Detects	0.35				CV Detects		2.702
241					Skewness Detects	5.623				Kurtosis Detects		37.26
242					Mean of Logged Detects	-1.089				SD of Logged Detects		1.655
243												
244	**Normal GOF Test on Detects Only**											
245					Shapiro Wilk Test Statistic	0.389				**Normal GOF Test on Detected Observations Only**		
246					5% Shapiro Wilk P Value	0				Detected Data Not Normal at 5% Significance Level		
247					Lilliefors Test Statistic	0.356				**Lilliefors GOF Test**		
248					5% Lilliefors Critical Value	0.0809				Detected Data Not Normal at 5% Significance Level		
249	**Detected Data Not Normal at 5% Significance Level**											
250												
251	**Kaplan-Meier (KM) Statistics using Normal Critical Values and other Nonparametric UCLs**											
252					KM Mean	1.153				KM Standard Error of Mean		0.286
253					KM SD	3.45				95% KM (BCA) UCL		1.718
254					95% KM (t) UCL	1.626				95% KM (Percentile Bootstrap) UCL		1.666
255					95% KM (z) UCL	1.623				95% KM Bootstrap t UCL		1.981

	A	B	C	D	E	F	G	H	I	J	K	L
256					90% KM Chebyshev UCL	2.011				95% KM Chebyshev UCL		2.399
257					97.5% KM Chebyshev UCL	2.938				99% KM Chebyshev UCL		3.996
258												
259					**Gamma GOF Tests on Detected Observations Only**							
260					A-D Test Statistic	5.84	**Anderson-Darling GOF Test**					
261					5% A-D Critical Value	0.83	Detected Data Not Gamma Distributed at 5% Significance Level					
262					K-S Test Statistic	0.177	**Kolmogorov-Smirnov GOF**					
263					5% K-S Critical Value	0.0894	Detected Data Not Gamma Distributed at 5% Significance Level					
264					**Detected Data Not Gamma Distributed at 5% Significance Level**							
265												
266					**Gamma Statistics on Detected Data Only**							
267					k hat (MLE)	0.453	k star (bias corrected MLE)					0.447
268					Theta hat (MLE)	3.082	Theta star (bias corrected MLE)					3.121
269					nu hat (MLE)	109.7	nu star (bias corrected)					108.3
270					Mean (detects)	1.397						
271												
272					**Gamma ROS Statistics using Imputed Non-Detects**							
273					GROS may not be used when data set has > 50% NDs with many tied observations at multiple DLs							
274					GROS may not be used when kstar of detects is small such as <1.0, especially when the sample size is small (e.g., <15-20)							
275					For such situations, GROS method may yield incorrect values of UCLs and BTVs							
276					This is especially true when the sample size is small.							
277					For gamma distributed detected data, BTVs and UCLs may be computed using gamma distribution on KM estimates							
278					Minimum	0.0044	Mean					1.151
279					Maximum	31	Median					0.21
280					SD	3.462	CV					3.007
281					k hat (MLE)	0.361	k star (bias corrected MLE)					0.358
282					Theta hat (MLE)	3.187	Theta star (bias corrected MLE)					3.213
283					nu hat (MLE)	106.2	nu star (bias corrected)					105.4
284					Adjusted Level of Significance (β)	0.0484						
285					Approximate Chi Square Value (105.36, α)	82.67	Adjusted Chi Square Value (105.36, β)					82.48
286					95% Gamma Approximate UCL (use when n>=50)	1.467	95% Gamma Adjusted UCL (use when n<50)					1.471
287												
288					**Estimates of Gamma Parameters using KM Estimates**							
289					Mean (KM)	1.153	SD (KM)					3.45
290					Variance (KM)	11.9	SE of Mean (KM)					0.286
291					k hat (KM)	0.112	k star (KM)					0.114
292					nu hat (KM)	32.87	nu star (KM)					33.53
293					theta hat (KM)	10.32	theta star (KM)					10.11
294					80% gamma percentile (KM)	0.953	90% gamma percentile (KM)					3.22
295					95% gamma percentile (KM)	6.622	99% gamma percentile (KM)					17.14
296												
297					**Gamma Kaplan-Meier (KM) Statistics**							
298					Approximate Chi Square Value (33.53, α)	21.29	Adjusted Chi Square Value (33.53, β)					21.19
299					95% Gamma Approximate KM-UCL (use when n>=50)	1.817	95% Gamma Adjusted KM-UCL (use when n<50)					1.825
300												
301					**Lognormal GOF Test on Detected Observations Only**							
302					Shapiro Wilk Approximate Test Statistic	0.985	**Shapiro Wilk GOF Test**					
303					5% Shapiro Wilk P Value	0.757	Detected Data appear Lognormal at 5% Significance Level					
304					Lilliefors Test Statistic	0.047	**Lilliefors GOF Test**					
305					5% Lilliefors Critical Value	0.0809	Detected Data appear Lognormal at 5% Significance Level					
306					**Detected Data appear Lognormal at 5% Significance Level**							
307												

	A	B	C	D	E	F	G	H	I	J	K	L
308	**Lognormal ROS Statistics Using Imputed Non-Detects**											
309					Mean in Original Scale	1.153					Mean in Log Scale	-1.668
310					SD in Original Scale	3.462					SD in Log Scale	1.987
311				95% t UCL (assumes normality of ROS data)		1.626					95% Percentile Bootstrap UCL	1.659
312					95% BCA Bootstrap UCL	1.835					95% Bootstrap t UCL	1.963
313					95% H-UCL (Log ROS)	2.325						
314												
315	**Statistics using KM estimates on Logged Data and Assuming Lognormal Distribution**											
316					KM Mean (logged)	-1.769					KM Geo Mean	0.17
317					KM SD (logged)	2.138					95% Critical H Value (KM-Log)	3.458
318					KM Standard Error of Mean (logged)	0.18					95% H-UCL (KM -Log)	3.088
319					KM SD (logged)	2.138					95% Critical H Value (KM-Log)	3.458
320					KM Standard Error of Mean (logged)	0.18						
321												
322	**DL/2 Statistics**											
323				**DL/2 Normal**						**DL/2 Log-Transformed**		
324					Mean in Original Scale	1.157					Mean in Log Scale	-1.679
325					SD in Original Scale	3.461					SD in Log Scale	2.039
326					95% t UCL (Assumes normality)	1.63					95% H-Stat UCL	2.62
327	**DL/2 is not a recommended method, provided for comparisons and historical reasons**											
328												
329	**Nonparametric Distribution Free UCL Statistics**											
330	**Detected Data appear Lognormal Distributed at 5% Significance Level**											
331												
332	**Suggested UCL to Use**											
333					KM H-UCL	3.088						
334												
335	Note: Suggestions regarding the selection of a 95% UCL are provided to help the user to select the most appropriate 95% UCL.											
336	Recommendations are based upon data size, data distribution, and skewness.											
337	These recommendations are based upon the results of the simulation studies summarized in Singh, Maichle, and Lee (2006).											
338	However, simulations results will not cover all Real World data sets; for additional insight the user may want to consult a statistician.											
339												
340	**Benzo[k]fluoranthene**											
341												
342	**General Statistics**											
343					Total Number of Observations	147					Number of Distinct Observations	106
344					Number of Detects	84					Number of Non-Detects	63
345					Number of Distinct Detects	72					Number of Distinct Non-Detects	37
346					Minimum Detect	0.0015					Minimum Non-Detect	9.8000E-4
347					Maximum Detect	14					Maximum Non-Detect	1.5
348					Variance Detects	3.071					Percent Non-Detects	42.86%
349					Mean Detects	0.606					SD Detects	1.752
350					Median Detects	0.135					CV Detects	2.894
351					Skewness Detects	6.025					Kurtosis Detects	42.47
352					Mean of Logged Detects	-1.902					SD of Logged Detects	1.586
353												
354	**Normal GOF Test on Detects Only**											
355					Shapiro Wilk Test Statistic	0.36				**Normal GOF Test on Detected Observations Only**		
356					5% Shapiro Wilk P Value	0				Detected Data Not Normal at 5% Significance Level		
357					Lilliefors Test Statistic	0.382				**Lilliefors GOF Test**		
358					5% Lilliefors Critical Value	0.0968				Detected Data Not Normal at 5% Significance Level		
359	**Detected Data Not Normal at 5% Significance Level**											

	A	B	C	D	E	F	G	H	I	J	K	L
360												
361	**Kaplan-Meier (KM) Statistics using Normal Critical Values and other Nonparametric UCLs**											
362					KM Mean	0.352				KM Standard Error of Mean		0.112
363					KM SD	1.35				95% KM (BCA) UCL		0.576
364					95% KM (t) UCL	0.537				95% KM (Percentile Bootstrap) UCL		0.549
365					95% KM (z) UCL	0.536				95% KM Bootstrap t UCL		0.742
366					90% KM Chebyshev UCL	0.688				95% KM Chebyshev UCL		0.84
367					97.5% KM Chebyshev UCL	1.051				99% KM Chebyshev UCL		1.466
368												
369	**Gamma GOF Tests on Detected Observations Only**											
370					A-D Test Statistic	5.287	**Anderson-Darling GOF Test**					
371					5% A-D Critical Value	0.828	Detected Data Not Gamma Distributed at 5% Significance Level					
372					K-S Test Statistic	0.203	**Kolmogorov-Smirnov GOF**					
373					5% K-S Critical Value	0.104	Detected Data Not Gamma Distributed at 5% Significance Level					
374	**Detected Data Not Gamma Distributed at 5% Significance Level**											
375												
376	**Gamma Statistics on Detected Data Only**											
377					k hat (MLE)	0.46				k star (bias corrected MLE)		0.451
378					Theta hat (MLE)	1.318				Theta star (bias corrected MLE)		1.343
379					nu hat (MLE)	77.2				nu star (bias corrected)		75.78
380					Mean (detects)	0.606						
381												
382	**Gamma ROS Statistics using Imputed Non-Detects**											
383	GROS may not be used when data set has > 50% NDs with many tied observations at multiple DLs											
384	GROS may not be used when kstar of detects is small such as <1.0, especially when the sample size is small (e.g., <15-20)											
385	For such situations, GROS method may yield incorrect values of UCLs and BTVs											
386	This is especially true when the sample size is small.											
387	For gamma distributed detected data, BTVs and UCLs may be computed using gamma distribution on KM estimates											
388					Minimum	0.0015				Mean		0.35
389					Maximum	14				Median		0.028
390					SD	1.354				CV		3.865
391					k hat (MLE)	0.336				k star (bias corrected MLE)		0.334
392					Theta hat (MLE)	1.041				Theta star (bias corrected MLE)		1.049
393					nu hat (MLE)	98.91				nu star (bias corrected)		98.22
394					Adjusted Level of Significance (β)	0.0484						
395					Approximate Chi Square Value (98.22, α)	76.36				Adjusted Chi Square Value (98.22, β)		76.17
396					95% Gamma Approximate UCL (use when n>=50)	0.451				95% Gamma Adjusted UCL (use when n<50)		0.452
397												
398	**Estimates of Gamma Parameters using KM Estimates**											
399					Mean (KM)	0.352				SD (KM)		1.35
400					Variance (KM)	1.821				SE of Mean (KM)		0.112
401					k hat (KM)	0.0679				k star (KM)		0.0711
402					nu hat (KM)	19.97				nu star (KM)		20.9
403					theta hat (KM)	5.178				theta star (KM)		4.948
404					80% gamma percentile (KM)	0.131				90% gamma percentile (KM)		0.768
405					95% gamma percentile (KM)	2.027				99% gamma percentile (KM)		6.582
406												
407	**Gamma Kaplan-Meier (KM) Statistics**											
408					Approximate Chi Square Value (20.90, α)	11.52				Adjusted Chi Square Value (20.90, β)		11.45
409					95% Gamma Approximate KM-UCL (use when n>=50)	0.638				95% Gamma Adjusted KM-UCL (use when n<50)		0.642
410												

	A	B	C	D	E	F	G	H	I	J	K	L
411	**Lognormal GOF Test on Detected Observations Only**											
412					Shapiro Wilk Approximate Test Statistic	0.982	**Shapiro Wilk GOF Test**					
413					5% Shapiro Wilk P Value	0.684	Detected Data appear Lognormal at 5% Significance Level					
414					Lilliefors Test Statistic	0.0745	**Lilliefors GOF Test**					
415					5% Lilliefors Critical Value	0.0968	Detected Data appear Lognormal at 5% Significance Level					
416	**Detected Data appear Lognormal at 5% Significance Level**											
417												
418	**Lognormal ROS Statistics Using Imputed Non-Detects**											
419					Mean in Original Scale	0.35				Mean in Log Scale		-3.298
420					SD in Original Scale	1.354				SD in Log Scale		2.095
421					95% t UCL (assumes normality of ROS data)	0.535				95% Percentile Bootstrap UCL		0.558
422					95% BCA Bootstrap UCL	0.629				95% Bootstrap t UCL		0.781
423					95% H-UCL (Log ROS)	0.598						
424												
425	**Statistics using KM estimates on Logged Data and Assuming Lognormal Distribution**											
426					KM Mean (logged)	-3.722				KM Geo Mean		0.0242
427					KM SD (logged)	2.588				95% Critical H Value (KM-Log)		4.025
428					KM Standard Error of Mean (logged)	0.231				95% H-UCL (KM -Log)		1.629
429					KM SD (logged)	2.588				95% Critical H Value (KM-Log)		4.025
430					KM Standard Error of Mean (logged)	0.231						
431												
432	**DL/2 Statistics**											
433		**DL/2 Normal**					**DL/2 Log-Transformed**					
434					Mean in Original Scale	0.368				Mean in Log Scale		-3.064
435					SD in Original Scale	1.353				SD in Log Scale		2.103
436					95% t UCL (Assumes normality)	0.553				95% H-Stat UCL		0.772
437	**DL/2 is not a recommended method, provided for comparisons and historical reasons**											
438												
439	**Nonparametric Distribution Free UCL Statistics**											
440	**Detected Data appear Lognormal Distributed at 5% Significance Level**											
441												
442	**Suggested UCL to Use**											
443					KM H-UCL	1.629						
444												
445	Note: Suggestions regarding the selection of a 95% UCL are provided to help the user to select the most appropriate 95% UCL.											
446	Recommendations are based upon data size, data distribution, and skewness.											
447	These recommendations are based upon the results of the simulation studies summarized in Singh, Maichle, and Lee (2006).											
448	However, simulations results will not cover all Real World data sets; for additional insight the user may want to consult a statistician.											
449												
450	Chrysene											
451												
452	**General Statistics**											
453					Total Number of Observations	147				Number of Distinct Observations		107
454					Number of Detects	125				Number of Non-Detects		22
455					Number of Distinct Detects	94				Number of Distinct Non-Detects		16
456					Minimum Detect	0.0018				Minimum Non-Detect		0.001
457					Maximum Detect	87				Maximum Non-Detect		0.9
458					Variance Detects	92.38				Percent Non-Detects		14.97%
459					Mean Detects	2.442				SD Detects		9.611
460					Median Detects	0.21				CV Detects		3.936
461					Skewness Detects	6.611				Kurtosis Detects		51.18
462					Mean of Logged Detects	-1.356				SD of Logged Detects		1.878

	A	B	C	D	E	F	G	H	I	J	K	L
463												
464	**Normal GOF Test on Detects Only**											
465					Shapiro Wilk Test Statistic	0.286	**Normal GOF Test on Detected Observations Only**					
466					5% Shapiro Wilk P Value	0	Detected Data Not Normal at 5% Significance Level					
467					Lilliefors Test Statistic	0.415	**Lilliefors GOF Test**					
468					5% Lilliefors Critical Value	0.0796	Detected Data Not Normal at 5% Significance Level					
469	**Detected Data Not Normal at 5% Significance Level**											
470												
471	**Kaplan-Meier (KM) Statistics using Normal Critical Values and other Nonparametric UCLs**											
472					KM Mean	2.079			KM Standard Error of Mean			0.735
473					KM SD	8.87			95% KM (BCA) UCL			3.529
474					95% KM (t) UCL	3.294			95% KM (Percentile Bootstrap) UCL			3.414
475					95% KM (z) UCL	3.287			95% KM Bootstrap t UCL			4.492
476					90% KM Chebyshev UCL	4.282			95% KM Chebyshev UCL			5.28
477					97.5% KM Chebyshev UCL	6.666			99% KM Chebyshev UCL			9.387
478												
479	**Gamma GOF Tests on Detected Observations Only**											
480					A-D Test Statistic	13.28	**Anderson-Darling GOF Test**					
481					5% A-D Critical Value	0.867	Detected Data Not Gamma Distributed at 5% Significance Level					
482					K-S Test Statistic	0.259	**Kolmogorov-Smirnov GOF**					
483					5% K-S Critical Value	0.09	Detected Data Not Gamma Distributed at 5% Significance Level					
484	**Detected Data Not Gamma Distributed at 5% Significance Level**											
485												
486	**Gamma Statistics on Detected Data Only**											
487					k hat (MLE)	0.306			k star (bias corrected MLE)			0.304
488					Theta hat (MLE)	7.987			Theta star (bias corrected MLE)			8.04
489					nu hat (MLE)	76.43			nu star (bias corrected)			75.93
490					Mean (detects)	2.442						
491												
492	**Gamma ROS Statistics using Imputed Non-Detects**											
493	GROS may not be used when data set has > 50% NDs with many tied observations at multiple DLs											
494	GROS may not be used when kstar of detects is small such as <1.0, especially when the sample size is small (e.g., <15-20)											
495	For such situations, GROS method may yield incorrect values of UCLs and BTVs											
496	This is especially true when the sample size is small.											
497	For gamma distributed detected data, BTVs and UCLs may be computed using gamma distribution on KM estimates											
498					Minimum	0.0018			Mean			2.078
499					Maximum	87			Median			0.15
500					SD	8.9			CV			4.283
501					k hat (MLE)	0.272			k star (bias corrected MLE)			0.271
502					Theta hat (MLE)	7.633			Theta star (bias corrected MLE)			7.662
503					nu hat (MLE)	80.03			nu star (bias corrected)			79.73
504					Adjusted Level of Significance (β)	0.0484						
505					Approximate Chi Square Value (79.73, α)	60.16			Adjusted Chi Square Value (79.73, β)			59.99
506					95% Gamma Approximate UCL (use when n>=50)	2.754			95% Gamma Adjusted UCL (use when n<50)			2.762
507												
508	**Estimates of Gamma Parameters using KM Estimates**											
509					Mean (KM)	2.079			SD (KM)			8.87
510					Variance (KM)	78.67			SE of Mean (KM)			0.735
511					k hat (KM)	0.0549			k star (KM)			0.0583
512					nu hat (KM)	16.15			nu star (KM)			17.15
513					theta hat (KM)	37.85			theta star (KM)			35.63

	A	B	C	D	E	F	G	H	I	J	K	L
514					80% gamma percentile (KM)	0.463					90% gamma percentile (KM)	3.799
515					95% gamma percentile (KM)	11.57					99% gamma percentile (KM)	42.44
516												
517					Gamma Kaplan-Meier (KM) Statistics							
518					Approximate Chi Square Value (17.15, α)	8.779					Adjusted Chi Square Value (17.15, β)	8.72
519					95% Gamma Approximate KM-UCL (use when n>=50)	4.06					95% Gamma Adjusted KM-UCL (use when n<50)	4.088
520												
521					Lognormal GOF Test on Detected Observations Only							
522					Shapiro Wilk Approximate Test Statistic	0.964					Shapiro Wilk GOF Test	
523					5% Shapiro Wilk P Value	0.0246					Detected Data Not Lognormal at 5% Significance Level	
524					Lilliefors Test Statistic	0.0928					Lilliefors GOF Test	
525					5% Lilliefors Critical Value	0.0796					Detected Data Not Lognormal at 5% Significance Level	
526					Detected Data Not Lognormal at 5% Significance Level							
527												
528					Lognormal ROS Statistics Using Imputed Non-Detects							
529					Mean in Original Scale	2.078					Mean in Log Scale	-1.894
530					SD in Original Scale	8.9					SD in Log Scale	2.181
531					95% t UCL (assumes normality of ROS data)	3.293					95% Percentile Bootstrap UCL	3.446
532					95% BCA Bootstrap UCL	3.933					95% Bootstrap t UCL	4.672
533					95% H-UCL (Log ROS)	3.059						
534												
535					Statistics using KM estimates on Logged Data and Assuming Lognormal Distribution							
536					KM Mean (logged)	-1.997					KM Geo Mean	0.136
537					KM SD (logged)	2.362					95% Critical H Value (KM-Log)	3.738
538					KM Standard Error of Mean (logged)	0.201					95% H-UCL (KM -Log)	4.59
539					KM SD (logged)	2.362					95% Critical H Value (KM-Log)	3.738
540					KM Standard Error of Mean (logged)	0.201						
541												
542					DL/2 Statistics							
543					DL/2 Normal						DL/2 Log-Transformed	
544					Mean in Original Scale	2.081					Mean in Log Scale	-1.869
545					SD in Original Scale	8.9					SD in Log Scale	2.184
546					95% t UCL (Assumes normality)	3.296					95% H-Stat UCL	3.159
547					DL/2 is not a recommended method, provided for comparisons and historical reasons							
548												
549					Nonparametric Distribution Free UCL Statistics							
550					Data do not follow a Discernible Distribution at 5% Significance Level							
551												
552					Suggested UCL to Use							
553					95% KM (Chebyshev) UCL	5.28						
554												
555					Note: Suggestions regarding the selection of a 95% UCL are provided to help the user to select the most appropriate 95% UCL.							
556					Recommendations are based upon data size, data distribution, and skewness.							
557					These recommendations are based upon the results of the simulation studies summarized in Singh, Maichle, and Lee (2006).							
558					However, simulations results will not cover all Real World data sets; for additional insight the user may want to consult a statistician.							
559												
560	Dibenz(a,h)anthracene											
561												
562					General Statistics							
563					Total Number of Observations	147					Number of Distinct Observations	99
564					Number of Detects	48					Number of Non-Detects	99
565					Number of Distinct Detects	44					Number of Distinct Non-Detects	65

	A	B	C	D	E	F	G	H	I	J	K	L
566					Minimum Detect	0.0094					Minimum Non-Detect	9.7000E-4
567					Maximum Detect	5.9					Maximum Non-Detect	0.84
568					Variance Detects	1.733					Percent Non-Detects	67.35%
569					Mean Detects	0.618					SD Detects	1.317
570					Median Detects	0.0945					CV Detects	2.131
571					Skewness Detects	2.866					Kurtosis Detects	8.016
572					Mean of Logged Detects	-2.088					SD of Logged Detects	1.724
573												
574					**Normal GOF Test on Detects Only**							
575					Shapiro Wilk Test Statistic	0.519			**Shapiro Wilk GOF Test**			
576					5% Shapiro Wilk Critical Value	0.947			Detected Data Not Normal at 5% Significance Level			
577					Lilliefors Test Statistic	0.366			**Lilliefors GOF Test**			
578					5% Lilliefors Critical Value	0.127			Detected Data Not Normal at 5% Significance Level			
579					**Detected Data Not Normal at 5% Significance Level**							
580												
581					**Kaplan-Meier (KM) Statistics using Normal Critical Values and other Nonparametric UCLs**							
582					KM Mean	0.203					KM Standard Error of Mean	0.0666
583					KM SD	0.798					95% KM (BCA) UCL	0.318
584					95% KM (t) UCL	0.314					95% KM (Percentile Bootstrap) UCL	0.316
585					95% KM (z) UCL	0.313					95% KM Bootstrap t UCL	0.374
586					90% KM Chebyshev UCL	0.403					95% KM Chebyshev UCL	0.494
587					97.5% KM Chebyshev UCL	0.619					99% KM Chebyshev UCL	0.866
588												
589					**Gamma GOF Tests on Detected Observations Only**							
590					A-D Test Statistic	3.919			**Anderson-Darling GOF Test**			
591					5% A-D Critical Value	0.836			Detected Data Not Gamma Distributed at 5% Significance Level			
592					K-S Test Statistic	0.271			**Kolmogorov-Smirnov GOF**			
593					5% K-S Critical Value	0.137			Detected Data Not Gamma Distributed at 5% Significance Level			
594					**Detected Data Not Gamma Distributed at 5% Significance Level**							
595												
596					**Gamma Statistics on Detected Data Only**							
597					k hat (MLE)	0.408					k star (bias corrected MLE)	0.397
598					Theta hat (MLE)	1.513					Theta star (bias corrected MLE)	1.557
599					nu hat (MLE)	39.2					nu star (bias corrected)	38.09
600					Mean (detects)	0.618						
601												
602					**Gamma ROS Statistics using Imputed Non-Detects**							
603					GROS may not be used when data set has > 50% NDs with many tied observations at multiple DLs							
604					GROS may not be used when kstar of detects is small such as <1.0, especially when the sample size is small (e.g., <15-20)							
605					For such situations, GROS method may yield incorrect values of UCLs and BTVs							
606					This is especially true when the sample size is small.							
607					For gamma distributed detected data, BTVs and UCLs may be computed using gamma distribution on KM estimates							
608					Minimum	0.0094					Mean	0.208
609					Maximum	5.9					Median	0.01
610					SD	0.8					CV	3.837
611					k hat (MLE)	0.31					k star (bias corrected MLE)	0.308
612					Theta hat (MLE)	0.673					Theta star (bias corrected MLE)	0.677
613					nu hat (MLE)	91.05					nu star (bias corrected)	90.52
614					Adjusted Level of Significance (β)	0.0484						
615					Approximate Chi Square Value (90.52, α)	69.59					Adjusted Chi Square Value (90.52, β)	69.41
616					95% Gamma Approximate UCL (use when n>=50)	0.271					95% Gamma Adjusted UCL (use when n<50)	0.272
617												

	A	B	C	D	E	F	G	H	I	J	K	L
618	**Estimates of Gamma Parameters using KM Estimates**											
619					Mean (KM)	0.203					SD (KM)	0.798
620					Variance (KM)	0.638					SE of Mean (KM)	0.0666
621					k hat (KM)	0.0649					k star (KM)	0.0682
622					nu hat (KM)	19.09					nu star (KM)	20.04
623					theta hat (KM)	3.133					theta star (KM)	2.986
624					80% gamma percentile (KM)	0.0684					90% gamma percentile (KM)	0.43
625					95% gamma percentile (KM)	1.166					99% gamma percentile (KM)	3.881
626												
627	**Gamma Kaplan-Meier (KM) Statistics**											
628					Approximate Chi Square Value (20.04, α)	10.88					Adjusted Chi Square Value (20.04, β)	10.81
629					95% Gamma Approximate KM-UCL (use when n>=50)	0.375					95% Gamma Adjusted KM-UCL (use when n<50)	0.377
630												
631	**Lognormal GOF Test on Detected Observations Only**											
632					Shapiro Wilk Test Statistic	0.919					**Shapiro Wilk GOF Test**	
633					5% Shapiro Wilk Critical Value	0.947					Detected Data Not Lognormal at 5% Significance Level	
634					Lilliefors Test Statistic	0.15					**Lilliefors GOF Test**	
635					5% Lilliefors Critical Value	0.127					Detected Data Not Lognormal at 5% Significance Level	
636	**Detected Data Not Lognormal at 5% Significance Level**											
637												
638	**Lognormal ROS Statistics Using Imputed Non-Detects**											
639					Mean in Original Scale	0.203					Mean in Log Scale	-5.397
640					SD in Original Scale	0.801					SD in Log Scale	2.63
641					95% t UCL (assumes normality of ROS data)	0.312					95% Percentile Bootstrap UCL	0.323
642					95% BCA Bootstrap UCL	0.345					95% Bootstrap t UCL	0.377
643					95% H-UCL (Log ROS)	0.35						
644												
645	**Statistics using KM estimates on Logged Data and Assuming Lognormal Distribution**											
646					KM Mean (logged)	-5.253					KM Geo Mean	0.00523
647					KM SD (logged)	2.478					95% Critical H Value (KM-Log)	3.885
648					KM Standard Error of Mean (logged)	0.212					95% H-UCL (KM -Log)	0.25
649					KM SD (logged)	2.478					95% Critical H Value (KM-Log)	3.885
650					KM Standard Error of Mean (logged)	0.212						
651												
652	**DL/2 Statistics**											
653					**DL/2 Normal**						**DL/2 Log-Transformed**	
654					Mean in Original Scale	0.211					Mean in Log Scale	-4.226
655					SD in Original Scale	0.8					SD in Log Scale	2.049
656					95% t UCL (Assumes normality)	0.321					95% H-Stat UCL	0.21
657	**DL/2 is not a recommended method, provided for comparisons and historical reasons**											
658												
659	**Nonparametric Distribution Free UCL Statistics**											
660	**Data do not follow a Discernible Distribution at 5% Significance Level**											
661												
662	**Suggested UCL to Use**											
663					95% KM (Chebyshev) UCL	0.494						
664												
665	Note: Suggestions regarding the selection of a 95% UCL are provided to help the user to select the most appropriate 95% UCL.											
666	Recommendations are based upon data size, data distribution, and skewness.											
667	These recommendations are based upon the results of the simulation studies summarized in Singh, Maichle, and Lee (2006).											
668	However, simulations results will not cover all Real World data sets; for additional insight the user may want to consult a statistician.											
669												

	A	B	C	D	E	F	G	H	I	J	K	L
670	Indeno[1,2,3-cd]pyrene											
671												
672	**General Statistics**											
673	Total Number of Observations					147	Number of Distinct Observations					108
674	Number of Detects					114	Number of Non-Detects					33
675	Number of Distinct Detects					88	Number of Distinct Non-Detects					24
676	Minimum Detect					0.0021	Minimum Non-Detect					9.7000E-4
677	Maximum Detect					18	Maximum Non-Detect					0.78
678	Variance Detects					4.061	Percent Non-Detects					22.45%
679	Mean Detects					0.686	SD Detects					2.015
680	Median Detects					0.135	CV Detects					2.938
681	Skewness Detects					6.445	Kurtosis Detects					50.03
682	Mean of Logged Detects					-1.803	SD of Logged Detects					1.575
683												
684	**Normal GOF Test on Detects Only**											
685	Shapiro Wilk Test Statistic					0.36	**Normal GOF Test on Detected Observations Only**					
686	5% Shapiro Wilk P Value					0	Detected Data Not Normal at 5% Significance Level					
687	Lilliefors Test Statistic					0.367	**Lilliefors GOF Test**					
688	5% Lilliefors Critical Value					0.0833	Detected Data Not Normal at 5% Significance Level					
689	**Detected Data Not Normal at 5% Significance Level**											
690												
691	**Kaplan-Meier (KM) Statistics using Normal Critical Values and other Nonparametric UCLs**											
692	KM Mean					0.534	KM Standard Error of Mean					0.148
693	KM SD					1.789	95% KM (BCA) UCL					0.806
694	95% KM (t) UCL					0.78	95% KM (Percentile Bootstrap) UCL					0.8
695	95% KM (z) UCL					0.778	95% KM Bootstrap t UCL					1.019
696	90% KM Chebyshev UCL					0.979	95% KM Chebyshev UCL					1.18
697	97.5% KM Chebyshev UCL					1.46	99% KM Chebyshev UCL					2.009
698												
699	**Gamma GOF Tests on Detected Observations Only**											
700	A-D Test Statistic					7.651	**Anderson-Darling GOF Test**					
701	5% A-D Critical Value					0.83	Detected Data Not Gamma Distributed at 5% Significance Level					
702	K-S Test Statistic					0.193	**Kolmogorov-Smirnov GOF**					
703	5% K-S Critical Value					0.0914	Detected Data Not Gamma Distributed at 5% Significance Level					
704	**Detected Data Not Gamma Distributed at 5% Significance Level**											
705												
706	**Gamma Statistics on Detected Data Only**											
707	k hat (MLE)					0.452	k star (bias corrected MLE)					0.446
708	Theta hat (MLE)					1.516	Theta star (bias corrected MLE)					1.537
709	nu hat (MLE)					103.1	nu star (bias corrected)					101.8
710	Mean (detects)					0.686						
711												
712	**Gamma ROS Statistics using Imputed Non-Detects**											
713	GROS may not be used when data set has > 50% NDs with many tied observations at multiple DLs											
714	GROS may not be used when kstar of detects is small such as <1.0, especially when the sample size is small (e.g., <15-20)											
715	For such situations, GROS method may yield incorrect values of UCLs and BTVs											
716	This is especially true when the sample size is small.											
717	For gamma distributed detected data, BTVs and UCLs may be computed using gamma distribution on KM estimates											
718	Minimum					0.0021	Mean					0.534
719	Maximum					18	Median					0.082
720	SD					1.795	CV					3.36
721	k hat (MLE)					0.369	k star (bias corrected MLE)					0.366

	A	B	C	D	E	F	G	H	I	J	K	L
722					Theta hat (MLE)	1.447				Theta star (bias corrected MLE)		1.459
723					nu hat (MLE)	108.6				nu star (bias corrected)		107.7
724				Adjusted Level of Significance (β)		0.0484						
725				Approximate Chi Square Value (107.68, α)		84.73				Adjusted Chi Square Value (107.68, β)		84.53
726			95% Gamma Approximate UCL (use when n>=50)			0.679				95% Gamma Adjusted UCL (use when n<50)		0.681
727												
728					**Estimates of Gamma Parameters using KM Estimates**							
729					Mean (KM)	0.534				SD (KM)		1.789
730					Variance (KM)	3.202				SE of Mean (KM)		0.148
731					k hat (KM)	0.0891				k star (KM)		0.0918
732					nu hat (KM)	26.2				nu star (KM)		27
733					theta hat (KM)	5.994				theta star (KM)		5.816
734				80% gamma percentile (KM)		0.325				90% gamma percentile (KM)		1.368
735				95% gamma percentile (KM)		3.111				99% gamma percentile (KM)		8.851
736												
737					**Gamma Kaplan-Meier (KM) Statistics**							
738				Approximate Chi Square Value (27.00, α)		16.15				Adjusted Chi Square Value (27.00, β)		16.07
739			95% Gamma Approximate KM-UCL (use when n>=50)			0.893				95% Gamma Adjusted KM-UCL (use when n<50)		0.898
740												
741					**Lognormal GOF Test on Detected Observations Only**							
742				Shapiro Wilk Approximate Test Statistic		0.976				**Shapiro Wilk GOF Test**		
743				5% Shapiro Wilk P Value		0.286				Detected Data appear Lognormal at 5% Significance Level		
744				Lilliefors Test Statistic		0.0952				**Lilliefors GOF Test**		
745				5% Lilliefors Critical Value		0.0833				Detected Data Not Lognormal at 5% Significance Level		
746					**Detected Data appear Approximate Lognormal at 5% Significance Level**							
747												
748					**Lognormal ROS Statistics Using Imputed Non-Detects**							
749				Mean in Original Scale		0.534				Mean in Log Scale		-2.506
750				SD in Original Scale		1.795				SD in Log Scale		1.933
751			95% t UCL (assumes normality of ROS data)			0.779				95% Percentile Bootstrap UCL		0.808
752				95% BCA Bootstrap UCL		0.911				95% Bootstrap t UCL		1.041
753				95% H-UCL (Log ROS)		0.883						
754												
755					**Statistics using KM estimates on Logged Data and Assuming Lognormal Distribution**							
756				KM Mean (logged)		-2.766				KM Geo Mean		0.0629
757				KM SD (logged)		2.33				95% Critical H Value (KM-Log)		3.698
758				KM Standard Error of Mean (logged)		0.201				95% H-UCL (KM -Log)		1.938
759				KM SD (logged)		2.33				95% Critical H Value (KM-Log)		3.698
760				KM Standard Error of Mean (logged)		0.201						
761												
762					**DL/2 Statistics**							
763			**DL/2 Normal**							**DL/2 Log-Transformed**		
764				Mean in Original Scale		0.537				Mean in Log Scale		-2.538
765				SD in Original Scale		1.795				SD in Log Scale		2.041
766			95% t UCL (Assumes normality)			0.782				95% H-Stat UCL		1.117
767					**DL/2 is not a recommended method, provided for comparisons and historical reasons**							
768												
769					**Nonparametric Distribution Free UCL Statistics**							
770					**Detected Data appear Approximate Lognormal Distributed at 5% Significance Level**							
771												
772					**Suggested UCL to Use**							
773					KM H-UCL	1.938						

	A	B	C	D	E	F	G	H	I	J	K	L
774												
775	Note: Suggestions regarding the selection of a 95% UCL are provided to help the user to select the most appropriate 95% UCL.											
776	Recommendations are based upon data size, data distribution, and skewness.											
777	These recommendations are based upon the results of the simulation studies summarized in Singh, Maichle, and Lee (2006).											
778	However, simulations results will not cover all Real World data sets; for additional insight the user may want to consult a statistician.											
779												
780	**Naphthalene**											
781												
782	**General Statistics**											
783					Total Number of Observations	147			Number of Distinct Observations		101	
784					Number of Detects	88			Number of Non-Detects		59	
785					Number of Distinct Detects	67			Number of Distinct Non-Detects		38	
786					Minimum Detect	0.0072			Minimum Non-Detect		7.1000E-4	
787					Maximum Detect	32			Maximum Non-Detect		0.65	
788					Variance Detects	13.42			Percent Non-Detects		40.14%	
789					Mean Detects	1.039			SD Detects		3.663	
790					Median Detects	0.21			CV Detects		3.526	
791					Skewness Detects	7.399			Kurtosis Detects		60.53	
792					Mean of Logged Detects	-1.661			SD of Logged Detects		1.822	
793												
794	**Normal GOF Test on Detects Only**											
795					Shapiro Wilk Test Statistic	0.288			**Normal GOF Test on Detected Observations Only**			
796					5% Shapiro Wilk P Value	0			Detected Data Not Normal at 5% Significance Level			
797					Lilliefors Test Statistic	0.389			**Lilliefors GOF Test**			
798					5% Lilliefors Critical Value	0.0946			Detected Data Not Normal at 5% Significance Level			
799	**Detected Data Not Normal at 5% Significance Level**											
800												
801	**Kaplan-Meier (KM) Statistics using Normal Critical Values and other Nonparametric UCLs**											
802					KM Mean	0.626			KM Standard Error of Mean		0.238	
803					KM SD	2.863			95% KM (BCA) UCL		1.113	
804					95% KM (t) UCL	1.019			95% KM (Percentile Bootstrap) UCL		1.047	
805					95% KM (z) UCL	1.016			95% KM Bootstrap t UCL		1.84	
806					90% KM Chebyshev UCL	1.338			95% KM Chebyshev UCL		1.661	
807					97.5% KM Chebyshev UCL	2.109			99% KM Chebyshev UCL		2.989	
808												
809	**Gamma GOF Tests on Detected Observations Only**											
810					A-D Test Statistic	4.042			**Anderson-Darling GOF Test**			
811					5% A-D Critical Value	0.846			Detected Data Not Gamma Distributed at 5% Significance Level			
812					K-S Test Statistic	0.148			**Kolmogorov-Smirnov GOF**			
813					5% K-S Critical Value	0.102			Detected Data Not Gamma Distributed at 5% Significance Level			
814	**Detected Data Not Gamma Distributed at 5% Significance Level**											
815												
816	**Gamma Statistics on Detected Data Only**											
817					k hat (MLE)	0.389			k star (bias corrected MLE)		0.383	
818					Theta hat (MLE)	2.671			Theta star (bias corrected MLE)		2.711	
819					nu hat (MLE)	68.46			nu star (bias corrected)		67.46	
820					Mean (detects)	1.039						
821												
822	**Gamma ROS Statistics using Imputed Non-Detects**											
823	GROS may not be used when data set has > 50% NDs with many tied observations at multiple DLs											
824	GROS may not be used when kstar of detects is small such as <1.0, especially when the sample size is small (e.g., <15-20)											
825	For such situations, GROS method may yield incorrect values of UCLs and BTVs											

	A	B	C	D	E	F	G	H	I	J	K	L
826	This is especially true when the sample size is small.											
827	For gamma distributed detected data, BTVs and UCLs may be computed using gamma distribution on KM estimates											
828					Minimum	0.0072				Mean		0.626
829					Maximum	32				Median		0.031
830					SD	2.873				CV		4.589
831					k hat (MLE)	0.292				k star (bias corrected MLE)		0.29
832					Theta hat (MLE)	2.146				Theta star (bias corrected MLE)		2.156
833					nu hat (MLE)	85.77				nu star (bias corrected)		85.36
834					Adjusted Level of Significance (β)	0.0484						
835					Approximate Chi Square Value (85.36, α)	65.06				Adjusted Chi Square Value (85.36, β)		64.89
836					95% Gamma Approximate UCL (use when n>=50)	0.821				95% Gamma Adjusted UCL (use when n<50)		0.823
837												
838	**Estimates of Gamma Parameters using KM Estimates**											
839					Mean (KM)	0.626				SD (KM)		2.863
840					Variance (KM)	8.198				SE of Mean (KM)		0.238
841					k hat (KM)	0.0477				k star (KM)		0.0513
842					nu hat (KM)	14.04				nu star (KM)		15.09
843					theta hat (KM)	13.1				theta star (KM)		12.19
844					80% gamma percentile (KM)	0.0928				90% gamma percentile (KM)		0.987
845					95% gamma percentile (KM)	3.358				99% gamma percentile (KM)		13.47
846												
847	**Gamma Kaplan-Meier (KM) Statistics**											
848					Approximate Chi Square Value (15.09, α)	7.321				Adjusted Chi Square Value (15.09, β)		7.267
849					95% Gamma Approximate KM-UCL (use when n>=50)	1.289				95% Gamma Adjusted KM-UCL (use when n<50)		1.299
850												
851	**Lognormal GOF Test on Detected Observations Only**											
852					Shapiro Wilk Approximate Test Statistic	0.964				**Shapiro Wilk GOF Test**		
853					5% Shapiro Wilk P Value	0.0748				Detected Data appear Lognormal at 5% Significance Level		
854					Lilliefors Test Statistic	0.0974				**Lilliefors GOF Test**		
855					5% Lilliefors Critical Value	0.0946				Detected Data Not Lognormal at 5% Significance Level		
856	**Detected Data appear Approximate Lognormal at 5% Significance Level**											
857												
858	**Lognormal ROS Statistics Using Imputed Non-Detects**											
859					Mean in Original Scale	0.625				Mean in Log Scale		-3.194
860					SD in Original Scale	2.873				SD in Log Scale		2.415
861					95% t UCL (assumes normality of ROS data)	1.017				95% Percentile Bootstrap UCL		1.036
862					95% BCA Bootstrap UCL	1.406				95% Bootstrap t UCL		1.953
863					95% H-UCL (Log ROS)	1.619						
864												
865	**Statistics using KM estimates on Logged Data and Assuming Lognormal Distribution**											
866					KM Mean (logged)	-3.644				KM Geo Mean		0.0261
867					KM SD (logged)	2.942				95% Critical H Value (KM-Log)		4.484
868					KM Standard Error of Mean (logged)	0.254				95% H-UCL (KM -Log)		5.911
869					KM SD (logged)	2.942				95% Critical H Value (KM-Log)		4.484
870					KM Standard Error of Mean (logged)	0.254						
871												
872	**DL/2 Statistics**											
873	**DL/2 Normal**						**DL/2 Log-Transformed**					
874					Mean in Original Scale	0.634				Mean in Log Scale		-2.895
875					SD in Original Scale	2.871				SD in Log Scale		2.252
876					95% t UCL (Assumes normality)	1.026				95% H-Stat UCL		1.368
877	**DL/2 is not a recommended method, provided for comparisons and historical reasons**											

	A	B	C	D	E	F	G	H	I	J	K	L
878												
879	**Nonparametric Distribution Free UCL Statistics**											
880	**Detected Data appear Approximate Lognormal Distributed at 5% Significance Level**											
881												
882	**Suggested UCL to Use**											
883					KM H-UCL	5.911						
884												
885	Note: Suggestions regarding the selection of a 95% UCL are provided to help the user to select the most appropriate 95% UCL.											
886	Recommendations are based upon data size, data distribution, and skewness.											
887	These recommendations are based upon the results of the simulation studies summarized in Singh, Maichle, and Lee (2006).											
888	However, simulations results will not cover all Real World data sets; for additional insight the user may want to consult a statistician.											
889												
890	**1,1'-Biphenyl**											
891												
892	**General Statistics**											
893					Total Number of Observations	80			Number of Distinct Observations		32	
894					Number of Detects	9			Number of Non-Detects		71	
895					Number of Distinct Detects	9			Number of Distinct Non-Detects		24	
896					Minimum Detect	0.013			Minimum Non-Detect		0.03	
897					Maximum Detect	6.3			Maximum Non-Detect		3.4	
898					Variance Detects	4.329			Percent Non-Detects		88.75%	
899					Mean Detects	0.754			SD Detects		2.081	
900					Median Detects	0.066			CV Detects		2.761	
901					Skewness Detects	2.996			Kurtosis Detects		8.984	
902					Mean of Logged Detects	-2.666			SD of Logged Detects		1.937	
903												
904	**Normal GOF Test on Detects Only**											
905					Shapiro Wilk Test Statistic	0.411			**Shapiro Wilk GOF Test**			
906					5% Shapiro Wilk Critical Value	0.829			Detected Data Not Normal at 5% Significance Level			
907					Lilliefors Test Statistic	0.499			**Lilliefors GOF Test**			
908					5% Lilliefors Critical Value	0.274			Detected Data Not Normal at 5% Significance Level			
909	**Detected Data Not Normal at 5% Significance Level**											
910												
911	**Kaplan-Meier (KM) Statistics using Normal Critical Values and other Nonparametric UCLs**											
912					KM Mean	0.101			KM Standard Error of Mean		0.0828	
913					KM SD	0.698			95% KM (BCA) UCL		0.261	
914					95% KM (t) UCL	0.238			95% KM (Percentile Bootstrap) UCL		0.258	
915					95% KM (z) UCL	0.237			95% KM Bootstrap t UCL		2.863	
916					90% KM Chebyshev UCL	0.349			95% KM Chebyshev UCL		0.461	
917					97.5% KM Chebyshev UCL	0.617			99% KM Chebyshev UCL		0.924	
918												
919	**Gamma GOF Tests on Detected Observations Only**											
920					A-D Test Statistic	1.6			**Anderson-Darling GOF Test**			
921					5% A-D Critical Value	0.811			Detected Data Not Gamma Distributed at 5% Significance Level			
922					K-S Test Statistic	0.392			**Kolmogorov-Smirnov GOF**			
923					5% K-S Critical Value	0.302			Detected Data Not Gamma Distributed at 5% Significance Level			
924	**Detected Data Not Gamma Distributed at 5% Significance Level**											
925												
926	**Gamma Statistics on Detected Data Only**											
927					k hat (MLE)	0.291			k star (bias corrected MLE)		0.268	
928					Theta hat (MLE)	2.591			Theta star (bias corrected MLE)		2.812	

	A	B	C	D	E	F	G	H	I	J	K	L
929					nu hat (MLE)	5.234				nu star (bias corrected)		4.823
930					Mean (detects)	0.754						
931												
932					**Gamma ROS Statistics using Imputed Non-Detects**							
933					GROS may not be used when data set has > 50% NDs with many tied observations at multiple DLs							
934					GROS may not be used when kstar of detects is small such as <1.0, especially when the sample size is small (e.g., <15-20)							
935					For such situations, GROS method may yield incorrect values of UCLs and BTVs							
936					This is especially true when the sample size is small.							
937					For gamma distributed detected data, BTVs and UCLs may be computed using gamma distribution on KM estimates							
938					Minimum	0.01				Mean		0.0942
939					Maximum	6.3				Median		0.01
940					SD	0.703				CV		7.464
941					k hat (MLE)	0.338				k star (bias corrected MLE)		0.333
942					Theta hat (MLE)	0.279				Theta star (bias corrected MLE)		0.283
943					nu hat (MLE)	54.02				nu star (bias corrected)		53.33
944					Adjusted Level of Significance (β)	0.047						
945					Approximate Chi Square Value (53.33, α)	37.55				Adjusted Chi Square Value (53.33, β)		37.31
946					95% Gamma Approximate UCL (use when n>=50)	0.134				95% Gamma Adjusted UCL (use when n<50)		0.135
947												
948					**Estimates of Gamma Parameters using KM Estimates**							
949					Mean (KM)	0.101				SD (KM)		0.698
950					Variance (KM)	0.487				SE of Mean (KM)		0.0828
951					k hat (KM)	0.0207				k star (KM)		0.0283
952					nu hat (KM)	3.318				nu star (KM)		4.527
953					theta hat (KM)	4.846				theta star (KM)		3.552
954					80% gamma percentile (KM)	7.6724E-4				90% gamma percentile (KM)		0.05
955					95% gamma percentile (KM)	0.367				99% gamma percentile (KM)		2.634
956												
957					**Gamma Kaplan-Meier (KM) Statistics**							
958					Approximate Chi Square Value (4.53, α)	0.94				Adjusted Chi Square Value (4.53, β)		0.912
959					95% Gamma Approximate KM-UCL (use when n>=50)	0.484				95% Gamma Adjusted KM-UCL (use when n<50)		0.499
960												
961					**Lognormal GOF Test on Detected Observations Only**							
962					Shapiro Wilk Test Statistic	0.805				**Shapiro Wilk GOF Test**		
963					5% Shapiro Wilk Critical Value	0.829				Detected Data Not Lognormal at 5% Significance Level		
964					Lilliefors Test Statistic	0.216				**Lilliefors GOF Test**		
965					5% Lilliefors Critical Value	0.274				Detected Data appear Lognormal at 5% Significance Level		
966					**Detected Data appear Approximate Lognormal at 5% Significance Level**							
967												
968					**Lognormal ROS Statistics Using Imputed Non-Detects**							
969					Mean in Original Scale	0.103				Mean in Log Scale		-4.002
970					SD in Original Scale	0.702				SD in Log Scale		1.085
971					95% t UCL (assumes normality of ROS data)	0.234				95% Percentile Bootstrap UCL		0.26
972					95% BCA Bootstrap UCL	0.344				95% Bootstrap t UCL		3.161
973					95% H-UCL (Log ROS)	0.0439						
974												
975					**Statistics using KM estimates on Logged Data and Assuming Lognormal Distribution**							
976					KM Mean (logged)	-3.941				KM Geo Mean		0.0194
977					KM SD (logged)	0.812				95% Critical H Value (KM-Log)		2.094
978					KM Standard Error of Mean (logged)	0.131				95% H-UCL (KM -Log)		0.0327
979					KM SD (logged)	0.812				95% Critical H Value (KM-Log)		2.094
980					KM Standard Error of Mean (logged)	0.131						

	A	B	C	D	E	F	G	H	I	J	K	L
981												
982						DL/2 Statistics						
983				DL/2 Normal					DL/2 Log-Transformed			
984					Mean in Original Scale	0.193					Mean in Log Scale	-3.246
985					SD in Original Scale	0.751					SD in Log Scale	1.354
986					95% t UCL (Assumes normality)	0.332					95% H-Stat UCL	0.146
987						DL/2 is not a recommended method, provided for comparisons and historical reasons						
988												
989						Nonparametric Distribution Free UCL Statistics						
990						Detected Data appear Approximate Lognormal Distributed at 5% Significance Level						
991												
992						Suggested UCL to Use						
993					KM H-UCL	0.0327						
994												
995						Note: Suggestions regarding the selection of a 95% UCL are provided to help the user to select the most appropriate 95% UCL.						
996						Recommendations are based upon data size, data distribution, and skewness.						
997						These recommendations are based upon the results of the simulation studies summarized in Singh, Maichle, and Lee (2006).						
998						However, simulations results will not cover all Real World data sets; for additional insight the user may want to consult a statistician.						
999												
1000	2-Methylnaphthalene											
1001												
1002						General Statistics						
1003					Total Number of Observations	80					Number of Distinct Observations	57
1004					Number of Detects	51					Number of Non-Detects	29
1005					Number of Distinct Detects	41					Number of Distinct Non-Detects	21
1006					Minimum Detect	0.0081					Minimum Non-Detect	0.0061
1007					Maximum Detect	76					Maximum Non-Detect	0.68
1008					Variance Detects	120.5					Percent Non-Detects	36.25%
1009					Mean Detects	2.134					SD Detects	10.98
1010					Median Detects	0.053					CV Detects	5.146
1011					Skewness Detects	6.441					Kurtosis Detects	43.23
1012					Mean of Logged Detects	-2.531					SD of Logged Detects	1.786
1013												
1014						Normal GOF Test on Detects Only						
1015					Shapiro Wilk Test Statistic	0.212			Normal GOF Test on Detected Observations Only			
1016					5% Shapiro Wilk P Value	0			Detected Data Not Normal at 5% Significance Level			
1017					Lilliefors Test Statistic	0.482			Lilliefors GOF Test			
1018					5% Lilliefors Critical Value	0.123			Detected Data Not Normal at 5% Significance Level			
1019						Detected Data Not Normal at 5% Significance Level						
1020												
1021						Kaplan-Meier (KM) Statistics using Normal Critical Values and other Nonparametric UCLs						
1022					KM Mean	1.365					KM Standard Error of Mean	0.987
1023					KM SD	8.739					95% KM (BCA) UCL	3.275
1024					95% KM (t) UCL	3.007					95% KM (Percentile Bootstrap) UCL	3.212
1025					95% KM (z) UCL	2.988					95% KM Bootstrap t UCL	51.69
1026					90% KM Chebyshev UCL	4.325					95% KM Chebyshev UCL	5.666
1027					97.5% KM Chebyshev UCL	7.527					99% KM Chebyshev UCL	11.18
1028												
1029						Gamma GOF Tests on Detected Observations Only						
1030					A-D Test Statistic	10.97			Anderson-Darling GOF Test			
1031					5% A-D Critical Value	0.902			Detected Data Not Gamma Distributed at 5% Significance Level			
1032					K-S Test Statistic	0.394			Kolmogorov-Smirnov GOF			

	A	B	C	D	E	F	G	H	I	J	K	L
1033					5% K-S Critical Value	0.137	Detected Data Not Gamma Distributed at 5% Significance Level					
1034					Detected Data Not Gamma Distributed at 5% Significance Level							
1035												
1036					Gamma Statistics on Detected Data Only							
1037					k hat (MLE)	0.22				k star (bias corrected MLE)		0.22
1038					Theta hat (MLE)	9.681				Theta star (bias corrected MLE)		9.676
1039					nu hat (MLE)	22.48				nu star (bias corrected)		22.49
1040					Mean (detects)	2.134						
1041												
1042					Gamma ROS Statistics using Imputed Non-Detects							
1043					GROS may not be used when data set has > 50% NDs with many tied observations at multiple DLs							
1044					GROS may not be used when kstar of detects is small such as <1.0, especially when the sample size is small (e.g., <15-20)							
1045					For such situations, GROS method may yield incorrect values of UCLs and BTVs							
1046					This is especially true when the sample size is small.							
1047					For gamma distributed detected data, BTVs and UCLs may be computed using gamma distribution on KM estimates							
1048					Minimum	0.0081				Mean		1.364
1049					Maximum	76				Median		0.022
1050					SD	8.794				CV		6.448
1051					k hat (MLE)	0.204				k star (bias corrected MLE)		0.205
1052					Theta hat (MLE)	6.68				Theta star (bias corrected MLE)		6.658
1053					nu hat (MLE)	32.67				nu star (bias corrected)		32.77
1054					Adjusted Level of Significance (β)	0.047						
1055					Approximate Chi Square Value (32.77, α)	20.69				Adjusted Chi Square Value (32.77, β)		20.51
1056					95% Gamma Approximate UCL (use when n>=50)	2.161				95% Gamma Adjusted UCL (use when n<50)		2.179
1057												
1058					Estimates of Gamma Parameters using KM Estimates							
1059					Mean (KM)	1.365				SD (KM)		8.739
1060					Variance (KM)	76.36				SE of Mean (KM)		0.987
1061					k hat (KM)	0.0244				k star (KM)		0.0318
1062					nu hat (KM)	3.904				nu star (KM)		5.091
1063					theta hat (KM)	55.95				theta star (KM)		42.9
1064					80% gamma percentile (KM)	0.0222				90% gamma percentile (KM)		0.92
1065					95% gamma percentile (KM)	5.57				99% gamma percentile (KM)		34.68
1066												
1067					Gamma Kaplan-Meier (KM) Statistics							
1068					Approximate Chi Square Value (5.09, α)	1.194				Adjusted Chi Square Value (5.09, β)		1.161
1069					95% Gamma Approximate KM-UCL (use when n>=50)	5.818				95% Gamma Adjusted KM-UCL (use when n<50)		5.986
1070												
1071					Lognormal GOF Test on Detected Observations Only							
1072					Shapiro Wilk Approximate Test Statistic	0.804				Shapiro Wilk GOF Test		
1073					5% Shapiro Wilk P Value	9.9624E-9				Detected Data Not Lognormal at 5% Significance Level		
1074					Lilliefors Test Statistic	0.176				Lilliefors GOF Test		
1075					5% Lilliefors Critical Value	0.123				Detected Data Not Lognormal at 5% Significance Level		
1076					Detected Data Not Lognormal at 5% Significance Level							
1077												
1078					Lognormal ROS Statistics Using Imputed Non-Detects							
1079					Mean in Original Scale	1.362				Mean in Log Scale		-3.663
1080					SD in Original Scale	8.794				SD in Log Scale		2.16
1081					95% t UCL (assumes normality of ROS data)	2.999				95% Percentile Bootstrap UCL		3.238
1082					95% BCA Bootstrap UCL	4.531				95% Bootstrap t UCL		52.05
1083					95% H-UCL (Log ROS)	0.642						
1084												

	A	B	C	D	E	F	G	H	I	J	K	L
1085	Statistics using KM estimates on Logged Data and Assuming Lognormal Distribution											
1086					KM Mean (logged)	-3.33					KM Geo Mean	0.0358
1087					KM SD (logged)	1.818					95% Critical H Value (KM-Log)	3.208
1088					KM Standard Error of Mean (logged)	0.209					95% H-UCL (KM -Log)	0.36
1089					KM SD (logged)	1.818					95% Critical H Value (KM-Log)	3.208
1090					KM Standard Error of Mean (logged)	0.209						
1091												
1092	DL/2 Statistics											
1093	DL/2 Normal						DL/2 Log-Transformed					
1094					Mean in Original Scale	1.373					Mean in Log Scale	-3.299
1095					SD in Original Scale	8.793					SD in Log Scale	1.948
1096					95% t UCL (Assumes normality)	3.01					95% H-Stat UCL	0.516
1097	DL/2 is not a recommended method, provided for comparisons and historical reasons											
1098												
1099	Nonparametric Distribution Free UCL Statistics											
1100	Data do not follow a Discernible Distribution at 5% Significance Level											
1101												
1102	Suggested UCL to Use											
1103					95% KM (Chebyshev) UCL	5.666						
1104												
1105	Note: Suggestions regarding the selection of a 95% UCL are provided to help the user to select the most appropriate 95% UCL.											
1106	Recommendations are based upon data size, data distribution, and skewness.											
1107	These recommendations are based upon the results of the simulation studies summarized in Singh, Maichle, and Lee (2006).											
1108	However, simulations results will not cover all Real World data sets; for additional insight the user may want to consult a statistician.											
1109												
1110	Dibenzofuran											
1111												
1112	General Statistics											
1113					Total Number of Observations	80					Number of Distinct Observations	34
1114					Number of Detects	13					Number of Non-Detects	67
1115					Number of Distinct Detects	11					Number of Distinct Non-Detects	24
1116					Minimum Detect	0.054					Minimum Non-Detect	0.034
1117					Maximum Detect	13					Maximum Non-Detect	3.7
1118					Variance Detects	12.66					Percent Non-Detects	83.75%
1119					Mean Detects	1.24					SD Detects	3.557
1120					Median Detects	0.12					CV Detects	2.869
1121					Skewness Detects	3.525					Kurtosis Detects	12.55
1122					Mean of Logged Detects	-1.595					SD of Logged Detects	1.555
1123												
1124	Normal GOF Test on Detects Only											
1125					Shapiro Wilk Test Statistic	0.376					Shapiro Wilk GOF Test	
1126					5% Shapiro Wilk Critical Value	0.866					Detected Data Not Normal at 5% Significance Level	
1127					Lilliefors Test Statistic	0.451					Lilliefors GOF Test	
1128					5% Lilliefors Critical Value	0.234					Detected Data Not Normal at 5% Significance Level	
1129	Detected Data Not Normal at 5% Significance Level											
1130												
1131	Kaplan-Meier (KM) Statistics using Normal Critical Values and other Nonparametric UCLs											
1132					KM Mean	0.235					KM Standard Error of Mean	0.169
1133					KM SD	1.448					95% KM (BCA) UCL	0.57
1134					95% KM (t) UCL	0.515					95% KM (Percentile Bootstrap) UCL	0.553
1135					95% KM (z) UCL	0.512					95% KM Bootstrap t UCL	5.456

	A	B	C	D	E	F	G	H	I	J	K	L
1136					90% KM Chebyshev UCL	0.74				95% KM Chebyshev UCL		0.969
1137					97.5% KM Chebyshev UCL	1.287				99% KM Chebyshev UCL		1.912
1138												
1139					Gamma GOF Tests on Detected Observations Only							
1140					A-D Test Statistic	2.293	Anderson-Darling GOF Test					
1141					5% A-D Critical Value	0.816	Detected Data Not Gamma Distributed at 5% Significance Level					
1142					K-S Test Statistic	0.401	Kolmogorov-Smirnov GOF					
1143					5% K-S Critical Value	0.254	Detected Data Not Gamma Distributed at 5% Significance Level					
1144					Detected Data Not Gamma Distributed at 5% Significance Level							
1145												
1146					Gamma Statistics on Detected Data Only							
1147					k hat (MLE)	0.368	k star (bias corrected MLE)					0.335
1148					Theta hat (MLE)	3.366	Theta star (bias corrected MLE)					3.705
1149					nu hat (MLE)	9.579	nu star (bias corrected)					8.702
1150					Mean (detects)	1.24						
1151												
1152					Gamma ROS Statistics using Imputed Non-Detects							
1153					GROS may not be used when data set has > 50% NDs with many tied observations at multiple DLs							
1154					GROS may not be used when kstar of detects is small such as <1.0, especially when the sample size is small (e.g., <15-20)							
1155					For such situations, GROS method may yield incorrect values of UCLs and BTVs							
1156					This is especially true when the sample size is small.							
1157					For gamma distributed detected data, BTVs and UCLs may be computed using gamma distribution on KM estimates							
1158					Minimum	0.01	Mean					0.21
1159					Maximum	13	Median					0.01
1160					SD	1.46	CV					6.956
1161					k hat (MLE)	0.274	k star (bias corrected MLE)					0.272
1162					Theta hat (MLE)	0.766	Theta star (bias corrected MLE)					0.772
1163					nu hat (MLE)	43.83	nu star (bias corrected)					43.52
1164					Adjusted Level of Significance (β)	0.047						
1165					Approximate Chi Square Value (43.52, α)	29.39	Adjusted Chi Square Value (43.52, β)					29.18
1166					95% Gamma Approximate UCL (use when n>=50)	0.311	95% Gamma Adjusted UCL (use when n<50)					0.313
1167												
1168					Estimates of Gamma Parameters using KM Estimates							
1169					Mean (KM)	0.235	SD (KM)					1.448
1170					Variance (KM)	2.096	SE of Mean (KM)					0.169
1171					k hat (KM)	0.0262	k star (KM)					0.0336
1172					nu hat (KM)	4.198	nu star (KM)					5.374
1173					theta hat (KM)	8.938	theta star (KM)					6.982
1174					80% gamma percentile (KM)	0.00525	90% gamma percentile (KM)					0.179
1175					95% gamma percentile (KM)	1	99% gamma percentile (KM)					5.864
1176												
1177					Gamma Kaplan-Meier (KM) Statistics							
1178					Approximate Chi Square Value (5.37, α)	1.329	Adjusted Chi Square Value (5.37, β)					1.293
1179					95% Gamma Approximate KM-UCL (use when n>=50)	0.948	95% Gamma Adjusted KM-UCL (use when n<50)					0.975
1180												
1181					Lognormal GOF Test on Detected Observations Only							
1182					Shapiro Wilk Test Statistic	0.781	Shapiro Wilk GOF Test					
1183					5% Shapiro Wilk Critical Value	0.866	Detected Data Not Lognormal at 5% Significance Level					
1184					Lilliefors Test Statistic	0.255	Lilliefors GOF Test					
1185					5% Lilliefors Critical Value	0.234	Detected Data Not Lognormal at 5% Significance Level					
1186					Detected Data Not Lognormal at 5% Significance Level							
1187												

	A	B	C	D	E	F	G	H	I	J	K	L
1188	Lognormal ROS Statistics Using Imputed Non-Detects											
1189					Mean in Original Scale	0.204					Mean in Log Scale	-5.787
1190					SD in Original Scale	1.46					SD in Log Scale	2.423
1191				95% t UCL (assumes normality of ROS data)		0.476					95% Percentile Bootstrap UCL	0.527
1192					95% BCA Bootstrap UCL	0.712					95% Bootstrap t UCL	5.472
1193					95% H-UCL (Log ROS)	0.172						
1194												
1195	Statistics using KM estimates on Logged Data and Assuming Lognormal Distribution											
1196					KM Mean (logged)	-3.039					KM Geo Mean	0.0479
1197					KM SD (logged)	0.915					95% Critical H Value (KM-Log)	2.186
1198					KM Standard Error of Mean (logged)	0.112					95% H-UCL (KM -Log)	0.0912
1199					KM SD (logged)	0.915					95% Critical H Value (KM-Log)	2.186
1200					KM Standard Error of Mean (logged)	0.112						
1201												
1202	DL/2 Statistics											
1203				DL/2 Normal						DL/2 Log-Transformed		
1204					Mean in Original Scale	0.32					Mean in Log Scale	-2.916
1205					SD in Original Scale	1.48					SD in Log Scale	1.445
1206					95% t UCL (Assumes normality)	0.595					95% H-Stat UCL	0.241
1207	DL/2 is not a recommended method, provided for comparisons and historical reasons											
1208												
1209	Nonparametric Distribution Free UCL Statistics											
1210	Data do not follow a Discernible Distribution at 5% Significance Level											
1211												
1212	Suggested UCL to Use											
1213					95% KM (Chebyshev) UCL	0.969						
1214												
1215	Note: Suggestions regarding the selection of a 95% UCL are provided to help the user to select the most appropriate 95% UCL.											
1216	Recommendations are based upon data size, data distribution, and skewness.											
1217	These recommendations are based upon the results of the simulation studies summarized in Singh, Maichle, and Lee (2006).											
1218	However, simulations results will not cover all Real World data sets; for additional insight the user may want to consult a statistician.											
1219												
1220	PCB-1254											
1221												
1222	General Statistics											
1223					Total Number of Observations	127					Number of Distinct Observations	29
1224					Number of Detects	13					Number of Non-Detects	114
1225					Number of Distinct Detects	13					Number of Distinct Non-Detects	16
1226					Minimum Detect	0.011					Minimum Non-Detect	6.5000E-4
1227					Maximum Detect	0.58					Maximum Non-Detect	0.064
1228					Variance Detects	0.0363					Percent Non-Detects	89.76%
1229					Mean Detects	0.135					SD Detects	0.191
1230					Median Detects	0.035					CV Detects	1.406
1231					Skewness Detects	1.579					Kurtosis Detects	1.393
1232					Mean of Logged Detects	-2.919					SD of Logged Detects	1.382
1233												
1234	Normal GOF Test on Detects Only											
1235					Shapiro Wilk Test Statistic	0.696					Shapiro Wilk GOF Test	
1236					5% Shapiro Wilk Critical Value	0.866					Detected Data Not Normal at 5% Significance Level	
1237					Lilliefors Test Statistic	0.382					Lilliefors GOF Test	
1238					5% Lilliefors Critical Value	0.234					Detected Data Not Normal at 5% Significance Level	
1239	Detected Data Not Normal at 5% Significance Level											

	A	B	C	D	E	F	G	H	I	J	K	L
1240												
1241	**Kaplan-Meier (KM) Statistics using Normal Critical Values and other Nonparametric UCLs**											
1242					KM Mean	0.0145				KM Standard Error of Mean		0.0066
1243					KM SD	0.0714				95% KM (BCA) UCL		0.0285
1244					95% KM (t) UCL	0.0254				95% KM (Percentile Bootstrap) UCL		0.0267
1245					95% KM (z) UCL	0.0253				95% KM Bootstrap t UCL		0.0369
1246					90% KM Chebyshev UCL	0.0343				95% KM Chebyshev UCL		0.0432
1247					97.5% KM Chebyshev UCL	0.0557				99% KM Chebyshev UCL		0.0801
1248												
1249	**Gamma GOF Tests on Detected Observations Only**											
1250					A-D Test Statistic	1.203	**Anderson-Darling GOF Test**					
1251					5% A-D Critical Value	0.777	Detected Data Not Gamma Distributed at 5% Significance Level					
1252					K-S Test Statistic	0.339	**Kolmogorov-Smirnov GOF**					
1253					5% K-S Critical Value	0.247	Detected Data Not Gamma Distributed at 5% Significance Level					
1254	**Detected Data Not Gamma Distributed at 5% Significance Level**											
1255												
1256	**Gamma Statistics on Detected Data Only**											
1257					k hat (MLE)	0.662				k star (bias corrected MLE)		0.56
1258					Theta hat (MLE)	0.205				Theta star (bias corrected MLE)		0.242
1259					nu hat (MLE)	17.21				nu star (bias corrected)		14.57
1260					Mean (detects)	0.135						
1261												
1262	**Gamma ROS Statistics using Imputed Non-Detects**											
1263	GROS may not be used when data set has > 50% NDs with many tied observations at multiple DLs											
1264	GROS may not be used when kstar of detects is small such as <1.0, especially when the sample size is small (e.g., <15-20)											
1265	For such situations, GROS method may yield incorrect values of UCLs and BTVs											
1266	This is especially true when the sample size is small.											
1267	For gamma distributed detected data, BTVs and UCLs may be computed using gamma distribution on KM estimates											
1268					Minimum	0.01				Mean		0.0228
1269					Maximum	0.58				Median		0.01
1270					SD	0.0701				CV		3.069
1271					k hat (MLE)	0.895				k star (bias corrected MLE)		0.879
1272					Theta hat (MLE)	0.0255				Theta star (bias corrected MLE)		0.026
1273					nu hat (MLE)	227.4				nu star (bias corrected)		223.3
1274					Adjusted Level of Significance (β)	0.0481						
1275					Approximate Chi Square Value (223.35, α)	189.8				Adjusted Chi Square Value (223.35, β)		189.4
1276					95% Gamma Approximate UCL (use when n>=50)	0.0269				95% Gamma Adjusted UCL (use when n<50)		0.0269
1277												
1278	**Estimates of Gamma Parameters using KM Estimates**											
1279					Mean (KM)	0.0145				SD (KM)		0.0714
1280					Variance (KM)	0.0051				SE of Mean (KM)		0.0066
1281					k hat (KM)	0.041				k star (KM)		0.0453
1282					nu hat (KM)	10.42				nu star (KM)		11.51
1283					theta hat (KM)	0.352				theta star (KM)		0.319
1284					80% gamma percentile (KM)	0.00136				90% gamma percentile (KM)		0.0192
1285					95% gamma percentile (KM)	0.074				99% gamma percentile (KM)		0.327
1286												
1287	**Gamma Kaplan-Meier (KM) Statistics**											
1288					Approximate Chi Square Value (11.51, α)	4.907				Adjusted Chi Square Value (11.51, β)		4.857
1289					95% Gamma Approximate KM-UCL (use when n>=50)	0.0339				95% Gamma Adjusted KM-UCL (use when n<50)		0.0343
1290												

	A	B	C	D	E	F	G	H	I	J	K	L
1291	Lognormal GOF Test on Detected Observations Only											
1292					Shapiro Wilk Test Statistic	0.859	Shapiro Wilk GOF Test					
1293					5% Shapiro Wilk Critical Value	0.866	Detected Data Not Lognormal at 5% Significance Level					
1294					Lilliefors Test Statistic	0.271	Lilliefors GOF Test					
1295					5% Lilliefors Critical Value	0.234	Detected Data Not Lognormal at 5% Significance Level					
1296	Detected Data Not Lognormal at 5% Significance Level											
1297												
1298	Lognormal ROS Statistics Using Imputed Non-Detects											
1299					Mean in Original Scale	0.0143				Mean in Log Scale		-9.135
1300					SD in Original Scale	0.0717				SD in Log Scale		3.225
1301					95% t UCL (assumes normality of ROS data)	0.0248				95% Percentile Bootstrap UCL		0.0254
1302					95% BCA Bootstrap UCL	0.0292				95% Bootstrap t UCL		0.0382
1303					95% H-UCL (Log ROS)	0.0776						
1304												
1305	Statistics using KM estimates on Logged Data and Assuming Lognormal Distribution											
1306					KM Mean (logged)	-6.884				KM Geo Mean		0.00102
1307					KM SD (logged)	1.408				95% Critical H Value (KM-Log)		2.588
1308					KM Standard Error of Mean (logged)	0.13				95% H-UCL (KM -Log)		0.00382
1309					KM SD (logged)	1.408				95% Critical H Value (KM-Log)		2.588
1310					KM Standard Error of Mean (logged)	0.13						
1311												
1312	DL/2 Statistics											
1313			DL/2 Normal							DL/2 Log-Transformed		
1314					Mean in Original Scale	0.0154				Mean in Log Scale		-6.158
1315					SD in Original Scale	0.0716				SD in Log Scale		1.235
1316					95% t UCL (Assumes normality)	0.026				95% H-Stat UCL		0.00591
1317	DL/2 is not a recommended method, provided for comparisons and historical reasons											
1318												
1319	Nonparametric Distribution Free UCL Statistics											
1320	Data do not follow a Discernible Distribution at 5% Significance Level											
1321												
1322	Suggested UCL to Use											
1323					95% KM (Chebyshev) UCL	0.0432						
1324												
1325	Note: Suggestions regarding the selection of a 95% UCL are provided to help the user to select the most appropriate 95% UCL.											
1326	Recommendations are based upon data size, data distribution, and skewness.											
1327	These recommendations are based upon the results of the simulation studies summarized in Singh, Maichle, and Lee (2006).											
1328	However, simulations results will not cover all Real World data sets; for additional insight the user may want to consult a statistician.											
1329												
1330	PCB-1260											
1331												
1332	General Statistics											
1333					Total Number of Observations	127				Number of Distinct Observations		39
1334					Number of Detects	35				Number of Non-Detects		92
1335					Number of Distinct Detects	30				Number of Distinct Non-Detects		13
1336					Minimum Detect	0.0031				Minimum Non-Detect		0.0024
1337					Maximum Detect	4.3				Maximum Non-Detect		0.0036
1338					Variance Detects	1.472				Percent Non-Detects		72.44%
1339					Mean Detects	0.627				SD Detects		1.213
1340					Median Detects	0.019				CV Detects		1.936
1341					Skewness Detects	1.916				Kurtosis Detects		2.363
1342					Mean of Logged Detects	-2.885				SD of Logged Detects		2.347

	A	B	C	D	E	F	G	H	I	J	K	L
1343												
1344						Normal GOF Test on Detects Only						
1345					Shapiro Wilk Test Statistic	0.576			Shapiro Wilk GOF Test			
1346					5% Shapiro Wilk Critical Value	0.934			Detected Data Not Normal at 5% Significance Level			
1347					Lilliefors Test Statistic	0.381			Lilliefors GOF Test			
1348					5% Lilliefors Critical Value	0.148			Detected Data Not Normal at 5% Significance Level			
1349						Detected Data Not Normal at 5% Significance Level						
1350												
1351						Kaplan-Meier (KM) Statistics using Normal Critical Values and other Nonparametric UCLs						
1352					KM Mean	0.174			KM Standard Error of Mean			0.0619
1353					KM SD	0.687			95% KM (BCA) UCL			0.287
1354					95% KM (t) UCL	0.277			95% KM (Percentile Bootstrap) UCL			0.278
1355					95% KM (z) UCL	0.276			95% KM Bootstrap t UCL			0.319
1356					90% KM Chebyshev UCL	0.36			95% KM Chebyshev UCL			0.444
1357					97.5% KM Chebyshev UCL	0.561			99% KM Chebyshev UCL			0.79
1358												
1359						Gamma GOF Tests on Detected Observations Only						
1360					A-D Test Statistic	3.261			Anderson-Darling GOF Test			
1361					5% A-D Critical Value	0.863			Detected Data Not Gamma Distributed at 5% Significance Level			
1362					K-S Test Statistic	0.262			Kolmogorov-Smirnov GOF			
1363					5% K-S Critical Value	0.162			Detected Data Not Gamma Distributed at 5% Significance Level			
1364						Detected Data Not Gamma Distributed at 5% Significance Level						
1365												
1366						Gamma Statistics on Detected Data Only						
1367					k hat (MLE)	0.287			k star (bias corrected MLE)			0.282
1368					Theta hat (MLE)	2.182			Theta star (bias corrected MLE)			2.226
1369					nu hat (MLE)	20.1			nu star (bias corrected)			19.71
1370					Mean (detects)	0.627						
1371												
1372						Gamma ROS Statistics using Imputed Non-Detects						
1373						GROS may not be used when data set has > 50% NDs with many tied observations at multiple DLs						
1374						GROS may not be used when kstar of detects is small such as <1.0, especially when the sample size is small (e.g., <15-20)						
1375						For such situations, GROS method may yield incorrect values of UCLs and BTVs						
1376						This is especially true when the sample size is small.						
1377						For gamma distributed detected data, BTVs and UCLs may be computed using gamma distribution on KM estimates						
1378					Minimum	0.0031			Mean			0.18
1379					Maximum	4.3			Median			0.01
1380					SD	0.688			CV			3.825
1381					k hat (MLE)	0.287			k star (bias corrected MLE)			0.286
1382					Theta hat (MLE)	0.626			Theta star (bias corrected MLE)			0.63
1383					nu hat (MLE)	73			nu star (bias corrected)			72.61
1384					Adjusted Level of Significance (β)	0.0481						
1385					Approximate Chi Square Value (72.61, α)	53.98			Adjusted Chi Square Value (72.61, β)			53.8
1386					95% Gamma Approximate UCL (use when n>=50)	0.242			95% Gamma Adjusted UCL (use when n<50)			0.243
1387												
1388						Estimates of Gamma Parameters using KM Estimates						
1389					Mean (KM)	0.174			SD (KM)			0.687
1390					Variance (KM)	0.472			SE of Mean (KM)			0.0619
1391					k hat (KM)	0.0645			k star (KM)			0.0682
1392					nu hat (KM)	16.38			nu star (KM)			17.33
1393					theta hat (KM)	2.705			theta star (KM)			2.557

	A	B	C	D	E	F	G	H	I	J	K	L
1394					80% gamma percentile (KM)	0.0588					90% gamma percentile (KM)	0.369
1395					95% gamma percentile (KM)	1					99% gamma percentile (KM)	3.326
1396												
1397					Gamma Kaplan-Meier (KM) Statistics							
1398					Approximate Chi Square Value (17.33, α)	8.907					Adjusted Chi Square Value (17.33, β)	8.837
1399					95% Gamma Approximate KM-UCL (use when n>=50)	0.339					95% Gamma Adjusted KM-UCL (use when n<50)	0.342
1400												
1401					Lognormal GOF Test on Detected Observations Only							
1402					Shapiro Wilk Test Statistic	0.865			Shapiro Wilk GOF Test			
1403					5% Shapiro Wilk Critical Value	0.934			Detected Data Not Lognormal at 5% Significance Level			
1404					Lilliefors Test Statistic	0.193			Lilliefors GOF Test			
1405					5% Lilliefors Critical Value	0.148			Detected Data Not Lognormal at 5% Significance Level			
1406					Detected Data Not Lognormal at 5% Significance Level							
1407												
1408					Lognormal ROS Statistics Using Imputed Non-Detects							
1409					Mean in Original Scale	0.173			Mean in Log Scale			-8.648
1410					SD in Original Scale	0.69			SD in Log Scale			4.484
1411					95% t UCL (assumes normality of ROS data)	0.274			95% Percentile Bootstrap UCL			0.285
1412					95% BCA Bootstrap UCL	0.312			95% Bootstrap t UCL			0.316
1413					95% H-UCL (Log ROS)	54.22						
1414												
1415					Statistics using KM estimates on Logged Data and Assuming Lognormal Distribution							
1416					KM Mean (logged)	-5.165			KM Geo Mean			0.00572
1417					KM SD (logged)	1.858			95% Critical H Value (KM-Log)			3.091
1418					KM Standard Error of Mean (logged)	0.167			95% H-UCL (KM -Log)			0.0535
1419					KM SD (logged)	1.858			95% Critical H Value (KM-Log)			3.091
1420					KM Standard Error of Mean (logged)	0.167						
1421												
1422					DL/2 Statistics							
1423					DL/2 Normal				DL/2 Log-Transformed			
1424					Mean in Original Scale	0.174			Mean in Log Scale			-5.553
1425					SD in Original Scale	0.69			SD in Log Scale			2.054
1426					95% t UCL (Assumes normality)	0.275			95% H-Stat UCL			0.0588
1427					DL/2 is not a recommended method, provided for comparisons and historical reasons							
1428												
1429					Nonparametric Distribution Free UCL Statistics							
1430					Data do not follow a Discernible Distribution at 5% Significance Level							
1431												
1432					Suggested UCL to Use							
1433					95% KM (Chebyshev) UCL	0.444						
1434												
1435					Note: Suggestions regarding the selection of a 95% UCL are provided to help the user to select the most appropriate 95% UCL.							
1436					Recommendations are based upon data size, data distribution, and skewness.							
1437					These recommendations are based upon the results of the simulation studies summarized in Singh, Maichle, and Lee (2006).							
1438					However, simulations results will not cover all Real World data sets; for additional insight the user may want to consult a statistician.							
1439												
1440	Antimony											
1441												
1442					General Statistics							
1443					Total Number of Observations	74			Number of Distinct Observations			56
1444					Number of Detects	71			Number of Non-Detects			3
1445					Number of Distinct Detects	54			Number of Distinct Non-Detects			2

	A	B	C	D	E	F	G	H	I	J	K	L
1446					Minimum Detect	0.016					Minimum Non-Detect	0.027
1447					Maximum Detect	6.9					Maximum Non-Detect	0.028
1448					Variance Detects	1.191					Percent Non-Detects	4.054%
1449					Mean Detects	0.806					SD Detects	1.091
1450					Median Detects	0.42					CV Detects	1.355
1451					Skewness Detects	3.278					Kurtosis Detects	13.91
1452					Mean of Logged Detects	-0.804					SD of Logged Detects	1.087
1453												
1454					**Normal GOF Test on Detects Only**							
1455					Shapiro Wilk Test Statistic	0.642			**Normal GOF Test on Detected Observations Only**			
1456					5% Shapiro Wilk P Value	0			Detected Data Not Normal at 5% Significance Level			
1457					Lilliefors Test Statistic	0.237			**Lilliefors GOF Test**			
1458					5% Lilliefors Critical Value	0.105			Detected Data Not Normal at 5% Significance Level			
1459					**Detected Data Not Normal at 5% Significance Level**							
1460												
1461					**Kaplan-Meier (KM) Statistics using Normal Critical Values and other Nonparametric UCLs**							
1462					KM Mean	0.774					KM Standard Error of Mean	0.126
1463					KM SD	1.073					95% KM (BCA) UCL	0.993
1464					95% KM (t) UCL	0.983					95% KM (Percentile Bootstrap) UCL	1
1465					95% KM (z) UCL	0.98					95% KM Bootstrap t UCL	1.056
1466					90% KM Chebyshev UCL	1.15					95% KM Chebyshev UCL	1.321
1467					97.5% KM Chebyshev UCL	1.558					99% KM Chebyshev UCL	2.023
1468												
1469					**Gamma GOF Tests on Detected Observations Only**							
1470					A-D Test Statistic	1.797			**Anderson-Darling GOF Test**			
1471					5% A-D Critical Value	0.781			Detected Data Not Gamma Distributed at 5% Significance Level			
1472					K-S Test Statistic	0.139			**Kolmogorov-Smirnov GOF**			
1473					5% K-S Critical Value	0.109			Detected Data Not Gamma Distributed at 5% Significance Level			
1474					**Detected Data Not Gamma Distributed at 5% Significance Level**							
1475												
1476					**Gamma Statistics on Detected Data Only**							
1477					k hat (MLE)	0.984					k star (bias corrected MLE)	0.952
1478					Theta hat (MLE)	0.819					Theta star (bias corrected MLE)	0.847
1479					nu hat (MLE)	139.7					nu star (bias corrected)	135.1
1480					Mean (detects)	0.806						
1481												
1482					**Gamma ROS Statistics using Imputed Non-Detects**							
1483					GROS may not be used when data set has > 50% NDs with many tied observations at multiple DLs							
1484					GROS may not be used when kstar of detects is small such as <1.0, especially when the sample size is small (e.g., <15-20)							
1485					For such situations, GROS method may yield incorrect values of UCLs and BTVs							
1486					This is especially true when the sample size is small.							
1487					For gamma distributed detected data, BTVs and UCLs may be computed using gamma distribution on KM estimates							
1488					Minimum	0.01					Mean	0.773
1489					Maximum	6.9					Median	0.385
1490					SD	1.08					CV	1.397
1491					k hat (MLE)	0.841					k star (bias corrected MLE)	0.816
1492					Theta hat (MLE)	0.92					Theta star (bias corrected MLE)	0.948
1493					nu hat (MLE)	124.5					nu star (bias corrected)	120.8
1494					Adjusted Level of Significance (β)	0.0468						
1495					Approximate Chi Square Value (120.75, α)	96.38					Adjusted Chi Square Value (120.75, β)	95.94
1496					95% Gamma Approximate UCL (use when n>=50)	0.969					95% Gamma Adjusted UCL (use when n<50)	0.973
1497												

	A	B	C	D	E	F	G	H	I	J	K	L
1498	**Estimates of Gamma Parameters using KM Estimates**											
1499					Mean (KM)	0.774					SD (KM)	1.073
1500					Variance (KM)	1.15					SE of Mean (KM)	0.126
1501					k hat (KM)	0.52					k star (KM)	0.508
1502					nu hat (KM)	76.97					nu star (KM)	75.19
1503					theta hat (KM)	1.487					theta star (KM)	1.523
1504					80% gamma percentile (KM)	1.271					90% gamma percentile (KM)	2.086
1505					95% gamma percentile (KM)	2.955					99% gamma percentile (KM)	5.088
1506												
1507	**Gamma Kaplan-Meier (KM) Statistics**											
1508					Approximate Chi Square Value (75.19, α)	56.22					Adjusted Chi Square Value (75.19, β)	55.89
1509					95% Gamma Approximate KM-UCL (use when n>=50)	1.035					95% Gamma Adjusted KM-UCL (use when n<50)	1.041
1510												
1511	**Lognormal GOF Test on Detected Observations Only**											
1512					Shapiro Wilk Approximate Test Statistic	0.989	**Shapiro Wilk GOF Test**					
1513					5% Shapiro Wilk P Value	0.943	Detected Data appear Lognormal at 5% Significance Level					
1514					Lilliefors Test Statistic	0.0598	**Lilliefors GOF Test**					
1515					5% Lilliefors Critical Value	0.105	Detected Data appear Lognormal at 5% Significance Level					
1516	**Detected Data appear Lognormal at 5% Significance Level**											
1517												
1518	**Lognormal ROS Statistics Using Imputed Non-Detects**											
1519					Mean in Original Scale	0.774					Mean in Log Scale	-0.903
1520					SD in Original Scale	1.079					SD in Log Scale	1.17
1521					95% t UCL (assumes normality of ROS data)	0.984					95% Percentile Bootstrap UCL	0.991
1522					95% BCA Bootstrap UCL	1.035					95% Bootstrap t UCL	1.066
1523					95% H-UCL (Log ROS)	1.12						
1524												
1525	**Statistics using KM estimates on Logged Data and Assuming Lognormal Distribution**											
1526					KM Mean (logged)	-0.939					KM Geo Mean	0.391
1527					KM SD (logged)	1.245					95% Critical H Value (KM-Log)	2.508
1528					KM Standard Error of Mean (logged)	0.146					95% H-UCL (KM -Log)	1.222
1529					KM SD (logged)	1.245					95% Critical H Value (KM-Log)	2.508
1530					KM Standard Error of Mean (logged)	0.146						
1531												
1532	**DL/2 Statistics**											
1533		**DL/2 Normal**					**DL/2 Log-Transformed**					
1534					Mean in Original Scale	0.773					Mean in Log Scale	-0.946
1535					SD in Original Scale	1.08					SD in Log Scale	1.27
1536					95% t UCL (Assumes normality)	0.983					95% H-Stat UCL	1.268
1537	**DL/2 is not a recommended method, provided for comparisons and historical reasons**											
1538												
1539	**Nonparametric Distribution Free UCL Statistics**											
1540	**Detected Data appear Lognormal Distributed at 5% Significance Level**											
1541												
1542	**Suggested UCL to Use**											
1543					KM H-UCL	1.222						
1544												
1545	Note: Suggestions regarding the selection of a 95% UCL are provided to help the user to select the most appropriate 95% UCL.											
1546	Recommendations are based upon data size, data distribution, and skewness.											
1547	These recommendations are based upon the results of the simulation studies summarized in Singh, Maichle, and Lee (2006).											
1548	However, simulations results will not cover all Real World data sets; for additional insight the user may want to consult a statistician.											
1549												

	A	B	C	D	E	F	G	H	I	J	K	L
1550	Arsenic											
1551												
1552						General Statistics						
1553					Total Number of Observations	74				Number of Distinct Observations		48
1554					Number of Detects	71				Number of Non-Detects		3
1555					Number of Distinct Detects	46				Number of Distinct Non-Detects		2
1556					Minimum Detect	0.35				Minimum Non-Detect		0.2
1557					Maximum Detect	17				Maximum Non-Detect		0.22
1558					Variance Detects	14.71				Percent Non-Detects		4.054%
1559					Mean Detects	4.324				SD Detects		3.836
1560					Median Detects	3				CV Detects		0.887
1561					Skewness Detects	1.612				Kurtosis Detects		2.214
1562					Mean of Logged Detects	1.1				SD of Logged Detects		0.891
1563												
1564						Normal GOF Test on Detects Only						
1565					Shapiro Wilk Test Statistic	0.808				Normal GOF Test on Detected Observations Only		
1566					5% Shapiro Wilk P Value	1.305E-12				Detected Data Not Normal at 5% Significance Level		
1567					Lilliefors Test Statistic	0.17				Lilliefors GOF Test		
1568					5% Lilliefors Critical Value	0.105				Detected Data Not Normal at 5% Significance Level		
1569						Detected Data Not Normal at 5% Significance Level						
1570												
1571						Kaplan-Meier (KM) Statistics using Normal Critical Values and other Nonparametric UCLs						
1572					KM Mean	4.157				KM Standard Error of Mean		0.447
1573					KM SD	3.818				95% KM (BCA) UCL		4.916
1574					95% KM (t) UCL	4.902				95% KM (Percentile Bootstrap) UCL		4.935
1575					95% KM (z) UCL	4.892				95% KM Bootstrap t UCL		5.035
1576					90% KM Chebyshev UCL	5.498				95% KM Chebyshev UCL		6.105
1577					97.5% KM Chebyshev UCL	6.949				99% KM Chebyshev UCL		8.605
1578												
1579						Gamma GOF Tests on Detected Observations Only						
1580					A-D Test Statistic	0.661				Anderson-Darling GOF Test		
1581					5% A-D Critical Value	0.769				Detected data appear Gamma Distributed at 5% Significance Level		
1582					K-S Test Statistic	0.0924				Kolmogorov-Smirnov GOF		
1583					5% K-S Critical Value	0.108				Detected data appear Gamma Distributed at 5% Significance Level		
1584						Detected data appear Gamma Distributed at 5% Significance Level						
1585												
1586						Gamma Statistics on Detected Data Only						
1587					k hat (MLE)	1.517				k star (bias corrected MLE)		1.462
1588					Theta hat (MLE)	2.851				Theta star (bias corrected MLE)		2.958
1589					nu hat (MLE)	215.4				nu star (bias corrected)		207.6
1590					Mean (detects)	4.324						
1591												
1592						Gamma ROS Statistics using Imputed Non-Detects						
1593						GROS may not be used when data set has > 50% NDs with many tied observations at multiple DLs						
1594						GROS may not be used when kstar of detects is small such as <1.0, especially when the sample size is small (e.g., <15-20)						
1595						For such situations, GROS method may yield incorrect values of UCLs and BTVs						
1596						This is especially true when the sample size is small.						
1597						For gamma distributed detected data, BTVs and UCLs may be computed using gamma distribution on KM estimates						
1598					Minimum	0.01				Mean		4.149
1599					Maximum	17				Median		2.85
1600					SD	3.853				CV		0.929
1601					k hat (MLE)	1.037				k star (bias corrected MLE)		1.004

	A	B	C	D	E	F	G	H	I	J	K	L
1602					Theta hat (MLE)	4.003					Theta star (bias corrected MLE)	4.135
1603					nu hat (MLE)	153.4					nu star (bias corrected)	148.5
1604					Adjusted Level of Significance (β)	0.0468						
1605					Approximate Chi Square Value (148.52, α)	121.4					Adjusted Chi Square Value (148.52, β)	120.9
1606					95% Gamma Approximate UCL (use when n>=50)	5.078					95% Gamma Adjusted UCL (use when n<50)	5.098
1607												
1608					**Estimates of Gamma Parameters using KM Estimates**							
1609					Mean (KM)	4.157					SD (KM)	3.818
1610					Variance (KM)	14.58					SE of Mean (KM)	0.447
1611					k hat (KM)	1.185					k star (KM)	1.146
1612					nu hat (KM)	175.4					nu star (KM)	169.6
1613					theta hat (KM)	3.507					theta star (KM)	3.627
1614					80% gamma percentile (KM)	6.611					90% gamma percentile (KM)	9.255
1615					95% gamma percentile (KM)	11.87					99% gamma percentile (KM)	17.89
1616												
1617					**Gamma Kaplan-Meier (KM) Statistics**							
1618					Approximate Chi Square Value (169.63, α)	140.5					Adjusted Chi Square Value (169.63, β)	140
1619					95% Gamma Approximate KM-UCL (use when n>=50)	5.018					95% Gamma Adjusted KM-UCL (use when n<50)	5.037
1620												
1621					**Lognormal GOF Test on Detected Observations Only**							
1622					Shapiro Wilk Approximate Test Statistic	0.974					**Shapiro Wilk GOF Test**	
1623					5% Shapiro Wilk P Value	0.362					Detected Data appear Lognormal at 5% Significance Level	
1624					Lilliefors Test Statistic	0.0728					**Lilliefors GOF Test**	
1625					5% Lilliefors Critical Value	0.105					Detected Data appear Lognormal at 5% Significance Level	
1626					**Detected Data appear Lognormal at 5% Significance Level**							
1627												
1628					**Lognormal ROS Statistics Using Imputed Non-Detects**							
1629					Mean in Original Scale	4.163					Mean in Log Scale	1.013
1630					SD in Original Scale	3.838					SD in Log Scale	0.971
1631					95% t UCL (assumes normality of ROS data)	4.906					95% Percentile Bootstrap UCL	4.939
1632					95% BCA Bootstrap UCL	4.987					95% Bootstrap t UCL	5.037
1633					95% H-UCL (Log ROS)	5.682						
1634												
1635					**Statistics using KM estimates on Logged Data and Assuming Lognormal Distribution**							
1636					KM Mean (logged)	0.99					KM Geo Mean	2.691
1637					KM SD (logged)	1.018					95% Critical H Value (KM-Log)	2.274
1638					KM Standard Error of Mean (logged)	0.119					95% H-UCL (KM -Log)	5.922
1639					KM SD (logged)	1.018					95% Critical H Value (KM-Log)	2.274
1640					KM Standard Error of Mean (logged)	0.119						
1641												
1642					**DL/2 Statistics**							
1643					**DL/2 Normal**						**DL/2 Log-Transformed**	
1644					Mean in Original Scale	4.153					Mean in Log Scale	0.964
1645					SD in Original Scale	3.848					SD in Log Scale	1.096
1646					95% t UCL (Assumes normality)	4.898					95% H-Stat UCL	6.462
1647					**DL/2 is not a recommended method, provided for comparisons and historical reasons**							
1648												
1649					**Nonparametric Distribution Free UCL Statistics**							
1650					**Detected Data appear Gamma Distributed at 5% Significance Level**							
1651												

	A	B	C	D	E	F	G	H	I	J	K	L
1652						**Suggested UCL to Use**						
1653					95% KM Approximate Gamma UCL	5.018				95% GROS Approximate Gamma UCL		5.078
1654												
1655					Note: Suggestions regarding the selection of a 95% UCL are provided to help the user to select the most appropriate 95% UCL.							
1656					Recommendations are based upon data size, data distribution, and skewness.							
1657					These recommendations are based upon the results of the simulation studies summarized in Singh, Maichle, and Lee (2006).							
1658					However, simulations results will not cover all Real World data sets; for additional insight the user may want to consult a statistician.							
1659												
1660												
1661	**Cadmium**											
1662												
1663						**General Statistics**						
1664					Total Number of Observations	74				Number of Distinct Observations		54
1665										Number of Missing Observations		0
1666					Minimum	0.13				Mean		1.809
1667					Maximum	8				Median		0.985
1668					SD	1.931				Std. Error of Mean		0.225
1669					Coefficient of Variation	1.068				Skewness		1.894
1670												
1671						**Normal GOF Test**						
1672					Shapiro Wilk Test Statistic	0.719				**Shapiro Wilk GOF Test**		
1673					5% Shapiro Wilk P Value	0				Data Not Normal at 5% Significance Level		
1674					Lilliefors Test Statistic	0.239				**Lilliefors GOF Test**		
1675					5% Lilliefors Critical Value	0.103				Data Not Normal at 5% Significance Level		
1676						**Data Not Normal at 5% Significance Level**						
1677												
1678						**Assuming Normal Distribution**						
1679					**95% Normal UCL**					**95% UCLs (Adjusted for Skewness)**		
1680					95% Student's-t UCL	2.183				95% Adjusted-CLT UCL (Chen-1995)		2.231
1681										95% Modified-t UCL (Johnson-1978)		2.191
1682												
1683						**Gamma GOF Test**						
1684					A-D Test Statistic	2.417				**Anderson-Darling Gamma GOF Test**		
1685					5% A-D Critical Value	0.775				Data Not Gamma Distributed at 5% Significance Level		
1686					K-S Test Statistic	0.179				**Kolmogorov-Smirnov Gamma GOF Test**		
1687					5% K-S Critical Value	0.106				Data Not Gamma Distributed at 5% Significance Level		
1688						**Data Not Gamma Distributed at 5% Significance Level**						
1689												
1690						**Gamma Statistics**						
1691					k hat (MLE)	1.282				k star (bias corrected MLE)		1.239
1692					Theta hat (MLE)	1.411				Theta star (bias corrected MLE)		1.46
1693					nu hat (MLE)	189.8				nu star (bias corrected)		183.4
1694					MLE Mean (bias corrected)	1.809				MLE Sd (bias corrected)		1.625
1695										Approximate Chi Square Value (0.05)		153.1
1696					Adjusted Level of Significance	0.0468				Adjusted Chi Square Value		152.6
1697												
1698						**Assuming Gamma Distribution**						
1699					95% Approximate Gamma UCL (use when n>=50))	2.168				95% Adjusted Gamma UCL (use when n<50)		2.175
1700												
1701						**Lognormal GOF Test**						
1702					Shapiro Wilk Test Statistic	0.963				**Shapiro Wilk Lognormal GOF Test**		
1703					5% Shapiro Wilk P Value	0.0885				Data appear Lognormal at 5% Significance Level		

	A	B	C	D	E	F	G	H	I	J	K	L
1704					Lilliefors Test Statistic	0.12	**Lilliefors Lognormal GOF Test**					
1705					5% Lilliefors Critical Value	0.103	Data Not Lognormal at 5% Significance Level					
1706	**Data appear Approximate Lognormal at 5% Significance Level**											
1707												
1708	**Lognormal Statistics**											
1709					Minimum of Logged Data	-2.04				Mean of logged Data		0.155
1710					Maximum of Logged Data	2.079				SD of logged Data		0.922
1711												
1712	**Assuming Lognormal Distribution**											
1713					95% H-UCL	2.259				90% Chebyshev (MVUE) UCL		2.435
1714					95% Chebyshev (MVUE) UCL	2.735				97.5% Chebyshev (MVUE) UCL		3.153
1715					99% Chebyshev (MVUE) UCL	3.972						
1716												
1717	**Nonparametric Distribution Free UCL Statistics**											
1718	**Data appear to follow a Discernible Distribution at 5% Significance Level**											
1719												
1720	**Nonparametric Distribution Free UCLs**											
1721					95% CLT UCL	2.179				95% Jackknife UCL		2.183
1722					95% Standard Bootstrap UCL	2.184				95% Bootstrap-t UCL		2.249
1723					95% Hall's Bootstrap UCL	2.223				95% Percentile Bootstrap UCL		2.192
1724					95% BCA Bootstrap UCL	2.215						
1725					90% Chebyshev(Mean, Sd) UCL	2.483				95% Chebyshev(Mean, Sd) UCL		2.788
1726					97.5% Chebyshev(Mean, Sd) UCL	3.211				99% Chebyshev(Mean, Sd) UCL		4.043
1727												
1728	**Suggested UCL to Use**											
1729					95% H-UCL	2.259						
1730												
1731	Note: Suggestions regarding the selection of a 95% UCL are provided to help the user to select the most appropriate 95% UCL.											
1732	Recommendations are based upon data size, data distribution, and skewness.											
1733	These recommendations are based upon the results of the simulation studies summarized in Singh, Maichle, and Lee (2006).											
1734	However, simulations results will not cover all Real World data sets; for additional insight the user may want to consult a statistician.											
1735												
1736	**ProUCL computes and outputs H-statistic based UCLs for historical reasons only.**											
1737	**H-statistic often results in unstable (both high and low) values of UCL95 as shown in examples in the Technical Guide.**											
1738	**It is therefore recommended to avoid the use of H-statistic based 95% UCLs.**											
1739	**Use of nonparametric methods are preferred to compute UCL95 for skewed data sets which do not follow a gamma distribution.**											
1740												
1741												
1742	**Cobalt**											
1743												
1744	**General Statistics**											
1745					Total Number of Observations	74				Number of Distinct Observations		50
1746										Number of Missing Observations		0
1747					Minimum	0.53				Mean		8.293
1748					Maximum	100				Median		3.85
1749					SD	14.26				Std. Error of Mean		1.658
1750					Coefficient of Variation	1.719				Skewness		4.647
1751												
1752	**Normal GOF Test**											
1753					Shapiro Wilk Test Statistic	0.479	**Shapiro Wilk GOF Test**					
1754					5% Shapiro Wilk P Value	0	Data Not Normal at 5% Significance Level					

	A	B	C	D	E	F	G	H	I	J	K	L
1755					Lilliefors Test Statistic	0.303	**Lilliefors GOF Test**					
1756					5% Lilliefors Critical Value	0.103	Data Not Normal at 5% Significance Level					
1757	**Data Not Normal at 5% Significance Level**											
1758												
1759	**Assuming Normal Distribution**											
1760	**95% Normal UCL**						**95% UCLs (Adjusted for Skewness)**					
1761					95% Student's-t UCL	11.05				95% Adjusted-CLT UCL (Chen-1995)		11.98
1762										95% Modified-t UCL (Johnson-1978)		11.2
1763												
1764	**Gamma GOF Test**											
1765					A-D Test Statistic	3.659	**Anderson-Darling Gamma GOF Test**					
1766					5% A-D Critical Value	0.781	Data Not Gamma Distributed at 5% Significance Level					
1767					K-S Test Statistic	0.176	**Kolmogorov-Smirnov Gamma GOF Test**					
1768					5% K-S Critical Value	0.107	Data Not Gamma Distributed at 5% Significance Level					
1769	**Data Not Gamma Distributed at 5% Significance Level**											
1770												
1771	**Gamma Statistics**											
1772					k hat (MLE)	0.993				k star (bias corrected MLE)		0.962
1773					Theta hat (MLE)	8.349				Theta star (bias corrected MLE)		8.621
1774					nu hat (MLE)	147				nu star (bias corrected)		142.4
1775					MLE Mean (bias corrected)	8.293				MLE Sd (bias corrected)		8.455
1776										Approximate Chi Square Value (0.05)		115.8
1777					Adjusted Level of Significance	0.0468				Adjusted Chi Square Value		115.3
1778												
1779	**Assuming Gamma Distribution**											
1780					95% Approximate Gamma UCL (use when n>=50))	10.2				95% Adjusted Gamma UCL (use when n<50)		10.24
1781												
1782	**Lognormal GOF Test**											
1783					Shapiro Wilk Test Statistic	0.961	**Shapiro Wilk Lognormal GOF Test**					
1784					5% Shapiro Wilk P Value	0.0678	Data appear Lognormal at 5% Significance Level					
1785					Lilliefors Test Statistic	0.118	**Lilliefors Lognormal GOF Test**					
1786					5% Lilliefors Critical Value	0.103	Data Not Lognormal at 5% Significance Level					
1787	**Data appear Approximate Lognormal at 5% Significance Level**											
1788												
1789	**Lognormal Statistics**											
1790					Minimum of Logged Data	-0.635				Mean of logged Data		1.534
1791					Maximum of Logged Data	4.605				SD of logged Data		0.963
1792												
1793	**Assuming Lognormal Distribution**											
1794					95% H-UCL	9.473				90% Chebyshev (MVUE) UCL		10.2
1795					95% Chebyshev (MVUE) UCL	11.51				97.5% Chebyshev (MVUE) UCL		13.33
1796					99% Chebyshev (MVUE) UCL	16.91						
1797												
1798	**Nonparametric Distribution Free UCL Statistics**											
1799	**Data appear to follow a Discernible Distribution at 5% Significance Level**											
1800												
1801	**Nonparametric Distribution Free UCLs**											
1802					95% CLT UCL	11.02				95% Jackknife UCL		11.05
1803					95% Standard Bootstrap UCL	10.93				95% Bootstrap-t UCL		13.16
1804					95% Hall's Bootstrap UCL	22.21				95% Percentile Bootstrap UCL		11.2
1805					95% BCA Bootstrap UCL	12.2						

	A	B	C	D	E	F	G	H	I	J	K	L
1806					90% Chebyshev(Mean, Sd) UCL	13.27				95% Chebyshev(Mean, Sd) UCL		15.52
1807					97.5% Chebyshev(Mean, Sd) UCL	18.64				99% Chebyshev(Mean, Sd) UCL		24.79
1808												
1809						**Suggested UCL to Use**						
1810					95% H-UCL	9.473						
1811												
1812					Note: Suggestions regarding the selection of a 95% UCL are provided to help the user to select the most appropriate 95% UCL.							
1813					Recommendations are based upon data size, data distribution, and skewness.							
1814					These recommendations are based upon the results of the simulation studies summarized in Singh, Maichle, and Lee (2006).							
1815					However, simulations results will not cover all Real World data sets; for additional insight the user may want to consult a statistician.							
1816												
1817					**ProUCL computes and outputs H-statistic based UCLs for historical reasons only.**							
1818					**H-statistic often results in unstable (both high and low) values of UCL95 as shown in examples in the Technical Guide.**							
1819					**It is therefore recommended to avoid the use of H-statistic based 95% UCLs.**							
1820					**Use of nonparametric methods are preferred to compute UCL95 for skewed data sets which do not follow a gamma distribution.**							
1821												
1822												
1823	**Copper**											
1824												
1825						**General Statistics**						
1826					Total Number of Observations	74				Number of Distinct Observations		44
1827										Number of Missing Observations		0
1828					Minimum	2.4				Mean		50.95
1829					Maximum	490				Median		32.5
1830					SD	64.39				Std. Error of Mean		7.485
1831					Coefficient of Variation	1.264				Skewness		4.755
1832												
1833						**Normal GOF Test**						
1834					Shapiro Wilk Test Statistic	0.569				**Shapiro Wilk GOF Test**		
1835					5% Shapiro Wilk P Value	0				Data Not Normal at 5% Significance Level		
1836					Lilliefors Test Statistic	0.245				**Lilliefors GOF Test**		
1837					5% Lilliefors Critical Value	0.103				Data Not Normal at 5% Significance Level		
1838						**Data Not Normal at 5% Significance Level**						
1839												
1840						**Assuming Normal Distribution**						
1841					**95% Normal UCL**					**95% UCLs (Adjusted for Skewness)**		
1842					95% Student's-t UCL	63.42				95% Adjusted-CLT UCL (Chen-1995)		67.68
1843										95% Modified-t UCL (Johnson-1978)		64.11
1844												
1845						**Gamma GOF Test**						
1846					A-D Test Statistic	2.178				**Anderson-Darling Gamma GOF Test**		
1847					5% A-D Critical Value	0.771				Data Not Gamma Distributed at 5% Significance Level		
1848					K-S Test Statistic	0.14				**Kolmogorov-Smirnov Gamma GOF Test**		
1849					5% K-S Critical Value	0.106				Data Not Gamma Distributed at 5% Significance Level		
1850						**Data Not Gamma Distributed at 5% Significance Level**						
1851												
1852						**Gamma Statistics**						
1853					k hat (MLE)	1.426				k star (bias corrected MLE)		1.378
1854					Theta hat (MLE)	35.72				Theta star (bias corrected MLE)		36.99
1855					nu hat (MLE)	211.1				nu star (bias corrected)		203.9

	A	B	C	D	E	F	G	H	I	J	K	L
1856					MLE Mean (bias corrected)	50.95					MLE Sd (bias corrected)	43.41
1857											Approximate Chi Square Value (0.05)	171.8
1858					Adjusted Level of Significance	0.0468					Adjusted Chi Square Value	171.3
1859												
1860					Assuming Gamma Distribution							
1861				95% Approximate Gamma UCL (use when n>=50))		60.45					95% Adjusted Gamma UCL (use when n<50)	60.66
1862												
1863					Lognormal GOF Test							
1864					Shapiro Wilk Test Statistic	0.981			Shapiro Wilk Lognormal GOF Test			
1865					5% Shapiro Wilk P Value	0.643			Data appear Lognormal at 5% Significance Level			
1866					Lilliefors Test Statistic	0.0867			Lilliefors Lognormal GOF Test			
1867					5% Lilliefors Critical Value	0.103			Data appear Lognormal at 5% Significance Level			
1868					Data appear Lognormal at 5% Significance Level							
1869												
1870					Lognormal Statistics							
1871					Minimum of Logged Data	0.875			Mean of logged Data			3.541
1872					Maximum of Logged Data	6.194			SD of logged Data			0.844
1873												
1874					Assuming Lognormal Distribution							
1875					95% H-UCL	60.69			90% Chebyshev (MVUE) UCL			65.4
1876					95% Chebyshev (MVUE) UCL	72.85			97.5% Chebyshev (MVUE) UCL			83.19
1877					99% Chebyshev (MVUE) UCL	103.5						
1878												
1879					Nonparametric Distribution Free UCL Statistics							
1880					Data appear to follow a Discernible Distribution at 5% Significance Level							
1881												
1882					Nonparametric Distribution Free UCLs							
1883					95% CLT UCL	63.26			95% Jackknife UCL			63.42
1884					95% Standard Bootstrap UCL	63.18			95% Bootstrap-t UCL			72.13
1885					95% Hall's Bootstrap UCL	116.7			95% Percentile Bootstrap UCL			64.38
1886					95% BCA Bootstrap UCL	69.99						
1887					90% Chebyshev(Mean, Sd) UCL	73.41			95% Chebyshev(Mean, Sd) UCL			83.58
1888					97.5% Chebyshev(Mean, Sd) UCL	97.69			99% Chebyshev(Mean, Sd) UCL			125.4
1889												
1890					Suggested UCL to Use							
1891					95% H-UCL	60.69						
1892												
1893					Note: Suggestions regarding the selection of a 95% UCL are provided to help the user to select the most appropriate 95% UCL.							
1894					Recommendations are based upon data size, data distribution, and skewness.							
1895					These recommendations are based upon the results of the simulation studies summarized in Singh, Maichle, and Lee (2006).							
1896					However, simulations results will not cover all Real World data sets; for additional insight the user may want to consult a statistician.							
1897												
1898					ProUCL computes and outputs H-statistic based UCLs for historical reasons only.							
1899					H-statistic often results in unstable (both high and low) values of UCL95 as shown in examples in the Technical Guide.							
1900					It is therefore recommended to avoid the use of H-statistic based 95% UCLs.							
1901					Use of nonparametric methods are preferred to compute UCL95 for skewed data sets which do not follow a gamma distribution.							
1902												
1903												

	A	B	C	D	E	F	G	H	I	J	K	L
1904	Iron											
1905												
1906					General Statistics							
1907					Total Number of Observations	74				Number of Distinct Observations		42
1908										Number of Missing Observations		0
1909					Minimum	8200				Mean		99030
1910					Maximum	430000				Median		87000
1911					SD	73875				Std. Error of Mean		8588
1912					Coefficient of Variation	0.746				Skewness		1.612
1913												
1914					Normal GOF Test							
1915					Shapiro Wilk Test Statistic	0.876			Shapiro Wilk GOF Test			
1916					5% Shapiro Wilk P Value	3.2751E-8			Data Not Normal at 5% Significance Level			
1917					Lilliefors Test Statistic	0.123			Lilliefors GOF Test			
1918					5% Lilliefors Critical Value	0.103			Data Not Normal at 5% Significance Level			
1919					Data Not Normal at 5% Significance Level							
1920												
1921					Assuming Normal Distribution							
1922				95% Normal UCL					95% UCLs (Adjusted for Skewness)			
1923					95% Student's-t UCL	113337				95% Adjusted-CLT UCL (Chen-1995)		114875
1924										95% Modified-t UCL (Johnson-1978)		113605
1925												
1926					Gamma GOF Test							
1927					A-D Test Statistic	0.554			Anderson-Darling Gamma GOF Test			
1928					5% A-D Critical Value	0.764			Detected data appear Gamma Distributed at 5% Significance Level			
1929					K-S Test Statistic	0.0771			Kolmogorov-Smirnov Gamma GOF Test			
1930					5% K-S Critical Value	0.105			Detected data appear Gamma Distributed at 5% Significance Level			
1931					Detected data appear Gamma Distributed at 5% Significance Level							
1932												
1933					Gamma Statistics							
1934					k hat (MLE)	1.909				k star (bias corrected MLE)		1.841
1935					Theta hat (MLE)	51870				Theta star (bias corrected MLE)		53797
1936					nu hat (MLE)	282.6				nu star (bias corrected)		272.4
1937					MLE Mean (bias corrected)	99030				MLE Sd (bias corrected)		72989
1938										Approximate Chi Square Value (0.05)		235.2
1939					Adjusted Level of Significance	0.0468				Adjusted Chi Square Value		234.5
1940												
1941					Assuming Gamma Distribution							
1942					95% Approximate Gamma UCL (use when n>=50)	114702				95% Adjusted Gamma UCL (use when n<50)		115036
1943												
1944					Lognormal GOF Test							
1945					Shapiro Wilk Test Statistic	0.966			Shapiro Wilk Lognormal GOF Test			
1946					5% Shapiro Wilk P Value	0.139			Data appear Lognormal at 5% Significance Level			
1947					Lilliefors Test Statistic	0.0913			Lilliefors Lognormal GOF Test			
1948					5% Lilliefors Critical Value	0.103			Data appear Lognormal at 5% Significance Level			
1949					Data appear Lognormal at 5% Significance Level							
1950												
1951					Lognormal Statistics							
1952					Minimum of Logged Data	9.012				Mean of logged Data		11.22
1953					Maximum of Logged Data	12.97				SD of logged Data		0.804
1954												

	A	B	C	D	E	F	G	H	I	J	K	L
1955	Assuming Lognormal Distribution											
1956					95% H-UCL	125162				90% Chebyshev (MVUE) UCL		134776
1957					95% Chebyshev (MVUE) UCL	149459				97.5% Chebyshev (MVUE) UCL		169840
1958					99% Chebyshev (MVUE) UCL	209873						
1959												
1960	Nonparametric Distribution Free UCL Statistics											
1961	Data appear to follow a Discernible Distribution at 5% Significance Level											
1962												
1963	Nonparametric Distribution Free UCLs											
1964					95% CLT UCL	113155				95% Jackknife UCL		113337
1965					95% Standard Bootstrap UCL	112882				95% Bootstrap-t UCL		115276
1966					95% Hall's Bootstrap UCL	116531				95% Percentile Bootstrap UCL		112662
1967					95% BCA Bootstrap UCL	114100						
1968					90% Chebyshev(Mean, Sd) UCL	124793				95% Chebyshev(Mean, Sd) UCL		136463
1969					97.5% Chebyshev(Mean, Sd) UCL	152661				99% Chebyshev(Mean, Sd) UCL		184478
1970												
1971	Suggested UCL to Use											
1972					95% Approximate Gamma UCL	114702						
1973												
1974	Note: Suggestions regarding the selection of a 95% UCL are provided to help the user to select the most appropriate 95% UCL.											
1975	Recommendations are based upon data size, data distribution, and skewness.											
1976	These recommendations are based upon the results of the simulation studies summarized in Singh, Maichle, and Lee (2006).											
1977	However, simulations results will not cover all Real World data sets; for additional insight the user may want to consult a statistician.											
1978												
1979												
1980	Lead											
1981												
1982	General Statistics											
1983					Total Number of Observations	74				Number of Distinct Observations		56
1984										Number of Missing Observations		0
1985					Minimum	0.35				Mean		98.03
1986					Maximum	830				Median		31
1987					SD	162.6				Std. Error of Mean		18.9
1988					Coefficient of Variation	1.658				Skewness		2.822
1989												
1990	Normal GOF Test											
1991					Shapiro Wilk Test Statistic	0.595				Shapiro Wilk GOF Test		
1992					5% Shapiro Wilk P Value	0				Data Not Normal at 5% Significance Level		
1993					Lilliefors Test Statistic	0.292				Lilliefors GOF Test		
1994					5% Lilliefors Critical Value	0.103				Data Not Normal at 5% Significance Level		
1995	Data Not Normal at 5% Significance Level											
1996												
1997	Assuming Normal Distribution											
1998			95% Normal UCL							95% UCLs (Adjusted for Skewness)		
1999					95% Student's-t UCL	129.5				95% Adjusted-CLT UCL (Chen-1995)		135.7
2000										95% Modified-t UCL (Johnson-1978)		130.5
2001												
2002	Gamma GOF Test											
2003					A-D Test Statistic	2.712				Anderson-Darling Gamma GOF Test		
2004					5% A-D Critical Value	0.803				Data Not Gamma Distributed at 5% Significance Level		
2005					K-S Test Statistic	0.146				Kolmogorov-Smirnov Gamma GOF Test		

	A	B	C	D	E	F	G	H	I	J	K	L
2006					5% K-S Critical Value	0.109	Data Not Gamma Distributed at 5% Significance Level					
2007	**Data Not Gamma Distributed at 5% Significance Level**											
2008												
2009	**Gamma Statistics**											
2010					k hat (MLE)	0.649				k star (bias corrected MLE)		0.632
2011					Theta hat (MLE)	151.1				Theta star (bias corrected MLE)		155.2
2012					nu hat (MLE)	96.04				nu star (bias corrected)		93.48
2013					MLE Mean (bias corrected)	98.03				MLE Sd (bias corrected)		123.3
2014										Approximate Chi Square Value (0.05)		72.18
2015					Adjusted Level of Significance	0.0468				Adjusted Chi Square Value		71.81
2016												
2017	**Assuming Gamma Distribution**											
2018					95% Approximate Gamma UCL (use when n>=50))	126.9				95% Adjusted Gamma UCL (use when n<50)		127.6
2019												
2020	**Lognormal GOF Test**											
2021					Shapiro Wilk Test Statistic	0.976	**Shapiro Wilk Lognormal GOF Test**					
2022					5% Shapiro Wilk P Value	0.448	Data appear Lognormal at 5% Significance Level					
2023					Lilliefors Test Statistic	0.0742	**Lilliefors Lognormal GOF Test**					
2024					5% Lilliefors Critical Value	0.103	Data appear Lognormal at 5% Significance Level					
2025	**Data appear Lognormal at 5% Significance Level**											
2026												
2027	**Lognormal Statistics**											
2028					Minimum of Logged Data	-1.05				Mean of logged Data		3.644
2029					Maximum of Logged Data	6.721				SD of logged Data		1.405
2030												
2031	**Assuming Lognormal Distribution**											
2032					95% H-UCL	159.8				90% Chebyshev (MVUE) UCL		165.4
2033					95% Chebyshev (MVUE) UCL	194.9				97.5% Chebyshev (MVUE) UCL		236
2034					99% Chebyshev (MVUE) UCL	316.6						
2035												
2036	**Nonparametric Distribution Free UCL Statistics**											
2037	**Data appear to follow a Discernible Distribution at 5% Significance Level**											
2038												
2039	**Nonparametric Distribution Free UCLs**											
2040					95% CLT UCL	129.1				95% Jackknife UCL		129.5
2041					95% Standard Bootstrap UCL	130.1				95% Bootstrap-t UCL		140.5
2042					95% Hall's Bootstrap UCL	136.2				95% Percentile Bootstrap UCL		131.2
2043					95% BCA Bootstrap UCL	135.7						
2044					90% Chebyshev(Mean, Sd) UCL	154.7				95% Chebyshev(Mean, Sd) UCL		180.4
2045					97.5% Chebyshev(Mean, Sd) UCL	216				99% Chebyshev(Mean, Sd) UCL		286
2046												
2047	**Suggested UCL to Use**											
2048					95% H-UCL	159.8						
2049												
2050	Note: Suggestions regarding the selection of a 95% UCL are provided to help the user to select the most appropriate 95% UCL.											
2051	Recommendations are based upon data size, data distribution, and skewness.											
2052	These recommendations are based upon the results of the simulation studies summarized in Singh, Maichle, and Lee (2006).											
2053	However, simulations results will not cover all Real World data sets; for additional insight the user may want to consult a statistician.											
2054												
2055	**ProUCL computes and outputs H-statistic based UCLs for historical reasons only.**											
2056	**H-statistic often results in unstable (both high and low) values of UCL95 as shown in examples in the Technical Guide.**											

	A	B	C	D	E	F	G	H	I	J	K	L
2057	It is therefore recommended to avoid the use of H-statistic based 95% UCLs.											
2058	Use of nonparametric methods are preferred to compute UCL95 for skewed data sets which do not follow a gamma distribution.											
2059												
2060												
2061	Manganese											
2062												
2063	General Statistics											
2064					Total Number of Observations	74	Number of Distinct Observations				51	
2065							Number of Missing Observations				0	
2066					Minimum	350	Mean				9591	
2067					Maximum	36000	Median				6950	
2068					SD	8318	Std. Error of Mean				966.9	
2069					Coefficient of Variation	0.867	Skewness				1.218	
2070												
2071	Normal GOF Test											
2072					Shapiro Wilk Test Statistic	0.852	Shapiro Wilk GOF Test					
2073					5% Shapiro Wilk P Value	4.848E-10	Data Not Normal at 5% Significance Level					
2074					Lilliefors Test Statistic	0.186	Lilliefors GOF Test					
2075					5% Lilliefors Critical Value	0.103	Data Not Normal at 5% Significance Level					
2076	Data Not Normal at 5% Significance Level											
2077												
2078	Assuming Normal Distribution											
2079	95% Normal UCL						95% UCLs (Adjusted for Skewness)					
2080					95% Student's-t UCL	11202	95% Adjusted-CLT UCL (Chen-1995)				11328	
2081							95% Modified-t UCL (Johnson-1978)				11225	
2082												
2083	Gamma GOF Test											
2084					A-D Test Statistic	0.505	Anderson-Darling Gamma GOF Test					
2085					5% A-D Critical Value	0.773	Detected data appear Gamma Distributed at 5% Significance Level					
2086					K-S Test Statistic	0.0719	Kolmogorov-Smirnov Gamma GOF Test					
2087					5% K-S Critical Value	0.106	Detected data appear Gamma Distributed at 5% Significance Level					
2088	Detected data appear Gamma Distributed at 5% Significance Level											
2089												
2090	Gamma Statistics											
2091					k hat (MLE)	1.369	k star (bias corrected MLE)				1.322	
2092					Theta hat (MLE)	7007	Theta star (bias corrected MLE)				7254	
2093					nu hat (MLE)	202.6	nu star (bias corrected)				195.7	
2094					MLE Mean (bias corrected)	9591	MLE Sd (bias corrected)				8341	
2095							Approximate Chi Square Value (0.05)				164.3	
2096					Adjusted Level of Significance	0.0468	Adjusted Chi Square Value				163.8	
2097												
2098	Assuming Gamma Distribution											
2099					95% Approximate Gamma UCL (use when n>=50)	11422	95% Adjusted Gamma UCL (use when n<50)				11462	
2100												
2101	Lognormal GOF Test											
2102					Shapiro Wilk Test Statistic	0.967	Shapiro Wilk Lognormal GOF Test					
2103					5% Shapiro Wilk P Value	0.157	Data appear Lognormal at 5% Significance Level					
2104					Lilliefors Test Statistic	0.0679	Lilliefors Lognormal GOF Test					
2105					5% Lilliefors Critical Value	0.103	Data appear Lognormal at 5% Significance Level					
2106	Data appear Lognormal at 5% Significance Level											
2107												

	A	B	C	D	E	F	G	H	I	J	K	L
2108	**Lognormal Statistics**											
2109					Minimum of Logged Data	5.858				Mean of logged Data		8.761
2110					Maximum of Logged Data	10.49				SD of logged Data		0.985
2111												
2112	**Assuming Lognormal Distribution**											
2113					95% H-UCL	13422				90% Chebyshev (MVUE) UCL		14449
2114					95% Chebyshev (MVUE) UCL	16344				97.5% Chebyshev (MVUE) UCL		18974
2115					99% Chebyshev (MVUE) UCL	24140						
2116												
2117	**Nonparametric Distribution Free UCL Statistics**											
2118	**Data appear to follow a Discernible Distribution at 5% Significance Level**											
2119												
2120	**Nonparametric Distribution Free UCLs**											
2121					95% CLT UCL	11182				95% Jackknife UCL		11202
2122					95% Standard Bootstrap UCL	11190				95% Bootstrap-t UCL		11320
2123					95% Hall's Bootstrap UCL	11370				95% Percentile Bootstrap UCL		11141
2124					95% BCA Bootstrap UCL	11278						
2125					90% Chebyshev(Mean, Sd) UCL	12492				95% Chebyshev(Mean, Sd) UCL		13806
2126					97.5% Chebyshev(Mean, Sd) UCL	15630				99% Chebyshev(Mean, Sd) UCL		19212
2127												
2128	**Suggested UCL to Use**											
2129					95% Approximate Gamma UCL	11422						
2130												
2131	Note: Suggestions regarding the selection of a 95% UCL are provided to help the user to select the most appropriate 95% UCL.											
2132	Recommendations are based upon data size, data distribution, and skewness.											
2133	These recommendations are based upon the results of the simulation studies summarized in Singh, Maichle, and Lee (2006).											
2134	However, simulations results will not cover all Real World data sets; for additional insight the user may want to consult a statistician.											
2135												
2136	**Mercury**											
2137												
2138	**General Statistics**											
2139					Total Number of Observations	74				Number of Distinct Observations		45
2140					Number of Detects	61				Number of Non-Detects		13
2141					Number of Distinct Detects	44				Number of Distinct Non-Detects		3
2142					Minimum Detect	0.011				Minimum Non-Detect		0.011
2143					Maximum Detect	2.8				Maximum Non-Detect		0.013
2144					Variance Detects	0.144				Percent Non-Detects		17.57%
2145					Mean Detects	0.135				SD Detects		0.379
2146					Median Detects	0.034				CV Detects		2.805
2147					Skewness Detects	6.15				Kurtosis Detects		42.2
2148					Mean of Logged Detects	-3.005				SD of Logged Detects		1.128
2149												
2150	**Normal GOF Test on Detects Only**											
2151					Shapiro Wilk Test Statistic	0.336				**Normal GOF Test on Detected Observations Only**		
2152					5% Shapiro Wilk P Value	0				Detected Data Not Normal at 5% Significance Level		
2153					Lilliefors Test Statistic	0.373				**Lilliefors GOF Test**		
2154					5% Lilliefors Critical Value	0.113				Detected Data Not Normal at 5% Significance Level		
2155	**Detected Data Not Normal at 5% Significance Level**											
2156												
2157	**Kaplan-Meier (KM) Statistics using Normal Critical Values and other Nonparametric UCLs**											
2158					KM Mean	0.113				KM Standard Error of Mean		0.0404
2159					KM SD	0.344				95% KM (BCA) UCL		0.193

	A	B	C	D	E	F	G	H	I	J	K	L
2160					95% KM (t) UCL	0.181				95% KM (Percentile Bootstrap) UCL		0.185
2161					95% KM (z) UCL	0.18				95% KM Bootstrap t UCL		0.306
2162					90% KM Chebyshev UCL	0.234				95% KM Chebyshev UCL		0.289
2163					97.5% KM Chebyshev UCL	0.365				99% KM Chebyshev UCL		0.515
2164												
2165					**Gamma GOF Tests on Detected Observations Only**							
2166					A-D Test Statistic	6.695			**Anderson-Darling GOF Test**			
2167					5% A-D Critical Value	0.805			Detected Data Not Gamma Distributed at 5% Significance Level			
2168					K-S Test Statistic	0.261			**Kolmogorov-Smirnov GOF**			
2169					5% K-S Critical Value	0.12			Detected Data Not Gamma Distributed at 5% Significance Level			
2170					**Detected Data Not Gamma Distributed at 5% Significance Level**							
2171												
2172					**Gamma Statistics on Detected Data Only**							
2173					k hat (MLE)	0.614			k star (bias corrected MLE)			0.595
2174					Theta hat (MLE)	0.22			Theta star (bias corrected MLE)			0.227
2175					nu hat (MLE)	74.92			nu star (bias corrected)			72.57
2176					Mean (detects)	0.135						
2177												
2178					**Gamma ROS Statistics using Imputed Non-Detects**							
2179					GROS may not be used when data set has > 50% NDs with many tied observations at multiple DLs							
2180					GROS may not be used when kstar of detects is small such as <1.0, especially when the sample size is small (e.g., <15-20)							
2181					For such situations, GROS method may yield incorrect values of UCLs and BTVs							
2182					This is especially true when the sample size is small.							
2183					For gamma distributed detected data, BTVs and UCLs may be computed using gamma distribution on KM estimates							
2184					Minimum	0.01			Mean			0.113
2185					Maximum	2.8			Median			0.03
2186					SD	0.347			CV			3.066
2187					k hat (MLE)	0.564			k star (bias corrected MLE)			0.55
2188					Theta hat (MLE)	0.201			Theta star (bias corrected MLE)			0.206
2189					nu hat (MLE)	83.43			nu star (bias corrected)			81.38
2190					Adjusted Level of Significance (β)	0.0468						
2191					Approximate Chi Square Value (81.38, α)	61.59			Adjusted Chi Square Value (81.38, β)			61.25
2192					95% Gamma Approximate UCL (use when n>=50)	0.149			95% Gamma Adjusted UCL (use when n<50)			0.15
2193												
2194					**Estimates of Gamma Parameters using KM Estimates**							
2195					Mean (KM)	0.113			SD (KM)			0.344
2196					Variance (KM)	0.119			SE of Mean (KM)			0.0404
2197					k hat (KM)	0.108			k star (KM)			0.113
2198					nu hat (KM)	16.01			nu star (KM)			16.69
2199					theta hat (KM)	1.047			theta star (KM)			1.004
2200					80% gamma percentile (KM)	0.0924			90% gamma percentile (KM)			0.315
2201					95% gamma percentile (KM)	0.651			99% gamma percentile (KM)			1.693
2202												
2203					**Gamma Kaplan-Meier (KM) Statistics**							
2204					Approximate Chi Square Value (16.69, α)	8.454			Adjusted Chi Square Value (16.69, β)			8.338
2205					95% Gamma Approximate KM-UCL (use when n>=50)	0.224			95% Gamma Adjusted KM-UCL (use when n<50)			0.227
2206												
2207					**Lognormal GOF Test on Detected Observations Only**							
2208					Shapiro Wilk Approximate Test Statistic	0.877			**Shapiro Wilk GOF Test**			
2209					5% Shapiro Wilk P Value	1.4781E-6			Detected Data Not Lognormal at 5% Significance Level			
2210					Lilliefors Test Statistic	0.143			**Lilliefors GOF Test**			

	A	B	C	D	E	F	G	H	I	J	K	L
2211					5% Lilliefors Critical Value	0.113	Detected Data Not Lognormal at 5% Significance Level					
2212					Detected Data Not Lognormal at 5% Significance Level							
2213												
2214					Lognormal ROS Statistics Using Imputed Non-Detects							
2215					Mean in Original Scale	0.112				Mean in Log Scale		-3.435
2216					SD in Original Scale	0.347				SD in Log Scale		1.401
2217					95% t UCL (assumes normality of ROS data)	0.179				95% Percentile Bootstrap UCL		0.184
2218					95% BCA Bootstrap UCL	0.234				95% Bootstrap t UCL		0.304
2219					95% H-UCL (Log ROS)	0.134						
2220												
2221					Statistics using KM estimates on Logged Data and Assuming Lognormal Distribution							
2222					KM Mean (logged)	-3.269				KM Geo Mean		0.038
2223					KM SD (logged)	1.166				95% Critical H Value (KM-Log)		2.425
2224					KM Standard Error of Mean (logged)	0.137				95% H-UCL (KM -Log)		0.105
2225					KM SD (logged)	1.166				95% Critical H Value (KM-Log)		2.425
2226					KM Standard Error of Mean (logged)	0.137						
2227												
2228					DL/2 Statistics							
2229					DL/2 Normal					DL/2 Log-Transformed		
2230					Mean in Original Scale	0.112				Mean in Log Scale		-3.38
2231					SD in Original Scale	0.347				SD in Log Scale		1.311
2232					95% t UCL (Assumes normality)	0.18				95% H-Stat UCL		0.119
2233					DL/2 is not a recommended method, provided for comparisons and historical reasons							
2234												
2235					Nonparametric Distribution Free UCL Statistics							
2236					Data do not follow a Discernible Distribution at 5% Significance Level							
2237												
2238					Suggested UCL to Use							
2239					95% KM (Chebyshev) UCL	0.289						
2240												
2241					Note: Suggestions regarding the selection of a 95% UCL are provided to help the user to select the most appropriate 95% UCL.							
2242					Recommendations are based upon data size, data distribution, and skewness.							
2243					These recommendations are based upon the results of the simulation studies summarized in Singh, Maichle, and Lee (2006).							
2244					However, simulations results will not cover all Real World data sets; for additional insight the user may want to consult a statistician.							
2245												
2246												
2247	Nickel											
2248												
2249					General Statistics							
2250					Total Number of Observations	74				Number of Distinct Observations		47
2251										Number of Missing Observations		0
2252					Minimum	0.87				Mean		83.27
2253					Maximum	4600				Median		15
2254					SD	532.6				Std. Error of Mean		61.91
2255					Coefficient of Variation	6.396				Skewness		8.586
2256												
2257					Normal GOF Test							
2258					Shapiro Wilk Test Statistic	0.137				Shapiro Wilk GOF Test		
2259					5% Shapiro Wilk P Value	0				Data Not Normal at 5% Significance Level		
2260					Lilliefors Test Statistic	0.483				Lilliefors GOF Test		
2261					5% Lilliefors Critical Value	0.103				Data Not Normal at 5% Significance Level		
2262					Data Not Normal at 5% Significance Level							

	A	B	C	D	E	F	G	H	I	J	K	L
2263												
2264						Assuming Normal Distribution						
2265				95% Normal UCL					95% UCLs (Adjusted for Skewness)			
2266					95% Student's-t UCL	186.4				95% Adjusted-CLT UCL (Chen-1995)		251.1
2267										95% Modified-t UCL (Johnson-1978)		196.7
2268												
2269						Gamma GOF Test						
2270					A-D Test Statistic	14.17			Anderson-Darling Gamma GOF Test			
2271					5% A-D Critical Value	0.84			Data Not Gamma Distributed at 5% Significance Level			
2272					K-S Test Statistic	0.336			Kolmogorov-Smirnov Gamma GOF Test			
2273					5% K-S Critical Value	0.111			Data Not Gamma Distributed at 5% Significance Level			
2274						Data Not Gamma Distributed at 5% Significance Level						
2275												
2276						Gamma Statistics						
2277					k hat (MLE)	0.408			k star (bias corrected MLE)			0.401
2278					Theta hat (MLE)	204			Theta star (bias corrected MLE)			207.9
2279					nu hat (MLE)	60.4			nu star (bias corrected)			59.28
2280					MLE Mean (bias corrected)	83.27			MLE Sd (bias corrected)			131.6
2281									Approximate Chi Square Value (0.05)			42.58
2282					Adjusted Level of Significance	0.0468			Adjusted Chi Square Value			42.3
2283												
2284						Assuming Gamma Distribution						
2285					95% Approximate Gamma UCL (use when n>=50))	115.9			95% Adjusted Gamma UCL (use when n<50)			116.7
2286												
2287						Lognormal GOF Test						
2288					Shapiro Wilk Test Statistic	0.882			Shapiro Wilk Lognormal GOF Test			
2289					5% Shapiro Wilk P Value	1.0370E-7			Data Not Lognormal at 5% Significance Level			
2290					Lilliefors Test Statistic	0.136			Lilliefors Lognormal GOF Test			
2291					5% Lilliefors Critical Value	0.103			Data Not Lognormal at 5% Significance Level			
2292						Data Not Lognormal at 5% Significance Level						
2293												
2294						Lognormal Statistics						
2295					Minimum of Logged Data	-0.139			Mean of logged Data			2.815
2296					Maximum of Logged Data	8.434			SD of logged Data			1.064
2297												
2298						Assuming Lognormal Distribution						
2299					95% H-UCL	39.23			90% Chebyshev (MVUE) UCL			42.11
2300					95% Chebyshev (MVUE) UCL	48.03			97.5% Chebyshev (MVUE) UCL			56.24
2301					99% Chebyshev (MVUE) UCL	72.37						
2302												
2303						Nonparametric Distribution Free UCL Statistics						
2304						Data do not follow a Discernible Distribution (0.05)						
2305												
2306						Nonparametric Distribution Free UCLs						
2307					95% CLT UCL	185.1			95% Jackknife UCL			186.4
2308					95% Standard Bootstrap UCL	184.1			95% Bootstrap-t UCL			2215
2309					95% Hall's Bootstrap UCL	800.3			95% Percentile Bootstrap UCL			206.5
2310					95% BCA Bootstrap UCL	332						
2311					90% Chebyshev(Mean, Sd) UCL	269			95% Chebyshev(Mean, Sd) UCL			353.1
2312					97.5% Chebyshev(Mean, Sd) UCL	469.9			99% Chebyshev(Mean, Sd) UCL			699.3
2313												

	A	B	C	D	E	F	G	H	I	J	K	L
2314						Suggested UCL to Use						
2315					95% Chebyshev (Mean, Sd) UCL	353.1						
2316												
2317					Note: Suggestions regarding the selection of a 95% UCL are provided to help the user to select the most appropriate 95% UCL.							
2318					Recommendations are based upon data size, data distribution, and skewness.							
2319					These recommendations are based upon the results of the simulation studies summarized in Singh, Maichle, and Lee (2006).							
2320					However, simulations results will not cover all Real World data sets; for additional insight the user may want to consult a statistician.							
2321												
2322	Thallium											
2323												
2324						General Statistics						
2325					Total Number of Observations	74			Number of Distinct Observations			58
2326					Number of Detects	65			Number of Non-Detects			9
2327					Number of Distinct Detects	55			Number of Distinct Non-Detects			5
2328					Minimum Detect	0.0023			Minimum Non-Detect			0.021
2329					Maximum Detect	0.81			Maximum Non-Detect			0.025
2330					Variance Detects	0.0221			Percent Non-Detects			12.16%
2331					Mean Detects	0.102			SD Detects			0.149
2332					Median Detects	0.05			CV Detects			1.45
2333					Skewness Detects	3.408			Kurtosis Detects			12.7
2334					Mean of Logged Detects	-2.884			SD of Logged Detects			1.101
2335												
2336						Normal GOF Test on Detects Only						
2337					Shapiro Wilk Test Statistic	0.581			Normal GOF Test on Detected Observations Only			
2338					5% Shapiro Wilk P Value	0			Detected Data Not Normal at 5% Significance Level			
2339					Lilliefors Test Statistic	0.25			Lilliefors GOF Test			
2340					5% Lilliefors Critical Value	0.11			Detected Data Not Normal at 5% Significance Level			
2341						Detected Data Not Normal at 5% Significance Level						
2342												
2343						Kaplan-Meier (KM) Statistics using Normal Critical Values and other Nonparametric UCLs						
2344					KM Mean	0.0912			KM Standard Error of Mean			0.0166
2345					KM SD	0.141			95% KM (BCA) UCL			0.125
2346					95% KM (t) UCL	0.119			95% KM (Percentile Bootstrap) UCL			0.119
2347					95% KM (z) UCL	0.118			95% KM Bootstrap t UCL			0.134
2348					90% KM Chebyshev UCL	0.141			95% KM Chebyshev UCL			0.163
2349					97.5% KM Chebyshev UCL	0.195			99% KM Chebyshev UCL			0.256
2350												
2351						Gamma GOF Tests on Detected Observations Only						
2352					A-D Test Statistic	1.812			Anderson-Darling GOF Test			
2353					5% A-D Critical Value	0.782			Detected Data Not Gamma Distributed at 5% Significance Level			
2354					K-S Test Statistic	0.143			Kolmogorov-Smirnov GOF			
2355					5% K-S Critical Value	0.114			Detected Data Not Gamma Distributed at 5% Significance Level			
2356						Detected Data Not Gamma Distributed at 5% Significance Level						
2357												
2358						Gamma Statistics on Detected Data Only						
2359					k hat (MLE)	0.957			k star (bias corrected MLE)			0.924
2360					Theta hat (MLE)	0.107			Theta star (bias corrected MLE)			0.111
2361					nu hat (MLE)	124.5			nu star (bias corrected)			120.1
2362					Mean (detects)	0.102						
2363												

	A	B	C	D	E	F	G	H	I	J	K	L
2364	**Gamma ROS Statistics using Imputed Non-Detects**											
2365	GROS may not be used when data set has > 50% NDs with many tied observations at multiple DLs											
2366	GROS may not be used when kstar of detects is small such as <1.0, especially when the sample size is small (e.g., <15-20)											
2367	For such situations, GROS method may yield incorrect values of UCLs and BTVs											
2368	This is especially true when the sample size is small.											
2369	For gamma distributed detected data, BTVs and UCLs may be computed using gamma distribution on KM estimates											
2370					Minimum	0.0023				Mean		0.0912
2371					Maximum	0.81				Median		0.0415
2372					SD	0.142				CV		1.561
2373					k hat (MLE)	0.843				k star (bias corrected MLE)		0.818
2374					Theta hat (MLE)	0.108				Theta star (bias corrected MLE)		0.111
2375					nu hat (MLE)	124.8				nu star (bias corrected)		121.1
2376					Adjusted Level of Significance (β)	0.0468						
2377					Approximate Chi Square Value (121.07, α)	96.66				Adjusted Chi Square Value (121.07, β)		96.23
2378					95% Gamma Approximate UCL (use when n>=50)	0.114				95% Gamma Adjusted UCL (use when n<50)		0.115
2379												
2380	**Estimates of Gamma Parameters using KM Estimates**											
2381					Mean (KM)	0.0912				SD (KM)		0.141
2382					Variance (KM)	0.02				SE of Mean (KM)		0.0166
2383					k hat (KM)	0.416				k star (KM)		0.409
2384					nu hat (KM)	61.63				nu star (KM)		60.46
2385					theta hat (KM)	0.219				theta star (KM)		0.223
2386					80% gamma percentile (KM)	0.148				90% gamma percentile (KM)		0.257
2387					95% gamma percentile (KM)	0.376				99% gamma percentile (KM)		0.676
2388												
2389	**Gamma Kaplan-Meier (KM) Statistics**											
2390					Approximate Chi Square Value (60.46, α)	43.58				Adjusted Chi Square Value (60.46, β)		43.3
2391					95% Gamma Approximate KM-UCL (use when n>=50)	0.127				95% Gamma Adjusted KM-UCL (use when n<50)		0.127
2392												
2393	**Lognormal GOF Test on Detected Observations Only**											
2394					Shapiro Wilk Approximate Test Statistic	0.979				**Shapiro Wilk GOF Test**		
2395					5% Shapiro Wilk P Value	0.626				Detected Data appear Lognormal at 5% Significance Level		
2396					Lilliefors Test Statistic	0.0983				**Lilliefors GOF Test**		
2397					5% Lilliefors Critical Value	0.11				Detected Data appear Lognormal at 5% Significance Level		
2398	**Detected Data appear Lognormal at 5% Significance Level**											
2399												
2400	**Lognormal ROS Statistics Using Imputed Non-Detects**											
2401					Mean in Original Scale	0.0912				Mean in Log Scale		-3.098
2402					SD in Original Scale	0.142				SD in Log Scale		1.186
2403					95% t UCL (assumes normality of ROS data)	0.119				95% Percentile Bootstrap UCL		0.121
2404					95% BCA Bootstrap UCL	0.127				95% Bootstrap t UCL		0.132
2405					95% H-UCL (Log ROS)	0.128						
2406												
2407	**Statistics using KM estimates on Logged Data and Assuming Lognormal Distribution**											
2408					KM Mean (logged)	-3.111				KM Geo Mean		0.0445
2409					KM SD (logged)	1.212				95% Critical H Value (KM-Log)		2.474
2410					KM Standard Error of Mean (logged)	0.147				95% H-UCL (KM -Log)		0.132
2411					KM SD (logged)	1.212				95% Critical H Value (KM-Log)		2.474
2412					KM Standard Error of Mean (logged)	0.147						
2413												

	A	B	C	D	E	F	G	H	I	J	K	L
2414	DL/2 Statistics											
2415	DL/2 Normal						DL/2 Log-Transformed					
2416					Mean in Original Scale	0.0914					Mean in Log Scale	-3.08
2417					SD in Original Scale	0.142					SD in Log Scale	1.159
2418					95% t UCL (Assumes normality)	0.119					95% H-Stat UCL	0.125
2419	DL/2 is not a recommended method, provided for comparisons and historical reasons											
2420												
2421	Nonparametric Distribution Free UCL Statistics											
2422	Detected Data appear Lognormal Distributed at 5% Significance Level											
2423												
2424	Suggested UCL to Use											
2425					KM H-UCL	0.132						
2426												
2427	Note: Suggestions regarding the selection of a 95% UCL are provided to help the user to select the most appropriate 95% UCL.											
2428	Recommendations are based upon data size, data distribution, and skewness.											
2429	These recommendations are based upon the results of the simulation studies summarized in Singh, Maichle, and Lee (2006).											
2430	However, simulations results will not cover all Real World data sets; for additional insight the user may want to consult a statistician.											
2431												
2432												
2433	Vanadium											
2434												
2435	General Statistics											
2436					Total Number of Observations	74					Number of Distinct Observations	54
2437											Number of Missing Observations	0
2438					Minimum	1.3					Mean	156.2
2439					Maximum	620					Median	91.5
2440					SD	160.3					Std. Error of Mean	18.63
2441					Coefficient of Variation	1.027					Skewness	1.184
2442												
2443	Normal GOF Test											
2444					Shapiro Wilk Test Statistic	0.824	Shapiro Wilk GOF Test					
2445					5% Shapiro Wilk P Value	4.277E-12	Data Not Normal at 5% Significance Level					
2446					Lilliefors Test Statistic	0.194	Lilliefors GOF Test					
2447					5% Lilliefors Critical Value	0.103	Data Not Normal at 5% Significance Level					
2448	Data Not Normal at 5% Significance Level											
2449												
2450	Assuming Normal Distribution											
2451	95% Normal UCL						95% UCLs (Adjusted for Skewness)					
2452					95% Student's-t UCL	187.2					95% Adjusted-CLT UCL (Chen-1995)	189.6
2453											95% Modified-t UCL (Johnson-1978)	187.6
2454												
2455	Gamma GOF Test											
2456					A-D Test Statistic	0.716	Anderson-Darling Gamma GOF Test					
2457					5% A-D Critical Value	0.787	Detected data appear Gamma Distributed at 5% Significance Level					
2458					K-S Test Statistic	0.103	Kolmogorov-Smirnov Gamma GOF Test					
2459					5% K-S Critical Value	0.107	Detected data appear Gamma Distributed at 5% Significance Level					
2460	Detected data appear Gamma Distributed at 5% Significance Level											
2461												
2462	Gamma Statistics											
2463					k hat (MLE)	0.87					k star (bias corrected MLE)	0.844
2464					Theta hat (MLE)	179.4					Theta star (bias corrected MLE)	185
2465					nu hat (MLE)	128.8					nu star (bias corrected)	124.9

	A	B	C	D	E	F	G	H	I	J	K	L
2466					MLE Mean (bias corrected)	156.2				MLE Sd (bias corrected)		170
2467										Approximate Chi Square Value (0.05)		100.1
2468					Adjusted Level of Significance	0.0468				Adjusted Chi Square Value		99.69
2469												
2470					**Assuming Gamma Distribution**							
2471				95% Approximate Gamma UCL (use when n>=50)		194.9				95% Adjusted Gamma UCL (use when n<50)		195.7
2472												
2473					**Lognormal GOF Test**							
2474					Shapiro Wilk Test Statistic	0.951			**Shapiro Wilk Lognormal GOF Test**			
2475					5% Shapiro Wilk P Value	0.0161			Data Not Lognormal at 5% Significance Level			
2476					Lilliefors Test Statistic	0.0872			**Lilliefors Lognormal GOF Test**			
2477					5% Lilliefors Critical Value	0.103			Data appear Lognormal at 5% Significance Level			
2478					**Data appear Approximate Lognormal at 5% Significance Level**							
2479												
2480					**Lognormal Statistics**							
2481					Minimum of Logged Data	0.262				Mean of logged Data		4.376
2482					Maximum of Logged Data	6.43				SD of logged Data		1.341
2483												
2484					**Assuming Lognormal Distribution**							
2485					95% H-UCL	294.8				90% Chebyshev (MVUE) UCL		308.2
2486					95% Chebyshev (MVUE) UCL	361.2				97.5% Chebyshev (MVUE) UCL		434.8
2487					99% Chebyshev (MVUE) UCL	579.3						
2488												
2489					**Nonparametric Distribution Free UCL Statistics**							
2490					**Data appear to follow a Discernible Distribution at 5% Significance Level**							
2491												
2492					**Nonparametric Distribution Free UCLs**							
2493					95% CLT UCL	186.8				95% Jackknife UCL		187.2
2494					95% Standard Bootstrap UCL	186.5				95% Bootstrap-t UCL		190.6
2495					95% Hall's Bootstrap UCL	188.5				95% Percentile Bootstrap UCL		186.1
2496					95% BCA Bootstrap UCL	192.1						
2497					90% Chebyshev(Mean, Sd) UCL	212.1				95% Chebyshev(Mean, Sd) UCL		237.4
2498					97.5% Chebyshev(Mean, Sd) UCL	272.5				99% Chebyshev(Mean, Sd) UCL		341.6
2499												
2500					**Suggested UCL to Use**							
2501					95% Approximate Gamma UCL	194.9						
2502												
2503					Note: Suggestions regarding the selection of a 95% UCL are provided to help the user to select the most appropriate 95% UCL.							
2504					Recommendations are based upon data size, data distribution, and skewness.							
2505					These recommendations are based upon the results of the simulation studies summarized in Singh, Maichle, and Lee (2006).							
2506					However, simulations results will not cover all Real World data sets; for additional insight the user may want to consult a statistician.							
2507												
2508												
2509	**Zinc**											
2510												
2511					**General Statistics**							
2512					Total Number of Observations	74				Number of Distinct Observations		60
2513										Number of Missing Observations		0
2514					Minimum	1.9				Mean		440.8
2515					Maximum	5100				Median		110
2516					SD	811				Std. Error of Mean		94.28
2517					Coefficient of Variation	1.84				Skewness		3.495

	A	B	C	D	E	F	G	H	I	J	K	L
2518												
2519						Normal GOF Test						
2520					Shapiro Wilk Test Statistic	0.562		Shapiro Wilk GOF Test				
2521					5% Shapiro Wilk P Value	0		Data Not Normal at 5% Significance Level				
2522					Lilliefors Test Statistic	0.301		Lilliefors GOF Test				
2523					5% Lilliefors Critical Value	0.103		Data Not Normal at 5% Significance Level				
2524					Data Not Normal at 5% Significance Level							
2525												
2526					Assuming Normal Distribution							
2527				95% Normal UCL				95% UCLs (Adjusted for Skewness)				
2528					95% Student's-t UCL	597.9			95% Adjusted-CLT UCL (Chen-1995)			636.8
2529									95% Modified-t UCL (Johnson-1978)			604.2
2530												
2531					Gamma GOF Test							
2532					A-D Test Statistic	4.626		Anderson-Darling Gamma GOF Test				
2533					5% A-D Critical Value	0.808		Data Not Gamma Distributed at 5% Significance Level				
2534					K-S Test Statistic	0.219		Kolmogorov-Smirnov Gamma GOF Test				
2535					5% K-S Critical Value	0.109		Data Not Gamma Distributed at 5% Significance Level				
2536					Data Not Gamma Distributed at 5% Significance Level							
2537												
2538					Gamma Statistics							
2539					k hat (MLE)	0.594			k star (bias corrected MLE)			0.579
2540					Theta hat (MLE)	741.5			Theta star (bias corrected MLE)			760.9
2541					nu hat (MLE)	87.98			nu star (bias corrected)			85.74
2542					MLE Mean (bias corrected)	440.8			MLE Sd (bias corrected)			579.1
2543									Approximate Chi Square Value (0.05)			65.4
2544					Adjusted Level of Significance	0.0468			Adjusted Chi Square Value			65.05
2545												
2546					Assuming Gamma Distribution							
2547					95% Approximate Gamma UCL (use when n>=50))	577.9			95% Adjusted Gamma UCL (use when n<50)			581
2548												
2549					Lognormal GOF Test							
2550					Shapiro Wilk Test Statistic	0.944		Shapiro Wilk Lognormal GOF Test				
2551					5% Shapiro Wilk P Value	0.00502		Data Not Lognormal at 5% Significance Level				
2552					Lilliefors Test Statistic	0.132		Lilliefors Lognormal GOF Test				
2553					5% Lilliefors Critical Value	0.103		Data Not Lognormal at 5% Significance Level				
2554					Data Not Lognormal at 5% Significance Level							
2555												
2556					Lognormal Statistics							
2557					Minimum of Logged Data	0.642			Mean of logged Data			5.048
2558					Maximum of Logged Data	8.537			SD of logged Data			1.409
2559												
2560					Assuming Lognormal Distribution							
2561					95% H-UCL	655.4			90% Chebyshev (MVUE) UCL			677.9
2562					95% Chebyshev (MVUE) UCL	799.4			97.5% Chebyshev (MVUE) UCL			968.1
2563					99% Chebyshev (MVUE) UCL	1299						
2564												
2565					Nonparametric Distribution Free UCL Statistics							
2566					Data do not follow a Discernible Distribution (0.05)							
2567												

	A	B	C	D	E	F	G	H	I	J	K	L
2568	**Nonparametric Distribution Free UCLs**											
2569					95% CLT UCL	595.9				95% Jackknife UCL		597.9
2570					95% Standard Bootstrap UCL	596.9				95% Bootstrap-t UCL		672.1
2571					95% Hall's Bootstrap UCL	689.5				95% Percentile Bootstrap UCL		609.9
2572					95% BCA Bootstrap UCL	642.9						
2573					90% Chebyshev(Mean, Sd) UCL	723.6				95% Chebyshev(Mean, Sd) UCL		851.7
2574					97.5% Chebyshev(Mean, Sd) UCL	1030				99% Chebyshev(Mean, Sd) UCL		1379
2575												
2576	**Suggested UCL to Use**											
2577					95% Chebyshev (Mean, Sd) UCL	851.7						
2578												
2579	Note: Suggestions regarding the selection of a 95% UCL are provided to help the user to select the most appropriate 95% UCL.											
2580	Recommendations are based upon data size, data distribution, and skewness.											
2581	These recommendations are based upon the results of the simulation studies summarized in Singh, Maichle, and Lee (2006).											
2582	However, simulations results will not cover all Real World data sets; for additional insight the user may want to consult a statistician.											
2583												
2584	**Cyanide, Total**											
2585												
2586	**General Statistics**											
2587					Total Number of Observations	74				Number of Distinct Observations		47
2588					Number of Detects	56				Number of Non-Detects		18
2589					Number of Distinct Detects	43				Number of Distinct Non-Detects		6
2590					Minimum Detect	0.11				Minimum Non-Detect		0.095
2591					Maximum Detect	26				Maximum Non-Detect		0.13
2592					Variance Detects	14.83				Percent Non-Detects		24.32%
2593					Mean Detects	2.014				SD Detects		3.851
2594					Median Detects	0.91				CV Detects		1.912
2595					Skewness Detects	4.891				Kurtosis Detects		28.14
2596					Mean of Logged Detects	-0.0135				SD of Logged Detects		1.095
2597												
2598	**Normal GOF Test on Detects Only**											
2599					Shapiro Wilk Test Statistic	0.46				**Normal GOF Test on Detected Observations Only**		
2600					5% Shapiro Wilk P Value	0				Detected Data Not Normal at 5% Significance Level		
2601					Lilliefors Test Statistic	0.315				**Lilliefors GOF Test**		
2602					5% Lilliefors Critical Value	0.118				Detected Data Not Normal at 5% Significance Level		
2603	**Detected Data Not Normal at 5% Significance Level**											
2604												
2605	**Kaplan-Meier (KM) Statistics using Normal Critical Values and other Nonparametric UCLs**											
2606					KM Mean	1.548				KM Standard Error of Mean		0.401
2607					KM SD	3.42				95% KM (BCA) UCL		2.308
2608					95% KM (t) UCL	2.216				95% KM (Percentile Bootstrap) UCL		2.243
2609					95% KM (z) UCL	2.208				95% KM Bootstrap t UCL		2.929
2610					90% KM Chebyshev UCL	2.751				95% KM Chebyshev UCL		3.296
2611					97.5% KM Chebyshev UCL	4.053				99% KM Chebyshev UCL		5.54
2612												
2613	**Gamma GOF Tests on Detected Observations Only**											
2614					A-D Test Statistic	2.92				**Anderson-Darling GOF Test**		
2615					5% A-D Critical Value	0.788				Detected Data Not Gamma Distributed at 5% Significance Level		
2616					K-S Test Statistic	0.201				**Kolmogorov-Smirnov GOF**		
2617					5% K-S Critical Value	0.123				Detected Data Not Gamma Distributed at 5% Significance Level		
2618	**Detected Data Not Gamma Distributed at 5% Significance Level**											
2619												

	A	B	C	D	E	F	G	H	I	J	K	L
2620	Gamma Statistics on Detected Data Only											
2621					k hat (MLE)	0.828	k star (bias corrected MLE)					0.795
2622					Theta hat (MLE)	2.433	Theta star (bias corrected MLE)					2.532
2623					nu hat (MLE)	92.73	nu star (bias corrected)					89.09
2624					Mean (detects)	2.014						
2625												
2626	Gamma ROS Statistics using Imputed Non-Detects											
2627	GROS may not be used when data set has > 50% NDs with many tied observations at multiple DLs											
2628	GROS may not be used when kstar of detects is small such as <1.0, especially when the sample size is small (e.g., <15-20)											
2629	For such situations, GROS method may yield incorrect values of UCLs and BTVs											
2630	This is especially true when the sample size is small.											
2631	For gamma distributed detected data, BTVs and UCLs may be computed using gamma distribution on KM estimates											
2632					Minimum	0.01	Mean					1.527
2633					Maximum	26	Median					0.635
2634					SD	3.453	CV					2.262
2635					k hat (MLE)	0.42	k star (bias corrected MLE)					0.412
2636					Theta hat (MLE)	3.633	Theta star (bias corrected MLE)					3.703
2637					nu hat (MLE)	62.2	nu star (bias corrected)					61.01
2638					Adjusted Level of Significance (β)	0.0468						
2639					Approximate Chi Square Value (61.01, α)	44.05	Adjusted Chi Square Value (61.01, β)					43.76
2640					95% Gamma Approximate UCL (use when n>=50)	2.115	95% Gamma Adjusted UCL (use when n<50)					2.128
2641												
2642	Estimates of Gamma Parameters using KM Estimates											
2643					Mean (KM)	1.548	SD (KM)					3.42
2644					Variance (KM)	11.7	SE of Mean (KM)					0.401
2645					k hat (KM)	0.205	k star (KM)					0.205
2646					nu hat (KM)	30.3	nu star (KM)					30.4
2647					theta hat (KM)	7.559	theta star (KM)					7.533
2648					80% gamma percentile (KM)	2.068	90% gamma percentile (KM)					4.681
2649					95% gamma percentile (KM)	7.918	99% gamma percentile (KM)					16.79
2650												
2651	Gamma Kaplan-Meier (KM) Statistics											
2652					Approximate Chi Square Value (30.40, α)	18.81	Adjusted Chi Square Value (30.40, β)					18.63
2653					95% Gamma Approximate KM-UCL (use when n>=50)	2.501	95% Gamma Adjusted KM-UCL (use when n<50)					2.526
2654												
2655	Lognormal GOF Test on Detected Observations Only											
2656					Shapiro Wilk Approximate Test Statistic	0.965	Shapiro Wilk GOF Test					
2657					5% Shapiro Wilk P Value	0.205	Detected Data appear Lognormal at 5% Significance Level					
2658					Lilliefors Test Statistic	0.101	Lilliefors GOF Test					
2659					5% Lilliefors Critical Value	0.118	Detected Data appear Lognormal at 5% Significance Level					
2660	Detected Data appear Lognormal at 5% Significance Level											
2661												
2662	Lognormal ROS Statistics Using Imputed Non-Detects											
2663					Mean in Original Scale	1.547	Mean in Log Scale					-0.61
2664					SD in Original Scale	3.444	SD in Log Scale					1.442
2665					95% t UCL (assumes normality of ROS data)	2.214	95% Percentile Bootstrap UCL					2.27
2666					95% BCA Bootstrap UCL	2.655	95% Bootstrap t UCL					2.984
2667					95% H-UCL (Log ROS)	2.437						
2668												
2669	Statistics using KM estimates on Logged Data and Assuming Lognormal Distribution											
2670					KM Mean (logged)	-0.58	KM Geo Mean					0.56
2671					KM SD (logged)	1.375	95% Critical H Value (KM-Log)					2.653

	A	B	C	D	E	F	G	H	I	J	K	L
2672					KM Standard Error of Mean (logged)	0.161					95% H-UCL (KM -Log)	2.208
2673					KM SD (logged)	1.375					95% Critical H Value (KM-Log)	2.653
2674					KM Standard Error of Mean (logged)	0.161						
2675												
2676					**DL/2 Statistics**							
2677					**DL/2 Normal**						**DL/2 Log-Transformed**	
2678					Mean in Original Scale	1.538					Mean in Log Scale	-0.711
2679					SD in Original Scale	3.448					SD in Log Scale	1.563
2680					95% t UCL (Assumes normality)	2.206					95% H-Stat UCL	2.815
2681					**DL/2 is not a recommended method, provided for comparisons and historical reasons**							
2682												
2683					**Nonparametric Distribution Free UCL Statistics**							
2684					**Detected Data appear Lognormal Distributed at 5% Significance Level**							
2685												
2686					**Suggested UCL to Use**							
2687					KM H-UCL	2.208						
2688												
2689					Note: Suggestions regarding the selection of a 95% UCL are provided to help the user to select the most appropriate 95% UCL.							
2690					Recommendations are based upon data size, data distribution, and skewness.							
2691					These recommendations are based upon the results of the simulation studies summarized in Singh, Maichle, and Lee (2006).							
2692					However, simulations results will not cover all Real World data sets; for additional insight the user may want to consult a statistician.							
2693												

	A	B	C	D	E	F	G	H	I	J	K	L
1	UCL Statistics for Data Sets with Non-Detects											
2												
3	User Selected Options											
4	Date/Time of Computation			ProUCL 5.15/18/2021 12:49:42 PM								
5	From File			HCL PerchedGW ProUCL.xls								
6	Full Precision			OFF								
7	Confidence Coefficient			95%								
8	Number of Bootstrap Operations			2000								
9												
10	1,1-Dichloroethane											
11												
12	General Statistics											
13	Total Number of Observations					14	Number of Distinct Observations					4
14	Number of Detects					2	Number of Non-Detects					12
15	Number of Distinct Detects					2	Number of Distinct Non-Detects					2
16	Minimum Detect					0.24	Minimum Non-Detect					0.12
17	Maximum Detect					0.25	Maximum Non-Detect					0.63
18	Variance Detects					5.0000E-5	Percent Non-Detects					85.71%
19	Mean Detects					0.245	SD Detects					0.00707
20	Median Detects					0.245	CV Detects					0.0289
21	Skewness Detects					N/A	Kurtosis Detects					N/A
22	Mean of Logged Detects					-1.407	SD of Logged Detects					0.0289
23												
24	Warning: Data set has only 2 Detected Values.											
25	This is not enough to compute meaningful or reliable statistics and estimates.											
26												
27												
28	Normal GOF Test on Detects Only											
29	Not Enough Data to Perform GOF Test											
30												
31	Kaplan-Meier (KM) Statistics using Normal Critical Values and other Nonparametric UCLs											
32	KM Mean					0.183	KM Standard Error of Mean					0.0443
33	KM SD					0.0626	95% KM (BCA) UCL					N/A
34	95% KM (t) UCL					0.261	95% KM (Percentile Bootstrap) UCL					N/A
35	95% KM (z) UCL					0.255	95% KM Bootstrap t UCL					N/A
36	90% KM Chebyshev UCL					0.315	95% KM Chebyshev UCL					0.375
37	97.5% KM Chebyshev UCL					0.459	99% KM Chebyshev UCL					0.623
38												
39	Gamma GOF Tests on Detected Observations Only											
40	Not Enough Data to Perform GOF Test											
41												
42	Gamma Statistics on Detected Data Only											
43	k hat (MLE)					2401	k star (bias corrected MLE)					N/A
44	Theta hat (MLE)					1.0205E-4	Theta star (bias corrected MLE)					N/A
45	nu hat (MLE)					9603	nu star (bias corrected)					N/A
46	Mean (detects)					0.245						
47												
48	Estimates of Gamma Parameters using KM Estimates											
49	Mean (KM)					0.183	SD (KM)					0.0626
50	Variance (KM)					0.00392	SE of Mean (KM)					0.0443
51	k hat (KM)					8.499	k star (KM)					6.726
52	nu hat (KM)					238	nu star (KM)					188.3

	A–E	F	G–K	L
53	theta hat (KM)	0.0215	theta star (KM)	0.0271
54	80% gamma percentile (KM)	0.238	90% gamma percentile (KM)	0.276
55	95% gamma percentile (KM)	0.312	99% gamma percentile (KM)	0.385
56				
57	**Gamma Kaplan-Meier (KM) Statistics**			
58			Adjusted Level of Significance (β)	0.0312
59	Approximate Chi Square Value (188.32, α)	157.6	Adjusted Chi Square Value (188.32, β)	153.8
60	95% Gamma Approximate KM-UCL (use when n>=50)	0.218	95% Gamma Adjusted KM-UCL (use when n<50)	0.223
61				
62	**Lognormal GOF Test on Detected Observations Only**			
63	**Not Enough Data to Perform GOF Test**			
64				
65	**Lognormal ROS Statistics Using Imputed Non-Detects**			
66	Mean in Original Scale	0.233	Mean in Log Scale	-1.46
67	SD in Original Scale	0.0143	SD in Log Scale	0.0614
68	95% t UCL (assumes normality of ROS data)	0.239	95% Percentile Bootstrap UCL	0.239
69	95% BCA Bootstrap UCL	0.239	95% Bootstrap t UCL	0.239
70	95% H-UCL (Log ROS)	N/A		
71				
72	**Statistics using KM estimates on Logged Data and Assuming Lognormal Distribution**			
73	KM Mean (logged)	-1.763	KM Geo Mean	0.171
74	KM SD (logged)	0.357	95% Critical H Value (KM-Log)	1.944
75	KM Standard Error of Mean (logged)	0.252	95% H-UCL (KM -Log)	0.222
76	KM SD (logged)	0.357	95% Critical H Value (KM-Log)	1.944
77	KM Standard Error of Mean (logged)	0.252		
78				
79	**DL/2 Statistics**			
80	**DL/2 Normal**		**DL/2 Log-Transformed**	
81	Mean in Original Scale	0.269	Mean in Log Scale	-1.428
82	SD in Original Scale	0.0919	SD in Log Scale	0.594
83	95% t UCL (Assumes normality)	0.312	95% H-Stat UCL	0.41
84	**DL/2 is not a recommended method, provided for comparisons and historical reasons**			
85				
86	**Nonparametric Distribution Free UCL Statistics**			
87	**Data do not follow a Discernible Distribution at 5% Significance Level**			
88				
89	**Suggested UCL to Use**			
90	95% KM (t) UCL	0.261	KM H-UCL	0.222
91	95% KM (BCA) UCL	N/A		
92	**Warning: One or more Recommended UCL(s) not available!**			
93	**Warning: Recommended UCL exceeds the maximum observation**			
94				
95	Note: Suggestions regarding the selection of a 95% UCL are provided to help the user to select the most appropriate 95% UCL.			
96	Recommendations are based upon data size, data distribution, and skewness.			
97	These recommendations are based upon the results of the simulation studies summarized in Singh, Maichle, and Lee (2006).			
98	However, simulations results will not cover all Real World data sets; for additional insight the user may want to consult a statistician.			
99				

	A	B	C	D	E	F	G	H	I	J	K	L
100	1,2-Dichlorobenzene											
101												
102	General Statistics											
103	Total Number of Observations					4	Number of Distinct Observations					3
104	Number of Detects					2	Number of Non-Detects					2
105	Number of Distinct Detects					2	Number of Distinct Non-Detects					1
106	Minimum Detect					34	Minimum Non-Detect					0.15
107	Maximum Detect					37	Maximum Non-Detect					0.15
108	Variance Detects					4.5	Percent Non-Detects					50%
109	Mean Detects					35.5	SD Detects					2.121
110	Median Detects					35.5	CV Detects					0.0598
111	Skewness Detects					N/A	Kurtosis Detects					N/A
112	Mean of Logged Detects					3.569	SD of Logged Detects					0.0598
113												
114	Warning: Data set has only 2 Detected Values.											
115	This is not enough to compute meaningful or reliable statistics and estimates.											
116												
117												
118	Note: Sample size is small (e.g., <10), if data are collected using ISM approach, you should use											
119	guidance provided in ITRC Tech Reg Guide on ISM (ITRC, 2012) to compute statistics of interest.											
120	For example, you may want to use Chebyshev UCL to estimate EPC (ITRC, 2012).											
121	Chebyshev UCL can be computed using the Nonparametric and All UCL Options of ProUCL 5.1											
122												
123	Normal GOF Test on Detects Only											
124	Not Enough Data to Perform GOF Test											
125												
126	Kaplan-Meier (KM) Statistics using Normal Critical Values and other Nonparametric UCLs											
127	KM Mean					17.83	KM Standard Error of Mean					12.52
128	KM SD					17.71	95% KM (BCA) UCL					N/A
129	95% KM (t) UCL					47.29	95% KM (Percentile Bootstrap) UCL					N/A
130	95% KM (z) UCL					38.42	95% KM Bootstrap t UCL					N/A
131	90% KM Chebyshev UCL					55.39	95% KM Chebyshev UCL					72.4
132	97.5% KM Chebyshev UCL					96.02	99% KM Chebyshev UCL					142.4
133												
134	Gamma GOF Tests on Detected Observations Only											
135	Not Enough Data to Perform GOF Test											
136												
137	Gamma Statistics on Detected Data Only											
138	k hat (MLE)					559.8	k star (bias corrected MLE)					N/A
139	Theta hat (MLE)					0.0634	Theta star (bias corrected MLE)					N/A
140	nu hat (MLE)					2239	nu star (bias corrected)					N/A
141	Mean (detects)					35.5						
142												
143	Estimates of Gamma Parameters using KM Estimates											
144	Mean (KM)					17.83	SD (KM)					17.71
145	Variance (KM)					313.5	SE of Mean (KM)					12.52
146	k hat (KM)					1.013	k star (KM)					0.42
147	nu hat (KM)					8.107	nu star (KM)					3.36
148	theta hat (KM)					17.59	theta star (KM)					42.44

	A	B	C	D	E	F	G	H	I	J	K	L
149					80% gamma percentile (KM)	28.92					90% gamma percentile (KM)	49.91
150					95% gamma percentile (KM)	72.82					99% gamma percentile (KM)	130.1
151												
152					Gamma Kaplan-Meier (KM) Statistics							
153											Adjusted Level of Significance (β)	0.00498
154					Approximate Chi Square Value (3.36, α)	0.487					Adjusted Chi Square Value (3.36, β)	0.139
155					95% Gamma Approximate KM-UCL (use when n>=50)	123.1					95% Gamma Adjusted KM-UCL (use when n<50)	429.8
156												
157					Lognormal GOF Test on Detected Observations Only							
158					Not Enough Data to Perform GOF Test							
159												
160					Lognormal ROS Statistics Using Imputed Non-Detects							
161					Mean in Original Scale	31.99					Mean in Log Scale	3.458
162					SD in Original Scale	4.346					SD in Log Scale	0.136
163					95% t UCL (assumes normality of ROS data)	37.1					95% Percentile Bootstrap UCL	N/A
164					95% BCA Bootstrap UCL	N/A					95% Bootstrap t UCL	N/A
165					95% H-UCL (Log ROS)	38.43						
166												
167					Statistics using KM estimates on Logged Data and Assuming Lognormal Distribution							
168					KM Mean (logged)	0.836					KM Geo Mean	2.307
169					KM SD (logged)	2.733					95% Critical H Value (KM-Log)	17.86
170					KM Standard Error of Mean (logged)	1.933					95% H-UCL (KM -Log)	1.685E+14
171					KM SD (logged)	2.733					95% Critical H Value (KM-Log)	17.86
172					KM Standard Error of Mean (logged)	1.933						
173												
174					DL/2 Statistics							
175					DL/2 Normal						DL/2 Log-Transformed	
176					Mean in Original Scale	17.79					Mean in Log Scale	0.489
177					SD in Original Scale	20.49					SD in Log Scale	3.556
178					95% t UCL (Assumes normality)	41.9					95% H-Stat UCL	4.543E+23
179					DL/2 is not a recommended method, provided for comparisons and historical reasons							
180												
181					Nonparametric Distribution Free UCL Statistics							
182					Data do not follow a Discernible Distribution at 5% Significance Level							
183												
184					Suggested UCL to Use							
185					95% KM (t) UCL	47.29					KM H-UCL	1.685E+14
186					95% KM (BCA) UCL	N/A						
187					Warning: One or more Recommended UCL(s) not available!							
188					Warning: Recommended UCL exceeds the maximum observation							
189												
190					Note: Suggestions regarding the selection of a 95% UCL are provided to help the user to select the most appropriate 95% UCL.							
191					Recommendations are based upon data size, data distribution, and skewness.							
192					These recommendations are based upon the results of the simulation studies summarized in Singh, Maichle, and Lee (2006).							
193					However, simulations results will not cover all Real World data sets; for additional insight the user may want to consult a statistician.							
194												

	A	B	C	D	E	F	G	H	I	J	K	L
195	cis-1,2-Dichloroethene											
196												
197						General Statistics						
198					Total Number of Observations	14				Number of Distinct Observations		7
199					Number of Detects	6				Number of Non-Detects		8
200					Number of Distinct Detects	6				Number of Distinct Non-Detects		1
201					Minimum Detect	0.54				Minimum Non-Detect		0.71
202					Maximum Detect	4.3				Maximum Non-Detect		0.71
203					Variance Detects	2.162				Percent Non-Detects		57.14%
204					Mean Detects	1.983				SD Detects		1.47
205					Median Detects	1.8				CV Detects		0.741
206					Skewness Detects	0.684				Kurtosis Detects		-0.747
207					Mean of Logged Detects	0.419				SD of Logged Detects		0.828
208												
209						Normal GOF Test on Detects Only						
210					Shapiro Wilk Test Statistic	0.891				Shapiro Wilk GOF Test		
211					5% Shapiro Wilk Critical Value	0.788				Detected Data appear Normal at 5% Significance Level		
212					Lilliefors Test Statistic	0.248				Lilliefors GOF Test		
213					5% Lilliefors Critical Value	0.325				Detected Data appear Normal at 5% Significance Level		
214						Detected Data appear Normal at 5% Significance Level						
215												
216						Kaplan-Meier (KM) Statistics using Normal Critical Values and other Nonparametric UCLs						
217					KM Mean	1.159				KM Standard Error of Mean		0.332
218					KM SD	1.132				95% KM (BCA) UCL		1.784
219					95% KM (t) UCL	1.746				95% KM (Percentile Bootstrap) UCL		1.719
220					95% KM (z) UCL	1.704				95% KM Bootstrap t UCL		1.986
221					90% KM Chebyshev UCL	2.153				95% KM Chebyshev UCL		2.604
222					97.5% KM Chebyshev UCL	3.229				99% KM Chebyshev UCL		4.457
223												
224						Gamma GOF Tests on Detected Observations Only						
225					A-D Test Statistic	0.375				Anderson-Darling GOF Test		
226					5% A-D Critical Value	0.704				Detected data appear Gamma Distributed at 5% Significance Level		
227					K-S Test Statistic	0.237				Kolmogorov-Smirnov GOF		
228					5% K-S Critical Value	0.336				Detected data appear Gamma Distributed at 5% Significance Level		
229						Detected data appear Gamma Distributed at 5% Significance Level						
230												
231						Gamma Statistics on Detected Data Only						
232					k hat (MLE)	2.035				k star (bias corrected MLE)		1.129
233					Theta hat (MLE)	0.974				Theta star (bias corrected MLE)		1.757
234					nu hat (MLE)	24.43				nu star (bias corrected)		13.55
235					Mean (detects)	1.983						
236												
237						Gamma ROS Statistics using Imputed Non-Detects						
238						GROS may not be used when data set has > 50% NDs with many tied observations at multiple DLs						
239						GROS may not be used when kstar of detects is small such as <1.0, especially when the sample size is small (e.g., <15-20)						
240						For such situations, GROS method may yield incorrect values of UCLs and BTVs						
241						This is especially true when the sample size is small.						
242						For gamma distributed detected data, BTVs and UCLs may be computed using gamma distribution on KM estimates						
243					Minimum	0.01				Mean		0.961
244					Maximum	4.3				Median		0.516
245					SD	1.312				CV		1.366
246					k hat (MLE)	0.41				k star (bias corrected MLE)		0.37

	A	B	C	D	E	F	G	H	I	J	K	L
247					Theta hat (MLE)	2.342					Theta star (bias corrected MLE)	2.597
248					nu hat (MLE)	11.49					nu star (bias corrected)	10.36
249					Adjusted Level of Significance (β)	0.0312						
250					Approximate Chi Square Value (10.36, α)	4.168					Adjusted Chi Square Value (10.36, β)	3.661
251					95% Gamma Approximate UCL (use when n>=50)	2.388					95% Gamma Adjusted UCL (use when n<50)	2.719
252												
253					**Estimates of Gamma Parameters using KM Estimates**							
254					Mean (KM)	1.159					SD (KM)	1.132
255					Variance (KM)	1.282					SE of Mean (KM)	0.332
256					k hat (KM)	1.047					k star (KM)	0.87
257					nu hat (KM)	29.31					nu star (KM)	24.37
258					theta hat (KM)	1.107					theta star (KM)	1.331
259					80% gamma percentile (KM)	1.884					90% gamma percentile (KM)	2.76
260					95% gamma percentile (KM)	3.647					99% gamma percentile (KM)	5.726
261												
262					**Gamma Kaplan-Meier (KM) Statistics**							
263					Approximate Chi Square Value (24.37, α)	14.13					Adjusted Chi Square Value (24.37, β)	13.1
264					95% Gamma Approximate KM-UCL (use when n>=50)	1.998					95% Gamma Adjusted KM-UCL (use when n<50)	2.155
265												
266					**Lognormal GOF Test on Detected Observations Only**							
267					Shapiro Wilk Test Statistic	0.918			**Shapiro Wilk GOF Test**			
268					5% Shapiro Wilk Critical Value	0.788			Detected Data appear Lognormal at 5% Significance Level			
269					Lilliefors Test Statistic	0.241			**Lilliefors GOF Test**			
270					5% Lilliefors Critical Value	0.325			Detected Data appear Lognormal at 5% Significance Level			
271					**Detected Data appear Lognormal at 5% Significance Level**							
272												
273					**Lognormal ROS Statistics Using Imputed Non-Detects**							
274					Mean in Original Scale	1.102					Mean in Log Scale	-0.372
275					SD in Original Scale	1.22					SD in Log Scale	0.984
276					95% t UCL (assumes normality of ROS data)	1.679					95% Percentile Bootstrap UCL	1.668
277					95% BCA Bootstrap UCL	1.787					95% Bootstrap t UCL	2.075
278					95% H-UCL (Log ROS)	2.377						
279												
280					**Statistics using KM estimates on Logged Data and Assuming Lognormal Distribution**							
281					KM Mean (logged)	-0.172					KM Geo Mean	0.842
282					KM SD (logged)	0.712					95% Critical H Value (KM-Log)	2.353
283					KM Standard Error of Mean (logged)	0.209					95% H-UCL (KM -Log)	1.727
284					KM SD (logged)	0.712					95% Critical H Value (KM-Log)	2.353
285					KM Standard Error of Mean (logged)	0.209						
286												
287					**DL/2 Statistics**							
288					**DL/2 Normal**				**DL/2 Log-Transformed**			
289					Mean in Original Scale	1.053					Mean in Log Scale	-0.412
290					SD in Original Scale	1.237					SD in Log Scale	0.907
291					95% t UCL (Assumes normality)	1.638					95% H-Stat UCL	1.941
292					**DL/2 is not a recommended method, provided for comparisons and historical reasons**							
293												

	A	B	C	D	E	F	G	H	I	J	K	L
294	Nonparametric Distribution Free UCL Statistics											
295	Detected Data appear Normal Distributed at 5% Significance Level											
296												
297	Suggested UCL to Use											
298					95% KM (t) UCL	1.746						
299												
300	Note: Suggestions regarding the selection of a 95% UCL are provided to help the user to select the most appropriate 95% UCL.											
301	Recommendations are based upon data size, data distribution, and skewness.											
302	These recommendations are based upon the results of the simulation studies summarized in Singh, Maichle, and Lee (2006).											
303	However, simulations results will not cover all Real World data sets; for additional insight the user may want to consult a statistician.											
304												
305	1,4-Dichlorobenzene											
306												
307	General Statistics											
308					Total Number of Observations	4			Number of Distinct Observations		3	
309					Number of Detects	2			Number of Non-Detects		2	
310					Number of Distinct Detects	2			Number of Distinct Non-Detects		1	
311					Minimum Detect	0.54			Minimum Non-Detect		0.21	
312					Maximum Detect	0.59			Maximum Non-Detect		0.21	
313					Variance Detects	0.00125			Percent Non-Detects		50%	
314					Mean Detects	0.565			SD Detects		0.0354	
315					Median Detects	0.565			CV Detects		0.0626	
316					Skewness Detects	N/A			Kurtosis Detects		N/A	
317					Mean of Logged Detects	-0.572			SD of Logged Detects		0.0626	
318												
319	Warning: Data set has only 2 Detected Values.											
320	This is not enough to compute meaningful or reliable statistics and estimates.											
321												
322												
323	Note: Sample size is small (e.g., <10), if data are collected using ISM approach, you should use											
324	guidance provided in ITRC Tech Reg Guide on ISM (ITRC, 2012) to compute statistics of interest.											
325	For example, you may want to use Chebyshev UCL to estimate EPC (ITRC, 2012).											
326	Chebyshev UCL can be computed using the Nonparametric and All UCL Options of ProUCL 5.1											
327												
328	Normal GOF Test on Detects Only											
329	Not Enough Data to Perform GOF Test											
330												
331	Kaplan-Meier (KM) Statistics using Normal Critical Values and other Nonparametric UCLs											
332					KM Mean	0.388			KM Standard Error of Mean		0.126	
333					KM SD	0.178			95% KM (BCA) UCL		N/A	
334					95% KM (t) UCL	0.684			95% KM (Percentile Bootstrap) UCL		N/A	
335					95% KM (z) UCL	0.595			95% KM Bootstrap t UCL		N/A	
336					90% KM Chebyshev UCL	0.766			95% KM Chebyshev UCL		0.937	
337					97.5% KM Chebyshev UCL	1.175			99% KM Chebyshev UCL		1.643	
338												
339	Gamma GOF Tests on Detected Observations Only											
340	Not Enough Data to Perform GOF Test											
341												

	A	B	C	D	E	F	G	H	I	J	K	L
342	Gamma Statistics on Detected Data Only											
343					k hat (MLE)	510.4				k star (bias corrected MLE)		N/A
344					Theta hat (MLE)	0.00111				Theta star (bias corrected MLE)		N/A
345					nu hat (MLE)	2042				nu star (bias corrected)		N/A
346					Mean (detects)	0.565						
347												
348	Estimates of Gamma Parameters using KM Estimates											
349					Mean (KM)	0.388				SD (KM)		0.178
350					Variance (KM)	0.0318				SE of Mean (KM)		0.126
351					k hat (KM)	4.719				k star (KM)		1.346
352					nu hat (KM)	37.75				nu star (KM)		10.77
353					theta hat (KM)	0.0821				theta star (KM)		0.288
354					80% gamma percentile (KM)	0.607				90% gamma percentile (KM)		0.829
355					95% gamma percentile (KM)	1.047				99% gamma percentile (KM)		1.542
356												
357	Gamma Kaplan-Meier (KM) Statistics											
358										Adjusted Level of Significance (β)		0.00498
359					Approximate Chi Square Value (10.77, α)	4.43				Adjusted Chi Square Value (10.77, β)		2.501
360					95% Gamma Approximate KM-UCL (use when n>=50)	0.942				95% Gamma Adjusted KM-UCL (use when n<50)		1.669
361												
362	Lognormal GOF Test on Detected Observations Only											
363	Not Enough Data to Perform GOF Test											
364												
365	Lognormal ROS Statistics Using Imputed Non-Detects											
366					Mean in Original Scale	0.507				Mean in Log Scale		-0.687
367					SD in Original Scale	0.0721				SD in Log Scale		0.143
368					95% t UCL (assumes normality of ROS data)	0.592				95% Percentile Bootstrap UCL		N/A
369					95% BCA Bootstrap UCL	N/A				95% Bootstrap t UCL		N/A
370					95% H-UCL (Log ROS)	0.615						
371												
372	Statistics using KM estimates on Logged Data and Assuming Lognormal Distribution											
373					KM Mean (logged)	-1.066				KM Geo Mean		0.344
374					KM SD (logged)	0.495				95% Critical H Value (KM-Log)		3.634
375					KM Standard Error of Mean (logged)	0.35				95% H-UCL (KM -Log)		1.1
376					KM SD (logged)	0.495				95% Critical H Value (KM-Log)		3.634
377					KM Standard Error of Mean (logged)	0.35						
378												
379	DL/2 Statistics											
380	DL/2 Normal						DL/2 Log-Transformed					
381					Mean in Original Scale	0.335				Mean in Log Scale		-1.413
382					SD in Original Scale	0.266				SD in Log Scale		0.972
383					95% t UCL (Assumes normality)	0.648				95% H-Stat UCL		14.88
384	DL/2 is not a recommended method, provided for comparisons and historical reasons											
385												
386	Nonparametric Distribution Free UCL Statistics											
387	Data do not follow a Discernible Distribution at 5% Significance Level											
388												

	A	B	C	D	E	F	G	H	I	J	K	L
389	**Suggested UCL to Use**											
390					95% KM (t) UCL	0.684					KM H-UCL	1.1
391					95% KM (BCA) UCL	N/A						
392	**Warning: One or more Recommended UCL(s) not available!**											
393	**Warning: Recommended UCL exceeds the maximum observation**											
394												
395	Note: Suggestions regarding the selection of a 95% UCL are provided to help the user to select the most appropriate 95% UCL.											
396	Recommendations are based upon data size, data distribution, and skewness.											
397	These recommendations are based upon the results of the simulation studies summarized in Singh, Maichle, and Lee (2006).											
398	However, simulations results will not cover all Real World data sets; for additional insight the user may want to consult a statistician.											
399												
400	**Benzene**											
401												
402	**General Statistics**											
403					Total Number of Observations	14					Number of Distinct Observations	5
404					Number of Detects	4					Number of Non-Detects	10
405					Number of Distinct Detects	4					Number of Distinct Non-Detects	1
406					Minimum Detect	0.13					Minimum Non-Detect	0.6
407					Maximum Detect	0.54					Maximum Non-Detect	0.6
408					Variance Detects	0.0337					Percent Non-Detects	71.43%
409					Mean Detects	0.303					SD Detects	0.184
410					Median Detects	0.27					CV Detects	0.607
411					Skewness Detects	0.749					Kurtosis Detects	-1.072
412					Mean of Logged Detects	-1.342					SD of Logged Detects	0.633
413												
414	**Normal GOF Test on Detects Only**											
415					Shapiro Wilk Test Statistic	0.942	**Shapiro Wilk GOF Test**					
416					5% Shapiro Wilk Critical Value	0.748	Detected Data appear Normal at 5% Significance Level					
417					Lilliefors Test Statistic	0.23	**Lilliefors GOF Test**					
418					5% Lilliefors Critical Value	0.375	Detected Data appear Normal at 5% Significance Level					
419	**Detected Data appear Normal at 5% Significance Level**											
420												
421	**Kaplan-Meier (KM) Statistics using Normal Critical Values and other Nonparametric UCLs**											
422					KM Mean	0.303					KM Standard Error of Mean	0.0918
423					KM SD	0.159					95% KM (BCA) UCL	N/A
424					95% KM (t) UCL	0.465					95% KM (Percentile Bootstrap) UCL	N/A
425					95% KM (z) UCL	0.453					95% KM Bootstrap t UCL	N/A
426					90% KM Chebyshev UCL	0.578					95% KM Chebyshev UCL	0.703
427					97.5% KM Chebyshev UCL	0.876					99% KM Chebyshev UCL	1.216
428												
429	**Gamma GOF Tests on Detected Observations Only**											
430					A-D Test Statistic	0.246	**Anderson-Darling GOF Test**					
431					5% A-D Critical Value	0.659	Detected data appear Gamma Distributed at 5% Significance Level					
432					K-S Test Statistic	0.237	**Kolmogorov-Smirnov GOF**					
433					5% K-S Critical Value	0.396	Detected data appear Gamma Distributed at 5% Significance Level					
434	**Detected data appear Gamma Distributed at 5% Significance Level**											
435												
436	**Gamma Statistics on Detected Data Only**											
437					k hat (MLE)	3.581					k star (bias corrected MLE)	1.062
438					Theta hat (MLE)	0.0845					Theta star (bias corrected MLE)	0.285
439					nu hat (MLE)	28.65					nu star (bias corrected)	8.496
440					Mean (detects)	0.303						

	A	B	C	D	E	F	G	H	I	J	K	L
441												
442						**Gamma ROS Statistics using Imputed Non-Detects**						
443						GROS may not be used when data set has > 50% NDs with many tied observations at multiple DLs						
444						GROS may not be used when kstar of detects is small such as <1.0, especially when the sample size is small (e.g., <15-20)						
445						For such situations, GROS method may yield incorrect values of UCLs and BTVs						
446						This is especially true when the sample size is small.						
447						For gamma distributed detected data, BTVs and UCLs may be computed using gamma distribution on KM estimates						
448					Minimum	0.0267				Mean		0.31
449					Maximum	0.707				Median		0.285
450					SD	0.198				CV		0.639
451					k hat (MLE)	2.044				k star (bias corrected MLE)		1.654
452					Theta hat (MLE)	0.152				Theta star (bias corrected MLE)		0.188
453					nu hat (MLE)	57.24				nu star (bias corrected)		46.3
454					Adjusted Level of Significance (β)	0.0312						
455					Approximate Chi Square Value (46.30, α)	31.69				Adjusted Chi Square Value (46.30, β)		30.09
456					95% Gamma Approximate UCL (use when n>=50)	0.453				95% Gamma Adjusted UCL (use when n<50)		N/A
457												
458						**Estimates of Gamma Parameters using KM Estimates**						
459					Mean (KM)	0.303				SD (KM)		0.159
460					Variance (KM)	0.0253				SE of Mean (KM)		0.0918
461					k hat (KM)	3.621				k star (KM)		2.893
462					nu hat (KM)	101.4				nu star (KM)		81
463					theta hat (KM)	0.0835				theta star (KM)		0.105
464					80% gamma percentile (KM)	0.433				90% gamma percentile (KM)		0.541
465					95% gamma percentile (KM)	0.642				99% gamma percentile (KM)		0.86
466												
467						**Gamma Kaplan-Meier (KM) Statistics**						
468					Approximate Chi Square Value (81.00, α)	61.26				Adjusted Chi Square Value (81.00, β)		58.99
469					95% Gamma Approximate KM-UCL (use when n>=50)	0.4				95% Gamma Adjusted KM-UCL (use when n<50)		0.415
470												
471						**Lognormal GOF Test on Detected Observations Only**						
472					Shapiro Wilk Test Statistic	0.973				**Shapiro Wilk GOF Test**		
473					5% Shapiro Wilk Critical Value	0.748				Detected Data appear Lognormal at 5% Significance Level		
474					Lilliefors Test Statistic	0.193				**Lilliefors GOF Test**		
475					5% Lilliefors Critical Value	0.375				Detected Data appear Lognormal at 5% Significance Level		
476						**Detected Data appear Lognormal at 5% Significance Level**						
477												
478						**Lognormal ROS Statistics Using Imputed Non-Detects**						
479					Mean in Original Scale	0.321				Mean in Log Scale		-1.342
480					SD in Original Scale	0.216				SD in Log Scale		0.678
481					95% t UCL (assumes normality of ROS data)	0.424				95% Percentile Bootstrap UCL		0.419
482					95% BCA Bootstrap UCL	0.43				95% Bootstrap t UCL		0.458
483					95% H-UCL (Log ROS)	0.508						
484												
485						**Statistics using KM estimates on Logged Data and Assuming Lognormal Distribution**						
486					KM Mean (logged)	-1.342				KM Geo Mean		0.261
487					KM SD (logged)	0.548				95% Critical H Value (KM-Log)		2.081
488					KM Standard Error of Mean (logged)	0.316				95% H-UCL (KM -Log)		0.417
489					KM SD (logged)	0.548				95% Critical H Value (KM-Log)		2.081
490					KM Standard Error of Mean (logged)	0.316						
491												
492						**DL/2 Statistics**						

	A	B	C	D	E	F	G	H	I	J	K	L
493	DL/2 Normal						DL/2 Log-Transformed					
494					Mean in Original Scale	0.301					Mean in Log Scale	-1.243
495					SD in Original Scale	0.0882					SD in Log Scale	0.311
496					95% t UCL (Assumes normality)	0.342					95% H-Stat UCL	0.357
497	DL/2 is not a recommended method, provided for comparisons and historical reasons											
498												
499	Nonparametric Distribution Free UCL Statistics											
500	Detected Data appear Normal Distributed at 5% Significance Level											
501												
502	Suggested UCL to Use											
503					95% KM (t) UCL	0.465						
504												
505	Note: Suggestions regarding the selection of a 95% UCL are provided to help the user to select the most appropriate 95% UCL.											
506	Recommendations are based upon data size, data distribution, and skewness.											
507	These recommendations are based upon the results of the simulation studies summarized in Singh, Maichle, and Lee (2006).											
508	However, simulations results will not cover all Real World data sets; for additional insight the user may want to consult a statistician.											
509												
510	Chloroform											
511												
512	General Statistics											
513					Total Number of Observations	14					Number of Distinct Observations	3
514					Number of Detects	1					Number of Non-Detects	13
515					Number of Distinct Detects	1					Number of Distinct Non-Detects	2
516												
517	Warning: Only one distinct data value was detected! ProUCL (or any other software) should not be used on such a data set!											
518	It is suggested to use alternative site specific values determined by the Project Team to estimate environmental parameters (e.g., EPC, BTV).											
519												
520	The data set for variable Chloroform was not processed!											
521												
522												
523	Dichlorobromomethane											
524												
525	General Statistics											
526					Total Number of Observations	14					Number of Distinct Observations	3
527					Number of Detects	1					Number of Non-Detects	13
528					Number of Distinct Detects	1					Number of Distinct Non-Detects	2
529												
530	Warning: Only one distinct data value was detected! ProUCL (or any other software) should not be used on such a data set!											
531	It is suggested to use alternative site specific values determined by the Project Team to estimate environmental parameters (e.g., EPC, BTV).											
532												
533	The data set for variable Dichlorobromomethane was not processed!											
534												
535												

	A	B	C	D	E	F	G	H	I	J	K	L
536	Ethylbenzene											
537												
538					General Statistics							
539					Total Number of Observations	14			Number of Distinct Observations			9
540					Number of Detects	8			Number of Non-Detects			6
541					Number of Distinct Detects	8			Number of Distinct Non-Detects			1
542					Minimum Detect	0.54			Minimum Non-Detect			0.51
543					Maximum Detect	16			Maximum Non-Detect			0.51
544					Variance Detects	32.77			Percent Non-Detects			42.86%
545					Mean Detects	5.54			SD Detects			5.724
546					Median Detects	3.45			CV Detects			1.033
547					Skewness Detects	1.095			Kurtosis Detects			-0.0207
548					Mean of Logged Detects	1.114			SD of Logged Detects			1.267
549												
550					Normal GOF Test on Detects Only							
551					Shapiro Wilk Test Statistic	0.847			Shapiro Wilk GOF Test			
552					5% Shapiro Wilk Critical Value	0.818			Detected Data appear Normal at 5% Significance Level			
553					Lilliefors Test Statistic	0.264			Lilliefors GOF Test			
554					5% Lilliefors Critical Value	0.283			Detected Data appear Normal at 5% Significance Level			
555					Detected Data appear Normal at 5% Significance Level							
556												
557					Kaplan-Meier (KM) Statistics using Normal Critical Values and other Nonparametric UCLs							
558					KM Mean	3.384			KM Standard Error of Mean			1.358
559					KM SD	4.752			95% KM (BCA) UCL			5.686
560					95% KM (t) UCL	5.789			95% KM (Percentile Bootstrap) UCL			5.596
561					95% KM (z) UCL	5.617			95% KM Bootstrap t UCL			7.716
562					90% KM Chebyshev UCL	7.457			95% KM Chebyshev UCL			9.302
563					97.5% KM Chebyshev UCL	11.86			99% KM Chebyshev UCL			16.89
564												
565					Gamma GOF Tests on Detected Observations Only							
566					A-D Test Statistic	0.299			Anderson-Darling GOF Test			
567					5% A-D Critical Value	0.737			Detected data appear Gamma Distributed at 5% Significance Level			
568					K-S Test Statistic	0.188			Kolmogorov-Smirnov GOF			
569					5% K-S Critical Value	0.302			Detected data appear Gamma Distributed at 5% Significance Level			
570					Detected data appear Gamma Distributed at 5% Significance Level							
571												
572					Gamma Statistics on Detected Data Only							
573					k hat (MLE)	0.969			k star (bias corrected MLE)			0.689
574					Theta hat (MLE)	5.719			Theta star (bias corrected MLE)			8.044
575					nu hat (MLE)	15.5			nu star (bias corrected)			11.02
576					Mean (detects)	5.54						
577												
578					Gamma ROS Statistics using Imputed Non-Detects							
579					GROS may not be used when data set has > 50% NDs with many tied observations at multiple DLs							
580					GROS may not be used when kstar of detects is small such as <1.0, especially when the sample size is small (e.g., <15-20)							
581					For such situations, GROS method may yield incorrect values of UCLs and BTVs							
582					This is especially true when the sample size is small.							
583					For gamma distributed detected data, BTVs and UCLs may be computed using gamma distribution on KM estimates							
584					Minimum	0.01			Mean			3.17
585					Maximum	16			Median			0.66
586					SD	5.071			CV			1.6
587					k hat (MLE)	0.28			k star (bias corrected MLE)			0.268

	A	B	C	D	E	F	G	H	I	J	K	L
588					Theta hat (MLE)	11.32					Theta star (bias corrected MLE)	11.85
589					nu hat (MLE)	7.839					nu star (bias corrected)	7.493
590					Adjusted Level of Significance (β)	0.0312						
591					Approximate Chi Square Value (7.49, α)	2.445					Adjusted Chi Square Value (7.49, β)	2.08
592					95% Gamma Approximate UCL (use when n>=50)	9.715					95% Gamma Adjusted UCL (use when n<50)	11.42
593												
594					**Estimates of Gamma Parameters using KM Estimates**							
595					Mean (KM)	3.384					SD (KM)	4.752
596					Variance (KM)	22.58					SE of Mean (KM)	1.358
597					k hat (KM)	0.507					k star (KM)	0.446
598					nu hat (KM)	14.2					nu star (KM)	12.49
599					theta hat (KM)	6.672					theta star (KM)	7.586
600					80% gamma percentile (KM)	5.52					90% gamma percentile (KM)	9.368
601					95% gamma percentile (KM)	13.54					99% gamma percentile (KM)	23.9
602												
603					**Gamma Kaplan-Meier (KM) Statistics**							
604					Approximate Chi Square Value (12.49, α)	5.553					Adjusted Chi Square Value (12.49, β)	4.952
605					95% Gamma Approximate KM-UCL (use when n>=50)	7.614					95% Gamma Adjusted KM-UCL (use when n<50)	8.537
606												
607					**Lognormal GOF Test on Detected Observations Only**							
608					Shapiro Wilk Test Statistic	0.934			**Shapiro Wilk GOF Test**			
609					5% Shapiro Wilk Critical Value	0.818			Detected Data appear Lognormal at 5% Significance Level			
610					Lilliefors Test Statistic	0.164			**Lilliefors GOF Test**			
611					5% Lilliefors Critical Value	0.283			Detected Data appear Lognormal at 5% Significance Level			
612					**Detected Data appear Lognormal at 5% Significance Level**							
613												
614					**Lognormal ROS Statistics Using Imputed Non-Detects**							
615					Mean in Original Scale	3.222					Mean in Log Scale	-0.391
616					SD in Original Scale	5.036					SD in Log Scale	2.129
617					95% t UCL (assumes normality of ROS data)	5.606					95% Percentile Bootstrap UCL	5.381
618					95% BCA Bootstrap UCL	6.001					95% Bootstrap t UCL	8.21
619					95% H-UCL (Log ROS)	120.4						
620												
621					**Statistics using KM estimates on Logged Data and Assuming Lognormal Distribution**							
622					KM Mean (logged)	0.348					KM Geo Mean	1.416
623					KM SD (logged)	1.259					95% Critical H Value (KM-Log)	3.242
624					KM Standard Error of Mean (logged)	0.36					95% H-UCL (KM -Log)	9.705
625					KM SD (logged)	1.259					95% Critical H Value (KM-Log)	3.242
626					KM Standard Error of Mean (logged)	0.36						
627												
628					**DL/2 Statistics**							
629					**DL/2 Normal**				**DL/2 Log-Transformed**			
630					Mean in Original Scale	3.275					Mean in Log Scale	0.0508
631					SD in Original Scale	5.001					SD in Log Scale	1.577
632					95% t UCL (Assumes normality)	5.642					95% H-Stat UCL	19.56
633					**DL/2 is not a recommended method, provided for comparisons and historical reasons**							
634												

	A	B	C	D	E	F	G	H	I	J	K	L
635	Nonparametric Distribution Free UCL Statistics											
636	Detected Data appear Normal Distributed at 5% Significance Level											
637												
638	Suggested UCL to Use											
639					95% KM (t) UCL	5.789						
640												
641	Note: Suggestions regarding the selection of a 95% UCL are provided to help the user to select the most appropriate 95% UCL.											
642	Recommendations are based upon data size, data distribution, and skewness.											
643	These recommendations are based upon the results of the simulation studies summarized in Singh, Maichle, and Lee (2006).											
644	However, simulations results will not cover all Real World data sets; for additional insight the user may want to consult a statistician.											
645												
646	Tetrachloroethene											
647												
648	General Statistics											
649					Total Number of Observations	14	Number of Distinct Observations				11	
650					Number of Detects	10	Number of Non-Detects				4	
651					Number of Distinct Detects	10	Number of Distinct Non-Detects				1	
652					Minimum Detect	0.88	Minimum Non-Detect				0.47	
653					Maximum Detect	10	Maximum Non-Detect				0.47	
654					Variance Detects	6.604	Percent Non-Detects				28.57%	
655					Mean Detects	3.298	SD Detects				2.57	
656					Median Detects	2.75	CV Detects				0.779	
657					Skewness Detects	2.228	Kurtosis Detects				6.103	
658					Mean of Logged Detects	0.97	SD of Logged Detects				0.705	
659												
660	Normal GOF Test on Detects Only											
661					Shapiro Wilk Test Statistic	0.74	Shapiro Wilk GOF Test					
662					5% Shapiro Wilk Critical Value	0.842	Detected Data Not Normal at 5% Significance Level					
663					Lilliefors Test Statistic	0.284	Lilliefors GOF Test					
664					5% Lilliefors Critical Value	0.262	Detected Data Not Normal at 5% Significance Level					
665	Detected Data Not Normal at 5% Significance Level											
666												
667	Kaplan-Meier (KM) Statistics using Normal Critical Values and other Nonparametric UCLs											
668					KM Mean	2.49	KM Standard Error of Mean				0.683	
669					KM SD	2.424	95% KM (BCA) UCL				3.524	
670					95% KM (t) UCL	3.7	95% KM (Percentile Bootstrap) UCL				3.576	
671					95% KM (z) UCL	3.613	95% KM Bootstrap t UCL				4.352	
672					90% KM Chebyshev UCL	4.539	95% KM Chebyshev UCL				5.467	
673					97.5% KM Chebyshev UCL	6.755	99% KM Chebyshev UCL				9.286	
674												
675	Gamma GOF Tests on Detected Observations Only											
676					A-D Test Statistic	0.564	Anderson-Darling GOF Test					
677					5% A-D Critical Value	0.734	Detected data appear Gamma Distributed at 5% Significance Level					
678					K-S Test Statistic	0.203	Kolmogorov-Smirnov GOF					
679					5% K-S Critical Value	0.269	Detected data appear Gamma Distributed at 5% Significance Level					
680	Detected data appear Gamma Distributed at 5% Significance Level											
681												
682	Gamma Statistics on Detected Data Only											
683					k hat (MLE)	2.396	k star (bias corrected MLE)				1.744	
684					Theta hat (MLE)	1.377	Theta star (bias corrected MLE)				1.891	
685					nu hat (MLE)	47.92	nu star (bias corrected)				34.88	
686					Mean (detects)	3.298						

	A	B	C	D	E	F	G	H	I	J	K	L
687												
688	**Gamma ROS Statistics using Imputed Non-Detects**											
689	GROS may not be used when data set has > 50% NDs with many tied observations at multiple DLs											
690	GROS may not be used when kstar of detects is small such as <1.0, especially when the sample size is small (e.g., <15-20)											
691	For such situations, GROS method may yield incorrect values of UCLs and BTVs											
692	This is especially true when the sample size is small.											
693	For gamma distributed detected data, BTVs and UCLs may be computed using gamma distribution on KM estimates											
694					Minimum	0.01				Mean		2.359
695					Maximum	10				Median		2.45
696					SD	2.636				CV		1.118
697					k hat (MLE)	0.438				k star (bias corrected MLE)		0.392
698					Theta hat (MLE)	5.385				Theta star (bias corrected MLE)		6.021
699					nu hat (MLE)	12.26				nu star (bias corrected)		10.97
700					Adjusted Level of Significance (β)	0.0312						
701					Approximate Chi Square Value (10.97, α)	4.556				Adjusted Chi Square Value (10.97, β)		4.022
702					95% Gamma Approximate UCL (use when n>=50)	5.678				95% Gamma Adjusted UCL (use when n<50)		6.433
703												
704	**Estimates of Gamma Parameters using KM Estimates**											
705					Mean (KM)	2.49				SD (KM)		2.424
706					Variance (KM)	5.878				SE of Mean (KM)		0.683
707					k hat (KM)	1.055				k star (KM)		0.876
708					nu hat (KM)	29.54				nu star (KM)		24.54
709					theta hat (KM)	2.36				theta star (KM)		2.841
710					80% gamma percentile (KM)	4.047				90% gamma percentile (KM)		5.922
711					95% gamma percentile (KM)	7.817				99% gamma percentile (KM)		12.26
712												
713	**Gamma Kaplan-Meier (KM) Statistics**											
714					Approximate Chi Square Value (24.54, α)	14.26				Adjusted Chi Square Value (24.54, β)		13.23
715					95% Gamma Approximate KM-UCL (use when n>=50)	4.285				95% Gamma Adjusted KM-UCL (use when n<50)		4.619
716												
717	**Lognormal GOF Test on Detected Observations Only**											
718					Shapiro Wilk Test Statistic	0.903				**Shapiro Wilk GOF Test**		
719					5% Shapiro Wilk Critical Value	0.842				Detected Data appear Lognormal at 5% Significance Level		
720					Lilliefors Test Statistic	0.246				**Lilliefors GOF Test**		
721					5% Lilliefors Critical Value	0.262				Detected Data appear Lognormal at 5% Significance Level		
722	**Detected Data appear Lognormal at 5% Significance Level**											
723												
724	**Lognormal ROS Statistics Using Imputed Non-Detects**											
725					Mean in Original Scale	2.505				Mean in Log Scale		0.493
726					SD in Original Scale	2.504				SD in Log Scale		0.996
727					95% t UCL (assumes normality of ROS data)	3.691				95% Percentile Bootstrap UCL		3.67
728					95% BCA Bootstrap UCL	4.036				95% Bootstrap t UCL		4.453
729					95% H-UCL (Log ROS)	5.808						
730												
731	**Statistics using KM estimates on Logged Data and Assuming Lognormal Distribution**											
732					KM Mean (logged)	0.477				KM Geo Mean		1.612
733					KM SD (logged)	0.963				95% Critical H Value (KM-Log)		2.731
734					KM Standard Error of Mean (logged)	0.271				95% H-UCL (KM -Log)		5.315
735					KM SD (logged)	0.963				95% Critical H Value (KM-Log)		2.731
736					KM Standard Error of Mean (logged)	0.271						
737												
738	**DL/2 Statistics**											

	A	B	C	D	E	F	G	H	I	J	K	L
739	DL/2 Normal						DL/2 Log-Transformed					
740					Mean in Original Scale	2.423					Mean in Log Scale	0.279
741					SD in Original Scale	2.576					SD in Log Scale	1.277
742					95% t UCL (Assumes normality)	3.642					95% H-Stat UCL	9.522
743	DL/2 is not a recommended method, provided for comparisons and historical reasons											
744												
745	Nonparametric Distribution Free UCL Statistics											
746	Detected Data appear Gamma Distributed at 5% Significance Level											
747												
748	Suggested UCL to Use											
749					95% KM Adjusted Gamma UCL	4.619					95% GROS Adjusted Gamma UCL	6.433
750												
751	Note: Suggestions regarding the selection of a 95% UCL are provided to help the user to select the most appropriate 95% UCL.											
752	Recommendations are based upon data size, data distribution, and skewness.											
753	These recommendations are based upon the results of the simulation studies summarized in Singh, Maichle, and Lee (2006).											
754	However, simulations results will not cover all Real World data sets; for additional insight the user may want to consult a statistician.											
755												
756	Trichloroethene											
757												
758	General Statistics											
759					Total Number of Observations	14					Number of Distinct Observations	6
760					Number of Detects	5					Number of Non-Detects	9
761					Number of Distinct Detects	5					Number of Distinct Non-Detects	1
762					Minimum Detect	0.31					Minimum Non-Detect	0.69
763					Maximum Detect	1.8					Maximum Non-Detect	0.69
764					Variance Detects	0.371					Percent Non-Detects	64.29%
765					Mean Detects	1.024					SD Detects	0.609
766					Median Detects	1.2					CV Detects	0.595
767					Skewness Detects	-0.0111					Kurtosis Detects	-1.646
768					Mean of Logged Detects	-0.162					SD of Logged Detects	0.732
769												
770	Normal GOF Test on Detects Only											
771					Shapiro Wilk Test Statistic	0.94	Shapiro Wilk GOF Test					
772					5% Shapiro Wilk Critical Value	0.762	Detected Data appear Normal at 5% Significance Level					
773					Lilliefors Test Statistic	0.214	Lilliefors GOF Test					
774					5% Lilliefors Critical Value	0.343	Detected Data appear Normal at 5% Significance Level					
775	Detected Data appear Normal at 5% Significance Level											
776												
777	Kaplan-Meier (KM) Statistics using Normal Critical Values and other Nonparametric UCLs											
778					KM Mean	0.629					KM Standard Error of Mean	0.145
779					KM SD	0.446					95% KM (BCA) UCL	0.929
780					95% KM (t) UCL	0.885					95% KM (Percentile Bootstrap) UCL	0.929
781					95% KM (z) UCL	0.867					95% KM Bootstrap t UCL	0.878
782					90% KM Chebyshev UCL	1.063					95% KM Chebyshev UCL	1.26
783					97.5% KM Chebyshev UCL	1.533					99% KM Chebyshev UCL	2.068
784												
785	Gamma GOF Tests on Detected Observations Only											
786					A-D Test Statistic	0.345	Anderson-Darling GOF Test					
787					5% A-D Critical Value	0.683	Detected data appear Gamma Distributed at 5% Significance Level					
788					K-S Test Statistic	0.281	Kolmogorov-Smirnov GOF					
789					5% K-S Critical Value	0.36	Detected data appear Gamma Distributed at 5% Significance Level					
790	Detected data appear Gamma Distributed at 5% Significance Level											

	A	B	C	D	E	F	G	H	I	J	K	L
791												
792	**Gamma Statistics on Detected Data Only**											
793					k hat (MLE)	2.842				k star (bias corrected MLE)		1.27
794					Theta hat (MLE)	0.36				Theta star (bias corrected MLE)		0.806
795					nu hat (MLE)	28.42				nu star (bias corrected)		12.7
796					Mean (detects)	1.024						
797												
798	**Gamma ROS Statistics using Imputed Non-Detects**											
799	GROS may not be used when data set has > 50% NDs with many tied observations at multiple DLs											
800	GROS may not be used when kstar of detects is small such as <1.0, especially when the sample size is small (e.g., <15-20)											
801	For such situations, GROS method may yield incorrect values of UCLs and BTVs											
802	This is especially true when the sample size is small.											
803	For gamma distributed detected data, BTVs and UCLs may be computed using gamma distribution on KM estimates											
804					Minimum	0.01				Mean		0.634
805					Maximum	1.8				Median		0.507
806					SD	0.506				CV		0.798
807					k hat (MLE)	1.212				k star (bias corrected MLE)		1
808					Theta hat (MLE)	0.523				Theta star (bias corrected MLE)		0.634
809					nu hat (MLE)	33.94				nu star (bias corrected)		28
810					Adjusted Level of Significance (β)	0.0312						
811					Approximate Chi Square Value (28.00, α)	16.93				Adjusted Chi Square Value (28.00, β)		15.79
812					95% Gamma Approximate UCL (use when n>=50)	1.048				95% Gamma Adjusted UCL (use when n<50)		1.124
813												
814	**Estimates of Gamma Parameters using KM Estimates**											
815					Mean (KM)	0.629				SD (KM)		0.446
816					Variance (KM)	0.199				SE of Mean (KM)		0.145
817					k hat (KM)	1.991				k star (KM)		1.612
818					nu hat (KM)	55.74				nu star (KM)		45.13
819					theta hat (KM)	0.316				theta star (KM)		0.39
820					80% gamma percentile (KM)	0.966				90% gamma percentile (KM)		1.289
821					95% gamma percentile (KM)	1.601				99% gamma percentile (KM)		2.302
822												
823	**Gamma Kaplan-Meier (KM) Statistics**											
824					Approximate Chi Square Value (45.13, α)	30.72				Adjusted Chi Square Value (45.13, β)		29.15
825					95% Gamma Approximate KM-UCL (use when n>=50)	0.924				95% Gamma Adjusted KM-UCL (use when n<50)		0.974
826												
827	**Lognormal GOF Test on Detected Observations Only**											
828					Shapiro Wilk Test Statistic	0.909				**Shapiro Wilk GOF Test**		
829					5% Shapiro Wilk Critical Value	0.762				Detected Data appear Lognormal at 5% Significance Level		
830					Lilliefors Test Statistic	0.281				**Lilliefors GOF Test**		
831					5% Lilliefors Critical Value	0.343				Detected Data appear Lognormal at 5% Significance Level		
832	**Detected Data appear Lognormal at 5% Significance Level**											
833												

	A	B	C	D	E	F	G	H	I	J	K	L
834	Lognormal ROS Statistics Using Imputed Non-Detects											
835					Mean in Original Scale	0.645					Mean in Log Scale	-0.663
836					SD in Original Scale	0.475					SD in Log Scale	0.688
837				95% t UCL (assumes normality of ROS data)		0.87					95% Percentile Bootstrap UCL	0.874
838					95% BCA Bootstrap UCL	0.903					95% Bootstrap t UCL	0.967
839					95% H-UCL (Log ROS)	1.017						
840												
841	Statistics using KM estimates on Logged Data and Assuming Lognormal Distribution											
842					KM Mean (logged)	-0.651					KM Geo Mean	0.522
843					KM SD (logged)	0.57					95% Critical H Value (KM-Log)	2.129
844					KM Standard Error of Mean (logged)	0.22					95% H-UCL (KM -Log)	0.859
845					KM SD (logged)	0.57					95% Critical H Value (KM-Log)	2.129
846					KM Standard Error of Mean (logged)	0.22						
847												
848	DL/2 Statistics											
849	DL/2 Normal						DL/2 Log-Transformed					
850					Mean in Original Scale	0.588					Mean in Log Scale	-0.742
851					SD in Original Scale	0.478					SD in Log Scale	0.605
852					95% t UCL (Assumes normality)	0.814					95% H-Stat UCL	0.829
853	DL/2 is not a recommended method, provided for comparisons and historical reasons											
854												
855	Nonparametric Distribution Free UCL Statistics											
856	Detected Data appear Normal Distributed at 5% Significance Level											
857												
858	Suggested UCL to Use											
859					95% KM (t) UCL	0.885						
860												
861	Note: Suggestions regarding the selection of a 95% UCL are provided to help the user to select the most appropriate 95% UCL.											
862	Recommendations are based upon data size, data distribution, and skewness.											
863	These recommendations are based upon the results of the simulation studies summarized in Singh, Maichle, and Lee (2006).											
864	However, simulations results will not cover all Real World data sets; for additional insight the user may want to consult a statistician.											
865												
866	Vinyl chloride											
867												
868	General Statistics											
869					Total Number of Observations	14					Number of Distinct Observations	3
870					Number of Detects	1					Number of Non-Detects	13
871					Number of Distinct Detects	1					Number of Distinct Non-Detects	2
872												
873	Warning: Only one distinct data value was detected! ProUCL (or any other software) should not be used on such a data set!											
874	It is suggested to use alternative site specific values determined by the Project Team to estimate environmental parameters (e.g., EPC, BTV).											
875												
876	The data set for variable Vinyl chloride was not processed!											
877												
878												
879	Xylenes, Total											
880												
881	General Statistics											
882					Total Number of Observations	14					Number of Distinct Observations	8
883					Number of Detects	8					Number of Non-Detects	6
884					Number of Distinct Detects	7					Number of Distinct Non-Detects	1
885					Minimum Detect	1.3					Minimum Non-Detect	0.89

	A	B	C	D	E	F	G	H	I	J	K	L
886					Maximum Detect	61					Maximum Non-Detect	0.89
887					Variance Detects	513.3					Percent Non-Detects	42.86%
888					Mean Detects	22.7					SD Detects	22.66
889					Median Detects	16					CV Detects	0.998
890					Skewness Detects	0.848					Kurtosis Detects	-0.713
891					Mean of Logged Detects	2.445					SD of Logged Detects	1.427
892												
893					**Normal GOF Test on Detects Only**							
894					Shapiro Wilk Test Statistic	0.867			**Shapiro Wilk GOF Test**			
895					5% Shapiro Wilk Critical Value	0.818			Detected Data appear Normal at 5% Significance Level			
896					Lilliefors Test Statistic	0.241			**Lilliefors GOF Test**			
897					5% Lilliefors Critical Value	0.283			Detected Data appear Normal at 5% Significance Level			
898					**Detected Data appear Normal at 5% Significance Level**							
899												
900					**Kaplan-Meier (KM) Statistics using Normal Critical Values and other Nonparametric UCLs**							
901					KM Mean	13.35			KM Standard Error of Mean			5.519
902					KM SD	19.32			95% KM (BCA) UCL			22.76
903					95% KM (t) UCL	23.13			95% KM (Percentile Bootstrap) UCL			22.98
904					95% KM (z) UCL	22.43			95% KM Bootstrap t UCL			30.14
905					90% KM Chebyshev UCL	29.91			95% KM Chebyshev UCL			37.41
906					97.5% KM Chebyshev UCL	47.82			99% KM Chebyshev UCL			68.27
907												
908					**Gamma GOF Tests on Detected Observations Only**							
909					A-D Test Statistic	0.331			**Anderson-Darling GOF Test**			
910					5% A-D Critical Value	0.741			Detected data appear Gamma Distributed at 5% Significance Level			
911					K-S Test Statistic	0.21			**Kolmogorov-Smirnov GOF**			
912					5% K-S Critical Value	0.303			Detected data appear Gamma Distributed at 5% Significance Level			
913					**Detected data appear Gamma Distributed at 5% Significance Level**							
914												
915					**Gamma Statistics on Detected Data Only**							
916					k hat (MLE)	0.867			k star (bias corrected MLE)			0.625
917					Theta hat (MLE)	26.19			Theta star (bias corrected MLE)			36.32
918					nu hat (MLE)	13.87			nu star (bias corrected)			10
919					Mean (detects)	22.7						
920												
921					**Gamma ROS Statistics using Imputed Non-Detects**							
922					GROS may not be used when data set has > 50% NDs with many tied observations at multiple DLs							
923					GROS may not be used when kstar of detects is small such as <1.0, especially when the sample size is small (e.g., <15-20)							
924					For such situations, GROS method may yield incorrect values of UCLs and BTVs							
925					This is especially true when the sample size is small.							
926					For gamma distributed detected data, BTVs and UCLs may be computed using gamma distribution on KM estimates							
927					Minimum	0.01			Mean			12.98
928					Maximum	61			Median			2.15
929					SD	20.3			CV			1.565
930					k hat (MLE)	0.229			k star (bias corrected MLE)			0.228
931					Theta hat (MLE)	56.57			Theta star (bias corrected MLE)			56.95
932					nu hat (MLE)	6.422			nu star (bias corrected)			6.379
933					Adjusted Level of Significance (β)	0.0312						
934					Approximate Chi Square Value (6.38, α)	1.837			Adjusted Chi Square Value (6.38, β)			1.533
935					95% Gamma Approximate UCL (use when n>=50)	45.07			95% Gamma Adjusted UCL (use when n<50)			54.01
936												
937					**Estimates of Gamma Parameters using KM Estimates**							

	A	B	C	D	E	F	G	H	I	J	K	L
938					Mean (KM)	13.35					SD (KM)	19.32
939					Variance (KM)	373.2					SE of Mean (KM)	5.519
940					k hat (KM)	0.478					k star (KM)	0.423
941					nu hat (KM)	13.38					nu star (KM)	11.85
942					theta hat (KM)	27.95					theta star (KM)	31.56
943					80% gamma percentile (KM)	21.68					90% gamma percentile (KM)	37.34
944					95% gamma percentile (KM)	54.41					99% gamma percentile (KM)	97.1
945												
946					**Gamma Kaplan-Meier (KM) Statistics**							
947					Approximate Chi Square Value (11.85, α)	5.125					Adjusted Chi Square Value (11.85, β)	4.552
948					95% Gamma Approximate KM-UCL (use when n>=50)	30.86					95% Gamma Adjusted KM-UCL (use when n<50)	34.75
949												
950					**Lognormal GOF Test on Detected Observations Only**							
951					Shapiro Wilk Test Statistic	0.914			**Shapiro Wilk GOF Test**			
952					5% Shapiro Wilk Critical Value	0.818			Detected Data appear Lognormal at 5% Significance Level			
953					Lilliefors Test Statistic	0.216			**Lilliefors GOF Test**			
954					5% Lilliefors Critical Value	0.283			Detected Data appear Lognormal at 5% Significance Level			
955					**Detected Data appear Lognormal at 5% Significance Level**							
956												
957					**Lognormal ROS Statistics Using Imputed Non-Detects**							
958					Mean in Original Scale	13.14					Mean in Log Scale	0.797
959					SD in Original Scale	20.19					SD in Log Scale	2.345
960					95% t UCL (assumes normality of ROS data)	22.69					95% Percentile Bootstrap UCL	22.02
961					95% BCA Bootstrap UCL	24.35					95% Bootstrap t UCL	28.05
962					95% H-UCL (Log ROS)	1143						
963												
964					**Statistics using KM estimates on Logged Data and Assuming Lognormal Distribution**							
965					KM Mean (logged)	1.347					KM Geo Mean	3.846
966					KM SD (logged)	1.62					95% Critical H Value (KM-Log)	3.922
967					KM Standard Error of Mean (logged)	0.463					95% H-UCL (KM -Log)	83.25
968					KM SD (logged)	1.62					95% Critical H Value (KM-Log)	3.922
969					KM Standard Error of Mean (logged)	0.463						
970												
971					**DL/2 Statistics**							
972					**DL/2 Normal**				**DL/2 Log-Transformed**			
973					Mean in Original Scale	13.16					Mean in Log Scale	1.05
974					SD in Original Scale	20.17					SD in Log Scale	1.972
975					95% t UCL (Assumes normality)	22.71					95% H-Stat UCL	250.1
976					**DL/2 is not a recommended method, provided for comparisons and historical reasons**							
977												
978					**Nonparametric Distribution Free UCL Statistics**							
979					**Detected Data appear Normal Distributed at 5% Significance Level**							
980												

	A	B	C	D	E	F	G	H	I	J	K	L
981						Suggested UCL to Use						
982					95% KM (t) UCL	23.13						
983												
984						Note: Suggestions regarding the selection of a 95% UCL are provided to help the user to select the most appropriate 95% UCL.						
985						Recommendations are based upon data size, data distribution, and skewness.						
986						These recommendations are based upon the results of the simulation studies summarized in Singh, Maichle, and Lee (2006).						
987						However, simulations results will not cover all Real World data sets; for additional insight the user may want to consult a statistician.						
988												
989	1,1'-Biphenyl											
990												
991						General Statistics						
992					Total Number of Observations	6			Number of Distinct Observations			6
993					Number of Detects	5			Number of Non-Detects			1
994					Number of Distinct Detects	5			Number of Distinct Non-Detects			1
995					Minimum Detect	0.78			Minimum Non-Detect			0.28
996					Maximum Detect	2.6			Maximum Non-Detect			0.28
997					Variance Detects	0.477			Percent Non-Detects			16.67%
998					Mean Detects	1.656			SD Detects			0.69
999					Median Detects	1.6			CV Detects			0.417
1000					Skewness Detects	0.208			Kurtosis Detects			-0.226
1001					Mean of Logged Detects	0.427			SD of Logged Detects			0.457
1002												
1003						Note: Sample size is small (e.g., <10), if data are collected using ISM approach, you should use						
1004						guidance provided in ITRC Tech Reg Guide on ISM (ITRC, 2012) to compute statistics of interest.						
1005						For example, you may want to use Chebyshev UCL to estimate EPC (ITRC, 2012).						
1006						Chebyshev UCL can be computed using the Nonparametric and All UCL Options of ProUCL 5.1						
1007												
1008						Normal GOF Test on Detects Only						
1009					Shapiro Wilk Test Statistic	0.997			Shapiro Wilk GOF Test			
1010					5% Shapiro Wilk Critical Value	0.762			Detected Data appear Normal at 5% Significance Level			
1011					Lilliefors Test Statistic	0.132			Lilliefors GOF Test			
1012					5% Lilliefors Critical Value	0.343			Detected Data appear Normal at 5% Significance Level			
1013						Detected Data appear Normal at 5% Significance Level						
1014												
1015						Kaplan-Meier (KM) Statistics using Normal Critical Values and other Nonparametric UCLs						
1016					KM Mean	1.427			KM Standard Error of Mean			0.348
1017					KM SD	0.762			95% KM (BCA) UCL			1.88
1018					95% KM (t) UCL	2.128			95% KM (Percentile Bootstrap) UCL			1.95
1019					95% KM (z) UCL	1.999			95% KM Bootstrap t UCL			2.047
1020					90% KM Chebyshev UCL	2.47			95% KM Chebyshev UCL			2.943
1021					97.5% KM Chebyshev UCL	3.599			99% KM Chebyshev UCL			4.888
1022												
1023						Gamma GOF Tests on Detected Observations Only						
1024					A-D Test Statistic	0.171			Anderson-Darling GOF Test			
1025					5% A-D Critical Value	0.68			Detected data appear Gamma Distributed at 5% Significance Level			
1026					K-S Test Statistic	0.143			Kolmogorov-Smirnov GOF			
1027					5% K-S Critical Value	0.358			Detected data appear Gamma Distributed at 5% Significance Level			
1028						Detected data appear Gamma Distributed at 5% Significance Level						
1029												

	A	B	C	D	E	F	G	H	I	J	K	L
1030	Gamma Statistics on Detected Data Only											
1031					k hat (MLE)	6.581				k star (bias corrected MLE)		2.766
1032					Theta hat (MLE)	0.252				Theta star (bias corrected MLE)		0.599
1033					nu hat (MLE)	65.81				nu star (bias corrected)		27.66
1034					Mean (detects)	1.656						
1035												
1036	Gamma ROS Statistics using Imputed Non-Detects											
1037	GROS may not be used when data set has > 50% NDs with many tied observations at multiple DLs											
1038	GROS may not be used when kstar of detects is small such as <1.0, especially when the sample size is small (e.g., <15-20)											
1039	For such situations, GROS method may yield incorrect values of UCLs and BTVs											
1040	This is especially true when the sample size is small.											
1041	For gamma distributed detected data, BTVs and UCLs may be computed using gamma distribution on KM estimates											
1042					Minimum	0.186				Mean		1.411
1043					Maximum	2.6				Median		1.45
1044					SD	0.861				CV		0.61
1045					k hat (MLE)	2.008				k star (bias corrected MLE)		1.115
1046					Theta hat (MLE)	0.703				Theta star (bias corrected MLE)		1.266
1047					nu hat (MLE)	24.09				nu star (bias corrected)		13.38
1048					Adjusted Level of Significance (β)	0.0122						
1049					Approximate Chi Square Value (13.38, α)	6.148				Adjusted Chi Square Value (13.38, β)		4.499
1050					95% Gamma Approximate UCL (use when n>=50)	3.07				95% Gamma Adjusted UCL (use when n<50)		4.196
1051												
1052	Estimates of Gamma Parameters using KM Estimates											
1053					Mean (KM)	1.427				SD (KM)		0.762
1054					Variance (KM)	0.581				SE of Mean (KM)		0.348
1055					k hat (KM)	3.505				k star (KM)		1.863
1056					nu hat (KM)	42.06				nu star (KM)		22.36
1057					theta hat (KM)	0.407				theta star (KM)		0.766
1058					80% gamma percentile (KM)	2.154				90% gamma percentile (KM)		2.821
1059					95% gamma percentile (KM)	3.461				99% gamma percentile (KM)		4.886
1060												
1061	Gamma Kaplan-Meier (KM) Statistics											
1062					Approximate Chi Square Value (22.36, α)	12.61				Adjusted Chi Square Value (22.36, β)		10.07
1063					95% Gamma Approximate KM-UCL (use when n>=50)	2.53				95% Gamma Adjusted KM-UCL (use when n<50)		3.168
1064												
1065	Lognormal GOF Test on Detected Observations Only											
1066					Shapiro Wilk Test Statistic	0.979				Shapiro Wilk GOF Test		
1067					5% Shapiro Wilk Critical Value	0.762				Detected Data appear Lognormal at 5% Significance Level		
1068					Lilliefors Test Statistic	0.16				Lilliefors GOF Test		
1069					5% Lilliefors Critical Value	0.343				Detected Data appear Lognormal at 5% Significance Level		
1070	Detected Data appear Lognormal at 5% Significance Level											
1071												
1072	Lognormal ROS Statistics Using Imputed Non-Detects											
1073					Mean in Original Scale	1.459				Mean in Log Scale		0.231
1074					SD in Original Scale	0.783				SD in Log Scale		0.629
1075					95% t UCL (assumes normality of ROS data)	2.104				95% Percentile Bootstrap UCL		1.95
1076					95% BCA Bootstrap UCL	1.98				95% Bootstrap t UCL		2.143
1077					95% H-UCL (Log ROS)	3.54						
1078												

	A	B	C	D	E	F	G	H	I	J	K	L
1079	Statistics using KM estimates on Logged Data and Assuming Lognormal Distribution											
1080					KM Mean (logged)	0.143					KM Geo Mean	1.154
1081					KM SD (logged)	0.735					95% Critical H Value (KM-Log)	3.276
1082					KM Standard Error of Mean (logged)	0.336					95% H-UCL (KM -Log)	4.439
1083					KM SD (logged)	0.735					95% Critical H Value (KM-Log)	3.276
1084					KM Standard Error of Mean (logged)	0.336						
1085												
1086	DL/2 Statistics											
1087	DL/2 Normal						DL/2 Log-Transformed					
1088					Mean in Original Scale	1.403					Mean in Log Scale	0.0277
1089					SD in Original Scale	0.874					SD in Log Scale	1.059
1090					95% t UCL (Assumes normality)	2.123					95% H-Stat UCL	14.02
1091	DL/2 is not a recommended method, provided for comparisons and historical reasons											
1092												
1093	Nonparametric Distribution Free UCL Statistics											
1094	Detected Data appear Normal Distributed at 5% Significance Level											
1095												
1096	Suggested UCL to Use											
1097					95% KM (t) UCL	2.128						
1098												
1099	Note: Suggestions regarding the selection of a 95% UCL are provided to help the user to select the most appropriate 95% UCL.											
1100	Recommendations are based upon data size, data distribution, and skewness.											
1101	These recommendations are based upon the results of the simulation studies summarized in Singh, Maichle, and Lee (2006).											
1102	However, simulations results will not cover all Real World data sets; for additional insight the user may want to consult a statistician.											
1103												
1104	2-Methylnaphthalene											
1105												
1106	General Statistics											
1107					Total Number of Observations	6					Number of Distinct Observations	6
1108					Number of Detects	5					Number of Non-Detects	1
1109					Number of Distinct Detects	5					Number of Distinct Non-Detects	1
1110					Minimum Detect	13					Minimum Non-Detect	0.3
1111					Maximum Detect	30					Maximum Non-Detect	0.3
1112					Variance Detects	47.5					Percent Non-Detects	16.67%
1113					Mean Detects	23					SD Detects	6.892
1114					Median Detects	22					CV Detects	0.3
1115					Skewness Detects	-0.573					Kurtosis Detects	-0.402
1116					Mean of Logged Detects	3.094					SD of Logged Detects	0.336
1117												
1118	Note: Sample size is small (e.g., <10), if data are collected using ISM approach, you should use											
1119	guidance provided in ITRC Tech Reg Guide on ISM (ITRC, 2012) to compute statistics of interest.											
1120	For example, you may want to use Chebyshev UCL to estimate EPC (ITRC, 2012).											
1121	Chebyshev UCL can be computed using the Nonparametric and All UCL Options of ProUCL 5.1											
1122												
1123	Normal GOF Test on Detects Only											
1124					Shapiro Wilk Test Statistic	0.921	Shapiro Wilk GOF Test					
1125					5% Shapiro Wilk Critical Value	0.762	Detected Data appear Normal at 5% Significance Level					
1126					Lilliefors Test Statistic	0.208	Lilliefors GOF Test					
1127					5% Lilliefors Critical Value	0.343	Detected Data appear Normal at 5% Significance Level					
1128	Detected Data appear Normal at 5% Significance Level											
1129												
1130	Kaplan-Meier (KM) Statistics using Normal Critical Values and other Nonparametric UCLs											

	A	B	C	D	E	F	G	H	I	J	K	L
1131					KM Mean	19.22				KM Standard Error of Mean		4.638
1132					KM SD	10.16				95% KM (BCA) UCL		25.5
1133					95% KM (t) UCL	28.56				95% KM (Percentile Bootstrap) UCL		25.5
1134					95% KM (z) UCL	26.84				95% KM Bootstrap t UCL		25.04
1135					90% KM Chebyshev UCL	33.13				95% KM Chebyshev UCL		39.43
1136					97.5% KM Chebyshev UCL	48.18				99% KM Chebyshev UCL		65.36
1137												
1138					Gamma GOF Tests on Detected Observations Only							
1139					A-D Test Statistic	0.357	Anderson-Darling GOF Test					
1140					5% A-D Critical Value	0.679	Detected data appear Gamma Distributed at 5% Significance Level					
1141					K-S Test Statistic	0.225	Kolmogorov-Smirnov GOF					
1142					5% K-S Critical Value	0.357	Detected data appear Gamma Distributed at 5% Significance Level					
1143					Detected data appear Gamma Distributed at 5% Significance Level							
1144												
1145					Gamma Statistics on Detected Data Only							
1146					k hat (MLE)	12.16				k star (bias corrected MLE)		4.996
1147					Theta hat (MLE)	1.892				Theta star (bias corrected MLE)		4.604
1148					nu hat (MLE)	121.6				nu star (bias corrected)		49.96
1149					Mean (detects)	23						
1150												
1151					Gamma ROS Statistics using Imputed Non-Detects							
1152					GROS may not be used when data set has > 50% NDs with many tied observations at multiple DLs							
1153					GROS may not be used when kstar of detects is small such as <1.0, especially when the sample size is small (e.g., <15-20)							
1154					For such situations, GROS method may yield incorrect values of UCLs and BTVs							
1155					This is especially true when the sample size is small.							
1156					For gamma distributed detected data, BTVs and UCLs may be computed using gamma distribution on KM estimates							
1157					Minimum	8.337				Mean		20.56
1158					Maximum	30				Median		21.5
1159					SD	8.593				CV		0.418
1160					k hat (MLE)	5.624				k star (bias corrected MLE)		2.923
1161					Theta hat (MLE)	3.655				Theta star (bias corrected MLE)		7.033
1162					nu hat (MLE)	67.48				nu star (bias corrected)		35.07
1163					Adjusted Level of Significance (β)	0.0122						
1164					Approximate Chi Square Value (35.07, α)	22.53				Adjusted Chi Square Value (35.07, β)		18.98
1165					95% Gamma Approximate UCL (use when n>=50)	32.01				95% Gamma Adjusted UCL (use when n<50)		37.99
1166												
1167					Estimates of Gamma Parameters using KM Estimates							
1168					Mean (KM)	19.22				SD (KM)		10.16
1169					Variance (KM)	103.2				SE of Mean (KM)		4.638
1170					k hat (KM)	3.577				k star (KM)		1.9
1171					nu hat (KM)	42.93				nu star (KM)		22.8
1172					theta hat (KM)	5.372				theta star (KM)		10.12
1173					80% gamma percentile (KM)	28.94				90% gamma percentile (KM)		37.83
1174					95% gamma percentile (KM)	46.33				99% gamma percentile (KM)		65.25
1175												
1176					Gamma Kaplan-Meier (KM) Statistics							
1177					Approximate Chi Square Value (22.80, α)	12.94				Adjusted Chi Square Value (22.80, β)		10.36
1178					95% Gamma Approximate KM-UCL (use when n>=50)	33.86				95% Gamma Adjusted KM-UCL (use when n<50)		42.29
1179												
1180					Lognormal GOF Test on Detected Observations Only							
1181					Shapiro Wilk Test Statistic	0.889	Shapiro Wilk GOF Test					
1182					5% Shapiro Wilk Critical Value	0.762	Detected Data appear Lognormal at 5% Significance Level					

	A	B	C	D	E	F	G	H	I	J	K	L
1183					Lilliefors Test Statistic	0.242	Lilliefors GOF Test					
1184					5% Lilliefors Critical Value	0.343	Detected Data appear Lognormal at 5% Significance Level					
1185	Detected Data appear Lognormal at 5% Significance Level											
1186												
1187	Lognormal ROS Statistics Using Imputed Non-Detects											
1188					Mean in Original Scale	20.8				Mean in Log Scale		2.958
1189					SD in Original Scale	8.196				SD in Log Scale		0.448
1190					95% t UCL (assumes normality of ROS data)	27.54				95% Percentile Bootstrap UCL		25.67
1191					95% BCA Bootstrap UCL	25.5				95% Bootstrap t UCL		26.94
1192					95% H-UCL (Log ROS)	35.27						
1193												
1194	Statistics using KM estimates on Logged Data and Assuming Lognormal Distribution											
1195					KM Mean (logged)	2.378				KM Geo Mean		10.78
1196					KM SD (logged)	1.625				95% Critical H Value (KM-Log)		6.331
1197					KM Standard Error of Mean (logged)	0.742				95% H-UCL (KM -Log)		4019
1198					KM SD (logged)	1.625				95% Critical H Value (KM-Log)		6.331
1199					KM Standard Error of Mean (logged)	0.742						
1200												
1201	DL/2 Statistics											
1202		DL/2 Normal					DL/2 Log-Transformed					
1203					Mean in Original Scale	19.19				Mean in Log Scale		2.262
1204					SD in Original Scale	11.18				SD in Log Scale		2.06
1205					95% t UCL (Assumes normality)	28.39				95% H-Stat UCL		117894
1206	DL/2 is not a recommended method, provided for comparisons and historical reasons											
1207												
1208	Nonparametric Distribution Free UCL Statistics											
1209	Detected Data appear Normal Distributed at 5% Significance Level											
1210												
1211	Suggested UCL to Use											
1212					95% KM (t) UCL	28.56						
1213												
1214	Note: Suggestions regarding the selection of a 95% UCL are provided to help the user to select the most appropriate 95% UCL.											
1215	Recommendations are based upon data size, data distribution, and skewness.											
1216	These recommendations are based upon the results of the simulation studies summarized in Singh, Maichle, and Lee (2006).											
1217	However, simulations results will not cover all Real World data sets; for additional insight the user may want to consult a statistician.											
1218												
1219	Benzo[a]anthracene											
1220												
1221	General Statistics											
1222					Total Number of Observations	6				Number of Distinct Observations		5
1223					Number of Detects	0				Number of Non-Detects		6
1224					Number of Distinct Detects	0				Number of Distinct Non-Detects		5
1225												

	A	B	C	D	E	F	G	H	I	J	K	L
1226	Warning: All observations are Non-Detects (NDs), therefore all statistics and estimates should also be NDs!											
1227	Specifically, sample mean, UCLs, UPLs, and other statistics are also NDs lying below the largest detection limit!											
1228	The Project Team may decide to use alternative site specific values to estimate environmental parameters (e.g., EPC, BTV).											
1229												
1230	The data set for variable Benzo[a]anthracene was not processed!											
1231												
1232												
1233	Benzo(a)pyrene											
1234												
1235	General Statistics											
1236	Total Number of Observations					6	Number of Distinct Observations				5	
1237	Number of Detects					0	Number of Non-Detects				6	
1238	Number of Distinct Detects					0	Number of Distinct Non-Detects				5	
1239												
1240	Warning: All observations are Non-Detects (NDs), therefore all statistics and estimates should also be NDs!											
1241	Specifically, sample mean, UCLs, UPLs, and other statistics are also NDs lying below the largest detection limit!											
1242	The Project Team may decide to use alternative site specific values to estimate environmental parameters (e.g., EPC, BTV).											
1243												
1244	The data set for variable Benzo(a)pyrene was not processed!											
1245												
1246												
1247	Benzo[b]fluoranthene											
1248												
1249	General Statistics											
1250	Total Number of Observations					6	Number of Distinct Observations				5	
1251	Number of Detects					0	Number of Non-Detects				6	
1252	Number of Distinct Detects					0	Number of Distinct Non-Detects				5	
1253												
1254	Warning: All observations are Non-Detects (NDs), therefore all statistics and estimates should also be NDs!											
1255	Specifically, sample mean, UCLs, UPLs, and other statistics are also NDs lying below the largest detection limit!											
1256	The Project Team may decide to use alternative site specific values to estimate environmental parameters (e.g., EPC, BTV).											
1257												
1258	The data set for variable Benzo[b]fluoranthene was not processed!											
1259												
1260												
1261	Benzo[k]fluoranthene											
1262												
1263	General Statistics											
1264	Total Number of Observations					6	Number of Distinct Observations				5	
1265	Number of Detects					0	Number of Non-Detects				6	
1266	Number of Distinct Detects					0	Number of Distinct Non-Detects				5	
1267												
1268	Warning: All observations are Non-Detects (NDs), therefore all statistics and estimates should also be NDs!											
1269	Specifically, sample mean, UCLs, UPLs, and other statistics are also NDs lying below the largest detection limit!											
1270	The Project Team may decide to use alternative site specific values to estimate environmental parameters (e.g., EPC, BTV).											
1271												
1272	The data set for variable Benzo[k]fluoranthene was not processed!											
1273												
1274												

	A	B	C	D	E	F	G	H	I	J	K	L
1275	Chrysene											
1276												
1277						General Statistics						
1278					Total Number of Observations	6			Number of Distinct Observations			5
1279					Number of Detects	0			Number of Non-Detects			6
1280					Number of Distinct Detects	0			Number of Distinct Non-Detects			5
1281												
1282						Warning: All observations are Non-Detects (NDs), therefore all statistics and estimates should also be NDs!						
1283						Specifically, sample mean, UCLs, UPLs, and other statistics are also NDs lying below the largest detection limit!						
1284						The Project Team may decide to use alternative site specific values to estimate environmental parameters (e.g., EPC, BTV).						
1285												
1286						The data set for variable Chrysene was not processed!						
1287												
1288												
1289	Dibenz(a,h)anthracene											
1290												
1291						General Statistics						
1292					Total Number of Observations	6			Number of Distinct Observations			5
1293					Number of Detects	0			Number of Non-Detects			6
1294					Number of Distinct Detects	0			Number of Distinct Non-Detects			5
1295												
1296						Warning: All observations are Non-Detects (NDs), therefore all statistics and estimates should also be NDs!						
1297						Specifically, sample mean, UCLs, UPLs, and other statistics are also NDs lying below the largest detection limit!						
1298						The Project Team may decide to use alternative site specific values to estimate environmental parameters (e.g., EPC, BTV).						
1299												
1300						The data set for variable Dibenz(a,h)anthracene was not processed!						
1301												
1302												
1303	Indeno[1,2,3-cd]pyrene											
1304												
1305						General Statistics						
1306					Total Number of Observations	6			Number of Distinct Observations			5
1307					Number of Detects	0			Number of Non-Detects			6
1308					Number of Distinct Detects	0			Number of Distinct Non-Detects			5
1309												
1310						Warning: All observations are Non-Detects (NDs), therefore all statistics and estimates should also be NDs!						
1311						Specifically, sample mean, UCLs, UPLs, and other statistics are also NDs lying below the largest detection limit!						
1312						The Project Team may decide to use alternative site specific values to estimate environmental parameters (e.g., EPC, BTV).						
1313												
1314						The data set for variable Indeno[1,2,3-cd]pyrene was not processed!						
1315												
1316												
1317	Naphthalene											
1318												
1319						General Statistics						
1320					Total Number of Observations	6			Number of Distinct Observations			6
1321					Number of Detects	5			Number of Non-Detects			1
1322					Number of Distinct Detects	5			Number of Distinct Non-Detects			1
1323					Minimum Detect	4.7			Minimum Non-Detect			0.28
1324					Maximum Detect	23			Maximum Non-Detect			0.28
1325					Variance Detects	58.14			Percent Non-Detects			16.67%
1326					Mean Detects	12.16			SD Detects			7.625

	A	B	C	D	E	F	G	H	I	J	K	L
1327					Median Detects	9.1					CV Detects	0.627
1328					Skewness Detects	0.757					Kurtosis Detects	-1.252
1329					Mean of Logged Detects	2.334					SD of Logged Detects	0.647
1330												
1331					Note: Sample size is small (e.g., <10), if data are collected using ISM approach, you should use							
1332					guidance provided in ITRC Tech Reg Guide on ISM (ITRC, 2012) to compute statistics of interest.							
1333					For example, you may want to use Chebyshev UCL to estimate EPC (ITRC, 2012).							
1334					Chebyshev UCL can be computed using the Nonparametric and All UCL Options of ProUCL 5.1							
1335												
1336					Normal GOF Test on Detects Only							
1337					Shapiro Wilk Test Statistic	0.913			Shapiro Wilk GOF Test			
1338					5% Shapiro Wilk Critical Value	0.762			Detected Data appear Normal at 5% Significance Level			
1339					Lilliefors Test Statistic	0.256			Lilliefors GOF Test			
1340					5% Lilliefors Critical Value	0.343			Detected Data appear Normal at 5% Significance Level			
1341					Detected Data appear Normal at 5% Significance Level							
1342												
1343					Kaplan-Meier (KM) Statistics using Normal Critical Values and other Nonparametric UCLs							
1344					KM Mean	10.18			KM Standard Error of Mean			3.487
1345					KM SD	7.64			95% KM (BCA) UCL			15.67
1346					95% KM (t) UCL	17.21			95% KM (Percentile Bootstrap) UCL			15.55
1347					95% KM (z) UCL	15.92			95% KM Bootstrap t UCL			21.63
1348					90% KM Chebyshev UCL	20.64			95% KM Chebyshev UCL			25.38
1349					97.5% KM Chebyshev UCL	31.96			99% KM Chebyshev UCL			44.88
1350												
1351					Gamma GOF Tests on Detected Observations Only							
1352					A-D Test Statistic	0.266			Anderson-Darling GOF Test			
1353					5% A-D Critical Value	0.682			Detected data appear Gamma Distributed at 5% Significance Level			
1354					K-S Test Statistic	0.219			Kolmogorov-Smirnov GOF			
1355					5% K-S Critical Value	0.359			Detected data appear Gamma Distributed at 5% Significance Level			
1356					Detected data appear Gamma Distributed at 5% Significance Level							
1357												
1358					Gamma Statistics on Detected Data Only							
1359					k hat (MLE)	3.205			k star (bias corrected MLE)			1.415
1360					Theta hat (MLE)	3.794			Theta star (bias corrected MLE)			8.592
1361					nu hat (MLE)	32.05			nu star (bias corrected)			14.15
1362					Mean (detects)	12.16						
1363												
1364					Gamma ROS Statistics using Imputed Non-Detects							
1365					GROS may not be used when data set has > 50% NDs with many tied observations at multiple DLs							
1366					GROS may not be used when kstar of detects is small such as <1.0, especially when the sample size is small (e.g., <15-20)							
1367					For such situations, GROS method may yield incorrect values of UCLs and BTVs							
1368					This is especially true when the sample size is small.							
1369					For gamma distributed detected data, BTVs and UCLs may be computed using gamma distribution on KM estimates							
1370					Minimum	0.01			Mean			10.14
1371					Maximum	23			Median			8.05
1372					SD	8.433			CV			0.832
1373					k hat (MLE)	0.55			k star (bias corrected MLE)			0.386
1374					Theta hat (MLE)	18.43			Theta star (bias corrected MLE)			26.25
1375					nu hat (MLE)	6.598			nu star (bias corrected)			4.633
1376					Adjusted Level of Significance (β)	0.0122						
1377					Approximate Chi Square Value (4.63, α)	0.986			Adjusted Chi Square Value (4.63, β)			0.513
1378					95% Gamma Approximate UCL (use when n>=50)	47.6			95% Gamma Adjusted UCL (use when n<50)			91.59

	A	B	C	D	E	F	G	H	I	J	K	L
1379												
1380					Estimates of Gamma Parameters using KM Estimates							
1381					Mean (KM)	10.18				SD (KM)		7.64
1382					Variance (KM)	58.36				SE of Mean (KM)		3.487
1383					k hat (KM)	1.776				k star (KM)		0.999
1384					nu hat (KM)	21.31				nu star (KM)		11.99
1385					theta hat (KM)	5.733				theta star (KM)		10.19
1386					80% gamma percentile (KM)	16.39				90% gamma percentile (KM)		23.45
1387					95% gamma percentile (KM)	30.51				99% gamma percentile (KM)		46.91
1388												
1389					Gamma Kaplan-Meier (KM) Statistics							
1390					Approximate Chi Square Value (11.99, α)	5.218				Adjusted Chi Square Value (11.99, β)		3.729
1391					95% Gamma Approximate KM-UCL (use when n>=50)	23.38				95% Gamma Adjusted KM-UCL (use when n<50)		32.72
1392												
1393					Lognormal GOF Test on Detected Observations Only							
1394					Shapiro Wilk Test Statistic	0.961				Shapiro Wilk GOF Test		
1395					5% Shapiro Wilk Critical Value	0.762				Detected Data appear Lognormal at 5% Significance Level		
1396					Lilliefors Test Statistic	0.18				Lilliefors GOF Test		
1397					5% Lilliefors Critical Value	0.343				Detected Data appear Lognormal at 5% Significance Level		
1398					Detected Data appear Lognormal at 5% Significance Level							
1399												
1400					Lognormal ROS Statistics Using Imputed Non-Detects							
1401					Mean in Original Scale	10.45				Mean in Log Scale		2.054
1402					SD in Original Scale	8				SD in Log Scale		0.899
1403					95% t UCL (assumes normality of ROS data)	17.03				95% Percentile Bootstrap UCL		15.63
1404					95% BCA Bootstrap UCL	16.17				95% Bootstrap t UCL		24.76
1405					95% H-UCL (Log ROS)	53.01						
1406												
1407					Statistics using KM estimates on Logged Data and Assuming Lognormal Distribution							
1408					KM Mean (logged)	1.733				KM Geo Mean		5.657
1409					KM SD (logged)	1.444				95% Critical H Value (KM-Log)		5.68
1410					KM Standard Error of Mean (logged)	0.659				95% H-UCL (KM -Log)		629.8
1411					KM SD (logged)	1.444				95% Critical H Value (KM-Log)		5.68
1412					KM Standard Error of Mean (logged)	0.659						
1413												
1414					DL/2 Statistics							
1415					DL/2 Normal					DL/2 Log-Transformed		
1416					Mean in Original Scale	10.16				Mean in Log Scale		1.617
1417					SD in Original Scale	8.402				SD in Log Scale		1.849
1418					95% t UCL (Assumes normality)	17.07				95% H-Stat UCL		10234
1419					DL/2 is not a recommended method, provided for comparisons and historical reasons							
1420												
1421					Nonparametric Distribution Free UCL Statistics							
1422					Detected Data appear Normal Distributed at 5% Significance Level							
1423												

	A	B	C	D	E	F	G	H	I	J	K	L
1424						Suggested UCL to Use						
1425					95% KM (t) UCL	17.21						
1426												
1427					Note: Suggestions regarding the selection of a 95% UCL are provided to help the user to select the most appropriate 95% UCL.							
1428					Recommendations are based upon data size, data distribution, and skewness.							
1429					These recommendations are based upon the results of the simulation studies summarized in Singh, Maichle, and Lee (2006).							
1430					However, simulations results will not cover all Real World data sets; for additional insight the user may want to consult a statistician.							
1431												
1432	Bis(2-ethylhexyl) phthalate											
1433												
1434						General Statistics						
1435					Total Number of Observations	6			Number of Distinct Observations		5	
1436					Number of Detects	4			Number of Non-Detects		2	
1437					Number of Distinct Detects	3			Number of Distinct Non-Detects		2	
1438					Minimum Detect	0.52			Minimum Non-Detect		30	
1439					Maximum Detect	1.6			Maximum Non-Detect		31	
1440					Variance Detects	0.34			Percent Non-Detects		33.33%	
1441					Mean Detects	1.098			SD Detects		0.583	
1442					Median Detects	1.135			CV Detects		0.532	
1443					Skewness Detects	-0.0569			Kurtosis Detects		-5.672	
1444					Mean of Logged Detects	-0.0286			SD of Logged Detects		0.585	
1445												
1446					Note: Sample size is small (e.g., <10), if data are collected using ISM approach, you should use							
1447					guidance provided in ITRC Tech Reg Guide on ISM (ITRC, 2012) to compute statistics of interest.							
1448					For example, you may want to use Chebyshev UCL to estimate EPC (ITRC, 2012).							
1449					Chebyshev UCL can be computed using the Nonparametric and All UCL Options of ProUCL 5.1							
1450												
1451						Normal GOF Test on Detects Only						
1452					Shapiro Wilk Test Statistic	0.79			Shapiro Wilk GOF Test			
1453					5% Shapiro Wilk Critical Value	0.748			Detected Data appear Normal at 5% Significance Level			
1454					Lilliefors Test Statistic	0.305			Lilliefors GOF Test			
1455					5% Lilliefors Critical Value	0.375			Detected Data appear Normal at 5% Significance Level			
1456						Detected Data appear Normal at 5% Significance Level						
1457												
1458						Kaplan-Meier (KM) Statistics using Normal Critical Values and other Nonparametric UCLs						
1459					KM Mean	1.098			KM Standard Error of Mean		0.292	
1460					KM SD	0.505			95% KM (BCA) UCL		N/A	
1461					95% KM (t) UCL	1.685			95% KM (Percentile Bootstrap) UCL		N/A	
1462					95% KM (z) UCL	1.577			95% KM Bootstrap t UCL		N/A	
1463					90% KM Chebyshev UCL	1.973			95% KM Chebyshev UCL		2.369	
1464					97.5% KM Chebyshev UCL	2.919			99% KM Chebyshev UCL		4	
1465												
1466						Gamma GOF Tests on Detected Observations Only						
1467					A-D Test Statistic	0.553			Anderson-Darling GOF Test			
1468					5% A-D Critical Value	0.659			Detected data appear Gamma Distributed at 5% Significance Level			
1469					K-S Test Statistic	0.338			Kolmogorov-Smirnov GOF			
1470					5% K-S Critical Value	0.396			Detected data appear Gamma Distributed at 5% Significance Level			
1471						Detected data appear Gamma Distributed at 5% Significance Level						
1472												

	A	B	C	D	E	F	G	H	I	J	K	L
1473	Gamma Statistics on Detected Data Only											
1474					k hat (MLE)	4.27					k star (bias corrected MLE)	1.234
1475					Theta hat (MLE)	0.257					Theta star (bias corrected MLE)	0.889
1476					nu hat (MLE)	34.16					nu star (bias corrected)	9.874
1477					Mean (detects)	1.098						
1478												
1479	Gamma ROS Statistics using Imputed Non-Detects											
1480	GROS may not be used when data set has > 50% NDs with many tied observations at multiple DLs											
1481	GROS may not be used when kstar of detects is small such as <1.0, especially when the sample size is small (e.g., <15-20)											
1482	For such situations, GROS method may yield incorrect values of UCLs and BTVs											
1483	This is especially true when the sample size is small.											
1484	For gamma distributed detected data, BTVs and UCLs may be computed using gamma distribution on KM estimates											
1485					Minimum	0.52					Mean	1.082
1486					Maximum	1.6					Median	1.05
1487					SD	0.453					CV	0.418
1488					k hat (MLE)	6.312					k star (bias corrected MLE)	3.267
1489					Theta hat (MLE)	0.171					Theta star (bias corrected MLE)	0.331
1490					nu hat (MLE)	75.74					nu star (bias corrected)	39.2
1491					Adjusted Level of Significance (β)	0.0122						
1492					Approximate Chi Square Value (39.20, α)	25.86					Adjusted Chi Square Value (39.20, β)	22.03
1493					95% Gamma Approximate UCL (use when n>=50)	1.64					95% Gamma Adjusted UCL (use when n<50)	N/A
1494												
1495	Estimates of Gamma Parameters using KM Estimates											
1496					Mean (KM)	1.098					SD (KM)	0.505
1497					Variance (KM)	0.255					SE of Mean (KM)	0.292
1498					k hat (KM)	4.718					k star (KM)	2.47
1499					nu hat (KM)	56.61					nu star (KM)	29.64
1500					theta hat (KM)	0.233					theta star (KM)	0.444
1501					80% gamma percentile (KM)	1.602					90% gamma percentile (KM)	2.033
1502					95% gamma percentile (KM)	2.439					99% gamma percentile (KM)	3.328
1503												
1504	Gamma Kaplan-Meier (KM) Statistics											
1505					Approximate Chi Square Value (29.64, α)	18.21					Adjusted Chi Square Value (29.64, β)	15.07
1506					95% Gamma Approximate KM-UCL (use when n>=50)	1.786					95% Gamma Adjusted KM-UCL (use when n<50)	2.159
1507												
1508	Lognormal GOF Test on Detected Observations Only											
1509					Shapiro Wilk Test Statistic	0.822			Shapiro Wilk GOF Test			
1510					5% Shapiro Wilk Critical Value	0.748			Detected Data appear Lognormal at 5% Significance Level			
1511					Lilliefors Test Statistic	0.303			Lilliefors GOF Test			
1512					5% Lilliefors Critical Value	0.375			Detected Data appear Lognormal at 5% Significance Level			
1513	Detected Data appear Lognormal at 5% Significance Level											
1514												
1515	Lognormal ROS Statistics Using Imputed Non-Detects											
1516					Mean in Original Scale	1.056					Mean in Log Scale	-0.0286
1517					SD in Original Scale	0.457					SD in Log Scale	0.453
1518					95% t UCL (assumes normality of ROS data)	1.431					95% Percentile Bootstrap UCL	N/A
1519					95% BCA Bootstrap UCL	N/A					95% Bootstrap t UCL	N/A
1520					95% H-UCL (Log ROS)	1.798						
1521												

	A	B	C	D	E	F	G	H	I	J	K	L
1522	Statistics using KM estimates on Logged Data and Assuming Lognormal Distribution											
1523					KM Mean (logged)	-0.0286					KM Geo Mean	0.972
1524					KM SD (logged)	0.507					95% Critical H Value (KM-Log)	2.654
1525					KM Standard Error of Mean (logged)	0.292					95% H-UCL (KM -Log)	2.016
1526					KM SD (logged)	0.507					95% Critical H Value (KM-Log)	2.654
1527					KM Standard Error of Mean (logged)	0.292						
1528												
1529	DL/2 Statistics											
1530	DL/2 Normal						DL/2 Log-Transformed					
1531					Mean in Original Scale	5.815					Mean in Log Scale	0.889
1532					SD in Original Scale	7.324					SD in Log Scale	1.492
1533					95% t UCL (Assumes normality)	11.84					95% H-Stat UCL	367.7
1534	DL/2 is not a recommended method, provided for comparisons and historical reasons											
1535												
1536	Nonparametric Distribution Free UCL Statistics											
1537	Detected Data appear Normal Distributed at 5% Significance Level											
1538												
1539	Suggested UCL to Use											
1540					95% KM (t) UCL	1.685						
1541	Warning: Recommended UCL exceeds the maximum observation											
1542												
1543	Note: Suggestions regarding the selection of a 95% UCL are provided to help the user to select the most appropriate 95% UCL.											
1544	Recommendations are based upon data size, data distribution, and skewness.											
1545	These recommendations are based upon the results of the simulation studies summarized in Singh, Maichle, and Lee (2006).											
1546	However, simulations results will not cover all Real World data sets; for additional insight the user may want to consult a statistician.											
1547												
1548	Dibenzofuran											
1549												
1550	General Statistics											
1551					Total Number of Observations	6					Number of Distinct Observations	4
1552					Number of Detects	5					Number of Non-Detects	1
1553					Number of Distinct Detects	3					Number of Distinct Non-Detects	1
1554					Minimum Detect	0.6					Minimum Non-Detect	0.35
1555					Maximum Detect	1.5					Maximum Non-Detect	0.35
1556					Variance Detects	0.158					Percent Non-Detects	16.67%
1557					Mean Detects	1.24					SD Detects	0.397
1558					Median Detects	1.5					CV Detects	0.321
1559					Skewness Detects	-1.408					Kurtosis Detects	1.106
1560					Mean of Logged Detects	0.16					SD of Logged Detects	0.398
1561												
1562	Note: Sample size is small (e.g., <10), if data are collected using ISM approach, you should use											
1563	guidance provided in ITRC Tech Reg Guide on ISM (ITRC, 2012) to compute statistics of interest.											
1564	For example, you may want to use Chebyshev UCL to estimate EPC (ITRC, 2012).											
1565	Chebyshev UCL can be computed using the Nonparametric and All UCL Options of ProUCL 5.1											
1566												
1567	Normal GOF Test on Detects Only											
1568					Shapiro Wilk Test Statistic	0.764	Shapiro Wilk GOF Test					
1569					5% Shapiro Wilk Critical Value	0.762	Detected Data appear Normal at 5% Significance Level					
1570					Lilliefors Test Statistic	0.343	Lilliefors GOF Test					

	A	B	C	D	E	F	G	H	I	J	K	L
1571					5% Lilliefors Critical Value	0.343	Detected Data Not Normal at 5% Significance Level					
1572	**Detected Data appear Approximate Normal at 5% Significance Level**											
1573												
1574	**Kaplan-Meier (KM) Statistics using Normal Critical Values and other Nonparametric UCLs**											
1575					KM Mean	1.092				KM Standard Error of Mean		0.212
1576					KM SD	0.464				95% KM (BCA) UCL		N/A
1577					95% KM (t) UCL	1.518				95% KM (Percentile Bootstrap) UCL		N/A
1578					95% KM (z) UCL	1.44				95% KM Bootstrap t UCL		N/A
1579					90% KM Chebyshev UCL	1.727				95% KM Chebyshev UCL		2.015
1580					97.5% KM Chebyshev UCL	2.414				99% KM Chebyshev UCL		3.199
1581												
1582	**Gamma GOF Tests on Detected Observations Only**											
1583					A-D Test Statistic	0.737	**Anderson-Darling GOF Test**					
1584					5% A-D Critical Value	0.679	Detected Data Not Gamma Distributed at 5% Significance Level					
1585					K-S Test Statistic	0.36	**Kolmogorov-Smirnov GOF**					
1586					5% K-S Critical Value	0.358	Detected Data Not Gamma Distributed at 5% Significance Level					
1587	**Detected Data Not Gamma Distributed at 5% Significance Level**											
1588												
1589	**Gamma Statistics on Detected Data Only**											
1590					k hat (MLE)	9.265				k star (bias corrected MLE)		3.839
1591					Theta hat (MLE)	0.134				Theta star (bias corrected MLE)		0.323
1592					nu hat (MLE)	92.65				nu star (bias corrected)		38.39
1593					Mean (detects)	1.24						
1594												
1595	**Gamma ROS Statistics using Imputed Non-Detects**											
1596	GROS may not be used when data set has > 50% NDs with many tied observations at multiple DLs											
1597	GROS may not be used when kstar of detects is small such as <1.0, especially when the sample size is small (e.g., <15-20)											
1598	For such situations, GROS method may yield incorrect values of UCLs and BTVs											
1599	This is especially true when the sample size is small.											
1600	For gamma distributed detected data, BTVs and UCLs may be computed using gamma distribution on KM estimates											
1601					Minimum	0.521				Mean		1.12
1602					Maximum	1.5				Median		1.3
1603					SD	0.461				CV		0.412
1604					k hat (MLE)	5.798				k star (bias corrected MLE)		3.01
1605					Theta hat (MLE)	0.193				Theta star (bias corrected MLE)		0.372
1606					nu hat (MLE)	69.58				nu star (bias corrected)		36.12
1607					Adjusted Level of Significance (β)	0.0122						
1608					Approximate Chi Square Value (36.12, α)	23.37				Adjusted Chi Square Value (36.12, β)		19.75
1609					95% Gamma Approximate UCL (use when n>=50)	1.732				95% Gamma Adjusted UCL (use when n<50)		2.049
1610												
1611	**Estimates of Gamma Parameters using KM Estimates**											
1612					Mean (KM)	1.092				SD (KM)		0.464
1613					Variance (KM)	0.215				SE of Mean (KM)		0.212
1614					k hat (KM)	5.534				k star (KM)		2.878
1615					nu hat (KM)	66.41				nu star (KM)		34.54
1616					theta hat (KM)	0.197				theta star (KM)		0.379
1617					80% gamma percentile (KM)	1.565				90% gamma percentile (KM)		1.954
1618					95% gamma percentile (KM)	2.319				99% gamma percentile (KM)		3.11
1619												

	A	B	C	D	E	F	G	H	I	J	K	L
1620	Gamma Kaplan-Meier (KM) Statistics											
1621	Approximate Chi Square Value (34.54, α)					22.09	Adjusted Chi Square Value (34.54, β)					18.59
1622	95% Gamma Approximate KM-UCL (use when n>=50)					1.706	95% Gamma Adjusted KM-UCL (use when n<50)					2.028
1623												
1624	Lognormal GOF Test on Detected Observations Only											
1625	Shapiro Wilk Test Statistic					0.736	Shapiro Wilk GOF Test					
1626	5% Shapiro Wilk Critical Value					0.762	Detected Data Not Lognormal at 5% Significance Level					
1627	Lilliefors Test Statistic					0.331	Lilliefors GOF Test					
1628	5% Lilliefors Critical Value					0.343	Detected Data appear Lognormal at 5% Significance Level					
1629	Detected Data appear Approximate Lognormal at 5% Significance Level											
1630												
1631	Lognormal ROS Statistics Using Imputed Non-Detects											
1632	Mean in Original Scale					1.116	Mean in Log Scale					0.0169
1633	SD in Original Scale					0.467	SD in Log Scale					0.5
1634	95% t UCL (assumes normality of ROS data)					1.501	95% Percentile Bootstrap UCL					N/A
1635	95% BCA Bootstrap UCL					N/A	95% Bootstrap t UCL					N/A
1636	95% H-UCL (Log ROS)					2.079						
1637												
1638	Statistics using KM estimates on Logged Data and Assuming Lognormal Distribution											
1639	KM Mean (logged)					-0.0415	KM Geo Mean					0.959
1640	KM SD (logged)					0.556	95% Critical H Value (KM-Log)					2.777
1641	KM Standard Error of Mean (logged)					0.254	95% H-UCL (KM -Log)					2.233
1642	KM SD (logged)					0.556	95% Critical H Value (KM-Log)					2.777
1643	KM Standard Error of Mean (logged)					0.254						
1644												
1645	DL/2 Statistics											
1646	DL/2 Normal						DL/2 Log-Transformed					
1647	Mean in Original Scale					1.063	Mean in Log Scale					-0.157
1648	SD in Original Scale					0.562	SD in Log Scale					0.855
1649	95% t UCL (Assumes normality)					1.525	95% H-Stat UCL					4.949
1650	DL/2 is not a recommended method, provided for comparisons and historical reasons											
1651												
1652	Nonparametric Distribution Free UCL Statistics											
1653	Detected Data appear Approximate Normal Distributed at 5% Significance Level											
1654												
1655	Suggested UCL to Use											
1656	95% KM (t) UCL					1.518						
1657	Warning: Recommended UCL exceeds the maximum observation											
1658												
1659	When a data set follows an approximate (e.g., normal) distribution passing one of the GOF test											
1660	When applicable, it is suggested to use a UCL based upon a distribution (e.g., gamma) passing both GOF tests in ProUCL											
1661												
1662	Note: Suggestions regarding the selection of a 95% UCL are provided to help the user to select the most appropriate 95% UCL.											
1663	Recommendations are based upon data size, data distribution, and skewness.											
1664	These recommendations are based upon the results of the simulation studies summarized in Singh, Maichle, and Lee (2006).											
1665	However, simulations results will not cover all Real World data sets; for additional insight the user may want to consult a statistician.											
1666												

	A	B	C	D	E	F	G	H	I	J	K	L
1667	Aluminum											
1668												
1669						General Statistics						
1670					Total Number of Observations	6				Number of Distinct Observations		5
1671					Number of Detects	4				Number of Non-Detects		2
1672					Number of Distinct Detects	4				Number of Distinct Non-Detects		1
1673					Minimum Detect	5.5				Minimum Non-Detect		13
1674					Maximum Detect	920				Maximum Non-Detect		13
1675					Variance Detects	195898				Percent Non-Detects		33.33%
1676					Mean Detects	256.9				SD Detects		442.6
1677					Median Detects	51				CV Detects		1.723
1678					Skewness Detects	1.986				Kurtosis Detects		3.955
1679					Mean of Logged Detects	4.098				SD of Logged Detects		2.099
1680												
1681					Note: Sample size is small (e.g., <10), if data are collected using ISM approach, you should use							
1682					guidance provided in ITRC Tech Reg Guide on ISM (ITRC, 2012) to compute statistics of interest.							
1683					For example, you may want to use Chebyshev UCL to estimate EPC (ITRC, 2012).							
1684					Chebyshev UCL can be computed using the Nonparametric and All UCL Options of ProUCL 5.1							
1685												
1686						Normal GOF Test on Detects Only						
1687					Shapiro Wilk Test Statistic	0.673				Shapiro Wilk GOF Test		
1688					5% Shapiro Wilk Critical Value	0.748				Detected Data Not Normal at 5% Significance Level		
1689					Lilliefors Test Statistic	0.428				Lilliefors GOF Test		
1690					5% Lilliefors Critical Value	0.375				Detected Data Not Normal at 5% Significance Level		
1691						Detected Data Not Normal at 5% Significance Level						
1692												
1693						Kaplan-Meier (KM) Statistics using Normal Critical Values and other Nonparametric UCLs						
1694					KM Mean	173.1				KM Standard Error of Mean		157.8
1695					KM SD	334.7				95% KM (BCA) UCL		N/A
1696					95% KM (t) UCL	491				95% KM (Percentile Bootstrap) UCL		N/A
1697					95% KM (z) UCL	432.6				95% KM Bootstrap t UCL		N/A
1698					90% KM Chebyshev UCL	646.4				95% KM Chebyshev UCL		860.7
1699					97.5% KM Chebyshev UCL	1158				99% KM Chebyshev UCL		1743
1700												
1701						Gamma GOF Tests on Detected Observations Only						
1702					A-D Test Statistic	0.461				Anderson-Darling GOF Test		
1703					5% A-D Critical Value	0.687				Detected data appear Gamma Distributed at 5% Significance Level		
1704					K-S Test Statistic	0.374				Kolmogorov-Smirnov GOF		
1705					5% K-S Critical Value	0.412				Detected data appear Gamma Distributed at 5% Significance Level		
1706						Detected data appear Gamma Distributed at 5% Significance Level						
1707												
1708						Gamma Statistics on Detected Data Only						
1709					k hat (MLE)	0.446				k star (bias corrected MLE)		0.278
1710					Theta hat (MLE)	576.1				Theta star (bias corrected MLE)		923.6
1711					nu hat (MLE)	3.567				nu star (bias corrected)		2.225
1712					Mean (detects)	256.9						
1713												
1714						Gamma ROS Statistics using Imputed Non-Detects						
1715						GROS may not be used when data set has > 50% NDs with many tied observations at multiple DLs						
1716						GROS may not be used when kstar of detects is small such as <1.0, especially when the sample size is small (e.g., <15-20)						
1717						For such situations, GROS method may yield incorrect values of UCLs and BTVs						
1718						This is especially true when the sample size is small.						

	A	B	C	D	E	F	G	H	I	J	K	L
1719	For gamma distributed detected data, BTVs and UCLs may be computed using gamma distribution on KM estimates											
1720					Minimum	0.01					Mean	171.3
1721					Maximum	920					Median	27.75
1722					SD	367.6					CV	2.147
1723					k hat (MLE)	0.188					k star (bias corrected MLE)	0.205
1724					Theta hat (MLE)	909.7					Theta star (bias corrected MLE)	834.4
1725					nu hat (MLE)	2.259					nu star (bias corrected)	2.463
1726					Adjusted Level of Significance (β)	0.0122						
1727					Approximate Chi Square Value (2.46, α)	0.233					Adjusted Chi Square Value (2.46, β)	0.11
1728					95% Gamma Approximate UCL (use when n>=50)	1811					95% Gamma Adjusted UCL (use when n<50)	N/A
1729												
1730	**Estimates of Gamma Parameters using KM Estimates**											
1731					Mean (KM)	173.1					SD (KM)	334.7
1732					Variance (KM)	111991					SE of Mean (KM)	157.8
1733					k hat (KM)	0.268					k star (KM)	0.245
1734					nu hat (KM)	3.21					nu star (KM)	2.938
1735					theta hat (KM)	647					theta star (KM)	706.9
1736					80% gamma percentile (KM)	249.5					90% gamma percentile (KM)	520.3
1737					95% gamma percentile (KM)	843					99% gamma percentile (KM)	1705
1738												
1739	**Gamma Kaplan-Meier (KM) Statistics**											
1740					Approximate Chi Square Value (2.94, α)	0.354					Adjusted Chi Square Value (2.94, β)	0.159
1741					95% Gamma Approximate KM-UCL (use when n>=50)	1435					95% Gamma Adjusted KM-UCL (use when n<50)	3197
1742												
1743	**Lognormal GOF Test on Detected Observations Only**											
1744					Shapiro Wilk Test Statistic	0.94					**Shapiro Wilk GOF Test**	
1745					5% Shapiro Wilk Critical Value	0.748					Detected Data appear Lognormal at 5% Significance Level	
1746					Lilliefors Test Statistic	0.278					**Lilliefors GOF Test**	
1747					5% Lilliefors Critical Value	0.375					Detected Data appear Lognormal at 5% Significance Level	
1748	**Detected Data appear Lognormal at 5% Significance Level**											
1749												
1750	**Lognormal ROS Statistics Using Imputed Non-Detects**											
1751					Mean in Original Scale	172.9					Mean in Log Scale	3.189
1752					SD in Original Scale	366.7					SD in Log Scale	2.194
1753					95% t UCL (assumes normality of ROS data)	474.6					95% Percentile Bootstrap UCL	469
1754					95% BCA Bootstrap UCL	485.3					95% Bootstrap t UCL	3327
1755					95% H-UCL (Log ROS)	1041982						
1756												
1757	**Statistics using KM estimates on Logged Data and Assuming Lognormal Distribution**											
1758					KM Mean (logged)	3.3					KM Geo Mean	27.12
1759					KM SD (logged)	1.864					95% Critical H Value (KM-Log)	7.203
1760					KM Standard Error of Mean (logged)	0.879					95% H-UCL (KM -Log)	62567
1761					KM SD (logged)	1.864					95% Critical H Value (KM-Log)	7.203
1762					KM Standard Error of Mean (logged)	0.879						
1763												

	A	B	C	D	E	F	G	H	I	J	K	L
1764	DL/2 Statistics											
1765	DL/2 Normal						DL/2 Log-Transformed					
1766					Mean in Original Scale	173.4					Mean in Log Scale	3.356
1767					SD in Original Scale	366.4					SD in Log Scale	1.991
1768					95% t UCL (Assumes normality)	474.8					95% H-Stat UCL	192479
1769	DL/2 is not a recommended method, provided for comparisons and historical reasons											
1770												
1771	Nonparametric Distribution Free UCL Statistics											
1772	Detected Data appear Gamma Distributed at 5% Significance Level											
1773												
1774	Suggested UCL to Use											
1775					95% KM Bootstrap t UCL	N/A					Adjusted KM-UCL (use when k<=1 and 15 < n < 50 but k<=1)	3197
1776												
1777	Note: Suggestions regarding the selection of a 95% UCL are provided to help the user to select the most appropriate 95% UCL.											
1778	Recommendations are based upon data size, data distribution, and skewness.											
1779	These recommendations are based upon the results of the simulation studies summarized in Singh, Maichle, and Lee (2006).											
1780	However, simulations results will not cover all Real World data sets; for additional insight the user may want to consult a statistician.											
1781												
1782	Antimony											
1783												
1784	General Statistics											
1785					Total Number of Observations	6					Number of Distinct Observations	4
1786					Number of Detects	2					Number of Non-Detects	4
1787					Number of Distinct Detects	2					Number of Distinct Non-Detects	2
1788					Minimum Detect	0.094					Minimum Non-Detect	0.019
1789					Maximum Detect	0.12					Maximum Non-Detect	0.38
1790					Variance Detects	3.3800E-4					Percent Non-Detects	66.67%
1791					Mean Detects	0.107					SD Detects	0.0184
1792					Median Detects	0.107					CV Detects	0.172
1793					Skewness Detects	N/A					Kurtosis Detects	N/A
1794					Mean of Logged Detects	-2.242					SD of Logged Detects	0.173
1795												
1796	Warning: Data set has only 2 Detected Values.											
1797	This is not enough to compute meaningful or reliable statistics and estimates.											
1798												
1799												
1800	Note: Sample size is small (e.g., <10), if data are collected using ISM approach, you should use											
1801	guidance provided in ITRC Tech Reg Guide on ISM (ITRC, 2012) to compute statistics of interest.											
1802	For example, you may want to use Chebyshev UCL to estimate EPC (ITRC, 2012).											
1803	Chebyshev UCL can be computed using the Nonparametric and All UCL Options of ProUCL 5.1											
1804												
1805	Normal GOF Test on Detects Only											
1806	Not Enough Data to Perform GOF Test											
1807												
1808	Kaplan-Meier (KM) Statistics using Normal Critical Values and other Nonparametric UCLs											
1809					KM Mean	0.063					KM Standard Error of Mean	0.0318
1810					KM SD	0.0449					95% KM (BCA) UCL	N/A
1811					95% KM (t) UCL	0.127					95% KM (Percentile Bootstrap) UCL	N/A
1812					95% KM (z) UCL	0.115					95% KM Bootstrap t UCL	N/A

	A	B	C	D	E	F	G	H	I	J	K	L
1813					90% KM Chebyshev UCL	0.158				95% KM Chebyshev UCL		0.202
1814					97.5% KM Chebyshev UCL	0.261				99% KM Chebyshev UCL		0.379
1815												
1816					Gamma GOF Tests on Detected Observations Only							
1817					Not Enough Data to Perform GOF Test							
1818												
1819					Gamma Statistics on Detected Data Only							
1820					k hat (MLE)	67.41				k star (bias corrected MLE)		N/A
1821					Theta hat (MLE)	0.00159				Theta star (bias corrected MLE)		N/A
1822					nu hat (MLE)	269.6				nu star (bias corrected)		N/A
1823					Mean (detects)	0.107						
1824												
1825					Estimates of Gamma Parameters using KM Estimates							
1826					Mean (KM)	0.063				SD (KM)		0.0449
1827					Variance (KM)	0.00202				SE of Mean (KM)		0.0318
1828					k hat (KM)	1.964				k star (KM)		1.093
1829					nu hat (KM)	23.57				nu star (KM)		13.12
1830					theta hat (KM)	0.0321				theta star (KM)		0.0576
1831					80% gamma percentile (KM)	0.101				90% gamma percentile (KM)		0.142
1832					95% gamma percentile (KM)	0.183				99% gamma percentile (KM)		0.277
1833												
1834					Gamma Kaplan-Meier (KM) Statistics							
1835										Adjusted Level of Significance (β)		0.0122
1836					Approximate Chi Square Value (13.12, α)	5.973				Adjusted Chi Square Value (13.12, β)		4.353
1837					95% Gamma Approximate KM-UCL (use when n>=50)	0.138				95% Gamma Adjusted KM-UCL (use when n<50)		0.19
1838												
1839					Lognormal GOF Test on Detected Observations Only							
1840					Not Enough Data to Perform GOF Test							
1841												
1842					Lognormal ROS Statistics Using Imputed Non-Detects							
1843					Mean in Original Scale	0.0808				Mean in Log Scale		-2.56
1844					SD in Original Scale	0.0263				SD in Log Scale		0.329
1845					95% t UCL (assumes normality of ROS data)	0.102				95% Percentile Bootstrap UCL		0.0976
1846					95% BCA Bootstrap UCL	0.0976				95% Bootstrap t UCL		0.107
1847					95% H-UCL (Log ROS)	0.114						
1848												
1849					Statistics using KM estimates on Logged Data and Assuming Lognormal Distribution							
1850					KM Mean (logged)	-3.103				KM Geo Mean		0.0449
1851					KM SD (logged)	0.865				95% Critical H Value (KM-Log)		3.668
1852					KM Standard Error of Mean (logged)	0.612				95% H-UCL (KM -Log)		0.27
1853					KM SD (logged)	0.865				95% Critical H Value (KM-Log)		3.668
1854					KM Standard Error of Mean (logged)	0.612						
1855												
1856					DL/2 Statistics							
1857					DL/2 Normal					DL/2 Log-Transformed		
1858					Mean in Original Scale	0.102				Mean in Log Scale		-2.853
1859					SD in Original Scale	0.0812				SD in Log Scale		1.423
1860					95% t UCL (Assumes normality)	0.169				95% H-Stat UCL		5.61
1861					DL/2 is not a recommended method, provided for comparisons and historical reasons							
1862												
1863					Nonparametric Distribution Free UCL Statistics							
1864					Data do not follow a Discernible Distribution at 5% Significance Level							

	A	B	C	D	E	F	G	H	I	J	K	L
1865												
1866						Suggested UCL to Use						
1867					95% KM (t) UCL	0.127					KM H-UCL	0.27
1868					95% KM (BCA) UCL	N/A						
1869						Warning: One or more Recommended UCL(s) not available!						
1870						Warning: Recommended UCL exceeds the maximum observation						
1871												
1872						Note: Suggestions regarding the selection of a 95% UCL are provided to help the user to select the most appropriate 95% UCL.						
1873						Recommendations are based upon data size, data distribution, and skewness.						
1874						These recommendations are based upon the results of the simulation studies summarized in Singh, Maichle, and Lee (2006).						
1875						However, simulations results will not cover all Real World data sets; for additional insight the user may want to consult a statistician.						
1876												
1877	Arsenic											
1878												
1879						General Statistics						
1880					Total Number of Observations	6					Number of Distinct Observations	5
1881					Number of Detects	5					Number of Non-Detects	1
1882					Number of Distinct Detects	4					Number of Distinct Non-Detects	1
1883					Minimum Detect	0.59					Minimum Non-Detect	0.29
1884					Maximum Detect	1.9					Maximum Non-Detect	0.29
1885					Variance Detects	0.224					Percent Non-Detects	16.67%
1886					Mean Detects	1.298					SD Detects	0.473
1887					Median Detects	1.4					CV Detects	0.364
1888					Skewness Detects	-0.534					Kurtosis Detects	1.58
1889					Mean of Logged Detects	0.194					SD of Logged Detects	0.436
1890												
1891						Note: Sample size is small (e.g., <10), if data are collected using ISM approach, you should use						
1892						guidance provided in ITRC Tech Reg Guide on ISM (ITRC, 2012) to compute statistics of interest.						
1893						For example, you may want to use Chebyshev UCL to estimate EPC (ITRC, 2012).						
1894						Chebyshev UCL can be computed using the Nonparametric and All UCL Options of ProUCL 5.1						
1895												
1896						Normal GOF Test on Detects Only						
1897					Shapiro Wilk Test Statistic	0.944					Shapiro Wilk GOF Test	
1898					5% Shapiro Wilk Critical Value	0.762					Detected Data appear Normal at 5% Significance Level	
1899					Lilliefors Test Statistic	0.218					Lilliefors GOF Test	
1900					5% Lilliefors Critical Value	0.343					Detected Data appear Normal at 5% Significance Level	
1901						Detected Data appear Normal at 5% Significance Level						
1902												
1903						Kaplan-Meier (KM) Statistics using Normal Critical Values and other Nonparametric UCLs						
1904					KM Mean	1.13					KM Standard Error of Mean	0.246
1905					KM SD	0.539					95% KM (BCA) UCL	N/A
1906					95% KM (t) UCL	1.625					95% KM (Percentile Bootstrap) UCL	N/A
1907					95% KM (z) UCL	1.534					95% KM Bootstrap t UCL	N/A
1908					90% KM Chebyshev UCL	1.868					95% KM Chebyshev UCL	2.202
1909					97.5% KM Chebyshev UCL	2.665					99% KM Chebyshev UCL	3.576
1910												

	A	B	C	D	E	F	G	H	I	J	K	L
1911	Gamma GOF Tests on Detected Observations Only											
1912					A-D Test Statistic	0.414	Anderson-Darling GOF Test					
1913					5% A-D Critical Value	0.68	Detected data appear Gamma Distributed at 5% Significance Level					
1914					K-S Test Statistic	0.263	Kolmogorov-Smirnov GOF					
1915					5% K-S Critical Value	0.358	Detected data appear Gamma Distributed at 5% Significance Level					
1916	Detected data appear Gamma Distributed at 5% Significance Level											
1917												
1918	Gamma Statistics on Detected Data Only											
1919					k hat (MLE)	7.634	k star (bias corrected MLE)					3.187
1920					Theta hat (MLE)	0.17	Theta star (bias corrected MLE)					0.407
1921					nu hat (MLE)	76.34	nu star (bias corrected)					31.87
1922					Mean (detects)	1.298						
1923												
1924	Gamma ROS Statistics using Imputed Non-Detects											
1925	GROS may not be used when data set has > 50% NDs with many tied observations at multiple DLs											
1926	GROS may not be used when kstar of detects is small such as <1.0, especially when the sample size is small (e.g., <15-20)											
1927	For such situations, GROS method may yield incorrect values of UCLs and BTVs											
1928	This is especially true when the sample size is small.											
1929	For gamma distributed detected data, BTVs and UCLs may be computed using gamma distribution on KM estimates											
1930					Minimum	0.338	Mean					1.138
1931					Maximum	1.9	Median					1.3
1932					SD	0.576	CV					0.506
1933					k hat (MLE)	3.529	k star (bias corrected MLE)					1.876
1934					Theta hat (MLE)	0.322	Theta star (bias corrected MLE)					0.607
1935					nu hat (MLE)	42.35	nu star (bias corrected)					22.51
1936					Adjusted Level of Significance (β)	0.0122						
1937					Approximate Chi Square Value (22.51, α)	12.72	Adjusted Chi Square Value (22.51, β)					10.17
1938					95% Gamma Approximate UCL (use when n>=50)	2.014	95% Gamma Adjusted UCL (use when n<50)					2.519
1939												
1940	Estimates of Gamma Parameters using KM Estimates											
1941					Mean (KM)	1.13	SD (KM)					0.539
1942					Variance (KM)	0.29	SE of Mean (KM)					0.246
1943					k hat (KM)	4.401	k star (KM)					2.312
1944					nu hat (KM)	52.81	nu star (KM)					27.74
1945					theta hat (KM)	0.257	theta star (KM)					0.489
1946					80% gamma percentile (KM)	1.663	90% gamma percentile (KM)					2.125
1947					95% gamma percentile (KM)	2.562	99% gamma percentile (KM)					3.523
1948												
1949	Gamma Kaplan-Meier (KM) Statistics											
1950					Approximate Chi Square Value (27.74, α)	16.73	Adjusted Chi Square Value (27.74, β)					13.73
1951					95% Gamma Approximate KM-UCL (use when n>=50)	1.874	95% Gamma Adjusted KM-UCL (use when n<50)					2.282
1952												
1953	Lognormal GOF Test on Detected Observations Only											
1954					Shapiro Wilk Test Statistic	0.87	Shapiro Wilk GOF Test					
1955					5% Shapiro Wilk Critical Value	0.762	Detected Data appear Lognormal at 5% Significance Level					
1956					Lilliefors Test Statistic	0.289	Lilliefors GOF Test					
1957					5% Lilliefors Critical Value	0.343	Detected Data appear Lognormal at 5% Significance Level					
1958	Detected Data appear Lognormal at 5% Significance Level											
1959												

	A	B	C	D	E	F	G	H	I	J	K	L
1960	Lognormal ROS Statistics Using Imputed Non-Detects											
1961					Mean in Original Scale	1.154					Mean in Log Scale	0.0232
1962					SD in Original Scale	0.55					SD in Log Scale	0.572
1963				95% t UCL (assumes normality of ROS data)		1.607					95% Percentile Bootstrap UCL	1.5
1964					95% BCA Bootstrap UCL	1.482					95% Bootstrap t UCL	1.574
1965					95% H-UCL (Log ROS)	2.479						
1966												
1967	Statistics using KM estimates on Logged Data and Assuming Lognormal Distribution											
1968					KM Mean (logged)	-0.0447					KM Geo Mean	0.956
1969					KM SD (logged)	0.642					95% Critical H Value (KM-Log)	3.005
1970					KM Standard Error of Mean (logged)	0.293					95% H-UCL (KM -Log)	2.783
1971					KM SD (logged)	0.642					95% Critical H Value (KM-Log)	3.005
1972					KM Standard Error of Mean (logged)	0.293						
1973												
1974	DL/2 Statistics											
1975	DL/2 Normal						DL/2 Log-Transformed					
1976					Mean in Original Scale	1.106					Mean in Log Scale	-0.16
1977					SD in Original Scale	0.633					SD in Log Scale	0.951
1978					95% t UCL (Assumes normality)	1.626					95% H-Stat UCL	7.173
1979	DL/2 is not a recommended method, provided for comparisons and historical reasons											
1980												
1981	Nonparametric Distribution Free UCL Statistics											
1982	Detected Data appear Normal Distributed at 5% Significance Level											
1983												
1984	Suggested UCL to Use											
1985					95% KM (t) UCL	1.625						
1986												
1987	Note: Suggestions regarding the selection of a 95% UCL are provided to help the user to select the most appropriate 95% UCL.											
1988	Recommendations are based upon data size, data distribution, and skewness.											
1989	These recommendations are based upon the results of the simulation studies summarized in Singh, Maichle, and Lee (2006).											
1990	However, simulations results will not cover all Real World data sets; for additional insight the user may want to consult a statistician.											
1991												
1992	Cadmium											
1993												
1994	General Statistics											
1995					Total Number of Observations	6					Number of Distinct Observations	3
1996					Number of Detects	1					Number of Non-Detects	5
1997					Number of Distinct Detects	1					Number of Distinct Non-Detects	2
1998												
1999	Warning: Only one distinct data value was detected! ProUCL (or any other software) should not be used on such a data set!											
2000	It is suggested to use alternative site specific values determined by the Project Team to estimate environmental parameters (e.g., EPC, BTV).											
2001												
2002	The data set for variable Cadmium was not processed!											
2003												
2004												
2005												

	A	B	C	D	E	F	G	H	I	J	K	L
2006	Cobalt											
2007												
2008					General Statistics							
2009					Total Number of Observations	6				Number of Distinct Observations		6
2010										Number of Missing Observations		0
2011					Minimum	0.077				Mean		16.61
2012					Maximum	98				Median		0.365
2013					SD	39.87				Std. Error of Mean		16.28
2014					Coefficient of Variation	2.401				Skewness		2.449
2015												
2016					Note: Sample size is small (e.g., <10), if data are collected using ISM approach, you should use							
2017					guidance provided in ITRC Tech Reg Guide on ISM (ITRC, 2012) to compute statistics of interest.							
2018					For example, you may want to use Chebyshev UCL to estimate EPC (ITRC, 2012).							
2019					Chebyshev UCL can be computed using the Nonparametric and All UCL Options of ProUCL 5.1							
2020												
2021					Normal GOF Test							
2022					Shapiro Wilk Test Statistic	0.502				Shapiro Wilk GOF Test		
2023					5% Shapiro Wilk Critical Value	0.788				Data Not Normal at 5% Significance Level		
2024					Lilliefors Test Statistic	0.488				Lilliefors GOF Test		
2025					5% Lilliefors Critical Value	0.325				Data Not Normal at 5% Significance Level		
2026					Data Not Normal at 5% Significance Level							
2027												
2028					Assuming Normal Distribution							
2029					95% Normal UCL					95% UCLs (Adjusted for Skewness)		
2030					95% Student's-t UCL	49.41				95% Adjusted-CLT UCL (Chen-1995)		60.78
2031										95% Modified-t UCL (Johnson-1978)		52.12
2032												
2033					Gamma GOF Test							
2034					A-D Test Statistic	1.154				Anderson-Darling Gamma GOF Test		
2035					5% A-D Critical Value	0.793				Data Not Gamma Distributed at 5% Significance Level		
2036					K-S Test Statistic	0.449				Kolmogorov-Smirnov Gamma GOF Test		
2037					5% K-S Critical Value	0.362				Data Not Gamma Distributed at 5% Significance Level		
2038					Data Not Gamma Distributed at 5% Significance Level							
2039												
2040					Gamma Statistics							
2041					k hat (MLE)	0.226				k star (bias corrected MLE)		0.224
2042					Theta hat (MLE)	73.56				Theta star (bias corrected MLE)		74.15
2043					nu hat (MLE)	2.709				nu star (bias corrected)		2.688
2044					MLE Mean (bias corrected)	16.61				MLE Sd (bias corrected)		35.09
2045										Approximate Chi Square Value (0.05)		0.286
2046					Adjusted Level of Significance	0.0122				Adjusted Chi Square Value		0.13
2047												
2048					Assuming Gamma Distribution							
2049					95% Approximate Gamma UCL (use when n>=50))	155.9				95% Adjusted Gamma UCL (use when n<50)		343.1
2050												
2051					Lognormal GOF Test							
2052					Shapiro Wilk Test Statistic	0.787				Shapiro Wilk Lognormal GOF Test		
2053					5% Shapiro Wilk Critical Value	0.788				Data Not Lognormal at 5% Significance Level		
2054					Lilliefors Test Statistic	0.326				Lilliefors Lognormal GOF Test		

	A	B	C	D	E	F	G	H	I	J	K	L
2055					5% Lilliefors Critical Value	0.325	Data Not Lognormal at 5% Significance Level					
2056					Data Not Lognormal at 5% Significance Level							
2057												
2058					Lognormal Statistics							
2059					Minimum of Logged Data	-2.564			Mean of logged Data			-0.388
2060					Maximum of Logged Data	4.585			SD of logged Data			2.561
2061												
2062					Assuming Lognormal Distribution							
2063					95% H-UCL	1311305			90% Chebyshev (MVUE) UCL			19.54
2064					95% Chebyshev (MVUE) UCL	25.85			97.5% Chebyshev (MVUE) UCL			34.61
2065					99% Chebyshev (MVUE) UCL	51.81						
2066												
2067					Nonparametric Distribution Free UCL Statistics							
2068					Data do not follow a Discernible Distribution (0.05)							
2069												
2070					Nonparametric Distribution Free UCLs							
2071					95% CLT UCL	43.39			95% Jackknife UCL			49.41
2072					95% Standard Bootstrap UCL	40.85			95% Bootstrap-t UCL			4883
2073					95% Hall's Bootstrap UCL	2352			95% Percentile Bootstrap UCL			49.13
2074					95% BCA Bootstrap UCL	65.36						
2075					90% Chebyshev(Mean, Sd) UCL	65.44			95% Chebyshev(Mean, Sd) UCL			87.57
2076					97.5% Chebyshev(Mean, Sd) UCL	118.3			99% Chebyshev(Mean, Sd) UCL			178.6
2077												
2078					Suggested UCL to Use							
2079					95% Hall's Bootstrap UCL	2352						
2080												
2081					Recommended UCL exceeds the maximum observation							
2082												
2083					In Case Bootstrap t and/or Hall's Bootstrap yields an unreasonably large UCL value, use 97.5% or 99% Chebyshev (Mean, Sd) UCL							
2084												
2085					Note: Suggestions regarding the selection of a 95% UCL are provided to help the user to select the most appropriate 95% UCL.							
2086					Recommendations are based upon data size, data distribution, and skewness.							
2087					These recommendations are based upon the results of the simulation studies summarized in Singh, Maichle, and Lee (2006).							
2088					However, simulations results will not cover all Real World data sets; for additional insight the user may want to consult a statistician.							
2089												
2090												
2091	Copper											
2092												
2093					General Statistics							
2094					Total Number of Observations	6			Number of Distinct Observations			6
2095									Number of Missing Observations			0
2096					Minimum	0.75			Mean			1.405
2097					Maximum	2.6			Median			1.2
2098					SD	0.7			Std. Error of Mean			0.286
2099					Coefficient of Variation	0.499			Skewness			1.114
2100												
2101					Note: Sample size is small (e.g., <10), if data are collected using ISM approach, you should use							
2102					guidance provided in ITRC Tech Reg Guide on ISM (ITRC, 2012) to compute statistics of interest.							
2103					For example, you may want to use Chebyshev UCL to estimate EPC (ITRC, 2012).							
2104					Chebyshev UCL can be computed using the Nonparametric and All UCL Options of ProUCL 5.1							
2105												
2106					Normal GOF Test							

	A	B	C	D	E	F	G	H	I	J	K	L
2107					Shapiro Wilk Test Statistic	0.897	Shapiro Wilk GOF Test					
2108					5% Shapiro Wilk Critical Value	0.788	Data appear Normal at 5% Significance Level					
2109					Lilliefors Test Statistic	0.218	Lilliefors GOF Test					
2110					5% Lilliefors Critical Value	0.325	Data appear Normal at 5% Significance Level					
2111	Data appear Normal at 5% Significance Level											
2112												
2113	Assuming Normal Distribution											
2114	95% Normal UCL						95% UCLs (Adjusted for Skewness)					
2115					95% Student's-t UCL	1.981	95% Adjusted-CLT UCL (Chen-1995)					2.014
2116							95% Modified-t UCL (Johnson-1978)					2.003
2117												
2118	Gamma GOF Test											
2119					A-D Test Statistic	0.277	Anderson-Darling Gamma GOF Test					
2120					5% A-D Critical Value	0.698	Detected data appear Gamma Distributed at 5% Significance Level					
2121					K-S Test Statistic	0.225	Kolmogorov-Smirnov Gamma GOF Test					
2122					5% K-S Critical Value	0.333	Detected data appear Gamma Distributed at 5% Significance Level					
2123	Detected data appear Gamma Distributed at 5% Significance Level											
2124												
2125	Gamma Statistics											
2126					k hat (MLE)	5.37	k star (bias corrected MLE)					2.796
2127					Theta hat (MLE)	0.262	Theta star (bias corrected MLE)					0.503
2128					nu hat (MLE)	64.44	nu star (bias corrected)					33.55
2129					MLE Mean (bias corrected)	1.405	MLE Sd (bias corrected)					0.84
2130							Approximate Chi Square Value (0.05)					21.31
2131					Adjusted Level of Significance	0.0122	Adjusted Chi Square Value					17.87
2132												
2133	Assuming Gamma Distribution											
2134					95% Approximate Gamma UCL (use when n>=50))	2.212	95% Adjusted Gamma UCL (use when n<50)					2.638
2135												
2136	Lognormal GOF Test											
2137					Shapiro Wilk Test Statistic	0.952	Shapiro Wilk Lognormal GOF Test					
2138					5% Shapiro Wilk Critical Value	0.788	Data appear Lognormal at 5% Significance Level					
2139					Lilliefors Test Statistic	0.197	Lilliefors Lognormal GOF Test					
2140					5% Lilliefors Critical Value	0.325	Data appear Lognormal at 5% Significance Level					
2141	Data appear Lognormal at 5% Significance Level											
2142												
2143	Lognormal Statistics											
2144					Minimum of Logged Data	-0.288	Mean of logged Data					0.244
2145					Maximum of Logged Data	0.956	SD of logged Data					0.472
2146												
2147	Assuming Lognormal Distribution											
2148					95% H-UCL	2.455	90% Chebyshev (MVUE) UCL					2.206
2149					95% Chebyshev (MVUE) UCL	2.572	97.5% Chebyshev (MVUE) UCL					3.08
2150					99% Chebyshev (MVUE) UCL	4.077						
2151												
2152	Nonparametric Distribution Free UCL Statistics											
2153	Data appear to follow a Discernible Distribution at 5% Significance Level											
2154												
2155	Nonparametric Distribution Free UCLs											
2156					95% CLT UCL	1.875	95% Jackknife UCL					1.981
2157					95% Standard Bootstrap UCL	1.816	95% Bootstrap-t UCL					2.301
2158					95% Hall's Bootstrap UCL	2.212	95% Percentile Bootstrap UCL					1.867

	A	B	C	D	E	F	G	H	I	J	K	L
2159					95% BCA Bootstrap UCL	1.913						
2160					90% Chebyshev(Mean, Sd) UCL	2.263					95% Chebyshev(Mean, Sd) UCL	2.651
2161					97.5% Chebyshev(Mean, Sd) UCL	3.191					99% Chebyshev(Mean, Sd) UCL	4.25
2162												
2163					**Suggested UCL to Use**							
2164					95% Student's-t UCL	1.981						
2165												
2166	Note: Suggestions regarding the selection of a 95% UCL are provided to help the user to select the most appropriate 95% UCL.											
2167	Recommendations are based upon data size, data distribution, and skewness.											
2168	These recommendations are based upon the results of the simulation studies summarized in Singh, Maichle, and Lee (2006).											
2169	However, simulations results will not cover all Real World data sets; for additional insight the user may want to consult a statistician.											
2170												
2171	Iron											
2172												
2173					**General Statistics**							
2174					Total Number of Observations	6					Number of Distinct Observations	6
2175					Number of Detects	5					Number of Non-Detects	1
2176					Number of Distinct Detects	5					Number of Distinct Non-Detects	1
2177					Minimum Detect	18					Minimum Non-Detect	14
2178					Maximum Detect	60000					Maximum Non-Detect	14
2179					Variance Detects	7.191E+8					Percent Non-Detects	16.67%
2180					Mean Detects	12029					SD Detects	26817
2181					Median Detects	42					CV Detects	2.229
2182					Skewness Detects	2.236					Kurtosis Detects	5
2183					Mean of Logged Detects	4.96					SD of Logged Detects	3.419
2184												
2185	**Note: Sample size is small (e.g., <10), if data are collected using ISM approach, you should use**											
2186	**guidance provided in ITRC Tech Reg Guide on ISM (ITRC, 2012) to compute statistics of interest.**											
2187	**For example, you may want to use Chebyshev UCL to estimate EPC (ITRC, 2012).**											
2188	**Chebyshev UCL can be computed using the Nonparametric and All UCL Options of ProUCL 5.1**											
2189												
2190					**Normal GOF Test on Detects Only**							
2191					Shapiro Wilk Test Statistic	0.553					**Shapiro Wilk GOF Test**	
2192					5% Shapiro Wilk Critical Value	0.762					Detected Data Not Normal at 5% Significance Level	
2193					Lilliefors Test Statistic	0.472					**Lilliefors GOF Test**	
2194					5% Lilliefors Critical Value	0.343					Detected Data Not Normal at 5% Significance Level	
2195	**Detected Data Not Normal at 5% Significance Level**											
2196												
2197	**Kaplan-Meier (KM) Statistics using Normal Critical Values and other Nonparametric UCLs**											
2198					KM Mean	10027					KM Standard Error of Mean	10201
2199					KM SD	22349					95% KM (BCA) UCL	30013
2200					95% KM (t) UCL	30582					95% KM (Percentile Bootstrap) UCL	30009
2201					95% KM (z) UCL	26805					95% KM Bootstrap t UCL	19824414
2202					90% KM Chebyshev UCL	40629					95% KM Chebyshev UCL	54491
2203					97.5% KM Chebyshev UCL	73730					99% KM Chebyshev UCL	111523
2204												
2205					**Gamma GOF Tests on Detected Observations Only**							
2206					A-D Test Statistic	1.075					**Anderson-Darling GOF Test**	
2207					5% A-D Critical Value	0.803					Detected Data Not Gamma Distributed at 5% Significance Level	
2208					K-S Test Statistic	0.472					**Kolmogorov-Smirnov GOF**	
2209					5% K-S Critical Value	0.393					Detected Data Not Gamma Distributed at 5% Significance Level	
2210	**Detected Data Not Gamma Distributed at 5% Significance Level**											

	A	B	C	D	E	F	G	H	I	J	K	L
2211												
2212	**Gamma Statistics on Detected Data Only**											
2213					k hat (MLE)	0.17				k star (bias corrected MLE)		0.201
2214					Theta hat (MLE)	70716				Theta star (bias corrected MLE)		59734
2215					nu hat (MLE)	1.701				nu star (bias corrected)		2.014
2216					Mean (detects)	12029						
2217												
2218	**Gamma ROS Statistics using Imputed Non-Detects**											
2219	GROS may not be used when data set has > 50% NDs with many tied observations at multiple DLs											
2220	GROS may not be used when kstar of detects is small such as <1.0, especially when the sample size is small (e.g., <15-20)											
2221	For such situations, GROS method may yield incorrect values of UCLs and BTVs											
2222	This is especially true when the sample size is small.											
2223	For gamma distributed detected data, BTVs and UCLs may be computed using gamma distribution on KM estimates											
2224					Minimum	0.01				Mean		10024
2225					Maximum	60000				Median		31
2226					SD	24483				CV		2.442
2227					k hat (MLE)	0.134				k star (bias corrected MLE)		0.178
2228					Theta hat (MLE)	75011				Theta star (bias corrected MLE)		56338
2229					nu hat (MLE)	1.604				nu star (bias corrected)		2.135
2230					Adjusted Level of Significance (β)	0.0122						
2231					Approximate Chi Square Value (2.14, α)	0.17				Adjusted Chi Square Value (2.14, β)		0.0908
2232					95% Gamma Approximate UCL (use when n>=50)	125612				95% Gamma Adjusted UCL (use when n<50)		235798
2233												
2234	**Estimates of Gamma Parameters using KM Estimates**											
2235					Mean (KM)	10027				SD (KM)		22349
2236					Variance (KM)	4.995E+8				SE of Mean (KM)		10201
2237					k hat (KM)	0.201				k star (KM)		0.212
2238					nu hat (KM)	2.415				nu star (KM)		2.541
2239					theta hat (KM)	49815				theta star (KM)		47351
2240					80% gamma percentile (KM)	13595				90% gamma percentile (KM)		30317
2241					95% gamma percentile (KM)	50885				99% gamma percentile (KM)		106997
2242												
2243	**Gamma Kaplan-Meier (KM) Statistics**											
2244					Approximate Chi Square Value (2.54, α)	0.251				Adjusted Chi Square Value (2.54, β)		0.116
2245					95% Gamma Approximate KM-UCL (use when n>=50)	101697				95% Gamma Adjusted KM-UCL (use when n<50)		218982
2246												
2247	**Lognormal GOF Test on Detected Observations Only**											
2248					Shapiro Wilk Test Statistic	0.689				**Shapiro Wilk GOF Test**		
2249					5% Shapiro Wilk Critical Value	0.762				Detected Data Not Lognormal at 5% Significance Level		
2250					Lilliefors Test Statistic	0.391				**Lilliefors GOF Test**		
2251					5% Lilliefors Critical Value	0.343				Detected Data Not Lognormal at 5% Significance Level		
2252	**Detected Data Not Lognormal at 5% Significance Level**											
2253												

	A	B	C	D	E	F	G	H	I	J	K	L
2254	Lognormal ROS Statistics Using Imputed Non-Detects											
2255					Mean in Original Scale	10024					Mean in Log Scale	3.697
2256					SD in Original Scale	24483					SD in Log Scale	4.35
2257				95% t UCL (assumes normality of ROS data)		30165					95% Percentile Bootstrap UCL	30009
2258					95% BCA Bootstrap UCL	40000					95% Bootstrap t UCL	15718188
2259					95% H-UCL (Log ROS)	4.056E+19						
2260												
2261	Statistics using KM estimates on Logged Data and Assuming Lognormal Distribution											
2262					KM Mean (logged)	4.573					KM Geo Mean	96.86
2263					KM SD (logged)	2.923					95% Critical H Value (KM-Log)	11.11
2264					KM Standard Error of Mean (logged)	1.334					95% H-UCL (KM -Log)	1.408E+10
2265					KM SD (logged)	2.923					95% Critical H Value (KM-Log)	11.11
2266					KM Standard Error of Mean (logged)	1.334						
2267												
2268	DL/2 Statistics											
2269				DL/2 Normal						DL/2 Log-Transformed		
2270					Mean in Original Scale	10025					Mean in Log Scale	4.458
2271					SD in Original Scale	24482					SD in Log Scale	3.296
2272					95% t UCL (Assumes normality)	30166					95% H-Stat UCL	2.007E+12
2273	DL/2 is not a recommended method, provided for comparisons and historical reasons											
2274												
2275	Nonparametric Distribution Free UCL Statistics											
2276	Data do not follow a Discernible Distribution at 5% Significance Level											
2277												
2278	Suggested UCL to Use											
2279					KM Bootstrap t UCL	30009						
2280												
2281	Note: Suggestions regarding the selection of a 95% UCL are provided to help the user to select the most appropriate 95% UCL.											
2282	Recommendations are based upon data size, data distribution, and skewness.											
2283	These recommendations are based upon the results of the simulation studies summarized in Singh, Maichle, and Lee (2006).											
2284	However, simulations results will not cover all Real World data sets; for additional insight the user may want to consult a statistician.											
2285												
2286	Lead											
2287												
2288	General Statistics											
2289					Total Number of Observations	6					Number of Distinct Observations	5
2290					Number of Detects	4					Number of Non-Detects	2
2291					Number of Distinct Detects	4					Number of Distinct Non-Detects	1
2292					Minimum Detect	0.052					Minimum Non-Detect	0.13
2293					Maximum Detect	1					Maximum Non-Detect	0.13
2294					Variance Detects	0.221					Percent Non-Detects	33.33%
2295					Mean Detects	0.295					SD Detects	0.47
2296					Median Detects	0.0645					CV Detects	1.592
2297					Skewness Detects	1.998					Kurtosis Detects	3.992
2298					Mean of Logged Detects	-2.114					SD of Logged Detects	1.417
2299												
2300	Note: Sample size is small (e.g., <10), if data are collected using ISM approach, you should use											
2301	guidance provided in ITRC Tech Reg Guide on ISM (ITRC, 2012) to compute statistics of interest.											
2302	For example, you may want to use Chebyshev UCL to estimate EPC (ITRC, 2012).											
2303	Chebyshev UCL can be computed using the Nonparametric and All UCL Options of ProUCL 5.1											
2304												
2305	Normal GOF Test on Detects Only											

	A	B	C	D	E	F	G	H	I	J	K	L
2306					Shapiro Wilk Test Statistic	0.646	**Shapiro Wilk GOF Test**					
2307					5% Shapiro Wilk Critical Value	0.748	Detected Data Not Normal at 5% Significance Level					
2308					Lilliefors Test Statistic	0.432	**Lilliefors GOF Test**					
2309					5% Lilliefors Critical Value	0.375	Detected Data Not Normal at 5% Significance Level					
2310					**Detected Data Not Normal at 5% Significance Level**							
2311												
2312					**Kaplan-Meier (KM) Statistics using Normal Critical Values and other Nonparametric UCLs**							
2313					KM Mean	0.217	KM Standard Error of Mean					0.165
2314					KM SD	0.35	95% KM (BCA) UCL					N/A
2315					95% KM (t) UCL	0.55	95% KM (Percentile Bootstrap) UCL					N/A
2316					95% KM (z) UCL	0.489	95% KM Bootstrap t UCL					N/A
2317					90% KM Chebyshev UCL	0.712	95% KM Chebyshev UCL					0.937
2318					97.5% KM Chebyshev UCL	1.248	99% KM Chebyshev UCL					1.86
2319												
2320					**Gamma GOF Tests on Detected Observations Only**							
2321					A-D Test Statistic	0.815	**Anderson-Darling GOF Test**					
2322					5% A-D Critical Value	0.673	Detected Data Not Gamma Distributed at 5% Significance Level					
2323					K-S Test Statistic	0.442	**Kolmogorov-Smirnov GOF**					
2324					5% K-S Critical Value	0.406	Detected Data Not Gamma Distributed at 5% Significance Level					
2325					**Detected Data Not Gamma Distributed at 5% Significance Level**							
2326												
2327					**Gamma Statistics on Detected Data Only**							
2328					k hat (MLE)	0.679	k star (bias corrected MLE)					0.336
2329					Theta hat (MLE)	0.435	Theta star (bias corrected MLE)					0.878
2330					nu hat (MLE)	5.431	nu star (bias corrected)					2.691
2331					Mean (detects)	0.295						
2332												
2333					**Gamma ROS Statistics using Imputed Non-Detects**							
2334					GROS may not be used when data set has > 50% NDs with many tied observations at multiple DLs							
2335					GROS may not be used when kstar of detects is small such as <1.0, especially when the sample size is small (e.g., <15-20)							
2336					For such situations, GROS method may yield incorrect values of UCLs and BTVs							
2337					This is especially true when the sample size is small.							
2338					For gamma distributed detected data, BTVs and UCLs may be computed using gamma distribution on KM estimates							
2339					Minimum	0.01	Mean					0.225
2340					Maximum	1	Median					0.0645
2341					SD	0.383	CV					1.699
2342					k hat (MLE)	0.62	k star (bias corrected MLE)					0.421
2343					Theta hat (MLE)	0.363	Theta star (bias corrected MLE)					0.535
2344					nu hat (MLE)	7.443	nu star (bias corrected)					5.055
2345					Adjusted Level of Significance (β)	0.0122						
2346					Approximate Chi Square Value (5.05, α)	1.178	Adjusted Chi Square Value (5.05, β)					0.636
2347					95% Gamma Approximate UCL (use when n>=50)	0.967	95% Gamma Adjusted UCL (use when n<50)					N/A
2348												
2349					**Estimates of Gamma Parameters using KM Estimates**							
2350					Mean (KM)	0.217	SD (KM)					0.35
2351					Variance (KM)	0.123	SE of Mean (KM)					0.165
2352					k hat (KM)	0.384	k star (KM)					0.303
2353					nu hat (KM)	4.603	nu star (KM)					3.635
2354					theta hat (KM)	0.566	theta star (KM)					0.716
2355					80% gamma percentile (KM)	0.333	90% gamma percentile (KM)					0.639
2356					95% gamma percentile (KM)	0.989	99% gamma percentile (KM)					1.899
2357												

	A	B	C	D	E	F	G	H	I	J	K	L
2358	Gamma Kaplan-Meier (KM) Statistics											
2359	Approximate Chi Square Value (3.63, α)					0.583	Adjusted Chi Square Value (3.63, β)					0.274
2360	95% Gamma Approximate KM-UCL (use when n>=50)					1.353	95% Gamma Adjusted KM-UCL (use when n<50)					2.881
2361												
2362	Lognormal GOF Test on Detected Observations Only											
2363	Shapiro Wilk Test Statistic					0.716	Shapiro Wilk GOF Test					
2364	5% Shapiro Wilk Critical Value					0.748	Detected Data Not Lognormal at 5% Significance Level					
2365	Lilliefors Test Statistic					0.389	Lilliefors GOF Test					
2366	5% Lilliefors Critical Value					0.375	Detected Data Not Lognormal at 5% Significance Level					
2367	Detected Data Not Lognormal at 5% Significance Level											
2368												
2369	Lognormal ROS Statistics Using Imputed Non-Detects											
2370	Mean in Original Scale					0.223	Mean in Log Scale					-2.296
2371	SD in Original Scale					0.381	SD in Log Scale					1.178
2372	95% t UCL (assumes normality of ROS data)					0.537	95% Percentile Bootstrap UCL					0.528
2373	95% BCA Bootstrap UCL					0.547	95% Bootstrap t UCL					5.568
2374	95% H-UCL (Log ROS)					2.448						
2375												
2376	Statistics using KM estimates on Logged Data and Assuming Lognormal Distribution											
2377	KM Mean (logged)					-2.349	KM Geo Mean					0.0955
2378	KM SD (logged)					1.059	95% Critical H Value (KM-Log)					4.334
2379	KM Standard Error of Mean (logged)					0.502	95% H-UCL (KM -Log)					1.302
2380	KM SD (logged)					1.059	95% Critical H Value (KM-Log)					4.334
2381	KM Standard Error of Mean (logged)					0.502						
2382												
2383	DL/2 Statistics											
2384	DL/2 Normal						DL/2 Log-Transformed					
2385	Mean in Original Scale					0.219	Mean in Log Scale					-2.32
2386	SD in Original Scale					0.383	SD in Log Scale					1.143
2387	95% t UCL (Assumes normality)					0.534	95% H-Stat UCL					2.01
2388	DL/2 is not a recommended method, provided for comparisons and historical reasons											
2389												
2390	Nonparametric Distribution Free UCL Statistics											
2391	Data do not follow a Discernible Distribution at 5% Significance Level											
2392												
2393	Suggested UCL to Use											
2394	95% KM (Chebyshev) UCL					0.937						
2395												
2396	Note: Suggestions regarding the selection of a 95% UCL are provided to help the user to select the most appropriate 95% UCL.											
2397	Recommendations are based upon data size, data distribution, and skewness.											
2398	These recommendations are based upon the results of the simulation studies summarized in Singh, Maichle, and Lee (2006).											
2399	However, simulations results will not cover all Real World data sets; for additional insight the user may want to consult a statistician.											
2400												

	A	B	C	D	E	F	G	H	I	J	K	L
2401	Manganese											
2402												
2403						General Statistics						
2404					Total Number of Observations	6				Number of Distinct Observations		6
2405					Number of Detects	5				Number of Non-Detects		1
2406					Number of Distinct Detects	5				Number of Distinct Non-Detects		1
2407					Minimum Detect	8.6				Minimum Non-Detect		1.4
2408					Maximum Detect	30000				Maximum Non-Detect		1.4
2409					Variance Detects	1.797E+8				Percent Non-Detects		16.67%
2410					Mean Detects	6023				SD Detects		13403
2411					Median Detects	35				CV Detects		2.225
2412					Skewness Detects	2.236				Kurtosis Detects		5
2413					Mean of Logged Detects	4.621				SD of Logged Detects		3.245
2414												
2415					Note: Sample size is small (e.g., <10), if data are collected using ISM approach, you should use							
2416					guidance provided in ITRC Tech Reg Guide on ISM (ITRC, 2012) to compute statistics of interest.							
2417					For example, you may want to use Chebyshev UCL to estimate EPC (ITRC, 2012).							
2418					Chebyshev UCL can be computed using the Nonparametric and All UCL Options of ProUCL 5.1							
2419												
2420						Normal GOF Test on Detects Only						
2421					Shapiro Wilk Test Statistic	0.553				Shapiro Wilk GOF Test		
2422					5% Shapiro Wilk Critical Value	0.762				Detected Data Not Normal at 5% Significance Level		
2423					Lilliefors Test Statistic	0.472				Lilliefors GOF Test		
2424					5% Lilliefors Critical Value	0.343				Detected Data Not Normal at 5% Significance Level		
2425						Detected Data Not Normal at 5% Significance Level						
2426												
2427						Kaplan-Meier (KM) Statistics using Normal Critical Values and other Nonparametric UCLs						
2428					KM Mean	5020				KM Standard Error of Mean		5099
2429					KM SD	11172				95% KM (BCA) UCL		15010
2430					95% KM (t) UCL	15295				95% KM (Percentile Bootstrap) UCL		15008
2431					95% KM (z) UCL	13407				95% KM Bootstrap t UCL		4916607
2432					90% KM Chebyshev UCL	20317				95% KM Chebyshev UCL		27246
2433					97.5% KM Chebyshev UCL	36863				99% KM Chebyshev UCL		55755
2434												
2435						Gamma GOF Tests on Detected Observations Only						
2436					A-D Test Statistic	1.025				Anderson-Darling GOF Test		
2437					5% A-D Critical Value	0.791				Detected Data Not Gamma Distributed at 5% Significance Level		
2438					K-S Test Statistic	0.472				Kolmogorov-Smirnov GOF		
2439					5% K-S Critical Value	0.391				Detected Data Not Gamma Distributed at 5% Significance Level		
2440						Detected Data Not Gamma Distributed at 5% Significance Level						
2441												
2442						Gamma Statistics on Detected Data Only						
2443					k hat (MLE)	0.183				k star (bias corrected MLE)		0.206
2444					Theta hat (MLE)	32950				Theta star (bias corrected MLE)		29175
2445					nu hat (MLE)	1.828				nu star (bias corrected)		2.065
2446					Mean (detects)	6023						
2447												
2448						Gamma ROS Statistics using Imputed Non-Detects						
2449						GROS may not be used when data set has > 50% NDs with many tied observations at multiple DLs						
2450						GROS may not be used when kstar of detects is small such as <1.0, especially when the sample size is small (e.g., <15-20)						
2451						For such situations, GROS method may yield incorrect values of UCLs and BTVs						
2452						This is especially true when the sample size is small.						

	A	B	C	D	E	F	G	H	I	J	K	L
2453	For gamma distributed detected data, BTVs and UCLs may be computed using gamma distribution on KM estimates											
2454					Minimum	0.01					Mean	5019
2455					Maximum	30000					Median	30
2456					SD	12238					CV	2.438
2457					k hat (MLE)	0.142					k star (bias corrected MLE)	0.182
2458					Theta hat (MLE)	35247					Theta star (bias corrected MLE)	27532
2459					nu hat (MLE)	1.709					nu star (bias corrected)	2.188
2460					Adjusted Level of Significance (β)	0.0122						
2461					Approximate Chi Square Value (2.19, α)	0.179					Adjusted Chi Square Value (2.19, β)	0.0931
2462					95% Gamma Approximate UCL (use when n>=50)	61325					95% Gamma Adjusted UCL (use when n<50)	117976
2463												
2464	**Estimates of Gamma Parameters using KM Estimates**											
2465					Mean (KM)	5020					SD (KM)	11172
2466					Variance (KM)	1.248E+8					SE of Mean (KM)	5099
2467					k hat (KM)	0.202					k star (KM)	0.212
2468					nu hat (KM)	2.423					nu star (KM)	2.545
2469					theta hat (KM)	24863					theta star (KM)	23671
2470					80% gamma percentile (KM)	6811					90% gamma percentile (KM)	15177
2471					95% gamma percentile (KM)	25465					99% gamma percentile (KM)	53524
2472												
2473	**Gamma Kaplan-Meier (KM) Statistics**											
2474					Approximate Chi Square Value (2.54, α)	0.251					Adjusted Chi Square Value (2.54, β)	0.117
2475					95% Gamma Approximate KM-UCL (use when n>=50)	50813					95% Gamma Adjusted KM-UCL (use when n<50)	109492
2476												
2477	**Lognormal GOF Test on Detected Observations Only**											
2478					Shapiro Wilk Test Statistic	0.739	**Shapiro Wilk GOF Test**					
2479					5% Shapiro Wilk Critical Value	0.762	Detected Data Not Lognormal at 5% Significance Level					
2480					Lilliefors Test Statistic	0.391	**Lilliefors GOF Test**					
2481					5% Lilliefors Critical Value	0.343	Detected Data Not Lognormal at 5% Significance Level					
2482	**Detected Data Not Lognormal at 5% Significance Level**											
2483												
2484	**Lognormal ROS Statistics Using Imputed Non-Detects**											
2485					Mean in Original Scale	5019					Mean in Log Scale	3.395
2486					SD in Original Scale	12238					SD in Log Scale	4.177
2487					95% t UCL (assumes normality of ROS data)	15087					95% Percentile Bootstrap UCL	15007
2488					95% BCA Bootstrap UCL	15018					95% Bootstrap t UCL	4620533
2489					95% H-UCL (Log ROS)	1.210E+18						
2490												
2491	**Statistics using KM estimates on Logged Data and Assuming Lognormal Distribution**											
2492					KM Mean (logged)	3.907					KM Geo Mean	49.75
2493					KM SD (logged)	3.093					95% Critical H Value (KM-Log)	11.75
2494					KM Standard Error of Mean (logged)	1.412					95% H-UCL (KM -Log)	6.805E+10
2495					KM SD (logged)	3.093					95% Critical H Value (KM-Log)	11.75
2496					KM Standard Error of Mean (logged)	1.412						
2497												

	A	B	C	D	E	F	G	H	I	J	K	L
2498	DL/2 Statistics											
2499	DL/2 Normal						DL/2 Log-Transformed					
2500					Mean in Original Scale	5020					Mean in Log Scale	3.792
2501					SD in Original Scale	12238					SD in Log Scale	3.543
2502					95% t UCL (Assumes normality)	15087					95% H-Stat UCL	4.116E+13
2503	DL/2 is not a recommended method, provided for comparisons and historical reasons											
2504												
2505	Nonparametric Distribution Free UCL Statistics											
2506	Data do not follow a Discernible Distribution at 5% Significance Level											
2507												
2508	Suggested UCL to Use											
2509					KM Bootstrap t UCL	15008						
2510												
2511	Note: Suggestions regarding the selection of a 95% UCL are provided to help the user to select the most appropriate 95% UCL.											
2512	Recommendations are based upon data size, data distribution, and skewness.											
2513	These recommendations are based upon the results of the simulation studies summarized in Singh, Maichle, and Lee (2006).											
2514	However, simulations results will not cover all Real World data sets; for additional insight the user may want to consult a statistician.											
2515												
2516	Mercury											
2517												
2518	General Statistics											
2519					Total Number of Observations	6					Number of Distinct Observations	3
2520					Number of Detects	1					Number of Non-Detects	5
2521					Number of Distinct Detects	1					Number of Distinct Non-Detects	2
2522												
2523	Warning: Only one distinct data value was detected! ProUCL (or any other software) should not be used on such a data set!											
2524	It is suggested to use alternative site specific values determined by the Project Team to estimate environmental parameters (e.g., EPC, BTV).											
2525												
2526	The data set for variable Mercury was not processed!											
2527												
2528												
2529	Nickel											
2530												
2531	General Statistics											
2532					Total Number of Observations	6					Number of Distinct Observations	6
2533					Number of Detects	3					Number of Non-Detects	3
2534					Number of Distinct Detects	3					Number of Distinct Non-Detects	3
2535					Minimum Detect	0.21					Minimum Non-Detect	0.17
2536					Maximum Detect	110					Maximum Non-Detect	1.7
2537					Variance Detects	4006					Percent Non-Detects	50%
2538					Mean Detects	36.92					SD Detects	63.29
2539					Median Detects	0.54					CV Detects	1.714
2540					Skewness Detects	1.732					Kurtosis Detects	N/A
2541					Mean of Logged Detects	0.841					SD of Logged Detects	3.375
2542												
2543	Warning: Data set has only 3 Detected Values.											
2544	This is not enough to compute meaningful or reliable statistics and estimates.											
2545												
2546												

	A	B	C	D	E	F	G	H	I	J	K	L
2547	Note: Sample size is small (e.g., <10), if data are collected using ISM approach, you should use											
2548	guidance provided in ITRC Tech Reg Guide on ISM (ITRC, 2012) to compute statistics of interest.											
2549	For example, you may want to use Chebyshev UCL to estimate EPC (ITRC, 2012).											
2550	Chebyshev UCL can be computed using the Nonparametric and All UCL Options of ProUCL 5.1											
2551												
2552	Normal GOF Test on Detects Only											
2553					Shapiro Wilk Test Statistic	0.752	Shapiro Wilk GOF Test					
2554					5% Shapiro Wilk Critical Value	0.767	Detected Data Not Normal at 5% Significance Level					
2555					Lilliefors Test Statistic	0.384	Lilliefors GOF Test					
2556					5% Lilliefors Critical Value	0.425	Detected Data appear Normal at 5% Significance Level					
2557	Detected Data appear Approximate Normal at 5% Significance Level											
2558												
2559	Kaplan-Meier (KM) Statistics using Normal Critical Values and other Nonparametric UCLs											
2560					KM Mean	18.56	KM Standard Error of Mean					20.45
2561					KM SD	40.89	95% KM (BCA) UCL					N/A
2562					95% KM (t) UCL	59.76	95% KM (Percentile Bootstrap) UCL					N/A
2563					95% KM (z) UCL	52.19	95% KM Bootstrap t UCL					N/A
2564					90% KM Chebyshev UCL	79.9	95% KM Chebyshev UCL					107.7
2565					97.5% KM Chebyshev UCL	146.2	99% KM Chebyshev UCL					222
2566												
2567	Gamma GOF Tests on Detected Observations Only											
2568	Not Enough Data to Perform GOF Test											
2569												
2570	Gamma Statistics on Detected Data Only											
2571					k hat (MLE)	0.256	k star (bias corrected MLE)					N/A
2572					Theta hat (MLE)	144.4	Theta star (bias corrected MLE)					N/A
2573					nu hat (MLE)	1.534	nu star (bias corrected)					N/A
2574					Mean (detects)	36.92						
2575												
2576	Gamma ROS Statistics using Imputed Non-Detects											
2577	GROS may not be used when data set has > 50% NDs with many tied observations at multiple DLs											
2578	GROS may not be used when kstar of detects is small such as <1.0, especially when the sample size is small (e.g., <15-20)											
2579	For such situations, GROS method may yield incorrect values of UCLs and BTVs											
2580	This is especially true when the sample size is small.											
2581	For gamma distributed detected data, BTVs and UCLs may be computed using gamma distribution on KM estimates											
2582					Minimum	0.01	Mean					18.46
2583					Maximum	110	Median					0.11
2584					SD	44.84	CV					2.429
2585					k hat (MLE)	0.159	k star (bias corrected MLE)					0.191
2586					Theta hat (MLE)	116.2	Theta star (bias corrected MLE)					96.9
2587					nu hat (MLE)	1.906	nu star (bias corrected)					2.286
2588					Adjusted Level of Significance (β)	0.0122						
2589					Approximate Chi Square Value (2.29, α)	0.197	Adjusted Chi Square Value (2.29, β)					0.0982
2590					95% Gamma Approximate UCL (use when n>=50)	214.5	95% Gamma Adjusted UCL (use when n<50)					N/A
2591												
2592	Estimates of Gamma Parameters using KM Estimates											
2593					Mean (KM)	18.56	SD (KM)					40.89
2594					Variance (KM)	1672	SE of Mean (KM)					20.45
2595					k hat (KM)	0.206	k star (KM)					0.214
2596					nu hat (KM)	2.473	nu star (KM)					2.57
2597					theta hat (KM)	90.07	theta star (KM)					86.68
2598					80% gamma percentile (KM)	25.31	90% gamma percentile (KM)					56.12

	A	B	C	D	E	F	G	H	I	J	K	L
2599					95% gamma percentile (KM)	93.93				99% gamma percentile (KM)		196.9
2600												
2601					Gamma Kaplan-Meier (KM) Statistics							
2602					Approximate Chi Square Value (2.57, α)	0.257				Adjusted Chi Square Value (2.57, β)		0.119
2603					95% Gamma Approximate KM-UCL (use when n>=50)	185.4				95% Gamma Adjusted KM-UCL (use when n<50)		401.4
2604												
2605					Lognormal GOF Test on Detected Observations Only							
2606					Shapiro Wilk Test Statistic	0.86				Shapiro Wilk GOF Test		
2607					5% Shapiro Wilk Critical Value	0.767				Detected Data appear Lognormal at 5% Significance Level		
2608					Lilliefors Test Statistic	0.334				Lilliefors GOF Test		
2609					5% Lilliefors Critical Value	0.425				Detected Data appear Lognormal at 5% Significance Level		
2610					Detected Data appear Lognormal at 5% Significance Level							
2611												
2612					Lognormal ROS Statistics Using Imputed Non-Detects							
2613					Mean in Original Scale	18.47				Mean in Log Scale		-1.778
2614					SD in Original Scale	44.84				SD in Log Scale		3.746
2615					95% t UCL (assumes normality of ROS data)	55.36				95% Percentile Bootstrap UCL		55.02
2616					95% BCA Bootstrap UCL	73.34				95% Bootstrap t UCL		10084
2617					95% H-UCL (Log ROS)	3.958E+12						
2618												
2619					Statistics using KM estimates on Logged Data and Assuming Lognormal Distribution							
2620					KM Mean (logged)	-0.386				KM Geo Mean		0.68
2621					KM SD (logged)	2.314				95% Critical H Value (KM-Log)		8.857
2622					KM Standard Error of Mean (logged)	1.162				95% H-UCL (KM -Log)		94543
2623					KM SD (logged)	2.314				95% Critical H Value (KM-Log)		8.857
2624					KM Standard Error of Mean (logged)	1.162						
2625												
2626					DL/2 Statistics							
2627					DL/2 Normal					DL/2 Log-Transformed		
2628					Mean in Original Scale	18.64				Mean in Log Scale		-0.328
2629					SD in Original Scale	44.76				SD in Log Scale		2.602
2630					95% t UCL (Assumes normality)	55.46				95% H-Stat UCL		2192769
2631					DL/2 is not a recommended method, provided for comparisons and historical reasons							
2632												
2633					Nonparametric Distribution Free UCL Statistics							
2634					Detected Data appear Approximate Normal Distributed at 5% Significance Level							
2635												
2636					Suggested UCL to Use							
2637					95% KM (t) UCL	59.76						
2638												
2639					When a data set follows an approximate (e.g., normal) distribution passing one of the GOF test							
2640					When applicable, it is suggested to use a UCL based upon a distribution (e.g., gamma) passing both GOF tests in ProUCL							
2641												
2642					Note: Suggestions regarding the selection of a 95% UCL are provided to help the user to select the most appropriate 95% UCL.							
2643					Recommendations are based upon data size, data distribution, and skewness.							
2644					These recommendations are based upon the results of the simulation studies summarized in Singh, Maichle, and Lee (2006).							
2645					However, simulations results will not cover all Real World data sets; for additional insight the user may want to consult a statistician.							
2646												
2647	Selenium											
2648												
2649					General Statistics							
2650					Total Number of Observations	6				Number of Distinct Observations		6

	A	B	C	D	E	F	G	H	I	J	K	L
2651					Number of Detects	5					Number of Non-Detects	1
2652					Number of Distinct Detects	5					Number of Distinct Non-Detects	1
2653					Minimum Detect	1.1					Minimum Non-Detect	2.6
2654					Maximum Detect	15					Maximum Non-Detect	2.6
2655					Variance Detects	31.59					Percent Non-Detects	16.67%
2656					Mean Detects	5.86					SD Detects	5.62
2657					Median Detects	4					CV Detects	0.959
2658					Skewness Detects	1.394					Kurtosis Detects	1.683
2659					Mean of Logged Detects	1.371					SD of Logged Detects	1.029
2660												
2661					Note: Sample size is small (e.g., <10), if data are collected using ISM approach, you should use							
2662					guidance provided in ITRC Tech Reg Guide on ISM (ITRC, 2012) to compute statistics of interest.							
2663					For example, you may want to use Chebyshev UCL to estimate EPC (ITRC, 2012).							
2664					Chebyshev UCL can be computed using the Nonparametric and All UCL Options of ProUCL 5.1							
2665												
2666					Normal GOF Test on Detects Only							
2667					Shapiro Wilk Test Statistic	0.871					Shapiro Wilk GOF Test	
2668					5% Shapiro Wilk Critical Value	0.762					Detected Data appear Normal at 5% Significance Level	
2669					Lilliefors Test Statistic	0.23					Lilliefors GOF Test	
2670					5% Lilliefors Critical Value	0.343					Detected Data appear Normal at 5% Significance Level	
2671					Detected Data appear Normal at 5% Significance Level							
2672												
2673					Kaplan-Meier (KM) Statistics using Normal Critical Values and other Nonparametric UCLs							
2674					KM Mean	5.142					KM Standard Error of Mean	2.223
2675					KM SD	4.865					95% KM (BCA) UCL	8.733
2676					95% KM (t) UCL	9.621					95% KM (Percentile Bootstrap) UCL	8.833
2677					95% KM (z) UCL	8.798					95% KM Bootstrap t UCL	16
2678					90% KM Chebyshev UCL	11.81					95% KM Chebyshev UCL	14.83
2679					97.5% KM Chebyshev UCL	19.03					99% KM Chebyshev UCL	27.26
2680												
2681					Gamma GOF Tests on Detected Observations Only							
2682					A-D Test Statistic	0.207					Anderson-Darling GOF Test	
2683					5% A-D Critical Value	0.687					Detected data appear Gamma Distributed at 5% Significance Level	
2684					K-S Test Statistic	0.182					Kolmogorov-Smirnov GOF	
2685					5% K-S Critical Value	0.362					Detected data appear Gamma Distributed at 5% Significance Level	
2686					Detected data appear Gamma Distributed at 5% Significance Level							
2687												
2688					Gamma Statistics on Detected Data Only							
2689					k hat (MLE)	1.403					k star (bias corrected MLE)	0.695
2690					Theta hat (MLE)	4.175					Theta star (bias corrected MLE)	8.435
2691					nu hat (MLE)	14.03					nu star (bias corrected)	6.947
2692					Mean (detects)	5.86						
2693												
2694					Gamma ROS Statistics using Imputed Non-Detects							
2695					GROS may not be used when data set has > 50% NDs with many tied observations at multiple DLs							
2696					GROS may not be used when kstar of detects is small such as <1.0, especially when the sample size is small (e.g., <15-20)							
2697					For such situations, GROS method may yield incorrect values of UCLs and BTVs							
2698					This is especially true when the sample size is small.							
2699					For gamma distributed detected data, BTVs and UCLs may be computed using gamma distribution on KM estimates							
2700					Minimum	0.741					Mean	5.007
2701					Maximum	15					Median	3
2702					SD	5.444					CV	1.087

	A	B	C	D	E	F	G	H	I	J	K	L
2703					k hat (MLE)	1.102					k star (bias corrected MLE)	0.662
2704					Theta hat (MLE)	4.543					Theta star (bias corrected MLE)	7.561
2705					nu hat (MLE)	13.23					nu star (bias corrected)	7.946
2706					Adjusted Level of Significance (β)	0.0122						
2707					Approximate Chi Square Value (7.95, α)	2.704					Adjusted Chi Square Value (7.95, β)	1.73
2708					95% Gamma Approximate UCL (use when n>=50)	14.71					95% Gamma Adjusted UCL (use when n<50)	22.99
2709												
2710					**Estimates of Gamma Parameters using KM Estimates**							
2711					Mean (KM)	5.142					SD (KM)	4.865
2712					Variance (KM)	23.67					SE of Mean (KM)	2.223
2713					k hat (KM)	1.117					k star (KM)	0.669
2714					nu hat (KM)	13.4					nu star (KM)	8.034
2715					theta hat (KM)	4.604					theta star (KM)	7.68
2716					80% gamma percentile (KM)	8.463					90% gamma percentile (KM)	13.04
2717					95% gamma percentile (KM)	17.78					99% gamma percentile (KM)	29.15
2718												
2719					**Gamma Kaplan-Meier (KM) Statistics**							
2720					Approximate Chi Square Value (8.03, α)	2.755					Adjusted Chi Square Value (8.03, β)	1.769
2721					95% Gamma Approximate KM-UCL (use when n>=50)	15					95% Gamma Adjusted KM-UCL (use when n<50)	23.35
2722												
2723					**Lognormal GOF Test on Detected Observations Only**							
2724					Shapiro Wilk Test Statistic	0.987			**Shapiro Wilk GOF Test**			
2725					5% Shapiro Wilk Critical Value	0.762			Detected Data appear Lognormal at 5% Significance Level			
2726					Lilliefors Test Statistic	0.145			**Lilliefors GOF Test**			
2727					5% Lilliefors Critical Value	0.343			Detected Data appear Lognormal at 5% Significance Level			
2728					**Detected Data appear Lognormal at 5% Significance Level**							
2729												
2730					**Lognormal ROS Statistics Using Imputed Non-Detects**							
2731					Mean in Original Scale	5.127					Mean in Log Scale	1.206
2732					SD in Original Scale	5.338					SD in Log Scale	1.006
2733					95% t UCL (assumes normality of ROS data)	9.518					95% Percentile Bootstrap UCL	8.783
2734					95% BCA Bootstrap UCL	9.7					95% Bootstrap t UCL	16.52
2735					95% H-UCL (Log ROS)	35.76						
2736												
2737					**Statistics using KM estimates on Logged Data and Assuming Lognormal Distribution**							
2738					KM Mean (logged)	1.209					KM Geo Mean	3.349
2739					KM SD (logged)	0.924					95% Critical H Value (KM-Log)	3.849
2740					KM Standard Error of Mean (logged)	0.427					95% H-UCL (KM -Log)	25.18
2741					KM SD (logged)	0.924					95% Critical H Value (KM-Log)	3.849
2742					KM Standard Error of Mean (logged)	0.427						
2743												

	A	B	C	D	E	F	G	H	I	J	K	L
2744	DL/2 Statistics											
2745	DL/2 Normal						DL/2 Log-Transformed					
2746					Mean in Original Scale	5.1				Mean in Log Scale		1.187
2747					SD in Original Scale	5.361				SD in Log Scale		1.026
2748					95% t UCL (Assumes normality)	9.51				95% H-Stat UCL		38.42
2749	DL/2 is not a recommended method, provided for comparisons and historical reasons											
2750												
2751	Nonparametric Distribution Free UCL Statistics											
2752	Detected Data appear Normal Distributed at 5% Significance Level											
2753												
2754	Suggested UCL to Use											
2755					95% KM (t) UCL	9.621						
2756												
2757	Note: Suggestions regarding the selection of a 95% UCL are provided to help the user to select the most appropriate 95% UCL.											
2758	Recommendations are based upon data size, data distribution, and skewness.											
2759	These recommendations are based upon the results of the simulation studies summarized in Singh, Maichle, and Lee (2006).											
2760	However, simulations results will not cover all Real World data sets; for additional insight the user may want to consult a statistician.											
2761												
2762	Thallium											
2763												
2764	General Statistics											
2765					Total Number of Observations	6				Number of Distinct Observations		4
2766					Number of Detects	2				Number of Non-Detects		4
2767					Number of Distinct Detects	2				Number of Distinct Non-Detects		2
2768					Minimum Detect	0.043				Minimum Non-Detect		0.015
2769					Maximum Detect	0.11				Maximum Non-Detect		0.13
2770					Variance Detects	0.00224				Percent Non-Detects		66.67%
2771					Mean Detects	0.0765				SD Detects		0.0474
2772					Median Detects	0.0765				CV Detects		0.619
2773					Skewness Detects	N/A				Kurtosis Detects		N/A
2774					Mean of Logged Detects	-2.677				SD of Logged Detects		0.664
2775												
2776	Warning: Data set has only 2 Detected Values.											
2777	This is not enough to compute meaningful or reliable statistics and estimates.											
2778												
2779												
2780	Note: Sample size is small (e.g., <10), if data are collected using ISM approach, you should use											
2781	guidance provided in ITRC Tech Reg Guide on ISM (ITRC, 2012) to compute statistics of interest.											
2782	For example, you may want to use Chebyshev UCL to estimate EPC (ITRC, 2012).											
2783	Chebyshev UCL can be computed using the Nonparametric and All UCL Options of ProUCL 5.1											
2784												
2785	Normal GOF Test on Detects Only											
2786	Not Enough Data to Perform GOF Test											
2787												
2788	Kaplan-Meier (KM) Statistics using Normal Critical Values and other Nonparametric UCLs											
2789					KM Mean	0.0458				KM Standard Error of Mean		0.0274
2790					KM SD	0.0388				95% KM (BCA) UCL		N/A
2791					95% KM (t) UCL	0.101				95% KM (Percentile Bootstrap) UCL		N/A
2792					95% KM (z) UCL	0.0909				95% KM Bootstrap t UCL		N/A

	A	B	C	D	E	F	G	H	I	J	K	L
2793					90% KM Chebyshev UCL	0.128				95% KM Chebyshev UCL		0.165
2794					97.5% KM Chebyshev UCL	0.217				99% KM Chebyshev UCL		0.319
2795												
2796					Gamma GOF Tests on Detected Observations Only							
2797					Not Enough Data to Perform GOF Test							
2798												
2799					Gamma Statistics on Detected Data Only							
2800					k hat (MLE)	4.858				k star (bias corrected MLE)		N/A
2801					Theta hat (MLE)	0.0157				Theta star (bias corrected MLE)		N/A
2802					nu hat (MLE)	19.43				nu star (bias corrected)		N/A
2803					Mean (detects)	0.0765						
2804												
2805					Estimates of Gamma Parameters using KM Estimates							
2806					Mean (KM)	0.0458				SD (KM)		0.0388
2807					Variance (KM)	0.00151				SE of Mean (KM)		0.0274
2808					k hat (KM)	1.389				k star (KM)		0.806
2809					nu hat (KM)	16.67				nu star (KM)		9.668
2810					theta hat (KM)	0.0329				theta star (KM)		0.0568
2811					80% gamma percentile (KM)	0.0747				90% gamma percentile (KM)		0.111
2812					95% gamma percentile (KM)	0.148				99% gamma percentile (KM)		0.235
2813												
2814					Gamma Kaplan-Meier (KM) Statistics							
2815										Adjusted Level of Significance (β)		0.0122
2816					Approximate Chi Square Value (9.67, α)	3.736				Adjusted Chi Square Value (9.67, β)		2.531
2817					95% Gamma Approximate KM-UCL (use when n>=50)	0.118				95% Gamma Adjusted KM-UCL (use when n<50)		0.175
2818												
2819					Lognormal GOF Test on Detected Observations Only							
2820					Not Enough Data to Perform GOF Test							
2821												
2822					Lognormal ROS Statistics Using Imputed Non-Detects							
2823					Mean in Original Scale	0.0365				Mean in Log Scale		-3.9
2824					SD in Original Scale	0.04				SD in Log Scale		1.265
2825					95% t UCL (assumes normality of ROS data)	0.0694				95% Percentile Bootstrap UCL		0.0634
2826					95% BCA Bootstrap UCL	0.0653				95% Bootstrap t UCL		0.099
2827					95% H-UCL (Log ROS)	0.782						
2828												
2829					Statistics using KM estimates on Logged Data and Assuming Lognormal Distribution							
2830					KM Mean (logged)	-3.438				KM Geo Mean		0.0321
2831					KM SD (logged)	0.831				95% Critical H Value (KM-Log)		3.568
2832					KM Standard Error of Mean (logged)	0.587				95% H-UCL (KM -Log)		0.171
2833					KM SD (logged)	0.831				95% Critical H Value (KM-Log)		3.568
2834					KM Standard Error of Mean (logged)	0.587						
2835												
2836					DL/2 Statistics							
2837					DL/2 Normal					DL/2 Log-Transformed		
2838					Mean in Original Scale	0.0497				Mean in Log Scale		-3.434
2839					SD in Original Scale	0.0393				SD in Log Scale		1.168
2840					95% t UCL (Assumes normality)	0.082				95% H-Stat UCL		0.749
2841					DL/2 is not a recommended method, provided for comparisons and historical reasons							
2842												
2843					Nonparametric Distribution Free UCL Statistics							
2844					Data do not follow a Discernible Distribution at 5% Significance Level							

	A	B	C	D	E	F	G	H	I	J	K	L
2845												
2846						Suggested UCL to Use						
2847					95% KM (Chebyshev) UCL	0.165						
2848						Warning: Recommended UCL exceeds the maximum observation						
2849												
2850						Note: Suggestions regarding the selection of a 95% UCL are provided to help the user to select the most appropriate 95% UCL.						
2851						Recommendations are based upon data size, data distribution, and skewness.						
2852						These recommendations are based upon the results of the simulation studies summarized in Singh, Maichle, and Lee (2006).						
2853						However, simulations results will not cover all Real World data sets; for additional insight the user may want to consult a statistician.						
2854												
2855	Vanadium											
2856												
2857						General Statistics						
2858					Total Number of Observations	6			Number of Distinct Observations		6	
2859					Number of Detects	5			Number of Non-Detects		1	
2860					Number of Distinct Detects	5			Number of Distinct Non-Detects		1	
2861					Minimum Detect	0.33			Minimum Non-Detect		0.082	
2862					Maximum Detect	5.7			Maximum Non-Detect		0.082	
2863					Variance Detects	4.262			Percent Non-Detects		16.67%	
2864					Mean Detects	2.206			SD Detects		2.064	
2865					Median Detects	1.5			CV Detects		0.936	
2866					Skewness Detects	1.656			Kurtosis Detects		3.173	
2867					Mean of Logged Detects	0.418			SD of Logged Detects		1.03	
2868												
2869						Note: Sample size is small (e.g., <10), if data are collected using ISM approach, you should use						
2870						guidance provided in ITRC Tech Reg Guide on ISM (ITRC, 2012) to compute statistics of interest.						
2871						For example, you may want to use Chebyshev UCL to estimate EPC (ITRC, 2012).						
2872						Chebyshev UCL can be computed using the Nonparametric and All UCL Options of ProUCL 5.1						
2873												
2874						Normal GOF Test on Detects Only						
2875					Shapiro Wilk Test Statistic	0.841			Shapiro Wilk GOF Test			
2876					5% Shapiro Wilk Critical Value	0.762			Detected Data appear Normal at 5% Significance Level			
2877					Lilliefors Test Statistic	0.301			Lilliefors GOF Test			
2878					5% Lilliefors Critical Value	0.343			Detected Data appear Normal at 5% Significance Level			
2879						Detected Data appear Normal at 5% Significance Level						
2880												
2881						Kaplan-Meier (KM) Statistics using Normal Critical Values and other Nonparametric UCLs						
2882					KM Mean	1.852			KM Standard Error of Mean		0.85	
2883					KM SD	1.862			95% KM (BCA) UCL		3.327	
2884					95% KM (t) UCL	3.565			95% KM (Percentile Bootstrap) UCL		3.297	
2885					95% KM (z) UCL	3.25			95% KM Bootstrap t UCL		4.915	
2886					90% KM Chebyshev UCL	4.402			95% KM Chebyshev UCL		5.557	
2887					97.5% KM Chebyshev UCL	7.16			99% KM Chebyshev UCL		10.31	
2888												
2889						Gamma GOF Tests on Detected Observations Only						
2890					A-D Test Statistic	0.259			Anderson-Darling GOF Test			
2891					5% A-D Critical Value	0.687			Detected data appear Gamma Distributed at 5% Significance Level			
2892					K-S Test Statistic	0.192			Kolmogorov-Smirnov GOF			
2893					5% K-S Critical Value	0.362			Detected data appear Gamma Distributed at 5% Significance Level			
2894						Detected data appear Gamma Distributed at 5% Significance Level						
2895												
2896						Gamma Statistics on Detected Data Only						

	A	B	C	D	E	F	G	H	I	J	K	L
2897					k hat (MLE)	1.483					k star (bias corrected MLE)	0.727
2898					Theta hat (MLE)	1.487					Theta star (bias corrected MLE)	3.036
2899					nu hat (MLE)	14.83					nu star (bias corrected)	7.266
2900					Mean (detects)	2.206						
2901												
2902					**Gamma ROS Statistics using Imputed Non-Detects**							
2903					GROS may not be used when data set has > 50% NDs with many tied observations at multiple DLs							
2904					GROS may not be used when kstar of detects is small such as <1.0, especially when the sample size is small (e.g., <15-20)							
2905					For such situations, GROS method may yield incorrect values of UCLs and BTVs							
2906					This is especially true when the sample size is small.							
2907					For gamma distributed detected data, BTVs and UCLs may be computed using gamma distribution on KM estimates							
2908					Minimum	0.01					Mean	1.84
2909					Maximum	5.7					Median	1.4
2910					SD	2.053					CV	1.116
2911					k hat (MLE)	0.6					k star (bias corrected MLE)	0.411
2912					Theta hat (MLE)	3.065					Theta star (bias corrected MLE)	4.474
2913					nu hat (MLE)	7.203					nu star (bias corrected)	4.935
2914					Adjusted Level of Significance (β)	0.0122						
2915					Approximate Chi Square Value (4.93, α)	1.122					Adjusted Chi Square Value (4.93, β)	0.6
2916					95% Gamma Approximate UCL (use when n>=50)	8.091					95% Gamma Adjusted UCL (use when n<50)	15.14
2917												
2918					**Estimates of Gamma Parameters using KM Estimates**							
2919					Mean (KM)	1.852					SD (KM)	1.862
2920					Variance (KM)	3.468					SE of Mean (KM)	0.85
2921					k hat (KM)	0.989					k star (KM)	0.606
2922					nu hat (KM)	11.87					nu star (KM)	7.268
2923					theta hat (KM)	1.872					theta star (KM)	3.058
2924					80% gamma percentile (KM)	3.053					90% gamma percentile (KM)	4.807
2925					95% gamma percentile (KM)	6.642					99% gamma percentile (KM)	11.08
2926												
2927					**Gamma Kaplan-Meier (KM) Statistics**							
2928					Approximate Chi Square Value (7.27, α)	2.319					Adjusted Chi Square Value (7.27, β)	1.441
2929					95% Gamma Approximate KM-UCL (use when n>=50)	5.805					95% Gamma Adjusted KM-UCL (use when n<50)	9.34
2930												
2931					**Lognormal GOF Test on Detected Observations Only**							
2932					Shapiro Wilk Test Statistic	0.963					**Shapiro Wilk GOF Test**	
2933					5% Shapiro Wilk Critical Value	0.762					Detected Data appear Lognormal at 5% Significance Level	
2934					Lilliefors Test Statistic	0.24					**Lilliefors GOF Test**	
2935					5% Lilliefors Critical Value	0.343					Detected Data appear Lognormal at 5% Significance Level	
2936					**Detected Data appear Lognormal at 5% Significance Level**							
2937												
2938					**Lognormal ROS Statistics Using Imputed Non-Detects**							
2939					Mean in Original Scale	1.857					Mean in Log Scale	-0.0141
2940					SD in Original Scale	2.034					SD in Log Scale	1.402
2941					95% t UCL (assumes normality of ROS data)	3.531					95% Percentile Bootstrap UCL	3.174

	A	B	C	D	E	F	G	H	I	J	K	L
2942					95% BCA Bootstrap UCL	3.488					95% Bootstrap t UCL	5.151
2943					95% H-UCL (Log ROS)	84.51						
2944												
2945					Statistics using KM estimates on Logged Data and Assuming Lognormal Distribution							
2946					KM Mean (logged)	-0.0688					KM Geo Mean	0.933
2947					KM SD (logged)	1.375					95% Critical H Value (KM-Log)	5.431
2948					KM Standard Error of Mean (logged)	0.627					95% H-UCL (KM -Log)	67.7
2949					KM SD (logged)	1.375					95% Critical H Value (KM-Log)	5.431
2950					KM Standard Error of Mean (logged)	0.627						
2951												
2952					DL/2 Statistics							
2953					DL/2 Normal						DL/2 Log-Transformed	
2954					Mean in Original Scale	1.845					Mean in Log Scale	-0.184
2955					SD in Original Scale	2.047					SD in Log Scale	1.739
2956					95% t UCL (Assumes normality)	3.529					95% H-Stat UCL	713.6
2957					DL/2 is not a recommended method, provided for comparisons and historical reasons							
2958												
2959					Nonparametric Distribution Free UCL Statistics							
2960					Detected Data appear Normal Distributed at 5% Significance Level							
2961												
2962					Suggested UCL to Use							
2963					95% KM (t) UCL	3.565						
2964												
2965					Note: Suggestions regarding the selection of a 95% UCL are provided to help the user to select the most appropriate 95% UCL.							
2966					Recommendations are based upon data size, data distribution, and skewness.							
2967					These recommendations are based upon the results of the simulation studies summarized in Singh, Maichle, and Lee (2006).							
2968					However, simulations results will not cover all Real World data sets; for additional insight the user may want to consult a statistician.							
2969												
2970	Zinc											
2971												
2972					General Statistics							
2973					Total Number of Observations	6					Number of Distinct Observations	5
2974					Number of Detects	4					Number of Non-Detects	2
2975					Number of Distinct Detects	4					Number of Distinct Non-Detects	1
2976					Minimum Detect	2.3					Minimum Non-Detect	3.2
2977					Maximum Detect	160					Maximum Non-Detect	3.2
2978					Variance Detects	6009					Percent Non-Detects	33.33%
2979					Mean Detects	43.78					SD Detects	77.52
2980					Median Detects	6.4					CV Detects	1.771
2981					Skewness Detects	1.994					Kurtosis Detects	3.981
2982					Mean of Logged Detects	2.387					SD of Logged Detects	1.865
2983												
2984					Note: Sample size is small (e.g., <10), if data are collected using ISM approach, you should use							
2985					guidance provided in ITRC Tech Reg Guide on ISM (ITRC, 2012) to compute statistics of interest.							
2986					For example, you may want to use Chebyshev UCL to estimate EPC (ITRC, 2012).							
2987					Chebyshev UCL can be computed using the Nonparametric and All UCL Options of ProUCL 5.1							
2988												
2989					Normal GOF Test on Detects Only							
2990					Shapiro Wilk Test Statistic	0.658					Shapiro Wilk GOF Test	
2991					5% Shapiro Wilk Critical Value	0.748					Detected Data Not Normal at 5% Significance Level	
2992					Lilliefors Test Statistic	0.427					Lilliefors GOF Test	
2993					5% Lilliefors Critical Value	0.375					Detected Data Not Normal at 5% Significance Level	

	A	B	C	D	E	F	G	H	I	J	K	L
2994	Detected Data Not Normal at 5% Significance Level											
2995												
2996	Kaplan-Meier (KM) Statistics using Normal Critical Values and other Nonparametric UCLs											
2997					KM Mean	29.95			KM Standard Error of Mean			27.43
2998					KM SD	58.2			95% KM (BCA) UCL			N/A
2999					95% KM (t) UCL	85.23			95% KM (Percentile Bootstrap) UCL			N/A
3000					95% KM (z) UCL	75.08			95% KM Bootstrap t UCL			N/A
3001					90% KM Chebyshev UCL	112.3			95% KM Chebyshev UCL			149.5
3002					97.5% KM Chebyshev UCL	201.3			99% KM Chebyshev UCL			302.9
3003												
3004	Gamma GOF Tests on Detected Observations Only											
3005					A-D Test Statistic	0.604	Anderson-Darling GOF Test					
3006					5% A-D Critical Value	0.685	Detected data appear Gamma Distributed at 5% Significance Level					
3007					K-S Test Statistic	0.397	Kolmogorov-Smirnov GOF					
3008					5% K-S Critical Value	0.412	Detected data appear Gamma Distributed at 5% Significance Level					
3009	Detected data appear Gamma Distributed at 5% Significance Level											
3010												
3011	Gamma Statistics on Detected Data Only											
3012					k hat (MLE)	0.462			k star (bias corrected MLE)			0.282
3013					Theta hat (MLE)	94.76			Theta star (bias corrected MLE)			155.1
3014					nu hat (MLE)	3.695			nu star (bias corrected)			2.257
3015					Mean (detects)	43.78						
3016												
3017	Gamma ROS Statistics using Imputed Non-Detects											
3018	GROS may not be used when data set has > 50% NDs with many tied observations at multiple DLs											
3019	GROS may not be used when kstar of detects is small such as <1.0, especially when the sample size is small (e.g., <15-20)											
3020	For such situations, GROS method may yield incorrect values of UCLs and BTVs											
3021	This is especially true when the sample size is small.											
3022	For gamma distributed detected data, BTVs and UCLs may be computed using gamma distribution on KM estimates											
3023					Minimum	0.01			Mean			29.19
3024					Maximum	160			Median			3.5
3025					SD	64.16			CV			2.198
3026					k hat (MLE)	0.219			k star (bias corrected MLE)			0.22
3027					Theta hat (MLE)	133.4			Theta star (bias corrected MLE)			132.4
3028					nu hat (MLE)	2.625			nu star (bias corrected)			2.646
3029					Adjusted Level of Significance (β)	0.0122						
3030					Approximate Chi Square Value (2.65, α)	0.276			Adjusted Chi Square Value (2.65, β)			0.126
3031					95% Gamma Approximate UCL (use when n>=50)	280.1			95% Gamma Adjusted UCL (use when n<50)			N/A
3032												
3033	Estimates of Gamma Parameters using KM Estimates											
3034					Mean (KM)	29.95			SD (KM)			58.2
3035					Variance (KM)	3387			SE of Mean (KM)			27.43
3036					k hat (KM)	0.265			k star (KM)			0.244
3037					nu hat (KM)	3.178			nu star (KM)			2.922
3038					theta hat (KM)	113.1			theta star (KM)			123
3039					80% gamma percentile (KM)	43.08			90% gamma percentile (KM)			90.05
3040					95% gamma percentile (KM)	146.1			99% gamma percentile (KM)			295.8
3041												
3042	Gamma Kaplan-Meier (KM) Statistics											
3043					Approximate Chi Square Value (2.92, α)	0.35			Adjusted Chi Square Value (2.92, β)			0.157
3044					95% Gamma Approximate KM-UCL (use when n>=50)	250.2			95% Gamma Adjusted KM-UCL (use when n<50)			557.4
3045												

	A	B	C	D	E	F	G	H	I	J	K	L
3046	Lognormal GOF Test on Detected Observations Only											
3047					Shapiro Wilk Test Statistic	0.866	Shapiro Wilk GOF Test					
3048					5% Shapiro Wilk Critical Value	0.748	Detected Data appear Lognormal at 5% Significance Level					
3049					Lilliefors Test Statistic	0.313	Lilliefors GOF Test					
3050					5% Lilliefors Critical Value	0.375	Detected Data appear Lognormal at 5% Significance Level					
3051	Detected Data appear Lognormal at 5% Significance Level											
3052												
3053	Lognormal ROS Statistics Using Imputed Non-Detects											
3054					Mean in Original Scale	29.66	Mean in Log Scale					1.659
3055					SD in Original Scale	63.91	SD in Log Scale					1.865
3056					95% t UCL (assumes normality of ROS data)	82.23	95% Percentile Bootstrap UCL					80.88
3057					95% BCA Bootstrap UCL	83.05	95% Bootstrap t UCL					1121
3058					95% H-UCL (Log ROS)	12170						
3059												
3060	Statistics using KM estimates on Logged Data and Assuming Lognormal Distribution											
3061					KM Mean (logged)	1.869	KM Geo Mean					6.481
3062					KM SD (logged)	1.508	95% Critical H Value (KM-Log)					5.91
3063					KM Standard Error of Mean (logged)	0.711	95% H-UCL (KM -Log)					1090
3064					KM SD (logged)	1.508	95% Critical H Value (KM-Log)					5.91
3065					KM Standard Error of Mean (logged)	0.711						
3066												
3067	DL/2 Statistics											
3068			DL/2 Normal				DL/2 Log-Transformed					
3069					Mean in Original Scale	29.72	Mean in Log Scale					1.748
3070					SD in Original Scale	63.87	SD in Log Scale					1.751
3071					95% t UCL (Assumes normality)	82.26	95% H-Stat UCL					5425
3072	DL/2 is not a recommended method, provided for comparisons and historical reasons											
3073												
3074	Nonparametric Distribution Free UCL Statistics											
3075	Detected Data appear Gamma Distributed at 5% Significance Level											
3076												
3077	Suggested UCL to Use											
3078					95% KM Bootstrap t UCL	N/A	Adjusted KM-UCL (use when k<=1 and 15 < n < 50 but k<=1)					557.4
3079												
3080	Note: Suggestions regarding the selection of a 95% UCL are provided to help the user to select the most appropriate 95% UCL.											
3081	Recommendations are based upon data size, data distribution, and skewness.											
3082	These recommendations are based upon the results of the simulation studies summarized in Singh, Maichle, and Lee (2006).											
3083	However, simulations results will not cover all Real World data sets; for additional insight the user may want to consult a statistician.											
3084												
3085	Cyanide, Total											
3086												
3087	General Statistics											
3088					Total Number of Observations	6	Number of Distinct Observations					2
3089					Number of Detects	0	Number of Non-Detects					6
3090					Number of Distinct Detects	0	Number of Distinct Non-Detects					2
3091												
3092	Warning: All observations are Non-Detects (NDs), therefore all statistics and estimates should also be NDs!											
3093	Specifically, sample mean, UCLs, UPLs, and other statistics are also NDs lying below the largest detection limit!											
3094	The Project Team may decide to use alternative site specific values to estimate environmental parameters (e.g., EPC, BTV).											
3095												
3096	The data set for variable Cyanide, Total was not processed!											
3097												

	A	B	C	D	E	F	G	H	I	J	K	L
3098												

APPENDIX D

VOLATILIZATION FACTORS FOR A TRENCH SCENARIO

APPENDIX D
VOLITILIZATION FACTORS FOR TRENCH SCENARIO - CONSTRUCTION WORKER
MINGO JUNCTION STEEL WORKS LLC - CAA VIM AND VIIM
VRP PROJECT #20015

For Mass-Transfer Coefficients

Kg,H2O	0.833	cm/s
MWH2O	18	
Kl,O2	0.002	cm/s
MWO2	32	
T	**77**	F
T	298	K
R	8.20E-05	atm-m3/mol-K

For Emission Flux and Concentration in Trench

CF1	1.00E-03	L/cm3
CF2	1.00E+04	cm2/m2
CF3	3600	s/hr
F	**1**	
ACH	2	hr-1

Trench dimensions

Length	**8**	ft
	2.44	m
Width	**3**	ft
	0.91	m
Depth	**8**	ft
	2.44	m
Width/Depth	0.38	

Notes:

1 - **http://www.deq.state.va.us/Programs/LandProtectionRevitalization/RemediationProgram/VoluntaryRemediationProgram/VRPRiskAssessmentGuidance/Guidance.aspx#3.22; Table 3.8 Groundwater less then or equal to 15 feet deep.**

APPENDIX D
VOLITILIZATION FACTORS FOR TRENCH SCENARIO - CONSTRUCTION WORKER
MINGO JUNCTION STEEL WORKS LLC - CAA VIM AND VIIM
VRP PROJECT #20015

Table 3.8 Exposure-point concentrations (inhalation) for construction/utility workers in a trench: Groundwater less than 15 feet deep revised 10/5/07	CAS No.	Molecular Weight MWi g/mol	Henry's Law Constant Hi atm-m3/mol	Gas-Phase Mass Transfer Coefficient KiG cm/s	Liquid-Phase Mass Transfer Coefficient KiL cm/s	Overall Mass Transfer Coefficient Ki cm/s	Concentration of Contaminant in Groundwater Cgw ug/L	Volatilization Factor VF L/m3	Concentration of Contaminant in Trench Ctrench ug/m3	Concentration of Contaminant in Trench Ctrench mg/m3
TAL Inorganics										
Mercury	7439-97-6	200.59	1.14E-02	3.71E-01	7.99E-04	7.95E-04	5.00E-02	5.87E+00	2.93E-01	2.93E-04
TCL Volatile Organic Compounds (VOCs)										
Benzene	71-43-2	78.11	5.55E-03	5.09E-01	1.28E-03	1.27E-03	4.65E-01	9.35E+00	4.35E+00	4.35E-03
Chloroform	67-66-3	119.38	3.67E-03	4.42E-01	1.04E-03	1.02E-03	3.50E+00	7.53E+00	2.63E+01	2.63E-02
Dibromochloromethane	124-48-1	208.28	7.83E-04	3.67E-01	7.84E-04	7.35E-04	1.30E+00	5.43E+00	7.05E+00	7.05E-03
1,2-Dichlorobenzene (ortho)	95-50-1	147.00	1.90E-03	4.12E-01	9.33E-04	9.07E-04	3.70E+01	6.69E+00	2.48E+02	2.48E-01
1,4-Dichlorobenzene (para)	106-46-7	147.00	2.43E-03	4.12E-01	9.33E-04	9.12E-04	5.90E-01	6.74E+00	3.97E+00	3.97E-03
1,1-Dichloroethane	75-34-3	98.96	5.62E-03	4.71E-01	1.14E-03	1.13E-03	2.50E-01	8.31E+00	2.08E+00	2.08E-03
cis-1,2-Dichloroethene	156-59-2	96.94	4.08E-03	4.74E-01	1.15E-03	1.13E-03	1.75E+00	8.36E+00	1.46E+01	1.46E-02
Ethylbenzene	100-41-4	106.17	7.88E-03	4.60E-01	1.10E-03	1.09E-03	5.79E+00	8.05E+00	4.66E+01	4.66E-02
Tetrachloroethene	127-18-4	165.83	1.84E-02	3.96E-01	8.79E-04	8.76E-04	4.62E+00	6.47E+00	2.99E+01	2.99E-02
Trichloroethene	79-01-6	131.39	1.03E-02	4.28E-01	9.87E-04	9.82E-04	8.85E-01	7.25E+00	6.41E+00	6.41E-03
Vinyl Chloride	75-01-4	62.50	2.70E-02	5.49E-01	1.43E-03	1.43E-03	4.90E-01	1.05E+01	5.16E+00	5.16E-03
Total Xylenes	1330-20-7	106.16	5.18E-03	4.60E-01	1.10E-03	1.09E-03	2.31E+01	8.02E+00	1.85E+02	1.85E-01
TCL Semivolatile Organic Compounds (SVOCs)										
1,1'-Biphenyl	92-52-4	154.21	3.00E-04	4.06E-01	9.11E-04	7.70E-04	2.13E+00	5.69E+00	1.21E+01	1.21E-02
Dibenzofuran	132-64-9	168.19	1.26E-05	3.94E-01	8.72E-04	1.65E-04	1.50E+00	1.22E+00	1.82E+00	1.82E-03
2-Methylnaphthalene	91-57-6	142.20	5.18E-04	4.17E-01	9.49E-04	8.57E-04	2.86E+01	6.32E+00	1.81E+02	1.81E-01
Naphthalene	91-20-3	128.17	4.83E-04	4.32E-01	9.99E-04	8.95E-04	1.72E+01	6.60E+00	1.14E+02	1.14E-01

Notes:
1 - http://www.deq.state.va.us/Programs/LandProtectionRevitalization/RemediationProgram/VoluntaryRemediationProgram/VRPRiskAssessmentGuidance/Guidance.aspx#3.22; Table 3.8 Groundwater less then or equal to 15 feet deep.

APPENDIX E

RISK SPREADSHEETS

TABLE E-1A
CONSTITUENT-SPECIFIC FACTORS
MINGO JUNCTION STEEL WORKS LLC - CAA VIM AND VIIM
WEIRTON, WEST VIRGINIA
VRP PROJECT # 20015

	Constituent-Specific Information [1]										
Contaminants of Concern	**Soil EPC (mg/kg)**	**Soil VF (m^3/kg)**	**RBA (unitless)[2]**	**Dermal ABS (unitless)**	**Gastrointestinal Absorption Efficiency (unitless)**	**Oral RfD (mg/kg-day)**	**Derm RfD (mg/kg-day)**	**Inhal. RfC (mg/m^3)**	**Oral CSF $(mg/kg\text{-}day)^{-1}$**	**Derm CSF $(mg/kg\text{-}day)^{-1}$**	**IUR $(mg/m^3)^{-1}$**
Benzo[a]anthracene	5.18	3.7E+06	1	0.13	1	NA	NA	NA	1.0E-01	1.0E-01	6.0E-02
Benzo[a]pyrene	4.01		1	0.13	1	3.0E-04	3.0E-04	2.0E-06	1.0E+00	1.0E+00	6.0E-01
Benzo[b]fluoranthene	3.79		1	0.13	1	NA	NA	NA	1.0E-01	1.0E-01	6.0E-02
Benzo[k]fluoranthene	1.36		1	0.13	1	NA	NA	NA	1.0E-02	1.0E-02	6.0E-03
Chrysene	9.45		1	0.13	1	NA	NA	NA	1.0E-03	1.0E-03	6.0E-04
Dibenz(a,h)anthracene	0.53		1	0.13	1	NA	NA	NA	1.0E+00	1.0E+00	6.0E-01
Indeno[1,2,3-cd]pyrene	1.93		1	0.13	1	NA	NA	NA	1.0E-01	1.0E-01	6.0E-02
Naphthalene	2.32	3.9E+04	1	0.13	1	2.0E-02	2.0E-02	3.0E-03	1.2E-01	1.2E-01	3.4E-02
1,1'-Biphenyl	0.036	9.5E+04	1		1	5.0E-01	5.0E-01	4.0E-04	8.0E-03	8.0E-03	NA
2-Methylnaphthalene	6.38	4.9E+04	1	0.13	1	4.0E-03	4.0E-03	NA	NA	NA	NA
Dibenzofuran	1.09	1.3E+05	1		1	1.0E-03	1.0E-03	NA	NA	NA	NA
PCB-1254	0.011	7.1E+05	1	0.14	1	2.0E-05	2.0E-05	NA	2.0E+00	2.0E+00	5.7E-01
PCB-1260	0.80	1.1E+06	1	0.14	1	NA	NA	NA	2.0E+00	2.0E+00	5.7E-01
Antimony	1.25		1		0.15	4.0E-04	6.0E-05	3.0E-04	NA	NA	NA
Arsenic			0.6	0.03	1	3.0E-04	3.0E-04	1.5E-05	1.5E+00	1.5E+00	4.3E+00
Cadmium	2.52		1	0.001	0.025	1.0E-03	2.5E-05	1.0E-05	NA	NA	1.8E+00
Cobalt	16.6		1		1	3.0E-04	3.0E-04	6.0E-06	NA	NA	9.0E+00
Copper	61.2		1		1	4.0E-02	4.0E-02	NA	NA	NA	NA
Iron	122924		1		1	7.0E-01	7.0E-01	NA	NA	NA	NA
Lead			1		1	NA	NA	NA	NA	NA	NA
Manganese	12518		1		0.04	2.4E-02	9.6E-04	5.0E-05	NA	NA	NA
Mercury	0.32	2.9E+04	1		1	1.6E-04	1.6E-04	3.0E-04	NA	NA	NA
Nickel	399		1		0.04	2.0E-02	8.0E-04	9.0E-05	NA	NA	2.6E-01
Thallium	0.11		1		1	1.0E-05	1.0E-05	NA	NA	NA	NA
Vanadium	217		1		0.026	9.0E-03	2.3E-04	7.0E-06	NA	NA	8.3E+00
Zinc	950		1		1	3.0E-01	3.0E-01	NA	NA	NA	NA
Cyanide, Total	2.30	4.5E+04	1		1	6.0E-04	6.0E-04	8.0E-04	NA	NA	NA

Notes:

1 - The source of the constituent-specific information presented in this table is described in Sections 3 and 4 of the report text.

2 - Relative Bioavailability Factor (RBA) that accounts for the differences in the bioavailability of a contaminant between the medium of exposure (e.g., soil) and the media associated with the toxicity value (e.g., the arsenic RfD and CSF are derived from drinking water studies). Based on USEPA (2021a) RSL User's Guide.

NA - USEPA-derived toxicity values are not available for this particular exposure route or endpoint.

TABLE E-1B
HAZARD INDICES AND THEORETICAL EXCESS LIFETIME CANCER RISKS
INCIDENTAL INGESTION AND DERMAL CONTACT WITH SOIL
MINGO JUNCTION STEEL WORKS LLC - CAA VIM AND VIIM
WEIRTON, WEST VIRGINIA
VRP PROJECT # 20015

		INPUT PARAMETERS					
		INGESTION			DERMAL CONTACT		
		CF	1E-06	kg/mg	CF	1E-06	kg/mg
MEDIUM:	SOIL	IR	100	mg/day	AF	0.12	mg/cm^2-event
RECEPTOR:	FUTURE OUTDOOR WORKER	EF	250	days/year	ABS	See Table E-1A	unitless
		ED	25	years	EF	250	days/year
		FI	1	unitless	ED	25	years
		BW	80	kg	EV	1	events/day
		AT_{nc}	9125	days	SA	3527	cm^2
		AT_c	25550	days	BW	80	kg
					AT_{nc}	9125	days
					AT_c	25550	days

	Ingestion Exposure				Direct Dermal Contact			
Contaminants of Concern	Ingestion Intake Noncancer (mg/kg-day)	Ingestion Intake Cancer (mg/kg-day)	HQ	ELCR	Absorbed Dose Noncancer (mg/kg-day)	Absorbed Dose Cancer (mg/kg-day)	HQ	ELCR
Benzo[a]anthracene	4.4E-06	1.6E-06	NA	2E-07	2.4E-06	8.7E-07	NA	9E-08
Benzo[a]pyrene	3.4E-06	1.2E-06	1E-02	1E-06	1.9E-06	6.7E-07	6E-03	7E-07
Benzo[b]fluoranthene	3.2E-06	1.2E-06	NA	1E-07	1.8E-06	6.4E-07	NA	6E-08
Benzo[k]fluoranthene	1.2E-06	4.2E-07	NA	4E-09	6.4E-07	2.3E-07	NA	2E-09
Chrysene	8.1E-06	2.9E-06	NA	3E-09	4.5E-06	1.6E-06	NA	2E-09
Dibenz(a,h)anthracene	4.5E-07	1.6E-07	NA	2E-07	2.5E-07	8.8E-08	NA	9E-08
Indeno[1,2,3-cd]pyrene	1.6E-06	5.9E-07	NA	6E-08	9.1E-07	3.2E-07	NA	3E-08
Naphthalene	2.0E-06	7.1E-07	1E-04	9E-08	1.1E-06	3.9E-07	5E-05	5E-08
1,1'-Biphenyl	3.1E-08	1.1E-08	6E-08	9E-11	0.0E+00	0.0E+00	0E+00	0E+00
2-Methylnaphthalene	5.5E-06	1.9E-06	1E-03	NA	3.0E-06	1.1E-06	8E-04	NA
Dibenzofuran	9.4E-07	3.3E-07	9E-04	NA	0.0E+00	0.0E+00	0E+00	NA
PCB-1254	9.4E-09	3.4E-09	5E-04	7E-09	5.6E-09	2.0E-09	3E-04	4E-09
PCB-1260	6.9E-07	2.4E-07	NA	5E-07	4.1E-07	1.5E-07	NA	3E-07
Antimony	1.1E-06	3.8E-07	3E-03	NA	0.0E+00	0.0E+00	0E+00	NA
Arsenic	0.0E+00	0.0E+00	0E+00	0E+00	0.0E+00	0.0E+00	0E+00	0E+00
Cadmium	2.2E-06	7.7E-07	2E-03	NA	9.1E-09	3.3E-09	4E-04	NA
Cobalt	1.4E-05	5.1E-06	5E-02	NA	0.0E+00	0.0E+00	0E+00	NA
Copper	5.2E-05	1.9E-05	1E-03	NA	0.0E+00	0.0E+00	0E+00	NA
Iron	1.1E-01	3.8E-02	2E-01	NA	0.0E+00	0.0E+00	0E+00	NA

TABLE E-1B
HAZARD INDICES AND THEORETICAL EXCESS LIFETIME CANCER RISKS
INCIDENTAL INGESTION AND DERMAL CONTACT WITH SOIL
MINGO JUNCTION STEEL WORKS LLC - CAA VIM AND VIIM
WEIRTON, WEST VIRGINIA
VRP PROJECT # 20015

		INPUT PARAMETERS					
		INGESTION			DERMAL CONTACT		
		CF	1E-06	kg/mg	CF	1E-06	kg/mg
MEDIUM:	**SOIL**	IR	100	mg/day	AF	0.12	mg/cm^2-event
RECEPTOR:	**FUTURE OUTDOOR WORKER**	EF	250	days/year	ABS	See Table E-1A	unitless
		ED	25	years	EF	250	days/year
		FI	1	unitless	ED	25	years
		BW	80	kg	EV	1	events/day
		AT_{nc}	9125	days	SA	3527	cm^2
		AT_c	25550	days	BW	80	kg
					AT_{nc}	9125	days
					AT_c	25550	days

	Ingestion Exposure				Direct Dermal Contact			
Contaminants of Concern	**Ingestion Intake Noncancer (mg/kg-day)**	**Ingestion Intake Cancer (mg/kg-day)**	**HQ**	**ELCR**	**Absorbed Dose Noncancer (mg/kg-day)**	**Absorbed Dose Cancer (mg/kg-day)**	**HQ**	**ELCR**
Lead	0.0E+00	0.0E+00	NA	NA	0.0E+00	0.0E+00	NA	NA
Manganese	1.1E-02	3.8E-03	4E-01	NA	0.0E+00	0.0E+00	0E+00	NA
Mercury	2.7E-07	9.8E-08	2E-03	NA	0.0E+00	0.0E+00	0E+00	NA
Nickel	3.4E-04	1.2E-04	2E-02	NA	0.0E+00	0.0E+00	0E+00	NA
Thallium	9.1E-08	3.2E-08	9E-03	NA	0.0E+00	0.0E+00	0E+00	NA
Vanadium	1.9E-04	6.6E-05	2E-02	NA	0.0E+00	0.0E+00	0E+00	NA
Zinc	8.1E-04	2.9E-04	3E-03	NA	0.0E+00	0.0E+00	0E+00	NA
Cyanide, Total	2.0E-06	7.0E-07	3E-03	NA	0.0E+00	0.0E+00	0E+00	NA
TOTAL			**7E-01**	**2E-06**			**8E-03**	**1E-06**

TABLE E-1C
HAZARD INDICES AND THEORETICAL EXCESS LIFETIME CANCER RISKS
INHALATION OF VOLATILE AND PARTICULATE EMISSIONS
MINGO JUNCTION STEEL WORKS LLC - CAA VIM AND VIIM
WEIRTON, WEST VIRGINIA
VRP PROJECT # 20015

		INPUT PARAMETERS					
		FUGITIVE DUST INHALATION			INHALATION - VOLATILE EMISSIONS		
		PEF	1.32E+09	m^3/kg			
MEDIUM:	SOIL	EF	250	days/year	EF	250	days/year
RECEPTOR:	FUTURE OUTDOOR WORKER	ED	25	years	ED	25	years
		ET	8	hours/day	ET	8	hours/day
		AT_{nc}	219000	hours	AT_{nc}	219000	hours
		AT_c	613200	hours	AT_c	613200	hours

	Fugitive Dust Exposure				Volatile Emissions Exposure			
Contaminants of Concern	Inhalation EC Noncancer (mg/m^3)	Inhalation EC Cancer (mg/m^3)	HQ	ELCR	Inhalation EC Noncancer (mg/m^3)	Inhalation EC Cancer (mg/m^3)	HQ	ELCR
Benzo[a]anthracene	9.0E-10	3.2E-10	NA	2E-11	3.2E-07	1.1E-07	NA	7E-09
Benzo[a]pyrene	6.9E-10	2.5E-10	3E-04	1E-10	NA	NA	NA	NA
Benzo[b]fluoranthene	6.6E-10	2.3E-10	NA	1E-11	NA	NA	NA	NA
Benzo[k]fluoranthene	2.4E-10	8.4E-11	NA	5E-13	NA	NA	NA	NA
Chrysene	1.6E-09	5.9E-10	NA	4E-13	NA	NA	NA	NA
Dibenz(a,h)anthracene	9.1E-11	3.3E-11	NA	2E-11	NA	NA	NA	NA
Indeno[1,2,3-cd]pyrene	3.3E-10	1.2E-10	NA	7E-12	NA	NA	NA	NA
Naphthalene	4.0E-10	1.4E-10	1E-07	5E-12	1.4E-05	4.9E-06	5E-03	2E-07
1,1'-Biphenyl	6.3E-12	2.2E-12	2E-08	NA	8.6E-08	3.1E-08	2E-04	NA
2-Methylnaphthalene	1.1E-09	4.0E-10	NA	NA	3.0E-05	1.1E-05	NA	NA
Dibenzofuran	1.9E-10	6.8E-11	NA	NA	1.9E-06	6.8E-07	NA	NA
PCB-1254	1.9E-12	6.8E-13	NA	4E-13	3.6E-09	1.3E-09	NA	7E-10
PCB-1260	1.4E-10	5.0E-11	NA	3E-11	1.7E-07	5.9E-08	NA	3E-08
Antimony	2.2E-10	7.7E-11	7E-07	NA	NA	NA	NA	NA
Arsenic	0.0E+00	0.0E+00	0E+00	0E+00	NA	NA	NA	NA
Cadmium	4.4E-10	1.6E-10	4E-05	3E-10	NA	NA	NA	NA
Cobalt	2.9E-09	1.0E-09	5E-04	9E-09	NA	NA	NA	NA
Copper	1.1E-08	3.8E-09	NA	NA	NA	NA	NA	NA
Iron	2.1E-05	7.6E-06	NA	NA	NA	NA	NA	NA
Lead	0.0E+00	0.0E+00	NA	NA	NA	NA	NA	NA
Manganese	2.2E-06	7.8E-07	4E-02	NA	NA	NA	NA	NA
Mercury	5.5E-11	2.0E-11	2E-07	NA	2.5E-06	9.0E-07	8E-03	NA

TABLE E-1C
HAZARD INDICES AND THEORETICAL EXCESS LIFETIME CANCER RISKS
INHALATION OF VOLATILE AND PARTICULATE EMISSIONS
MINGO JUNCTION STEEL WORKS LLC - CAA VIM AND VIIM
WEIRTON, WEST VIRGINIA
VRP PROJECT # 20015

		INPUT PARAMETERS					
		FUGITIVE DUST INHALATION			INHALATION - VOLATILE EMISSIONS		
		PEF	1.32E+09	m^3/kg			
MEDIUM:	**SOIL**	EF	250	days/year	EF	250	days/year
RECEPTOR:	**FUTURE OUTDOOR WORKER**	ED	25	years	ED	25	years
		ET	8	hours/day	ET	8	hours/day
		AT_{nc}	219000	hours	AT_{nc}	219000	hours
		AT_c	613200	hours	AT_c	613200	hours

	Fugitive Dust Exposure				Volatile Emissions Exposure			
Contaminants of Concern	**Inhalation EC Noncancer (mg/m^3)**	**Inhalation EC Cancer (mg/m^3)**	**HQ**	**ELCR**	**Inhalation EC Noncancer (mg/m^3)**	**Inhalation EC Cancer (mg/m^3)**	**HQ**	**ELCR**
Nickel	6.9E-08	2.5E-08	8E-04	6E-09	NA	NA	NA	NA
Thallium	1.8E-11	6.6E-12	NA	NA	NA	NA	NA	NA
Vanadium	3.8E-08	1.3E-08	5E-03	1E-07	NA	NA	NA	NA
Zinc	1.6E-07	5.9E-08	NA	NA	NA	NA	NA	NA
Cyanide, Total	4.0E-10	1.4E-10	5E-07	NA	1.2E-05	4.2E-06	1E-02	NA
TOTAL			**5E-02**	**1E-07**			**3E-02**	**2E-07**

TABLE E-1D
SUMMARY OF HAZARD INDICES AND THEORETICAL EXCESS LIFETIME CANCER RISKS
FUTURE OUTDOOR WORKER
MINGO JUNCTION STEEL WORKS LLC - CAA VIM AND VIIM
WEIRTON, WEST VIRGINIA
VRP PROJECT # 20015

	CONSTITUENT AND PATHWAY SPECIFIC HQS					CONSTITUENT AND PATHWAY SPECIFIC CANCER RISK				
Contaminants of Concern	**Ingestion of Soil**	**Dermal Contact with Soil**	**Inhalation Particulates**	**Inhalation Volatiles (Soil)**	**TOTAL HAZARD INDEX**	**Ingestion of Soil**	**Dermal Contact with Soil**	**Inhalation Particulates**	**Inhalation Volatiles (Soil)**	**TOTAL CANCER RISK**
Benzo[a]anthracene	NA	NA	NA	NA	**0E+00**	2E-07	9E-08	2E-11	7E-09	**3E-07**
Benzo[a]pyrene	1E-02	6E-03	3E-04	NA	**2E-02**	1E-06	7E-07	1E-10	NA	**2E-06**
Benzo[b]fluoranthene	NA	NA	NA	NA	**0E+00**	1E-07	6E-08	1E-11	NA	**2E-07**
Benzo[k]fluoranthene	NA	NA	NA	NA	**0E+00**	4E-09	2E-09	5E-13	NA	**6E-09**
Chrysene	NA	NA	NA	NA	**0E+00**	3E-09	2E-09	4E-13	NA	**4E-09**
Dibenz(a,h)anthracene	NA	NA	NA	NA	**0E+00**	2E-07	9E-08	2E-11	NA	**2E-07**
Indeno[1,2,3-cd]pyrene	NA	NA	NA	NA	**0E+00**	6E-08	3E-08	7E-12	NA	**9E-08**
Naphthalene	1E-04	5E-05	1E-07	5E-03	**5E-03**	9E-08	5E-08	5E-12	2E-07	**3E-07**
1,1'-Biphenyl	6E-08	0E+00	2E-08	2E-04	**2E-04**	9E-11	0E+00	NA	NA	**9E-11**
2-Methylnaphthalene	1E-03	8E-04	NA	NA	**2E-03**	NA	NA	NA	NA	**0E+00**
Dibenzofuran	9E-04	0E+00	NA	NA	**9E-04**	NA	NA	NA	NA	**0E+00**
PCB-1254	5E-04	3E-04	NA	NA	**7E-04**	7E-09	4E-09	4E-13	7E-10	**1E-08**
PCB-1260	NA	NA	NA	NA	**0E+00**	5E-07	3E-07	3E-11	3E-08	**8E-07**
Antimony	3E-03	0E+00	7E-07	NA	**3E-03**	NA	NA	NA	NA	**0E+00**
Arsenic	0E+00	0E+00	0E+00	NA	**0E+00**	0E+00	0E+00	0E+00	NA	**0E+00**
Cadmium	2E-03	4E-04	4E-05	NA	**3E-03**	NA	NA	3E-10	NA	**3E-10**
Cobalt	5E-02	0E+00	5E-04	NA	**5E-02**	NA	NA	9E-09	NA	**9E-09**
Copper	1E-03	0E+00	NA	NA	**1E-03**	NA	NA	NA	NA	**0E+00**
Iron	2E-01	0E+00	NA	NA	**2E-01**	NA	NA	NA	NA	**0E+00**
Lead	NA	NA	NA	NA	**0E+00**	NA	NA	NA	NA	**0E+00**
Manganese	4E-01	0E+00	4E-02	NA	**5E-01**	NA	NA	NA	NA	**0E+00**
Mercury	2E-03	0E+00	2E-07	8E-03	**1E-02**	NA	NA	NA	NA	**0E+00**
Nickel	2E-02	0E+00	8E-04	NA	**2E-02**	NA	NA	6E-09	NA	**6E-09**
Thallium	9E-03	0E+00	NA	NA	**9E-03**	NA	NA	NA	NA	**0E+00**
Vanadium	2E-02	0E+00	5E-03	NA	**3E-02**	NA	NA	1E-07	NA	**1E-07**
Zinc	3E-03	0E+00	NA	NA	**3E-03**	NA	NA	NA	NA	**0E+00**
Cyanide, Total	3E-03	0E+00	5E-07	1E-02	**2E-02**	NA	NA	NA	NA	**0E+00**
TOTAL					**8E-01**					**4E-06**

TABLE E-2A
CONSTITUENT-SPECIFIC FACTORS
MINGO JUNCTION STEEL WORKS LLC - CAA VIM AND VIIM
WEIRTON, WEST VIRGINIA
VRP PROJECT # 20015

	Constituent-Specific Information [1]										
Contaminants of Concern	**Soil EPC (mg/kg)**	**Soil VF (m^3/kg)**	**RBA (unitless)[2]**	**Dermal ABS (unitless)**	**Gastrointestinal Absorption Efficiency (unitless)**	**Oral RfD (mg/kg-day)**	**Derm RfD (mg/kg-day)**	**Inhal. RfC (mg/m^3)**	**Oral CSF $(mg/kg\text{-}day)^{-1}$**	**Derm CSF $(mg/kg\text{-}day)^{-1}$**	**IUR $(mg/m^3)^{-1}$**
Benzo[a]anthracene	5.18	3.7E+06	1	0.13	1	NA	NA	NA	*3.0E-01*	*3.0E-01*	*1.8E-01*
Benzo[a]pyrene	4.01		1	0.13	1	3.0E-04	3.0E-04	2.0E-06	*3.0E+00*	*3.0E+00*	*1.8E+00*
Benzo[b]fluoranthene	3.79		1	0.13	1	NA	NA	NA	*3.0E-01*	*3.0E-01*	*1.8E-01*
Benzo[k]fluoranthene	1.36		1	0.13	1	NA	NA	NA	*3.0E-02*	*3.0E-02*	*1.8E-02*
Chrysene	9.45		1	0.13	1	NA	NA	NA	*3.0E-03*	*3.0E-03*	*1.8E-03*
Dibenz(a,h)anthracene	0.53		1	0.13	1	NA	NA	NA	*3.0E+00*	*3.0E+00*	*1.8E+00*
Indeno[1,2,3-cd]pyrene	1.93		1	0.13	1	NA	NA	NA	*3.0E-01*	*3.0E-01*	*1.8E-01*
Naphthalene	2.32	3.9E+04	1	0.13	1	2.0E-02	2.0E-02	3.0E-03	1.2E-01	1.2E-01	3.4E-02
1,1'-Biphenyl	0.036	9.5E+04	1		1	5.0E-01	5.0E-01	4.0E-04	8.0E-03	8.0E-03	NA
2-Methylnaphthalene	6.38	4.9E+04	1	0.13	1	4.0E-03	4.0E-03	NA	NA	NA	NA
Dibenzofuran	1.09	1.3E+05	1		1	1.0E-03	1.0E-03	NA	NA	NA	NA
PCB-1254	0.011	7.1E+05	1	0.14	1	2.0E-05	2.0E-05	NA	2.0E+00	2.0E+00	5.7E-01
PCB-1260	0.80	1.1E+06	1	0.14	1	NA	NA	NA	2.0E+00	2.0E+00	5.7E-01
Antimony	1.25		1		0.15	4.0E-04	6.0E-05	3.0E-04	NA	NA	NA
Arsenic			0.6	0.03	1	3.0E-04	3.0E-04	1.5E-05	1.5E+00	1.5E+00	4.3E+00
Cadmium	2.52		1	0.001	0.025	1.0E-03	2.5E-05	1.0E-05	NA	NA	1.8E+00
Cobalt	16.6		1		1	3.0E-04	3.0E-04	6.0E-06	NA	NA	9.0E+00
Copper	61.2		1		1	4.0E-02	4.0E-02	NA	NA	NA	NA
Iron	122924		1		1	7.0E-01	7.0E-01	NA	NA	NA	NA
Lead			1		1	NA	NA	NA	NA	NA	NA
Manganese	12518		1		0.04	2.4E-02	9.6E-04	5.0E-05	NA	NA	NA
Mercury	0.32	2.9E+04	1		1	1.6E-04	1.6E-04	3.0E-04	NA	NA	NA
Nickel	399		1		0.04	2.0E-02	8.0E-04	9.0E-05	NA	NA	2.6E-01
Thallium	0.11		1		1	1.0E-05	1.0E-05	NA	NA	NA	NA
Vanadium	217		1		0.026	9.0E-03	2.3E-04	7.0E-06	NA	NA	8.3E+00
Zinc	950		1		1	3.0E-01	3.0E-01	NA	NA	NA	NA
Cyanide, Total	2.30	4.5E+04	1		1	6.0E-04	6.0E-04	8.0E-04	NA	NA	NA

Notes:

Red italics indicate the CSF/IUR has been increased by a factor of 3 to account for mutagenic modes of action.

1 - The source of the constituent-specific information presented in this table is described in Sections 3 and 4 of the report text.

2 - Relative Bioavailability Factor (RBA) that accounts for the differences in the bioavailability of a contaminant between the medium of exposure (e.g., soil) and the media associated with the toxicity value (e.g., the arsenic RfD and CSF are derived from drinking water studies). Based on USEPA (2021a) RSL User's Guide.

NA - USEPA-derived toxicity values are not available for this particular exposure route or endpoint.

TABLE E-2B
HAZARD INDICES AND THEORETICAL EXCESS LIFETIME CANCER RISKS
INCIDENTAL INGESTION AND DERMAL CONTACT WITH SOIL
MINGO JUNCTION STEEL WORKS LLC - CAA VIM AND VIIM
WEIRTON, WEST VIRGINIA
VRP PROJECT # 20015

		INPUT PARAMETERS					
		INGESTION			DERMAL CONTACT		
		CF	1E-06	kg/mg	CF	1E-06	kg/mg
MEDIUM:	SOIL	IR	100	mg/day	AF	0.04	mg/cm^2-event
RECEPTOR:	YOUTH TRESPASSER	EF	30	days/year	ABS	See Table E-2A	unitless
		ED	5	years	EF	30	days/year
		FI	1	unitless	ED	5	years
		BW	56.8	kg	EV	1	events/day
		AT_{nc}	1825	days	SA	11083	cm^2
		AT_c	25550	days	BW	56.8	kg
					AT_{nc}	1825	days
					AT_c	25550	days

	Ingestion Exposure				Direct Dermal Contact			
Contaminants of Concern	Ingestion Intake Noncancer (mg/kg-day)	Ingestion Intake Cancer (mg/kg-day)	HQ	ELCR	Absorbed Dose Noncancer (mg/kg-day)	Absorbed Dose Cancer (mg/kg-day)	HQ	ELCR
Benzo[a]anthracene	7.5E-07	5.4E-08	NA	2E-08	4.3E-07	3.1E-08	NA	9E-09
Benzo[a]pyrene	5.8E-07	4.1E-08	2E-03	1E-07	3.3E-07	2.4E-08	1E-03	7E-08
Benzo[b]fluoranthene	5.5E-07	3.9E-08	NA	1E-08	3.2E-07	2.3E-08	NA	7E-09
Benzo[k]fluoranthene	2.0E-07	1.4E-08	NA	4E-10	1.1E-07	8.1E-09	NA	2E-10
Chrysene	1.4E-06	9.8E-08	NA	3E-10	7.9E-07	5.6E-08	NA	2E-10
Dibenz(a,h)anthracene	7.6E-08	5.4E-09	NA	2E-08	4.4E-08	3.1E-09	NA	9E-09
Indeno[1,2,3-cd]pyrene	2.8E-07	2.0E-08	NA	6E-09	1.6E-07	1.1E-08	NA	3E-09
Naphthalene	3.4E-07	2.4E-08	2E-05	3E-09	1.9E-07	1.4E-08	1E-05	2E-09
1,1'-Biphenyl	5.2E-09	3.7E-10	1E-08	3E-12	0.0E+00	0.0E+00	0E+00	0E+00
2-Methylnaphthalene	9.2E-07	6.6E-08	2E-04	NA	5.3E-07	3.8E-08	1E-04	NA
Dibenzofuran	1.6E-07	1.1E-08	2E-04	NA	0.0E+00	0.0E+00	0E+00	NA
PCB-1254	1.6E-09	1.1E-10	8E-05	2E-10	9.9E-10	7.1E-11	5E-05	1E-10
PCB-1260	1.2E-07	8.3E-09	NA	2E-08	7.2E-08	5.1E-09	NA	1E-08
Antimony	1.8E-07	1.3E-08	5E-04	NA	0.0E+00	0.0E+00	0E+00	NA
Arsenic	0.0E+00	0.0E+00	0E+00	0E+00	0.0E+00	0.0E+00	0E+00	0E+00
Cadmium	3.7E-07	2.6E-08	4E-04	NA	1.6E-09	1.2E-10	6E-05	NA
Cobalt	2.4E-06	1.7E-07	8E-03	NA	0.0E+00	0.0E+00	0E+00	NA
Copper	8.9E-06	6.3E-07	2E-04	NA	0.0E+00	0.0E+00	0E+00	NA
Iron	1.8E-02	1.3E-03	3E-02	NA	0.0E+00	0.0E+00	0E+00	NA

TABLE E-2B
HAZARD INDICES AND THEORETICAL EXCESS LIFETIME CANCER RISKS
INCIDENTAL INGESTION AND DERMAL CONTACT WITH SOIL
MINGO JUNCTION STEEL WORKS LLC - CAA VIM AND VIIM
WEIRTON, WEST VIRGINIA
VRP PROJECT # 20015

		INPUT PARAMETERS					
		INGESTION			DERMAL CONTACT		
		CF	1E-06	kg/mg	CF	1E-06	kg/mg
MEDIUM:	**SOIL**	IR	100	mg/day	AF	0.04	mg/cm^2-event
RECEPTOR:	**YOUTH TRESPASSER**	EF	30	days/year	ABS	See Table E-2A	unitless
		ED	5	years	EF	30	days/year
		FI	1	unitless	ED	5	years
		BW	56.8	kg	EV	1	events/day
		AT_{nc}	1825	days	SA	11083	cm^2
		AT_c	25550	days	BW	56.8	kg
					AT_{nc}	1825	days
					AT_c	25550	days

	Ingestion Exposure				Direct Dermal Contact			
Contaminants of Concern	**Ingestion Intake Noncancer (mg/kg-day)**	**Ingestion Intake Cancer (mg/kg-day)**	**HQ**	**ELCR**	**Absorbed Dose Noncancer (mg/kg-day)**	**Absorbed Dose Cancer (mg/kg-day)**	**HQ**	**ELCR**
Lead	0.0E+00	0.0E+00	NA	NA	0.0E+00	0.0E+00	NA	NA
Manganese	1.8E-03	1.3E-04	8E-02	NA	0.0E+00	0.0E+00	0E+00	NA
Mercury	4.6E-08	3.3E-09	3E-04	NA	0.0E+00	0.0E+00	0E+00	NA
Nickel	5.8E-05	4.1E-06	3E-03	NA	0.0E+00	0.0E+00	0E+00	NA
Thallium	1.5E-08	1.1E-09	2E-03	NA	0.0E+00	0.0E+00	0E+00	NA
Vanadium	3.1E-05	2.2E-06	3E-03	NA	0.0E+00	0.0E+00	0E+00	NA
Zinc	1.4E-04	9.8E-06	5E-04	NA	0.0E+00	0.0E+00	0E+00	NA
Cyanide, Total	3.3E-07	2.4E-08	6E-04	NA	0.0E+00	0.0E+00	0E+00	NA
TOTAL			**1E-01**	**2E-07**			**1E-03**	**1E-07**

TABLE E-2C
HAZARD INDICES AND THEORETICAL EXCESS LIFETIME CANCER RISKS
INHALATION OF VOLATILE AND PARTICULATE EMISSIONS
MINGO JUNCTION STEEL WORKS LLC - CAA VIM AND VIIM
WEIRTON, WEST VIRGINIA
VRP PROJECT # 20015

		INPUT PARAMETERS					
		FUGITIVE DUST INHALATION			INHALATION - VOLATILE EMISSIONS		
		PEF	1.32E+09	m^3/kg			
MEDIUM:	SOIL	EF	30	days/year	EF	30	days/year
RECEPTOR:	YOUTH TRESPASSER	ED	5	years	ED	5	years
		ET	2	hours/day	ET	2	hours/day
		AT_{nc}	43800	hours	AT_{nc}	43800	hours
		AT_c	613200	hours	AT_c	613200	hours

	Fugitive Dust Exposure				Volatile Emissions Exposure			
Contaminants of Concern	Inhalation EC Noncancer (mg/m^3)	Inhalation EC Cancer (mg/m^3)	HQ	ELCR	Inhalation EC Noncancer (mg/m^3)	Inhalation EC Cancer (mg/m^3)	HQ	ELCR
Benzo[a]anthracene	2.7E-11	1.9E-12	NA	3E-13	9.6E-09	6.9E-10	NA	1E-10
Benzo[a]pyrene	2.1E-11	1.5E-12	1E-05	3E-12	NA	NA	NA	NA
Benzo[b]fluoranthene	2.0E-11	1.4E-12	NA	3E-13	NA	NA	NA	NA
Benzo[k]fluoranthene	7.1E-12	5.1E-13	NA	9E-15	NA	NA	NA	NA
Chrysene	4.9E-11	3.5E-12	NA	6E-15	NA	NA	NA	NA
Dibenz(a,h)anthracene	2.7E-12	2.0E-13	NA	4E-13	NA	NA	NA	NA
Indeno[1,2,3-cd]pyrene	1.0E-11	7.2E-13	NA	1E-13	NA	NA	NA	NA
Naphthalene	1.2E-11	8.6E-13	4E-09	3E-14	4.1E-07	2.9E-08	1E-04	1E-09
1,1'-Biphenyl	1.9E-13	1.3E-14	5E-10	NA	2.6E-09	1.9E-10	6E-06	NA
2-Methylnaphthalene	3.3E-11	2.4E-12	NA	NA	9.0E-07	6.4E-08	NA	NA
Dibenzofuran	5.7E-12	4.1E-13	NA	NA	5.7E-08	4.1E-09	NA	NA
PCB-1254	5.7E-14	4.1E-15	NA	2E-15	1.1E-10	7.6E-12	NA	4E-12
PCB-1260	4.2E-12	3.0E-13	NA	2E-13	5.0E-09	3.6E-10	NA	2E-10
Antimony	6.5E-12	4.6E-13	2E-08	NA	NA	NA	NA	NA
Arsenic	0.0E+00	0.0E+00	0E+00	0E+00	NA	NA	NA	NA
Cadmium	1.3E-11	9.4E-13	1E-06	2E-12	NA	NA	NA	NA
Cobalt	8.6E-11	6.2E-12	1E-05	6E-11	NA	NA	NA	NA
Copper	3.2E-10	2.3E-11	NA	NA	NA	NA	NA	NA
Iron	6.4E-07	4.6E-08	NA	NA	NA	NA	NA	NA
Lead	0.0E+00	0.0E+00	NA	NA	NA	NA	NA	NA
Manganese	6.5E-08	4.7E-09	1E-03	NA	NA	NA	NA	NA
Mercury	1.7E-12	1.2E-13	6E-09	NA	7.5E-08	5.4E-09	3E-04	NA

TABLE E-2C
HAZARD INDICES AND THEORETICAL EXCESS LIFETIME CANCER RISKS
INHALATION OF VOLATILE AND PARTICULATE EMISSIONS
MINGO JUNCTION STEEL WORKS LLC - CAA VIM AND VIIM
WEIRTON, WEST VIRGINIA
VRP PROJECT # 20015

		INPUT PARAMETERS					
		FUGITIVE DUST INHALATION			INHALATION - VOLATILE EMISSIONS		
		PEF	1.32E+09	m^3/kg			
MEDIUM:	**SOIL**	EF	30	days/year	EF	30	days/year
RECEPTOR:	**YOUTH TRESPASSER**	ED	5	years	ED	5	years
		ET	2	hours/day	ET	2	hours/day
		AT_{nc}	43800	hours	AT_{nc}	43800	hours
		AT_c	613200	hours	AT_c	613200	hours

	Fugitive Dust Exposure				Volatile Emissions Exposure			
Contaminants of Concern	**Inhalation EC Noncancer (mg/m^3)**	**Inhalation EC Cancer (mg/m^3)**	**HQ**	**ELCR**	**Inhalation EC Noncancer (mg/m^3)**	**Inhalation EC Cancer (mg/m^3)**	**HQ**	**ELCR**
Nickel	2.1E-09	1.5E-10	2E-05	4E-11	NA	NA	NA	NA
Thallium	5.5E-13	3.9E-14	NA	NA	NA	NA	NA	NA
Vanadium	1.1E-09	8.1E-11	2E-04	7E-10	NA	NA	NA	NA
Zinc	4.9E-09	3.5E-10	NA	NA	NA	NA	NA	NA
Cyanide, Total	1.2E-11	8.5E-13	1E-08	NA	3.5E-07	2.5E-08	4E-04	NA
TOTAL			**2E-03**	**8E-10**			**8E-04**	**1E-09**

TABLE E-2D
SUMMARY OF HAZARD INDICES AND THEORETICAL EXCESS LIFETIME CANCER RISKS
YOUTH TRESPASSER
MINGO JUNCTION STEEL WORKS LLC - CAA VIM AND VIIM
WEIRTON, WEST VIRGINIA
VRP PROJECT # 20015

	CONSTITUENT AND PATHWAY SPECIFIC HQS					CONSTITUENT AND PATHWAY SPECIFIC CANCER RISK				
Contaminants of Concern	**Ingestion of Soil**	**Dermal Contact with Soil**	**Inhalation Particulates**	**Inhalation Volatiles (Soil)**	**TOTAL HAZARD INDEX**	**Ingestion of Soil**	**Dermal Contact with Soil**	**Inhalation Particulates**	**Inhalation Volatiles (Soil)**	**TOTAL CANCER RISK**
Benzo[a]anthracene	NA	NA	NA	NA	**0E+00**	2E-08	9E-09	3E-13	1E-10	**3E-08**
Benzo[a]pyrene	2E-03	1E-03	1E-05	NA	**3E-03**	1E-07	7E-08	3E-12	NA	**2E-07**
Benzo[b]fluoranthene	NA	NA	NA	NA	**0E+00**	1E-08	7E-09	3E-13	NA	**2E-08**
Benzo[k]fluoranthene	NA	NA	NA	NA	**0E+00**	4E-10	2E-10	9E-15	NA	**7E-10**
Chrysene	NA	NA	NA	NA	**0E+00**	3E-10	2E-10	6E-15	NA	**5E-10**
Dibenz(a,h)anthracene	NA	NA	NA	NA	**0E+00**	2E-08	9E-09	4E-13	NA	**3E-08**
Indeno[1,2,3-cd]pyrene	NA	NA	NA	NA	**0E+00**	6E-09	3E-09	1E-13	NA	**9E-09**
Naphthalene	2E-05	1E-05	4E-09	1E-04	**2E-04**	3E-09	2E-09	3E-14	1E-09	**6E-09**
1,1'-Biphenyl	1E-08	0E+00	5E-10	6E-06	**6E-06**	3E-12	0E+00	NA	NA	**3E-12**
2-Methylnaphthalene	2E-04	1E-04	NA	NA	**4E-04**	NA	NA	NA	NA	**0E+00**
Dibenzofuran	2E-04	0E+00	NA	NA	**2E-04**	NA	NA	NA	NA	**0E+00**
PCB-1254	8E-05	5E-05	NA	NA	**1E-04**	2E-10	1E-10	2E-15	4E-12	**4E-10**
PCB-1260	NA	NA	NA	NA	**0E+00**	2E-08	1E-08	2E-13	2E-10	**3E-08**
Antimony	5E-04	0E+00	2E-08	NA	**5E-04**	NA	NA	NA	NA	**0E+00**
Arsenic	0E+00	0E+00	0E+00	NA	**0E+00**	0E+00	0E+00	0E+00	NA	**0E+00**
Cadmium	4E-04	6E-05	1E-06	NA	**4E-04**	NA	NA	2E-12	NA	**2E-12**
Cobalt	8E-03	0E+00	1E-05	NA	**8E-03**	NA	NA	6E-11	NA	**6E-11**
Copper	2E-04	0E+00	NA	NA	**2E-04**	NA	NA	NA	NA	**0E+00**
Iron	3E-02	0E+00	NA	NA	**3E-02**	NA	NA	NA	NA	**0E+00**
Lead	NA	NA	NA	NA	**0E+00**	NA	NA	NA	NA	**0E+00**
Manganese	8E-02	0E+00	1E-03	NA	**8E-02**	NA	NA	NA	NA	**0E+00**
Mercury	3E-04	0E+00	6E-09	3E-04	**5E-04**	NA	NA	NA	NA	**0E+00**
Nickel	3E-03	0E+00	2E-05	NA	**3E-03**	NA	NA	4E-11	NA	**4E-11**
Thallium	2E-03	0E+00	NA	NA	**2E-03**	NA	NA	NA	NA	**0E+00**
Vanadium	3E-03	0E+00	2E-04	NA	**4E-03**	NA	NA	7E-10	NA	**7E-10**
Zinc	5E-04	0E+00	NA	NA	**5E-04**	NA	NA	NA	NA	**0E+00**
Cyanide, Total	6E-04	0E+00	1E-08	4E-04	**1E-03**	NA	NA	NA	NA	**0E+00**
TOTAL					**1E-01**					**3E-07**

TABLE E-3A
CONSTITUENT-SPECIFIC FACTORS
MINGO JUNCTION STEEL WORKS LLC - CAA VIM AND VIIM
WEIRTON, WEST VIRGINIA
VRP PROJECT # 20015

	Constituent-Specific Information [1]												
Contaminants of Concern	Soil EPC (mg/kg)	Soil VF (m^3/kg)	Groundwater EPC (ug/L)	Ambient Air EPC (Trench) mg/m^3	RBA (unitless)[2]	Dermal ABS (unitless)	Gastrointestinal Absorption Efficiency (unitless)	Oral RfD (mg/kg-day)	Derm RfD (mg/kg-day)	Inhal. RfC (mg/m^3)	Oral CSF $(mg/kg\text{-}day)^{-1}$	Derm CSF $(mg/kg\text{-}day)^{-1}$	IUR $(mg/m^3)^{-1}$
1,1-Dichloroethane			0.25	2.1E-03	1		1	2.0E+00	2.0E+00	NA	5.7E-03	5.7E-03	1.6E-03
1,2-Dichlorobenzene			37	2.5E-01	1		1	6.0E-01	6.0E-01	2.0E+00	NA	NA	NA
cis-1,2-Dichloroethene			1.75	1.5E-02	1		1	2.0E-02	2.0E-02	NA	NA	NA	NA
1,4-Dichlorobenzene			0.59	4.0E-03	1		1	7.0E-02	7.0E-02	1.2E+00	5.4E-03	5.4E-03	1.1E-02
Benzene			0.47	4.3E-03	1		1	1.0E-02	1.0E-02	8.0E-02	5.5E-02	5.5E-02	7.8E-03
Chloroform			3.50	2.6E-02	1		1	1.0E-01	1.0E-01	2.4E-01	3.1E-02	3.1E-02	2.3E-02
Dichlorobromomethane			1.30	7.1E-03	1		1	8.0E-03	8.0E-03	NA	6.2E-02	6.2E-02	3.7E-02
Ethylbenzene			5.79	4.7E-02	1		1	5.0E-02	5.0E-02	9.0E+00	1.1E-02	1.1E-02	2.5E-03
Tetrachloroethene			4.62	3.0E-02	1		1	8.0E-03	8.0E-03	4.1E-02	2.1E-03	2.1E-03	2.6E-04
Trichloroethene			0.89	6.4E-03	1		1	5.0E-04	5.0E-04	2.2E-03	4.6E-02	4.6E-02	4.1E-03
Vinyl chloride			0.49	5.2E-03	1		1	3.0E-03	3.0E-03	7.7E-02	7.2E-01	7.2E-01	4.4E-03
Xylenes, Total			23.1	1.9E-01	1		1	4.0E-01	4.0E-01	4.0E-01	NA	NA	NA
1,1'-Biphenyl	0.033	2.5E+04	2.13	1.2E-02	1		1	1.0E-01	1.0E-01	4.0E-03	8.0E-03	8.0E-03	NA
2-Methylnaphthalene	5.67	1.3E+04	28.6	1.8E-01	1	0.13	1	4.0E-03	4.0E-03	NA	NA	NA	NA
Benzo[a]anthracene	3.00	9.6E+05			1	0.13	1	NA	NA	NA	1.0E-01	1.0E-01	6.0E-02
Benzo(a)pyrene	2.32				1	0.13	1	3.0E-04	3.0E-04	2.0E-06	1.0E+00	1.0E+00	6.0E-01
Benzo[b]fluoranthene	3.09				1	0.13	1	NA	NA	NA	1.0E-01	1.0E-01	6.0E-02
Benzo[k]fluoranthene	1.63				1	0.13	1	NA	NA	NA	1.0E-02	1.0E-02	6.0E-03
Chrysene	5.28				1	0.13	1	NA	NA	NA	1.0E-03	1.0E-03	6.0E-04
Dibenz(a,h)anthracene	0.49				1	0.13	1	NA	NA	NA	1.0E+00	1.0E+00	6.0E-01
Indeno[1,2,3-cd]pyrene	1.94				1	0.13	1	NA	NA	NA	1.0E-01	1.0E-01	6.0E-02
Naphthalene	5.91	1.0E+04	17.2	1.1E-01	1	0.13	1	6.0E-01	6.0E-01	3.0E-03	1.2E-01	1.2E-01	3.4E-02
Bis(2-ethylhexyl) phthalate			1.60		1	0.10	1	2.0E-02	2.0E-02	NA	1.4E-02	1.4E-02	2.4E-03
Dibenzofuran	0.97	3.4E+04	1.50	1.8E-03	1		1	4.0E-03	4.0E-03	NA	NA	NA	NA
PCB-1254	0.043	1.8E+05			1	0.14	1	3.0E-05	3.0E-05	NA	2.0E+00	2.0E+00	5.7E-01
PCB-1260	0.44	2.9E+05			1	0.14	1	NA	NA	NA	2.0E+00	2.0E+00	5.7E-01
Aluminum			920		1		1	1.0E+00	1.0E+00	5.0E-03	NA	NA	NA
Antimony	1.22		0.12		1		0.15	4.0E-04	6.0E-05	1.0E-03	NA	NA	NA
Arsenic			1.63		0.6	0.03	1	3.0E-04	3.0E-04	1.5E-05	1.5E+00	1.5E+00	4.3E+00
Cadmium	2.26		0.84		1	0.001	0.025	5.0E-04	1.3E-05	1.0E-05	NA	NA	1.8E+00
Cobalt	9.47		98		1		1	3.0E-03	3.0E-03	2.0E-05	NA	NA	9.0E+00
Copper	60.7		1.98		1		1	1.0E-02	1.0E-02	NA	NA	NA	NA
Iron	114702		30,013		1		1	7.0E-01	7.0E-01	NA	NA	NA	NA
Lead					1		1	NA	NA	NA	NA	NA	NA
Manganese	11,422		15010		1		0.04	2.4E-02	9.6E-04	5.0E-05	NA	NA	NA
Mercury	0.29	7.5E+03	0.050	2.9E-04	1		1	1.6E-04	1.6E-04	3.0E-04	NA	NA	NA
Nickel	353		59.8		1		0.04	2.0E-02	8.0E-04	2.0E-04	NA	NA	2.6E-01
Selenium			9.62		1		1	5.0E-03	5.0E-03	2.0E-02	NA	NA	NA
Thallium	0.13		0.11		1		1	4.0E-05	4.0E-05	NA	NA	NA	NA
Vanadium	195		3.57		1		0.026	7.0E-04	1.8E-05	1.0E-04	NA	NA	8.3E+00
Zinc	852		160		1		1	3.0E-01	3.0E-01	NA	NA	NA	NA
Cyanide, Total	2.21	1.2E+04			1		1	2.0E-02	2.0E-02	8.0E-04	NA	NA	NA

Notes:

1 - The source of the constituent-specific information presented in this table is described in Sections 3 and 4 of the report text.

2 - Relative Bioavailability Factor (RBA) that accounts for the differences in the bioavailability of a contaminant between the medium of exposure (e.g., soil) and the media associated with the toxicity value (e.g., the arsenic RfD and CSF are derived from drinking water studies). Based on USEPA (2021a) RSL User's Guide.

NA - USEPA-derived toxicity values are not available for this particular exposure route or endpoint.

TABLE E-3B
HAZARD INDICES AND THEORETICAL EXCESS LIFETIME CANCER RISKS
INCIDENTAL INGESTION AND DERMAL CONTACT WITH SOIL
MINGO JUNCTION STEEL WORKS LLC - CAA VIM AND VIIM
WEIRTON, WEST VIRGINIA
VRP PROJECT # 20015

MEDIUM: SOIL
RECEPTOR: FUTURE CONSTRUCTION WORKER

INPUT PARAMETERS					
INGESTION			DERMAL CONTACT		
CF	1E-06	kg/mg	CF	1E-06	kg/mg
IR	330	mg/day	AF	0.3	mg/cm^2-event
EF	250	days/year	ABS	See Table E-3A	unitless
ED	1	years	EF	250	days/year
FI	1	unitless	ED	1	years
BW	80	kg	EV	1	events/day
AT_{nc}	365	days	SA	3527	cm^2
AT_c	25550	days	BW	80	kg
			AT_{nc}	365	days
			AT_c	25550	days

	Ingestion Exposure				Direct Dermal Contact			
Contaminants of Concern	Ingestion Intake Noncancer	Ingestion Intake Cancer	HQ	ELCR	Absorbed Dose Noncancer	Absorbed Dose Cancer	HQ	ELCR
1,1'-Biphenyl	9.2E-08	1.3E-09	9E-07	1E-11	0.0E+00	0.0E+00	0E+00	0E+00
2-Methylnaphthalene	1.6E-05	2.3E-07	4E-03	NA	6.7E-06	9.5E-08	2E-03	NA
Benzo[a]anthracene	8.5E-06	1.2E-07	NA	1E-08	3.5E-06	5.0E-08	NA	5E-09
Benzo(a)pyrene	6.5E-06	9.3E-08	2E-02	9E-08	2.7E-06	3.9E-08	9E-03	4E-08
Benzo[b]fluoranthene	8.7E-06	1.2E-07	NA	1E-08	3.6E-06	5.2E-08	NA	5E-09
Benzo[k]fluoranthene	4.6E-06	6.6E-08	NA	7E-10	1.9E-06	2.7E-08	NA	3E-10
Chrysene	1.5E-05	2.1E-07	NA	2E-10	6.2E-06	8.9E-08	NA	9E-11
Dibenz(a,h)anthracene	1.4E-06	2.0E-08	NA	2E-08	5.8E-07	8.3E-09	NA	8E-09
Indeno[1,2,3-cd]pyrene	5.5E-06	7.8E-08	NA	8E-09	2.3E-06	3.3E-08	NA	3E-09
Naphthalene	1.7E-05	2.4E-07	3E-05	3E-08	7.0E-06	9.9E-08	1E-05	1E-08
Dibenzofuran	2.7E-06	3.9E-08	7E-04	NA	0.0E+00	0.0E+00	0E+00	NA
PCB-1254	1.2E-07	1.7E-09	4E-03	3E-09	5.5E-08	7.8E-10	2E-03	2E-09
PCB-1260	1.3E-06	1.8E-08	NA	4E-08	5.6E-07	8.0E-09	NA	2E-08
Antimony	3.5E-06	4.9E-08	9E-03	NA	0.0E+00	0.0E+00	0E+00	NA
Cadmium	6.4E-06	9.1E-08	1E-02	NA	2.0E-08	2.9E-10	2E-03	NA
Cobalt	2.7E-05	3.8E-07	9E-03	NA	0.0E+00	0.0E+00	0E+00	NA
Copper	1.7E-04	2.4E-06	2E-02	NA	0.0E+00	0.0E+00	0E+00	NA

TABLE E-3B
HAZARD INDICES AND THEORETICAL EXCESS LIFETIME CANCER RISKS
INCIDENTAL INGESTION AND DERMAL CONTACT WITH SOIL
MINGO JUNCTION STEEL WORKS LLC - CAA VIM AND VIIM
WEIRTON, WEST VIRGINIA
VRP PROJECT # 20015

MEDIUM: SOIL
RECEPTOR: FUTURE CONSTRUCTION WORKER

INPUT PARAMETERS					
INGESTION			DERMAL CONTACT		
CF	1E-06	kg/mg	CF	1E-06	kg/mg
IR	330	mg/day	AF	0.3	mg/cm^2-event
EF	250	days/year	ABS	See Table E-3A	unitless
ED	1	years	EF	250	days/year
FI	1	unitless	ED	1	years
BW	80	kg	EV	1	events/day
AT_{nc}	365	days	SA	3527	cm^2
AT_c	25550	days	BW	80	kg
			AT_{nc}	365	days
			AT_c	25550	days

	Ingestion Exposure				Direct Dermal Contact			
Contaminants of Concern	Ingestion Intake Noncancer	Ingestion Intake Cancer	HQ	ELCR	Absorbed Dose Noncancer	Absorbed Dose Cancer	HQ	ELCR
Iron	3.2E-01	4.6E-03	5E-01	NA	0.0E+00	0.0E+00	0E+00	NA
Manganese	3.2E-02	4.6E-04	1E+00	NA	0.0E+00	0.0E+00	0E+00	NA
Mercury	8.2E-07	1.2E-08	5E-03	NA	0.0E+00	0.0E+00	0E+00	NA
Nickel	1.0E-03	1.4E-05	5E-02	NA	0.0E+00	0.0E+00	0E+00	NA
Thallium	3.7E-07	5.3E-09	9E-03	NA	0.0E+00	0.0E+00	0E+00	NA
Vanadium	5.5E-04	7.9E-06	8E-01	NA	0.0E+00	0.0E+00	0E+00	NA
Zinc	2.4E-03	3.4E-05	8E-03	NA	0.0E+00	0.0E+00	0E+00	NA
Cyanide, Total	6.2E-06	8.9E-08	3E-04	NA	0.0E+00	0.0E+00	0E+00	NA
TOTAL			**3E+00**	**2E-07**			**1E-02**	**9E-08**

TABLE E-3C
HAZARD INDICES AND THEORETICAL EXCESS LIFETIME CANCER RISKS
INHALATION OF VOLATILE AND PARTICULATE EMISSIONS
MINGO JUNCTION STEEL WORKS LLC - CAA VIM AND VIIM
WEIRTON, WEST VIRGINIA
VRP PROJECT # 20015

		INPUT PARAMETERS					
		FUGITIVE DUST INHALATION			INHALATION - VOLATILE EMISSIONS		
		PEF	6.9E+06	m^3/kg			
MEDIUM:	**SOIL**	EF	250	days/year	EF	250	days/year
RECEPTOR:	**FUTURE CONSTRUCTION WORKER**	ED	1	years	ED	1	years
		ET	8	hours/day	ET	8	hours/day
		AT_{nc}	8760	hours	AT_{nc}	8760	hours
		AT_c	613200	hours	AT_c	613200	hours

	Fugitive Dust Exposure				Volatile Emissions Exposure			
Contaminants of Concern	**Inhalation EC Noncancer**	**Inhalation EC Cancer**	**HQ**	**ELCR**	**Inhalation EC Noncancer**	**Inhalation EC Cancer**	**HQ**	**ELCR**
1,1'-Biphenyl	1.1E-09	1.5E-11	3E-07	NA	3.0E-07	4.3E-09	8E-05	NA
2-Methylnaphthalene	1.9E-07	2.7E-09	NA	NA	1.0E-04	1.5E-06	NA	NA
Benzo[a]anthracene	9.9E-08	1.4E-09	NA	8E-11	7.2E-07	1.0E-08	NA	6E-10
Benzo(a)pyrene	7.6E-08	1.1E-09	4E-02	7E-10	NA	NA	NA	NA
Benzo[b]fluoranthene	1.0E-07	1.5E-09	NA	9E-11	NA	NA	NA	NA
Benzo[k]fluoranthene	5.4E-08	7.7E-10	NA	5E-12	NA	NA	NA	NA
Chrysene	1.7E-07	2.5E-09	NA	1E-12	NA	NA	NA	NA
Dibenz(a,h)anthracene	1.6E-08	2.3E-10	NA	1E-10	NA	NA	NA	NA
Indeno[1,2,3-cd]pyrene	6.4E-08	9.1E-10	NA	5E-11	NA	NA	NA	NA
Naphthalene	1.9E-07	2.8E-09	6E-05	9E-11	1.3E-04	1.9E-06	4E-02	7E-08
Dibenzofuran	3.2E-08	4.6E-10	NA	NA	6.6E-06	9.4E-08	NA	NA
PCB-1254	1.4E-09	2.0E-11	NA	1E-11	5.4E-08	7.7E-10	NA	4E-10
PCB-1260	1.5E-08	2.1E-10	NA	1E-10	3.6E-07	5.1E-09	NA	3E-09
Antimony	4.0E-08	5.8E-10	4E-05	NA	NA	NA	NA	NA
Cadmium	7.4E-08	1.1E-09	7E-03	2E-09	NA	NA	NA	NA
Cobalt	3.1E-07	4.5E-09	2E-02	4E-08	NA	NA	NA	NA
Copper	2.0E-06	2.9E-08	NA	NA	NA	NA	NA	NA
Iron	3.8E-03	5.4E-05	NA	NA	NA	NA	NA	NA
Manganese	3.8E-04	5.4E-06	8E+00	NA	NA	NA	NA	NA
Mercury	9.5E-09	1.4E-10	3E-05	NA	8.8E-06	1.3E-07	3E-02	NA
Nickel	1.2E-05	1.7E-07	6E-02	4E-08	NA	NA	NA	NA
Thallium	4.4E-09	6.2E-11	NA	NA	NA	NA	NA	NA
Vanadium	6.4E-06	9.2E-08	6E-02	8E-07	NA	NA	NA	NA
Zinc	2.8E-05	4.0E-07	NA	NA	NA	NA	NA	NA
Cyanide, Total	7.3E-08	1.0E-09	9E-05	NA	4.4E-05	6.2E-07	5E-02	NA
TOTAL			**8E+00**	**8E-07**			**1E-01**	**7E-08**

TABLE E-3D
CALCULATION OF DERMAL ABSORBED DOSE PER EVENT FOR CONSTITUENTS IN GROUNDWATER
MINGO JUNCTION STEEL WORKS LLC - CAA VIM AND VIIM
WEIRTON, WEST VIRGINIA
VRP PROJECT # 20015

For organics, if t_{event} is ≤ t* (equation 3.2 of USEPA, 2004):

$$DA_{event} = 2FA \times K_P \times C_W \sqrt{\frac{6\tau_{event} \times t_{event}}{\pi}}$$

For organics, if t_{event} is > t* (equation 3.3 of USEPA, 2004):

$$DA_{event} = FA \times K_P \times C_W \left[\frac{t_{event}}{1+B} + 2\tau_{event} \left(\frac{1+3B+3B^2}{(1+B)^2} \right) \right]$$

For inorganics (equation 3.4 of USEPA, 2004) :

$$DA_{event} = K_P \times C_W \times t_{event}$$

Parameter	Definition	units	Value
DA_{event}	Dermal absorbed dose per event	mg/cm^2-event	Calculated
FA	Fraction absorbed water	unitless	Constituent-specific*
K_P	Dermal permeability coefficient in water	cm/hr	Constituent-specific*
C_w	Constituent Concentration in water	mg/cm^3	Constituent-specific*
τ_{event}	Lag time per event	hr/event	Constituent-specific*
t_{event}	Event duration	hr/event	Assumes work in a trench for 8 hours a day
t*	time to reach steady state	hr	Constituent-specific*
B	ratio of the permeability coefficient of a compound through the stratum corneum relative to its permeability coefficient across the viable epidermis	unitless	Constituent-specific*

* Note: Constituent-specific factors obtained from USEPA (2021a) table of Chemical-Specific Parameters (https://www.epa.gov/risk/regional-screening-levels-rsls-generic-tables).

TABLE E-3D
CALCULATION OF DERMAL ABSORBED DOSE PER EVENT FOR CONSTITUENTS IN GROUNDWATER
MINGO JUNCTION STEEL WORKS LLC - CAA VIM AND VIIM
WEIRTON, WEST VIRGINIA
VRP PROJECT # 20015

Contaminants of Concern	FA	K_P	Cw	τ_{event}	t_{event}	t*	B	DA_{event}
1,1-Dichloroethane	1	6.8E-03	2.5E-07	3.8E-01	8	9.0E-01	2.6E-02	1.45E-08
1,2-Dichlorobenzene	1	4.5E-02	3.7E-05	7.0E-01	8	1.7E+00	2.1E-01	1.37E-05
cis-1,2-Dichloroethene	1	1.1E-02	1.7E-06	3.7E-01	8	8.8E-01	4.2E-02	1.62E-07
1,4-Dichlorobenzene	1	4.5E-02	5.9E-07	7.0E-01	8	1.7E+00	2.1E-01	2.22E-07
Benzene	1	1.5E-02	4.7E-07	2.9E-01	8	6.9E-01	5.1E-02	5.69E-08
Chloroform	1	6.8E-03	3.5E-06	4.9E-01	8	1.2E+00	2.9E-02	2.10E-07
Dichlorobromomethane	1	4.0E-03	1.3E-06	8.7E-01	8	2.1E+00	2.0E-02	5.03E-08
Ethylbenzene	1	4.9E-02	5.8E-06	4.1E-01	8	9.9E-01	2.0E-01	2.19E-06
Tetrachloroethene	1	3.3E-02	4.6E-06	8.9E-01	8	2.1E+00	1.7E-01	1.38E-06
Trichloroethene	1	1.2E-02	8.9E-07	5.7E-01	8	1.4E+00	5.1E-02	9.05E-08
Vinyl chloride	1	8.4E-03	4.9E-07	2.4E-01	8	5.7E-01	2.5E-02	3.40E-08
Xylenes, Total	1	5.0E-02	2.3E-05	4.1E-01	8	9.9E-01	2.0E-01	8.86E-06
1,1'-Biphenyl	1	9.4E-02	2.1E-06	7.7E-01	8	1.8E+00	4.5E-01	1.54E-06
2-Methylnaphthalene	1	9.2E-02	2.9E-05	6.6E-01	8	1.6E+00	4.2E-01	1.95E-05
Naphthalene	1	4.7E-02	1.7E-05	5.5E-01	8	1.3E+00	2.0E-01	6.39E-06
Bis(2-ethylhexyl) phthalate	1	1.1E+00	1.6E-06	1.6E+01	8	7.3E+01	8.6E+00	5.69E-05
Dibenzofuran	1	9.8E-02	1.5E-06	9.2E-01	8	2.2E+00	4.9E-01	1.17E-06
Aluminum	1	1.0E-03	9.2E-04	1.5E-01	8	3.6E-01	2.0E-03	7.36E-06
Antimony	1	1.0E-03	1.2E-07	5.1E-01	8	1.2E+00	4.2E-03	9.60E-10
Arsenic	1	1.0E-03	1.6E-06	2.8E-01	8	6.6E-01	3.3E-03	1.30E-08
Cadmium	1	1.0E-03	8.4E-07	4.5E-01	8	1.1E+00	4.1E-03	6.72E-09
Cobalt	1	4.0E-04	9.8E-05	2.2E-01	8	5.4E-01	1.2E-03	3.14E-07
Copper	1	1.0E-03	2.0E-06	2.4E-01	8	5.7E-01	3.1E-03	1.58E-08
Iron	1	1.0E-03	3.0E-02	2.2E-01	8	5.2E-01	2.9E-03	2.40E-04
Manganese	1	1.0E-03	1.5E-02	2.1E-01	8	5.1E-01	2.9E-03	1.20E-04
Mercury	1	1.0E-03	5.0E-08	1.4E+00	8	3.4E+00	5.4E-03	4.00E-10
Nickel	1	2.0E-04	6.0E-05	2.2E-01	8	5.4E-01	5.9E-04	9.56E-08
Selenium	1	1.0E-03	9.6E-06	2.9E-01	8	7.0E-01	3.4E-03	7.70E-08
Thallium	1	1.0E-03	1.1E-07	1.5E+00	8	3.5E+00	5.5E-03	8.80E-10
Vanadium	1	1.0E-03	3.6E-06	2.0E-01	8	5.9E-01	1.9E-03	2.85E-08
Zinc	1	6.0E-04	1.6E-04	2.4E-01	8	7.0E+00	3.7E-03	7.68E-07

TABLE E-3E
HAZARD INDICES AND THEORETICAL LIFETIME CANCER RISKS
INGESTION AND DERMAL CONTACT WITH GROUNDWATER
MINGO JUNCTION STEEL WORKS LLC - CAA VIM AND VIIM
WEIRTON, WEST VIRGINIA
VRP PROJECT # 20015

		INPUT PARAMETERS					
		INGESTION			DERMAL CONTACT		
		IR	0.025	L/day	DA_{event}	see Table E-3D	mg/cm^2-event
MEDIUM:	**GROUNDWATER**	EF	30	days/yr	EV	1	events/day
RECEPTOR:	**FUTURE CONSTRUCTION WORKER**	ED	1	yrs	ED	1	yrs
		BW	80	kg	EF	30	days/yr
		AT_{nc}	365	days	SA	6032	cm^2
		AT_c	25550	days	BW	80	kg
					AT_{nc}	365	days
					AT_c	25550	days

	Ingestion Exposure				Direct Dermal Contact			
Contaminants of Concern	**Ingestion Intake Noncancer**	**Ingestion Intake Cancer**	**HQ**	**ELCR**	**Absorbed Dose Noncancer**	**Absorbed Dose Cancer**	**HQ**	**ELCR**
1,1-Dichloroethane	6.4E-09	9.2E-11	3E-09	5E-13	9.0E-08	1.3E-09	4E-08	7E-12
1,2-Dichlorobenzene	9.5E-07	1.4E-08	2E-06	NA	8.5E-05	1.2E-06	1E-04	NA
cis-1,2-Dichloroethene	4.5E-08	6.4E-10	2E-06	NA	1.0E-06	1.4E-08	5E-05	NA
1,4-Dichlorobenzene	1.5E-08	2.2E-10	2E-07	1E-12	1.4E-06	2.0E-08	2E-05	1E-10
Benzene	1.2E-08	1.7E-10	1E-06	9E-12	3.5E-07	5.0E-09	4E-05	3E-10
Chloroform	9.0E-08	1.3E-09	9E-07	4E-11	1.3E-06	1.9E-08	1E-05	6E-10
Dichlorobromomethane	3.3E-08	4.8E-10	4E-06	3E-11	3.1E-07	4.5E-09	4E-05	3E-10
Ethylbenzene	1.5E-07	2.1E-09	3E-06	2E-11	1.4E-05	1.9E-07	3E-04	2E-09
Tetrachloroethene	1.2E-07	1.7E-09	1E-05	4E-12	8.5E-06	1.2E-07	1E-03	3E-10
Trichloroethene	2.3E-08	3.2E-10	5E-05	1E-11	5.6E-07	8.0E-09	1E-03	4E-10
Vinyl chloride	1.3E-08	1.8E-10	4E-06	1E-10	2.1E-07	3.0E-09	7E-05	2E-09
Xylenes, Total	5.9E-07	8.5E-09	1E-06	NA	5.5E-05	7.8E-07	1E-04	NA
1,1'-Biphenyl	5.5E-08	7.8E-10	5E-07	6E-12	9.5E-06	1.4E-07	1E-04	1E-09
2-Methylnaphthalene	7.3E-07	1.0E-08	2E-04	NA	1.2E-04	1.7E-06	3E-02	NA
Naphthalene	4.4E-07	6.3E-09	7E-07	8E-10	4.0E-05	5.7E-07	7E-05	7E-08
Bis(2-ethylhexyl) phthalate	4.1E-08	5.9E-10	2E-06	8E-12	3.5E-04	5.0E-06	2E-02	7E-08
Dibenzofuran	3.9E-08	5.5E-10	1E-05	NA	7.3E-06	1.0E-07	2E-03	NA
Aluminum	2.4E-05	3.4E-07	2E-05	NA	4.6E-05	6.5E-07	5E-05	NA
Antimony	3.1E-09	4.4E-11	8E-06	NA	5.9E-09	8.5E-11	1E-04	NA
Arsenic	4.2E-08	6.0E-10	1E-04	9E-10	8.1E-08	1.2E-09	3E-04	2E-09
Cadmium	2.2E-08	3.1E-10	4E-05	NA	4.2E-08	5.9E-10	3E-03	NA

TABLE E-3E
HAZARD INDICES AND THEORETICAL LIFETIME CANCER RISKS
INGESTION AND DERMAL CONTACT WITH GROUNDWATER
MINGO JUNCTION STEEL WORKS LLC - CAA VIM AND VIIM
WEIRTON, WEST VIRGINIA
VRP PROJECT # 20015

		INPUT PARAMETERS					
		INGESTION			DERMAL CONTACT		
		IR	0.025	L/day	DA_{event}	see Table E-3D	mg/cm^2-event
MEDIUM:	**GROUNDWATER**	EF	30	days/yr	EV	1	events/day
RECEPTOR:	**FUTURE CONSTRUCTION WORKER**	ED	1	yrs	ED	1	yrs
		BW	80	kg	EF	30	days/yr
		AT_{nc}	365	days	SA	6032	cm^2
		AT_c	25550	days	BW	80	kg
					AT_{nc}	365	days
					AT_c	25550	days

	Ingestion Exposure				Direct Dermal Contact			
Contaminants of Concern	**Ingestion Intake Noncancer**	**Ingestion Intake Cancer**	**HQ**	**ELCR**	**Absorbed Dose Noncancer**	**Absorbed Dose Cancer**	**HQ**	**ELCR**
Cobalt	2.5E-06	3.6E-08	8E-04	NA	1.9E-06	2.8E-08	6E-04	NA
Copper	5.1E-08	7.3E-10	5E-06	NA	9.8E-08	1.4E-09	1E-05	NA
Iron	7.7E-04	1.1E-05	1E-03	NA	1.5E-03	2.1E-05	2E-03	NA
Manganese	3.9E-04	5.5E-06	2E-02	NA	7.4E-04	1.1E-05	8E-01	NA
Mercury	1.3E-09	1.8E-11	8E-06	NA	2.5E-09	3.5E-11	2E-05	NA
Nickel	1.5E-06	2.2E-08	8E-05	NA	5.9E-07	8.5E-09	7E-04	NA
Selenium	2.5E-07	3.5E-09	5E-05	NA	4.8E-07	6.8E-09	1E-04	NA
Thallium	2.8E-09	4.0E-11	7E-05	NA	5.5E-09	7.8E-11	1E-04	NA
Vanadium	9.2E-08	1.3E-09	1E-04	NA	1.8E-07	2.5E-09	1E-02	NA
Zinc	4.1E-06	5.9E-08	1E-05	NA	4.8E-06	6.8E-08	2E-05	NA
TOTAL			**2E-02**	**2E-09**			**8E-01**	**1E-07**

TABLE E-3F
HAZARD INDICES AND THEORETICAL EXCESS LIFETIME CANCER RISKS
INHALATION OF VOLATILE AND PARTICULATE EMISSIONS
MINGO JUNCTION STEEL WORKS LLC - CAA VIM AND VIIM
WEIRTON, WEST VIRGINIA
VRP PROJECT # 20015

		INPUT PARAMETERS					
		VOLATILE EMISSION INHALATION (TRENCH)					
MEDIUM:	**GROUNDWATER**	EF	30	days/year			
RECEPTOR:	**FUTURE CONSTRUCTION WORKER**	ED	1	years			
		ET	8	hours/day			
		AT_{nc}	8760	hours			
		AT_c	613200	hours			

	Volatile Emissions Exposure							
Contaminants of Concern	**Inhalation EC Noncancer**	**Inhalation EC Cancer**	**HQ**	**ELCR**				
1,1-Dichloroethane	5.7E-05	8.1E-07	NA	1E-09				
1,2-Dichlorobenzene	6.8E-03	9.7E-05	3E-03	NA				
cis-1,2-Dichloroethene	4.0E-04	5.7E-06	NA	NA				
1,4-Dichlorobenzene	1.1E-04	1.6E-06	9E-05	2E-08				
Benzene	1.2E-04	1.7E-06	1E-03	1E-08				
Chloroform	7.2E-04	1.0E-05	3E-03	2E-07				
Dichlorobromomethane	1.9E-04	2.8E-06	NA	1E-07				
Ethylbenzene	1.3E-03	1.8E-05	1E-04	5E-08				
Tetrachloroethene	8.2E-04	1.2E-05	2E-02	3E-09				
Trichloroethene	1.8E-04	2.5E-06	8E-02	1E-08				
Vinyl chloride	1.4E-04	2.0E-06	2E-03	9E-09				
Xylenes, Total	5.1E-03	7.3E-05	1E-02	NA				
1,1'-Biphenyl	3.3E-04	4.7E-06	8E-02	NA				
2-Methylnaphthalene	4.9E-03	7.1E-05	NA	NA				
Naphthalene	3.1E-03	4.4E-05	1E+00	2E-06				
Dibenzofuran	5.0E-05	7.1E-07	NA	NA				
Mercury	8.0E-06	1.1E-07	3E-02	NA				
TOTAL			**1E+00**	**2E-06**				

TABLE E-3G
SUMMARY OF HAZARD INDICES AND THEORETICAL EXCESS LIFETIME CANCER RISKS
MINGO JUNCTION STEEL WORKS LLC - CAA VIM AND VIIM
WEIRTON, WEST VIRGINIA
VRP PROJECT # 20015

	CONSTITUENT AND PATHWAY SPECIFIC HQS								CONSTITUENT AND PATHWAY SPECIFIC CANCER RISK							
Contaminants of Concern	**Ingestion of Soil**	**Dermal Contact with Soil**	**Inhalation Particulates**	**Inhalation Volatiles (Soil)**	**Ingestion of Water**	**Dermal Contact with Water**	**Inhalation Volatiles (Water)**	**TOTAL HAZARD INDEX**	**Ingestion of Soil**	**Dermal Contact with Soil**	**Inhalation Particulates**	**Inhalation Volatiles (Soil)**	**Ingestion of Water**	**Dermal Contact with Water**	**Inhalation Volatiles (Water)**	**TOTAL CANCER RISK**
1,1-Dichloroethane	0E+00	0E+00	NA	NA	3E-09	4E-08	NA	**5E-08**	0E+00	0E+00	0E+00	NA	5E-13	7E-12	1E-09	**1E-09**
1,2-Dichlorobenzene	0E+00	0E+00	0E+00	NA	2E-06	1E-04	3E-03	**4E-03**	NA	NA	NA	NA	NA	NA	NA	**0E+00**
cis-1,2-Dichloroethene	0E+00	0E+00	NA	NA	2E-06	5E-05	NA	**5E-05**	NA	NA	NA	NA	NA	NA	NA	**0E+00**
1,4-Dichlorobenzene	0E+00	0E+00	0E+00	NA	2E-07	2E-05	9E-05	**1E-04**	0E+00	0E+00	0E+00	NA	1E-12	1E-10	2E-08	**2E-08**
Benzene	0E+00	0E+00	0E+00	NA	1E-06	4E-05	1E-03	**2E-03**	0E+00	0E+00	0E+00	NA	9E-12	3E-10	1E-08	**1E-08**
Chloroform	0E+00	0E+00	0E+00	NA	9E-07	1E-05	3E-03	**3E-03**	0E+00	0E+00	0E+00	NA	4E-11	6E-10	2E-07	**2E-07**
Dichlorobromomethane	0E+00	0E+00	NA	NA	4E-06	4E-05	NA	**4E-05**	0E+00	0E+00	0E+00	NA	3E-11	3E-10	1E-07	**1E-07**
Ethylbenzene	0E+00	0E+00	0E+00	NA	3E-06	3E-04	1E-04	**4E-04**	0E+00	0E+00	0E+00	NA	2E-11	2E-09	5E-08	**5E-08**
Tetrachloroethene	0E+00	0E+00	0E+00	NA	1E-05	1E-03	2E-02	**2E-02**	0E+00	0E+00	0E+00	NA	4E-12	3E-10	3E-09	**3E-09**
Trichloroethene	0E+00	0E+00	0E+00	NA	5E-05	1E-03	8E-02	**8E-02**	0E+00	0E+00	0E+00	NA	1E-11	4E-10	1E-08	**1E-08**
Vinyl chloride	0E+00	0E+00	0E+00	NA	4E-06	7E-05	2E-03	**2E-03**	0E+00	0E+00	0E+00	NA	1E-10	2E-09	9E-09	**1E-08**
Xylenes, Total	0E+00	0E+00	0E+00	NA	1E-06	1E-04	1E-02	**1E-02**	NA	NA	NA	NA	NA	NA	NA	**0E+00**
1,1'-Biphenyl	9E-07	0E+00	3E-07	8E-05	5E-07	1E-04	8E-02	**8E-02**	1E-11	0E+00	NA	NA	6E-12	1E-09	NA	**1E-09**
2-Methylnaphthalene	4E-03	2E-03	NA	NA	2E-04	3E-02	NA	**4E-02**	NA	NA	NA	NA	NA	NA	NA	**0E+00**
Benzo[a]anthracene	NA	NA	NA	NA	NA	NA	NA	**0E+00**	1E-08	5E-09	8E-11	6E-10	0E+00	NA	NA	**2E-08**
Benzo(a)pyrene	2E-02	9E-03	4E-02	NA	0E+00	NA	NA	**7E-02**	9E-08	4E-08	7E-10	NA	0E+00	NA	NA	**1E-07**
Benzo[b]fluoranthene	NA	NA	NA	NA	NA	NA	NA	**0E+00**	1E-08	5E-09	9E-11	NA	0E+00	NA	NA	**2E-08**
Benzo[k]fluoranthene	NA	NA	NA	NA	NA	NA	NA	**0E+00**	7E-10	3E-10	5E-12	NA	0E+00	NA	NA	**9E-10**
Chrysene	NA	NA	NA	NA	NA	NA	NA	**0E+00**	2E-10	9E-11	1E-12	NA	0E+00	NA	NA	**3E-10**
Dibenz(a,h)anthracene	NA	NA	NA	NA	NA	NA	NA	**0E+00**	2E-08	8E-09	1E-10	NA	0E+00	NA	NA	**3E-08**
Indeno[1,2,3-cd]pyrene	NA	NA	NA	NA	NA	NA	NA	**0E+00**	8E-09	3E-09	5E-11	NA	0E+00	NA	NA	**1E-08**
Naphthalene	3E-05	1E-05	6E-05	4E-02	7E-07	7E-05	1E+00	**1E+00**	3E-08	1E-08	9E-11	7E-08	8E-10	7E-08	2E-06	**2E-06**
Bis(2-ethylhexyl) phthalate	0E+00	0E+00	NA	NA	2E-06	2E-02	NA	**2E-02**	0E+00	0E+00	0E+00	NA	8E-12	7E-08	NA	**7E-08**
Dibenzofuran	7E-04	0E+00	NA	NA	1E-05	2E-03	NA	**3E-03**	NA	NA	NA	NA	NA	NA	NA	**0E+00**
PCB-1254	4E-03	2E-03	NA	NA	0E+00	NA	NA	**6E-03**	3E-09	2E-09	1E-11	4E-10	0E+00	NA	NA	**6E-09**
PCB-1260	NA	NA	NA	NA	NA	NA	NA	**0E+00**	4E-08	2E-08	1E-10	3E-09	0E+00	NA	NA	**5E-08**
Aluminum	0E+00	0E+00	0E+00	NA	2E-05	5E-05	NA	**7E-05**	NA	NA	NA	NA	NA	NA	NA	**0E+00**
Antimony	9E-03	0E+00	4E-05	NA	8E-06	1E-04	NA	**9E-03**	NA	NA	NA	NA	NA	NA	NA	**0E+00**
Arsenic	0E+00	0E+00	0E+00	NA	1E-04	3E-04	NA	**4E-04**	0E+00	0E+00	0E+00	NA	9E-10	2E-09	NA	**3E-09**
Cadmium	1E-02	2E-03	7E-03	NA	4E-05	3E-03	NA	**3E-02**	NA	NA	2E-09	NA	NA	NA	NA	**2E-09**
Cobalt	9E-03	0E+00	2E-02	NA	8E-04	6E-04	NA	**3E-02**	NA	NA	4E-08	NA	NA	NA	NA	**4E-08**
Copper	2E-02	0E+00	NA	NA	5E-06	1E-05	NA	**2E-02**	NA	NA	NA	NA	NA	NA	NA	**0E+00**
Iron	5E-01	0E+00	NA	NA	1E-03	2E-03	NA	**5E-01**	NA	NA	NA	NA	NA	NA	NA	**0E+00**
Lead	NA	NA	NA	NA	NA	NA	NA	**0E+00**	NA	NA	NA	NA	NA	NA	NA	**0E+00**
Manganese	1E+00	0E+00	8E+00	NA	2E-02	8E-01	NA	**1E+01**	NA	NA	NA	NA	NA	NA	NA	**0E+00**
Mercury	5E-03	0E+00	3E-05	3E-02	8E-06	2E-05	3E-02	**6E-02**	NA	NA	NA	NA	NA	NA	NA	**0E+00**
Nickel	5E-02	0E+00	6E-02	NA	8E-05	7E-04	NA	**1E-01**	NA	NA	4E-08	NA	NA	NA	NA	**4E-08**
Selenium	0E+00	0E+00	0E+00	NA	5E-05	1E-04	NA	**1E-04**	NA	NA	NA	NA	NA	NA	NA	**0E+00**
Thallium	9E-03	0E+00	NA	NA	7E-05	1E-04	NA	**1E-02**	NA	NA	NA	NA	NA	NA	NA	**0E+00**
Vanadium	8E-01	0E+00	6E-02	NA	1E-04	1E-02	NA	**9E-01**	NA	NA	8E-07	NA	NA	NA	NA	**8E-07**
Zinc	8E-03	0E+00	NA	NA	1E-05	2E-05	NA	**8E-03**	NA	NA	NA	NA	NA	NA	NA	**0E+00**
Cyanide, Total	3E-04	0E+00	9E-05	5E-02	0E+00	NA	NA	**5E-02**	NA	NA	NA	NA	NA	NA	NA	**0E+00**
TOTAL								**1E+01**								**3E-06**

TABLE E-4A
CONSTITUENT-SPECIFIC FACTORS
MINGO JUNCTION STEEL WORKS LLC - CAA VIM AND VIIM
WEIRTON, WEST VIRGINIA - WOODED HILLSIDE
VRP PROJECT # 20015

	Constituent-Specific Information [1]										
Contaminants of Concern	**Soil EPC (mg/kg)**	**Soil VF (m^3/kg)**	**RBA (unitless)[2]**	**Dermal ABS (unitless)**	**Gastrointestinal Absorption Efficiency (unitless)**	**Oral RfD (mg/kg-day)**	**Derm RfD (mg/kg-day)**	**Inhal. RfC (mg/m^3)**	**Oral CSF $(mg/kg\text{-}day)^{-1}$**	**Derm CSF $(mg/kg\text{-}day)^{-1}$**	**IUR $(mg/m^3)^{-1}$**
Arsenic	32		0.6	0.03	1	3.0E-04	3.0E-04	1.5E-05	1.5E+00	1.5E+00	4.3E+00
Iron	51553		1		1	7.0E-01	7.0E-01	NA	NA	NA	NA
Manganese	1955		1		0.04	2.4E-02	9.6E-04	5.0E-05	NA	NA	NA

Notes:

1 - The source of the constituent-specific information presented in this table is described in Sections 3 and 4 of the report text.

2 - Relative Bioavailability Factor (RBA) that accounts for the differences in the bioavailability of a contaminant between the medium of exposure (e.g., soil) and the media associated with the toxicity value (e.g., the arsenic RfD and CSF are derived from drinking water studies). Based on USEPA (2021a) RSL User's Guide.

NA - USEPA-derived toxicity values are not available for this particular exposure route or endpoint.

TABLE E-4B
HAZARD INDICES AND THEORETICAL EXCESS LIFETIME CANCER RISKS
INCIDENTAL INGESTION AND DERMAL CONTACT WITH SOIL
MINGO JUNCTION STEEL WORKS LLC - CAA VIM AND VIIM
WEIRTON, WEST VIRGINIA - WOODED HILLSIDE
VRP PROJECT # 20015

		INPUT PARAMETERS					
		INGESTION			DERMAL CONTACT		
		CF	1E-06	kg/mg	CF	1E-06	kg/mg
MEDIUM:	**SOIL**	IR	100	mg/day	AF	0.04	mg/cm^2-event
RECEPTOR:	**YOUTH TRESPASSER**	EF	30	days/year	ABS	See Table E-4A	unitless
		ED	5	years	EF	30	days/year
		FI	1	unitless	ED	5	years
		BW	56.8	kg	EV	1	events/day
		AT_{nc}	1825	days	SA	11083	cm^2
		AT_c	25550	days	BW	56.8	kg
					AT_{nc}	1825	days
					AT_c	25550	days

	Ingestion Exposure				Direct Dermal Contact			
Contaminants of Concern	**Ingestion Intake Noncancer (mg/kg-day)**	**Ingestion Intake Cancer (mg/kg-day)**	**HQ**	**ELCR**	**Absorbed Dose Noncancer (mg/kg-day)**	**Absorbed Dose Cancer (mg/kg-day)**	**HQ**	**ELCR**
Arsenic	2.8E-06	2.0E-07	9E-03	3E-07	6.2E-07	4.4E-08	2E-03	7E-08
Iron	7.5E-03	5.3E-04	1E-02	NA	0.0E+00	0.0E+00	0E+00	NA
Manganese	2.8E-04	2.0E-05	1E-02	NA	0.0E+00	0.0E+00	0E+00	NA
TOTAL			**3E-02**	**3E-07**			**2E-03**	**7E-08**

TABLE E-4C
HAZARD INDICES AND THEORETICAL EXCESS LIFETIME CANCER RISKS
INHALATION OF VOLATILE AND PARTICULATE EMISSIONS
MINGO JUNCTION STEEL WORKS LLC - CAA VIM AND VIIM
WEIRTON, WEST VIRGINIA - WOODED HILLSIDE
VRP PROJECT # 20015

		INPUT PARAMETERS					
		FUGITIVE DUST INHALATION			INHALATION - VOLATILE EMISSIONS		
		PEF	1.32E+09	m^3/kg			
MEDIUM:	**SOIL**	EF	30	days/year	EF	30	days/year
RECEPTOR:	**YOUTH TRESPASSER**	ED	5	years	ED	5	years
		ET	2	hours/day	ET	2	hours/day
		AT_{nc}	43800	hours	AT_{nc}	43800	hours
		AT_c	613200	hours	AT_c	613200	hours

	Fugitive Dust Exposure				Volatile Emissions Exposure			
Contaminants of Concern	**Inhalation EC Noncancer (mg/m^3)**	**Inhalation EC Cancer (mg/m^3)**	**HQ**	**ELCR**	**Inhalation EC Noncancer (mg/m^3)**	**Inhalation EC Cancer (mg/m^3)**	**HQ**	**ELCR**
Arsenic	1.7E-10	1.2E-11	1E-05	5E-11	NA	NA	NA	NA
Iron	2.7E-07	1.9E-08	NA	NA	NA	NA	NA	NA
Manganese	1.0E-08	7.3E-10	2E-04	NA	NA	NA	NA	NA
TOTAL			**2E-04**	**5E-11**			**0E+00**	**0E+00**

TABLE E-4D
SUMMARY OF HAZARD INDICES AND THEORETICAL EXCESS LIFETIME CANCER RISKS
YOUTH TRESPASSER
MINGO JUNCTION STEEL WORKS LLC - CAA VIM AND VIIM
WEIRTON, WEST VIRGINIA - WOODED HILLSIDE
VRP PROJECT # 20015

	CONSTITUENT AND PATHWAY SPECIFIC HQS					CONSTITUENT AND PATHWAY SPECIFIC CANCER RISK				
Contaminants of Concern	**Ingestion of Soil**	**Dermal Contact with Soil**	**Inhalation Particulates**	**Inhalation Volatiles (Soil)**	**TOTAL HAZARD INDEX**	**Ingestion of Soil**	**Dermal Contact with Soil**	**Inhalation Particulates**	**Inhalation Volatiles (Soil)**	**TOTAL CANCER RISK**
Arsenic	9E-03	2E-03	1E-05	NA	**1E-02**	3E-07	7E-08	5E-11	NA	**4E-07**
Iron	1E-02	0E+00	NA	NA	**1E-02**	NA	NA	NA	NA	**0E+00**
Manganese	1E-02	0E+00	2E-04	NA	**1E-02**	NA	NA	NA	NA	**0E+00**
TOTAL					**3E-02**					**4E-07**