RECORD OF DECISION
OPERABLE UNIT 1
SHAFFER EQUIPMENT COMPANY PROPERTY
SOIL

SHAFFER EQUIPMENT / ARBUCKLE CREEK AREA SUPERFUND SITE
MINDEN, FAYETTE COUNTY, WEST VIRGINIA

UNITED STATES ENVIRONMENTAL
PROTECTION AGENCY

REGION 3
PHILADELPHIA, PENNSYLVANIA
July 2024

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LIST OF ACRONYMS

ARARs	Applicable or Relevant and Appropriate Requirements
CERCLA	Comprehensive Environmental Response, Compensation and Liability Act
COC	Contaminant of Concern
COPC	Contaminant of Potential Concern
EPA	United States Environmental Protection Agency
EPC	Exposure Point Concentration
HDPE	High-Density Polyethylene
HHRA	Human Health Risk Assessment
HI	Hazard Index
HQ	Hazard Quotient
ICs	Institutional Controls
LTM	Long-Term Monitoring
mg/kg	Milligrams per Kilogram
NCP	National Oil and Hazardous Substances Pollution Contingency Plan
NPL	National Priorities List
OU	Operable Unit
OU-1	Operable Unit 1
O&M	Operation and Maintenance
PCB	Polychlorinated Biphenyl
PSL	Project Screening Level
RAO	Remedial Action Objective
RCRA	Resource Conservation and Recovery Act
RI	Remedial Investigation
RME	Reasonable Maximum Exposure
ROD	Record of Decision
SEC	Shaffer Equipment Company
SVOC	Semi-Volatile Organic Compound
TSCA	Toxic Substances Control Act
UCL	Upper Confidence Limit
VOC	Volatile Organic Compound
WVDEP	West Virginia Department of Environmental Protection

I. DECLARATION

SHAFFER EQUIPMENT / ARBUCKLE CREEK AREA SUPERFUND SITE
OPERABLE UNIT 1

MINDEN, FAYETTE COUNTY, WEST VIRGINIA

RECORD OF DECISION FOR REMEDIAL ACTION
SHAFFER EQUIPMENT / ARBUCKLE CREEK AREA SUPERFUND SITE

I. DECLARATION

Site Name and Location

The Shaffer Equipment / Arbuckle Creek Area Superfund Site (Site) is located in Minden, Fayette County, West Virginia. The Shaffer Equipment Company (SEC) built electrical substations for the coal mining industry from approximately 1970 until 1983. Mismanagement of electrical transformers by the SEC resulted in the release of oils containing polychlorinated biphenyls (PCBs) to the environment. The Site consists of the SEC property, contaminated sediments within Arbuckle Creek, and other areas where site-related contamination may be located. The National Superfund Database Identification Number for the Site is WVD988768909. A Site Location Map is included as Figure 1 and the Site Layout is included as Figure 2. The SEC property is located in the approximate area where the SEC facility operated and where EPA has historically performed Removal Actions as shown on Figure 3.

Statement of Basis and Purpose

This Record of Decision (ROD) presents the United States Environmental Protection Agency's (EPA's) Selected Remedy for soil at and in proximity to the former SEC property, which is designated as Operable Unit 1 (OU-1) at the Site. EPA is selecting the remedy for OU-1 as an early action while the Remedial Investigation and Feasibility Study for the remainder of the Site is being completed. In addition to the SEC property, the Site includes several areas of potential concern that have been investigated. When the Remedial Investigation and Feasibility Study for the Site is completed, the remaining areas of potential concern will be evaluated in a future cleanup plan, and any remedy for areas other than OU-1 will be documented in a future ROD.

This Selected Remedy was chosen in accordance with the Comprehensive Environmental Response, Compensation and Liability Act of 1980 (CERCLA), 42 U.S.C. § 9601 et seq., as amended, and to the extent practicable, the National Oil and Hazardous Substances Pollution Contingency Plan (NCP), 40 C.F.R. Part 300, as amended. This ROD is based on the Administrative Record for the Site, which was developed in accordance with Section 113(k) of CERCLA, 42 U.S.C. § 9613(k). The Administrative Record can be found in the Administrative Record file located in the EPA Region III Office, the Oak Hill Public Library in Oak Hill, West Virginia and online at https://semspub.epa.gov/src/collection/03/AR67298.

The West Virginia Department of Environmental Protection (WVDEP) does not object to EPA's preferred alternative in the March 2023 Proposed Remedial Action Plan (Proposed Plan) for the Shaffer Equipment / Arbuckle Creek Area Superfund Site and will concur if West Virginia can secure their cost share of the remedial action. Signature of the ROD will allow EPA to proceed with the remedial design, but a Superfund State Contract memorializing the State cost sharing will be required prior to the start of the remedial action (Appendix A).

Assessment of the Site

The Selected Remedy in this ROD is necessary to protect the public health or welfare or the environment from actual or threatened releases of hazardous substances into the environment.

Description of the Selected Remedy

The Selected Remedy in this ROD will address the soil at and in proximity to the former SEC property.

The goal of the Selected Remedy is to prevent direct exposure to contaminated soil and prevent the migration of contaminants from soil to groundwater and surface water/sediments within Arbuckle Creek and downstream wetlands. EPA's Selected Remedy for the SEC property soils is ***Alternative 3 – Impervious Cap/Barrier Area Excavation***.

The Selected Remedy (Alternative 3) consists of the following components:

1. Removal of the impervious cap/barrier

2. Excavation of all PCB-contaminated soil above performance standards

3. Disposal of excavated PCB-contaminated soil and the impervious cap/barrier at an approved offsite disposal facility

4. Backfill with clean fill, as necessary

Statutory Determinations

The Selected Remedy for the SEC property soil is protective of human health and the environment, is cost effective, and to the maximum extent possible utilizes permanent solutions for treatment of principal threat waste. The Selected Remedy for the SEC property soil will comply with all Applicable or Relevant and Appropriate Requirements (ARARs). ARARs for the Selected Remedy are presented in Table 1.

A statutory review to ensure that the Selected Remedy is, or will be, protective of human health and the environment pursuant to Section 121(c) of CERCLA, 42 U.S.C. § 9621(c), and 40 C.F.R. § 300.430(f)(4)(ii) of the NCP is not required because the Selected Remedy, once successfully implemented, will not result in hazardous substances remaining onsite above levels that do not allow for unlimited use and unrestricted exposure.

ROD Data Certification Checklist

The following information is included in the Decision Summary (Part II) of this ROD. Additional information can be found in the Administrative Record for the Site:

ROD CERTIFICATION CHECKLIST	
Information	**Location/Page Number**
Contaminants of Concern (COCs) and respective concentrations	Section 7.1.4, page 16
Baseline risk represented by COCs	Section 7.1.4, page 15
Cleanup levels established for COCs and the basis for these levels	Section 12.2.2, page 26
How source materials constituting principal threat are addressed	Section 11.0, page 25
Current and reasonably anticipated future land use assumptions potential future beneficial uses of groundwater used in the baseline risk assessment and ROD	Section 7.1.2, page 14
Potential land use that will be available at the Site as a result of the Selected Remedy	Section 6.0, page 11
Estimated capital, annual Operations & Maintenance (O&M), and total present worth costs, discount rate, and the number of years over which the remedy cost estimates are projected	Section 12.3, page 27
Key factors that led to selecting the remedy	Section 12.1, page 25

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Paul Leonard, Director
Superfund and Emergency Management Division
EPA Region III

II. DECISION SUMMARY

SHAFFER EQUIPMENT / ARBUCKLE CREEK AREA SUPERFUND SITE
OPERABLE UNIT 1

MINDEN, FAYETTE COUNTY, WEST VIRGINIA

II. DECISION SUMMARY

1.0 Site Name, Location and Description

The Shaffer Equipment / Arbuckle Creek Area Superfund Site is located in Minden, Fayette County, West Virginia. The SEC built electrical substations for the coal mining industry from approximately 1970 until 1983. The substations incorporated various types of transformers, capacitors, switches, and related voltage regulation and distribution devices that utilized cooling oil that contained PCBs. Mismanagement of these electrical devices by the SEC resulted in the release of PCB-containing oils to the environment.

The SEC conducted operations at a facility located near the western end of Minden. The SEC property is approximately five acres and is located within the floodplain of Arbuckle Creek, which borders the property to the north. There were various structures at the property that supported SEC operations; however, all of these structures have been demolished and the transformers have been removed. Presently, much of the SEC property is overgrown with woody vegetation and an area covered with an engineered impervious cap/barrier. Additionally, a metal sheet piling wall is located along the northern edge of the property, bordering Arbuckle Creek, to prevent erosion of the stream bank. The National Superfund Database Identification Number is WVD988768909.

In addition to the SEC property, the Site includes several areas of potential concern that have been investigated as part of the initial investigation as well as the ongoing Remedial Investigation. These areas of potential concern are being evaluated and will be discussed in a future final cleanup plan but are not part of this action. A Site Location Map is included as Figure 1 and the Site Layout is included as Figure 2. These areas of potential concern include the following:

- Possible Transformer Storage Area (adjacent to the east of the SEC property)
- Britt Bath House Area
- Berwind Green Hill Mine Dump Area (aka Needles Eye)
- Rocklick Road
- NR&P Supply House (aka Powerhouse)
- Residential Properties (located along Arbuckle Creek)
- Arbuckle Creek Floodplain
- Arbuckle Creek and associated wetland areas within the limits of the SEC property and to its confluence with the New River
- New River
- Mines

EPA is the lead agency for the Site and WVDEP is the support agency. EPA has not identified any liable, financially viable potentially responsible parties at the Site and all response actions at the Site will be conducted by EPA as fund-lead actions.

2.0 Site History and Enforcement Activities

This section of the ROD provides the history of the Site and a discussion of EPA and WVDEP investigations and response activities. The "Proposed Rule" proposing the Site to the National Priorities List (NPL) was published in the *Federal Register* on September 13, 2018. The "Final Rule" adding the Site to the NPL was published in the *Federal Register* on May 15, 2019.

2.1 History of Contamination

Mismanagement of various types of transformers, capacitors, switches, and related voltage regulation and distribution devices that utilized cooling oil that contained PCBs by the SEC resulted in the release of PCB-containing oils to the environment. Flooding has caused PCB-contaminated soil to be deposited downstream of the SEC property. Community members also reported that PCB-contaminated sediments were placed in different areas of Minden, PCB oil was spread on roadways as dust suppression, PCB oil was dumped into a suspected pit, and PCB oil was disposed in the former mines.

2.2 Previous Environmental Investigations and Response Actions

In September of 1984, the West Virginia Division of Natural Resources, of which part is now incorporated within the WVDEP, inspected the SEC property. EPA initially inspected the Site in October of 1984. During these initial inspections hundreds of transformers and capacitors were observed across the SEC property. Several of the transformers and capacitors were broken open with oil spillage evident on the ground surface. Samples were collected during these inspections and the analytical results revealed very high (up to 260,000 milligrams per kilogram (mg/kg)) levels of PCBs. Additional sampling was completed between November 1984 and February 1985 to better characterize the impacts.

Between December 1984 and December 1987, EPA conducted a Removal Action in response to the high levels for PCBs and the evidence of offsite contamination migration. The Removal Action included the removal and disposal of capacitors, transformers, drummed solids and liquids, and approximately 4,735 tons of PCB-contaminated soil. The western end of the property was excavated to a depth of six inches while an area just west of the SEC building was excavated to a depth of two feet. The Removal Action included an attempt to treat the 4,735 tons of excavated soil onsite via solvent extraction, which proved unsuccessful.

EPA returned to Minden in 1990 and conducted sampling at the SEC property and the surrounding area. Surface soil, subsurface soil, surface water, sediment, and the public water supply were sampled. The sample analyses indicated that the public water supply was not impacted. Due to elevated PCB concentrations at the SEC property, another Removal Action was conducted between November 1990 and January 1991. This Removal Action consisted of the excavation of six areas around the SEC building. All excavated soil was disposed of offsite. All excavated areas were backfilled with soil from an area south of the SEC property.

In 1993, additional soil sampling was performed by EPA with split sampling performed by the property owner and WVDEP. The highest PCB result from this sampling event was over 1,200 mg/kg.

Following a fire at the SEC building, EPA performed a third Removal Action from 2000 to 2001 due to PCBs remaining in the soil at levels as high as 1,200 mg/kg at the SEC property. This Removal Action consisted of the installation of an impervious cap/barrier over PCB contamination and the foundation of the SEC building. The impervious cap/barrier covers approximately one acre. The impervious cap is an 18-inch compacted low permeability clay layer overlaid with 40-millimeter thick, high-density polyethylene (HDPE) liner. On top of the impervious layer is 12 inches of clean soil then 6 inches of topsoil. The impervious cap includes a sheet pile cutoff wall along Arbuckle Creek to prevent erosion of the creek bank. There are also surface diversions and drainage ditches to direct stormwater away from the impervious cap/barrier. Four monitoring wells were installed in the capped area.

Due to community concerns of potential migration of contamination from the SEC property, EPA returned in 2017 to perform additional sampling at the SEC property and the surrounding areas. This sampling identified elevated PCBs as high as 54 mg/kg in the adjacent area south of the capped area. A fourth Removal Action was conducted in this area from October 2019 to February 2020 to excavate approximately 1,100 tons of PCB-contaminated soil. The excavated soil was disposed offsite at approved disposal facilities. During this Removal Action, the east section of the cap wall was repaired and reinforced. Also, the swale on the south side of the capped area was cleared and repaired.

3.0 Community Participation

During various stages of the Site work there have been numerous community meetings hosted by EPA in close proximity to the Site. These meetings included information sessions for EPA to answer questions on current activities and for the community to provide suggestions on sampling locations. Over 10 fact sheets and/or public notices have been distributed to notify the public about these community meetings and other Site updates. EPA sends updates approximately every month from an EPA email address designated for the Site, R3_Shaffer@epa.gov, to those community members who have signed up to receive Site updates.

On March 9, 2023, pursuant to Section 113(k)(2)(B) of CERCLA, 42 U.S.C. § 9613(k)(2)(B), EPA released the Proposed Plan for OU-1 for a 30-day public comment period. The Proposed Plan was based on documents contained in the Administrative Record File for the Site and set forth EPA's preferred remedial alternative. EPA held a public meeting on March 21, 2023, at the Minden Community Center / New Beginning Apostolic Church in Minden, West Virginia, to inform local officials, interested citizens, and other stakeholders in attendance about EPA's proposed cleanup plan and the Superfund process, to respond to questions, and to receive comments on the Proposed Plan. These community participation activities meet the public participation requirements in CERCLA Section 117, 42 U.S.C. § 9617, and 40 C.F.R. § 300.430(f)(3) of the NCP.

The Administrative Record can be found in the Administrative Record file located in the EPA Region III Office, the Oak Hill Public Library in Oak Hill, West Virginia and online at https://semspub.epa.gov/src/collection/03/AR67298. The notice of the availability of these documents was published in *The Fayette Tribune* on March 9, 2023. The public comment period was held from March 13, 2023 to April 12, 2023.

A fact sheet detailing the Proposed Plan was mailed to local citizens on March 8, 2023. EPA's responses to comments received during the public comment period are included in the Responsiveness Summary, which is included as Part III of this ROD.

4.0 Scope and Role of Operable Unit

EPA is organizing the work at the Site into Operable Units (OUs). This action is for the soils at the SEC property (OU-1) and includes the previously capped material along with the adjacent impacted soils (Figure 3). The purpose of this action is to address a potential source of contamination at the SEC property as an early action. The SEC property soil is a potential source of contamination due to the repeated, and likely future, flooding of Arbuckle Creek potentially causing releases of soil source material migrating to the downstream wetlands and residential properties. To facilitate selection of a remedy for OU-1 as an early action, EPA completed a human health risk assessment and focused feasibility study for OU-1 ahead of completion of the sitewide Remedial Investigation / Feasibility Study. Following the completion of the Remedial Investigation / Feasibility Study, EPA expects to establish at least one other OU and will seek comments on an additional proposed cleanup plan for any remaining contamination at the Site.

5.0 Site Characteristics

This section of the ROD provides an overview of the Site's geology and hydrogeology, the sampling strategy used during Site investigations, and the nature and extent of contamination. Additional information regarding the nature and extent of contamination can be found in the Administrative Record.

5.1 Physical Setting

Minden is situated in the Appalachian Plateau Physiographic Province. Topographically, the Appalachian Plateau Physiographic Province is characterized by a series of uplifted, dissected plateaus. The major tributaries have eroded broad, deep, steep-sided valleys; local relief along the valleys may exceed 1,000 feet. Minden is located within one of these valleys with a localized relief of approximately 400 feet.

In the vicinity of Minden, West Virginia, there are several coal seams that contained economically viable thicknesses of coal for mining. These seams were mined as early as the late 1800s and continued to be mined until at least the late 1960s. Shallow coal seams were mined by stripping the land to reach the coal, but most mining occurred through the use of underground

mining using room and pillar mining methods. A closed, abandoned mine entrance is located to the southeast of the SEC property.

The SEC property is located within Arbuckle Creek's floodplain (Figure 4). The floodplain is a Federal Emergency Management Agency designated Zone A Flood Hazard Area, indicating that the area is subject to inundation by the 1-percent-annual-chance flood event (100-year floodplain). Recent flooding events have occurred in Minden in June 2016, June 2017, June 2020, and July 2022. A July 2001 flood engulfed the town in several feet of water.

5.2 Geology and Hydrogeology

5.2.1 Overburden

The area around Arbuckle Creek is mostly underlain by Dekalb and Gilpin, very stony soils. The Dekalb Series consists of moderately deep, well-drained soils found on ridge tops, hillsides, and mountainsides and formed in acid material weathered from sandstone. The Gilpin Series consists of moderately deep, well-drained soils found on rolling shale ridges and mountainsides and formed in acid material weathered from sandstone, siltstone, and shale.

At the SEC property there are areas at the surface covered with a few feet of fill material consisting of brick, "red dog" (combustion product of coal waste), gravel, coal, silty sand, and occasional construction and trash debris. Below the fill material is silty sand to sandy silt with gravel alluvial material of Arbuckle Creek.

5.2.2 Bedrock

Bedrock is approximately 6 to 12 feet below ground surface. The bedrock elevations are generally deeper closer to Arbuckle Creek and deeper to the south. The SEC property and most of the surrounding area along Arbuckle Creek are underlain by the Pennsylvanian New River Formation (Pottsville Group). The New River Formation ranges in stratigraphic thickness from 0 to 730 feet in the Fayette County area and consists predominantly of sandstone, with some shale, siltstone, and coal. Minor amounts of conglomeratic sandstone may be present.

5.2.3 Hydrogeology

Groundwater is encountered in the overburden and bedrock. Groundwater in the overburden was encountered at approximately 8 feet below ground surface and flows parallel to the creek towards the northeast at the SEC property, most likely a result of the sheet piling wall constructed between contaminated soil and Arbuckle Creek. Groundwater in the bedrock appears to flow towards the east/southeast but there is some uncertainty to the different screened depths of the bedrock wells and the influence of past underground mining in the area.

5.3 Nature and Extent of Contamination

The Remedial Investigation sampling for the Site started in November 2019. The work has been conducted in phases (Phase 1 and Phase 2). During the Phase 1 activities at the SEC property, 22

soil borings were advanced with three soil samples collected from each soil boring. The soil borings were advanced on the three sides of the impervious cap/barrier. Soil borings were not able to be advanced between the impervious cap/barrier and Arbuckle Creek, nor through the impervious cap/barrier itself. The soil borings were also advanced in areas where past excavation activities were completed. During the Phase 2 activities, nine additional soil borings were advanced to delineate the PCB impacts identified from Phase 1. Three soil samples were collected from each Phase 2 soil boring.

All soil samples were analyzed for PCB congeners while a subset of the Phase 1 soil samples also was analyzed for PCB Aroclors. PCBs are a group of man-made organic chemicals consisting of carbon, hydrogen, and chlorine atoms. A PCB congener is any single, unique chemical compound in the PCB category. There are a total of 209 unique PCB congeners. Aroclor is a PCB mixture and one of the most commonly known trade names for PCB mixtures. There are many types of Aroclors, and each has a distinguishing suffix that indicates the amount of chlorine in the mixture.

Total Aroclor concentrations ranged from non-detect to 24 mg/kg and total PCB congener concentrations ranged from 0.000002 mg/kg to 49.7 mg/kg. While no soil samples were collected under the impervious cap/barrier during the Remedial Investigation sampling, a review of historical results indicate that the highest total PCB result found is 1,208.8 mg/kg below the cap.

In addition to the PCB analyses, all soil samples were also analyzed for semi-volatile organic compounds (SVOCs), pesticides, dioxin/furans, metals, and cyanide, while the samples collected at depth during Phase 1 were also analyzed for volatile organic compounds (VOCs). The analytical results were compared to project screening levels (PSLs). These PSLs are either from the EPA regional screening levels or the West Virginia Residential De Minimis Standards under the WVDEP Voluntary Remediation Program. The PSLs are not cleanup standards but were used to help identify contaminants that may require additional evaluation.

VOC results were not detected in any of the samples above PSLs. Of the 90 samples analyzed for SVOCs, 25 samples had at least one SVOC above a PSL. Only one of 90 samples analyzed for pesticides had a concentration above the PSLs. Hexachlorodibenzo-p-dioxin was detected above a PSL in two samples. No other dioxins or furans were detected above PSLs. Aluminum, antimony, arsenic, cadmium, chromium, cobalt, iron, lead, manganese, and thallium were the inorganics (metals) detected above PSLs. Cyanide was not detected above a PSL in any of the samples.

6.0 Current and Future Potential Land Use

Land use in the vicinity of the SEC property is primarily residential. The SEC property covers several land parcels. Despite the historical use by the SEC, the SEC property parcels as well as the surrounding parcels are zoned as either land conservation or residential, according to the City of Oak Hill website. Due to frequent flooding of Arbuckle Creek and the location of the SEC property within the mapped floodplain, development and future use of the SEC property are unlikely.

6.1 National Historical Preservation Act

EPA has consulted with the West Virginia Department of Arts, Culture and History's State Historic Preservation Office to determine potential project effects on cultural resources. There is one previously recorded archaeological resource located near the SEC property. Due to all SEC property previously being disturbed and a portion of it capped, no additional consultation is required for the recorded archaeological resource.

6.2 Tribal Interest

There are no federally recognized tribes in West Virginia. Additionally, no federally recognized tribes have indicated to EPA Region III an interest in the Shaffer Equipment / Arbuckle Creek Area Superfund Site.

7.0 Summary of Site Risks

During the Remedial Investigation, a Human Health Risk Assessment (HHRA) was conducted for the SEC property to determine the current and potential future effects of contaminated media on human health in the absence of any cleanup actions at the SEC property. A baseline risk assessment (before any cleanup) provides the basis for taking a remedial action and indicates the exposure pathway(s) that need to be addressed by the remedial action. This section summarizes the results of the HHRA at the SEC property.

For more detailed human health information, please refer to the August 2022 Shaffer Equipment Company Property HHRA available in the Administrative Record for the Site. Human health risk summary tables from the August 2022 Shaffer Equipment Company Property HHRA are included as Appendix B to this ROD.

WHAT IS RISK AND HOW IS IT CALCULATED?

A Superfund human health risk assessment estimates the baseline risk. The baseline risk is an estimate of the likelihood of health problems occurring if no cleanup action were taken at a site. To estimate the baseline risk at a Superfund site, EPA undertakes a four-step process:

Step 1: Analyze Contamination
Step 2: Estimate Exposure
Step 3: Assess Potential Health Dangers
Step 4: Characterize Site Risk

In Step 1, EPA looks at the concentrations of contaminants found at a site as well as past scientific studies on the effects these contaminants have had on people (or animals, when human studies are unavailable). Comparisons between site-specific concentrations and concentrations reported in past studies help EPA to determine which contaminants are most likely to pose the greatest threat to human health.

In Step 2, EPA considers the different ways that people might be exposed to the contaminants identified in Step 1, the concentrations that people might be exposed to, and the potential frequency and duration of exposure. Using this information, EPA calculates a "reasonable maximum exposure" scenario, which portrays the highest level of human exposure that could reasonably be expected to occur.

In Step 3, EPA uses the information from Step 2 combined with information on the toxicity of each chemical to assess potential risks. EPA considers two types of risk: cancer and non-cancer risk. The likelihood of any kind of cancer resulting from a Superfund site is generally expressed as an upper bound probability; for example, a "1 in 10,000 chance." In other words, for every 10,000 people that could be exposed, one extra cancer may occur as a result of exposure to site contaminants. An extra cancer case means that one more person could get cancer than would normally be expected to from all other causes. For non-cancer health effects, EPA calculates a "hazard index." The key concept here is that a "threshold level" (measured as a HI of equal to or less than 1) exists below which non-cancer health effects are no longer predicted.

In Step 4, EPA determines whether site risks are great enough to cause health problems for people at or near the Superfund site. The results of the three previous steps are combined, evaluated, and summarized. EPA adds up the potential risks from the individual contaminants and exposure pathways and calculates a total site risk. Generally, cancer risks between 10^{-4} and 10^{-6}, and a non-cancer HI of 1 or less are considered acceptable for EPA Superfund sites.

7.1 Human Health Risk Assessment

The HHRA was conducted to characterize and quantify the current and potential future human health risks that would occur if no remedial action were taken to address contaminated media at the SEC property. The HHRA identifies the potential exposure pathways in which people may be exposed to Site contaminants, the toxicity of the contaminants present, and the potential for carcinogenic and non-carcinogenic effects to occur from exposure to the contaminants.

7.1.1 Identification of Chemicals of Concern

The selection of contaminants of potential concern (COPCs) is a risk-based screening step to identify chemicals that should be included in the quantitative risk assessment. The selection of COPCs was based on information regarding chemical substances found at the SEC property including chemical-specific concentrations, occurrence, distribution, and toxicity. COPCs include only those chemicals with positive detections and are limited to those chemicals that exceed the selection criterion. The selection criteria (the lower of the EPA Regional Screening Levels or West Virginia De Minimis Standards, as applicable) were used to reduce the number of chemicals considered in the risk assessment. Screening levels based on residential exposure assumptions were used for this HHRA as a conservative screening tool to be protective of all potential current and future Site uses. Screening levels based on residential exposure assumptions are very conservative for screening soil for recreator, trespasser, and worker populations.

A chemical was selected as a COPC if the maximum detected concentration was greater than the associated COPC screening level. Frequency of detection was not considered in COPC selection. COCs are a subset of COPCs that need to be addressed by a response action. Contribution to risk and background concentrations are two factors that are used to narrow down COPCs to COCs.

Risk assessments are conducted using an exposure point concentration (EPC) for each COPC. The EPC represents an estimated concentration to which a receptor is assumed to be continuously exposed while in contact with an environmental medium. Consistent with EPA's *Supplemental Guidance to RAGS: Calculating the Concentration Term*, a conservative estimate of the mean concentration is used as the EPC. The EPC is generally defined as the 95 percent upper confidence limit (UCL) on the mean and is calculated using EPA's ProUCL 5.1 software.

EPCs used in the risk assessment are presented in Appendix B.

7.1.2. Exposure Assessment

The HHRA was undertaken to assess risk posed by surface and subsurface soil at the SEC property. Currently, the land is vacant and is not used for industrial, commercial, or residential purposes. Five potential receptor populations were identified for risk-based evaluation under a reasonable maximum exposure (RME) scenario:

The receptors evaluated include:

- Adult and child recreators;
- Adolescent trespasser;
- Adult and child residents;
- Industrial worker (composite worker); and
- Construction worker.

The adult and child recreators and the adolescent trespasser (ages 6-16) are assumed to contact surface soil, defined as soils in the upper six inches of the soil column. Potentially complete exposure pathways for the adult and child recreators and adolescent trespasser include incidental ingestion of soil, dermal exposure to soil, inhalation of fugitive dust from windblown erosion, and inhalation of vapors in ambient air.

Future land use is expected to remain the same as current land use. However, potential future users could also include residents (adult/child) if the property were to be developed. Adult and child residents are assumed to come in contact with surface, near-surface, and subsurface soils. Potentially complete exposure pathways for the resident include incidental ingestion of soil, dermal exposure to soil, and inhalation of fugitive dust and ambient vapor.

As a result of the potential for future industrial use of the Site, industrial workers were considered appropriate receptors to be evaluated. The industrial worker is potentially exposed to COPCs in surface and near-surface soil (0-2 feet below ground surface). Potentially complete exposure pathways for the industrial worker include incidental ingestion of soil, dermal exposure to soil, and inhalation of fugitive dust and ambient vapor.

Although it is not definitively known if future use of the Site will entail construction activities, a construction worker scenario is included in the HHRA to account for this possibility. The construction worker is assumed to come in contact with surface, near-surface, and subsurface soils. Potentially complete exposure pathways for the construction worker include incidental ingestion of soil, dermal exposure to soil, and inhalation of fugitive dust from truck traffic on unpaved roads, and inhalation of ambient vapor.

Risk assessments are conducted using an EPC for each COPC. The EPC represents an estimated concentration to which a receptor is assumed to be continuously exposed while in contact with an environmental medium. See Section 7.1.1, above, regarding calculation of EPCs for this HHRA.

7.1.3. Toxicity Assessment

The toxicity assessment for the COPCs examines information concerning the potential human health effects of exposure to COPCs. The goal of the toxicity assessment is to provide, for each COPC, a quantitative estimate of the relationship between the magnitude and type of exposure and the severity or probability of human health effects.

For cancer effects, the toxicity values are expressed as cancer slope factors in units of per milligrams of COPC per kilogram per day or as inhalation unit risk factors in units of per micrograms of COPC per cubic meter. For non-cancer effects, the toxicity values are expressed as reference dose in units of mg/kg-day and reference concentrations in units of milligrams per cubic meter. The entire toxicological database is used to guide the derivation of these toxicity values. These data may include epidemiological studies, long-term animal bioassays, short-term tests, and evaluations of molecular structure.

The toxicity values applied in the HHRA can be found in the RAGS Part D tables in Appendix B.

7.1.4. Risk Characterization

EPA has set a target risk range of 10^{-4} to 10^{-6} for a lifetime excess carcinogenic risk. An excess lifetime cancer risk means the acceptable risk to an individual of developing cancer from exposure over a lifetime of carcinogens at a site is between 10,000 to 1 (10^{-4}) and 1,000,000 to 1 (10^{-6}). For non-carcinogenic contaminants, EPA sets a target Hazard Index (HI) of no greater than 1. The hazard quotient (HQ) measures the risk posed by each exposure pathway (i.e., inhalation, ingestion, and dermal contact) for a single non-carcinogenic contaminant at a site, while the HI is the sum of all of the HQ values for the respective receptor (e.g., child or adult resident).

- Potential future exposure by child resident to COPCs in surface soil (0.0 – 0.5 feet) (ingestion and dermal contact):
    - Non-carcinogenic HI of 2.

- Potential future exposure by resident to COPCs in total soil (0.0 – 8.8 feet) (ingestion, dermal contact, and inhalation):
    - Carcinogenic risk of 2×10^{-4}.

The COPCs identified in the HHRA for the SEC property include PCBs, dioxin, benzo(a)pyrene, arsenic, chromium, and cobalt. As part of the focused feasibility study for the SEC property a background analysis determined that arsenic, chromium, and cobalt in total soils were attributable to background conditions and not a release at the Site. Benzo(a)pyrene and dioxins were identified as COPCs in the HHRA, but their contributions to the cumulative risk were minimal and addressing the cancer risk presented by PCBs in soil at the SEC property is expected to reduce the overall risks at the Site to acceptable levels. Thus, PCBs are the only COPCs from the HHRA that are considered COCs and need to be addressed by a response action. COCs with performance standards for the soil at the SEC property are presented in Table 2.

A summary of the carcinogenic and non-carcinogenic risks are presented in the RAGS Part D tables in Appendix B.

7.2 Ecological Risk Assessment

An ecological risk assessment is currently in-progress for the entire Shaffer Equipment/Arbuckle Creek Area Superfund Site as part of Remedial Investigation activities. Ecological risks will be addressed in a future feasibility study and considered in a future cleanup plan.

7.3 Basis for Remedial Action

In summary, the HHRA for the SEC property demonstrated that Site conditions pose unacceptable potential risks to human health and that remedial actions are necessary to reduce the risks to below EPA's acceptable levels. Therefore, EPA has determined that response actions are necessary to protect public health or welfare or the environment from actual or threatened releases of hazardous substances into the environment. In addition, EPA and WVDEP remain concerned about the location of the SEC property in a Zone A Flood Hazard Area and the likelihood of potential releases of PCBs to downstream wetlands and residential properties during future flood events.

8.0 Remedial Action Objectives

To protect human health and the environment from potential future risk, the Remedial Action Objectives (RAOs) for the SEC property are as follows:

1. Prevent migration of contaminants from soil source materials to groundwater and surface water/sediments within Arbuckle Creek and downstream wetlands.

2. Prevent direct exposure (inhalation, dermal contact, or ingestion) to soil exceeding EPA's cleanup level.

The Selected Remedy in this ROD will reduce the potential for future excess carcinogenic risk from exposure to contaminated soil at the SEC property to within EPA's acceptable risk range of 10^{-4} to 10^{-6} and reduce excess non-carcinogenic risk to a HI of less than or equal to 1.

9.0 Description of Alternatives

CERCLA Section 121, 42 U.S.C. § 9621, requires that any remedial action to address contamination at a Superfund site be protective of human health and the environment, cost effective, in compliance with regulatory and statutory provisions that are ARARs (unless waived pursuant to CERCLA Section 121(d)(4)), and compliant with the NCP to the extent practicable. Permanent solutions to contamination, which reduce the volume, toxicity, or mobility of the contaminants, should be developed whenever possible. Emphasis is also placed on treating the wastes at a site whenever possible, and on applying innovative technologies to clean up the contaminant.

The following Remedial Alternatives were evaluated to address the soil at the SEC property:

- Alternative 1: No Action
- Alternative 2: Impervious Cap/Barrier Area Improvements
- Alternative 3: Impervious Cap/Barrier Area Excavation

Alternative 1: No Action

Estimated Capital Costs: $0
Estimated Annual O&M Cost: $0
Estimated Present Worth Cost: $0
Estimated Construction Timeframe: Not applicable

The NCP requires that a "no action" alternative be developed and retained as a baseline scenario to which the other alternatives may be compared. Under this "no action" alternative, EPA assumes that no additional remedial activities will be conducted at the SEC property, providing an environmental baseline against which impacts of the various remedial alternatives can be compared. With this alternative, there would be no change in the concentrations of COCs in the media because no treatment, containment, or removal of source material would occur.

Alternative 2: Impervious Cap/Barrier Area Improvements

Estimated Capital Cost: $2,193,660
Estimated Annual O&M Cost: $192,883
Estimated Present Worth Cost: $4,634,624
Estimated Construction Timeframe: 4 months

This alternative would include making repairs/improvements to the existing impervious cap/barrier and extending the cap to contain total PCB concentrations greater than 1 mg/kg. The existing surface water controls (polyvinyl chloride piping network and drainage ditches) would be thoroughly inspected and repaired as needed. Areas requiring new cap construction (~2 acres) would be addressed in the same manner as the existing cap. An 18-inch compacted low permeability clay layer would be overlaid with 40-mil HDPE liner, followed by 12 inches of clean backfill material and a 6-inch layer of topsoil. Revegetation of any disturbed areas of the cap would be performed. New surface water controls would be installed as needed. Vegetation clearing to construct the new cap area would be needed in select areas.

Any loss of wetlands/floodplain area based on impervious cap/barrier area improvements must be mitigated during implementation of Alternative 2. Impacts to the creek, riparian corridor, and all associated wetlands that may be adversely impacted by the alternative must be considered and controlled/mitigated during remedy and following remedy implementation. There are no onsite wetlands or unique habitats that would be disturbed by implementing Alternative 2. However, upgradient disturbance within the floodplain may have unintended negative impacts on the downstream wetland areas.

The engineered impervious cap/barrier and PCB-remediation waste under it is considered a Toxic Substances Control Act (TSCA) chemical waste landfill. The requirements for a TSCA chemical landfill are summarized in 40 C.F.R. § 761.75 and include landfill design specifications and regulatory approval processes.

To comply with ARARs, and because PCB concentrations in soil under the cap are known to be over 100 mg/kg and located within the 100-year floodplain, additional enhancements to the cap would be required to ensure migration potential is mitigated. There are two reasons for this. First, as currently situated, the principal threat waste does not sit at least 50 feet above the historical high groundwater table as required by 40 C.F.R. § 761.75(b)(3). Second, while there are diversion dikes present, they do not comply with 40 C.F.R. § 761.75(b)(4) because they are not around the entire perimeter of the capped area of the site with a minimum height equal to two feet above the 100-year floodwater elevation. Therefore, the waste could not remain in place without EPA making the determination to waive a TSCA permit approval requirement of 40 C.F.R. § 761.75(b), in accordance with 40 C.F.R. § 761.75(c)(4), based on the conclusion that failure of the landfill to comport with the requirement waived would not lead to an unreasonable risk to human health and the environment.

Due to the risk of flooding within the SEC property, precautions would need to be taken to mitigate the risk that PCB-contaminated soil will be released during excavation activities and potentially transported downstream within the creek and adjacent floodplains.

Because contamination would be left in place at the SEC property above levels posing unacceptable human health exposure risks and to protect the impervious cap/barrier area, institutional controls (ICs) would be required to prohibit disturbance of the impervious cap/barrier area.

To prevent trespassers from damaging the impervious cap/barrier, engineering controls such as a fence with signage would be constructed along the SEC property boundary.

Periodic O&M would be required for the impervious cap/barrier and ICs established for the SEC property into perpetuity (note: 30 years will be used as basis for present worth cost analysis only). O&M activities would consist of inspections performed on an annual basis and following significant storm events that may occur. Repairs would be performed as needed based on inspection results. Long-term monitoring (LTM) would include groundwater sampling using the existing overburden well network and surface water sampling of Arbuckle Creek and associated downstream wetlands. Reviews of ICs would be performed on an annual basis. Annual reporting during LTM activities would be required.

Periodic reviews to determine if the clean-up remains protective at a frequency of no less than every five years (i.e., Five-Year Reviews) would also be required.

Alternative 3: Impervious Cap/Barrier Area Excavation

Estimated Capital Cost: $22,682,328
Estimated Annual O&M Cost: $0
Estimated Present Worth Cost: $22,682,328
Estimated Construction Timeframe: 1 year

This alternative would constitute a complete removal of all PCB-contaminated soil currently contained below the impervious cap/barrier and replacement with clean backfill followed by restoration activities. Additionally, soil with PCBs greater than 1 mg/kg would be excavated outside of the cap within the SEC property. Based on sample results, the depth of excavation outside of the footprint of the impervious cap/barrier would extend to approximately 4 feet below ground surface. Confirmation sampling would be required to verify that remaining PCB concentrations are statistically less than 1 mg/kg. Excavated material would be transported offsite for disposal. This alternative also includes the removal of the sheet pile wall and the foundation of the SEC building. During excavation and material handling activities, both perimeter and onsite air monitoring would be required.

Based on the area of the existing impervious cap/barrier, the areas of elevated PCBs detected around the cap, and the assumed excavation depths, it is estimated that 38,900 tons[1] of contaminated material would require removal. Because of when the releases at the SEC property occurred, the PCB-contaminated material is defined as PCB remediation waste under the TSCA. Based on prior removal actions within the SEC property and known concentrations of PCBs remaining under the impervious cap/barriers, it is assumed that approximately 57% of excavated material would have PCB concentrations greater than 50 mg/kg. The PCB remediation waste with 50 mg/kg and greater would be disposed of in a TSCA approved landfill, TSCA approved incinerator, or a Resource Conservation and Recovery Act (RCRA) Subtitle C landfill permitted

[1] The cap area is estimated to be approximately 1 acre requiring excavation to a depth of 10.5 feet (496,461 cubic feet). The area outside the cap is estimated to be approximately 2 acres requiring excavation to a depth of 4 feet (356,696 cubic feet). Assuming a bulking factor of 20% post-excavation and a density of 76 pounds per cubic foot, a total of approximately 38,900 tons of contaminated soil would require excavation and offsite disposal.

to accept 50 mg/kg and greater PCB waste. The PCB remediation waste with greater than 1 mg/kg but less than 50 mg/kg PCBs would be required, at a minimum, to be disposed of in a RCRA Subtitle D landfill. Treatment of the principal threat waste could potentially be required. Possible treatment would occur at the disposal facility and would be contingent on the results of the waste characterization samples.

Because the depth to groundwater in the overburden is approximately eight feet below ground surface, dewatering would be required during excavation activities. Approximately 55,000 gallons of groundwater is estimated to be collected during excavation dewatering based on the 2019 removal action. Based on recent Remedial Investigation activities and prior removal actions that generated investigation-derived waste within the SEC property, it is anticipated that water generated during excavation would be non-hazardous/non-TSCA waste, which would be transported offsite for disposal. Alternatively, water generated through excavation dewatering could be treated onsite prior to discharge to a local wastewater treatment plant. It is unlikely that water generated could be discharged directly to Arbuckle Creek and be in compliance with the substantive requirements of the Clean Water Act for effluent standards and the prevention of degradation of surface water. Pre-remedial design studies may be necessary to evaluate the viability of onsite treatment and to perform a cost-benefit analysis for onsite treatment versus offsite disposal.

During implementation, short-term groundwater monitoring would be performed to assess the effects of removal of the PCB remediation waste on groundwater quality.

Due to the risk of flooding within the SEC property, precautions would need to be taken to mitigate the risk that PCB-contaminated soil would be released during excavation activities and potentially transported downstream within the creek and adjacent floodplains.

Because the excavated material would be permanently removed from the SEC property, no future remedial actions would be anticipated for this operable unit, nor land use restrictions required if this alternative is selected as the remedy. Thus, no ICs or long-term O&M would be required. Five-Year Reviews would also not be required since no hazardous substances, pollutants, or contaminants would remain.

10.0 Comparative Analysis of Alternatives

The alternatives discussed above were compared to each other against the nine criteria set forth in 40 C.F.R. § 300.430(e)(9)(iii) of the NCP in order to select a remedy for OU-1 of the Site. These nine criteria are categorized according to three groups: threshold criteria; primary balancing criteria; and modifying criteria. These evaluation criteria relate directly to the requirements of Section 121 of CERCLA, 42 U.S.C. § 9621, which determine the overall feasibility and acceptability of the remedy.

Threshold criteria must be satisfied in order for a remedy to be eligible for selection. Primary balancing criteria are used to weigh major trade-offs among remedies. State and community acceptance are modifying criteria formally taken into consideration after public comment is received on the Proposed Plan. A summary of each of the criteria is presented below, followed

by a summary of the relative performance of the alternatives with respect to each of the nine criteria. These summaries provide the basis for determining which alternative provides the "best balance" of trade-offs with respect to the nine criteria.

Evaluation Criteria for Superfund Remedial Alternatives
Threshold criteria: Must be satisfied in order for a remedy to be eligible for selection.
1. Overall Protection of Human Health and the Environment determines whether an alternative eliminates, reduces, or controls threats to public health and the environment through ICs, engineering controls, or treatment.
2. Compliance with ARARs evaluates whether the alternative will meet all applicable or relevant and appropriate requirements of Federal and State environmental statutes, regulations, and other requirements that pertain to the site, and/or justifies a waiver.
Primary balancing criteria: Used to weigh major tradeoff between remedial alternatives.
3. Long-term Effectiveness and Permanence considers the expected residual risk and the ability of an alternative to maintain protection of human health and the environment over time.
4. Reduction of Toxicity, Mobility, or Volume of Contaminants through Treatment evaluates the anticipated performance of an alternative's use of treatment to reduce the harmful effects of principal contaminants, their ability to move in the environment, and the amount of contamination present.
5. Short-term Effectiveness considers the length of time needed to implement an alternative and the risks the alternative poses to workers, residents, and the environment during the construction and implementation period, until the cleanup goals are achieved.
6. Implementability considers the technical and administrative feasibility of implementing an alternative, including the availability of goods and services needed to implement a particular option.
7. Cost includes estimated capital and annual operations and maintenance costs; compared as present worth cost.
Modifying criteria: Considered by EPA after public comment is received on the Proposed Plan.
8. State/ Support Agency Acceptance addresses whether the State concurs or has comments on the preferred alternative, as described in the Proposed Plan.
9. Community Acceptance considers whether the local community agrees with EPA's analysis of the preferred alternative, as described in the Proposed Plan.

10.1 Overall Protection of Human Health and the Environment

A no action alternative (Alternative 1) must be evaluated in accordance with CERCLA and the NCP to serve as a basis for comparison with the other alternatives. Alternative 1 is not protective of human health and the environment because it does not address the unacceptable risk posed by potential future exposures to contaminated soil described above in Section 7. Alternative 1 fails to meet the threshold criterion of protectiveness and will, therefore, not be considered further.

Alternative 2 would be protective of human health by preventing direct exposure (dermal contact, incidental ingestion, and inhalation) with surface and subsurface contaminated soil.

Alternative 3 would be protective of human health by preventing direct exposure (dermal contact, incidental ingestion, and inhalation) through excavation and removal of contaminated soil. In addition, due to the increased risk of flooding events from climate change, the potential for a release of PCB-contaminated soil remains likely over the years. Excavation and offsite disposal of this material permanently eliminates the potential for future releases and therefore provides the most protection to human health and the environment in the long term.

Alternatives 2 and 3 would therefore both protect human health and the environment.

10.2 Compliance with ARARs

Section 121(d) of CERCLA, 42 U.S.C. § 9621(d), and the NCP at 40 C.F.R. § 300.430(f)(1)(ii)(B), require that remedial actions at CERCLA sites at least attain legally applicable or relevant and appropriate Federal and State requirements, standards of control, and other substantive environmental protection requirements, criteria, or limitations promulgated under Federal or State law, which are collectively referred to as "ARARs," unless such ARARs are waived under Section 121(d)(4) of CERCLA, 42 U.S.C. § 9621(d)(4), and the NCP at 40 C.F.R. § 300.430(f)(1)(ii)(C).

Currently, Alternative 2 does not comply with the location-specific ARAR requirements for a chemical waste landfill pursuant to TSCA (40 C.F.R. § 761.75) due to the location within the 100-year floodplain. To comply with this ARAR, it would have to be demonstrated to the satisfaction of the Regional Administrator that, as currently sited, the landfill would not present an unreasonable risk of injury to human health or the environment from PCBs, and the Regional Administrator would have to waive certain TSCA landfill requirements to approve the PCB-contaminated soil covered by the impermeable cap/barrier as a chemical waste landfill. EPA did not propose to waive the TSCA landfill requirements and, so, Alternative 2 would not comply with the location-specific ARAR. Alternative 2 would comply with the chemical-specific ARARs because the PCB-contaminated soil would be contained below the cap with no complete exposure pathways.

Alternative 3 would comply with the ARARs because the PCB-contaminated soil would be disposed of at an offsite TSCA-approved chemical waste landfill.

10.3 Long Term Effectiveness and Permanence

Alternative 2 would be effective for the long term to the extent that the cap is maintained, and Institutional Controls (ICs) are enforced. Although a large flooding event could cause damage to the cap and release PCB-contaminated soil, as long as the cap remains intact, exposure to contaminants will not occur, protecting receptors from potential carcinogenic risks. Contaminated soil would remain onsite but would be controlled and contained.

Alternative 3 would be a completely effective long-term and permanent remedy because source material and any material above performance standards would be excavated and disposed of offsite at an appropriate disposal facility.

Thus, Alternatives 2 and 3 would both provide long-term effectiveness and permanence, but Alternative 3 would be more effective in that the source material would be removed and not at risk of release from a future flooding event.

10.4 Reduction of Toxicity, Mobility, or Volume through Treatment

Alternative 2 would not provide a reduction of toxicity, mobility, or volume through treatment. Alternative 3 would provide a reduction of toxicity, mobility, or volume through treatment if the waste characterization sampling results indicate treatment at the disposal facility is required. However, the source material would be removed and not pose a risk of release from a future flooding event eliminating its mobility.

10.5 Short-term Effectiveness

Both Alternatives 2 and 3 would pose potential short-term risks to the surrounding community which would have to be mitigated to the extent practicable due to increased truck and vehicular traffic during construction activities. The increased vehicular traffic on public roads could be coordinated and scheduled to minimize impacts to the local community. Fugitive dust emissions from construction could be minimized or eliminated by applying proper engineering controls (e.g., dust suppressants, enclosures, etc.) and monitoring. Short-term risks to workers during construction activities from exposure to contaminated soil can be minimized or eliminated via use of proper personal protective equipment and monitoring.

While both Alternatives 2 and 3 would have a short-term risk associated with a potential release caused by flooding during construction, the risk would be higher with Alternative 3 due to the cap being removed to expose PCB-contaminated soil. Both alternatives would require precautions to be taken during construction to lessen the chance of a release due to flooding.

10.6 Implementability

Alternatives 2 and 3 would both require precautions to be taken during construction due to the potential release of PCB-contaminated soil during a flooding event. Access to the SEC property is via a dirt road that is damaged from flooding and would need to be improved to support the construction traffic. Additional road upgrades may be warranted, especially for Alternative 3 which would have increased vehicle traffic to transport the waste material to an offsite disposal facility. Alternative 2 would require the identification and assessment of permanent changes to the floodplain and the potential impacts on the stream, riparian corridor, and all associated wetlands. Alternative 3 would not make any permanent changes to the floodplain if the ground surface elevations were restored to preconstruction levels.

While Alternative 2 may be slightly easier to implement, given the proper precautions, Alternative 3 can be implemented to minimize a release. These precautions include continuous weather monitoring and working during months when flooding is less likely, engineering controls for the excavation area, excavating in small areas at a time, having a mobile laboratory onsite so backfilling can be completed as soon as possible to minimize open excavations, and proper temporary storage of contaminated materials.

10.7 Cost

The costs for Alternatives 2 and 3 are summarized as follows:

	Alternative 2	Alternative 3
Estimated Capital Cost:	$2,193,660	$22,682,328
Estimated Annual O&M Cost:	$192,883	$0
Estimated Present Worth Cost:	$4,634,624	$22,682,328

Present worth cost is the total of an alternative over time in today's dollar value. The 30-year timeframe in the cost estimates is based on EPA guidance. Alternative 2 would require the State of West Virginia to pay for O&M costs past 30 years and those costs are not included in this cost estimate which is just for comparison of the alternatives. Cost estimates are expected to be accurate within a range of +50 to -30 percent. The 30-year present worth estimate was calculated using a 7 percent discount rate. Costs for long-term monitoring and Five-Year Reviews are included in the annual O&M costs above.

10.8 State Acceptance

The WVDEP does not object to EPA's preferred alternative in the March 2023 Proposed Plan for the Shaffer Equipment / Arbuckle Creek Area Superfund Site and will concur if West Virginia can secure their cost share of the remedial action. Signature of the ROD will allow EPA to proceed with the remedial design, but a Superfund State Contract memorializing the State cost sharing will be required prior to the start of the remedial action concurs with the Selected Remedy (Appendix A).

10.9 Community Acceptance

EPA held a 30-day public comment period from March 13, 2023, through April 12, 2023, to accept public comments on the remedial action alternatives presented in the Proposed Plan and on the other documents contained in the Administrative Record File compiled to provide the basis for EPA's Preferred Alternative. On March 21, 2023, EPA held a public meeting to discuss the Proposed Plan and accept comments. A transcript of this meeting is included in the Administrative Record File. EPA's Preferred Alternative was not well received by those in attendance because the majority of the attendees who commented requested permanent relocation or provided comments that were not associated with the Proposed Plan. Permanent relocation was not one of the alternatives considered because this OU addresses the SEC property and does not address residential properties; further, the results of the sampling data from nearby residential properties, gathered in the context of the Remedial Investigation, does not support permanent relocation. Permanent relocation is only considered in cases where contamination poses an immediate threat that cannot be mitigated or remediated, implementation of remedial measures would require the destruction of homes, or the cleanup requires residents to be temporarily relocated for over one year.[2] There were some comments provided to EPA

[2] See "Interim Policy on the Use of Permanent Relocations as Part of Superfund Remedial Actions," OSWER Directive 9355.0-71P, pp. 6-7, June 30, 1999.

during the public comment period in support of EPA's Preferred Alternative for the SEC property. Additional comments and questions that did not pertain to the SEC property were provided by those in attendance at the public meeting. All the substantive comments received including additional comments submitted to EPA during the comment period, along with EPA's responses to those comments, are provided in Section III of this ROD, the Responsiveness Summary.

11.0 Principal Threat Waste

The NCP, 40 C.F.R. § 300.430(a)(1)(iii)(A), establishes an expectation that EPA will use treatment to address the principal threats posed by a Site wherever practicable. The principal threat concept is applied to the characterization of source materials at a Superfund site. A source material is material that includes or contains hazardous substances, pollutants or contaminants that act as a reservoir for migration of contamination, for example, to groundwater. Principal threat wastes are those source materials considered to be highly toxic or highly mobile, which would present a significant risk to human health or the environment should exposure occur.

Based on the 1990 EPA *Guidance on Remedial Actions for Superfund Sites with PCB Contamination*, PCB-contaminated soil is generally considered a principal threat waste at concentrations exceeding 100 mg/kg (residential) or 500 mg/kg (industrial land use). Treatment of principal threat waste to the maximum extent practicable was therefore considered during this remedy selection process. The 100 mg/kg PCB value was used during this remedy selection process due to the close proximity of the residential properties.

During the RI, PCBs have not been encountered in soil at the SEC property at concentrations above 100 mg/kg. However, a review of historical sampling data indicated that concentrations above 100 mg/kg exist under the impervious cap/barrier. Thus, the Selected Remedy will address the principal threat waste that exists under the impervious cap/barrier.

12.0 Selected Remedy

Following review and consideration of the information in the Administrative Record, the requirements of CERCLA and the NCP, and public comments, EPA has selected ***Alternative 3 – Impervious Cap/Barrier Area Excavation*** as the Selected Remedy for the SEC property. The Selected Remedy will address contaminated soil at the SEC property.

12.1 Summary of the Rationale for Selected Remedy

EPA's Selected Remedy meets the threshold criteria for overall protection of human health and the environment and compliance with ARARs. Based on the information currently available, EPA has determined that the Selected Remedy provides the best balance of advantages and disadvantages among the alternatives when evaluating them using the balancing criteria.

In addition, the Selected Remedy will remove a potential source of contamination due to the repeated, and likely future, flooding of Arbuckle Creek, potentially causing releases of soil source material migrating to the downstream wetlands and residential properties.

12.2 Description of the Selected Remedy

Based on the comparison of the nine criteria against the alternatives, EPA's Selected Remedy is ***Alternative 3 – Impervious Cap/Barrier Area Excavation***. EPA has determined that the Selected Remedy will be the most effective alternative in addressing contaminated soil at and in proximity to the SEC property. A conceptual layout of the Selected Remedy is shown on Figure 5.

12.2.1 Remedy Components

The Selected Remedy – Impervious Cap/Barrier Area Excavation – consists of the following components:

1. Removal of the impervious cap/barrier

2. Excavation of all PCB-contaminated soil above performance standards

3. Disposal of excavated PCB-contaminated soil and the impervious cap/barrier at an approved offsite disposal facility

4. Backfill with clean fill, as necessary

12.2.2 Performance Standards

The cleanup level is 1 mg/kg of total PCBs, which is a risk-based cleanup level resulting in a cancer risk of 4.4×10^{-6}, which is within EPA's acceptable risk range of 10^{-4} to 10^{-6}. EPA will remove contaminated material until concentrations of total PCBs from the post-excavation soil samples are under 1 mg/kg. The 95% UCL of all post-excavation soil samples can be used to determine if total PCB concentrations are under 1 mg/kg.

12.2.3 Design Considerations

Due to the potential release of PCB-contaminated soil during a flooding event, the following mitigation strategies will be taken during the excavation work to minimize the risk of a release:

- Prior to work:
    - Evaluate upgradient watershed contributing stormwater runoff to the project area
    - Estimate stormwater flows during various storm events
    - Install perimeter erosion and stormwater controls, including diversion ditches
    - Establish dewatering procedures for encountered groundwater during excavation
- During the work:
    - Continuously monitor weather for potential flash flood events
    - Excavate in small areas at a time
    - Backfill as soon as possible to minimize open excavations
    - Line and cover stockpiles with temporary covers

- Establish a decontamination area to clean trucks and equipment before leaving the project area
- Establish an area of sufficient size and volume to handle encountered groundwater

12.3 Cost Estimate for the Selected Remedy

The estimated present worth cost for the Selected Remedy is $22,682,328. Appendix C includes details of the estimated costs to construct and implement the Selected Remedy. The information in this cost estimate is based upon the best available information regarding the anticipated scope of the Remedial Action.

Changes to the cost estimates may occur during implementation as a result of new information and data collected during the engineering design of the Selected Remedy. Changes to the Selected Remedy may be documented in the form of a memorandum to the Administrative Record File, an ESD, or a ROD Amendment, as appropriate. This cost estimate is an order-of-magnitude engineering cost estimate that is expected to be within +50 to -30 percent of the actual project cost.

12.4 Expected Outcomes of the Selected Remedy

The Selected Remedy presented herein will prevent exposure to contaminated soil and prevent the migration of contaminants from soil to groundwater and surface water/sediments within Arbuckle Creek and downstream wetlands.

13.0 Statutory Determinations

Under Section 121 of CERCLA, 42 U.S.C. § 9621, and 40 C.F.R. § 300.430(f)(5)(ii) of the NCP, EPA must select remedies that are protective of human health and the environment, comply with ARARs, are cost effective, and utilize permanent solutions and alternative treatment technologies or resource recovery to the maximum extent possible. There is also a preference for remedies that use treatment that permanently and significantly reduce the volume, toxicity, or mobility of hazardous wastes as a principal element. The following sections discuss how the Selected Remedy meets these statutory requirements.

13.1 Protection of Human Health and the Environment

Based on the information currently available, EPA has determined that the Selected Remedy for the SEC property is protective of human health and the environment by preventing direct exposure (dermal contact, incidental ingestion, and inhalation) to contaminated soil and permanently eliminating the potential for future releases through excavation and removal of contaminated soil.

13.2 Compliance with Applicable or Relevant and Appropriate Requirements

The NCP, 40 C.F.R. §§ 300.430(f)(5)(ii)(B) and (C), requires that a ROD describe Federal and State ARARs that the remedial action will attain or provide a justification for any waivers. Applicable requirements are those cleanup standards, standards of control, and other substantive requirements, criteria, or limitations promulgated under federal environmental or state environmental of facility siting laws that specifically address a hazardous substance, pollutant, contaminant, remedial action, location, or other circumstance found at a CERCLA site. Relevant and appropriate requirements are those cleanup standards, standards of control, and other substantive requirements, criteria, or limitations promulgated under federal environmental or state environmental or facility siting laws that, while not "applicable" to a hazardous substance, pollutant, contaminant, remedial action, location, or other circumstance at a CERCLA site, address problems or situations sufficiently similar to those encountered at the CERCLA site that their use is well suited to the particular site.

The Selected Remedy will comply with all Federal and State requirements, standards, criteria and limitations that are applicable or relevant and appropriate, as required by Section 121(c) of CERCLA, 42 U.S.C. § 9621(c). The Selected Remedy will also consider other To Be Considered criteria where appropriate. Such requirements, standards, criteria, and limitations are identified in Table 1 of this ROD.

13.3 Cost Effectiveness

Section 300.430(f)(1)(ii)(D) of the NCP, 40 C.F.R. § 300.430(f)(1)(ii)(D), requires EPA to evaluate cost effectiveness by comparing all of the alternatives that meet the threshold criteria against each other for long-term effectiveness and permanence, short-term effectiveness, and reduction of toxicity, mobility or volume through treatment (collectively referred to as "overall effectiveness"). The NCP further states that overall effectiveness is then compared to cost to ensure that the remedy is cost effective and that its costs are proportional to its overall effectiveness.

EPA concludes, following an evaluation of these criteria, that the Selected Remedy is cost effective in providing overall protection in proportion to costs and meets all other requirements of CERCLA. The estimated present worth cost of the Selected Remedy is $22,682,328.

13.4 Utilization of Permanent Solutions to the Maximum Extent Practicable

EPA has determined that the Selected Remedy represents the maximum extent to which permanent solutions and treatment are practicable at the Site. When compared to the other protective alternatives that was evaluated, EPA has determined that the Selected Remedy provides the best balance of trade-offs in terms of the five balancing criteria. The Selected Remedy also has State concurrence and, when compared to the other alternatives, community acceptance.

13.5 Five-Year Review Requirements

A statutory review to ensure that the Selected Remedy is, or will be, protective of human health and the environment pursuant to Section 121(c) of CERCLA, 42 U.S.C. § 9621(c), and 40 C.F.R. § 300.430(f)(4)(ii) of the NCP is not required because the Selected Remedy will not result in hazardous substances remaining onsite above levels that do not allow for unlimited use and unrestricted exposure.

14.0 Documentation of Significant Changes

The Proposed Plan was released for public comment in March 2023. EPA has reviewed all verbal and written comments submitted during the public comment period. EPA has made two significant changes to the remedy, as originally identified in the Proposed Plan.

The first change is describing the extent of where the remedial action will occur. The words "and in proximity to" have been added where appropriate to clarify that the Selected Remedy will address the soil at and in proximity to the former SEC property. This change was made so as to not restrict the remedial action to the lines drawn on a figure, but rather to base it on where the PCB-contamination is located.

The second change is that the estimated costs of the alternatives were revised. The cost estimates were finalized in the January 2023 Focused Feasibility Study and presented in the Proposed Plan. EPA has observed an increase in disposal costs for PCB-contaminated soil that increases the cost of the preferred alternative by close to 50 percent of the cost presented in the Proposed Plan. To provide more accurate costs, all costs for each alternative were reevaluated. These revised costs are presented in the above sections and the revised cost estimates are included as Appendix C.

III. RESPONSIVENESS SUMMARY

SHAFFER EQUIPMENT / ARBUCKLE CREEK AREA SUPERFUND SITE
OPERABLE UNIT 1

MINDEN, FAYETTE COUNTY, WEST VIRGINIA

III. RESPONSIVENESS SUMMARY

Introduction

This Responsiveness Summary summarizes the significant comments and concerns received during the public comment period for the Proposed Plan for the Site and provides EPA's responses to those comments. After reviewing and considering all public comments received during the public comment period, EPA's Selected Remedial Action is ***Alternative 3 – Impervious Cap/Barrier Area Excavation*** for the SEC property.

The Proposed Plan and supporting documents were made available to the public in the Administrative Record File, which was compiled to support selection of this Remedial Action. EPA provided notice to the public that the Administrative Record File could be viewed online at https://semspub.epa.gov/src/collection/03/AR67298, or at the following locations:

Oak Hill Public Library
611 Main Street
Oak Hill, WV 25901
Hours: Call (304) 469-9890

EPA Administrative Records Room
Administrative Records Coordinator
Four Penn Center
1600 John F. Kennedy Boulevard
Philadelphia, PA 19103
Phone: (215) 814-2469
Hours: Monday - Friday 8:30 am to 4:00 pm
By appointment only

The notice of availability of these documents was published in the *Fayette Tribune*, a local newspaper, on March 9, 2023. In addition, EPA sent a fact sheet summarizing EPA's preferred remedial action alternative to residences in Minden in March 2023. For community members that have signed up to receive Site updates via email, EPA sent out a notification of the public comment period from the email address R3_Shaffer@epa.gov.

EPA held a 30-day public comment period from March 13, 2023 to April 12, 2023, to accept public comments on the remedial alternatives presented in the Proposed Plan, as well as other documents contained within the Administrative Record File. On March 21, 2023, EPA held a public meeting at the Minden Community Center / New Beginnings Church in Minden, West Virginia, to inform local officials, interested citizens, and other stakeholders in attendance about EPA's proposed cleanup plan and the Superfund process, to respond to questions, and to receive comments on the Proposed Plan. A transcript of the meeting is included in the Administrative Record File. Responses to significant comments received at the public meeting are included in this Responsiveness Summary.

March 21, 2023 Public Meeting

Numerous comments were made during the public meeting. Several of the comments did not pertain to the specific cleanup alternatives and several comments were repeated. Below is a summary of the comments and responses provided during the public meeting. Repeated comments received during the public meeting are only listed once. Similar questions and comments have been grouped together. For the full question and corresponding answer provided

at the public meeting, please see the transcripts from the public meeting which are included in the Administrative Record File.

Comments related to EPA's Preferred Alternative

Comment 1: Several residents requested permanent residential relocation.

EPA Response: There are no residents living on the SEC property, so permanent relocation cannot be considered for this selected remedy. EPA has sampled residential properties during the remedial investigation and the environmental data do not indicate that relocation is an appropriate response action. Permanent relocation is only considered in cases where contamination poses an immediate threat that cannot be mitigated or remediated, implementation of remedial measures would require the destruction of homes, or the cleanup requires residents to be temporarily relocated for over one year.[3]

Comment 2: When specifically commenting on whether EPA should clean up the Site, several residents agreed with EPA's preferred alternative.

EPA Response: EPA agrees and thanks the residents for these comments.

Comment 3: A few of the participants indicated that any alternative that's not a buyout is unacceptable.

EPA Response: EPA understands the participants' position and thanks them for the comment. Please see the above response to Comment 1 as to why permanent relocation is not considered for this selected remedy.

Comment 4: A resident stated that the area has been cleaned up a number of times, the contamination cannot be removed and asked how deep EPA is proposing to excavate.

EPA Response: EPA has performed four Removal Actions that addressed an immediate threat to human health and the environment. Following the past Removal Actions, concentrations of PCBs are not nearly as high as previously identified. This Remedial Action will address a potential future unacceptable risk. To remove total PCBs to a cleanup standard of 1 mg/kg, the proposed excavation is estimated to go down to approximately 10.5 feet.

Comment 5: A commenter asked, "What makes you think you're going to get rid of it now? What are you going to do, burn it again?"

EPA Response: EPA never burned soil or material at the Site. The PCB-contaminated soil will be excavated and sent to an approved offsite disposal facility. At the disposal facility, the PCB-contaminated soil could potentially be incinerated based on the PCB concentrations in the soil. The approved disposal facility will decide on whether incineration will be used.

[3] See fn. 2, in Section 10.9 for citation to EPA's guidance.

Comment 6: A resident asked how many times EPA will have to come back to clean up contamination caused by the former SEC operations.

EPA Response: EPA has returned several times to clean up the contamination caused by the operations at Shaffer Equipment. The preferred alternative selected in this ROD is a permanent solution for the soil at the SEC property that will not require EPA to return. For the rest of the Site, EPA will complete the remedial investigation, which includes risk assessments that are conducted to determine the need for action and to ensure that any future selected remedy will be protective. Additionally, throughout the Superfund process, EPA may return to any area for additional investigation if EPA believes it is warranted.

Comment 7: A reporter stated that the Community Involvement Plan notes there were two floods recently, one in 2016 and one in 2017. The plan further states PCB contamination in onsite soils washed into nearby Arbuckle Creek, where elevated PCB levels have been found over one mile downstream. The reporter's question was: What confidence level does EPA have that alternative three will eliminate this problem in terms of not only Arbuckle Creek, but also potentially groundwater?

EPA Response: EPA is very confident that the Preferred Alternative will prevent the future spreading of PCB contamination. While EPA can't prevent flooding, one of the remedial action objectives is to prevent migration of contaminants from soil source materials to groundwater and surface water/sediments within Arbuckle Creek and downstream wetlands, which the preferred alternative will achieve.

Comment 8: A reporter asked for clarification on the PCB cleanup standard in the Proposed Plan and if it is the same as in groundwater.

EPA Response: The proposed PCB cleanup standard for soil in the Proposed Plan is 1 mg/kg which is sometimes expressed as parts per million. For groundwater cleanup, the federal drinking water standard for PCBs is 0.5 microgram per liter which is sometimes expressed as parts per billion. Groundwater is being investigated as part of EPA's ongoing remedial investigation for the remainder of the Site. If cleanup of groundwater is necessary, it will be addressed in a future action.

Comment 9: A question was asked about where groundwater flows at the SEC property. A follow up statement was made by a resident that the groundwater then flows into contaminated New River Gorge National Park and Preserve. This resident then followed up with the statement by asking at what levels?

EPA Response: Based on the first two groundwater sampling events, it appears that groundwater in the overburden flows parallel to Arbuckle Creek, which is understandable due to the sheet pile barrier. While there have been concentrations of PCBs in the shallow groundwater that are above federal drinking water standards, the concentrations attenuate as the groundwater flows parallel to Arbuckle Creek. While EPA has not collected porewater samples, EPA has collected surface water samples and these surface water samples do not indicate a release of PCBs into Arbuckle Creek and subsequently New River Gorge National Park and Preserve.

Comment 10: A community member questioned EPA's immediate plans.

EPA Response: EPA responded that it will complete the Record of Decision once the public comment period closes. During the public meeting, EPA estimated that the ROD would be completed by September 2023.

Comment 11: A reporter stated that he believes it has been 21 years since 4,700 tons of soil were removed from the Shaffer site. Please clarify why you're returning now, 21 years later?

EPA Response: EPA previously performed Removal Actions to address an immediate threat to human health and the environment. In May 2019, the Site was added to the NPL so that EPA can take a more long-term look at the Site and address potential future risk. The cleanup EPA is proposing is to address a potential future risk for residents living at or near the SEC property and remove the risk that flooding could move PCB contaminated soil downstream.

Comment 12: A community member asked if the community members can have a say in how the money is spent.

EPA Response: One of the nine criteria set forth in 40 C.F.R. § 300.430(e)(9)(iii) of the NCP in order to select a remedy includes community acceptance for the proposed remedial alternative, and to assess the criterion, EPA receives, considers very carefully, and responds to all comments provided by the community. Public comments can raise important considerations for whether a proposed remedy should be selected, modified, or re-assessed. However, the money that is used for the cleanup cannot be provided to the community for other purposes.

Comment 13: A resident asked for clarification on cleaning up to an acceptable risk?

EPA Response: As explained in Section 7.0, EPA has set a target risk range of 10^{-4} to 10^{-6} for a lifetime excess carcinogenic risk. An excess lifetime cancer risk means the acceptable risk to an individual of developing cancer from exposure over a lifetime of carcinogens at a site is between 10,000 to 1 (10^{-4}) and 1,000,000 to 1 (10^{-6}). For non-carcinogenic contaminants, EPA sets a target HI of no greater than 1. The HQ measures the risk posed by each exposure pathway (i.e., inhalation, ingestion, and dermal contact) for a single non-carcinogenic contaminant at a site, while the HI is the sum of all of the HQ values for the respective receptor (e.g., child or adult resident).

Comment 14: A commenter asked, "It makes it seem like the comments that the community has really doesn't matter. So why do we even make comments? Why do we make comments? Because if that's what you want to do, that's what you're going to do. Because in all reality, you're still not listening or you're listening in your ear, but you're still not listening what the people here want."

EPA Response: EPA listens to and considers all substantive comments received during the public comment period on the alternatives presented in the proposed plan. Changes can occur to

Proposed Plans based on public input, but the changes have to be consistent with CERCLA, the NCP and EPA's regulatory authority.

Comments that are Site-related but not associated with the SEC property

Comment 15: A commenter asked, "I've been asking for about two years now over the pit area. We didn't want so much as you have it on top of sludge, right? In doing that, you guys are basically saying you don't know where the pit is. I got paperwork right here in my hand that states that you knew where it was at all along, you just wasn't wanting to test it. You all couldn't drill through 15 foot of shale rock. You still refuse to test it. We're serious about this. I mean, that's thousands and thousands of gallons."

EPA Response: The suspected pit area mentioned by the commenter is not associated with this OU. The suspected pit is an area of reported dumping of oil during the operation of the SEC. In 1993, a former SEC employee identified an area believed to be the suspected pit area southwest of the former SEC building. EPA has investigated this area as part of the remedial investigation via soil and groundwater sampling. These results have not indicated widespread dumping of PCB oil that would be present if such a pit area were present.

Comment 16: A commenter asked, "Do you know anything about what it was back in the day? Do you know what parts were doing and everything was back then?"

EPA Response: During the meeting, EPA responded that the PCB concentrations were much higher before the prior EPA removal actions were performed. As stated in Section 2.2, PCB concentrations were detected as high as 260,000 mg/kg prior to any of the removal actions. The construction of the cap prevented exposure to the remaining highest concentration observed at approximately 1,200 mg/kg. Current remaining PCB concentrations observed outside the cap are all under 50 mg/kg, with most concentrations in the single digits or less. The past EPA removal actions have removed or capped the highest concentrations.

Comment 17: A commenter asked, "And you know what, I think Bob got cancer, too. Because Bob got up here and burnt all of the material that he could that had even burned. It was flowing all over Minden, all over Oak Hill. That stuff travels for 200-some miles when it's burnt like that, so were you aware of that?"

EPA Response: EPA believes the "Bob" referenced by the commenter was EPA's On-Scene Coordinator (OSC) in the 1980s. The Removal Action in the 1980s did not include any burning. An effort to treat the PCB-contaminated soil via solvent extraction which does not involve burning was attempted but ultimately failed. Following the failure of the treatment, that PCB-contaminated soil was disposed of at an approved offsite facility. EPA is not aware of any other "Bob" to whom the commenter could be referring.

Comment 18: A resident asked for the hazard ranking score (HRS) number that was used to place the Site on the NPL.

EPA Response: The HRS Site score is 50.54 and the HRS documentation record can be found at https://semspub.epa.gov/work/03/2259069.pdf.

Comment 19: A community member asked about how much EPA has spent investigating and cleaning up Minden.

EPA Response: To date, EPA has spent approximately $23,700,000 on the cleanups and investigations associated with contamination caused by the Shaffer Equipment Company.

Comments that are not associated with the Site

Comment 20: A resident asked if EPA knows anything about the Concho Landfill?

EPA Response: The Concho Landfill is not part of the Site. EPA has performed a Removal Site Evaluation of the Concho Landfill which included collecting surface water, sediment, surface soil and subsurface soil samples. Based on the analytical results, EPA determined that no further action was warranted.

Comments that are health related

Comment 21: EPA received several comments and questions regarding what EPA can do for a resident's health problem.

EPA Response: EPA's response authorities are listed under Section 104 of CERCLA, 42 U.S.C. § 9604. EPA does not have the authority to provide health services.

Comment 22: A resident asked if anybody has ever tested the long-term effects of PCBs.

EPA Response: PCBs are considered a probable human carcinogen by EPA. The Agency for Toxic Substances and Disease Registry (ATSDR) fact sheet for PCBs (https://www.atsdr.cdc.gov/toxfaqs/tfacts17.pdf) provides answers to frequently asked health questions about PCBs.

Comment 23: A resident asked if it is still safe to live in Minden.

EPA Response: It is safe to live in Minden. The environmental data collected as part of the remedial investigation do not indicate an immediate threat to human health or the environment. Currently the only unacceptable risk is associated with future hypothetical people living on the SEC property.

Comment 24: A community member asked, "Now, what's been done about that? What's the ATSDR done for me down there? Nothing. Not a thing. Did you ever show up? No. Maybe not you, but nobody from ATSDR showed up. What are you going to do about that, anything?"

EPA Response: ATSDR completed a Public Health Assessment in 1994 and is currently updating the assessment with more recent environmental data collected by EPA as part of its

remedial investigation. ATSDR is a federal public health agency, part of the U.S. Centers for Disease Control and Prevention. ATSDR typically assesses data collected by other agencies and organizations, primarily EPA and state regulatory agencies, such as the WVDEP. To complete a health assessment, ATSDR evaluates environmental exposure pathways and environmental data collected in those pathways to determine whether health effects may occur in the community, including for sensitive subpopulations (e.g., children, individuals with underlying health conditions). ATSDR health assessment documents thoroughly explore site-specific information on environmental exposures and the toxicological literature to determine whether and what health effects may occur in the community. As part of the public health assessment process, ATSDR develops daily exposure doses for infants, children and adults based on the environmental data and standard exposure parameters (e.g., adults typically consume about 2 liters of drinking water per day). These daily exposure doses are then compared to published toxicological studies, including those in ATSDR toxicological profiles. ATSDR health assessments look at estimated maximum and typical exposure doses (i.e., for infants, children, and adults) that are above a health-based screening level (which are more health-protective than an effect level) to determine whether a specific health effect will occur. ATSDR collaborates with local and State health partners to provide health services and support. ATSDR, EPA, and local/State officials are working towards participating in a community health fair in 2024.

Comment 25: A reporter commented that the EPA community involvement plan states residents of Minden have experienced high incidence of cancer and illness. Now, that information comports with what residents have collected in terms of that they report hundreds of deaths that they believe were attributed to cancer or other exotic illnesses. It all comports with the data collected by Dr. Amjad and her father. However, the West Virginia Department of Health and Human Services claims there's no incident of cancer or other illness here. So, on what basis is that statement made?

EPA Response: The statement in the community involvement plan was made based on interviews EPA conducted with the Minden residents and not an official health study. Additionally, the community involvement plan is being revised to clarify that these statements regarding high incidence of cancer and illness were provided from the local residents during interviews with EPA.

Additional Comments

Comment 26: A community member asked, "The question is when are you going to stop telling us you're going to do this, do that and help us when you're not doing nothing to help us?"

EPA Response: In terms of cleaning up the contamination caused by the SEC, EPA is doing what it can within its statutory authority. While EPA cannot provide healthcare services, EPA is trying to coordinate with local and state authorities that may be able to provide support.

Comment 27: A community member asked, "When will somebody stand up that doesn't live in this community, stand up for the people in Minden and do something?"

EPA Response: EPA has and is doing what it can within its authority. EPA removal actions have significantly reduced PCB concentrations on the SEC property and in the community. EPA has repeatedly returned to listen to community concerns and collect samples as requested in locations pointed out by local residents. EPA now proposes to take an action that would permanently remove hazardous substances remaining at OU-1 above levels that do not allow for unlimited use and unrestricted exposure (potential residential use). Additionally, EPA is evaluating other areas of potential concern at the Site and these areas will be discussed in a future final cleanup plan but are not part of this proposed action.

Comments about the remedial design

Comment 28: A resident asked with the close proximity of Arbuckle Creek to that site, what are EPA's intentions or has EPA planned to handle the creek during the excavation work, if there was a flood event during the cleanup?

EPA Response: EPA has started to contemplate a number of design considerations, and they can be found above in Section 12.2.3. This list will be expanded during development of the remedial design and is one of the reasons the design may take longer than initially expected. EPA will design the remedial action to attempt to prevent a release during the cleanup.

Comment 29: A resident asked if there is a chance that EPA can dredge Arbuckle Creek at the same time EPA is removing the cap material in order to help with flooding?

EPA Response: EPA is still looking at Arbuckle Creek as part of the ecological risk assessment and human health risk assessment to determine if a cleanup of Arbuckle Creek is warranted. If EPA determines that the cleanup of Arbuckle Creek is necessary, then EPA would follow the same process that it is using at the SEC property, where EPA provides several alternatives including a preferred alternative for public comment. Hypothetically, if the dredging of Arbuckle Creek were selected as the cleanup method, EPA would not dredge with the express purpose to reduce the risk of flooding, but during the cleanup EPA could look to restore the area in a way that would help mitigate the risk of future flooding.

Comment 30: A resident asked, "When you go start moving everything around and you start knocking everything down, do you not think that the PCB level doesn't subsequently change?"

EPA Response: PCB levels won't change by moving material from one place to another.

<u>Responses to Public Comments Received via Email</u>

Six emails were received by EPA providing comments to EPA during the public comment period. Several similar comments were received in the emails and those comments have been combined.

Comment 1: In five of the emails, the comments requested for EPA to provide financial compensation for permanent relocation.

EPA Response: There are no residents living on the SEC property, so permanent relocation cannot be considered for this selected remedy. EPA has sampled residential properties during the remedial investigation and the environmental data do not indicate that relocation is an appropriate response action. Permanent relocation is only considered in cases where contamination poses an immediate threat that cannot be mitigated or remediated, implementation of remedial measures would require the destruction of homes, or the cleanup requires residents to be temporarily relocated for over one year.[4]

Comment 2: One commenter stated that the Site does need to be cleaned up.

EPA Response: EPA agrees and thanks the resident for this comment.

Comment 3: One commenter asked if the community will be safe during the remedial action due to flood concerns.

EPA Response: EPA has started to contemplate a number of design considerations and they can be found above in Section 12.2.3. This list will be expanded during development of the remedial design and is one of the reasons the design may take longer than expected. EPA will design the remedial action to attempt to prevent a release during the cleanup.

Comment 4: One email contained a comment that Minden residents should be given lifetime healthcare screenings. At least yearly bloodwork, CT, MRI, or PET scans should be available as part of the remedial and site maintenance plans.

EPA Response: EPA does not have the authority to provide healthcare services. EPA's response authorities are listed under Section 104 of CERCLA, 42 U.S.C. § 9604. While EPA can't provide healthcare services, EPA continues to coordinate with local and state representatives that may be able to provide support.

Comment 5: Two emails referenced EPA cleanup numbers versus WVDEP cleanup numbers, and that the EPA should have the same number.

EPA Response: Remedial actions under CERCLA must meet substantive requirements of all applicable or relevant and appropriate requirements (ARARs) and be protective of human health and the environment. The PCB-contaminated soil is classified as PCB remediation waste under the Toxic Substance Control Act (TSCA); therefore TSCA is considered an applicable requirement and EPA must ensure the remedial action complies with TSCA. EPA conducted a Human Health Risk Assessment for the SEC property which demonstrated that Site conditions pose unacceptable risks to human health. EPA has set a target acceptable risk range of 10^{-4} to 10^{-6} (1 in 10 thousand to 1 in a million) for a lifetime excess carcinogenic risk. The proposed cleanup number of 1 mg/kg results in a residential cancer risk of 4.4×10^{-6} (4.4 in 1 million) which is within EPA's acceptable risk range. The WVDEP Voluntary Remediation Program de minimus standard of 0.31 mg/kg results in a residential cancer risk of 1.3×10^{-6} (1.3 in 1 million). In other words, for the 1 mg/kg PCB number for every 1 million people that could be exposed, 4.4 extra cancer cases may occur, while for the exposure to the 0.31 mg/kg PCB

[4] See fn. 2, in Section 10.9 for citation to EPA's guidance.

number, 1.3 extra cancer case may occur for every 1 million people. An extra cancer case means that one more person could get cancer than would normally be expected to from all other causes. Both risks fall within the EPA's acceptable cancer risk range. This proposed cleanup is reducing the potential future cancer risk from 2 x 10^{-4} (2 in 10 thousand, or 200 in 1 million) to 4.4 x 10^{-6} (4.4 in 1 million). In addition, removal of the cap and PCB-contaminated materials above 1 mg/kg will also address the non-cancer hazards associated with other chemicals beneath the cap. Additionally, the WVDEP Voluntary Remediation Program has procedures for using cleanup numbers that could be greater than the de minimus standards.

Comment 6: One of the commenters had several questions regarding health effects of PCBs.

EPA Response: PCBs are considered a probable human carcinogenic by EPA. The PCB ATSDR fact sheet (https://www.atsdr.cdc.gov/toxfaqs/tfacts17.pdf) provides answers to frequently asked health questions about PCBs. However, it is important to note that the complex nature of cancer makes it challenging to establish a connection between cancers or other illnesses and environmental exposures.

Comment 8: A commenter asked, "Agent Orange happens when the oil is burned. What's the damage to people in a 200 mile area?"

EPA Response: EPA disagrees with the statement that Agent Orange forms when PCB oil is burned. Agent Orange is a pesticide mixture that was used during wartime by the military. Samples collected during the remedial investigation have been analyzed for pesticides and the HHRA has concluded that pesticides are not contaminants of concern for the SEC property.

Comment 9: A commenter asked, "Why were we told that you would test wherever we want, but it didn't happen?"

EPA Response: EPA disagrees with this statement. EPA has been responsive to requests to sample based on public input. Several of the areas, such as Rocklick Road, the NR&P Supply House and Berwind Green Hill Mine Dump Area have been investigated in response to input from the community. In fact, community members have pointed to exact locations for samples to be collected and EPA collected samples from those locations.

Comment 13: A commenter asked, "Why are your levels the same as Robert Kern, yet EPA put him in prison?"

EPA Response: Robert Caron was the OSC for the first Removal Action, which removed the highest levels of PCBs at the former SEC property. Due to issues with Mr. Caron's educational background, he was removed from his employment with EPA. EPA is unaware of any penal sentencing for Mr. Caron.

Comment 14: A commenter asked, "Why in the last 17 years was not EPA overseeing what was happening to the people or the site? What about all the cancer then and PCB levels?"

EPA Response: Following the construction of the barrier/impervious cap, an operations and maintenance plan was produced that indicated that the landowner would be responsible for periodic inspections and necessary maintenance while WVDEP would be responsible from a regulatory standpoint. When EPA returned, EPA observed that there was damage to a portion of the cap, but there was no indication that a release had occurred. EPA subsequently performed limited cap repairs and excavated additional soils as part of a removal action.

Comment 15: One of the emailers commented that EPA knows where the "suspected pit" is located.

EPA Response: The suspected pit area is not associated with this OU-1. The suspected pit is an area of reported dumping of oil during the operation of the SEC. In 1993, a former SEC employee identified an area believed to be the suspected pit area southwest of the former SEC building. EPA has investigated this area as part of the remedial investigation via soil and groundwater sampling. These results are not indicative of widespread dumping of PCB oil that would be present if such a put area were present.

Responses to Public Comments Received via Voicemail

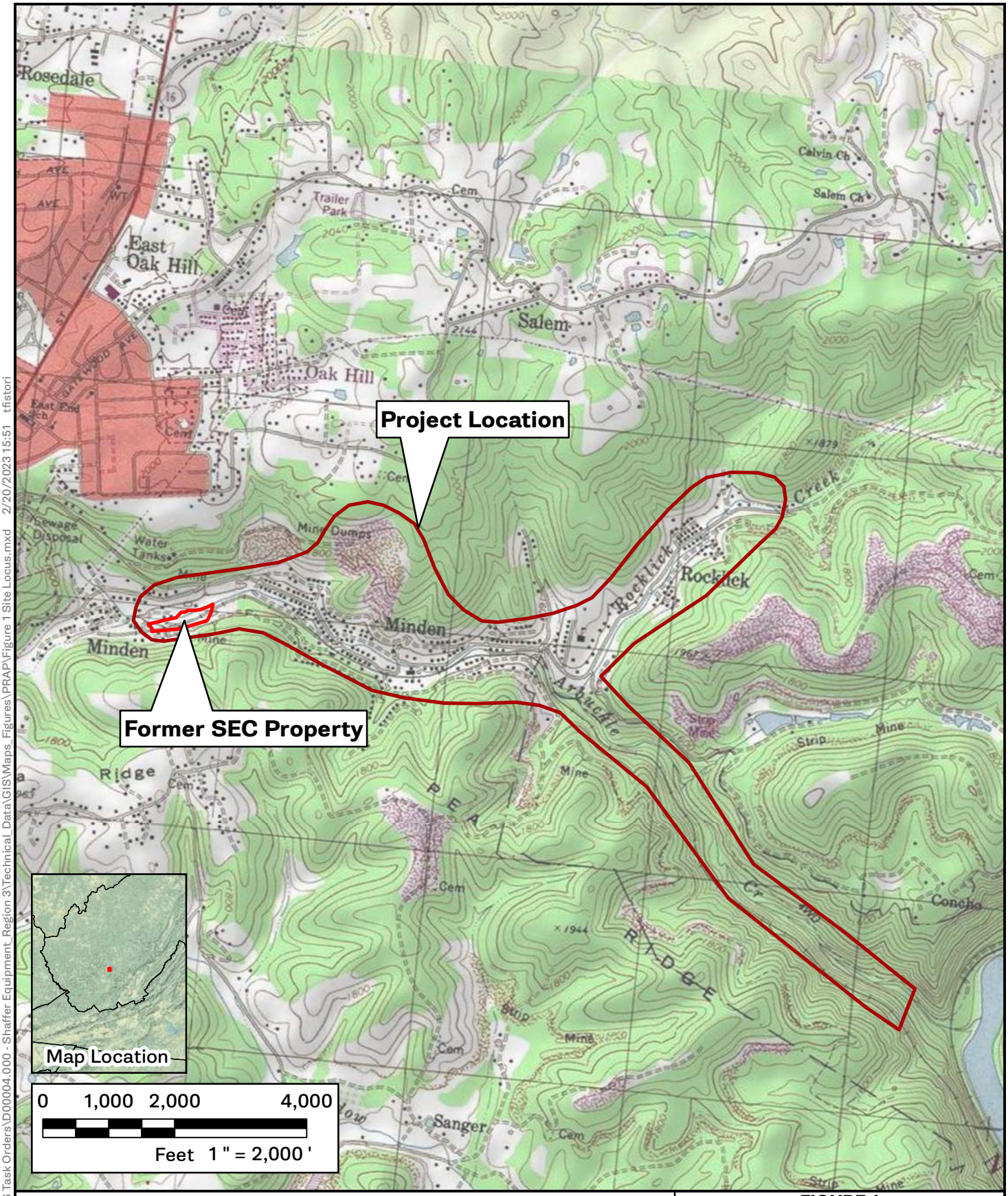
Two local community members provided EPA comments via voicemail during the public comment period. The voicemails were similar and are summarized together along with EPA's response.

Voicemail Comments: Both voicemail commentors stated that residents should be provided financial compensation for permanent relocation.

EPA Response: There are no residents living on the SEC property, so permanent relocation cannot be considered for this selected remedy. EPA has sampled residential properties during the remedial investigation and the environmental data do not indicate that relocation is an appropriate response action. Permanent relocation is only considered in cases where contamination poses an immediate threat that cannot be mitigated or remediated, implementation of remedial measures would require the destruction of homes, or the cleanup requires residents to be temporarily relocated for over one year.[5]

[5] See fn. 2, in Section 10.9 for citation to EPA's guidance.

FIGURES



USGS Topographic Map
Minden, Fayette County, WV
Revised 1984

FIGURE 1

SHAFFER EQUIPMENT/
ARBUCKLE CREEK AREA SUPERFUND SITE
MINDEN, FAYETTE COUNTY, WV

PREPARED BY: TF	CHECKED BY: ANE
PROJECT NO. D00004.004	DATE: FEBRUARY 2023

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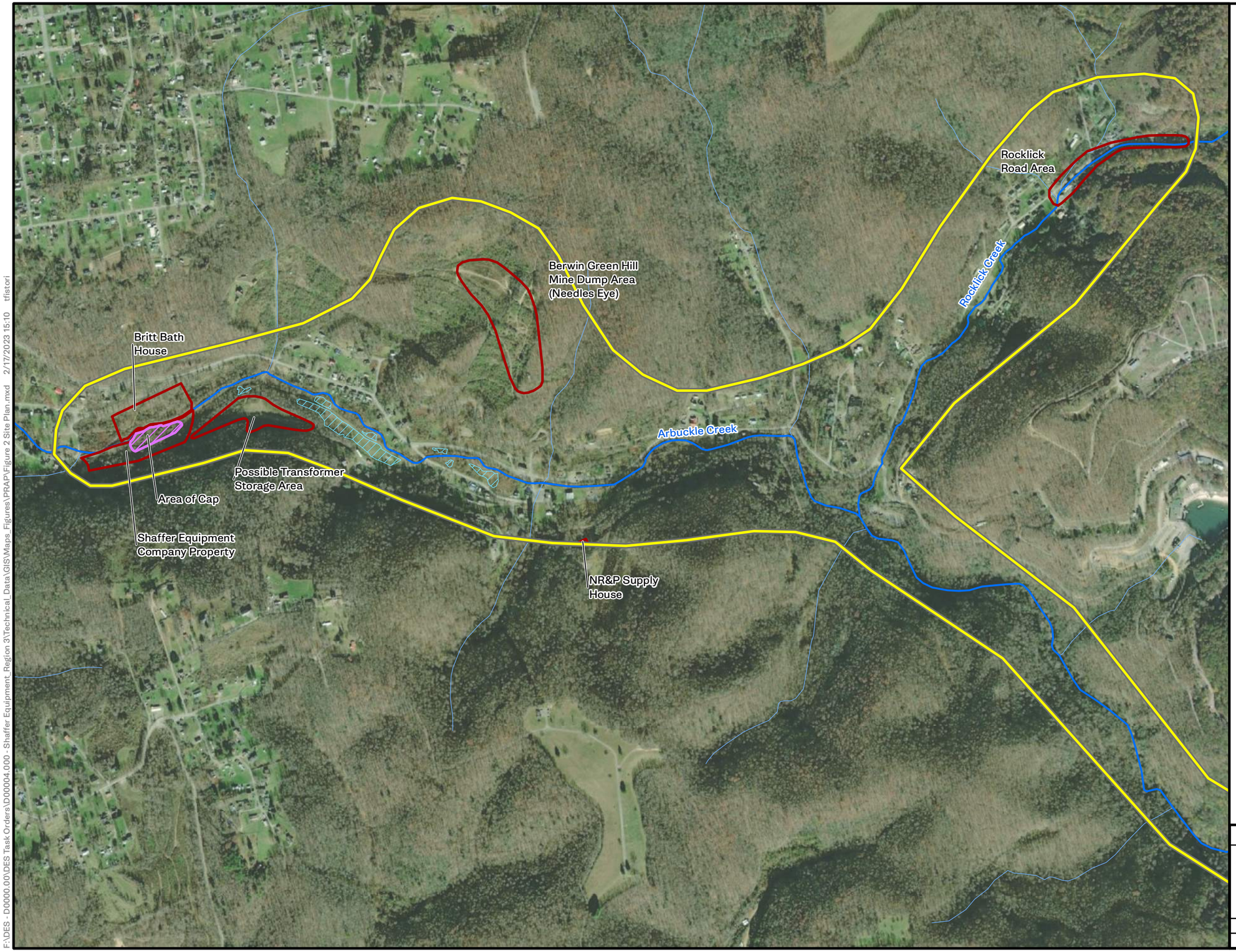

Notes:

1. Locations of site features depicted hereon are approximate and given for illustrative purposes only.

2. Aerial image courtesy of ESRI.

3. Roads courtesy of West Virginia GIS Technical Center.

Legend

- Project Location
- Project Areas
- Area of Cap
- Wetland Boundary
- Arbuckle Creek
- Unnamed Tributary

N

0 500 1,000 2,000 Feet

1 inch = 1,000 feet

FIGURE 2

SHAFFER EQUIPMENT/ARBUCKLE CREEK AREA
SUPERFUND SITE
MINDEN, FAYETTE COUNTY, WV

PREPARED BY: TF	CHECKED BY: ANE
PROJECT NO. D00004.004	DATE: FEBRUARY 2023

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Notes:

1. Locations of site features depicted hereon are approximate and given for illustrative purposes only.

2. Aerial imagery provided by ESRI.

Legend

- Area of Past Soil Removal Action
- Area of 2019 EPA Soil Removal
- Area of Cap
- Former SEC Property
- Arbuckle Creek
- Unnamed Tributary
- Wetland Boundary

0 50 100 200 Feet

1 inch = 100 feet

N

FIGURE 3

SHAFFER EQUIPMENT/ARBUCKLE CREEK
AREA SUPERFUND SITE
MINDEN, FAYETTE COUNTY, WV

PREPARED BY: TF	CHECKED BY: ANE
PROJECT NO. D00004.004	DATE: FEBRUARY 2023

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Notes:

1. Locations of site features depicted hereon are approximate and given for illustrative purposes only.

2. Aerial imagery provided by ESRI.

Legend

- Area of Past Soil Removal Action
- Area of 2019 EPA Soil Removal
- Area of Cap
- Former SEC Property
- FEMA Zone A Flood Hazard
- Arbuckle Creek
- Unnamed Tributary
- Wetland Boundary

0 200 400 800 Feet

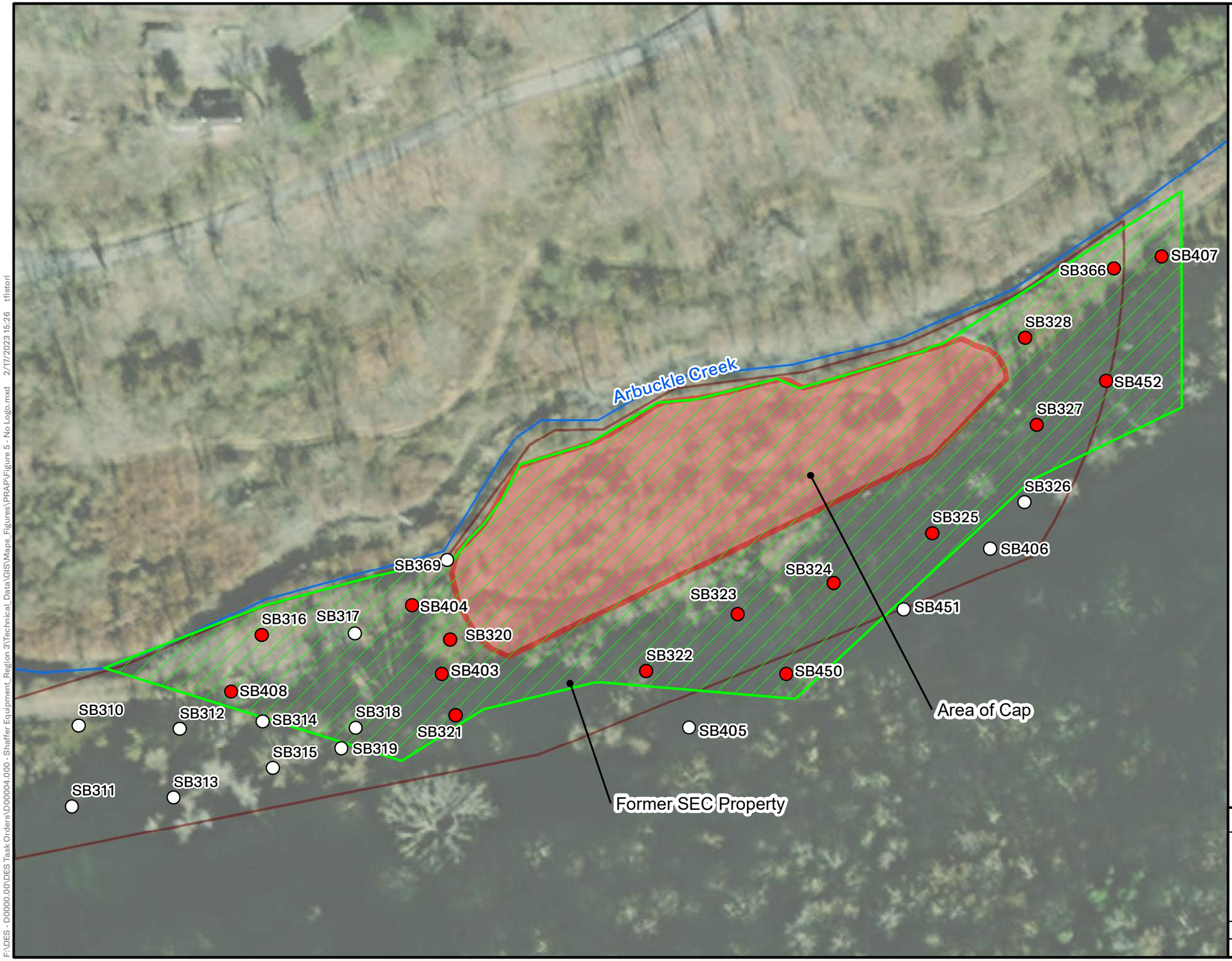
1 inch = 400 feet

N

FIGURE 4

SHAFFER EQUIPMENT/ARBUCKLE CREEK
AREA SUPERFUND SITE
MINDEN, FAYETTE COUNTY, WV

PREPARED BY: TF	CHECKED BY: ANE
PROJECT NO. D00004.004	DATE: FEBRUARY 2023



Notes:

1. Locations of site features depicted hereon are approximate and given for illustrative purposes only.

2. Sample locations are color-coded according to the highest result for each location (depths vary).

3. Aerial imagery provided by ESRI.

Legend

RI Soil Boring Total PCB Concentration (mg/kg)

- < 1
- > 1

Project Areas

- Proposed Excavation Area 136,456 Sq ft
- Area of Cap 47,282 Sq ft
- Former SEC Property
- Arbuckle Creek

N

0 35 70 140 Feet

1 inch = 75 feet

FIGURE 5

SHAFFER EQUIPMENT/ARBUCKLE CREEK AREA
SUPERFUND SITE
MINDEN, FAYETTE COUNTY, WV

PREPARED BY: TF	CHECKED BY: ANE
PROJECT NO. D0004.004	DATE: FEBRUARY 2023

F:\DES - D0000.00\DES Task Orders\D00004.000 - Shaffer Equipment_Region 3\Technical_Data\GIS\Maps_Figures\PRAP\Figure 5 - No Logo.mxd 2/17/2023 15:26 tfistori

TABLES

TABLE 1
APPLICAPLE OR RELEVANT AND APPROPRIATE REQUIREMENTS
SHAFFER EQUIPMENT/ARBUCKLE CREEK AREA SUPERFUND SITE
MINDEN, WEST VIRGINIA

Authority	Requirement	Requirement Synopsis	Status	Consideration
Chemical Specific				
Federal Criteria, Advisories, and Guidance	EPA Guidance of Remedial Actions for Superfund Sites with PCB Contamination, EPA-540-G-90-007 (August 1990)	EPA Guidance for developing risk-based remediation standards for risks posed by PCBs at Superfund Sites.	To Be Considered	This guidance document sets a PRG of 1 mg/kg for PCBs in residential soils and a PRG of 10 mg/kg to 25 mg/kg for PCBs in non-residential soils. The former SEC Property is currently zoned as a Medium Density Residential District and/or a Land Conservation District.
Federal Regulatory Requirement	Toxic Substances Control Act (TSCA) - Sampling PCB Remediation Waste Destined for Off-Site Disposal (40 CFR 761.61(a), (b) and (c))	Guidance describing methods to sample and dispose of PCB remediation waste to analyze the waste to determine PCB concentration or leaching characteristics for storage or disposal.	Applicable	Will be used to evaluate sampling and analysis of PCBs in soil and to determine the PCB concentrations or leaching characteristics for storage or disposal.
Federal Regulations	National Primary Drinking Water Regulations 40 CFR §§ 40 CFR 141.50-.51, and 141.61-.62	Establishes Maximum Contaminant Levels (MCLs) and Maximum Contaminant Level Goals (MCLGs) for public water supplies. The MCLs apply to public drinking water distribution systems. MCLs are enforceable regulations used for drinking water and are also used to assess groundwater quality at contaminated sites. MCLGs are non-enforceable standards set for drinking water and are referenced if no MCL is available for a particular analyte. As health-based goals, MCLGs are set at levels at which no known or anticipated adverse effects on human health will occur, with an adequate margin of safety.	Relevant and Appropriate	To be used during data evaluation when groundwater monitoring is performed.

TABLE 1
APPLICAPLE OR RELEVANT AND APPROPRIATE REQUIREMENTS
SHAFFER EQUIPMENT/ARBUCKLE CREEK AREA SUPERFUND SITE
MINDEN, WEST VIRGINIA

Authority	Requirement	Requirement Synopsis	Status	Consideration
State Regulatory Requirement	WV Requirements Governing (Surface) Water Quality Standards (47 CSR 2-3.2(a)-(f), 3.2(i), and 4-5)	Regulates the discharge of wastes (sewage, industrial, other, etc.) into standing or flowing surface water of the State and establishes water quality criteria.	Relevant and Appropriate	These regulations will be followed during remedial activities to make sure no waste causes distinctly visible solids, tastes or odors that would adversely affect the designated uses of the affected waters, or concentrations which are harmful, hazardous, or toxic to man, animal, and aquatic life. Surface water standards to be used during interim monitoring activities for active remedial alternatives.
State Regulatory Requirement	WV Requirements Governing Groundwater Standards (46 CSR 12, Appendix A)	Establishes the minimum standards of water purity and quality for groundwater located in the State as the Rule for the Groundwater Protection Act.	Applicable	To be used during data evaluation when groundwater monitoring is performed. This is for dioxin because the standard in Appendix A is more stringent than the federal drinking water standard.
Location Specific				
Federal Regulatory Requirement	Clean Water Act, Section 404; Section 404(b)(1) Guidelines for Specification of Disposal Sites for Dredged or Fill Material, 33 U.S.C. § 1344's implementing regulations at 40 C.F.R. Part 230, Subpart B-H	Under this requirement, no activity that adversely affects a wetland shall be permitted if a practicable alternative with lesser effects is available. Sets standards for restoration and mitigation required as a result of unavoidable impacts to aquatic resources. EPA must determine which alternative is the "Least Environmentally Damaging Practicable Alternative" (LEDPA) to protect wetland and aquatic resources. Under Section 10, the obstruction or alteration (including dredging) of any navigable water of the United States is prohibited except as authorized after a finding that the activity in not contrary to the public interest and otherwise complies with applicable federal laws, pursuant to 33 C.F.R. Part 320.	Applicable	Remedial actions required within or along the bank of Arbuckle Creek and all associated wetlands will comply with this requirement. If the selected alternative is the LEDPA, mitigation and restoration measures will be included to restore the disturbed areas damaged by the remedial action.

TABLE 1
APPLICAPLE OR RELEVANT AND APPROPRIATE REQUIREMENTS
SHAFFER EQUIPMENT/ARBUCKLE CREEK AREA SUPERFUND SITE
MINDEN, WEST VIRGINIA

Authority	Requirement	Requirement Synopsis	Status	Consideration
Federal Regulatory Requirement	Endangered Species Act of 1973, 16 USC 1531 et seq.'s implementing regulations at 50 CFR 402	Establishes requirements to protect species threatened by extinction and habitats critical to their survival.	Applicable	Multiple species of clams, plants, and mammals that are listed threatened or endangered species are known to exist in the area. Consultation with other Federal agencies will occur and mitigation measures, as necessary, will be implemented. Should additional endangered species or critical habitats be identified during the remedial design, consultation will occur, and measures will be developed to protect the identified species or habitats critical to their survival, as necessary.
Federal Regulatory Requirement	Migratory Bird Treaty Act, 16 U.SC. § 703	Prohibits the unlawful taking, possession or sale of any migratory bird, including any part, nest, or egg of any such bird, native to the U.S. or its territories.	Applicable	Remediation activities might be performed while migratory birds are present. Appropriate actions will be taken during the remedial action to ensure that no on-Site migratory birds, listed at 50 C.F.R. § 10.13, or their nests are adversely affected.
Federal Regulatory Requirement	Floodplains Management and Protection of Wetlands: FEMA Regulations (44 CFR Part 9, §9.10 and 9.11)	Regulations that set forth the policy, procedure, and responsibilities to implement and enforce Executive Order 11988 (Floodplain Management). Requires the avoidance of impacts associated with the occupancy and modification of federally-designated 100-year and 500-year floodplain.	Applicable	Impacts within the 500-year floodplain will be assessed during the alternative development. Floodplain habitat will be restored/replaced, as required.
Federal Criteria, Advisories, and Guidance	USEPA "Policy on Floodplains and Wetland Assessments for CERCLA Actions" OSWER Dir. 9280.0 (August 6, 1985)	This guidance details situations that require preparation of floodplains or wetlands assessments and the factors that should be considered in preparing an assessment for actions taken under Section 104 or 106 of CERCLA, including avoiding adverse impacts to wetlands and floodplains unless there is no practicable alternative, and the proposed action includes all practicable measures to minimize harm that may result from such actions.	To Be Considered	This guidance will be considered when planning and implementing actions within protected resources.

TABLE 1
APPLICAPLE OR RELEVANT AND APPROPRIATE REQUIREMENTS
SHAFFER EQUIPMENT/ARBUCKLE CREEK AREA SUPERFUND SITE
MINDEN, WEST VIRGINIA

Authority	Requirement	Requirement Synopsis	Status	Consideration
Federal Regulatory Requirement	Toxic Substances Control Act for Chemical Waste Landfills 40 CFR § 761.75(a) through (c)	This section applies to facilities used to dispose of PCBs. A chemical waste landfill used for the disposal of PCBs and PCB Items shall be approved by the Agency Regional Administrator pursuant to paragraph (c) of this section. The landfill shall meet all of the requirements specified in paragraph (b) of this section, unless a waiver from these requirements is obtained pursuant to paragraph (c)(4) of this section. In addition, the landfill shall meet any other requirements that may be prescribed pursuant to paragraph (c)(3) of this section.	Applicable.	These regulations apply to the current conditions at the former SEC Property that leave PCB-contaminated soil capped within the SEC Property because soil is currently capped with concentrations up to 1,200 mg/kg for PCBs. §761.61(a)(4)(i)(B)(3) allows for up to 100 ppm PCBs to be left on-site under a cap. The location of the site with regards to the floodplain is not a limitation until you cap over 100 ppm on-site. However, capping greater than 100 ppm on-site can only be approved under 761.61(c) and requires that EPA make a determination of no unreasonable risk to human health and the environment as well as demonstrating that the on-site capped area meets the technical requirements of 761.75(b) since it would be considered an on-site chemical waste landfill. 761.75(b)(4) states that for sites located below the 100-year floodwater elevation they are required to have diversion dikes around the perimeter of the capped area of the site with a minimum height equal to two feet above the 100-year floodwater elevation. Even if the capped area currently meets the diversion dike requirement, EPA still has to make a no unreasonable risk determination that leaving greater than 100 ppm on-site will not pose an unreasonable risk.
State Criteria, Advisories, and Guidance	2015 West Virginia State Wildlife Action Plan, West Virginia Division of Natural Resources (WVDNR), 9.1.2015	This plan identifies over 600 animal and 400 plants "Species of Greatest Conservation Need" in the state with the goal of halting the decline of at-risk species to avoid listing as threatened or endangered, assisting with the recovery of federally listed species, keeping common species common and conserving the full array of habitat types and biological diversity of the state.	To Be Considered	Consultation with WVDNR will determine if any of the Species of Greatest Conservation Need are identified that may be impacted by site-related activities. If any Species of Greatest Conservation Need are identified the development of protective measures may be needed that meet the goals of the State Wildlife Action Plan.

TABLE 1
APPLICAPLE OR RELEVANT AND APPROPRIATE REQUIREMENTS
SHAFFER EQUIPMENT/ARBUCKLE CREEK AREA SUPERFUND SITE
MINDEN, WEST VIRGINIA

Authority	Requirement	Requirement Synopsis	Status	Consideration
Action Specific				
Federal Regulatory Requirement	Toxic Substances Control Act (TSCA), 15 U.S.C. 2601 *et seq.*'s implementing regulations at PCB Remediation Waste 40 C.F.R. 761.61(b) and (c)	These regulations establish requirements for the management and disposal of PCB remediation waste.	Applicable	The storage and response to PCB remediation waste will be conducted pursuant to TSCA's risk-based approval provisions or in accordance with other provisions of 40 CFR 761.61.
Federal Regulatory Requirement	TSCA - Decontamination Standards and Procedures (40 CFR 761.79)	These regulations establish decontamination standards and procedures for removing PCBs for disposal. Provides numeric standards for allowable PCB concentrations in various building materials and in liquids.	Applicable	Equipment and materials contaminated with PCBs during the remedial action will be decontaminated in accordance with these regulations. Wastes from decontamination will need to be disposed of appropriately.
Federal Regulatory Requirement	Toxic Substances Control Act (TSCA), 40 C.F.R. 761.65(a), 40 C.F.R. 761.65(b), 40 C.F.R. 761.65(c)(6), 40 C.F.R. 761.65(c)(9)	Establishes requirements for temporary storage of PCB remediation waste. Section (a) identifies limitation on the storage of waste, Section (c)(6) identifies the requirements for the storage containers, and Section (c)(9) identifies the requirements for soils stockpiles.	Applicable	Stockpiles and storage containers used to store PCB remediation waste will comply with this regulation. Time frames for storage of PCB remediation waste will be adhered to. This regulation is only applicable to PCB remediation waste concentrations greater than 50 mg/kg total PCBs and is not required for soils with PCB concentrations less than 50 mg/kg.
Federal Regulatory Requirement	40 C.F.R. Noise Abatement Programs Parts 204 and 205 Part B	National Noise Abatement Programs for construction equipment and transportation equipment and the Noise Control Act. Regulates noise pollution with the intent of protecting human health and minimizing annoyance of noise to the general public.	Applicable	Construction and trucking equipment may be utilized for the chosen remedial alternatives for soil thus these regulations would apply. Especially due to close vicinity of residential properties to the former SEC Property.
Federal Regulatory Requirement	Clean Water Act NPDES Regulations (Stormwater Discharges) (40 CFR 122.26(c)(ii)(C))	Discharges of stormwater associated with construction activities are required to implement measures, including best management practices, to control pollutants in stormwater discharges during and after construction activities.	Applicable	Remedial construction will be designed and implemented to comply with the substantive provisions, including use of best management practices and other measures to control pollutants in stormwater discharges.

TABLE 1
APPLICAPLE OR RELEVANT AND APPROPRIATE REQUIREMENTS
SHAFFER EQUIPMENT/ARBUCKLE CREEK AREA SUPERFUND SITE
MINDEN, WEST VIRGINIA

Authority	Requirement	Requirement Synopsis	Status	Consideration
Federal Regulatory Requirement	Clean Water Act, NPDES's implementing regulations at, 40 CFR 122.44-45	These standards govern discharge of water into surface waters.	Applicable	Discharge of water into surface water (from dewatering activities, collection of stormwater, decontamination water) shall meet the substantive standards of this regulations including meeting effluent standards and preventing degradation of surface water.
State Regulatory Requirement	WVDEP Division of Air Quality – Control of Air Pollution from Hazardous Waste TSD Facilities (45 CSR 25-4.3)	These standards state that facilities shall minimize unplanned releases of hazardous constituents into the air.	Relevant and Appropriate	Construction will have control measures implemented to prevent unplanned releases of hazardous constituents into the air.
State Regulatory Requirement	WVDEP Erosion and Sediment Control Best Management Practice Manual (47 CSR 2 Appendix E, Table 1, line 8.53)	The Manual addresses erosion and sediment control for earth disturbing activities by assisting in identifying and implementing the most appropriate best management practices. This eliminates the requirement for in-stream turbidity monitoring as an alternative to 47CSR2-8.33.	Relevant and Appropriate	Earth moving will follow standardized and comprehensive erosion and sediment control management practices to reduce the water quality impacts. The turbidity monitoring requirement does not apply where Best Management Practices in accordance with the State Water Quality Management Plan are being utilized.
State Regulatory Requirement	WVDEP DWWM – Groundwater/UIC Program -Groundwater Protection Regulations (47 CSR 58-7.1)	Certain practices must be followed for the protections of the State's groundwater	Applicable	Site cleanup/construction activities will be conducted in a manner that prevents release of hazardous substances to the groundwater.
State Regulatory Requirement	WVDEP DWWM – Groundwater/UIC Program - Monitoring Well Regulations and Monitoring Well Design Standards (47 CSR 59-4 and 60-5 to 60-21)	Requirements for certification of monitoring well drillers and for the construction/abandonment of monitoring wells.	Relevant and Appropriate	The installation or abandonment of temporary or permanent monitoring wells, recovery wells, piezometers, and boreholes shall be subject to these regulations.

TABLE 2
CONTAMINANTS OF CONCERN AND PERFORMANCE STANDARDS
SHAFFER EQUIPMENT/ARBUCKLE CREEK AREA SUPERFUND SITE
MINDEN, WEST VIRGINIA

Contaminant	Maximum Detected Concentration (mg/kg)	Performance Standard (mg/kg)
PCBs	49.7	1

Notes:

mg/kg – milligrams per kilogram

PCBs – polychlorinated biphenyls

Maximum detected concentration for PCBs is for total PCB congeners detected during the remedial investigation

APPENDICES

APPENDIX A

WEST VIRGINIA DEPARTMENT OF ENVIRONMENTAL PROTECTION CORRESPONDENCE

west virginia department of environmental protection

Division of Land Restoration
601 57th Street, SE
Charleston, WV 25304
Phone: 304-926-0499

Harold D. Ward, Cabinet Secretary
dep.wv.gov

July 1, 2024

Mr. Paul Leonard
US EPA Mid-Atlantic Region
1650 Arch Street
Philadelphia, PA 19103

Dear Mr. Leonard:

WVDEP does not object to EPA's preferred alternative in the March 2023 Proposed Remedial Action Plan for the Shaffer Equipment / Arbuckle Creek Area Superfund Site and will concur if West Virginia can secure their cost share of the remedial action. Signature of the ROD will allow EPA to proceed with the remedial design, but a Superfund State Contract memorializing the State cost sharing will be required prior to the start of the remedial action.

Should you have any questions, I can be contacted by phone at 304-926-0499, ext. 41208 or email at Robert.Rice@wv.gov.

Sincerely,

Robert Rice
Deputy Cabinet Secretary

APPENDIX B

RISK ASSESSMENT CALCULATIONS

Table A-1
Selection of Exposure Pathways
Human Health Risk Assessment
Shaffer Equipment/Arbuckle Creek Area Superfund Site, Minden, West Virginia

Scenario Timeframe	Medium	Exposure Medium	Exposure Point	Receptor Population [2]	Receptor Age	Exposure Route	Type of Analysis	Rationale for Selection or Exclusion of Exposure Pathway
Current/Future	Surface Soil (0 - 0.5 ft bgs)	Surface Soil	Surface Soil	Trespasser	Adolescent (6-16)	Ingestion Dermal Absorption	Quantification	Receptor could ingest/contact surface soil while trespassing on the site.
				Recreator	Child			Receptor could ingest/contact surface soil while recreating at the site.
					Adult			
					Child/Adult			The cancer risk estimates for the adult recreator (20 years) and child recreator (6 years) are added together (26 years) to address lifetime exposure to surface soil. The non-cancer hazard evaluations are treated separately for child and adult recreator.
		Air	Outdoor Ambient Air Above Surface Soil (Vapors and Particulates)	Trespasser	Adolescent (6-16)	Inhalation	Quantification	Receptor could inhale particulates from ambient air above the surface soil.
				Recreator	Child			Receptor could inhale particulates from ambient air above the surface soil.
					Adult			
					Child/Adult			The cancer risk estimates for the adult recreator (20 years) and child recreator (6 years) are added together (26 years) to address lifetime exposure to surface soil. The non-cancer hazard evaluations are treated separately for child and adult recreator.
			Upward Migration of Vapors from Surface Soil (Indoors)	Trespasser	Adolescent (10-16)		None	Receptor is assumed to spend his/her time mostly outdoors. Receptor is not likely to inhale vapors/particulates from indoor air in any significant quantities.
				Recreator	Child			Receptor is assumed to spend most of his/her time outdoors.
					Adult			
					Child/Adult			
Future	Surface Soil (0 - 0.5 ft bgs)	Surface Soil	Surface Soil	Hypothetical Resident	Child	Ingestion Dermal Absorption	Quantification	Receptor could ingest/contact surface soil while living on site.
					Adult			
					Child/Adult			The cancer risk estimates for the adult resident (20 years) and child resident (6 years) are added together (26 years) to address lifetime exposure to surface soil. The non-cancer hazard evaluations are treated separately for child and adult resident.
				Construction Worker	Adult			Receptor could ingest/contact surface soil from the site during construction activities.
				Industrial Worker				Receptor could ingest/contact surface soil from the site while conducting routine maintenance activities (i.e., mowing lawns).
		Air	Outdoor Ambient Air Above Surface Soil (Vapors and Particulates)	Hypothetical Resident	Child	Inhalation	Quantification	Receptor could inhale vapors/particulates from ambient air above the surface soil while living on site.
					Adult			
					Child/Adult			The cancer risk estimates for the adult resident (20 years) and child resident (6 years) are added together (26 years) to address lifetime exposure to surface soil. The non-cancer hazard evaluations are treated separately for child and adult resident.
				Construction Worker	Adult			Receptor could inhale vapors/particulates from ambient air above the surface soil.
				Industrial Worker				Receptor could inhale vapors/particulates from ambient air above the surface soil.
			Upward Migration of Vapors from Soil (Indoors)	Hypothetical Resident	Child		None	Receptor could inhale VOCs from soil via vapor intrusion into residence. USEPA (2015) guidance recommends using groundwater data for evaluating this exposure pathway.
					Adult			
					Child/Adult			The cancer risk estimates for the adult resident (20 years) and child resident (6 years) are added together (26 years) to address lifetime exposure to surface soil. The non-cancer hazard evaluations are treated separately for child and adult resident.
				Construction Worker	Adult			Receptor is assumed to spend most of his/her time outdoors.
				Industrial Worker				Receptor could inhale VOCs from soil via vapor intrusion into building while working indoors. USEPA (2015) guidance recommends using groundwater data for evaluating this exposure pathway.

Table A-1
Selection of Exposure Pathways
Human Health Risk Assessment
Shaffer Equipment/Arbuckle Creek Area Superfund Site, Minden, West Virginia

Scenario Timeframe	Medium	Exposure Medium	Exposure Point	Receptor Population [2]	Receptor Age	Exposure Route	Type of Analysis	Rationale for Selection or Exclusion of Exposure Pathway
Future	Subsurface Soil (0.5 - 2 ft bgs; 0.5 - 8.8 ft bgs)[1]	Subsurface Soil	Subsurface Soil	Hypothetical Resident	Child	Ingestion Dermal Absorption	Quantification	Receptor could ingest/contact subsurface soil when mixed with surface soil from construction of a residence.
					Adult			
					Child/Adult			The cancer risk estimates for the adult resident (20 years) and child resident (6 years) are added together (26 years) to address lifetime exposure to subsurface soil. The non-cancer hazard evaluations are treated separately for child and adult resident.
				Construction Worker	Adult			Receptor could ingest/contact subsurface soil from the site while during construction activities.
				Industrial Worker				Receptor could ingest/contact subsurface soil when mixed with surface soil following land redevelopment activities.
		Air	Outdoor Ambient Air Above Subsurface Soil (Vapors and Particulates)	Hypothetical Resident	Child	Inhalation	Quantification	Receptor could inhale vapors/particulates from ambient air above the subsurface soil when mixed with surface soil from construction of a residence.
					Adult			
					Child/Adult			The cancer risk estimates for the adult resident (20 years) and child resident (6 years) are added together (26 years) to address lifetime exposure to subsurface soil. The non-cancer hazard evaluations are treated separately for child and adult resident.
				Construction Worker	Adult			Receptor could inhale vapors/particulates from ambient air above the subsurface soil during construction activities.
				Industrial Worker				Receptor could inhale vapors/particulates from ambient air above the subsurface when mixed with surface soil following land redevelopment activities.
			Upward Migration of Vapors from Soil (Indoors)	Hypothetical Resident	Adult		None	Receptor could inhale VOCs from soil via vapor intrusion into residence. USEPA (2015) guidance recommends using groundwater data for evaluating this exposure pathway.
					Child			
					Child/Adult			The cancer risk estimates for the adult resident (20 years) and child resident (6 years) are added together (26 years) to address lifetime exposure to subsurface soil. The non-cancer hazard evaluations are treated separately for child and adult resident.
				Construction Worker	Adult			Receptor is assumed to spend most of his/her time outdoors.
				Industrial Worker				Receptor could inhale VOCs from soil via vapor intrusion into building while working indoors. USEPA (2015) guidance recommends using groundwater data for evaluating this exposure pathway.

Notes:
ft bgs = feet below ground surface

(1) Industrial worker exposed to 0.5 - 2 ft bgs only; all other future receptors exposed to full 0.5 - 8.8 ft bgs interval.
USEPA (2015). Technical Guide for Assessing and Mitigating the Vapor Intrusion Pathway from Subsurface Vapor Sources to Indoor Air. OSWER Publication 9200.2-154. June.

Table A-2.1
Occurrence, Distribution, and Selection of Constituents of Interest (Direct Contact – Site-Wide; Surface Soil, 0 – 0.5 feet)
Reasonable Maximum Exposure
Human Health Risk Assessment
Shaffer Equipment/Arbuckle Creek Area Superfund Site, Minden, West Virginia

Scenario Timeframe: Current and Future
Medium: Soil
Exposure Medium: Soil
Exposure Point: Soil (0 – 0.5 feet)

Chemical	CASRN	Minimum Detected Concentration		Maximum Detected Concentration		Units	Location of Maximum	Depth (ft bgs)	Detection Frequency		Range of Reporting Limits	Screening Concentration		Background Value	Screening Level [1, 2]		Source	Potential ARAR [3]	Source	COPC Flag (Yes/No)	Rationale for Selection/Deletion
Volatile Organic Compounds (VOCs)																					
1,1,1-Trichloroethane	71-55-6	N/A		N/A		mg/kg	N/A	N/A	0/21	0%	0.0042 – 0.43	0.43	CRQL	N/A	810		RSL	640	WVDEP	No	100% ND and CRQL ≤ SL
1,1,2,2-Tetrachloroethane	79-34-5	N/A		N/A		mg/kg	N/A	N/A	0/21	0%	0.0042 – 0.43	0.43	CRQL	N/A	0.6		RSL	0.64	WVDEP	No	100% ND and CRQL ≤ SL
1,1,2-Trichloro-1,2,2-trifluoroethane	76-13-1	N/A		N/A		mg/kg	N/A	N/A	0/21	0%	0.0042 – 0.43	0.43	CRQL	N/A	670		RSL	910	WVDEP	No	100% ND and CRQL ≤ SL
1,1,2-Trichloroethane	79-00-5	N/A		N/A		mg/kg	N/A	N/A	0/21	0%	0.0042 – 0.43	0.43	CRQL	N/A	0.15		RSL	1.2	WVDEP	See Uncertainty	100% ND and CRQL > SL
1,1-Dichloroethane	75-34-3	N/A		N/A		mg/kg	N/A	N/A	0/21	0%	0.0042 – 0.43	0.43	CRQL	N/A	3.6		RSL	3.8	WVDEP	No	100% ND and CRQL ≤ SL
1,1-Dichloroethene	75-35-4	N/A		N/A		mg/kg	N/A	N/A	0/21	0%	0.0042 – 0.43	0.43	CRQL	N/A	23		RSL	240	WVDEP	No	100% ND and CRQL ≤ SL
1,2,3-Trichlorobenzene	87-61-6	N/A		N/A		mg/kg	N/A	N/A	0/19	0%	0.0042 – 0.43	0.43	CRQL	N/A	6.3		RSL	N/A	--	No	100% ND and CRQL ≤ SL
1,2,4-Trichlorobenzene	120-82-1	N/A		N/A		mg/kg	N/A	N/A	0/19	0%	0.0042 – 0.43	0.43	CRQL	N/A	5.8		RSL	24	WVDEP	No	100% ND and CRQL ≤ SL
1,2-Dibromo-3-chloropropane	96-12-8	N/A		N/A		mg/kg	N/A	N/A	0/19	0%	0.0042 – 0.43	0.43	CRQL	N/A	0.0053		RSL	0.0057	WVDEP	See Uncertainty	100% ND and CRQL > SL
1,2-Dibromoethane	106-93-4	N/A		N/A		mg/kg	N/A	N/A	0/21	0%	0.0042 – 0.43	0.43	CRQL	N/A	0.036		RSL	0.039	WVDEP	See Uncertainty	100% ND and CRQL > SL
1,2-Dichlorobenzene	95-50-1	N/A		N/A		mg/kg	N/A	N/A	0/19	0%	0.0042 – 0.43	0.43	CRQL	N/A	180		RSL	380	WVDEP	No	100% ND and CRQL ≤ SL
1,2-Dichloroethane	107-06-2	N/A		N/A		mg/kg	N/A	N/A	0/21	0%	0.0042 – 0.43	0.43	CRQL	N/A	0.46		RSL	0.5	WVDEP	No	100% ND and CRQL ≤ SL
1,2-Dichloropropane	78-87-5	N/A		N/A		mg/kg	N/A	N/A	0/21	0%	0.0042 – 0.43	0.43	CRQL	N/A	1.6		RSL	2.7	WVDEP	No	100% ND and CRQL ≤ SL
1,3-Dichlorobenzene	541-73-1	N/A		N/A		mg/kg	N/A	N/A	0/19	0%	0.0042 – 0.43	0.43	CRQL	N/A	180	*	RSL	N/A	--	No	100% ND and CRQL ≤ SL
1,4-Dichlorobenzene	106-46-7	N/A		N/A		mg/kg	N/A	N/A	0/19	0%	0.0042 – 0.43	0.43	CRQL	N/A	2.6		RSL	2.8	WVDEP	No	100% ND and CRQL ≤ SL
2-Butanone	78-93-3	0.018		0.018		mg/kg	SA-SB314 (11/7/2019)	0 - 0.5	1/21	5%	0.0085 – 0.85	0.018	MDC	N/A	2700		RSL	28000	WVDEP	No	CRQL and MDC ≤ SL
2-Hexanone	591-78-6	N/A		N/A		mg/kg	N/A	N/A	0/21	0%	0.0085 – 0.85	0.85	CRQL	N/A	20		RSL	N/A	--	No	100% ND and CRQL ≤ SL
4-Methyl-2-pentanone	108-10-1	N/A		N/A		mg/kg	N/A	N/A	0/21	0%	0.0085 – 0.85	0.85	CRQL	N/A	3300		RSL	3400	WVDEP	No	100% ND and CRQL ≤ SL
Acetone	67-64-1	0.0091	J	0.15		mg/kg	SA-SB314 (11/7/2019)	0 - 0.5	7/21	33%	0.0085 – 0.85	0.15	MDC	N/A	7000		RSL	61000	WVDEP	No	CRQL and MDC ≤ SL
Benzene	71-43-2	N/A		N/A		mg/kg	N/A	N/A	0/21	0%	0.0042 – 0.43	0.43	CRQL	N/A	1.2		RSL	1.2	WVDEP	No	100% ND and CRQL ≤ SL
Bromochloromethane	74-97-5	N/A		N/A		mg/kg	N/A	N/A	0/21	0%	0.0042 – 0.43	0.43	CRQL	N/A	15		RSL	N/A	--	No	100% ND and CRQL ≤ SL
Bromodichloromethane	75-27-4	N/A		N/A		mg/kg	N/A	N/A	0/15	0%	0.0042 – 0.43	0.43	CRQL	N/A	0.29		RSL	0.31	WVDEP	See Uncertainty	100% ND and CRQL > SL
Bromoform	75-25-2	N/A		N/A		mg/kg	N/A	N/A	0/19	0%	0.0042 – 0.43	0.43	CRQL	N/A	19		RSL	20	WVDEP	No	100% ND and CRQL ≤ SL
Bromomethane	74-83-9	N/A		N/A		mg/kg	N/A	N/A	0/21	0%	0.0042 – 0.43	0.43	CRQL	N/A	0.68		RSL	7.3	WVDEP	No	100% ND and CRQL ≤ SL
Carbon disulfide	75-15-0	N/A		N/A		mg/kg	N/A	N/A	0/21	0%	0.0042 – 0.43	0.43	CRQL	N/A	77		RSL	740	WVDEP	No	100% ND and CRQL ≤ SL
Carbon tetrachloride	56-23-5	N/A		N/A		mg/kg	N/A	N/A	0/21	0%	0.0042 – 0.43	0.43	CRQL	N/A	0.65		RSL	0.7	WVDEP	No	100% ND and CRQL ≤ SL
Chlorobenzene	108-90-7	N/A		N/A		mg/kg	N/A	N/A	0/21	0%	0.0042 – 0.43	0.43	CRQL	N/A	28		RSL	290	WVDEP	No	100% ND and CRQL ≤ SL
Chloroethane	75-00-3	N/A		N/A		mg/kg	N/A	N/A	0/21	0%	0.0042 – 0.43	0.43	CRQL	N/A	540		RSL	2100	WVDEP	No	100% ND and CRQL ≤ SL
Chloroform	67-66-3	N/A		N/A		mg/kg	N/A	N/A	0/21	0%	0.0042 – 0.43	0.43	CRQL	N/A	0.32		RSL	0.34	WVDEP	See Uncertainty	100% ND and CRQL > SL
Chloromethane	74-87-3	N/A		N/A		mg/kg	N/A	N/A	0/21	0%	0.0042 – 0.43	0.43	CRQL	N/A	11		RSL	120	WVDEP	No	100% ND and CRQL ≤ SL
cis-1,2-Dichloroethene	156-59-2	N/A		N/A		mg/kg	N/A	N/A	0/21	0%	0.0042 – 0.43	0.43	CRQL	N/A	16		RSL	17	WVDEP	No	100% ND and CRQL ≤ SL
cis-1,3-Dichloropropene	10061-01-5	N/A		N/A		mg/kg	N/A	N/A	0/21	0%	0.0042 – 0.43	0.43	CRQL	N/A	1.8	*	RSL	N/A	--	No	100% ND and CRQL ≤ SL
Cyclohexane	110-82-7	N/A		N/A		mg/kg	N/A	N/A	0/21	0%	0.0042 – 0.43	0.43	CRQL	N/A	650		RSL	120	WVDEP	No	100% ND and CRQL ≤ SL
Dibromochloromethane	124-48-1	N/A		N/A		mg/kg	N/A	N/A	0/21	0%	0.0042 – 0.43	0.43	CRQL	N/A	8.3		RSL	8.3	WVDEP	No	100% ND and CRQL ≤ SL
Dichlorodifluoromethane	75-71-8	N/A		N/A		mg/kg	N/A	N/A	0/21	0%	0.0042 – 0.43	0.43	CRQL	N/A	8.7		RSL	94	WVDEP	No	100% ND and CRQL ≤ SL
Ethylbenzene	100-41-4	0.49		0.49		mg/kg	SA-SB310 (11/7/2019)	0 - 0.5	1/21	5%	0.0042 – 0.0079	0.49	MDC	N/A	5.8		RSL	6.2	WVDEP	No	CRQL and MDC ≤ SL
Isopropylbenzene	98-82-8	N/A		N/A		mg/kg	N/A	N/A	0/21	0%	0.0042 – 0.43	0.43	CRQL	N/A	190		RSL	270	WVDEP	No	100% ND and CRQL ≤ SL
m,p-Xylene	179601-23-1	2.5		2.5		mg/kg	SA-SB310 (11/7/2019)	0 - 0.5	1/21	5%	0.0042 – 0.0079	2.5	MDC	N/A	58	*	RSL	N/A	--	No	CRQL and MDC ≤ SL
Methyl acetate	79-20-9	0.0069	J-	0.56		mg/kg	SA-SB310 (11/7/2019)	0 - 0.5	3/21	14%	0.0042 – 0.0069	0.56	MDC	N/A	7800		RSL	23000	WVDEP	No	CRQL and MDC ≤ SL
Methyl tert-butyl ether	1634-04-4	N/A		N/A		mg/kg	N/A	N/A	0/21	0%	0.0042 – 0.43	0.43	CRQL	N/A	47		RSL	50	WVDEP	No	100% ND and CRQL ≤ SL
Methylcyclohexane	108-87-2	0.00096	J	0.004	J	mg/kg	SA-SB327 (11/15/2019)	0 - 0.5	4/21	19%	0.0042 – 0.43	0.004	MDC	N/A	650	*	RSL	N/A	--	No	CRQL and MDC ≤ SL
Methylene chloride	75-09-2	N/A		N/A		mg/kg	N/A	N/A	0/21	0%	0.0042 – 0.43	0.43	CRQL	N/A	35		RSL	58	WVDEP	No	100% ND and CRQL ≤ SL
o-Xylene	95-47-6	0.83		0.83		mg/kg	SA-SB310 (11/7/2019)	0 - 0.5	1/21	5%	0.0042 – 0.0079	0.83	MDC	N/A	64		RSL	N/A	--	No	CRQL and MDC ≤ SL
Styrene	100-42-5	N/A		N/A		mg/kg	N/A	N/A	0/21	0%	0.0042 – 0.43	0.43	CRQL	N/A	600		RSL	870	WVDEP	No	100% ND and CRQL ≤ SL
Tetrachloroethene	127-18-4	N/A		N/A		mg/kg	N/A	N/A	0/21	0%	0.0042 – 0.43	0.43	CRQL	N/A	8.1		RSL	25	WVDEP	No	100% ND and CRQL ≤ SL
Toluene	108-88-3	N/A		N/A		mg/kg	N/A	N/A	0/21	0%	0.0042 – 0.43	0.43	CRQL	N/A	490		RSL	820	WVDEP	No	100% ND and CRQL ≤ SL
trans-1,2-Dichloroethene	156-60-5	N/A		N/A		mg/kg	N/A	N/A	0/21	0%	0.0042 – 0.43	0.43	CRQL	N/A	7		RSL	75	WVDEP	No	100% ND and CRQL ≤ SL
trans-1,3-Dichloropropene	10061-02-6	N/A		N/A		mg/kg	N/A	N/A	0/21	0%	0.0042 – 0.43	0.43	CRQL	N/A	1.8	*	RSL	N/A	--	No	100% ND and CRQL ≤ SL
Trichloroethene	79-01-6	N/A		N/A		mg/kg	N/A	N/A	0/13	0%	0.0042 – 0.43	0.43	CRQL	N/A	0.41		RSL	1	WVDEP	See Uncertainty	100% ND and CRQL > SL
Trichlorofluoromethane	75-69-4	N/A		N/A		mg/kg	N/A	N/A	0/21	0%	0.0042 – 0.43	0.43	CRQL	N/A	2300		RSL	790	WVDEP	No	100% ND and CRQL ≤ SL
Vinyl chloride	75-01-4	N/A		N/A		mg/kg	N/A	N/A	0/21	0%	0.0042 – 0.43	0.43	CRQL	N/A	0.059		RSL	0.061	WVDEP	See Uncertainty	100% ND and CRQL > SL
Semi-Volatile Organic Compounds (SVOCs)																					
1,1'-Biphenyl	92-52-4	0.024	J	0.024	J	mg/kg	SA-SB327 (11/15/2019)	0 - 0.5	1/30	3%	0.18 – 0.25	0.024	MDC	N/A	4.7		RSL	51	WVDEP	No	CRQL and MDC ≤ SL
1,2,4,5-Tetrachlorobenzene	95-94-3	N/A		N/A		mg/kg	N/A	N/A	0/30	0%	0.18 – 0.25	0.25	CRQL	N/A	0.23		RSL	17	WVDEP	See Uncertainty	100% ND and CRQL > SL

Table A-2.1
Occurrence, Distribution, and Selection of Constituents of Interest (Direct Contact – Site-Wide; Surface Soil, 0 – 0.5 feet)
Reasonable Maximum Exposure
Human Health Risk Assessment
Shaffer Equipment/Arbuckle Creek Area Superfund Site, Minden, West Virginia

Scenario Timeframe: Current and Future
Medium: Soil
Exposure Medium: Soil
Exposure Point: Soil (0 – 0.5 feet)

Chemical	CASRN	Minimum Detected Concentration		Maximum Detected Concentration		Units	Location of Maximum	Depth (ft bgs)	Detection Frequency		Range of Reporting Limits	Screening Concentration		Background Value	Screening Level [1, 2]		Source	Potential ARAR [3]	Source	COPC Flag (Yes/No)	Rationale for Selection/Deletion
1,4-Dioxane	123-91-1	N/A		N/A		mg/kg	N/A	N/A	0/30	0%	0.071 – 0.1	0.1	CRQL	N/A	5.3		RSL	5.4	WVDEP	No	100% ND and CRQL ≤ SL
2,2'-Oxybis(1-chloropropane)	108-60-1	N/A		N/A		mg/kg	N/A	N/A	0/30	0%	0.35 – 0.49	0.49	CRQL	N/A	310		RSL	5.1	WVDEP	No	100% ND and CRQL ≤ SL
2,3,4,6-Tetrachlorophenol	58-90-2	N/A		N/A		mg/kg	N/A	N/A	0/30	0%	0.18 – 0.25	0.25	CRQL	N/A	190		RSL	1900	WVDEP	No	100% ND and CRQL ≤ SL
2,4,5-Trichlorophenol	95-95-4	N/A		N/A		mg/kg	N/A	N/A	0/30	0%	0.18 – 0.25	0.25	CRQL	N/A	630		RSL	6300	WVDEP	No	100% ND and CRQL ≤ SL
2,4,6-Trichlorophenol	88-06-2	N/A		N/A		mg/kg	N/A	N/A	0/30	0%	0.18 – 0.25	0.25	CRQL	N/A	6.3		RSL	49	WVDEP	No	100% ND and CRQL ≤ SL
2,4-Dichlorophenol	120-83-2	N/A		N/A		mg/kg	N/A	N/A	0/30	0%	0.18 – 0.25	0.25	CRQL	N/A	19		RSL	190	WVDEP	No	100% ND and CRQL ≤ SL
2,4-Dimethylphenol	105-67-9	N/A		N/A		mg/kg	N/A	N/A	0/30	0%	0.18 – 0.25	0.25	CRQL	N/A	130		RSL	1300	WVDEP	No	100% ND and CRQL ≤ SL
2,4-Dinitrophenol	51-28-5	N/A		N/A		mg/kg	N/A	N/A	0/30	0%	0.35 – 0.49	0.49	CRQL	N/A	13		RSL	130	WVDEP	No	100% ND and CRQL ≤ SL
2,4-Dinitrotoluene	121-14-2	N/A		N/A		mg/kg	N/A	N/A	0/30	0%	0.18 – 0.25	0.25	CRQL	N/A	1.7		RSL	1.7	WVDEP	No	100% ND and CRQL ≤ SL
2,6-Dinitrotoluene	606-20-2	N/A		N/A		mg/kg	N/A	N/A	0/30	0%	0.18 – 0.25	0.25	CRQL	N/A	0.36		RSL	0.36	WVDEP	No	100% ND and CRQL ≤ SL
2-Chloronaphthalene	91-58-7	N/A		N/A		mg/kg	N/A	N/A	0/30	0%	0.18 – 0.25	0.25	CRQL	N/A	480		RSL	5000	WVDEP	No	100% ND and CRQL ≤ SL
2-Chlorophenol	95-57-8	N/A		N/A		mg/kg	N/A	N/A	0/30	0%	0.18 – 0.25	0.25	CRQL	N/A	39		RSL	340	WVDEP	No	100% ND and CRQL ≤ SL
2-Methylnaphthalene	91-57-6	0.0011	J	0.098		mg/kg	SA-SB327 (11/15/2019)	0 - 0.5	29/30	97%	0.0039 – 0.0039	0.098	MDC	N/A	24		RSL	310	WVDEP	No	CRQL and MDC ≤ SL
2-Methylphenol	95-48-7	N/A		N/A		mg/kg	N/A	N/A	0/30	0%	0.35 – 0.49	0.49	CRQL	N/A	320		RSL	3200	WVDEP	No	100% ND and CRQL ≤ SL
2-Nitroaniline	88-74-4	N/A		N/A		mg/kg	N/A	N/A	0/30	0%	0.18 – 0.25	0.25	CRQL	N/A	63		RSL	630	WVDEP	No	100% ND and CRQL ≤ SL
2-Nitrophenol	88-75-5	N/A		N/A		mg/kg	N/A	N/A	0/30	0%	0.18 – 0.25	0.25	CRQL	N/A	1900	*	RSL	N/A	--	No	100% ND and CRQL ≤ SL
3 & 4 Methylphenol	15831-10-4	0.035	J	0.068	J	mg/kg	Multiple Locations	N/A	3/21	14%	0.38 – 0.45	0.068	MDC	N/A	630	*	RSL	3200	WVDEP	No	CRQL and MDC ≤ SL
3,3'-Dichlorobenzidine	91-94-1	N/A		N/A		mg/kg	N/A	N/A	0/30	0%	0.35 – 0.49	0.49	CRQL	N/A	1.2		RSL	1.2	WVDEP	No	100% ND and CRQL ≤ SL
3-Nitroaniline	99-09-2	N/A		N/A		mg/kg	N/A	N/A	0/30	0%	0.35 – 0.49	0.49	CRQL	N/A	63	*	RSL	N/A	--	No	100% ND and CRQL ≤ SL
4,6-Dinitro-2-methylphenol	534-52-1	N/A		N/A		mg/kg	N/A	N/A	0/30	0%	0.35 – 0.49	0.49	CRQL	N/A	0.51		RSL	N/A	--	No	100% ND and CRQL ≤ SL
4-Bromophenyl-phenylether	101-55-3	N/A		N/A		mg/kg	N/A	N/A	0/30	0%	0.18 – 0.25	0.25	CRQL	N/A	See Rationale		N/A	N/A	--	See Uncertainty	No SL or surrogate toxicity available
4-Chloro-3-methylphenol	59-50-7	N/A		N/A		mg/kg	N/A	N/A	0/30	0%	0.18 – 0.25	0.25	CRQL	N/A	630		RSL	N/A	--	No	100% ND and CRQL ≤ SL
4-Chloroaniline	106-47-8	N/A		N/A		mg/kg	N/A	N/A	0/30	0%	0.35 – 0.49	0.49	CRQL	N/A	2.7		RSL	2.7	WVDEP	No	100% ND and CRQL ≤ SL
4-Chlorophenyl-phenylether	7005-72-3	N/A		N/A		mg/kg	N/A	N/A	0/30	0%	0.18 – 0.25	0.25	CRQL	N/A	See Rationale		N/A	N/A	--	See Uncertainty	No SL or surrogate toxicity available
4-Methylphenol	106-44-5	N/A		N/A		mg/kg	N/A	N/A	0/9	0%	0.35 – 0.49	0.49	CRQL	N/A	130		RSL	6300	WVDEP	No	100% ND and CRQL ≤ SL
4-Nitroaniline	100-01-6	N/A		N/A		mg/kg	N/A	N/A	0/30	0%	0.35 – 0.49	0.49	CRQL	N/A	25		RSL	N/A	--	No	100% ND and CRQL ≤ SL
4-Nitrophenol	100-02-7	N/A		N/A		mg/kg	N/A	N/A	0/30	0%	0.35 – 0.49	0.49	CRQL	N/A	1900	*	RSL	N/A	--	No	100% ND and CRQL ≤ SL
Acenaphthene	83-32-9	0.0011	J	0.029	J	mg/kg	SA-SB326 (11/15/2019)	0 - 0.5	22/30	73%	0.0039 – 0.23	0.029	MDC	N/A	360		RSL	4100	WVDEP	No	CRQL and MDC ≤ SL
Acenaphthylene	208-96-8	0.001	J	0.1		mg/kg	SA-SB327 (11/15/2019)	0 - 0.5	26/30	87%	0.0039 – 0.2	0.1	MDC	N/A	See Rationale		N/A	4200	WVDEP	See Uncertainty	No SL or surrogate toxicity available
Acetophenone	98-86-2	N/A		N/A		mg/kg	N/A	N/A	0/30	0%	0.35 – 0.49	0.49	CRQL	N/A	780		RSL	2500	WVDEP	No	100% ND and CRQL ≤ SL
Anthracene	120-12-7	0.0011	J	0.079		mg/kg	Multiple Locations	N/A	28/30	93%	0.004 – 0.2	0.079	MDC	N/A	1800		RSL	23000	WVDEP	No	CRQL and MDC ≤ SL
Atrazine	1912-24-9	N/A		N/A		mg/kg	N/A	N/A	0/30	0%	0.35 – 0.49	0.49	CRQL	N/A	2.4		RSL	2.4	WVDEP	No	100% ND and CRQL ≤ SL
Benzaldehyde	100-52-7	0.16	J	0.16	J	mg/kg	SA-SB319 (11/7/2019)	0 - 0.5	1/30	3%	0.35 – 0.49	0.16	MDC	N/A	170		RSL	170	WVDEP	No	CRQL and MDC ≤ SL
Benzo(a)anthracene	56-55-3	0.0018	J	0.31		mg/kg	SA-SB327 (11/15/2019)	0 - 0.5	30/30	100%	N/A	0.31	MDC	N/A	1.1		RSL	1.5	WVDEP	No	MDC ≤ SL (CRQL N/A)
Benzo(a)pyrene	50-32-8	0.0014	J	0.29		mg/kg	SA-SB310 (11/7/2019)	0 - 0.5	30/30	100%	N/A	0.29	MDC	N/A	0.11		RSL	0.11	WVDEP	Yes	MDC > SL (CRQL N/A)
Benzo(b)fluoranthene	205-99-2	0.0019	J	0.48		mg/kg	SA-SB310 (11/7/2019)	0 - 0.5	30/30	100%	N/A	0.48	MDC	N/A	1.1		RSL	1.1	WVDEP	No	MDC ≤ SL (CRQL N/A)
Benzo(g,h,i)perylene	191-24-2	0.001	J	0.17	J	mg/kg	Multiple Locations	N/A	30/30	100%	N/A	0.17	MDC	N/A	See Rationale		N/A	1800	WVDEP	See Uncertainty	No SL or surrogate toxicity available
Benzo(k)fluoranthene	207-08-9	0.001	J	0.19	J	mg/kg	SA-SB310 (11/7/2019)	0 - 0.5	30/30	100%	N/A	0.19	MDC	N/A	11		RSL	11	WVDEP	No	MDC ≤ SL (CRQL N/A)
Bis(2-chloroethoxy)methane	111-91-1	N/A		N/A		mg/kg	N/A	N/A	0/30	0%	0.18 – 0.25	0.25	CRQL	N/A	19		RSL	N/A	--	No	100% ND and CRQL ≤ SL
Bis(2-chloroethyl)ether	111-44-4	0.03	J	0.03	J	mg/kg	SA-SB319 (11/7/2019)	0 - 0.5	1/30	3%	0.35 – 0.49	0.03	MDC	N/A	0.23		RSL	0.24	WVDEP	No	MDC ≤ SL < CRQL
Bis(2-ethylhexyl)phthalate	117-81-7	0.022	J	0.1	J	mg/kg	SA-SB312 (11/7/2019)	0 - 0.5	11/30	37%	0.18 – 0.25	0.1	MDC	N/A	39		RSL	39	WVDEP	No	CRQL and MDC ≤ SL
Butylbenzylphthalate	85-68-7	N/A		N/A		mg/kg	N/A	N/A	0/30	0%	0.18 – 0.25	0.25	CRQL	N/A	290		RSL	290	WVDEP	No	100% ND and CRQL ≤ SL
Caprolactam	105-60-2	N/A		N/A		mg/kg	N/A	N/A	0/30	0%	0.35 – 0.49	0.49	CRQL	N/A	3100		RSL	31000	WVDEP	No	100% ND and CRQL ≤ SL
Carbazole	86-74-8	0.047	J	0.047	J	mg/kg	SA-SB326 (11/15/2019)	0 - 0.5	1/30	3%	0.35 – 0.49	0.047	MDC	N/A	See Rationale		N/A	N/A	--	See Uncertainty	No SL or surrogate toxicity available
Chrysene	218-01-9	0.0027	J	0.35		mg/kg	SA-SB327 (11/15/2019)	0 - 0.5	30/30	100%	N/A	0.35	MDC	N/A	110		RSL	110	WVDEP	No	MDC ≤ SL (CRQL N/A)
Dibenz(a,h)anthracene	53-70-3	0.001	J	0.031		mg/kg	SA-SB369 (11/21/2019)	0 - 0.5	15/30	50%	0.2 – 0.23	0.031	MDC	N/A	0.11		RSL	0.11	WVDEP	No	MDC ≤ SL < CRQL
Dibenzofuran	132-64-9	0.018	J	0.039	J	mg/kg	SA-SB327 (11/15/2019)	0 - 0.5	5/30	17%	0.18 – 0.25	0.039	MDC	N/A	7.8		RSL	78	WVDEP	No	CRQL and MDC ≤ SL
Diethylphthalate	84-66-2	N/A		N/A		mg/kg	N/A	N/A	0/30	0%	0.18 – 0.25	0.25	CRQL	N/A	5100		RSL	51000	WVDEP	No	100% ND and CRQL ≤ SL
Dimethylphthalate	131-11-3	0.15	J	0.28		mg/kg	SA-SB321 (11/25/2019)	0 - 0.5	7/30	23%	0.18 – 0.25	0.28	MDC	N/A	See Rationale		N/A	N/A	--	See Uncertainty	No SL or surrogate toxicity available
Di-N-Butylphthalate	84-74-2	N/A		N/A		mg/kg	N/A	N/A	0/30	0%	0.18 – 0.25	0.25	CRQL	N/A	630		RSL	6300	WVDEP	No	100% ND and CRQL ≤ SL
Di-N-Octyl Phthalate	117-84-0	N/A		N/A		mg/kg	N/A	N/A	0/30	0%	0.35 – 0.49	0.49	CRQL	N/A	63		RSL	N/A	--	No	100% ND and CRQL ≤ SL
Fluoranthene	206-44-0	0.0027	J	0.58		mg/kg	SA-SB366 (11/15/2019)	0 - 0.5	29/30	97%	0.0039 – 0.0039	0.58	MDC	N/A	240		RSL	2400	WVDEP	No	CRQL and MDC ≤ SL
Fluorene	86-73-7	0.001	J	0.036		mg/kg	Multiple Locations	N/A	20/30	67%	0.0039 – 0.23	0.036	MDC	N/A	240		RSL	2900	WVDEP	No	CRQL and MDC ≤ SL
Hexachlorobenzene	118-74-1	N/A		N/A		mg/kg	N/A	N/A	0/30	0%	0.18 – 0.25	0.25	CRQL	N/A	0.078		RSL	0.22	WVDEP	See Uncertainty	100% ND and CRQL > SL
Hexachlorobutadiene	87-68-3	N/A		N/A		mg/kg	N/A	N/A	0/30	0%	0.18 – 0.25	0.25	CRQL	N/A	1.2		RSL	1.3	WVDEP	No	100% ND and CRQL ≤ SL

Table A-2.1
Occurrence, Distribution, and Selection of Constituents of Interest (Direct Contact – Site-Wide; Surface Soil, 0 – 0.5 feet)
Reasonable Maximum Exposure
Human Health Risk Assessment
Shaffer Equipment/Arbuckle Creek Area Superfund Site, Minden, West Virginia

Scenario Timeframe: Current and Future
Medium: Soil
Exposure Medium: Soil
Exposure Point: Soil (0 – 0.5 feet)

Chemical	CASRN	Minimum Detected Concentration		Maximum Detected Concentration		Units	Location of Maximum	Depth (ft bgs)	Detection Frequency		Range of Reporting Limits	Screening Concentration		Background Value	Screening Level [1, 2]		Source	Potential ARAR [3]	Source	COPC Flag (Yes/No)	Rationale for Selection/Deletion
Hexachlorocyclopentadiene	77-47-4	N/A		N/A		mg/kg	N/A	N/A	0/30	0%	0.35 – 0.49	0.49	CRQL	N/A	0.18		RSL	1.9	WVDEP	See Uncertainty	100% ND and CRQL > SL
Hexachloroethane	67-72-1	N/A		N/A		mg/kg	N/A	N/A	0/30	0%	0.18 – 0.25	0.25	CRQL	N/A	1.8		RSL	2	WVDEP	No	100% ND and CRQL ≤ SL
Indeno(1,2,3-cd)pyrene	193-39-5	0.00084	J	0.19	J	mg/kg	SA-SB310 (11/7/2019)	0 - 0.5	30/30	100%	N/A	0.19	MDC	N/A	1.1		RSL	1.1	WVDEP	No	MDC ≤ SL (CRQL N/A)
Isophorone	78-59-1	N/A		N/A		mg/kg	N/A	N/A	0/30	0%	0.18 – 0.25	0.25	CRQL	N/A	570		RSL	570	WVDEP	No	100% ND and CRQL ≤ SL
Naphthalene	91-20-3	0.0013	J	0.13		mg/kg	SA-SB328 (11/15/2019)	0 - 0.5	28/30	93%	0.0039 – 0.004	0.13	MDC	N/A	2		RSL	2.4	WVDEP	No	CRQL and MDC ≤ SL
Naphthalene, 1-methyl-	90-12-0	0.0032	J	0.041	J	mg/kg	SB408 (7/16/2021)	0 - 0.5	7/9	78%	0.0039 – 0.004	0.041	MDC	N/A	18		RSL	24	WVDEP	No	CRQL and MDC ≤ SL
Nitrobenzene	98-95-3	N/A		N/A		mg/kg	N/A	N/A	0/30	0%	0.18 – 0.25	0.25	CRQL	N/A	5.1		RSL	5.5	WVDEP	No	100% ND and CRQL ≤ SL
N-Nitroso-di-n-propylamine (NDPA)	621-64-7	N/A		N/A		mg/kg	N/A	N/A	0/30	0%	0.18 – 0.25	0.25	CRQL	N/A	0.078		RSL	0.078	WVDEP	See Uncertainty	100% ND and CRQL > SL
N-Nitrosodiphenylamine	86-30-6	N/A		N/A		mg/kg	N/A	N/A	0/30	0%	0.18 – 0.25	0.25	CRQL	N/A	110		RSL	110	WVDEP	No	100% ND and CRQL ≤ SL
Pentachlorophenol	87-86-5	0.001	J	0.012		mg/kg	SA-SB327 (11/15/2019)	0 - 0.5	2/30	7%	0.0071 – 0.45	0.012	MDC	N/A	1		RSL	1	WVDEP	No	CRQL and MDC ≤ SL
Phenanthrene	85-01-8	0.0011	J	0.45	J	mg/kg	SA-SB326 (11/15/2019)	0 - 0.5	30/30	100%	N/A	0.45	MDC	N/A	See Rationale		N/A	23000	WVDEP	See Uncertainty	No SL or surrogate toxicity available
Phenol	108-95-2	0.045	J	0.073	J	mg/kg	SA-SB321 (11/25/2019)	0 - 0.5	5/30	17%	0.35 – 0.49	0.073	MDC	N/A	1900		RSL	19000	WVDEP	No	CRQL and MDC ≤ SL
Pyrene	129-00-0	0.0016	J	0.47	J	mg/kg	SA-SB366 (11/15/2019)	0 - 0.5	30/30	100%	N/A	0.47	MDC	N/A	180		RSL	2300	WVDEP	No	MDC ≤ SL (CRQL N/A)
Pesticides																					
4,4'-DDD	72-54-8	0.00045	J	0.0029	J	mg/kg	SA-SB326 (11/15/2019)	0 - 0.5	9/28	32%	0.0035 – 0.0049	0.0029	MDC	N/A	0.19		RSL	1.9	WVDEP	No	CRQL and MDC ≤ SL
4,4'-DDE	72-55-9	0.00028	J	0.0065	J	mg/kg	SA-SB366 (11/15/2019)	0 - 0.5	8/30	27%	0.0035 – 0.0049	0.0065	MDC	N/A	2		RSL	2	WVDEP	No	CRQL and MDC ≤ SL
4,4'-DDT	50-29-3	0.0009	J	0.52		mg/kg	SA-SB366 (11/15/2019)	0 - 0.5	7/30	23%	0.0035 – 0.0046	0.52	MDC	N/A	1.9		RSL	1.9	WVDEP	No	CRQL and MDC ≤ SL
Aldrin	309-00-2	0.00024	J	0.00069	J	mg/kg	SA-SB327 (11/15/2019)	0 - 0.5	2/29	7%	0.0018 – 0.0025	0.00069	MDC	N/A	0.039		RSL	0.039	WVDEP	No	CRQL and MDC ≤ SL
alpha-BHC	319-84-6	N/A		N/A		mg/kg	N/A	N/A	0/30	0%	0.0018 – 0.0025	0.0025	CRQL	N/A	0.086		RSL	0.086	WVDEP	No	100% ND and CRQL ≤ SL
beta-BHC	319-85-7	N/A		N/A		mg/kg	N/A	N/A	0/30	0%	0.0018 – 0.0025	0.0025	CRQL	N/A	0.3		RSL	0.3	WVDEP	No	100% ND and CRQL ≤ SL
cis-Chlordane	5103-71-9	0.00038	J	0.0011	J	mg/kg	SA-SB326 (11/15/2019)	0 - 0.5	5/30	17%	0.0018 – 0.0025	0.0011	MDC	N/A	3.6		RSL	N/A	--	No	CRQL and MDC ≤ SL
delta-BHC	319-86-8	0.0041	J	0.0041	J	mg/kg	SB407 (7/15/2021)	0 - 0.5	1/30	3%	0.0018 – 0.0024	0.0041	MDC	N/A	0.086	*	RSL	N/A	--	No	CRQL and MDC ≤ SL
Dieldrin	60-57-1	0.0012	J	0.0083	J	mg/kg	SB408 (7/16/2021)	0 - 0.5	6/27	22%	0.0038 – 0.0046	0.0083	MDC	N/A	0.034		RSL	0.042	WVDEP	No	CRQL and MDC ≤ SL
Endosulfan I	959-98-8	0.00054	J	0.0011	J	mg/kg	SA-SB366 (11/15/2019)	0 - 0.5	3/30	10%	0.0018 – 0.0025	0.0011	MDC	N/A	47	*	RSL	N/A	--	No	CRQL and MDC ≤ SL
Endosulfan II	33213-65-9	0.00044	J	0.0059	J	mg/kg	SB408 (7/16/2021)	0 - 0.5	7/30	23%	0.0037 – 0.0046	0.0059	MDC	N/A	47	*	RSL	N/A	--	No	CRQL and MDC ≤ SL
Endosulfan Sulfate	1031-07-8	0.00061	J	0.11	J	mg/kg	SA-SB366 (11/15/2019)	0 - 0.5	3/30	10%	0.0035 – 0.0049	0.11	MDC	N/A	38		RSL	N/A	--	No	CRQL and MDC ≤ SL
Endrin	72-20-8	0.00022	J	0.0074	J	mg/kg	SB408 (7/16/2021)	0 - 0.5	9/30	30%	0.0038 – 0.0049	0.0074	MDC	N/A	1.9		RSL	19	WVDEP	No	CRQL and MDC ≤ SL
Endrin Aldehyde	7421-93-4	0.00049	J	0.0011	J	mg/kg	SA-SB326 (11/15/2019)	0 - 0.5	2/28	7%	0.0035 – 0.0049	0.0011	MDC	N/A	1.9	*	RSL	N/A	--	No	CRQL and MDC ≤ SL
Endrin Ketone	53494-70-5	N/A		N/A		mg/kg	N/A	N/A	0/27	0%	0.0035 – 0.0049	0.0049	CRQL	N/A	1.9	*	RSL	N/A	--	No	100% ND and CRQL ≤ SL
gamma-BHC (Lindane)	58-89-9	0.0002	J	0.0024	J	mg/kg	SA-SB326 (11/15/2019)	0 - 0.5	14/30	47%	0.0019 – 0.0024	0.0024	MDC	N/A	0.071		RSL	0.57	WVDEP	No	CRQL and MDC ≤ SL
Heptachlor	76-44-8	0.00033	J	0.00045	J	mg/kg	SA-SB326 (11/15/2019)	0 - 0.5	2/30	7%	0.0018 – 0.0025	0.00045	MDC	N/A	0.13		RSL	0.14	WVDEP	No	CRQL and MDC ≤ SL
Heptachlor Epoxide	1024-57-3	0.00038	J	0.00077	J	mg/kg	SA-SB327 (11/15/2019)	0 - 0.5	4/30	13%	0.0018 – 0.0025	0.00077	MDC	N/A	0.07		RSL	0.071	WVDEP	No	CRQL and MDC ≤ SL
Methoxychlor	72-43-5	0.003	J	0.014	J	mg/kg	SA-SB327 (11/15/2019)	0 - 0.5	4/30	13%	0.018 – 0.025	0.014	MDC	N/A	32		RSL	320	WVDEP	No	CRQL and MDC ≤ SL
Toxaphene	8001-35-2	N/A		N/A		mg/kg	N/A	N/A	0/30	0%	0.18 – 0.25	0.25	CRQL	N/A	0.49		RSL	0.49	WVDEP	No	100% ND and CRQL ≤ SL
trans-Chlordane	5103-74-2	0.00083	J	0.013		mg/kg	SB408 (7/16/2021)	0 - 0.5	3/27	11%	0.0019 – 0.0025	0.013	MDC	N/A	3.6		RSL	N/A	--	No	CRQL and MDC ≤ SL
Polychlorinated Biphenyls (PCBs)																					
Aroclor 1016	12674-11-2	N/A		N/A		mg/kg	N/A	N/A	0/10	0%	0.038 – 0.045	0.045	CRQL	N/A	0.41		RSL	5.5	WVDEP	No	100% ND and CRQL ≤ SL
Aroclor 1221	11104-28-2	N/A		N/A		mg/kg	N/A	N/A	0/10	0%	0.038 – 0.045	0.045	CRQL	N/A	0.2		RSL	0.26	WVDEP	No	100% ND and CRQL ≤ SL
Aroclor 1232	11141-16-5	N/A		N/A		mg/kg	N/A	N/A	0/10	0%	0.038 – 0.045	0.045	CRQL	N/A	0.17		RSL	0.22	WVDEP	No	100% ND and CRQL ≤ SL
Aroclor 1242	53469-21-9	N/A		N/A		mg/kg	N/A	N/A	0/10	0%	0.038 – 0.045	0.045	CRQL	N/A	0.23		RSL	0.31	WVDEP	No	100% ND and CRQL ≤ SL
Aroclor 1248	12672-29-6	N/A		N/A		mg/kg	N/A	N/A	0/10	0%	0.038 – 0.045	0.045	CRQL	N/A	0.23		RSL	0.31	WVDEP	No	100% ND and CRQL ≤ SL
Aroclor 1254	11097-69-1	N/A		N/A		mg/kg	N/A	N/A	0/10	0%	0.038 – 0.045	0.045	CRQL	N/A	0.12		RSL	0.32	WVDEP	No	100% ND and CRQL ≤ SL
Aroclor 1260	11096-82-5	0.028	J	1.6		mg/kg	SA-SB328 (11/15/2019)	0 - 0.5	9/10	90%	0.039 – 0.039	1.6	MDC	N/A	0.24		RSL	0.33	WVDEP	Yes	MDC > SL
Aroclor 1262	37324-23-5	N/A		N/A		mg/kg	N/A	N/A	0/10	0%	0.038 – 0.045	0.045	CRQL	N/A	0.23	*	RSL	N/A	--	No	100% ND and CRQL ≤ SL
Aroclor 1268	11100-14-4	N/A		N/A		mg/kg	N/A	N/A	0/10	0%	0.038 – 0.045	0.045	CRQL	N/A	0.23	*	RSL	N/A	--	No	100% ND and CRQL ≤ SL
TOTAL AROCLOR HALFND	CALC021	0.1755		1.78		mg/kg	SA-SB328 (11/15/2019)	0 - 0.5	10/10	100%	N/A	1.78	MDC	N/A	N/A		N/A	N/A	--	No	Qualitative Evaluation
PCBs - Congeners																					
PCB-1	2051-60-7	0.000004		0.00099		mg/kg	SB407 (7/15/2021)	0 - 0.5	24/30	80%	0.000002 – 0.0013	0.00099	MDC	N/A	See Aroclors		N/A	N/A	--	No	Aroclor data used to evaluate chemical
PCB-10	33146-45-1	0.0000012	J	0.00054		mg/kg	SB407 (7/15/2021)	0 - 0.5	18/30	60%	0.0000019 – 0.0013	0.00054	MDC	N/A	See Aroclors		N/A	N/A	--	No	Aroclor data used to evaluate chemical
PCB-100	39485-83-1	0.0000019	J	0.00027		mg/kg	SA-SB327 (11/15/2019)	0 - 0.5	9/14	64%	0.000002 – 0.000002	0.00027	MDC	N/A	See Aroclors		N/A	N/A	--	No	Aroclor data used to evaluate chemical
PCB-101/90	PCB101/90	0.000075		0.39		mg/kg	SA-SB366 (11/15/2019)	0 - 0.5	14/14	100%	N/A	0.39	MDC	N/A	See Aroclors		N/A	N/A	--	No	Aroclor data used to evaluate chemical
PCB-103	60145-21-3	0.00000058	J	0.00063		mg/kg	SB408 (7/16/2021)	0 - 0.5	27/30	90%	0.000002 – 0.0013	0.00063	MDC	N/A	See Aroclors		N/A	N/A	--	No	Aroclor data used to evaluate chemical
PCB-104	56558-16-8	0.0000012	J	0.0000076	J	mg/kg	SB403 (7/16/2021)	0 - 0.5	4/30	13%	0.0000019 – 0.0013	0.0000076	MDC	N/A	See Aroclors		N/A	N/A	--	No	Aroclor data used to evaluate chemical
PCB-105	32598-14-4	0.000014		0.021		mg/kg	SA-SB366 (11/15/2019)	0 - 0.5	30/30	100%	N/A	0.021	MDC	N/A	See TEQ		N/A	N/A	--	No	TEQ used to evaluate chemical
PCB-106	70424-69-0	N/A		N/A		mg/kg	N/A	N/A	0/16	0%	0.0000019 – 0.0013	0.0013	CRQL	N/A	See Aroclors		N/A	N/A	--	No	Aroclor data used to evaluate chemical

Table A-2.1
Occurrence, Distribution, and Selection of Constituents of Interest (Direct Contact – Site-Wide; Surface Soil, 0 – 0.5 feet)
Reasonable Maximum Exposure
Human Health Risk Assessment
Shaffer Equipment/Arbuckle Creek Area Superfund Site, Minden, West Virginia

Scenario Timeframe: Current and Future
Medium: Soil
Exposure Medium: Soil
Exposure Point: Soil (0 – 0.5 feet)

Chemical	CASRN	Minimum Detected Concentration		Maximum Detected Concentration		Units	Location of Maximum	Depth (ft bgs)	Detection Frequency		Range of Reporting Limits	Screening Concentration		Background Value	Screening Level [1, 2]		Source	Potential ARAR [3]	Source	COPC Flag (Yes/No)	Rationale for Selection/Deletion
PCB-107	70424-68-9	0.000072	J	0.002		mg/kg	SA-SB322 (11/22/2019)	0 - 0.5	7/7	100%	N/A	0.002	MDC	N/A	See Aroclors		N/A	N/A	--	No	Aroclor data used to evaluate chemical
PCB-107/108	70424-68-9/703~	0.0000038	J	0.0025		mg/kg	SA-SB366 (11/15/2019)	0 - 0.5	14/14	100%	N/A	0.0025	MDC	N/A	See Aroclors		N/A	N/A	--	No	Aroclor data used to evaluate chemical
PCB-107/124	70424-68-9/704~	0.0000028	J	0.0013		mg/kg	SB407 (7/15/2021)	0 - 0.5	9/9	100%	N/A	0.0013	MDC	N/A	See Aroclors		N/A	N/A	--	No	Aroclor data used to evaluate chemical
PCB-108/124	70362-41-3/704~	0.000044	J	0.0014		mg/kg	SA-SB322 (11/22/2019)	0 - 0.5	7/7	100%	N/A	0.0014	MDC	N/A	See Aroclors		N/A	N/A	--	No	Aroclor data used to evaluate chemical
PCB-109	74472-35-8	0.0000027	J	0.0016		mg/kg	SB407 (7/15/2021)	0 - 0.5	9/23	39%	0.000002 – 0.000002	0.0016	MDC	N/A	See Aroclors		N/A	N/A	--	No	Aroclor data used to evaluate chemical
PCB-11	2050-67-1	0.000014		0.00035		mg/kg	SB403 (7/16/2021)	0 - 0.5	20/30	67%	0.000009 – 0.0013	0.00035	MDC	N/A	See Aroclors		N/A	N/A	--	No	Aroclor data used to evaluate chemical
PCB-110	38380-03-9	0.000059		0.15		mg/kg	SA-SB366 (11/15/2019)	0 - 0.5	14/14	100%	N/A	0.15	MDC	N/A	See Aroclors		N/A	N/A	--	No	Aroclor data used to evaluate chemical
PCB-110/115	38380-03-9/744~	0.000037		0.092		mg/kg	SA-SB325 (11/22/2019)	0 - 0.5	16/16	100%	N/A	0.092	MDC	N/A	See Aroclors		N/A	N/A	--	No	Aroclor data used to evaluate chemical
PCB-111	39635-32-0	0.000012		0.000012		mg/kg	SB408 (7/16/2021)	0 - 0.5	1/16	6%	0.0000019 – 0.0013	0.000012	MDC	N/A	See Aroclors		N/A	N/A	--	No	Aroclor data used to evaluate chemical
PCB-111/115	39635-32-0/744~	0.0000053		0.00019		mg/kg	SA-SB328 (11/15/2019)	0 - 0.5	12/14	86%	0.000004 – 0.000004	0.00019	MDC	N/A	See Aroclors		N/A	N/A	--	No	Aroclor data used to evaluate chemical
PCB-112	74472-36-9	N/A		N/A		mg/kg	N/A	N/A	0/16	0%	0.0000019 – 0.0013	0.0013	CRQL	N/A	See Aroclors		N/A	N/A	--	No	Aroclor data used to evaluate chemical
PCB-113	68194-10-5	N/A		N/A		mg/kg	N/A	N/A	0/14	0%	0.000002 – 0.000002	0.000002	CRQL	N/A	See Aroclors		N/A	N/A	--	No	Aroclor data used to evaluate chemical
PCB-114	74472-37-0	0.000003	J	0.0017		mg/kg	SA-SB366 (11/15/2019)	0 - 0.5	27/30	90%	0.0000012 – 0.00034	0.0017	MDC	N/A	See TEQ		N/A	N/A	--	No	TEQ used to evaluate chemical
PCB-118	31508-00-6	0.000029		0.05		mg/kg	SB407 (7/15/2021)	0 - 0.5	16/16	100%	N/A	0.05	MDC	N/A	See TEQ		N/A	N/A	--	No	TEQ used to evaluate chemical
PCB-118/106	31508-00-6/704~	0.000043		0.11		mg/kg	SA-SB366 (11/15/2019)	0 - 0.5	14/14	100%	N/A	0.11	MDC	N/A	See Aroclors		N/A	N/A	--	No	Aroclor data used to evaluate chemical
PCB-119	56558-17-9	0.0000032		0.00073		mg/kg	SA-SB366 (11/15/2019)	0 - 0.5	13/14	93%	0.000002 – 0.000002	0.00073	MDC	N/A	See Aroclors		N/A	N/A	--	No	Aroclor data used to evaluate chemical
PCB-12	2974-92-7	0.0000025		0.000092		mg/kg	SA-SB366 (11/15/2019)	0 - 0.5	13/14	93%	0.000002 – 0.000002	0.000092	MDC	N/A	See Aroclors		N/A	N/A	--	No	Aroclor data used to evaluate chemical
PCB-12/13	2974-92-7/2974~	0.000016	J	0.0038		mg/kg	SB407 (7/15/2021)	0 - 0.5	9/16	56%	0.000018 – 0.0027	0.0038	MDC	N/A	See Aroclors		N/A	N/A	--	No	Aroclor data used to evaluate chemical
PCB-120	68194-12-7	0.00000055	J	0.001		mg/kg	SA-SB366 (11/15/2019)	0 - 0.5	22/30	73%	0.000002 – 0.0013	0.001	MDC	N/A	See Aroclors		N/A	N/A	--	No	Aroclor data used to evaluate chemical
PCB-121	56558-18-0	0.0000047	J	0.0000084	J	mg/kg	SB408 (7/16/2021)	0 - 0.5	2/30	7%	0.0000019 – 0.0013	0.0000084	MDC	N/A	See Aroclors		N/A	N/A	--	No	Aroclor data used to evaluate chemical
PCB-122	76842-07-4	0.00000053	J	0.00066		mg/kg	SA-SB366 (11/15/2019)	0 - 0.5	20/30	67%	0.0000019 – 0.0013	0.00066	MDC	N/A	See Aroclors		N/A	N/A	--	No	Aroclor data used to evaluate chemical
PCB-123	65510-44-3	0.0000058		0.0013		mg/kg	SB408 (7/16/2021)	0 - 0.5	26/30	87%	0.000001 – 0.00034	0.0013	MDC	N/A	See TEQ		N/A	N/A	--	No	TEQ used to evaluate chemical
PCB-124	70424-70-3	0.0000032		0.0058		mg/kg	SA-SB366 (11/15/2019)	0 - 0.5	14/14	100%	N/A	0.0058	MDC	N/A	See Aroclors		N/A	N/A	--	No	Aroclor data used to evaluate chemical
PCB-126	57465-28-8	0.0000009	J	0.0011		mg/kg	SA-SB322 (11/22/2019)	0 - 0.5	25/30	83%	0.0000012 – 0.0004	0.0011	MDC	N/A	See TEQ		N/A	N/A	--	No	TEQ used to evaluate chemical
PCB-127	39635-33-1	0.0000022	J	0.0000071		mg/kg	SA-SB310 (11/7/2019)	0 - 0.5	2/30	7%	0.0000019 – 0.0013	0.0000071	MDC	N/A	See Aroclors		N/A	N/A	--	No	Aroclor data used to evaluate chemical
PCB-128/162	38380-07-3/396~	0.000017		0.065		mg/kg	SA-SB366 (11/15/2019)	0 - 0.5	14/14	100%	N/A	0.065	MDC	N/A	See Aroclors		N/A	N/A	--	No	Aroclor data used to evaluate chemical
PCB-128/166	38380-07-3/414~	0.00011		0.04		mg/kg	SA-SB325 (11/22/2019)	0 - 0.5	16/16	100%	N/A	0.04	MDC	N/A	See Aroclors		N/A	N/A	--	No	Aroclor data used to evaluate chemical
PCB-129	55215-18-4	0.0000058		0.013		mg/kg	SA-SB366 (11/15/2019)	0 - 0.5	14/14	100%	N/A	0.013	MDC	N/A	See Aroclors		N/A	N/A	--	No	Aroclor data used to evaluate chemical
PCB-129/138/163	55215-18-4/350~	0.0014		0.58		mg/kg	SA-SB325 (11/22/2019)	0 - 0.5	16/16	100%	N/A	0.58	MDC	N/A	See Aroclors		N/A	N/A	--	No	Aroclor data used to evaluate chemical
PCB-13	2974-90-5	0.0000027		0.000084		mg/kg	SA-SB327 (11/15/2019)	0 - 0.5	13/14	93%	0.000002 – 0.000002	0.000084	MDC	N/A	See Aroclors		N/A	N/A	--	No	Aroclor data used to evaluate chemical
PCB-130	52663-66-8	0.00001		0.03		mg/kg	SA-SB366 (11/15/2019)	0 - 0.5	30/30	100%	N/A	0.03	MDC	N/A	See Aroclors		N/A	N/A	--	No	Aroclor data used to evaluate chemical
PCB-131	61798-70-7	0.0000075	J	0.0034		mg/kg	SB403 (7/16/2021)	0 - 0.5	15/16	94%	0.000009 – 0.000009	0.0034	MDC	N/A	See Aroclors		N/A	N/A	--	No	Aroclor data used to evaluate chemical
PCB-131/133	61798-70-7/356~	0.0000049		0.014		mg/kg	SA-SB366 (11/15/2019)	0 - 0.5	14/14	100%	N/A	0.014	MDC	N/A	See Aroclors		N/A	N/A	--	No	Aroclor data used to evaluate chemical
PCB-132	38380-05-1	0.00011		0.13		mg/kg	SA-SB325 (11/22/2019)	0 - 0.5	16/16	100%	N/A	0.13	MDC	N/A	See Aroclors		N/A	N/A	--	No	Aroclor data used to evaluate chemical
PCB-132/161	38380-05-1/744~	0.00004		0.21		mg/kg	SA-SB366 (11/15/2019)	0 - 0.5	14/14	100%	N/A	0.21	MDC	N/A	See Aroclors		N/A	N/A	--	No	Aroclor data used to evaluate chemical
PCB-133	35694-04-3	0.000018		0.0049		mg/kg	SA-SB325 (11/22/2019)	0 - 0.5	16/16	100%	N/A	0.0049	MDC	N/A	See Aroclors		N/A	N/A	--	No	Aroclor data used to evaluate chemical
PCB-134	52704-70-8	0.00019	J	0.018		mg/kg	SA-SB325 (11/22/2019)	0 - 0.5	7/7	100%	N/A	0.018	MDC	N/A	See Aroclors		N/A	N/A	--	No	Aroclor data used to evaluate chemical
PCB-134/143	52704-70-8/681~	0.0000074		0.03		mg/kg	SA-SB366 (11/15/2019)	0 - 0.5	23/23	100%	N/A	0.03	MDC	N/A	See Aroclors		N/A	N/A	--	No	Aroclor data used to evaluate chemical
PCB-135	52744-13-5	0.000026		0.12		mg/kg	SA-SB366 (11/15/2019)	0 - 0.5	14/14	100%	N/A	0.12	MDC	N/A	See Aroclors		N/A	N/A	--	No	Aroclor data used to evaluate chemical
PCB-135/151	52744-13-5/526~	0.00036		0.21		mg/kg	SA-SB325 (11/22/2019)	0 - 0.5	16/16	100%	N/A	0.21	MDC	N/A	See Aroclors		N/A	N/A	--	No	Aroclor data used to evaluate chemical
PCB-136	38411-22-2	0.000026		0.14		mg/kg	SA-SB366 (11/15/2019)	0 - 0.5	30/30	100%	N/A	0.14	MDC	N/A	See Aroclors		N/A	N/A	--	No	Aroclor data used to evaluate chemical
PCB-137	35694-06-5	0.0000033		0.036		mg/kg	SB407 (7/15/2021)	0 - 0.5	23/30	77%	0.000009 – 0.0000096	0.036	MDC	N/A	See Aroclors		N/A	N/A	--	No	Aroclor data used to evaluate chemical
PCB-138/163/164	35065-28-2/744~	0.00023		0.98	J	mg/kg	SA-SB366 (11/15/2019)	0 - 0.5	14/14	100%	N/A	0.98	MDC	N/A	See Aroclors		N/A	N/A	--	No	Aroclor data used to evaluate chemical
PCB-139/140	56030-56-9/592~	0.0000045	J	0.0007		mg/kg	SA-SB322 (11/22/2019)	0 - 0.5	14/16	88%	0.000018 – 0.0027	0.0007	MDC	N/A	See Aroclors		N/A	N/A	--	No	Aroclor data used to evaluate chemical
PCB-139/149	56030-56-9/383~	0.00018		0.94	J	mg/kg	SA-SB366 (11/15/2019)	0 - 0.5	14/14	100%	N/A	0.94	MDC	N/A	See Aroclors		N/A	N/A	--	No	Aroclor data used to evaluate chemical
PCB-14	34883-41-5	N/A		N/A		mg/kg	N/A	N/A	0/30	0%	0.0000019 – 0.0013	0.0013	CRQL	N/A	See Aroclors		N/A	N/A	--	No	Aroclor data used to evaluate chemical
PCB-140	59291-64-4	0.000044		0.00019		mg/kg	SA-SB318 (11/8/2019)	0 - 0.5	3/14	21%	0.000002 – 0.000002	0.00019	MDC	N/A	See Aroclors		N/A	N/A	--	No	Aroclor data used to evaluate chemical
PCB-141	52712-04-6	0.00005		0.26	J	mg/kg	SA-SB366 (11/15/2019)	0 - 0.5	30/30	100%	N/A	0.26	MDC	N/A	See Aroclors		N/A	N/A	--	No	Aroclor data used to evaluate chemical
PCB-142	41411-61-4	N/A		N/A		mg/kg	N/A	N/A	0/30	0%	0.0000019 – 0.0013	0.0013	CRQL	N/A	See Aroclors		N/A	N/A	--	No	Aroclor data used to evaluate chemical
PCB-143	68194-15-0	N/A		N/A		mg/kg	N/A	N/A	0/7	0%	0.0000019 – 0.0013	0.0013	CRQL	N/A	See Aroclors		N/A	N/A	--	No	Aroclor data used to evaluate chemical
PCB-144	68194-14-9	0.000011		0.068		mg/kg	SA-SB366 (11/15/2019)	0 - 0.5	30/30	100%	N/A	0.068	MDC	N/A	See Aroclors		N/A	N/A	--	No	Aroclor data used to evaluate chemical
PCB-145	74472-40-5	0.00000047	J	0.000052	J	mg/kg	SA-SB322 (11/22/2019)	0 - 0.5	3/30	10%	0.0000019 – 0.0013	0.000052	MDC	N/A	See Aroclors		N/A	N/A	--	No	Aroclor data used to evaluate chemical
PCB-146	51908-16-8	0.00021		0.068		mg/kg	SA-SB325 (11/22/2019)	0 - 0.5	16/16	100%	N/A	0.068	MDC	N/A	See Aroclors		N/A	N/A	--	No	Aroclor data used to evaluate chemical
PCB-146/165	51908-16-8/744~	0.000033		0.13		mg/kg	SA-SB366 (11/15/2019)	0 - 0.5	14/14	100%	N/A	0.13	MDC	N/A	See Aroclors		N/A	N/A	--	No	Aroclor data used to evaluate chemical
PCB-147	68194-13-8	0.0000021		0.003		mg/kg	SA-SB366 (11/15/2019)	0 - 0.5	14/14	100%	N/A	0.003	MDC	N/A	See Aroclors		N/A	N/A	--	No	Aroclor data used to evaluate chemical

Table A-2.1
Occurrence, Distribution, and Selection of Constituents of Interest (Direct Contact – Site-Wide; Surface Soil, 0 – 0.5 feet)
Reasonable Maximum Exposure
Human Health Risk Assessment
Shaffer Equipment/Arbuckle Creek Area Superfund Site, Minden, West Virginia

Scenario Timeframe: Current and Future
Medium: Soil
Exposure Medium: Soil
Exposure Point: Soil (0 – 0.5 feet)

Chemical	CASRN	Minimum Detected Concentration		Maximum Detected Concentration		Units	Location of Maximum	Depth (ft bgs)	Detection Frequency		Range of Reporting Limits	Screening Concentration		Background Value	Screening Level [1, 2]		Source	Potential ARAR [3]	Source	COPC Flag (Yes/No)	Rationale for Selection/Deletion
PCB-147/149	68194-13-8/383~	0.00083		0.46		mg/kg	SA-SB325 (11/22/2019)	0 - 0.5	16/16	100%	N/A	0.46	MDC	N/A	See Aroclors		N/A	N/A	--	No	Aroclor data used to evaluate chemical
PCB-148	74472-41-6	0.0000026		0.00012		mg/kg	SB407 (7/15/2021)	0 - 0.5	10/30	33%	0.000002 – 0.0013	0.00012	MDC	N/A	See Aroclors		N/A	N/A	--	No	Aroclor data used to evaluate chemical
PCB-15	2050-68-2	0.0000052		0.042		mg/kg	SB407 (7/15/2021)	0 - 0.5	29/30	97%	0.000009 – 0.000009	0.042	MDC	N/A	See Aroclors		N/A	N/A	--	No	Aroclor data used to evaluate chemical
PCB-150	68194-08-1	0.0000026		0.00016		mg/kg	SB408 (7/16/2021)	0 - 0.5	20/30	67%	0.000002 – 0.0013	0.00016	MDC	N/A	See Aroclors		N/A	N/A	--	No	Aroclor data used to evaluate chemical
PCB-151	52663-63-5	0.000064		0.36	J	mg/kg	SA-SB366 (11/15/2019)	0 - 0.5	14/14	100%	N/A	0.36	MDC	N/A	See Aroclors		N/A	N/A	--	No	Aroclor data used to evaluate chemical
PCB-152	68194-09-2	0.00000078	J	0.000041	J	mg/kg	SA-SB325 (11/22/2019)	0 - 0.5	14/30	47%	0.000002 – 0.0013	0.000041	MDC	N/A	See Aroclors		N/A	N/A	--	No	Aroclor data used to evaluate chemical
PCB-153	35065-27-1	0.00026		1.2	J	mg/kg	SA-SB366 (11/15/2019)	0 - 0.5	14/14	100%	N/A	1.2	MDC	N/A	See Aroclors		N/A	N/A	--	No	Aroclor data used to evaluate chemical
PCB-153/168	35065-27-1/592~	0.0018		0.6		mg/kg	SA-SB325 (11/22/2019)	0 - 0.5	16/16	100%	N/A	0.6	MDC	N/A	See Aroclors		N/A	N/A	--	No	Aroclor data used to evaluate chemical
PCB-154	60145-22-4	0.0000066		0.001		mg/kg	SA-SB327 (11/15/2019)	0 - 0.5	20/21	95%	0.000002 – 0.000002	0.001	MDC	N/A	See Aroclors		N/A	N/A	--	No	Aroclor data used to evaluate chemical
PCB-155	33979-03-2	0.0000046	J	0.0000066		mg/kg	SA-SB327 (11/15/2019)	0 - 0.5	3/30	10%	0.0000019 – 0.0013	0.0000066	MDC	N/A	See Aroclors		N/A	N/A	--	No	Aroclor data used to evaluate chemical
PCB-156	38380-08-4	0.000015		0.075	J	mg/kg	SA-SB366 (11/15/2019)	0 - 0.5	14/14	100%	N/A	0.075	MDC	N/A	See TEQ		N/A	N/A	--	No	TEQ used to evaluate chemical
PCB-156/157	38380-08-4/697~	0.000035		0.038		mg/kg	SA-SB325 (11/22/2019)	0 - 0.5	16/16	100%	N/A	0.038	MDC	N/A	See TEQ		N/A	N/A	--	No	TEQ used to evaluate chemical
PCB-157	69782-90-7	0.000024		0.0046		mg/kg	SA-SB366 (11/15/2019)	0 - 0.5	13/14	93%	0.0000016 – 0.0000016	0.0046	MDC	N/A	See TEQ		N/A	N/A	--	No	TEQ used to evaluate chemical
PCB-158	74472-42-7	0.000061		0.046		mg/kg	SA-SB325 (11/22/2019)	0 - 0.5	16/16	100%	N/A	0.046	MDC	N/A	See Aroclors		N/A	N/A	--	No	Aroclor data used to evaluate chemical
PCB-158/160	74472-42-7/414~	0.00002		0.1		mg/kg	SA-SB366 (11/15/2019)	0 - 0.5	14/14	100%	N/A	0.1	MDC	N/A	See Aroclors		N/A	N/A	--	No	Aroclor data used to evaluate chemical
PCB-159	39635-35-3	0.0000043		0.0088		mg/kg	SA-SB366 (11/15/2019)	0 - 0.5	23/30	77%	0.0000019 – 0.0013	0.0088	MDC	N/A	See Aroclors		N/A	N/A	--	No	Aroclor data used to evaluate chemical
PCB-16	38444-78-9	0.0000084		0.0048		mg/kg	SB407 (7/15/2021)	0 - 0.5	27/30	90%	0.000002 – 0.0013	0.0048	MDC	N/A	See Aroclors		N/A	N/A	--	No	Aroclor data used to evaluate chemical
PCB-160	41411-62-5	N/A		N/A		mg/kg	N/A	N/A	0/7	0%	0.0000019 – 0.0013	0.0013	CRQL	N/A	See Aroclors		N/A	N/A	--	No	Aroclor data used to evaluate chemical
PCB-161	74472-43-8	0.0000014	J	0.015		mg/kg	SB452 (7/15/2021)	0 - 0.5	4/16	25%	0.0000019 – 0.0013	0.015	MDC	N/A	See Aroclors		N/A	N/A	--	No	Aroclor data used to evaluate chemical
PCB-162	39635-34-2	0.0000024	J	0.0034		mg/kg	SB407 (7/15/2021)	0 - 0.5	10/16	63%	0.0000019 – 0.00028	0.0034	MDC	N/A	See Aroclors		N/A	N/A	--	No	Aroclor data used to evaluate chemical
PCB-164	74472-45-0	0.000067		0.035		mg/kg	SA-SB325 (11/22/2019)	0 - 0.5	14/16	88%	0.000018 – 0.000018	0.035	MDC	N/A	See Aroclors		N/A	N/A	--	No	Aroclor data used to evaluate chemical
PCB-165	74472-46-1	0.0000022	J	0.0014		mg/kg	SB408 (7/16/2021)	0 - 0.5	7/16	44%	0.0000019 – 0.0013	0.0014	MDC	N/A	See Aroclors		N/A	N/A	--	No	Aroclor data used to evaluate chemical
PCB-166	41411-63-6	0.000002		0.0019		mg/kg	SA-SB366 (11/15/2019)	0 - 0.5	12/14	86%	0.000002 – 0.000002	0.0019	MDC	N/A	See Aroclors		N/A	N/A	--	No	Aroclor data used to evaluate chemical
PCB-167	52663-72-6	0.0000074		0.027		mg/kg	SA-SB366 (11/15/2019)	0 - 0.5	30/30	100%	N/A	0.027	MDC	N/A	See TEQ		N/A	N/A	--	No	TEQ used to evaluate chemical
PCB-168	59291-65-5	N/A		N/A		mg/kg	N/A	N/A	0/14	0%	0.000002 – 0.000002	0.000002	CRQL	N/A	See Aroclors		N/A	N/A	--	No	Aroclor data used to evaluate chemical
PCB-169	32774-16-6	0.0000043		0.00098	Z	mg/kg	SA-SB325 (11/22/2019)	0 - 0.5	15/30	50%	0.00000047 – 0.00042	0.00098	MDC	N/A	See TEQ		N/A	N/A	--	No	TEQ used to evaluate chemical
PCB-17	37680-66-3	0.000013		0.015		mg/kg	SB407 (7/15/2021)	0 - 0.5	27/30	90%	0.000002 – 0.0013	0.015	MDC	N/A	See Aroclors		N/A	N/A	--	No	Aroclor data used to evaluate chemical
PCB-170	35065-30-6	0.00011		0.54	J	mg/kg	SA-SB366 (11/15/2019)	0 - 0.5	30/30	100%	N/A	0.54	MDC	N/A	See Aroclors		N/A	N/A	--	No	Aroclor data used to evaluate chemical
PCB-171	52663-71-5	0.000024		0.14		mg/kg	SA-SB366 (11/15/2019)	0 - 0.5	14/14	100%	N/A	0.14	MDC	N/A	See Aroclors		N/A	N/A	--	No	Aroclor data used to evaluate chemical
PCB-171/173	52663-71-5/681~	0.000096		0.076		mg/kg	SA-SB325 (11/22/2019)	0 - 0.5	16/16	100%	N/A	0.076	MDC	N/A	See Aroclors		N/A	N/A	--	No	Aroclor data used to evaluate chemical
PCB-172	52663-74-8	0.000022		0.083		mg/kg	SA-SB366 (11/15/2019)	0 - 0.5	30/30	100%	N/A	0.083	MDC	N/A	See Aroclors		N/A	N/A	--	No	Aroclor data used to evaluate chemical
PCB-173	68194-16-1	0.000044		0.012		mg/kg	SA-SB366 (11/15/2019)	0 - 0.5	13/14	93%	0.000002 – 0.000002	0.012	MDC	N/A	See Aroclors		N/A	N/A	--	No	Aroclor data used to evaluate chemical
PCB-174	38411-25-5	0.00012		0.49	J	mg/kg	SA-SB366 (11/15/2019)	0 - 0.5	30/30	100%	N/A	0.49	MDC	N/A	See Aroclors		N/A	N/A	--	No	Aroclor data used to evaluate chemical
PCB-175	40186-70-7	0.0000043		0.018		mg/kg	SA-SB366 (11/15/2019)	0 - 0.5	30/30	100%	N/A	0.018	MDC	N/A	See Aroclors		N/A	N/A	--	No	Aroclor data used to evaluate chemical
PCB-176	52663-65-7	0.000011		0.056		mg/kg	SA-SB366 (11/15/2019)	0 - 0.5	30/30	100%	N/A	0.056	MDC	N/A	See Aroclors		N/A	N/A	--	No	Aroclor data used to evaluate chemical
PCB-177	52663-70-4	0.000063		0.31	J	mg/kg	SA-SB366 (11/15/2019)	0 - 0.5	30/30	100%	N/A	0.31	MDC	N/A	See Aroclors		N/A	N/A	--	No	Aroclor data used to evaluate chemical
PCB-178	52663-67-9	0.000022		0.097		mg/kg	SA-SB366 (11/15/2019)	0 - 0.5	30/30	100%	N/A	0.097	MDC	N/A	See Aroclors		N/A	N/A	--	No	Aroclor data used to evaluate chemical
PCB-179	52663-64-6	0.000042		0.2		mg/kg	SA-SB366 (11/15/2019)	0 - 0.5	30/30	100%	N/A	0.2	MDC	N/A	See Aroclors		N/A	N/A	--	No	Aroclor data used to evaluate chemical
PCB-18	37680-65-2	0.0000038		0.00064		mg/kg	SA-SB366 (11/15/2019)	0 - 0.5	14/14	100%	N/A	0.00064	MDC	N/A	See Aroclors		N/A	N/A	--	No	Aroclor data used to evaluate chemical
PCB-18/30	37680-65-2/356~	0.000023		0.01		mg/kg	SB407 (7/15/2021)	0 - 0.5	15/16	94%	0.000018 – 0.000018	0.01	MDC	N/A	See Aroclors		N/A	N/A	--	No	Aroclor data used to evaluate chemical
PCB-180	35065-29-3	0.00025		0.92	J	mg/kg	SA-SB366 (11/15/2019)	0 - 0.5	14/14	100%	N/A	0.92	MDC	N/A	See Aroclors		N/A	N/A	--	No	Aroclor data used to evaluate chemical
PCB-180/193	35065-29-3/697~	0.0011		0.54		mg/kg	SA-SB325 (11/22/2019)	0 - 0.5	16/16	100%	N/A	0.54	MDC	N/A	See Aroclors		N/A	N/A	--	No	Aroclor data used to evaluate chemical
PCB-181	74472-47-2	0.0000054	J	0.00076		mg/kg	SA-SB325 (11/22/2019)	0 - 0.5	11/30	37%	0.000002 – 0.0013	0.00076	MDC	N/A	See Aroclors		N/A	N/A	--	No	Aroclor data used to evaluate chemical
PCB-182	60145-23-5	0.0000029	J	0.00034		mg/kg	SA-SB322 (11/22/2019)	0 - 0.5	4/16	25%	0.0000019 – 0.0013	0.00034	MDC	N/A	See Aroclors		N/A	N/A	--	No	Aroclor data used to evaluate chemical
PCB-182/187	60145-23-5/526~	0.00015		0.55	J	mg/kg	SA-SB366 (11/15/2019)	0 - 0.5	14/14	100%	N/A	0.55	MDC	N/A	See Aroclors		N/A	N/A	--	No	Aroclor data used to evaluate chemical
PCB-183	52663-69-1	0.000053		0.26	J	mg/kg	SA-SB366 (11/15/2019)	0 - 0.5	14/14	100%	N/A	0.26	MDC	N/A	See Aroclors		N/A	N/A	--	No	Aroclor data used to evaluate chemical
PCB-183/185	52663-69-1/527~	0.00023		0.17		mg/kg	SA-SB325 (11/22/2019)	0 - 0.5	16/16	100%	N/A	0.17	MDC	N/A	See Aroclors		N/A	N/A	--	No	Aroclor data used to evaluate chemical
PCB-184	74472-48-3	0.00000084	J	0.00017		mg/kg	SA-SB366 (11/15/2019)	0 - 0.5	12/30	40%	0.000002 – 0.0013	0.00017	MDC	N/A	See Aroclors		N/A	N/A	--	No	Aroclor data used to evaluate chemical
PCB-185	52712-05-7	0.000015		0.061		mg/kg	SA-SB366 (11/15/2019)	0 - 0.5	14/14	100%	N/A	0.061	MDC	N/A	See Aroclors		N/A	N/A	--	No	Aroclor data used to evaluate chemical
PCB-186	74472-49-4	N/A		N/A		mg/kg	N/A	N/A	0/30	0%	0.0000019 – 0.0013	0.0013	CRQL	N/A	See Aroclors		N/A	N/A	--	No	Aroclor data used to evaluate chemical
PCB-187	52663-68-0	0.00065		0.26		mg/kg	SA-SB325 (11/22/2019)	0 - 0.5	16/16	100%	N/A	0.26	MDC	N/A	See Aroclors		N/A	N/A	--	No	Aroclor data used to evaluate chemical
PCB-188	74487-85-7	0.0000018	J	0.00015		mg/kg	SA-SB366 (11/15/2019)	0 - 0.5	18/30	60%	0.000002 – 0.0013	0.00015	MDC	N/A	See Aroclors		N/A	N/A	--	No	Aroclor data used to evaluate chemical
PCB-189	39635-31-9	0.0000044		0.019		mg/kg	SA-SB366 (11/15/2019)	0 - 0.5	30/30	100%	N/A	0.019	MDC	N/A	See TEQ		N/A	N/A	--	No	TEQ used to evaluate chemical
PCB-19	38444-73-4	0.0000022		0.0034		mg/kg	SB407 (7/15/2021)	0 - 0.5	26/30	87%	0.000002 – 0.0013	0.0034	MDC	N/A	See Aroclors		N/A	N/A	--	No	Aroclor data used to evaluate chemical
PCB-190	41411-64-7	0.000027		0.12		mg/kg	SA-SB366 (11/15/2019)	0 - 0.5	30/30	100%	N/A	0.12	MDC	N/A	See Aroclors		N/A	N/A	--	No	Aroclor data used to evaluate chemical

Table A-2.1
Occurrence, Distribution, and Selection of Constituents of Interest (Direct Contact – Site-Wide; Surface Soil, 0 – 0.5 feet)
Reasonable Maximum Exposure
Human Health Risk Assessment
Shaffer Equipment/Arbuckle Creek Area Superfund Site, Minden, West Virginia

Scenario Timeframe: Current and Future
Medium: Soil
Exposure Medium: Soil
Exposure Point: Soil (0 – 0.5 feet)

Chemical	CASRN	Minimum Detected Concentration		Maximum Detected Concentration		Units	Location of Maximum	Depth (ft bgs)	Detection Frequency		Range of Reporting Limits	Screening Concentration		Background Value	Screening Level [1, 2]		Source	Potential ARAR [3]	Source	COPC Flag (Yes/No)	Rationale for Selection/Deletion
PCB-191	74472-50-7	0.0000089	J	0.02		mg/kg	SA-SB366 (11/15/2019)	0 - 0.5	29/30	97%	0.000002 – 0.000002	0.02	MDC	N/A	See Aroclors		N/A	N/A	--	No	Aroclor data used to evaluate chemical
PCB-192	74472-51-8	N/A		N/A		mg/kg	N/A	N/A	0/30	0%	0.0000019 – 0.0013	0.0013	CRQL	N/A	See Aroclors		N/A	N/A	--	No	Aroclor data used to evaluate chemical
PCB-193	69782-91-8	0.000017		0.062		mg/kg	SA-SB366 (11/15/2019)	0 - 0.5	14/14	100%	N/A	0.062	MDC	N/A	See Aroclors		N/A	N/A	--	No	Aroclor data used to evaluate chemical
PCB-194	35694-08-7	0.000046		0.21	J	mg/kg	SA-SB366 (11/15/2019)	0 - 0.5	30/30	100%	N/A	0.21	MDC	N/A	See Aroclors		N/A	N/A	--	No	Aroclor data used to evaluate chemical
PCB-195	52663-78-2	0.000021		0.1		mg/kg	SA-SB366 (11/15/2019)	0 - 0.5	30/30	100%	N/A	0.1	MDC	N/A	See Aroclors		N/A	N/A	--	No	Aroclor data used to evaluate chemical
PCB-196	42740-50-1	0.00011		0.052		mg/kg	SA-SB325 (11/22/2019)	0 - 0.5	16/16	100%	N/A	0.052	MDC	N/A	See Aroclors		N/A	N/A	--	No	Aroclor data used to evaluate chemical
PCB-196/203	42740-50-1/526~	0.000064		0.23		mg/kg	SA-SB366 (11/15/2019)	0 - 0.5	14/14	100%	N/A	0.23	MDC	N/A	See Aroclors		N/A	N/A	--	No	Aroclor data used to evaluate chemical
PCB-197	33091-17-7	0.0000022		0.0067		mg/kg	SA-SB366 (11/15/2019)	0 - 0.5	14/14	100%	N/A	0.0067	MDC	N/A	See Aroclors		N/A	N/A	--	No	Aroclor data used to evaluate chemical
PCB-197/200	33091-17-7/526~	0.000037		0.016		mg/kg	SA-SB325 (11/22/2019)	0 - 0.5	16/16	100%	N/A	0.016	MDC	N/A	See Aroclors		N/A	N/A	--	No	Aroclor data used to evaluate chemical
PCB-198	68194-17-2	0.0000062		0.014		mg/kg	SA-SB366 (11/15/2019)	0 - 0.5	14/14	100%	N/A	0.014	MDC	N/A	See Aroclors		N/A	N/A	--	No	Aroclor data used to evaluate chemical
PCB-198/199	68194-17-2/526~	0.00026		0.096		mg/kg	SA-SB325 (11/22/2019)	0 - 0.5	16/16	100%	N/A	0.096	MDC	N/A	See Aroclors		N/A	N/A	--	No	Aroclor data used to evaluate chemical
PCB-199	52663-75-9	0.000061		0.19		mg/kg	SA-SB366 (11/15/2019)	0 - 0.5	14/14	100%	N/A	0.19	MDC	N/A	See Aroclors		N/A	N/A	--	No	Aroclor data used to evaluate chemical
PCB-2	2051-61-8	0.0000016	J	0.00019		mg/kg	SB407 (7/15/2021)	0 - 0.5	18/30	60%	0.0000019 – 0.0013	0.00019	MDC	N/A	See Aroclors		N/A	N/A	--	No	Aroclor data used to evaluate chemical
PCB-20/21/33	38444-84-7/557~	0.0000026	J	0.0012		mg/kg	SA-SB327 (11/15/2019)	0 - 0.5	14/14	100%	N/A	0.0012	MDC	N/A	See Aroclors		N/A	N/A	--	No	Aroclor data used to evaluate chemical
PCB-20/28	38444-84-7/701~	0.00015	J	0.08		mg/kg	SB407 (7/15/2021)	0 - 0.5	15/16	94%	0.000018 – 0.000018	0.08	MDC	N/A	See Aroclors		N/A	N/A	--	No	Aroclor data used to evaluate chemical
PCB-200	52663-73-7	0.0000081		0.027		mg/kg	SA-SB366 (11/15/2019)	0 - 0.5	14/14	100%	N/A	0.027	MDC	N/A	See Aroclors		N/A	N/A	--	No	Aroclor data used to evaluate chemical
PCB-201	40186-71-8	0.0000059		0.023		mg/kg	SA-SB366 (11/15/2019)	0 - 0.5	30/30	100%	N/A	0.023	MDC	N/A	See Aroclors		N/A	N/A	--	No	Aroclor data used to evaluate chemical
PCB-202	2136-99-4	0.0000099		0.029		mg/kg	SA-SB366 (11/15/2019)	0 - 0.5	30/30	100%	N/A	0.029	MDC	N/A	See Aroclors		N/A	N/A	--	No	Aroclor data used to evaluate chemical
PCB-203	52663-76-0	0.00021		0.064		mg/kg	SA-SB325 (11/22/2019)	0 - 0.5	16/16	100%	N/A	0.064	MDC	N/A	See Aroclors		N/A	N/A	--	No	Aroclor data used to evaluate chemical
PCB-204	74472-52-9	0.000011	J	0.000011	J	mg/kg	SB407 (7/15/2021)	0 - 0.5	1/30	3%	0.0000019 – 0.0013	0.000011	MDC	N/A	See Aroclors		N/A	N/A	--	No	Aroclor data used to evaluate chemical
PCB-205	74472-53-0	0.0000043		0.012		mg/kg	SA-SB366 (11/15/2019)	0 - 0.5	30/30	100%	N/A	0.012	MDC	N/A	See Aroclors		N/A	N/A	--	No	Aroclor data used to evaluate chemical
PCB-206	40186-72-9	0.000017		0.038		mg/kg	SA-SB325 (11/22/2019)	0 - 0.5	30/30	100%	N/A	0.038	MDC	N/A	See Aroclors		N/A	N/A	--	No	Aroclor data used to evaluate chemical
PCB-207	52663-79-3	0.0000021		0.0046		mg/kg	SA-SB366 (11/15/2019)	0 - 0.5	30/30	100%	N/A	0.0046	MDC	N/A	See Aroclors		N/A	N/A	--	No	Aroclor data used to evaluate chemical
PCB-208	52663-77-1	0.0000041		0.013		mg/kg	SA-SB325 (11/22/2019)	0 - 0.5	30/30	100%	N/A	0.013	MDC	N/A	See Aroclors		N/A	N/A	--	No	Aroclor data used to evaluate chemical
PCB-209 (Decachlorobiphenyl)	2051-24-3	0.000012		0.039		mg/kg	SA-SB325 (11/22/2019)	0 - 0.5	30/30	100%	N/A	0.039	MDC	N/A	See Aroclors		N/A	N/A	--	No	Aroclor data used to evaluate chemical
PCB-21/33	55702-46-0/384~	0.000044	J	0.021		mg/kg	SB407 (7/15/2021)	0 - 0.5	15/16	94%	0.000018 – 0.000018	0.021	MDC	N/A	See Aroclors		N/A	N/A	--	No	Aroclor data used to evaluate chemical
PCB-22	38444-85-8	0.0000049		0.04		mg/kg	SB407 (7/15/2021)	0 - 0.5	29/30	97%	0.000009 – 0.000009	0.04	MDC	N/A	See Aroclors		N/A	N/A	--	No	Aroclor data used to evaluate chemical
PCB-23	55720-44-0	0.0000013	J	0.000017	J	mg/kg	SB407 (7/15/2021)	0 - 0.5	3/30	10%	0.0000019 – 0.0013	0.000017	MDC	N/A	See Aroclors		N/A	N/A	--	No	Aroclor data used to evaluate chemical
PCB-24	55702-45-9	0.0000016	J	0.0015		mg/kg	SB407 (7/15/2021)	0 - 0.5	24/30	80%	0.000002 – 0.0013	0.0015	MDC	N/A	See Aroclors		N/A	N/A	--	No	Aroclor data used to evaluate chemical
PCB-25	55712-37-3	0.0000052		0.0057		mg/kg	SB407 (7/15/2021)	0 - 0.5	28/30	93%	0.000002 – 0.000009	0.0057	MDC	N/A	See Aroclors		N/A	N/A	--	No	Aroclor data used to evaluate chemical
PCB-26	38444-81-4	0.0000014	J	0.00061		mg/kg	SA-SB327 (11/15/2019)	0 - 0.5	14/14	100%	N/A	0.00061	MDC	N/A	See Aroclors		N/A	N/A	--	No	Aroclor data used to evaluate chemical
PCB-26/29	38444-81-4/158~	0.000017	J	0.014		mg/kg	SB407 (7/15/2021)	0 - 0.5	15/16	94%	0.000018 – 0.000018	0.014	MDC	N/A	See Aroclors		N/A	N/A	--	No	Aroclor data used to evaluate chemical
PCB-27	38444-76-7	0.0000015	J	0.0029		mg/kg	SB407 (7/15/2021)	0 - 0.5	27/30	90%	0.000002 – 0.0013	0.0029	MDC	N/A	See Aroclors		N/A	N/A	--	No	Aroclor data used to evaluate chemical
PCB-28	7012-37-5	0.000012		0.0049		mg/kg	SA-SB327 (11/15/2019)	0 - 0.5	14/14	100%	N/A	0.0049	MDC	N/A	See Aroclors		N/A	N/A	--	No	Aroclor data used to evaluate chemical
PCB-29	15862-07-4	0.000002		0.000018		mg/kg	SA-SB327 (11/15/2019)	0 - 0.5	8/14	57%	0.000002 – 0.000002	0.000018	MDC	N/A	See Aroclors		N/A	N/A	--	No	Aroclor data used to evaluate chemical
PCB-3	2051-62-9	0.0000031	J	0.0013		mg/kg	SB407 (7/15/2021)	0 - 0.5	27/30	90%	0.000002 – 0.0013	0.0013	MDC	N/A	See Aroclors		N/A	N/A	--	No	Aroclor data used to evaluate chemical
PCB-30	35693-92-6	N/A		N/A		mg/kg	N/A	N/A	0/14	0%	0.000002 – 0.000002	0.000002	CRQL	N/A	See Aroclors		N/A	N/A	--	No	Aroclor data used to evaluate chemical
PCB-31	16606-02-3	0.0000088		0.06		mg/kg	SB407 (7/15/2021)	0 - 0.5	29/30	97%	0.000009 – 0.000009	0.06	MDC	N/A	See Aroclors		N/A	N/A	--	No	Aroclor data used to evaluate chemical
PCB-32	38444-77-8	0.0000026		0.017		mg/kg	SB407 (7/15/2021)	0 - 0.5	29/30	97%	0.000009 – 0.000009	0.017	MDC	N/A	See Aroclors		N/A	N/A	--	No	Aroclor data used to evaluate chemical
PCB-34	37680-68-5	0.0000014	J	0.00023		mg/kg	SB407 (7/15/2021)	0 - 0.5	14/30	47%	0.000002 – 0.0013	0.00023	MDC	N/A	See Aroclors		N/A	N/A	--	No	Aroclor data used to evaluate chemical
PCB-35	37680-69-6	0.000003		0.00088		mg/kg	SB407 (7/15/2021)	0 - 0.5	22/30	73%	0.000002 – 0.0013	0.00088	MDC	N/A	See Aroclors		N/A	N/A	--	No	Aroclor data used to evaluate chemical
PCB-36	38444-87-0	N/A		N/A		mg/kg	N/A	N/A	0/30	0%	0.0000019 – 0.0013	0.0013	CRQL	N/A	See Aroclors		N/A	N/A	--	No	Aroclor data used to evaluate chemical
PCB-37	38444-90-5	0.0000015	J	0.044		mg/kg	SB407 (7/15/2021)	0 - 0.5	30/30	100%	N/A	0.044	MDC	N/A	See Aroclors		N/A	N/A	--	No	Aroclor data used to evaluate chemical
PCB-38	53555-66-1	0.0000017	J	0.000011		mg/kg	SA-SB318 (11/8/2019)	0 - 0.5	7/30	23%	0.0000019 – 0.0013	0.000011	MDC	N/A	See Aroclors		N/A	N/A	--	No	Aroclor data used to evaluate chemical
PCB-39	38444-88-1	0.00000075	J	0.0000021		mg/kg	SA-SB320 (11/25/2019)	0 - 0.5	4/30	13%	0.000002 – 0.0013	0.0000021	MDC	N/A	See Aroclors		N/A	N/A	--	No	Aroclor data used to evaluate chemical
PCB-4	13029-08-8	0.0000059		0.0019		mg/kg	SB407 (7/15/2021)	0 - 0.5	24/30	80%	0.000002 – 0.0013	0.0019	MDC	N/A	See Aroclors		N/A	N/A	--	No	Aroclor data used to evaluate chemical
PCB-40	38444-93-8	0.0000032		0.00045		mg/kg	SA-SB327 (11/15/2019)	0 - 0.5	14/14	100%	N/A	0.00045	MDC	N/A	See Aroclors		N/A	N/A	--	No	Aroclor data used to evaluate chemical
PCB-40/41/71	38444-93-8/526~	0.000029		0.029		mg/kg	SB407 (7/15/2021)	0 - 0.5	8/9	89%	0.000027 – 0.000027	0.029	MDC	N/A	See Aroclors		N/A	N/A	--	No	Aroclor data used to evaluate chemical
PCB-40/71	NOB20161110_001	0.000053	J	0.012		mg/kg	SA-SB322 (11/22/2019)	0 - 0.5	7/7	100%	N/A	0.012	MDC	N/A	See Aroclors		N/A	N/A	--	No	Aroclor data used to evaluate chemical
PCB-41	52663-59-9	0.0000057	J	0.0022		mg/kg	SA-SB322 (11/22/2019)	0 - 0.5	5/7	71%	0.00022 – 0.0013	0.0022	MDC	N/A	See Aroclors		N/A	N/A	--	No	Aroclor data used to evaluate chemical
PCB-41/64/71/72	52663-59-9/526~	0.000025		0.0034		mg/kg	SA-SB366 (11/15/2019)	0 - 0.5	14/14	100%	N/A	0.0034	MDC	N/A	See Aroclors		N/A	N/A	--	No	Aroclor data used to evaluate chemical
PCB-42	36559-22-5	0.000018		0.014		mg/kg	SB407 (7/15/2021)	0 - 0.5	14/16	88%	0.000009 – 0.0013	0.014	MDC	N/A	See Aroclors		N/A	N/A	--	No	Aroclor data used to evaluate chemical
PCB-42/59	36559-22-5/744~	0.00001		0.0011		mg/kg	SA-SB327 (11/15/2019)	0 - 0.5	14/14	100%	N/A	0.0011	MDC	N/A	See Aroclors		N/A	N/A	--	No	Aroclor data used to evaluate chemical
PCB-43	70362-46-8	0.0000011	J	0.0013		mg/kg	SA-SB322 (11/22/2019)	0 - 0.5	6/16	38%	0.000009 – 0.0013	0.0013	MDC	N/A	See Aroclors		N/A	N/A	--	No	Aroclor data used to evaluate chemical
PCB-43/49	70362-46-8/414~	0.000026		0.0044		mg/kg	SA-SB327 (11/15/2019)	0 - 0.5	14/14	100%	N/A	0.0044	MDC	N/A	See Aroclors		N/A	N/A	--	No	Aroclor data used to evaluate chemical

Table A-2.1
Occurrence, Distribution, and Selection of Constituents of Interest (Direct Contact – Site-Wide; Surface Soil, 0 – 0.5 feet)
Reasonable Maximum Exposure
Human Health Risk Assessment
Shaffer Equipment/Arbuckle Creek Area Superfund Site, Minden, West Virginia

Scenario Timeframe: Current and Future
Medium: Soil
Exposure Medium: Soil
Exposure Point: Soil (0 – 0.5 feet)

Chemical	CASRN	Minimum Detected Concentration		Maximum Detected Concentration		Units	Location of Maximum	Depth (ft bgs)	Detection Frequency		Range of Reporting Limits	Screening Concentration		Background Value	Screening Level [1, 2]		Source	Potential ARAR [3]	Source	COPC Flag (Yes/No)	Rationale for Selection/Deletion
PCB-44	41464-39-5	0.000013		0.0036		mg/kg	SA-SB327 (11/15/2019)	0 - 0.5	14/14	100%	N/A	0.0036	MDC	N/A	See Aroclors		N/A	N/A	--	No	Aroclor data used to evaluate chemical
PCB-44/47/65	41464-39-5/243~	0.000075		0.042		mg/kg	SB407 (7/15/2021)	0 - 0.5	14/16	88%	0.000027 – 0.004	0.042	MDC	N/A	See Aroclors		N/A	N/A	--	No	Aroclor data used to evaluate chemical
PCB-45	70362-45-7	0.0000044		0.00049		mg/kg	SA-SB327 (11/15/2019)	0 - 0.5	14/14	100%	N/A	0.00049	MDC	N/A	See Aroclors		N/A	N/A	--	No	Aroclor data used to evaluate chemical
PCB-45/51	70362-45-7/681~	0.0000069	J	0.0075		mg/kg	SB407 (7/15/2021)	0 - 0.5	15/16	94%	0.000018 – 0.000018	0.0075	MDC	N/A	See Aroclors		N/A	N/A	--	No	Aroclor data used to evaluate chemical
PCB-46	41464-47-5	0.0000018	J	0.0015		mg/kg	SB407 (7/15/2021)	0 - 0.5	27/30	90%	0.000009 – 0.0013	0.0015	MDC	N/A	See Aroclors		N/A	N/A	--	No	Aroclor data used to evaluate chemical
PCB-47	2437-79-8	0.00001		0.0017		mg/kg	SA-SB327 (11/15/2019)	0 - 0.5	14/14	100%	N/A	0.0017	MDC	N/A	See Aroclors		N/A	N/A	--	No	Aroclor data used to evaluate chemical
PCB-48	70362-47-9	0.00000083	J	0.013		mg/kg	SB407 (7/15/2021)	0 - 0.5	13/16	81%	0.000018 – 0.0013	0.013	MDC	N/A	See Aroclors		N/A	N/A	--	No	Aroclor data used to evaluate chemical
PCB-48/75	70362-47-9/325~	0.0000036	J	0.00041		mg/kg	SA-SB328 (11/15/2019)	0 - 0.5	14/14	100%	N/A	0.00041	MDC	N/A	See Aroclors		N/A	N/A	--	No	Aroclor data used to evaluate chemical
PCB-49/69	41464-40-8/602~	0.0000023	J	0.03		mg/kg	SB407 (7/15/2021)	0 - 0.5	16/16	100%	N/A	0.03	MDC	N/A	See Aroclors		N/A	N/A	--	No	Aroclor data used to evaluate chemical
PCB-5	16605-91-7	0.0000066		0.00022		mg/kg	SA-SB318 (11/8/2019)	0 - 0.5	4/30	13%	0.0000019 – 0.0013	0.00022	MDC	N/A	See Aroclors		N/A	N/A	--	No	Aroclor data used to evaluate chemical
PCB-50	62796-65-0	0.0000017	J	0.0000087		mg/kg	SA-SB327 (11/15/2019)	0 - 0.5	7/14	50%	0.000002 – 0.000002	0.0000087	MDC	N/A	See Aroclors		N/A	N/A	--	No	Aroclor data used to evaluate chemical
PCB-50/53	62796-65-0/414~	0.0000054	J	0.0057		mg/kg	SB407 (7/15/2021)	0 - 0.5	14/16	88%	0.000018 – 0.0027	0.0057	MDC	N/A	See Aroclors		N/A	N/A	--	No	Aroclor data used to evaluate chemical
PCB-51	68194-04-7	0.0000012	J	0.00016		mg/kg	SA-SB327 (11/15/2019)	0 - 0.5	14/14	100%	N/A	0.00016	MDC	N/A	See Aroclors		N/A	N/A	--	No	Aroclor data used to evaluate chemical
PCB-52	35693-99-3	0.00016		0.044		mg/kg	SB407 (7/15/2021)	0 - 0.5	15/16	94%	0.000009 – 0.000009	0.044	MDC	N/A	See Aroclors		N/A	N/A	--	No	Aroclor data used to evaluate chemical
PCB-52/69	35693-99-3/602~	0.00003		0.019		mg/kg	SA-SB366 (11/15/2019)	0 - 0.5	14/14	100%	N/A	0.019	MDC	N/A	See Aroclors		N/A	N/A	--	No	Aroclor data used to evaluate chemical
PCB-53	41464-41-9	0.0000037		0.00042		mg/kg	SA-SB327 (11/15/2019)	0 - 0.5	14/14	100%	N/A	0.00042	MDC	N/A	See Aroclors		N/A	N/A	--	No	Aroclor data used to evaluate chemical
PCB-54	15968-05-5	0.00000095	J	0.0001		mg/kg	SB407 (7/15/2021)	0 - 0.5	15/30	50%	0.0000019 – 0.0013	0.0001	MDC	N/A	See Aroclors		N/A	N/A	--	No	Aroclor data used to evaluate chemical
PCB-55	74338-24-2	0.00000083	J	0.00096		mg/kg	SA-SB322 (11/22/2019)	0 - 0.5	21/30	70%	0.0000019 – 0.0013	0.00096	MDC	N/A	See Aroclors		N/A	N/A	--	No	Aroclor data used to evaluate chemical
PCB-56	41464-43-1	0.000037		0.017		mg/kg	SA-SB322 (11/22/2019)	0 - 0.5	13/16	81%	0.000009 – 0.000018	0.017	MDC	N/A	See Aroclors		N/A	N/A	--	No	Aroclor data used to evaluate chemical
PCB-56/60	41464-43-1/330~	0.000017		0.0044		mg/kg	SA-SB327 (11/15/2019)	0 - 0.5	14/14	100%	N/A	0.0044	MDC	N/A	See Aroclors		N/A	N/A	--	No	Aroclor data used to evaluate chemical
PCB-57	70424-67-8	0.0000012	J	0.000079	J	mg/kg	SA-SB322 (11/22/2019)	0 - 0.5	14/30	47%	0.0000019 – 0.0013	0.000079	MDC	N/A	See Aroclors		N/A	N/A	--	No	Aroclor data used to evaluate chemical
PCB-58	41464-49-7	0.00000071	J	0.0018		mg/kg	SB403 (7/16/2021)	0 - 0.5	13/30	43%	0.0000019 – 0.0013	0.0018	MDC	N/A	See Aroclors		N/A	N/A	--	No	Aroclor data used to evaluate chemical
PCB-59/62/75	74472-33-6/542~	0.0000052	J	0.004		mg/kg	SB407 (7/15/2021)	0 - 0.5	13/16	81%	0.000027 – 0.004	0.004	MDC	N/A	See Aroclors		N/A	N/A	--	No	Aroclor data used to evaluate chemical
PCB-6	25569-80-6	0.0000056		0.0046		mg/kg	SB407 (7/15/2021)	0 - 0.5	23/30	77%	0.000002 – 0.0013	0.0046	MDC	N/A	See Aroclors		N/A	N/A	--	No	Aroclor data used to evaluate chemical
PCB-60	33025-41-1	0.000017		0.011		mg/kg	SA-SB322 (11/22/2019)	0 - 0.5	12/16	75%	0.000009 – 0.000018	0.011	MDC	N/A	See Aroclors		N/A	N/A	--	No	Aroclor data used to evaluate chemical
PCB-61/70	33284-53-6/325~	0.000025		0.1		mg/kg	SB407 (7/15/2021)	0 - 0.5	22/23	96%	0.000036 – 0.000036	0.1	MDC	N/A	See Aroclors		N/A	N/A	--	No	Aroclor data used to evaluate chemical
PCB-61/70/74/76	TTNUS817	0.00041	J	0.04		mg/kg	SA-SB322 (11/22/2019)	0 - 0.5	7/7	100%	N/A	0.04	MDC	N/A	See Aroclors		N/A	N/A	--	No	Aroclor data used to evaluate chemical
PCB-62	54230-22-7	N/A		N/A		mg/kg	N/A	N/A	0/14	0%	0.000002 – 0.000002	0.000002	CRQL	N/A	See Aroclors		N/A	N/A	--	No	Aroclor data used to evaluate chemical
PCB-63	74472-34-7	0.0000054	J	0.0015		mg/kg	SA-SB322 (11/22/2019)	0 - 0.5	26/30	87%	0.000002 – 0.0013	0.0015	MDC	N/A	See Aroclors		N/A	N/A	--	No	Aroclor data used to evaluate chemical
PCB-64	52663-58-8	0.0000018	J	0.023		mg/kg	SB407 (7/15/2021)	0 - 0.5	16/16	100%	N/A	0.023	MDC	N/A	See Aroclors		N/A	N/A	--	No	Aroclor data used to evaluate chemical
PCB-65	33284-54-7	N/A		N/A		mg/kg	N/A	N/A	0/14	0%	0.000002 – 0.000002	0.000002	CRQL	N/A	See Aroclors		N/A	N/A	--	No	Aroclor data used to evaluate chemical
PCB-66	32598-10-0	0.00012		0.069		mg/kg	SB407 (7/15/2021)	0 - 0.5	15/16	94%	0.000009 – 0.000009	0.069	MDC	N/A	See Aroclors		N/A	N/A	--	No	Aroclor data used to evaluate chemical
PCB-66/76	32598-10-0/703~	0.000031		0.01		mg/kg	SA-SB366 (11/15/2019)	0 - 0.5	14/14	100%	N/A	0.01	MDC	N/A	See Aroclors		N/A	N/A	--	No	Aroclor data used to evaluate chemical
PCB-67	73575-53-8	0.0000038		0.001		mg/kg	SA-SB322 (11/22/2019)	0 - 0.5	25/30	83%	0.000002 – 0.0013	0.001	MDC	N/A	See Aroclors		N/A	N/A	--	No	Aroclor data used to evaluate chemical
PCB-68	73575-52-7	0.00000076	J	0.000046		mg/kg	SA-SB366 (11/15/2019)	0 - 0.5	22/30	73%	0.000002 – 0.0013	0.000046	MDC	N/A	See Aroclors		N/A	N/A	--	No	Aroclor data used to evaluate chemical
PCB-7	33284-50-3	0.0000015	J	0.00054		mg/kg	SB407 (7/15/2021)	0 - 0.5	21/30	70%	0.0000019 – 0.0013	0.00054	MDC	N/A	See Aroclors		N/A	N/A	--	No	Aroclor data used to evaluate chemical
PCB-72	41464-42-0	0.0000018	J	0.00019	J	mg/kg	SA-SB322 (11/22/2019)	0 - 0.5	9/16	56%	0.000009 – 0.0013	0.00019	MDC	N/A	See Aroclors		N/A	N/A	--	No	Aroclor data used to evaluate chemical
PCB-73	74338-23-1	0.0000011	J	0.000018		mg/kg	SA-SB317 (11/8/2019)	0 - 0.5	9/30	30%	0.0000019 – 0.0013	0.000018	MDC	N/A	See Aroclors		N/A	N/A	--	No	Aroclor data used to evaluate chemical
PCB-74	32690-93-0	0.000013		0.0033		mg/kg	SA-SB327 (11/15/2019)	0 - 0.5	14/14	100%	N/A	0.0033	MDC	N/A	See Aroclors		N/A	N/A	--	No	Aroclor data used to evaluate chemical
PCB-77	32598-13-3	0.000006		0.0075	J	mg/kg	SB407 (7/15/2021)	0 - 0.5	29/30	97%	0.0000018 – 0.0000018	0.0075	MDC	N/A	See TEQ		N/A	N/A	--	No	TEQ used to evaluate chemical
PCB-78	70362-49-1	0.0000015	J	0.0000083		mg/kg	SA-SB318 (11/8/2019)	0 - 0.5	6/30	20%	0.0000019 – 0.0013	0.0000083	MDC	N/A	See Aroclors		N/A	N/A	--	No	Aroclor data used to evaluate chemical
PCB-79	41464-48-6	0.0000035		0.00017		mg/kg	SA-SB366 (11/15/2019)	0 - 0.5	17/30	57%	0.000002 – 0.0013	0.00017	MDC	N/A	See Aroclors		N/A	N/A	--	No	Aroclor data used to evaluate chemical
PCB-8	34883-43-7	0.000002		0.021		mg/kg	SB407 (7/15/2021)	0 - 0.5	29/30	97%	0.000009 – 0.000009	0.021	MDC	N/A	See Aroclors		N/A	N/A	--	No	Aroclor data used to evaluate chemical
PCB-80	33284-52-5	0.000065	J+	0.000065	J+	mg/kg	SB404 (7/16/2021)	0 - 0.5	1/30	3%	0.0000019 – 0.0013	0.000065	MDC	N/A	See Aroclors		N/A	N/A	--	No	Aroclor data used to evaluate chemical
PCB-81	70362-50-4	0.00000098	J	0.00097		mg/kg	SA-SB366 (11/15/2019)	0 - 0.5	24/30	80%	0.0000038 – 0.00029	0.00097	MDC	N/A	See TEQ		N/A	N/A	--	No	TEQ used to evaluate chemical
PCB-82	52663-62-4	0.0000014	J	0.0041		mg/kg	SA-SB322 (11/22/2019)	0 - 0.5	27/30	90%	0.000018 – 0.0013	0.0041	MDC	N/A	See Aroclors		N/A	N/A	--	No	Aroclor data used to evaluate chemical
PCB-83	60145-20-2	0.00004	J	0.0024		mg/kg	SA-SB322 (11/22/2019)	0 - 0.5	7/7	100%	N/A	0.0024	MDC	N/A	See Aroclors		N/A	N/A	--	No	Aroclor data used to evaluate chemical
PCB-83/112	60145-20-2/744~	0.0000084		0.0012		mg/kg	SA-SB366 (11/15/2019)	0 - 0.5	13/14	93%	0.000004 – 0.000004	0.0012	MDC	N/A	See Aroclors		N/A	N/A	--	No	Aroclor data used to evaluate chemical
PCB-83/99	60145-20-2/383~	0.000065		0.018		mg/kg	SB407 (7/15/2021)	0 - 0.5	8/9	89%	0.000018 – 0.000018	0.018	MDC	N/A	See Aroclors		N/A	N/A	--	No	Aroclor data used to evaluate chemical
PCB-84	52663-60-2	0.0000027	J	0.0076		mg/kg	SB407 (7/15/2021)	0 - 0.5	16/16	100%	N/A	0.0076	MDC	N/A	See Aroclors		N/A	N/A	--	No	Aroclor data used to evaluate chemical
PCB-84/92	52663-60-2/526~	0.000022		0.046		mg/kg	SA-SB366 (11/15/2019)	0 - 0.5	14/14	100%	N/A	0.046	MDC	N/A	See Aroclors		N/A	N/A	--	No	Aroclor data used to evaluate chemical
PCB-85/116	65510-45-4/182~	0.000011		0.012		mg/kg	SB407 (7/15/2021)	0 - 0.5	22/23	96%	0.000027 – 0.000027	0.012	MDC	N/A	See Aroclors		N/A	N/A	--	No	Aroclor data used to evaluate chemical
PCB-85/116/117	TTNUS799	0.00016	J	0.0056		mg/kg	SA-SB322 (11/22/2019)	0 - 0.5	6/7	86%	0.004 – 0.004	0.0056	MDC	N/A	See Aroclors		N/A	N/A	--	No	Aroclor data used to evaluate chemical
PCB-86	55312-69-1	0.0000036		0.0000036		mg/kg	SA-SB311 (11/7/2019)	0 - 0.5	1/14	7%	0.000002 – 0.000002	0.0000036	MDC	N/A	See Aroclors		N/A	N/A	--	No	Aroclor data used to evaluate chemical
PCB-86/87/97/109/119/125	55312-69-1/383~	0.000084		0.031		mg/kg	SB407 (7/15/2021)	0 - 0.5	15/16	94%	0.000054 – 0.000054	0.031	MDC	N/A	See Aroclors		N/A	N/A	--	No	Aroclor data used to evaluate chemical

Table A-2.1
Occurrence, Distribution, and Selection of Constituents of Interest (Direct Contact – Site-Wide; Surface Soil, 0 – 0.5 feet)
Reasonable Maximum Exposure
Human Health Risk Assessment
Shaffer Equipment/Arbuckle Creek Area Superfund Site, Minden, West Virginia

Scenario Timeframe: Current and Future
Medium: Soil
Exposure Medium: Soil
Exposure Point: Soil (0 – 0.5 feet)

Chemical	CASRN	Minimum Detected Concentration		Maximum Detected Concentration		Units	Location of Maximum	Depth (ft bgs)	Detection Frequency		Range of Reporting Limits	Screening Concentration		Background Value	Screening Level [1, 2]		Source	Potential ARAR [3]	Source	COPC Flag (Yes/No)	Rationale for Selection/Deletion
PCB-87/117/125	38380-02-8/681~	0.000017		0.048		mg/kg	SA-SB366 (11/15/2019)	0 - 0.5	14/14	100%	N/A	0.048	MDC	N/A	See Aroclors		N/A	N/A	--	No	Aroclor data used to evaluate chemical
PCB-88/91	55215-17-3/681~	0.0000016	J	0.0044		mg/kg	SA-SB322 (11/22/2019)	0 - 0.5	29/30	97%	0.0027 – 0.0027	0.0044	MDC	N/A	See Aroclors		N/A	N/A	--	No	Aroclor data used to evaluate chemical
PCB-89	73575-57-2	0.0000048		0.00045		mg/kg	SA-SB322 (11/22/2019)	0 - 0.5	11/30	37%	0.000002 – 0.0013	0.00045	MDC	N/A	See Aroclors		N/A	N/A	--	No	Aroclor data used to evaluate chemical
PCB-9	34883-39-1	0.0000018	J	0.0011		mg/kg	SB407 (7/15/2021)	0 - 0.5	21/30	70%	0.000002 – 0.0013	0.0011	MDC	N/A	See Aroclors		N/A	N/A	--	No	Aroclor data used to evaluate chemical
PCB-90/101	68194-07-0/376~	0.000067		0.13		mg/kg	SB407 (7/15/2021)	0 - 0.5	9/9	100%	N/A	0.13	MDC	N/A	See Aroclors		N/A	N/A	--	No	Aroclor data used to evaluate chemical
PCB-90/101/113	TTNUS619	0.0013	J	0.16		mg/kg	SA-SB325 (11/22/2019)	0 - 0.5	7/7	100%	N/A	0.16	MDC	N/A	See Aroclors		N/A	N/A	--	No	Aroclor data used to evaluate chemical
PCB-92	52663-61-3	0.000015		0.017		mg/kg	Multiple Locations	N/A	16/16	100%	N/A	0.017	MDC	N/A	See Aroclors		N/A	N/A	--	No	Aroclor data used to evaluate chemical
PCB-93	73575-56-1	N/A		N/A		mg/kg	N/A	N/A	0/14	0%	0.000002 – 0.000002	0.000002	CRQL	N/A	See Aroclors		N/A	N/A	--	No	Aroclor data used to evaluate chemical
PCB-93/100	73575-56-1/394~	0.0000039		0.0004	J	mg/kg	SA-SB322 (11/22/2019)	0 - 0.5	5/7	71%	0.00043 – 0.0027	0.0004	MDC	N/A	See Aroclors		N/A	N/A	--	No	Aroclor data used to evaluate chemical
PCB-93/95/98/100/102	73575-56-1/383~	0.00017		0.067		mg/kg	SB407 (7/15/2021)	0 - 0.5	8/9	89%	0.000045 – 0.000045	0.067	MDC	N/A	See Aroclors		N/A	N/A	--	No	Aroclor data used to evaluate chemical
PCB-94	73575-55-0	0.00000056	J	0.00019	J	mg/kg	SA-SB322 (11/22/2019)	0 - 0.5	18/30	60%	0.000002 – 0.0013	0.00019	MDC	N/A	See Aroclors		N/A	N/A	--	No	Aroclor data used to evaluate chemical
PCB-95	38379-99-6	0.000066		0.18		mg/kg	SA-SB366 (11/15/2019)	0 - 0.5	21/21	100%	N/A	0.18	MDC	N/A	See Aroclors		N/A	N/A	--	No	Aroclor data used to evaluate chemical
PCB-96	73575-54-9	0.0000004	J	0.00026		mg/kg	SB407 (7/15/2021)	0 - 0.5	23/30	77%	0.000002 – 0.0013	0.00026	MDC	N/A	See Aroclors		N/A	N/A	--	No	Aroclor data used to evaluate chemical
PCB-97	41464-51-1	0.000013		0.012		mg/kg	SA-SB366 (11/15/2019)	0 - 0.5	14/14	100%	N/A	0.012	MDC	N/A	See Aroclors		N/A	N/A	--	No	Aroclor data used to evaluate chemical
PCB-98/102	60233-25-2/681~	0.000016		0.0012		mg/kg	SA-SB322 (11/22/2019)	0 - 0.5	6/21	29%	0.000004 – 0.0027	0.0012	MDC	N/A	See Aroclors		N/A	N/A	--	No	Aroclor data used to evaluate chemical
PCB-99	38380-01-7	0.000019		0.016		mg/kg	SA-SB366 (11/15/2019)	0 - 0.5	21/21	100%	N/A	0.016	MDC	N/A	See Aroclors		N/A	N/A	--	No	Aroclor data used to evaluate chemical
PCBC TEQ MAMMAL HALFND	CALC029P	8.32E-08		1.13E-04		mg/kg	SA-SB322 (11/22/2019)	0 - 0.5	30/30	100%	N/A	1.13E-04	MDC	N/A	4.80E-06	*	RSL	N/A	--	Yes	MDC > SL (CRQL N/A)
Total DiCB	25512-42-9	0.000024	J	0.076	J	mg/kg	SB407 (7/15/2021)	0 - 0.5	29/30	97%	0.00011 – 0.00011	0.076	MDC	N/A	N/A		N/A	N/A	--	No	Qualitative Evaluation
Total HpCB	28655-71-2	0.00093	J	3.8	J	mg/kg	SA-SB366 (11/15/2019)	0 - 0.5	30/30	100%	N/A	3.8	MDC	N/A	N/A		N/A	N/A	--	No	Qualitative Evaluation
Total HxCB	26601-64-9	0.001	J	4	J	mg/kg	SA-SB366 (11/15/2019)	0 - 0.5	30/30	100%	N/A	4	MDC	N/A	N/A		N/A	N/A	--	No	Qualitative Evaluation
Total MoCB	27323-18-8	0.00001	J	0.0025	J	mg/kg	SB407 (7/15/2021)	0 - 0.5	27/30	90%	0 – 0.000027	0.0025	MDC	N/A	N/A		N/A	N/A	--	No	Qualitative Evaluation
Total NoCB	53742-07-7	0.000023	J	0.054	J	mg/kg	SA-SB325 (11/22/2019)	0 - 0.5	30/30	100%	N/A	0.054	MDC	N/A	N/A		N/A	N/A	--	No	Qualitative Evaluation
Total OcCB	55722-26-4	0.00023	J	0.81	J	mg/kg	SA-SB366 (11/15/2019)	0 - 0.5	30/30	100%	N/A	0.81	MDC	N/A	N/A		N/A	N/A	--	No	Qualitative Evaluation
Total PeCB	25429-29-2	0.00025	J	1.1	J	mg/kg	SA-SB366 (11/15/2019)	0 - 0.5	30/30	100%	N/A	1.1	MDC	N/A	N/A		N/A	N/A	--	No	Qualitative Evaluation
Total TeCB	26914-33-0	0.000036	J	0.39	J	mg/kg	SB407 (7/15/2021)	0 - 0.5	30/30	100%	N/A	0.39	MDC	N/A	N/A		N/A	N/A	--	No	Qualitative Evaluation
Total TrCB	25323-68-6	0.000012	J	0.32	J	mg/kg	SB407 (7/15/2021)	0 - 0.5	30/30	100%	N/A	0.32	MDC	N/A	N/A		N/A	N/A	--	No	Qualitative Evaluation
TOTAL PCB HOMOLOGS HALFND	CALCHOMOL	0.00296238		9.82831		mg/kg	SA-SB366 (11/15/2019)	0 - 0.5	30/30	100%	N/A	9.82831	MDC	N/A	N/A		N/A	N/A	--	No	Qualitative Evaluation
Dioxins and Furans																					
1,2,3,4,6,7,8,9-Octachlorodibenzofuran	39001-02-0	0.0000017	J	0.00077		mg/kg	SA-SB327 (11/15/2019)	0 - 0.5	24/24	100%	N/A	0.00077	MDC	N/A	See TEQ		N/A	N/A	--	No	TEQ used to evaluate chemical
1,2,3,4,6,7,8,9-Octachlorodibenzo-p-dioxin	3268-87-9	0.000059		0.0071	J	mg/kg	SA-SB327 (11/15/2019)	0 - 0.5	24/24	100%	N/A	0.0071	MDC	N/A	See TEQ		N/A	N/A	--	No	TEQ used to evaluate chemical
1,2,3,4,6,7,8-Heptachlorodibenzofuran	67562-39-4	0.00000085	J	0.00012		mg/kg	SA-SB327 (11/15/2019)	0 - 0.5	23/24	96%	0.0000023 – 0.0000023	0.00012	MDC	N/A	See TEQ		N/A	N/A	--	No	TEQ used to evaluate chemical
1,2,3,4,6,7,8-Heptachlorodibenzo-p-dioxin	35822-46-9	0.000003	J	0.00064		mg/kg	SA-SB327 (11/15/2019)	0 - 0.5	24/24	100%	N/A	0.00064	MDC	N/A	See TEQ		N/A	N/A	--	No	TEQ used to evaluate chemical
1,2,3,4,7,8,9-Heptachlorodibenzofuran	55673-89-7	0.00000047	J	0.000015		mg/kg	SA-SB366 (11/15/2019)	0 - 0.5	19/24	79%	0.0000002 – 0.0000023	0.000015	MDC	N/A	See TEQ		N/A	N/A	--	No	TEQ used to evaluate chemical
1,2,3,4,7,8-Hexachlorodibenzofuran	70648-26-9	0.0000011	J	0.00009		mg/kg	SA-SB321 (11/25/2019)	0 - 0.5	23/24	96%	0.00000024 – 0.00000024	0.00009	MDC	N/A	See TEQ		N/A	N/A	--	No	TEQ used to evaluate chemical
1,2,3,4,7,8-Hexachlorodibenzo-p-dioxin	39227-28-6	0.00000029	JZ	0.0000055		mg/kg	SA-SB327 (11/15/2019)	0 - 0.5	15/24	63%	0.00000031 – 0.0000015	0.0000055	MDC	N/A	See TEQ		N/A	N/A	--	No	TEQ used to evaluate chemical
1,2,3,6,7,8-Hexachlorodibenzofuran	57117-44-9	0.00000055	J	0.000019		mg/kg	SA-SB311 (11/7/2019)	0 - 0.5	20/24	83%	0.0000003 – 0.0000019	0.000019	MDC	N/A	See TEQ		N/A	N/A	--	No	TEQ used to evaluate chemical
1,2,3,6,7,8-Hexachlorodibenzo-p-dioxin	57653-85-7	0.00000034	J	0.000016		mg/kg	SA-SB327 (11/15/2019)	0 - 0.5	20/24	83%	0.0000011 – 0.0000013	0.000016	MDC	N/A	See TEQ		N/A	N/A	--	No	TEQ used to evaluate chemical
1,2,3,7,8,9-Hexachlorodibenzofuran	72918-21-9	0.00000033	J	0.000012		mg/kg	SA-SB327 (11/15/2019)	0 - 0.5	7/24	29%	0.00000021 – 0.0000015	0.000012	MDC	N/A	See TEQ		N/A	N/A	--	No	TEQ used to evaluate chemical
1,2,3,7,8,9-Hexachlorodibenzo-p-dioxin	19408-74-3	0.00000055	JZ	0.000011		mg/kg	SA-SB327 (11/15/2019)	0 - 0.5	14/24	58%	0.00000032 – 0.0000024	0.000011	MDC	N/A	See TEQ		N/A	N/A	--	No	TEQ used to evaluate chemical
1,2,3,7,8-Pentachlorodibenzofuran	57117-41-6	0.00000067	J	0.00021		mg/kg	SA-SB321 (11/25/2019)	0 - 0.5	17/24	71%	0.00000021 – 0.0000017	0.00021	MDC	N/A	See TEQ		N/A	N/A	--	No	TEQ used to evaluate chemical
1,2,3,7,8-Pentachlorodibenzo-p-dioxin	40321-76-4	0.00000034	J	0.0000042	Z	mg/kg	SA-SB324 (11/22/2019)	0 - 0.5	16/24	67%	0.00000018 – 0.0000019	0.0000042	MDC	N/A	See TEQ		N/A	N/A	--	No	TEQ used to evaluate chemical
2,3,4,6,7,8-Hexachlorodibenzofuran	60851-34-5	0.00000068	J	0.000021		mg/kg	SA-SB311 (11/7/2019)	0 - 0.5	21/24	88%	0.00000029 – 0.00000099	0.000021	MDC	N/A	See TEQ		N/A	N/A	--	No	TEQ used to evaluate chemical
2,3,4,7,8-Pentachlorodibenzofuran	57117-31-4	0.00000082	J	0.00026		mg/kg	SA-SB366 (11/15/2019)	0 - 0.5	21/24	88%	0.00000024 – 0.00000091	0.00026	MDC	N/A	See TEQ		N/A	N/A	--	No	TEQ used to evaluate chemical
2,3,7,8-Tetrachlorodibenzofuran	51207-31-9	0.0000002	J	0.000027		mg/kg	SA-SB366 (11/15/2019)	0 - 0.5	24/24	100%	N/A	0.000027	MDC	N/A	See TEQ		N/A	N/A	--	No	TEQ used to evaluate chemical
2,3,7,8-Tetrachlorodibenzo-p-dioxin	1746-01-6	0.00000024	J	0.000001		mg/kg	SA-SB311 (11/7/2019)	0 - 0.5	11/24	46%	0.000000097 – 0.00000049	0.000001	MDC	N/A	See TEQ		N/A	0.0000052	WVDEP	No	TEQ used to evaluate chemical
DIOXIN TEQ MAMMAL HALFND	CALC029D	9.41E-07		9.00E-05		mg/kg	SA-SB366 (11/15/2019)	0 - 0.5	24/24	100%	N/A	9.00E-05	MDC	N/A	4.80E-06	*	RSL	N/A	--	Yes	MDC > SL (CRQL N/A)
Metals																					
Aluminum	7429-90-5	2260		15700		mg/kg	SA-SB319 (11/7/2019)	0 - 0.5	30/30	100%	N/A	15700	MDC	N/A	7700		RSL	77000	WVDEP	Yes	MDC > SL (CRQL N/A)
Antimony	7440-36-0	0.21	J	1.2		mg/kg	Multiple Locations	N/A	16/30	53%	1.1 – 8.2	1.2	MDC	N/A	3.1		RSL	31	WVDEP	No	MDC ≤ SL < CRQL
Arsenic	7440-38-2	1.9		14.6		mg/kg	SA-SB317 (11/8/2019)	0 - 0.5	30/30	100%	N/A	14.6	MDC	N/A	0.68		RSL	0.68	WVDEP	Yes	MDC > SL (CRQL N/A)
Barium	7440-39-3	37.1		222		mg/kg	SA-SB311 (11/7/2019)	0 - 0.5	30/30	100%	N/A	222	MDC	N/A	1500		RSL	15000	WVDEP	No	MDC ≤ SL (CRQL N/A)
Beryllium	7440-41-7	0.33	J	1.4		mg/kg	SA-SB317 (11/8/2019)	0 - 0.5	30/30	100%	N/A	1.4	MDC	N/A	16		RSL	160	WVDEP	No	MDC ≤ SL (CRQL N/A)
Cadmium	7440-43-9	0.1	J	0.5	J	mg/kg	SA-SB316 (11/8/2019)	0 - 0.5	26/30	87%	0.55 – 0.63	0.5	MDC	N/A	0.71		RSL	37	WVDEP	No	CRQL and MDC ≤ SL
Calcium	7440-70-2	776		23000		mg/kg	SB408 (7/16/2021)	0 - 0.5	29/30	97%	580 – 580	23000	MDC	N/A	Nutrient		N/A	Nutrient	--	No	Classified as an essential nutrient
Chromium	7440-47-3	6.6		18		mg/kg	SB451 (7/15/2021)	0 - 0.5	30/30	100%	N/A	18	MDC	N/A	0.3	*	RSL	0.3	WVDEP	Yes	MDC > SL (CRQL N/A)

Table A-2.1
Occurrence, Distribution, and Selection of Constituents of Interest (Direct Contact – Site-Wide; Surface Soil, 0 – 0.5 feet)
Reasonable Maximum Exposure
Human Health Risk Assessment
Shaffer Equipment/Arbuckle Creek Area Superfund Site, Minden, West Virginia

Scenario Timeframe: Current and Future
Medium: Soil
Exposure Medium: Soil
Exposure Point: Soil (0 – 0.5 feet)

Chemical	CASRN	Minimum Detected Concentration		Maximum Detected Concentration		Units	Location of Maximum	Depth (ft bgs)	Detection Frequency		Range of Reporting Limits	Screening Concentration		Background Value	Screening Level [1, 2]		Source	Potential ARAR [3]	Source	COPC Flag (Yes/No)	Rationale for Selection/Deletion
Cobalt	7440-48-4	2.9	J	23.6		mg/kg	SA-SB317 (11/8/2019)	0 - 0.5	30/30	100%	N/A	23.6	MDC	N/A	2.3		RSL	23	WVDEP	Yes	MDC > SL (CRQL N/A)
Copper	7440-50-8	3.7		129		mg/kg	SA-SB326 (11/15/2019)	0 - 0.5	30/30	100%	N/A	129	MDC	N/A	310		RSL	3100	WVDEP	No	MDC ≤ SL (CRQL N/A)
Iron	7439-89-6	5700		77700		mg/kg	SA-SB320 (11/25/2019)	0 - 0.5	30/30	100%	N/A	77700	MDC	N/A	5500		RSL	55000	WVDEP	Yes	MDC > SL (CRQL N/A)
Lead	7439-92-1	8.5		99.9		mg/kg	SA-SB319 (11/7/2019)	0 - 0.5	30/30	100%	N/A	99.9	MDC	N/A	400		RSL	400	WVDEP	No	MDC ≤ SL (CRQL N/A)
Magnesium	7439-95-4	549	J	4780		mg/kg	SA-SB320 (11/25/2019)	0 - 0.5	29/30	97%	580 – 580	4780	MDC	N/A	Nutrient		N/A	Nutrient	--	No	Classified as an essential nutrient
Manganese	7439-96-5	50		1140		mg/kg	SA-SB322 (11/22/2019)	0 - 0.5	30/30	100%	N/A	1140	MDC	N/A	180		RSL	1800	WVDEP	Yes	MDC > SL (CRQL N/A)
Mercury	7439-97-6	0.018	J	0.12		mg/kg	SA-SB313 (11/7/2019)	0 - 0.5	19/30	63%	0.11 – 0.13	0.12	MDC	N/A	1.1	*	RSL	3.1	WVDEP	No	CRQL and MDC ≤ SL
Nickel	7440-02-0	4.5		28.1		mg/kg	SA-SB318 (11/8/2019)	0 - 0.5	30/30	100%	N/A	28.1	MDC	N/A	150		RSL	1500	WVDEP	No	MDC ≤ SL (CRQL N/A)
Potassium	7440-09-7	624		3400		mg/kg	SA-SB319 (11/7/2019)	0 - 0.5	27/30	90%	579 – 664	3400	MDC	N/A	Nutrient		N/A	Nutrient	--	No	Classified as an essential nutrient
Selenium	7782-49-2	0.18	J	1.3	J	mg/kg	SA-SB319 (11/7/2019)	0 - 0.5	18/30	60%	2.8 – 4.8	1.3	MDC	N/A	39		RSL	390	WVDEP	No	CRQL and MDC ≤ SL
Silver	7440-22-4	0.053	J	0.19	J	mg/kg	SA-SB369 (11/21/2019)	0 - 0.5	9/30	30%	0.55 – 1.4	0.19	MDC	N/A	39		RSL	390	WVDEP	No	CRQL and MDC ≤ SL
Sodium	7440-23-5	8.5	J	172	J	mg/kg	SA-SB314 (11/7/2019)	0 - 0.5	14/30	47%	500 – 701	172	MDC	N/A	Nutrient		N/A	Nutrient	--	No	Classified as an essential nutrient
Thallium	7440-28-0	0.046	J	0.25	J	mg/kg	SA-SB327 (11/15/2019)	0 - 0.5	10/30	33%	0.55 – 3.4	0.25	MDC	N/A	0.078		RSL	0.78	WVDEP	Yes	MDC > SL
Vanadium	7440-62-2	5		25		mg/kg	SB406 (7/15/2021)	0 - 0.5	30/30	100%	N/A	25	MDC	N/A	39	*	RSL	460	WVDEP	No	MDC ≤ SL (CRQL N/A)
Zinc	7440-66-6	9.1		161		mg/kg	SA-SB369 (11/21/2019)	0 - 0.5	30/30	100%	N/A	161	MDC	N/A	2300		RSL	23000	WVDEP	No	MDC ≤ SL (CRQL N/A)
Cyanide																					
Cyanide	57-12-5	0.013	J	0.47	J	mg/kg	SA-SB319 (11/7/2019)	0 - 0.5	12/15	80%	0.53 – 0.63	0.47	MDC	N/A	2.3		RSL	N/A	--	No	CRQL and MDC ≤ SL

Notes:
% = Percent
ARAR = Applicable or Relevant and Appropriate Requirements
CASRN = Chemical Abstracts Service Registry Number
COPC = Chemical of Potential Concern
CRQL = Contract Required Quantitation Limit
ft bgs = feet below gound surface
J = Estimated Concentration (+/- indicates a positive or negative bia, respectively)
MDC = Maximum Detected Concentration
mg/kg = milligram per kilogram
N/A = Not Applicable
ND = Non-Detect or Not Detected
RSL = Regional Screening Level
SL = Screening Level
TEQ = Toxicity Equivalence
USEPA = United States Environmental Protection Agency
WVDEP = West Virginia Department of Environmental Protection
(1) Site data screened against USEPA Residential Soil RSLs, last updated November 2021 (TR = 1E-6, THQ = 0.1).
(2) An asterisk,"*", indicates surrogate toxicity information was used to derive a Screening Level (see **Table 2-4**).
(3) As indicated in the WVDEP Voluntary Remediation Program technical guidance, residential soil "De Minimis" values pursuant to 60CSR9 (effective 12/2/2021) were selected as potential ARARs.

Table A-2.2
Occurrence, Distribution, and Selection of Constituents of Interest (Direct Contact – Site-Wide; Near Surface Soil, 0.5 – 2 feet)
Reasonable Maximum Exposure
Human Health Risk Assessment
Shaffer Equipment/Arbuckle Creek Area Superfund Site, Minden, West Virginia

Scenario Timeframe: Current and Future
Medium: Soil
Exposure Medium: Soil
Exposure Point: Soil (0.5 – 2 feet)

Chemical	CASRN	Minimum Detected Concentration		Maximum Detected Concentration		Units	Location of Maximum	Depth (ft bgs)	Detection Frequency		Range of Reporting Limits	Screening Concentration		Background Value	Screening Level [1, 2]		Source	Potential ARAR [3]	Source	COPC Flag (Yes/No)	Rationale for Selection/Deletion
Volatile Organic Compounds (VOCs)																					
1,1,1-Trichloroethane	71-55-6	0.0016	J	0.14	J	mg/kg	SA-SB323 (11/22/2019)	0.5 - 2	2/20	10%	0.0041 – 0.0096	0.14	MDC	N/A	810		RSL	640	WVDEP	No	CRQL and MDC ≤ SL
1,1,2,2-Tetrachloroethane	79-34-5	N/A		N/A		mg/kg	N/A	N/A	0/20	0%	0.0041 – 0.44	0.44	CRQL	N/A	0.6		RSL	0.64	WVDEP	No	100% ND and CRQL ≤ SL
1,1,2-Trichloro-1,2,2-trifluoroethane	76-13-1	N/A		N/A		mg/kg	N/A	N/A	0/21	0%	0.0041 – 0.44	0.44	CRQL	N/A	670		RSL	910	WVDEP	No	100% ND and CRQL ≤ SL
1,1,2-Trichloroethane	79-00-5	N/A		N/A		mg/kg	N/A	N/A	0/20	0%	0.0041 – 0.44	0.44	CRQL	N/A	0.15		RSL	1.2	WVDEP	See Uncertainty	100% ND and CRQL > SL
1,1-Dichloroethane	75-34-3	N/A		N/A		mg/kg	N/A	N/A	0/21	0%	0.0041 – 0.44	0.44	CRQL	N/A	3.6		RSL	3.8	WVDEP	No	100% ND and CRQL ≤ SL
1,1-Dichloroethene	75-35-4	N/A		N/A		mg/kg	N/A	N/A	0/21	0%	0.0041 – 0.44	0.44	CRQL	N/A	23		RSL	240	WVDEP	No	100% ND and CRQL ≤ SL
1,2,3-Trichlorobenzene	87-61-6	N/A		N/A		mg/kg	N/A	N/A	0/15	0%	0.0041 – 0.44	0.44	CRQL	N/A	6.3		RSL	N/A	--	No	100% ND and CRQL ≤ SL
1,2,4-Trichlorobenzene	120-82-1	N/A		N/A		mg/kg	N/A	N/A	0/15	0%	0.0041 – 0.44	0.44	CRQL	N/A	5.8		RSL	24	WVDEP	No	100% ND and CRQL ≤ SL
1,2-Dibromo-3-chloropropane	96-12-8	N/A		N/A		mg/kg	N/A	N/A	0/15	0%	0.0041 – 0.44	0.44	CRQL	N/A	0.0053		RSL	0.0057	WVDEP	See Uncertainty	100% ND and CRQL > SL
1,2-Dibromoethane	106-93-4	N/A		N/A		mg/kg	N/A	N/A	0/20	0%	0.0041 – 0.44	0.44	CRQL	N/A	0.036		RSL	0.039	WVDEP	See Uncertainty	100% ND and CRQL > SL
1,2-Dichlorobenzene	95-50-1	N/A		N/A		mg/kg	N/A	N/A	0/15	0%	0.0041 – 0.44	0.44	CRQL	N/A	180		RSL	380	WVDEP	No	100% ND and CRQL ≤ SL
1,2-Dichloroethane	107-06-2	N/A		N/A		mg/kg	N/A	N/A	0/21	0%	0.0041 – 0.44	0.44	CRQL	N/A	0.46		RSL	0.5	WVDEP	No	100% ND and CRQL ≤ SL
1,2-Dichloropropane	78-87-5	N/A		N/A		mg/kg	N/A	N/A	0/20	0%	0.0041 – 0.44	0.44	CRQL	N/A	1.6		RSL	2.7	WVDEP	No	100% ND and CRQL ≤ SL
1,3-Dichlorobenzene	541-73-1	N/A		N/A		mg/kg	N/A	N/A	0/15	0%	0.0041 – 0.44	0.44	CRQL	N/A	180	*	RSL	N/A	--	No	100% ND and CRQL ≤ SL
1,4-Dichlorobenzene	106-46-7	N/A		N/A		mg/kg	N/A	N/A	0/15	0%	0.0041 – 0.44	0.44	CRQL	N/A	2.6		RSL	2.8	WVDEP	No	100% ND and CRQL ≤ SL
2-Butanone	78-93-3	N/A		N/A		mg/kg	N/A	N/A	0/21	0%	0.0083 – 0.88	0.88	CRQL	N/A	2700		RSL	28000	WVDEP	No	100% ND and CRQL ≤ SL
2-Hexanone	591-78-6	N/A		N/A		mg/kg	N/A	N/A	0/20	0%	0.0083 – 0.88	0.88	CRQL	N/A	20		RSL	N/A	--	No	100% ND and CRQL ≤ SL
4-Methyl-2-pentanone	108-10-1	N/A		N/A		mg/kg	N/A	N/A	0/20	0%	0.0083 – 0.88	0.88	CRQL	N/A	3300		RSL	3400	WVDEP	No	100% ND and CRQL ≤ SL
Acetone	67-64-1	0.0045	J	0.026		mg/kg	SA-SB327 (11/15/2019)	0.5 - 2	8/21	38%	0.0093 – 0.88	0.026	MDC	N/A	7000		RSL	61000	WVDEP	No	CRQL and MDC ≤ SL
Benzene	71-43-2	0.00089	J	0.0038	J	mg/kg	SA-SB316 (11/8/2019)	0.5 - 2	2/20	10%	0.0041 – 0.44	0.0038	MDC	N/A	1.2		RSL	1.2	WVDEP	No	CRQL and MDC ≤ SL
Bromochloromethane	74-97-5	N/A		N/A		mg/kg	N/A	N/A	0/21	0%	0.0041 – 0.44	0.44	CRQL	N/A	15		RSL	N/A	--	No	100% ND and CRQL ≤ SL
Bromodichloromethane	75-27-4	N/A		N/A		mg/kg	N/A	N/A	0/14	0%	0.0041 – 0.44	0.44	CRQL	N/A	0.29		RSL	0.31	WVDEP	See Uncertainty	100% ND and CRQL > SL
Bromoform	75-25-2	N/A		N/A		mg/kg	N/A	N/A	0/15	0%	0.0041 – 0.44	0.44	CRQL	N/A	19		RSL	20	WVDEP	No	100% ND and CRQL ≤ SL
Bromomethane	74-83-9	N/A		N/A		mg/kg	N/A	N/A	0/21	0%	0.0041 – 0.44	0.44	CRQL	N/A	0.68		RSL	7.3	WVDEP	No	100% ND and CRQL ≤ SL
Carbon disulfide	75-15-0	N/A		N/A		mg/kg	N/A	N/A	0/21	0%	0.0041 – 0.44	0.44	CRQL	N/A	77		RSL	740	WVDEP	No	100% ND and CRQL ≤ SL
Carbon tetrachloride	56-23-5	N/A		N/A		mg/kg	N/A	N/A	0/20	0%	0.0041 – 0.44	0.44	CRQL	N/A	0.65		RSL	0.7	WVDEP	No	100% ND and CRQL ≤ SL
Chlorobenzene	108-90-7	N/A		N/A		mg/kg	N/A	N/A	0/20	0%	0.0041 – 0.44	0.44	CRQL	N/A	28		RSL	290	WVDEP	No	100% ND and CRQL ≤ SL
Chloroethane	75-00-3	N/A		N/A		mg/kg	N/A	N/A	0/21	0%	0.0041 – 0.44	0.44	CRQL	N/A	540		RSL	2100	WVDEP	No	100% ND and CRQL ≤ SL
Chloroform	67-66-3	N/A		N/A		mg/kg	N/A	N/A	0/21	0%	0.0041 – 0.44	0.44	CRQL	N/A	0.32		RSL	0.34	WVDEP	See Uncertainty	100% ND and CRQL > SL
Chloromethane	74-87-3	N/A		N/A		mg/kg	N/A	N/A	0/21	0%	0.0041 – 0.44	0.44	CRQL	N/A	11		RSL	120	WVDEP	No	100% ND and CRQL ≤ SL
cis-1,2-Dichloroethene	156-59-2	N/A		N/A		mg/kg	N/A	N/A	0/21	0%	0.0041 – 0.44	0.44	CRQL	N/A	16		RSL	17	WVDEP	No	100% ND and CRQL ≤ SL
cis-1,3-Dichloropropene	10061-01-5	N/A		N/A		mg/kg	N/A	N/A	0/20	0%	0.0041 – 0.44	0.44	CRQL	N/A	1.8	*	RSL	N/A	--	No	100% ND and CRQL ≤ SL
Cyclohexane	110-82-7	N/A		N/A		mg/kg	N/A	N/A	0/20	0%	0.0041 – 0.44	0.44	CRQL	N/A	650		RSL	120	WVDEP	No	100% ND and CRQL ≤ SL
Dibromochloromethane	124-48-1	N/A		N/A		mg/kg	N/A	N/A	0/20	0%	0.0041 – 0.44	0.44	CRQL	N/A	8.3		RSL	8.3	WVDEP	No	100% ND and CRQL ≤ SL
Dichlorodifluoromethane	75-71-8	N/A		N/A		mg/kg	N/A	N/A	0/21	0%	0.0041 – 0.44	0.44	CRQL	N/A	8.7		RSL	94	WVDEP	No	100% ND and CRQL ≤ SL
Ethylbenzene	100-41-4	N/A		N/A		mg/kg	N/A	N/A	0/20	0%	0.0041 – 0.44	0.44	CRQL	N/A	5.8		RSL	6.2	WVDEP	No	100% ND and CRQL ≤ SL
Isopropylbenzene	98-82-8	N/A		N/A		mg/kg	N/A	N/A	0/20	0%	0.0041 – 0.44	0.44	CRQL	N/A	190		RSL	270	WVDEP	No	100% ND and CRQL ≤ SL
m,p-Xylene	179601-23-1	N/A		N/A		mg/kg	N/A	N/A	0/20	0%	0.0041 – 0.44	0.44	CRQL	N/A	58	*	RSL	N/A	--	No	100% ND and CRQL ≤ SL
Methyl acetate	79-20-9	N/A		N/A		mg/kg	N/A	N/A	0/21	0%	0.0041 – 0.44	0.44	CRQL	N/A	7800		RSL	23000	WVDEP	No	100% ND and CRQL ≤ SL
Methyl tert-butyl ether	1634-04-4	N/A		N/A		mg/kg	N/A	N/A	0/21	0%	0.0041 – 0.44	0.44	CRQL	N/A	47		RSL	50	WVDEP	No	100% ND and CRQL ≤ SL
Methylcyclohexane	108-87-2	0.0013	J	0.13	J	mg/kg	SA-SB323 (11/22/2019)	0.5 - 2	4/20	20%	0.0041 – 0.0096	0.13	MDC	N/A	650	*	RSL	N/A	--	No	CRQL and MDC ≤ SL
Methylene chloride	75-09-2	N/A		N/A		mg/kg	N/A	N/A	0/21	0%	0.0041 – 0.44	0.44	CRQL	N/A	35		RSL	58	WVDEP	No	100% ND and CRQL ≤ SL
o-Xylene	95-47-6	N/A		N/A		mg/kg	N/A	N/A	0/20	0%	0.0041 – 0.44	0.44	CRQL	N/A	64		RSL	N/A	--	No	100% ND and CRQL ≤ SL
Styrene	100-42-5	N/A		N/A		mg/kg	N/A	N/A	0/20	0%	0.0041 – 0.44	0.44	CRQL	N/A	600		RSL	870	WVDEP	No	100% ND and CRQL ≤ SL
Tetrachloroethene	127-18-4	N/A		N/A		mg/kg	N/A	N/A	0/20	0%	0.0041 – 0.44	0.44	CRQL	N/A	8.1		RSL	25	WVDEP	No	100% ND and CRQL ≤ SL
Toluene	108-88-3	0.0015	J	0.0064	J	mg/kg	SA-SB316 (11/8/2019)	0.5 - 2	2/20	10%	0.0041 – 0.44	0.0064	MDC	N/A	490		RSL	820	WVDEP	No	CRQL and MDC ≤ SL
trans-1,2-Dichloroethene	156-60-5	N/A		N/A		mg/kg	N/A	N/A	0/21	0%	0.0041 – 0.44	0.44	CRQL	N/A	7		RSL	75	WVDEP	No	100% ND and CRQL ≤ SL
trans-1,3-Dichloropropene	10061-02-6	N/A		N/A		mg/kg	N/A	N/A	0/20	0%	0.0041 – 0.44	0.44	CRQL	N/A	1.8	*	RSL	N/A	--	No	100% ND and CRQL ≤ SL
Trichloroethene	79-01-6	N/A		N/A		mg/kg	N/A	N/A	0/11	0%	0.0041 – 0.44	0.44	CRQL	N/A	0.41		RSL	1	WVDEP	See Uncertainty	100% ND and CRQL > SL
Trichlorofluoromethane	75-69-4	N/A		N/A		mg/kg	N/A	N/A	0/21	0%	0.0041 – 0.44	0.44	CRQL	N/A	2300		RSL	790	WVDEP	No	100% ND and CRQL ≤ SL
Vinyl chloride	75-01-4	N/A		N/A		mg/kg	N/A	N/A	0/21	0%	0.0041 – 0.44	0.44	CRQL	N/A	0.059		RSL	0.061	WVDEP	See Uncertainty	100% ND and CRQL > SL
Semi-Volatile Organic Compounds (SVOCs)																					
1,1'-Biphenyl	92-52-4	0.014	J	0.2		mg/kg	SA-SB327 (11/15/2019)	0.5 - 2	8/30	27%	0.19 – 0.21	0.2	MDC	N/A	4.7		RSL	51	WVDEP	No	CRQL and MDC ≤ SL
1,2,4,5-Tetrachlorobenzene	95-94-3	0.062	J	0.062	J	mg/kg	SA-SB320 (11/25/2019)	0.5 - 2	1/30	3%	0.19 – 0.21	0.062	MDC	N/A	0.23		RSL	17	WVDEP	No	CRQL and MDC ≤ SL

Table A-2.2
Occurrence, Distribution, and Selection of Constituents of Interest (Direct Contact – Site-Wide; Near Surface Soil, 0.5 – 2 feet)
Reasonable Maximum Exposure
Human Health Risk Assessment
Shaffer Equipment/Arbuckle Creek Area Superfund Site, Minden, West Virginia

Scenario Timeframe: Current and Future
Medium: Soil
Exposure Medium: Soil
Exposure Point: Soil (0.5 – 2 feet)

Chemical	CASRN	Minimum Detected Concentration		Maximum Detected Concentration		Units	Location of Maximum	Depth (ft bgs)	Detection Frequency		Range of Reporting Limits	Screening Concentration		Background Value	Screening Level [1, 2]		Source	Potential ARAR [3]	Source	COPC Flag (Yes/No)	Rationale for Selection/Deletion
1,4-Dioxane	123-91-1	N/A		N/A		mg/kg	N/A	N/A	0/30	0%	0.073 – 0.083	0.083	CRQL	N/A	5.3		RSL	5.4	WVDEP	No	100% ND and CRQL ≤ SL
2,2'-Oxybis(1-chloropropane)	108-60-1	N/A		N/A		mg/kg	N/A	N/A	0/30	0%	0.36 – 0.41	0.41	CRQL	N/A	310		RSL	5.1	WVDEP	No	100% ND and CRQL ≤ SL
2,3,4,6-Tetrachlorophenol	58-90-2	N/A		N/A		mg/kg	N/A	N/A	0/30	0%	0.19 – 0.21	0.21	CRQL	N/A	190		RSL	1900	WVDEP	No	100% ND and CRQL ≤ SL
2,4,5-Trichlorophenol	95-95-4	N/A		N/A		mg/kg	N/A	N/A	0/30	0%	0.19 – 0.21	0.21	CRQL	N/A	630		RSL	6300	WVDEP	No	100% ND and CRQL ≤ SL
2,4,6-Trichlorophenol	88-06-2	N/A		N/A		mg/kg	N/A	N/A	0/30	0%	0.19 – 0.21	0.21	CRQL	N/A	6.3		RSL	49	WVDEP	No	100% ND and CRQL ≤ SL
2,4-Dichlorophenol	120-83-2	N/A		N/A		mg/kg	N/A	N/A	0/30	0%	0.19 – 0.21	0.21	CRQL	N/A	19		RSL	190	WVDEP	No	100% ND and CRQL ≤ SL
2,4-Dimethylphenol	105-67-9	N/A		N/A		mg/kg	N/A	N/A	0/30	0%	0.19 – 0.21	0.21	CRQL	N/A	130		RSL	1300	WVDEP	No	100% ND and CRQL ≤ SL
2,4-Dinitrophenol	51-28-5	N/A		N/A		mg/kg	N/A	N/A	0/30	0%	0.36 – 0.41	0.41	CRQL	N/A	13		RSL	130	WVDEP	No	100% ND and CRQL ≤ SL
2,4-Dinitrotoluene	121-14-2	N/A		N/A		mg/kg	N/A	N/A	0/30	0%	0.19 – 0.21	0.21	CRQL	N/A	1.7		RSL	1.7	WVDEP	No	100% ND and CRQL ≤ SL
2,6-Dinitrotoluene	606-20-2	N/A		N/A		mg/kg	N/A	N/A	0/30	0%	0.19 – 0.21	0.21	CRQL	N/A	0.36		RSL	0.36	WVDEP	No	100% ND and CRQL ≤ SL
2-Chloronaphthalene	91-58-7	N/A		N/A		mg/kg	N/A	N/A	0/30	0%	0.19 – 0.21	0.21	CRQL	N/A	480		RSL	5000	WVDEP	No	100% ND and CRQL ≤ SL
2-Chlorophenol	95-57-8	N/A		N/A		mg/kg	N/A	N/A	0/30	0%	0.19 – 0.21	0.21	CRQL	N/A	39		RSL	340	WVDEP	No	100% ND and CRQL ≤ SL
2-Methylnaphthalene	91-57-6	0.0049		0.48		mg/kg	SA-SB327 (11/15/2019)	0.5 - 2	27/30	90%	0.0037 – 0.19	0.48	MDC	N/A	24		RSL	310	WVDEP	No	CRQL and MDC ≤ SL
2-Methylphenol	95-48-7	N/A		N/A		mg/kg	N/A	N/A	0/30	0%	0.36 – 0.41	0.41	CRQL	N/A	320		RSL	3200	WVDEP	No	100% ND and CRQL ≤ SL
2-Nitroaniline	88-74-4	N/A		N/A		mg/kg	N/A	N/A	0/30	0%	0.19 – 0.21	0.21	CRQL	N/A	63		RSL	630	WVDEP	No	100% ND and CRQL ≤ SL
2-Nitrophenol	88-75-5	N/A		N/A		mg/kg	N/A	N/A	0/30	0%	0.19 – 0.21	0.21	CRQL	N/A	1900	*	RSL	N/A	--	No	100% ND and CRQL ≤ SL
3 & 4 Methylphenol	15831-10-4	N/A		N/A		mg/kg	N/A	N/A	0/21	0%	0.36 – 0.41	0.41	CRQL	N/A	630	*	RSL	3200	WVDEP	No	100% ND and CRQL ≤ SL
3,3'-Dichlorobenzidine	91-94-1	N/A		N/A		mg/kg	N/A	N/A	0/30	0%	0.36 – 0.41	0.41	CRQL	N/A	1.2		RSL	1.2	WVDEP	No	100% ND and CRQL ≤ SL
3-Nitroaniline	99-09-2	N/A		N/A		mg/kg	N/A	N/A	0/30	0%	0.36 – 0.41	0.41	CRQL	N/A	63	*	RSL	N/A	--	No	100% ND and CRQL ≤ SL
4,6-Dinitro-2-methylphenol	534-52-1	N/A		N/A		mg/kg	N/A	N/A	0/30	0%	0.36 – 0.41	0.41	CRQL	N/A	0.51		RSL	N/A	--	No	100% ND and CRQL ≤ SL
4-Bromophenyl-phenylether	101-55-3	N/A		N/A		mg/kg	N/A	N/A	0/30	0%	0.19 – 0.21	0.21	CRQL	N/A	See Rationale		N/A	N/A	--	See Uncertainty	No SL or surrogate toxicity available
4-Chloro-3-methylphenol	59-50-7	N/A		N/A		mg/kg	N/A	N/A	0/30	0%	0.19 – 0.21	0.21	CRQL	N/A	630		RSL	N/A	--	No	100% ND and CRQL ≤ SL
4-Chloroaniline	106-47-8	N/A		N/A		mg/kg	N/A	N/A	0/30	0%	0.36 – 0.41	0.41	CRQL	N/A	2.7		RSL	2.7	WVDEP	No	100% ND and CRQL ≤ SL
4-Chlorophenyl-phenylether	7005-72-3	N/A		N/A		mg/kg	N/A	N/A	0/30	0%	0.19 – 0.21	0.21	CRQL	N/A	See Rationale		N/A	N/A	--	See Uncertainty	No SL or surrogate toxicity available
4-Methylphenol	106-44-5	N/A		N/A		mg/kg	N/A	N/A	0/9	0%	0.36 – 0.41	0.41	CRQL	N/A	130		RSL	6300	WVDEP	No	100% ND and CRQL ≤ SL
4-Nitroaniline	100-01-6	N/A		N/A		mg/kg	N/A	N/A	0/30	0%	0.36 – 0.41	0.41	CRQL	N/A	25		RSL	N/A	--	No	100% ND and CRQL ≤ SL
4-Nitrophenol	100-02-7	N/A		N/A		mg/kg	N/A	N/A	0/30	0%	0.36 – 0.41	0.41	CRQL	N/A	1900	*	RSL	N/A	--	No	100% ND and CRQL ≤ SL
Acenaphthene	83-32-9	0.00087	J	2.4		mg/kg	SA-SB327 (11/15/2019)	0.5 - 2	25/30	83%	0.0037 – 0.19	2.4	MDC	N/A	360		RSL	4100	WVDEP	No	CRQL and MDC ≤ SL
Acenaphthylene	208-96-8	0.0013	J	0.86		mg/kg	SA-SB318 (11/8/2019)	0.5 - 2	27/30	90%	0.0037 – 0.19	0.86	MDC	N/A	See Rationale		N/A	4200	WVDEP	See Uncertainty	No SL or surrogate toxicity available
Acetophenone	98-86-2	N/A		N/A		mg/kg	N/A	N/A	0/30	0%	0.36 – 0.41	0.41	CRQL	N/A	780		RSL	2500	WVDEP	No	100% ND and CRQL ≤ SL
Anthracene	120-12-7	0.0018	J	0.81		mg/kg	SA-SB327 (11/15/2019)	0.5 - 2	27/30	90%	0.0037 – 0.19	0.81	MDC	N/A	1800		RSL	23000	WVDEP	No	CRQL and MDC ≤ SL
Atrazine	1912-24-9	N/A		N/A		mg/kg	N/A	N/A	0/30	0%	0.36 – 0.41	0.41	CRQL	N/A	2.4		RSL	2.4	WVDEP	No	100% ND and CRQL ≤ SL
Benzaldehyde	100-52-7	0.035	J	0.035	J	mg/kg	SA-SB318 (11/8/2019)	0.5 - 2	1/30	3%	0.36 – 0.41	0.035	MDC	N/A	170		RSL	170	WVDEP	No	CRQL and MDC ≤ SL
Benzo(a)anthracene	56-55-3	0.0016	J	3.9		mg/kg	SA-SB318 (11/8/2019)	0.5 - 2	28/30	93%	0.0037 – 0.0039	3.9	MDC	N/A	1.1		RSL	1.5	WVDEP	Yes	MDC > SL
Benzo(a)pyrene	50-32-8	0.0012	J	3.3		mg/kg	SA-SB318 (11/8/2019)	0.5 - 2	28/30	93%	0.0037 – 0.0039	3.3	MDC	N/A	0.11		RSL	0.11	WVDEP	Yes	MDC > SL
Benzo(b)fluoranthene	205-99-2	0.0023	J	5.7		mg/kg	SA-SB318 (11/8/2019)	0.5 - 2	28/30	93%	0.0037 – 0.0039	5.7	MDC	N/A	1.1		RSL	1.1	WVDEP	Yes	MDC > SL
Benzo(g,h,i)perylene	191-24-2	0.00087	J	1.2		mg/kg	SA-SB318 (11/8/2019)	0.5 - 2	28/30	93%	0.0037 – 0.0039	1.2	MDC	N/A	See Rationale		N/A	1800	WVDEP	See Uncertainty	No SL or surrogate toxicity available
Benzo(k)fluoranthene	207-08-9	0.00083	J	1.8		mg/kg	SA-SB318 (11/8/2019)	0.5 - 2	28/30	93%	0.0037 – 0.0039	1.8	MDC	N/A	11		RSL	11	WVDEP	No	CRQL and MDC ≤ SL
Bis(2-chloroethoxy)methane	111-91-1	N/A		N/A		mg/kg	N/A	N/A	0/30	0%	0.19 – 0.21	0.21	CRQL	N/A	19		RSL	N/A	--	No	100% ND and CRQL ≤ SL
Bis(2-chloroethyl)ether	111-44-4	N/A		N/A		mg/kg	N/A	N/A	0/30	0%	0.36 – 0.41	0.41	CRQL	N/A	0.23		RSL	0.24	WVDEP	See Uncertainty	100% ND and CRQL > SL
Bis(2-ethylhexyl)phthalate	117-81-7	0.02	J	0.13	J	mg/kg	SA-SB319 (11/7/2019)	0.5 - 2	6/30	20%	0.19 – 0.21	0.13	MDC	N/A	39		RSL	39	WVDEP	No	CRQL and MDC ≤ SL
Butylbenzylphthalate	85-68-7	0.045	J	0.045	J	mg/kg	SA-SB319 (11/7/2019)	0.5 - 2	1/30	3%	0.19 – 0.21	0.045	MDC	N/A	290		RSL	290	WVDEP	No	CRQL and MDC ≤ SL
Caprolactam	105-60-2	N/A		N/A		mg/kg	N/A	N/A	0/30	0%	0.36 – 0.41	0.41	CRQL	N/A	3100		RSL	31000	WVDEP	No	100% ND and CRQL ≤ SL
Carbazole	86-74-8	0.025	J	0.24	J	mg/kg	SA-SB327 (11/15/2019)	0.5 - 2	4/30	13%	0.36 – 0.41	0.24	MDC	N/A	See Rationale		N/A	N/A	--	See Uncertainty	No SL or surrogate toxicity available
Chrysene	218-01-9	0.0018	J	2.4		mg/kg	SA-SB318 (11/8/2019)	0.5 - 2	28/30	93%	0.0037 – 0.0039	2.4	MDC	N/A	110		RSL	110	WVDEP	No	CRQL and MDC ≤ SL
Dibenz(a,h)anthracene	53-70-3	0.0012	J	0.055	J	mg/kg	SA-SB320 (11/25/2019)	0.5 - 2	14/30	47%	0.0037 – 0.21	0.055	MDC	N/A	0.11		RSL	0.11	WVDEP	No	MDC ≤ SL < CRQL
Dibenzofuran	132-64-9	0.02	J	0.98		mg/kg	SA-SB327 (11/15/2019)	0.5 - 2	9/30	30%	0.19 – 0.21	0.98	MDC	N/A	7.8		RSL	78	WVDEP	No	CRQL and MDC ≤ SL
Diethylphthalate	84-66-2	0.024	J	0.024	J	mg/kg	SA-SB315 (11/7/2019)	0.5 - 2	1/30	3%	0.19 – 0.21	0.024	MDC	N/A	5100		RSL	51000	WVDEP	No	CRQL and MDC ≤ SL
Dimethylphthalate	131-11-3	0.19	J	0.52		mg/kg	SA-SB322 (11/22/2019)	0.5 - 2	7/30	23%	0.19 – 0.21	0.52	MDC	N/A	See Rationale		N/A	N/A	--	See Uncertainty	No SL or surrogate toxicity available
Di-N-Butylphthalate	84-74-2	0.019	J	0.032	J	mg/kg	SA-SB319 (11/7/2019)	0.5 - 2	3/30	10%	0.19 – 0.21	0.032	MDC	N/A	630		RSL	6300	WVDEP	No	CRQL and MDC ≤ SL
Di-N-Octyl Phthalate	117-84-0	N/A		N/A		mg/kg	N/A	N/A	0/30	0%	0.36 – 0.41	0.41	CRQL	N/A	63		RSL	N/A	--	No	100% ND and CRQL ≤ SL
Fluoranthene	206-44-0	0.0023	J	6.6		mg/kg	SA-SB318 (11/8/2019)	0.5 - 2	28/30	93%	0.0037 – 0.0039	6.6	MDC	N/A	240		RSL	2400	WVDEP	No	CRQL and MDC ≤ SL
Fluorene	86-73-7	0.0013	J	3.5		mg/kg	SA-SB327 (11/15/2019)	0.5 - 2	25/30	83%	0.0037 – 0.19	3.5	MDC	N/A	240		RSL	2900	WVDEP	No	CRQL and MDC ≤ SL
Hexachlorobenzene	118-74-1	N/A		N/A		mg/kg	N/A	N/A	0/30	0%	0.19 – 0.21	0.21	CRQL	N/A	0.078		RSL	0.22	WVDEP	See Uncertainty	100% ND and CRQL > SL
Hexachlorobutadiene	87-68-3	N/A		N/A		mg/kg	N/A	N/A	0/30	0%	0.19 – 0.21	0.21	CRQL	N/A	1.2		RSL	1.3	WVDEP	No	100% ND and CRQL ≤ SL

Table A-2.2
Occurrence, Distribution, and Selection of Constituents of Interest (Direct Contact – Site-Wide; Near Surface Soil, 0.5 – 2 feet)
Reasonable Maximum Exposure
Human Health Risk Assessment
Shaffer Equipment/Arbuckle Creek Area Superfund Site, Minden, West Virginia

Scenario Timeframe: Current and Future
Medium: Soil
Exposure Medium: Soil
Exposure Point: Soil (0.5 – 2 feet)

Chemical	CASRN	Minimum Detected Concentration		Maximum Detected Concentration		Units	Location of Maximum	Depth (ft bgs)	Detection Frequency		Range of Reporting Limits	Screening Concentration		Background Value	Screening Level [1, 2]		Source	Potential ARAR [3]	Source	COPC Flag (Yes/No)	Rationale for Selection/Deletion
Hexachlorocyclopentadiene	77-47-4	N/A		N/A		mg/kg	N/A	N/A	0/30	0%	0.36 – 0.41	0.41	CRQL	N/A	0.18		RSL	1.9	WVDEP	See Uncertainty	100% ND and CRQL > SL
Hexachloroethane	67-72-1	N/A		N/A		mg/kg	N/A	N/A	0/30	0%	0.19 – 0.21	0.21	CRQL	N/A	1.8		RSL	2	WVDEP	No	100% ND and CRQL ≤ SL
Indeno(1,2,3-cd)pyrene	193-39-5	0.00081	J	1.5		mg/kg	SA-SB318 (11/8/2019)	0.5 - 2	28/30	93%	0.0037 – 0.0039	1.5	MDC	N/A	1.1		RSL	1.1	WVDEP	Yes	MDC > SL
Isophorone	78-59-1	N/A		N/A		mg/kg	N/A	N/A	0/30	0%	0.19 – 0.21	0.21	CRQL	N/A	570		RSL	570	WVDEP	No	100% ND and CRQL ≤ SL
Naphthalene	91-20-3	0.0034	J	0.99		mg/kg	SA-SB327 (11/15/2019)	0.5 - 2	26/30	87%	0.0037 – 0.19	0.99	MDC	N/A	2		RSL	2.4	WVDEP	No	CRQL and MDC ≤ SL
Naphthalene, 1-methyl-	90-12-0	0.0039	J	0.1		mg/kg	SB408 (7/16/2021)	0.5 - 2	7/9	78%	0.0037 – 0.0039	0.1	MDC	N/A	18		RSL	24	WVDEP	No	CRQL and MDC ≤ SL
Nitrobenzene	98-95-3	N/A		N/A		mg/kg	N/A	N/A	0/30	0%	0.19 – 0.21	0.21	CRQL	N/A	5.1		RSL	5.5	WVDEP	No	100% ND and CRQL ≤ SL
N-Nitroso-di-n-propylamine (NDPA)	621-64-7	N/A		N/A		mg/kg	N/A	N/A	0/30	0%	0.19 – 0.21	0.21	CRQL	N/A	0.078		RSL	0.078	WVDEP	See Uncertainty	100% ND and CRQL > SL
N-Nitrosodiphenylamine	86-30-6	N/A		N/A		mg/kg	N/A	N/A	0/30	0%	0.19 – 0.21	0.21	CRQL	N/A	110		RSL	110	WVDEP	No	100% ND and CRQL ≤ SL
Pentachlorophenol	87-86-5	N/A		N/A		mg/kg	N/A	N/A	0/30	0%	0.0074 – 0.41	0.41	CRQL	N/A	1		RSL	1	WVDEP	No	100% ND and CRQL ≤ SL
Phenanthrene	85-01-8	0.0013	J	2		mg/kg	SA-SB327 (11/15/2019)	0.5 - 2	28/30	93%	0.0037 – 0.0039	2	MDC	N/A	See Rationale		N/A	23000	WVDEP	See Uncertainty	No SL or surrogate toxicity available
Phenol	108-95-2	0.041	J	0.072	J	mg/kg	SA-SB369 (11/21/2019)	0.5 - 2	6/30	20%	0.36 – 0.41	0.072	MDC	N/A	1900		RSL	19000	WVDEP	No	CRQL and MDC ≤ SL
Pyrene	129-00-0	0.0025	J	6.9		mg/kg	SA-SB318 (11/8/2019)	0.5 - 2	28/30	93%	0.0037 – 0.0039	6.9	MDC	N/A	180		RSL	2300	WVDEP	No	CRQL and MDC ≤ SL
Pesticides																					
4,4'-DDD	72-54-8	0.00042	J	0.0093	J	mg/kg	SA-SB321 (11/25/2019)	0.5 - 2	8/26	31%	0.0036 – 0.0043	0.0093	MDC	N/A	0.19		RSL	1.9	WVDEP	No	CRQL and MDC ≤ SL
4,4'-DDE	72-55-9	0.00028	J	0.0044		mg/kg	SA-SB327 (11/15/2019)	0.5 - 2	5/28	18%	0.0036 – 0.0043	0.0044	MDC	N/A	2		RSL	2	WVDEP	No	CRQL and MDC ≤ SL
4,4'-DDT	50-29-3	0.0004	J	0.13	J	mg/kg	SA-SB327 (11/15/2019)	0.5 - 2	4/30	13%	0.0036 – 0.0043	0.13	MDC	N/A	1.9		RSL	1.9	WVDEP	No	CRQL and MDC ≤ SL
Aldrin	309-00-2	0.00022	J	0.00073	J	mg/kg	SB404 (7/16/2021)	0.5 - 2	2/30	7%	0.0019 – 0.0022	0.00073	MDC	N/A	0.039		RSL	0.039	WVDEP	No	CRQL and MDC ≤ SL
alpha-BHC	319-84-6	N/A		N/A		mg/kg	N/A	N/A	0/30	0%	0.0019 – 0.0022	0.0022	CRQL	N/A	0.086		RSL	0.086	WVDEP	No	100% ND and CRQL ≤ SL
beta-BHC	319-85-7	0.00025	J	0.00054	J	mg/kg	SA-SB326 (11/15/2019)	0.5 - 2	3/29	10%	0.0019 – 0.0022	0.00054	MDC	N/A	0.3		RSL	0.3	WVDEP	No	CRQL and MDC ≤ SL
cis-Chlordane	5103-71-9	0.00052	J	0.0016	J	mg/kg	SA-SB327 (11/15/2019)	0.5 - 2	5/30	17%	0.0019 – 0.0022	0.0016	MDC	N/A	3.6		RSL	N/A	--	No	CRQL and MDC ≤ SL
delta-BHC	319-86-8	0.00024	J	0.0015	J	mg/kg	SB408 (7/16/2021)	0.5 - 2	3/30	10%	0.0019 – 0.0022	0.0015	MDC	N/A	0.086	*	RSL	N/A	--	No	CRQL and MDC ≤ SL
Dieldrin	60-57-1	0.00052	J	0.022	J	mg/kg	SB408 (7/16/2021)	0.5 - 2	7/28	25%	0.0036 – 0.0043	0.022	MDC	N/A	0.034		RSL	0.042	WVDEP	No	CRQL and MDC ≤ SL
Endosulfan I	959-98-8	0.00034	J	0.00083	J	mg/kg	SA-SB326 (11/15/2019)	0.5 - 2	4/30	13%	0.0019 – 0.0022	0.00083	MDC	N/A	47	*	RSL	N/A	--	No	CRQL and MDC ≤ SL
Endosulfan II	33213-65-9	0.00028	J	0.02	J	mg/kg	SB408 (7/16/2021)	0.5 - 2	10/30	33%	0.0036 – 0.0043	0.02	MDC	N/A	47	*	RSL	N/A	--	No	CRQL and MDC ≤ SL
Endosulfan Sulfate	1031-07-8	0.00083	J	0.0013	J	mg/kg	SB406 (7/15/2021)	0.5 - 2	4/30	13%	0.0036 – 0.0043	0.0013	MDC	N/A	38		RSL	N/A	--	No	CRQL and MDC ≤ SL
Endrin	72-20-8	0.00031	J	0.021	J	mg/kg	SB408 (7/16/2021)	0.5 - 2	12/29	41%	0.0036 – 0.0043	0.021	MDC	N/A	1.9		RSL	19	WVDEP	No	CRQL and MDC ≤ SL
Endrin Aldehyde	7421-93-4	0.001	J	0.0025	J	mg/kg	SA-SB328 (11/15/2019)	0.5 - 2	3/30	10%	0.0036 – 0.0043	0.0025	MDC	N/A	1.9	*	RSL	N/A	--	No	CRQL and MDC ≤ SL
Endrin Ketone	53494-70-5	0.0029	J	0.003	J	mg/kg	SA-SB326 (11/15/2019)	0.5 - 2	2/30	7%	0.0036 – 0.039	0.003	MDC	N/A	1.9	*	RSL	N/A	--	No	CRQL and MDC ≤ SL
gamma-BHC (Lindane)	58-89-9	0.00042	J	0.012	J	mg/kg	SA-SB321 (11/25/2019)	0.5 - 2	16/28	57%	0.0019 – 0.0021	0.012	MDC	N/A	0.071		RSL	0.57	WVDEP	No	CRQL and MDC ≤ SL
Heptachlor	76-44-8	0.00037	J	0.00048	J	mg/kg	SA-SB327 (11/15/2019)	0.5 - 2	3/30	10%	0.0019 – 0.0022	0.00048	MDC	N/A	0.13		RSL	0.14	WVDEP	No	CRQL and MDC ≤ SL
Heptachlor Epoxide	1024-57-3	0.00026	J	0.00087	J	mg/kg	SA-SB328 (11/15/2019)	0.5 - 2	3/30	10%	0.0019 – 0.0022	0.00087	MDC	N/A	0.07		RSL	0.071	WVDEP	No	CRQL and MDC ≤ SL
Methoxychlor	72-43-5	0.0068	J	0.028	J	mg/kg	SA-SB327 (11/15/2019)	0.5 - 2	4/30	13%	0.019 – 0.022	0.028	MDC	N/A	32		RSL	320	WVDEP	No	CRQL and MDC ≤ SL
Toxaphene	8001-35-2	N/A		N/A		mg/kg	N/A	N/A	0/30	0%	0.19 – 0.22	0.22	CRQL	N/A	0.49		RSL	0.49	WVDEP	No	100% ND and CRQL ≤ SL
trans-Chlordane	5103-74-2	0.0051		0.039	J	mg/kg	SB408 (7/16/2021)	0.5 - 2	3/27	11%	0.0019 – 0.0022	0.039	MDC	N/A	3.6		RSL	N/A	--	No	CRQL and MDC ≤ SL
Polychlorinated Biphenyls (PCBs)																					
Aroclor 1016	12674-11-2	N/A		N/A		mg/kg	N/A	N/A	0/21	0%	0.269 – 0.352	0.352	CRQL	N/A	0.41		RSL	5.5	WVDEP	No	100% ND and CRQL ≤ SL
Aroclor 1221	11104-28-2	N/A		N/A		mg/kg	N/A	N/A	0/21	0%	0.538 – 0.704	0.704	CRQL	N/A	0.2		RSL	0.26	WVDEP	See Uncertainty	100% ND and CRQL > SL
Aroclor 1232	11141-16-5	N/A		N/A		mg/kg	N/A	N/A	0/21	0%	0.269 – 0.352	0.352	CRQL	N/A	0.17		RSL	0.22	WVDEP	See Uncertainty	100% ND and CRQL > SL
Aroclor 1242	53469-21-9	N/A		N/A		mg/kg	N/A	N/A	0/21	0%	0.269 – 0.352	0.352	CRQL	N/A	0.23		RSL	0.31	WVDEP	See Uncertainty	100% ND and CRQL > SL
Aroclor 1248	12672-29-6	N/A		N/A		mg/kg	N/A	N/A	0/21	0%	0.269 – 0.352	0.352	CRQL	N/A	0.23		RSL	0.31	WVDEP	See Uncertainty	100% ND and CRQL > SL
Aroclor 1254	11097-69-1	0.053	J+	0.551		mg/kg	SA-SB319 (11/7/2019)	0.5 - 2	2/21	10%	0.269 – 0.333	0.551	MDC	N/A	0.12		RSL	0.32	WVDEP	Yes	MDC > SL
Aroclor 1260	11096-82-5	0.082	J	24	C	mg/kg	SA-SB320 (11/25/2019)	0.5 - 2	15/21	71%	0.272 – 0.352	24	MDC	N/A	0.24		RSL	0.33	WVDEP	Yes	MDC > SL
Aroclor 1262	37324-23-5	N/A		N/A		mg/kg	N/A	N/A	0/21	0%	0.269 – 0.352	0.352	CRQL	N/A	0.23	*	RSL	N/A	--	See Uncertainty	100% ND and CRQL > SL
Aroclor 1268	11100-14-4	N/A		N/A		mg/kg	N/A	N/A	0/21	0%	0.269 – 0.352	0.352	CRQL	N/A	0.23	*	RSL	N/A	--	See Uncertainty	100% ND and CRQL > SL
TOTAL AROCLOR HALFND	CALC021	1.333		24.144		mg/kg	SA-SB320 (11/25/2019)	0.5 - 2	21/21	100%	N/A	24.144	MDC	N/A	N/A		N/A	N/A	--	No	Qualitative Evaluation
PCBs - Congeners																					
PCB-1	2051-60-7	0.0000021		0.0021		mg/kg	SA-SB320 (11/25/2019)	0.5 - 2	24/30	80%	0.000002 – 0.0012	0.0021	MDC	N/A	See Aroclors		N/A	N/A	--	No	Aroclor data used to evaluate chemical
PCB-10	33146-45-1	0.00000075	J	0.000062		mg/kg	SB407 (7/15/2021)	0.5 - 2	14/30	47%	0.000002 – 0.0012	0.000062	MDC	N/A	See Aroclors		N/A	N/A	--	No	Aroclor data used to evaluate chemical
PCB-100	39485-83-1	0.0000012	J	0.0002		mg/kg	SA-SB327 (11/15/2019)	0.5 - 2	10/14	71%	0.000002 – 0.000002	0.0002	MDC	N/A	See Aroclors		N/A	N/A	--	No	Aroclor data used to evaluate chemical
PCB-101/90	PCB101/90	0.000044		0.08	J	mg/kg	SA-SB327 (11/15/2019)	0.5 - 2	14/14	100%	N/A	0.08	MDC	N/A	See Aroclors		N/A	N/A	--	No	Aroclor data used to evaluate chemical
PCB-103	60145-21-3	0.0000015	J	0.0077		mg/kg	SB408 (7/16/2021)	0.5 - 2	23/30	77%	0.000002 – 0.0012	0.0077	MDC	N/A	See Aroclors		N/A	N/A	--	No	Aroclor data used to evaluate chemical
PCB-104	56558-16-8	0.0000031	J	0.00003		mg/kg	SB404 (7/16/2021)	0.5 - 2	3/30	10%	0.000002 – 0.0012	0.00003	MDC	N/A	See Aroclors		N/A	N/A	--	No	Aroclor data used to evaluate chemical
PCB-105	32598-14-4	0.0000097		0.036		mg/kg	SA-SB320 (11/25/2019)	0.5 - 2	28/30	93%	0.000004 – 0.0000042	0.036	MDC	N/A	See TEQ		N/A	N/A	--	No	TEQ used to evaluate chemical
PCB-106	70424-69-0	N/A		N/A		mg/kg	N/A	N/A	0/16	0%	0.000002 – 0.0012	0.0012	CRQL	N/A	See Aroclors		N/A	N/A	--	No	Aroclor data used to evaluate chemical

Table A-2.2
Occurrence, Distribution, and Selection of Constituents of Interest (Direct Contact – Site-Wide; Near Surface Soil, 0.5 – 2 feet)
Reasonable Maximum Exposure
Human Health Risk Assessment
Shaffer Equipment/Arbuckle Creek Area Superfund Site, Minden, West Virginia

Scenario Timeframe: Current and Future
Medium: Soil
Exposure Medium: Soil
Exposure Point: Soil (0.5 – 2 feet)

Chemical	CASRN	Minimum Detected Concentration		Maximum Detected Concentration		Units	Location of Maximum	Depth (ft bgs)	Detection Frequency		Range of Reporting Limits	Screening Concentration		Background Value	Screening Level [1, 2]		Source	Potential ARAR [3]	Source	COPC Flag (Yes/No)	Rationale for Selection/Deletion
PCB-107	70424-68-9	0.000047		0.0039		mg/kg	SA-SB320 (11/25/2019)	0.5 - 2	7/7	100%	N/A	0.0039	MDC	N/A	See Aroclors		N/A	N/A	--	No	Aroclor data used to evaluate chemical
PCB-107/108	70424-68-9/703~	0.0000016	J	0.0014		mg/kg	Multiple Locations	N/A	14/14	100%	N/A	0.0014	MDC	N/A	See Aroclors		N/A	N/A	--	No	Aroclor data used to evaluate chemical
PCB-107/124	70424-68-9/704~	0.00000042	J	0.0036		mg/kg	SB408 (7/16/2021)	0.5 - 2	7/9	78%	0.000018 – 0.000019	0.0036	MDC	N/A	See Aroclors		N/A	N/A	--	No	Aroclor data used to evaluate chemical
PCB-108/124	70362-41-3/704~	0.000032	J	0.0032		mg/kg	SA-SB320 (11/25/2019)	0.5 - 2	6/7	86%	0.0005 – 0.0005	0.0032	MDC	N/A	See Aroclors		N/A	N/A	--	No	Aroclor data used to evaluate chemical
PCB-109	74472-35-8	0.00000043	J	0.0086		mg/kg	SB408 (7/16/2021)	0.5 - 2	8/23	35%	0.000002 – 0.000009	0.0086	MDC	N/A	See Aroclors		N/A	N/A	--	No	Aroclor data used to evaluate chemical
PCB-11	2050-67-1	0.0000042		0.00016		mg/kg	SB407 (7/15/2021)	0.5 - 2	16/30	53%	0.000002 – 0.0012	0.00016	MDC	N/A	See Aroclors		N/A	N/A	--	No	Aroclor data used to evaluate chemical
PCB-110	38380-03-9	0.000037		0.041	J	mg/kg	SA-SB327 (11/15/2019)	0.5 - 2	14/14	100%	N/A	0.041	MDC	N/A	See Aroclors		N/A	N/A	--	No	Aroclor data used to evaluate chemical
PCB-110/115	38380-03-9/744~	0.00051		0.32		mg/kg	SA-SB320 (11/25/2019)	0.5 - 2	14/16	88%	0.000018 – 0.000019	0.32	MDC	N/A	See Aroclors		N/A	N/A	--	No	Aroclor data used to evaluate chemical
PCB-111	39635-32-0	N/A		N/A		mg/kg	N/A	N/A	0/16	0%	0.000002 – 0.0012	0.0012	CRQL	N/A	See Aroclors		N/A	N/A	--	No	Aroclor data used to evaluate chemical
PCB-111/115	39635-32-0/744~	0.00000095	J	0.00043		mg/kg	SA-SB319 (11/7/2019)	0.5 - 2	14/14	100%	N/A	0.00043	MDC	N/A	See Aroclors		N/A	N/A	--	No	Aroclor data used to evaluate chemical
PCB-112	74472-36-9	N/A		N/A		mg/kg	N/A	N/A	0/16	0%	0.000002 – 0.0012	0.0012	CRQL	N/A	See Aroclors		N/A	N/A	--	No	Aroclor data used to evaluate chemical
PCB-113	68194-10-5	0.028		0.028		mg/kg	SA-SB318 (11/8/2019)	0.5 - 2	1/14	7%	0.000002 – 0.000002	0.028	MDC	N/A	See Aroclors		N/A	N/A	--	No	Aroclor data used to evaluate chemical
PCB-114	74472-37-0	0.0000034		0.0021		mg/kg	SA-SB320 (11/25/2019)	0.5 - 2	25/30	83%	0.00000097 – 0.00025	0.0021	MDC	N/A	See TEQ		N/A	N/A	--	No	TEQ used to evaluate chemical
PCB-118	31508-00-6	0.0000076	J	0.14		mg/kg	SA-SB320 (11/25/2019)	0.5 - 2	15/16	94%	0.0000042 – 0.0000042	0.14	MDC	N/A	See TEQ		N/A	N/A	--	No	TEQ used to evaluate chemical
PCB-118/106	31508-00-6/704~	0.000025		0.029		mg/kg	SA-SB327 (11/15/2019)	0.5 - 2	14/14	100%	N/A	0.029	MDC	N/A	See Aroclors		N/A	N/A	--	No	Aroclor data used to evaluate chemical
PCB-119	56558-17-9	0.000005		0.0015		mg/kg	SA-SB327 (11/15/2019)	0.5 - 2	13/14	93%	0.000002 – 0.000002	0.0015	MDC	N/A	See Aroclors		N/A	N/A	--	No	Aroclor data used to evaluate chemical
PCB-12	2974-92-7	0.0000014	J	0.000028		mg/kg	SA-SB316 (11/8/2019)	0.5 - 2	13/14	93%	0.000002 – 0.000002	0.000028	MDC	N/A	See Aroclors		N/A	N/A	--	No	Aroclor data used to evaluate chemical
PCB-12/13	2974-92-7/2974~	0.000011		0.00058		mg/kg	SB407 (7/15/2021)	0.5 - 2	4/16	25%	0.0000039 – 0.0024	0.00058	MDC	N/A	See Aroclors		N/A	N/A	--	No	Aroclor data used to evaluate chemical
PCB-120	68194-12-7	0.0000011	J	0.0014		mg/kg	SB408 (7/16/2021)	0.5 - 2	19/30	63%	0.000002 – 0.0012	0.0014	MDC	N/A	See Aroclors		N/A	N/A	--	No	Aroclor data used to evaluate chemical
PCB-121	56558-18-0	N/A		N/A		mg/kg	N/A	N/A	0/30	0%	0.000002 – 0.0012	0.0012	CRQL	N/A	See Aroclors		N/A	N/A	--	No	Aroclor data used to evaluate chemical
PCB-122	76842-07-4	0.0000013	J	0.00025		mg/kg	SA-SB319 (11/7/2019)	0.5 - 2	17/30	57%	0.000002 – 0.0012	0.00025	MDC	N/A	See Aroclors		N/A	N/A	--	No	Aroclor data used to evaluate chemical
PCB-123	65510-44-3	0.0000031		0.002		mg/kg	SB407 (7/15/2021)	0.5 - 2	25/30	83%	0.000001 – 0.00025	0.002	MDC	N/A	See TEQ		N/A	N/A	--	No	TEQ used to evaluate chemical
PCB-124	70424-70-3	0.0000012	J	0.0019		mg/kg	SA-SB327 (11/15/2019)	0.5 - 2	14/14	100%	N/A	0.0019	MDC	N/A	See Aroclors		N/A	N/A	--	No	Aroclor data used to evaluate chemical
PCB-126	57465-28-8	0.0000032		0.00075		mg/kg	SB408 (7/16/2021)	0.5 - 2	22/30	73%	0.00000095 – 0.00055	0.00075	MDC	N/A	See TEQ		N/A	N/A	--	No	TEQ used to evaluate chemical
PCB-127	39635-33-1	N/A		N/A		mg/kg	N/A	N/A	0/30	0%	0.000002 – 0.0012	0.0012	CRQL	N/A	See Aroclors		N/A	N/A	--	No	Aroclor data used to evaluate chemical
PCB-128/162	38380-07-3/396~	0.000011		0.011		mg/kg	SA-SB327 (11/15/2019)	0.5 - 2	14/14	100%	N/A	0.011	MDC	N/A	See Aroclors		N/A	N/A	--	No	Aroclor data used to evaluate chemical
PCB-128/166	38380-07-3/414~	0.00023		0.1		mg/kg	SA-SB320 (11/25/2019)	0.5 - 2	14/16	88%	0.000018 – 0.000019	0.1	MDC	N/A	See Aroclors		N/A	N/A	--	No	Aroclor data used to evaluate chemical
PCB-129	55215-18-4	0.0000025		0.0028		mg/kg	SA-SB327 (11/15/2019)	0.5 - 2	14/14	100%	N/A	0.0028	MDC	N/A	See Aroclors		N/A	N/A	--	No	Aroclor data used to evaluate chemical
PCB-129/138/163	55215-18-4/350~	0.00008		2.5		mg/kg	SA-SB320 (11/25/2019)	0.5 - 2	16/16	100%	N/A	2.5	MDC	N/A	See Aroclors		N/A	N/A	--	No	Aroclor data used to evaluate chemical
PCB-13	2974-90-5	0.0000012	J	0.000067		mg/kg	SA-SB328 (11/15/2019)	0.5 - 2	13/14	93%	0.000002 – 0.000002	0.000067	MDC	N/A	See Aroclors		N/A	N/A	--	No	Aroclor data used to evaluate chemical
PCB-130	52663-66-8	0.0000027	J	0.056		mg/kg	SA-SB320 (11/25/2019)	0.5 - 2	29/30	97%	0.000009 – 0.000009	0.056	MDC	N/A	See Aroclors		N/A	N/A	--	No	Aroclor data used to evaluate chemical
PCB-131	61798-70-7	0.000013		0.012		mg/kg	SA-SB320 (11/25/2019)	0.5 - 2	12/16	75%	0.000009 – 0.0012	0.012	MDC	N/A	See Aroclors		N/A	N/A	--	No	Aroclor data used to evaluate chemical
PCB-131/133	61798-70-7/356~	0.0000023	J	0.0049		mg/kg	SA-SB327 (11/15/2019)	0.5 - 2	14/14	100%	N/A	0.0049	MDC	N/A	See Aroclors		N/A	N/A	--	No	Aroclor data used to evaluate chemical
PCB-132	38380-05-1	0.000012		0.67		mg/kg	SA-SB320 (11/25/2019)	0.5 - 2	16/16	100%	N/A	0.67	MDC	N/A	See Aroclors		N/A	N/A	--	No	Aroclor data used to evaluate chemical
PCB-132/161	38380-05-1/744~	0.000049		0.057	J	mg/kg	SA-SB327 (11/15/2019)	0.5 - 2	14/14	100%	N/A	0.057	MDC	N/A	See Aroclors		N/A	N/A	--	No	Aroclor data used to evaluate chemical
PCB-133	35694-04-3	0.0000015	J	0.022		mg/kg	SA-SB320 (11/25/2019)	0.5 - 2	13/16	81%	0.000009 – 0.0000096	0.022	MDC	N/A	See Aroclors		N/A	N/A	--	No	Aroclor data used to evaluate chemical
PCB-134	52704-70-8	0.0003		0.098		mg/kg	SA-SB320 (11/25/2019)	0.5 - 2	7/7	100%	N/A	0.098	MDC	N/A	See Aroclors		N/A	N/A	--	No	Aroclor data used to evaluate chemical
PCB-134/143	52704-70-8/681~	0.0000017	J	0.054		mg/kg	SB408 (7/16/2021)	0.5 - 2	22/23	96%	0.000018 – 0.000018	0.054	MDC	N/A	See Aroclors		N/A	N/A	--	No	Aroclor data used to evaluate chemical
PCB-135	52744-13-5	0.000013		0.03	J	mg/kg	SA-SB327 (11/15/2019)	0.5 - 2	14/14	100%	N/A	0.03	MDC	N/A	See Aroclors		N/A	N/A	--	No	Aroclor data used to evaluate chemical
PCB-135/151	52744-13-5/526~	0.000024	J	1.3		mg/kg	SA-SB320 (11/25/2019)	0.5 - 2	16/16	100%	N/A	1.3	MDC	N/A	See Aroclors		N/A	N/A	--	No	Aroclor data used to evaluate chemical
PCB-136	38411-22-2	0.000011		0.41		mg/kg	SA-SB320 (11/25/2019)	0.5 - 2	28/30	93%	0.000009 – 0.0000096	0.41	MDC	N/A	See Aroclors		N/A	N/A	--	No	Aroclor data used to evaluate chemical
PCB-137	35694-06-5	0.0000025		0.047		mg/kg	SB407 (7/15/2021)	0.5 - 2	24/30	80%	0.000009 – 0.000018	0.047	MDC	N/A	See Aroclors		N/A	N/A	--	No	Aroclor data used to evaluate chemical
PCB-138/163/164	35065-28-2/744~	0.00016		0.17	J	mg/kg	SA-SB327 (11/15/2019)	0.5 - 2	14/14	100%	N/A	0.17	MDC	N/A	See Aroclors		N/A	N/A	--	No	Aroclor data used to evaluate chemical
PCB-139/140	56030-56-9/592~	0.0000091	J	0.0057		mg/kg	SB408 (7/16/2021)	0.5 - 2	11/16	69%	0.0000039 – 0.0024	0.0057	MDC	N/A	See Aroclors		N/A	N/A	--	No	Aroclor data used to evaluate chemical
PCB-139/149	56030-56-9/383~	0.0001		0.18	J	mg/kg	SA-SB327 (11/15/2019)	0.5 - 2	14/14	100%	N/A	0.18	MDC	N/A	See Aroclors		N/A	N/A	--	No	Aroclor data used to evaluate chemical
PCB-14	34883-41-5	N/A		N/A		mg/kg	N/A	N/A	0/30	0%	0.000002 – 0.0012	0.0012	CRQL	N/A	See Aroclors		N/A	N/A	--	No	Aroclor data used to evaluate chemical
PCB-140	59291-64-4	0.0000047		0.0015		mg/kg	SA-SB327 (11/15/2019)	0.5 - 2	6/14	43%	0.000002 – 0.000002	0.0015	MDC	N/A	See Aroclors		N/A	N/A	--	No	Aroclor data used to evaluate chemical
PCB-141	52712-04-6	0.000014		0.7		mg/kg	SA-SB320 (11/25/2019)	0.5 - 2	30/30	100%	N/A	0.7	MDC	N/A	See Aroclors		N/A	N/A	--	No	Aroclor data used to evaluate chemical
PCB-142	41411-61-4	0.0000047		0.0000047		mg/kg	SA-SB319 (11/7/2019)	0.5 - 2	1/30	3%	0.000002 – 0.0012	0.0000047	MDC	N/A	See Aroclors		N/A	N/A	--	No	Aroclor data used to evaluate chemical
PCB-143	68194-15-0	N/A		N/A		mg/kg	N/A	N/A	0/7	0%	0.000002 – 0.0012	0.0012	CRQL	N/A	See Aroclors		N/A	N/A	--	No	Aroclor data used to evaluate chemical
PCB-144	68194-14-9	0.0000031	J	0.17		mg/kg	SA-SB320 (11/25/2019)	0.5 - 2	29/30	97%	0.000009 – 0.000009	0.17	MDC	N/A	See Aroclors		N/A	N/A	--	No	Aroclor data used to evaluate chemical
PCB-145	74472-40-5	0.0000037		0.0000098		mg/kg	SA-SB318 (11/8/2019)	0.5 - 2	5/30	17%	0.000002 – 0.0012	0.0000098	MDC	N/A	See Aroclors		N/A	N/A	--	No	Aroclor data used to evaluate chemical
PCB-146	51908-16-8	0.000013		0.3		mg/kg	SA-SB320 (11/25/2019)	0.5 - 2	16/16	100%	N/A	0.3	MDC	N/A	See Aroclors		N/A	N/A	--	No	Aroclor data used to evaluate chemical
PCB-146/165	51908-16-8/744~	0.000021		0.037		mg/kg	SA-SB327 (11/15/2019)	0.5 - 2	14/14	100%	N/A	0.037	MDC	N/A	See Aroclors		N/A	N/A	--	No	Aroclor data used to evaluate chemical
PCB-147	68194-13-8	0.0000046		0.00049		mg/kg	SA-SB327 (11/15/2019)	0.5 - 2	13/14	93%	0.000002 – 0.000002	0.00049	MDC	N/A	See Aroclors		N/A	N/A	--	No	Aroclor data used to evaluate chemical

Table A-2.2
Occurrence, Distribution, and Selection of Constituents of Interest (Direct Contact – Site-Wide; Near Surface Soil, 0.5 – 2 feet)
Reasonable Maximum Exposure
Human Health Risk Assessment
Shaffer Equipment/Arbuckle Creek Area Superfund Site, Minden, West Virginia

Scenario Timeframe: Current and Future
Medium: Soil
Exposure Medium: Soil
Exposure Point: Soil (0.5 – 2 feet)

Chemical	CASRN	Minimum Detected Concentration		Maximum Detected Concentration		Units	Location of Maximum	Depth (ft bgs)	Detection Frequency		Range of Reporting Limits	Screening Concentration		Background Value	Screening Level [1, 2]		Source	Potential ARAR [3]	Source	COPC Flag (Yes/No)	Rationale for Selection/Deletion
PCB-147/149	68194-13-8/383~	0.000059		1.9		mg/kg	SA-SB320 (11/25/2019)	0.5 - 2	16/16	100%	N/A	1.9	MDC	N/A	See Aroclors		N/A	N/A	--	No	Aroclor data used to evaluate chemical
PCB-148	74472-41-6	0.0000013	J	0.0016		mg/kg	SB408 (7/16/2021)	0.5 - 2	6/30	20%	0.000002 – 0.0012	0.0016	MDC	N/A	See Aroclors		N/A	N/A	--	No	Aroclor data used to evaluate chemical
PCB-15	2050-68-2	0.0000029		0.007		mg/kg	SB408 (7/16/2021)	0.5 - 2	26/30	87%	0.000009 – 0.0012	0.007	MDC	N/A	See Aroclors		N/A	N/A	--	No	Aroclor data used to evaluate chemical
PCB-150	68194-08-1	0.0000008	J	0.0013		mg/kg	SB408 (7/16/2021)	0.5 - 2	18/30	60%	0.000002 – 0.0012	0.0013	MDC	N/A	See Aroclors		N/A	N/A	--	No	Aroclor data used to evaluate chemical
PCB-151	52663-63-5	0.000035		0.08	J	mg/kg	SA-SB327 (11/15/2019)	0.5 - 2	14/14	100%	N/A	0.08	MDC	N/A	See Aroclors		N/A	N/A	--	No	Aroclor data used to evaluate chemical
PCB-152	68194-09-2	0.00000083	J	0.00045		mg/kg	SB408 (7/16/2021)	0.5 - 2	14/30	47%	0.000002 – 0.0012	0.00045	MDC	N/A	See Aroclors		N/A	N/A	--	No	Aroclor data used to evaluate chemical
PCB-153	35065-27-1	0.00014		0.22	J	mg/kg	SA-SB327 (11/15/2019)	0.5 - 2	14/14	100%	N/A	0.22	MDC	N/A	See Aroclors		N/A	N/A	--	No	Aroclor data used to evaluate chemical
PCB-153/168	35065-27-1/592~	0.000095		2.8		mg/kg	SA-SB320 (11/25/2019)	0.5 - 2	16/16	100%	N/A	2.8	MDC	N/A	See Aroclors		N/A	N/A	--	No	Aroclor data used to evaluate chemical
PCB-154	60145-22-4	0.000005		0.0038		mg/kg	SA-SB327 (11/15/2019)	0.5 - 2	18/21	86%	0.000002 – 0.0012	0.0038	MDC	N/A	See Aroclors		N/A	N/A	--	No	Aroclor data used to evaluate chemical
PCB-155	33979-03-2	0.000029		0.000029		mg/kg	SB404 (7/16/2021)	0.5 - 2	1/30	3%	0.000002 – 0.0012	0.000029	MDC	N/A	See Aroclors		N/A	N/A	--	No	Aroclor data used to evaluate chemical
PCB-156	38380-08-4	0.00001		0.011		mg/kg	SA-SB327 (11/15/2019)	0.5 - 2	14/14	100%	N/A	0.011	MDC	N/A	See TEQ		N/A	N/A	--	No	TEQ used to evaluate chemical
PCB-156/157	38380-08-4/697~	0.00018		0.12		mg/kg	SA-SB320 (11/25/2019)	0.5 - 2	14/16	88%	0.0000069 – 0.0000073	0.12	MDC	N/A	See TEQ		N/A	N/A	--	No	TEQ used to evaluate chemical
PCB-157	69782-90-7	0.0000016	J	0.00086		mg/kg	SA-SB327 (11/15/2019)	0.5 - 2	14/14	100%	N/A	0.00086	MDC	N/A	See TEQ		N/A	N/A	--	No	TEQ used to evaluate chemical
PCB-158	74472-42-7	0.0000041	J	0.19		mg/kg	SA-SB320 (11/25/2019)	0.5 - 2	16/16	100%	N/A	0.19	MDC	N/A	See Aroclors		N/A	N/A	--	No	Aroclor data used to evaluate chemical
PCB-158/160	74472-42-7/414~	0.0000098		0.017		mg/kg	SA-SB327 (11/15/2019)	0.5 - 2	14/14	100%	N/A	0.017	MDC	N/A	See Aroclors		N/A	N/A	--	No	Aroclor data used to evaluate chemical
PCB-159	39635-35-3	0.0000012	J	0.031		mg/kg	SB408 (7/16/2021)	0.5 - 2	23/30	77%	0.000002 – 0.0012	0.031	MDC	N/A	See Aroclors		N/A	N/A	--	No	Aroclor data used to evaluate chemical
PCB-16	38444-78-9	0.000011		0.0044		mg/kg	SA-SB320 (11/25/2019)	0.5 - 2	26/30	87%	0.000002 – 0.0012	0.0044	MDC	N/A	See Aroclors		N/A	N/A	--	No	Aroclor data used to evaluate chemical
PCB-160	41411-62-5	N/A		N/A		mg/kg	N/A	N/A	0/7	0%	0.000002 – 0.0012	0.0012	CRQL	N/A	See Aroclors		N/A	N/A	--	No	Aroclor data used to evaluate chemical
PCB-161	74472-43-8	0.000012		0.01		mg/kg	SB450 (7/15/2021)	0.5 - 2	2/16	13%	0.000002 – 0.0012	0.01	MDC	N/A	See Aroclors		N/A	N/A	--	No	Aroclor data used to evaluate chemical
PCB-162	39635-34-2	0.0000051	J	0.0037		mg/kg	SB407 (7/15/2021)	0.5 - 2	7/16	44%	0.000002 – 0.0011	0.0037	MDC	N/A	See Aroclors		N/A	N/A	--	No	Aroclor data used to evaluate chemical
PCB-164	74472-45-0	0.0000042	J	0.16		mg/kg	SA-SB320 (11/25/2019)	0.5 - 2	15/16	94%	0.000015 – 0.000015	0.16	MDC	N/A	See Aroclors		N/A	N/A	--	No	Aroclor data used to evaluate chemical
PCB-165	74472-46-1	0.0000043	J	0.0081		mg/kg	SB408 (7/16/2021)	0.5 - 2	4/16	25%	0.000002 – 0.0012	0.0081	MDC	N/A	See Aroclors		N/A	N/A	--	No	Aroclor data used to evaluate chemical
PCB-166	41411-63-6	0.0000022		0.00021		mg/kg	SA-SB316 (11/8/2019)	0.5 - 2	12/14	86%	0.000002 – 0.000002	0.00021	MDC	N/A	See Aroclors		N/A	N/A	--	No	Aroclor data used to evaluate chemical
PCB-167	52663-72-6	0.0000056		0.041		mg/kg	SA-SB320 (11/25/2019)	0.5 - 2	28/30	93%	0.0000039 – 0.0000041	0.041	MDC	N/A	See TEQ		N/A	N/A	--	No	TEQ used to evaluate chemical
PCB-168	59291-65-5	N/A		N/A		mg/kg	N/A	N/A	0/14	0%	0.000002 – 0.000002	0.000002	CRQL	N/A	See Aroclors		N/A	N/A	--	No	Aroclor data used to evaluate chemical
PCB-169	32774-16-6	0.0000036		0.00052	Z	mg/kg	SA-SB323 (11/22/2019)	0.5 - 2	11/30	37%	0.00000078 – 0.00041	0.00052	MDC	N/A	See TEQ		N/A	N/A	--	No	TEQ used to evaluate chemical
PCB-17	37680-66-3	0.000011		0.0053		mg/kg	SA-SB320 (11/25/2019)	0.5 - 2	27/30	90%	0.000002 – 0.0000096	0.0053	MDC	N/A	See Aroclors		N/A	N/A	--	No	Aroclor data used to evaluate chemical
PCB-170	35065-30-6	0.000026		1.1		mg/kg	SA-SB320 (11/25/2019)	0.5 - 2	30/30	100%	N/A	1.1	MDC	N/A	See Aroclors		N/A	N/A	--	No	Aroclor data used to evaluate chemical
PCB-171	52663-71-5	0.000023		0.032	J	mg/kg	SA-SB327 (11/15/2019)	0.5 - 2	14/14	100%	N/A	0.032	MDC	N/A	See Aroclors		N/A	N/A	--	No	Aroclor data used to evaluate chemical
PCB-171/173	52663-71-5/681~	0.0000077	J	0.35		mg/kg	SA-SB320 (11/25/2019)	0.5 - 2	16/16	100%	N/A	0.35	MDC	N/A	See Aroclors		N/A	N/A	--	No	Aroclor data used to evaluate chemical
PCB-172	52663-74-8	0.0000048	J	0.21		mg/kg	SA-SB320 (11/25/2019)	0.5 - 2	30/30	100%	N/A	0.21	MDC	N/A	See Aroclors		N/A	N/A	--	No	Aroclor data used to evaluate chemical
PCB-173	68194-16-1	0.0000017	J	0.0022		mg/kg	SA-SB327 (11/15/2019)	0.5 - 2	14/14	100%	N/A	0.0022	MDC	N/A	See Aroclors		N/A	N/A	--	No	Aroclor data used to evaluate chemical
PCB-174	38411-25-5	0.00003		1.4		mg/kg	SA-SB320 (11/25/2019)	0.5 - 2	30/30	100%	N/A	1.4	MDC	N/A	See Aroclors		N/A	N/A	--	No	Aroclor data used to evaluate chemical
PCB-175	40186-70-7	0.00000098	J	0.055		mg/kg	SA-SB320 (11/25/2019)	0.5 - 2	27/30	90%	0.000002 – 0.0000096	0.055	MDC	N/A	See Aroclors		N/A	N/A	--	No	Aroclor data used to evaluate chemical
PCB-176	52663-65-7	0.0000026	J	0.18		mg/kg	SA-SB320 (11/25/2019)	0.5 - 2	30/30	100%	N/A	0.18	MDC	N/A	See Aroclors		N/A	N/A	--	No	Aroclor data used to evaluate chemical
PCB-177	52663-70-4	0.000022		0.75		mg/kg	SA-SB320 (11/25/2019)	0.5 - 2	30/30	100%	N/A	0.75	MDC	N/A	See Aroclors		N/A	N/A	--	No	Aroclor data used to evaluate chemical
PCB-178	52663-67-9	0.000011		0.28		mg/kg	SA-SB320 (11/25/2019)	0.5 - 2	29/30	97%	0.0000096 – 0.0000096	0.28	MDC	N/A	See Aroclors		N/A	N/A	--	No	Aroclor data used to evaluate chemical
PCB-179	52663-64-6	0.000013		0.61		mg/kg	SA-SB320 (11/25/2019)	0.5 - 2	30/30	100%	N/A	0.61	MDC	N/A	See Aroclors		N/A	N/A	--	No	Aroclor data used to evaluate chemical
PCB-18	37680-65-2	0.0000023		0.0021		mg/kg	SA-SB319 (11/7/2019)	0.5 - 2	14/14	100%	N/A	0.0021	MDC	N/A	See Aroclors		N/A	N/A	--	No	Aroclor data used to evaluate chemical
PCB-18/30	37680-65-2/356~	0.00000046	J	0.011		mg/kg	SA-SB320 (11/25/2019)	0.5 - 2	15/16	94%	0.000019 – 0.000019	0.011	MDC	N/A	See Aroclors		N/A	N/A	--	No	Aroclor data used to evaluate chemical
PCB-180	35065-29-3	0.00024		0.19	J	mg/kg	SA-SB327 (11/15/2019)	0.5 - 2	14/14	100%	N/A	0.19	MDC	N/A	See Aroclors		N/A	N/A	--	No	Aroclor data used to evaluate chemical
PCB-180/193	35065-29-3/697~	0.000066		3		mg/kg	SA-SB320 (11/25/2019)	0.5 - 2	16/16	100%	N/A	3	MDC	N/A	See Aroclors		N/A	N/A	--	No	Aroclor data used to evaluate chemical
PCB-181	74472-47-2	0.0000083		0.00039		mg/kg	SB407 (7/15/2021)	0.5 - 2	6/30	20%	0.000002 – 0.0012	0.00039	MDC	N/A	See Aroclors		N/A	N/A	--	No	Aroclor data used to evaluate chemical
PCB-182	60145-23-5	0.0000012	J	0.00014		mg/kg	SB407 (7/15/2021)	0.5 - 2	5/16	31%	0.000009 – 0.0012	0.00014	MDC	N/A	See Aroclors		N/A	N/A	--	No	Aroclor data used to evaluate chemical
PCB-182/187	60145-23-5/526~	0.00012		0.15	J	mg/kg	SA-SB327 (11/15/2019)	0.5 - 2	14/14	100%	N/A	0.15	MDC	N/A	See Aroclors		N/A	N/A	--	No	Aroclor data used to evaluate chemical
PCB-183	52663-69-1	0.000048		0.067	J	mg/kg	SA-SB327 (11/15/2019)	0.5 - 2	14/14	100%	N/A	0.067	MDC	N/A	See Aroclors		N/A	N/A	--	No	Aroclor data used to evaluate chemical
PCB-183/185	52663-69-1/527~	0.00002		0.88		mg/kg	SA-SB320 (11/25/2019)	0.5 - 2	15/16	94%	0.000019 – 0.000019	0.88	MDC	N/A	See Aroclors		N/A	N/A	--	No	Aroclor data used to evaluate chemical
PCB-184	74472-48-3	0.00000073	J	0.000062		mg/kg	SB408 (7/16/2021)	0.5 - 2	8/30	27%	0.000002 – 0.0012	0.000062	MDC	N/A	See Aroclors		N/A	N/A	--	No	Aroclor data used to evaluate chemical
PCB-185	52712-05-7	0.0000097		0.012		mg/kg	SA-SB327 (11/15/2019)	0.5 - 2	14/14	100%	N/A	0.012	MDC	N/A	See Aroclors		N/A	N/A	--	No	Aroclor data used to evaluate chemical
PCB-186	74472-49-4	0.00000091	J	0.00000091	J	mg/kg	SA-SB324 (11/22/2019)	0.5 - 2	1/30	3%	0.000002 – 0.0012	0.00000091	MDC	N/A	See Aroclors		N/A	N/A	--	No	Aroclor data used to evaluate chemical
PCB-187	52663-68-0	0.000047		1.6		mg/kg	SA-SB320 (11/25/2019)	0.5 - 2	16/16	100%	N/A	1.6	MDC	N/A	See Aroclors		N/A	N/A	--	No	Aroclor data used to evaluate chemical
PCB-188	74487-85-7	0.00000074	J	0.0003		mg/kg	SB408 (7/16/2021)	0.5 - 2	13/30	43%	0.000002 – 0.0012	0.0003	MDC	N/A	See Aroclors		N/A	N/A	--	No	Aroclor data used to evaluate chemical
PCB-189	39635-31-9	0.0000033		0.036		mg/kg	SA-SB320 (11/25/2019)	0.5 - 2	28/30	93%	0.0000041 – 0.0000043	0.036	MDC	N/A	See TEQ		N/A	N/A	--	No	TEQ used to evaluate chemical
PCB-19	38444-73-4	0.0000042		0.0014		mg/kg	SA-SB320 (11/25/2019)	0.5 - 2	24/30	80%	0.000002 – 0.0012	0.0014	MDC	N/A	See Aroclors		N/A	N/A	--	No	Aroclor data used to evaluate chemical
PCB-190	41411-64-7	0.0000078	J	0.25		mg/kg	SA-SB320 (11/25/2019)	0.5 - 2	30/30	100%	N/A	0.25	MDC	N/A	See Aroclors		N/A	N/A	--	No	Aroclor data used to evaluate chemical

Table A-2.2
Occurrence, Distribution, and Selection of Constituents of Interest (Direct Contact – Site-Wide; Near Surface Soil, 0.5 – 2 feet)
Reasonable Maximum Exposure
Human Health Risk Assessment
Shaffer Equipment/Arbuckle Creek Area Superfund Site, Minden, West Virginia

Scenario Timeframe: Current and Future
Medium: Soil
Exposure Medium: Soil
Exposure Point: Soil (0.5 – 2 feet)

Chemical	CASRN	Minimum Detected Concentration		Maximum Detected Concentration		Units	Location of Maximum	Depth (ft bgs)	Detection Frequency		Range of Reporting Limits	Screening Concentration		Background Value	Screening Level [1, 2]		Source	Potential ARAR [3]	Source	COPC Flag (Yes/No)	Rationale for Selection/Deletion
PCB-191	74472-50-7	0.00000085	J	0.044		mg/kg	SA-SB320 (11/25/2019)	0.5 - 2	28/30	93%	0.000009 – 0.0012	0.044	MDC	N/A	See Aroclors		N/A	N/A	--	No	Aroclor data used to evaluate chemical
PCB-192	74472-51-8	N/A		N/A		mg/kg	N/A	N/A	0/30	0%	0.000002 – 0.0012	0.0012	CRQL	N/A	See Aroclors		N/A	N/A	--	No	Aroclor data used to evaluate chemical
PCB-193	69782-91-8	0.000011		0.013		mg/kg	SA-SB327 (11/15/2019)	0.5 - 2	14/14	100%	N/A	0.013	MDC	N/A	See Aroclors		N/A	N/A	--	No	Aroclor data used to evaluate chemical
PCB-194	35694-08-7	0.000015		0.62		mg/kg	SA-SB320 (11/25/2019)	0.5 - 2	30/30	100%	N/A	0.62	MDC	N/A	See Aroclors		N/A	N/A	--	No	Aroclor data used to evaluate chemical
PCB-195	52663-78-2	0.0000098		0.26		mg/kg	SA-SB320 (11/25/2019)	0.5 - 2	30/30	100%	N/A	0.26	MDC	N/A	See Aroclors		N/A	N/A	--	No	Aroclor data used to evaluate chemical
PCB-196	42740-50-1	0.0000067	J	0.33		mg/kg	SA-SB320 (11/25/2019)	0.5 - 2	16/16	100%	N/A	0.33	MDC	N/A	See Aroclors		N/A	N/A	--	No	Aroclor data used to evaluate chemical
PCB-196/203	42740-50-1/526~	0.000048		0.048	J	mg/kg	SA-SB327 (11/15/2019)	0.5 - 2	14/14	100%	N/A	0.048	MDC	N/A	See Aroclors		N/A	N/A	--	No	Aroclor data used to evaluate chemical
PCB-197	33091-17-7	0.000015		0.0018		mg/kg	SA-SB327 (11/15/2019)	0.5 - 2	14/14	100%	N/A	0.0018	MDC	N/A	See Aroclors		N/A	N/A	--	No	Aroclor data used to evaluate chemical
PCB-197/200	33091-17-7/526~	0.0000027	J	0.11		mg/kg	SA-SB320 (11/25/2019)	0.5 - 2	16/16	100%	N/A	0.11	MDC	N/A	See Aroclors		N/A	N/A	--	No	Aroclor data used to evaluate chemical
PCB-198	68194-17-2	0.0000038		0.0023		mg/kg	SA-SB327 (11/15/2019)	0.5 - 2	14/14	100%	N/A	0.0023	MDC	N/A	See Aroclors		N/A	N/A	--	No	Aroclor data used to evaluate chemical
PCB-198/199	68194-17-2/526~	0.000019		0.67		mg/kg	SA-SB320 (11/25/2019)	0.5 - 2	16/16	100%	N/A	0.67	MDC	N/A	See Aroclors		N/A	N/A	--	No	Aroclor data used to evaluate chemical
PCB-199	52663-75-9	0.000046		0.038	J	mg/kg	SA-SB327 (11/15/2019)	0.5 - 2	14/14	100%	N/A	0.038	MDC	N/A	See Aroclors		N/A	N/A	--	No	Aroclor data used to evaluate chemical
PCB-2	2051-61-8	0.00000094	J	0.00011		mg/kg	SB407 (7/15/2021)	0.5 - 2	20/30	67%	0.000002 – 0.0012	0.00011	MDC	N/A	See Aroclors		N/A	N/A	--	No	Aroclor data used to evaluate chemical
PCB-20/21/33	38444-84-7/557~	0.000002	J	0.00094		mg/kg	SA-SB328 (11/15/2019)	0.5 - 2	14/14	100%	N/A	0.00094	MDC	N/A	See Aroclors		N/A	N/A	--	No	Aroclor data used to evaluate chemical
PCB-20/28	38444-84-7/701~	0.00031		0.034		mg/kg	SB408 (7/16/2021)	0.5 - 2	14/16	88%	0.000018 – 0.000019	0.034	MDC	N/A	See Aroclors		N/A	N/A	--	No	Aroclor data used to evaluate chemical
PCB-200	52663-73-7	0.0000054		0.0064		mg/kg	SA-SB327 (11/15/2019)	0.5 - 2	14/14	100%	N/A	0.0064	MDC	N/A	See Aroclors		N/A	N/A	--	No	Aroclor data used to evaluate chemical
PCB-201	40186-71-8	0.0000013	J	0.08		mg/kg	SA-SB320 (11/25/2019)	0.5 - 2	29/30	97%	0.000009 – 0.000009	0.08	MDC	N/A	See Aroclors		N/A	N/A	--	No	Aroclor data used to evaluate chemical
PCB-202	2136-99-4	0.000003	J	0.11		mg/kg	SA-SB320 (11/25/2019)	0.5 - 2	30/30	100%	N/A	0.11	MDC	N/A	See Aroclors		N/A	N/A	--	No	Aroclor data used to evaluate chemical
PCB-203	52663-76-0	0.000014		0.38		mg/kg	SA-SB320 (11/25/2019)	0.5 - 2	16/16	100%	N/A	0.38	MDC	N/A	See Aroclors		N/A	N/A	--	No	Aroclor data used to evaluate chemical
PCB-204	74472-52-9	0.00000069	J	0.00000069	J	mg/kg	SA-SB324 (11/22/2019)	0.5 - 2	1/30	3%	0.000002 – 0.0012	0.00000069	MDC	N/A	See Aroclors		N/A	N/A	--	No	Aroclor data used to evaluate chemical
PCB-205	74472-53-0	0.0000011	J	0.03		mg/kg	SA-SB320 (11/25/2019)	0.5 - 2	30/30	100%	N/A	0.03	MDC	N/A	See Aroclors		N/A	N/A	--	No	Aroclor data used to evaluate chemical
PCB-206	40186-72-9	0.0000041	J	0.11		mg/kg	SA-SB320 (11/25/2019)	0.5 - 2	30/30	100%	N/A	0.11	MDC	N/A	See Aroclors		N/A	N/A	--	No	Aroclor data used to evaluate chemical
PCB-207	52663-79-3	0.00000053	J	0.017		mg/kg	SA-SB320 (11/25/2019)	0.5 - 2	29/30	97%	0.0000096 – 0.0000096	0.017	MDC	N/A	See Aroclors		N/A	N/A	--	No	Aroclor data used to evaluate chemical
PCB-208	52663-77-1	0.00000083	J	0.022		mg/kg	SA-SB320 (11/25/2019)	0.5 - 2	30/30	100%	N/A	0.022	MDC	N/A	See Aroclors		N/A	N/A	--	No	Aroclor data used to evaluate chemical
PCB-209 (Decachlorobiphenyl)	2051-24-3	0.00000086	J	0.0073		mg/kg	SA-SB323 (11/22/2019)	0.5 - 2	30/30	100%	N/A	0.0073	MDC	N/A	See Aroclors		N/A	N/A	--	No	Aroclor data used to evaluate chemical
PCB-21/33	55702-46-0/384~	0.000067		0.012		mg/kg	SA-SB320 (11/25/2019)	0.5 - 2	14/16	88%	0.000018 – 0.000019	0.012	MDC	N/A	See Aroclors		N/A	N/A	--	No	Aroclor data used to evaluate chemical
PCB-22	38444-85-8	0.0000024		0.013		mg/kg	SB408 (7/16/2021)	0.5 - 2	27/30	90%	0.000009 – 0.0000096	0.013	MDC	N/A	See Aroclors		N/A	N/A	--	No	Aroclor data used to evaluate chemical
PCB-23	55720-44-0	N/A		N/A		mg/kg	N/A	N/A	0/30	0%	0.000002 – 0.0012	0.0012	CRQL	N/A	See Aroclors		N/A	N/A	--	No	Aroclor data used to evaluate chemical
PCB-24	55702-45-9	0.0000024		0.0011		mg/kg	SB408 (7/16/2021)	0.5 - 2	22/30	73%	0.000002 – 0.0012	0.0011	MDC	N/A	See Aroclors		N/A	N/A	--	No	Aroclor data used to evaluate chemical
PCB-25	55712-37-3	0.0000034		0.0022		mg/kg	SB408 (7/16/2021)	0.5 - 2	25/30	83%	0.000002 – 0.0012	0.0022	MDC	N/A	See Aroclors		N/A	N/A	--	No	Aroclor data used to evaluate chemical
PCB-26	38444-81-4	0.000011		0.00043		mg/kg	SA-SB328 (11/15/2019)	0.5 - 2	13/14	93%	0.000002 – 0.000002	0.00043	MDC	N/A	See Aroclors		N/A	N/A	--	No	Aroclor data used to evaluate chemical
PCB-26/29	38444-81-4/158~	0.00002		0.0043		mg/kg	SB408 (7/16/2021)	0.5 - 2	12/16	75%	0.000018 – 0.0024	0.0043	MDC	N/A	See Aroclors		N/A	N/A	--	No	Aroclor data used to evaluate chemical
PCB-27	38444-76-7	0.0000023		0.00097	J	mg/kg	SA-SB320 (11/25/2019)	0.5 - 2	24/30	80%	0.000002 – 0.0012	0.00097	MDC	N/A	See Aroclors		N/A	N/A	--	No	Aroclor data used to evaluate chemical
PCB-28	7012-37-5	0.0000042		0.0031		mg/kg	SA-SB328 (11/15/2019)	0.5 - 2	14/14	100%	N/A	0.0031	MDC	N/A	See Aroclors		N/A	N/A	--	No	Aroclor data used to evaluate chemical
PCB-29	15862-07-4	0.0000017	J	0.000015		mg/kg	SA-SB328 (11/15/2019)	0.5 - 2	7/14	50%	0.000002 – 0.000002	0.000015	MDC	N/A	See Aroclors		N/A	N/A	--	No	Aroclor data used to evaluate chemical
PCB-3	2051-62-9	0.0000011	J	0.0012		mg/kg	SA-SB320 (11/25/2019)	0.5 - 2	25/30	83%	0.000009 – 0.0012	0.0012	MDC	N/A	See Aroclors		N/A	N/A	--	No	Aroclor data used to evaluate chemical
PCB-30	35693-92-6	N/A		N/A		mg/kg	N/A	N/A	0/14	0%	0.000002 – 0.000002	0.000002	CRQL	N/A	See Aroclors		N/A	N/A	--	No	Aroclor data used to evaluate chemical
PCB-31	16606-02-3	0.0000051		0.025		mg/kg	SB408 (7/16/2021)	0.5 - 2	27/30	90%	0.000009 – 0.0012	0.025	MDC	N/A	See Aroclors		N/A	N/A	--	No	Aroclor data used to evaluate chemical
PCB-32	38444-77-8	0.0000012	J	0.0071		mg/kg	SB408 (7/16/2021)	0.5 - 2	27/30	90%	0.000009 – 0.00025	0.0071	MDC	N/A	See Aroclors		N/A	N/A	--	No	Aroclor data used to evaluate chemical
PCB-34	37680-68-5	0.00000088	J	0.000037		mg/kg	SB407 (7/15/2021)	0.5 - 2	10/30	33%	0.000002 – 0.0012	0.000037	MDC	N/A	See Aroclors		N/A	N/A	--	No	Aroclor data used to evaluate chemical
PCB-35	37680-69-6	0.000002		0.00047	J	mg/kg	SA-SB320 (11/25/2019)	0.5 - 2	15/30	50%	0.000002 – 0.0012	0.00047	MDC	N/A	See Aroclors		N/A	N/A	--	No	Aroclor data used to evaluate chemical
PCB-36	38444-87-0	N/A		N/A		mg/kg	N/A	N/A	0/30	0%	0.000002 – 0.0012	0.0012	CRQL	N/A	See Aroclors		N/A	N/A	--	No	Aroclor data used to evaluate chemical
PCB-37	38444-90-5	0.0000012	J	0.012		mg/kg	SB408 (7/16/2021)	0.5 - 2	29/30	97%	0.000009 – 0.000009	0.012	MDC	N/A	See Aroclors		N/A	N/A	--	No	Aroclor data used to evaluate chemical
PCB-38	53555-66-1	0.000003		0.000059		mg/kg	SA-SB318 (11/8/2019)	0.5 - 2	5/30	17%	0.000002 – 0.0012	0.000059	MDC	N/A	See Aroclors		N/A	N/A	--	No	Aroclor data used to evaluate chemical
PCB-39	38444-88-1	0.0000014	J	0.0000046		mg/kg	SA-SB319 (11/7/2019)	0.5 - 2	2/30	7%	0.000002 – 0.0012	0.0000046	MDC	N/A	See Aroclors		N/A	N/A	--	No	Aroclor data used to evaluate chemical
PCB-4	13029-08-8	0.0000029		0.0056		mg/kg	SA-SB320 (11/25/2019)	0.5 - 2	23/30	77%	0.000002 – 0.0012	0.0056	MDC	N/A	See Aroclors		N/A	N/A	--	No	Aroclor data used to evaluate chemical
PCB-40	38444-93-8	0.000012		0.00087		mg/kg	SA-SB319 (11/7/2019)	0.5 - 2	13/14	93%	0.000002 – 0.000002	0.00087	MDC	N/A	See Aroclors		N/A	N/A	--	No	Aroclor data used to evaluate chemical
PCB-40/41/71	38444-93-8/526~	0.000082		0.016		mg/kg	SB408 (7/16/2021)	0.5 - 2	7/9	78%	0.000027 – 0.000029	0.016	MDC	N/A	See Aroclors		N/A	N/A	--	No	Aroclor data used to evaluate chemical
PCB-40/71	NOB20161110_001	0.000099	J	0.0064		mg/kg	SA-SB320 (11/25/2019)	0.5 - 2	7/7	100%	N/A	0.0064	MDC	N/A	See Aroclors		N/A	N/A	--	No	Aroclor data used to evaluate chemical
PCB-41	52663-59-9	0.000026		0.0024		mg/kg	SA-SB320 (11/25/2019)	0.5 - 2	4/7	57%	0.000021 – 0.0012	0.0024	MDC	N/A	See Aroclors		N/A	N/A	--	No	Aroclor data used to evaluate chemical
PCB-41/64/71/72	52663-59-9/526~	0.0000062	J	0.0045		mg/kg	SA-SB319 (11/7/2019)	0.5 - 2	14/14	100%	N/A	0.0045	MDC	N/A	See Aroclors		N/A	N/A	--	No	Aroclor data used to evaluate chemical
PCB-42	36559-22-5	0.000061	J	0.0055		mg/kg	SB408 (7/16/2021)	0.5 - 2	10/16	63%	0.000009 – 0.0012	0.0055	MDC	N/A	See Aroclors		N/A	N/A	--	No	Aroclor data used to evaluate chemical
PCB-42/59	36559-22-5/744~	0.0000023	J	0.0017		mg/kg	SA-SB319 (11/7/2019)	0.5 - 2	14/14	100%	N/A	0.0017	MDC	N/A	See Aroclors		N/A	N/A	--	No	Aroclor data used to evaluate chemical
PCB-43	70362-46-8	0.000012		0.000021		mg/kg	SA-SB322 (11/22/2019)	0.5 - 2	3/16	19%	0.000009 – 0.0012	0.000021	MDC	N/A	See Aroclors		N/A	N/A	--	No	Aroclor data used to evaluate chemical
PCB-43/49	70362-46-8/414~	0.0000063		0.0046		mg/kg	SA-SB319 (11/7/2019)	0.5 - 2	14/14	100%	N/A	0.0046	MDC	N/A	See Aroclors		N/A	N/A	--	No	Aroclor data used to evaluate chemical

Table A-2.2
Occurrence, Distribution, and Selection of Constituents of Interest (Direct Contact – Site-Wide; Near Surface Soil, 0.5 – 2 feet)
Reasonable Maximum Exposure
Human Health Risk Assessment
Shaffer Equipment/Arbuckle Creek Area Superfund Site, Minden, West Virginia

Scenario Timeframe: Current and Future
Medium: Soil
Exposure Medium: Soil
Exposure Point: Soil (0.5 – 2 feet)

Chemical	CASRN	Minimum Detected Concentration		Maximum Detected Concentration		Units	Location of Maximum	Depth (ft bgs)	Detection Frequency		Range of Reporting Limits	Screening Concentration		Background Value	Screening Level [1, 2]		Source	Potential ARAR [3]	Source	COPC Flag (Yes/No)	Rationale for Selection/Deletion
PCB-44	41464-39-5	0.0000052		0.0058		mg/kg	SA-SB319 (11/7/2019)	0.5 - 2	14/14	100%	N/A	0.0058	MDC	N/A	See Aroclors		N/A	N/A	--	No	Aroclor data used to evaluate chemical
PCB-44/47/65	41464-39-5/243~	0.00027		0.039		mg/kg	SB408 (7/16/2021)	0.5 - 2	12/16	75%	0.000027 – 0.0035	0.039	MDC	N/A	See Aroclors		N/A	N/A	--	No	Aroclor data used to evaluate chemical
PCB-45	70362-45-7	0.0000089		0.00071		mg/kg	SA-SB319 (11/7/2019)	0.5 - 2	13/14	93%	0.000002 – 0.000002	0.00071	MDC	N/A	See Aroclors		N/A	N/A	--	No	Aroclor data used to evaluate chemical
PCB-45/51	70362-45-7/681~	0.000015	J	0.0063		mg/kg	SB408 (7/16/2021)	0.5 - 2	13/16	81%	0.000018 – 0.00043	0.0063	MDC	N/A	See Aroclors		N/A	N/A	--	No	Aroclor data used to evaluate chemical
PCB-46	41464-47-5	0.0000037		0.0012		mg/kg	SB408 (7/16/2021)	0.5 - 2	24/30	80%	0.000002 – 0.0012	0.0012	MDC	N/A	See Aroclors		N/A	N/A	--	No	Aroclor data used to evaluate chemical
PCB-47	2437-79-8	0.0000036		0.0013		mg/kg	SA-SB319 (11/7/2019)	0.5 - 2	14/14	100%	N/A	0.0013	MDC	N/A	See Aroclors		N/A	N/A	--	No	Aroclor data used to evaluate chemical
PCB-48	70362-47-9	0.00000057	J	0.0046		mg/kg	SB408 (7/16/2021)	0.5 - 2	13/16	81%	0.000009 – 0.0012	0.0046	MDC	N/A	See Aroclors		N/A	N/A	--	No	Aroclor data used to evaluate chemical
PCB-48/75	70362-47-9/325~	0.0000097		0.00082		mg/kg	SA-SB319 (11/7/2019)	0.5 - 2	13/14	93%	0.000004 – 0.000004	0.00082	MDC	N/A	See Aroclors		N/A	N/A	--	No	Aroclor data used to evaluate chemical
PCB-49/69	41464-40-8/602~	0.00000065	J	0.035		mg/kg	SB408 (7/16/2021)	0.5 - 2	16/16	100%	N/A	0.035	MDC	N/A	See Aroclors		N/A	N/A	--	No	Aroclor data used to evaluate chemical
PCB-5	16605-91-7	0.0002		0.0002		mg/kg	SB403 (7/16/2021)	0.5 - 2	1/30	3%	0.000002 – 0.0012	0.0002	MDC	N/A	See Aroclors		N/A	N/A	--	No	Aroclor data used to evaluate chemical
PCB-50	62796-65-0	0.0000012	J	0.000014		mg/kg	SA-SB319 (11/7/2019)	0.5 - 2	6/14	43%	0.000002 – 0.000002	0.000014	MDC	N/A	See Aroclors		N/A	N/A	--	No	Aroclor data used to evaluate chemical
PCB-50/53	62796-65-0/414~	0.000019		0.0071		mg/kg	SB408 (7/16/2021)	0.5 - 2	13/16	81%	0.000018 – 0.0024	0.0071	MDC	N/A	See Aroclors		N/A	N/A	--	No	Aroclor data used to evaluate chemical
PCB-51	68194-04-7	0.0000029		0.0002		mg/kg	SA-SB319 (11/7/2019)	0.5 - 2	13/14	93%	0.000002 – 0.000002	0.0002	MDC	N/A	See Aroclors		N/A	N/A	--	No	Aroclor data used to evaluate chemical
PCB-52	35693-99-3	0.00035		0.07		mg/kg	SB408 (7/16/2021)	0.5 - 2	14/16	88%	0.000009 – 0.0000096	0.07	MDC	N/A	See Aroclors		N/A	N/A	--	No	Aroclor data used to evaluate chemical
PCB-52/69	35693-99-3/602~	0.0000073		0.01		mg/kg	SA-SB319 (11/7/2019)	0.5 - 2	14/14	100%	N/A	0.01	MDC	N/A	See Aroclors		N/A	N/A	--	No	Aroclor data used to evaluate chemical
PCB-53	41464-41-9	0.0000092		0.00064		mg/kg	SA-SB319 (11/7/2019)	0.5 - 2	13/14	93%	0.000002 – 0.000002	0.00064	MDC	N/A	See Aroclors		N/A	N/A	--	No	Aroclor data used to evaluate chemical
PCB-54	15968-05-5	0.0000012	J	0.00025		mg/kg	SB404 (7/16/2021)	0.5 - 2	14/30	47%	0.000002 – 0.00025	0.00025	MDC	N/A	See Aroclors		N/A	N/A	--	No	Aroclor data used to evaluate chemical
PCB-55	74338-24-2	0.0000013	J	0.00083	J	mg/kg	SA-SB320 (11/25/2019)	0.5 - 2	20/30	67%	0.000002 – 0.0012	0.00083	MDC	N/A	See Aroclors		N/A	N/A	--	No	Aroclor data used to evaluate chemical
PCB-56	41464-43-1	0.00011	J	0.017		mg/kg	SB408 (7/16/2021)	0.5 - 2	10/16	63%	0.000009 – 0.000015	0.017	MDC	N/A	See Aroclors		N/A	N/A	--	No	Aroclor data used to evaluate chemical
PCB-56/60	41464-43-1/330~	0.0000057		0.0031		mg/kg	SA-SB328 (11/15/2019)	0.5 - 2	14/14	100%	N/A	0.0031	MDC	N/A	See Aroclors		N/A	N/A	--	No	Aroclor data used to evaluate chemical
PCB-57	70424-67-8	0.00000099	J	0.000036		mg/kg	SA-SB327 (11/15/2019)	0.5 - 2	10/30	33%	0.000002 – 0.0012	0.000036	MDC	N/A	See Aroclors		N/A	N/A	--	No	Aroclor data used to evaluate chemical
PCB-58	41464-49-7	0.00000089	J	0.0047		mg/kg	SB404 (7/16/2021)	0.5 - 2	7/30	23%	0.000002 – 0.0012	0.0047	MDC	N/A	See Aroclors		N/A	N/A	--	No	Aroclor data used to evaluate chemical
PCB-59/62/75	74472-33-6/542~	0.000024	J	0.0017		mg/kg	SB408 (7/16/2021)	0.5 - 2	10/16	63%	0.000027 – 0.0035	0.0017	MDC	N/A	See Aroclors		N/A	N/A	--	No	Aroclor data used to evaluate chemical
PCB-6	25569-80-6	0.0000027		0.0027		mg/kg	SA-SB320 (11/25/2019)	0.5 - 2	23/30	77%	0.000002 – 0.0012	0.0027	MDC	N/A	See Aroclors		N/A	N/A	--	No	Aroclor data used to evaluate chemical
PCB-60	33025-41-1	0.000019		0.0077		mg/kg	SB408 (7/16/2021)	0.5 - 2	11/16	69%	0.000009 – 0.000015	0.0077	MDC	N/A	See Aroclors		N/A	N/A	--	No	Aroclor data used to evaluate chemical
PCB-61/70	33284-53-6/325~	0.000014		0.062		mg/kg	SB408 (7/16/2021)	0.5 - 2	21/23	91%	0.000036 – 0.000038	0.062	MDC	N/A	See Aroclors		N/A	N/A	--	No	Aroclor data used to evaluate chemical
PCB-61/70/74/76	TTNUS817	0.00054	J	0.04		mg/kg	SA-SB320 (11/25/2019)	0.5 - 2	6/7	86%	0.0047 – 0.0047	0.04	MDC	N/A	See Aroclors		N/A	N/A	--	No	Aroclor data used to evaluate chemical
PCB-62	54230-22-7	N/A		N/A		mg/kg	N/A	N/A	0/14	0%	0.000002 – 0.000002	0.000002	CRQL	N/A	See Aroclors		N/A	N/A	--	No	Aroclor data used to evaluate chemical
PCB-63	74472-34-7	0.0000038		0.00069	J	mg/kg	SA-SB320 (11/25/2019)	0.5 - 2	20/30	67%	0.000002 – 0.0012	0.00069	MDC	N/A	See Aroclors		N/A	N/A	--	No	Aroclor data used to evaluate chemical
PCB-64	52663-58-8	0.0000014	J	0.0088		mg/kg	SB408 (7/16/2021)	0.5 - 2	14/16	88%	0.000009 – 0.000018	0.0088	MDC	N/A	See Aroclors		N/A	N/A	--	No	Aroclor data used to evaluate chemical
PCB-65	33284-54-7	N/A		N/A		mg/kg	N/A	N/A	0/14	0%	0.000002 – 0.000002	0.000002	CRQL	N/A	See Aroclors		N/A	N/A	--	No	Aroclor data used to evaluate chemical
PCB-66	32598-10-0	0.00015		0.034		mg/kg	SB408 (7/16/2021)	0.5 - 2	14/16	88%	0.000009 – 0.0000096	0.034	MDC	N/A	See Aroclors		N/A	N/A	--	No	Aroclor data used to evaluate chemical
PCB-66/76	32598-10-0/703~	0.0000072		0.0055		mg/kg	Multiple Locations	N/A	14/14	100%	N/A	0.0055	MDC	N/A	See Aroclors		N/A	N/A	--	No	Aroclor data used to evaluate chemical
PCB-67	73575-53-8	0.0000032		0.00057	J	mg/kg	SA-SB320 (11/25/2019)	0.5 - 2	20/30	67%	0.000002 – 0.0012	0.00057	MDC	N/A	See Aroclors		N/A	N/A	--	No	Aroclor data used to evaluate chemical
PCB-68	73575-52-7	0.0000018	J	0.00036		mg/kg	SB408 (7/16/2021)	0.5 - 2	12/30	40%	0.000002 – 0.0012	0.00036	MDC	N/A	See Aroclors		N/A	N/A	--	No	Aroclor data used to evaluate chemical
PCB-7	33284-50-3	0.00000089	J	0.00024		mg/kg	SB408 (7/16/2021)	0.5 - 2	17/30	57%	0.000002 – 0.0012	0.00024	MDC	N/A	See Aroclors		N/A	N/A	--	No	Aroclor data used to evaluate chemical
PCB-72	41464-42-0	0.0000025	J	0.00055		mg/kg	SB404 (7/16/2021)	0.5 - 2	6/16	38%	0.000009 – 0.0012	0.00055	MDC	N/A	See Aroclors		N/A	N/A	--	No	Aroclor data used to evaluate chemical
PCB-73	74338-23-1	0.00000098	J	0.000081		mg/kg	SA-SB319 (11/7/2019)	0.5 - 2	9/30	30%	0.000002 – 0.0012	0.000081	MDC	N/A	See Aroclors		N/A	N/A	--	No	Aroclor data used to evaluate chemical
PCB-74	32690-93-0	0.0000032		0.0023		mg/kg	SA-SB319 (11/7/2019)	0.5 - 2	14/14	100%	N/A	0.0023	MDC	N/A	See Aroclors		N/A	N/A	--	No	Aroclor data used to evaluate chemical
PCB-77	32598-13-3	0.0000018	J	0.003		mg/kg	SA-SB320 (11/25/2019)	0.5 - 2	27/30	90%	0.0000044 – 0.00023	0.003	MDC	N/A	See TEQ		N/A	N/A	--	No	TEQ used to evaluate chemical
PCB-78	70362-49-1	0.0000018	J	0.000043		mg/kg	SA-SB318 (11/8/2019)	0.5 - 2	9/30	30%	0.000002 – 0.0012	0.000043	MDC	N/A	See Aroclors		N/A	N/A	--	No	Aroclor data used to evaluate chemical
PCB-79	41464-48-6	0.0000012	J	0.004		mg/kg	SA-SB320 (11/25/2019)	0.5 - 2	16/30	53%	0.000002 – 0.0012	0.004	MDC	N/A	See Aroclors		N/A	N/A	--	No	Aroclor data used to evaluate chemical
PCB-8	34883-43-7	0.0000016	J	0.011		mg/kg	SA-SB320 (11/25/2019)	0.5 - 2	25/30	83%	0.000009 – 0.0012	0.011	MDC	N/A	See Aroclors		N/A	N/A	--	No	Aroclor data used to evaluate chemical
PCB-80	33284-52-5	N/A		N/A		mg/kg	N/A	N/A	0/30	0%	0.000002 – 0.0012	0.0012	CRQL	N/A	See Aroclors		N/A	N/A	--	No	Aroclor data used to evaluate chemical
PCB-81	70362-50-4	0.0000028		0.00035		mg/kg	SA-SB318 (11/8/2019)	0.5 - 2	20/30	67%	0.0000012 – 0.0014	0.00035	MDC	N/A	See TEQ		N/A	N/A	--	No	TEQ used to evaluate chemical
PCB-82	52663-62-4	0.000012		0.006		mg/kg	SA-SB320 (11/25/2019)	0.5 - 2	26/30	87%	0.000002 – 0.000015	0.006	MDC	N/A	See Aroclors		N/A	N/A	--	No	Aroclor data used to evaluate chemical
PCB-83	60145-20-2	0.000048		0.012		mg/kg	SA-SB320 (11/25/2019)	0.5 - 2	7/7	100%	N/A	0.012	MDC	N/A	See Aroclors		N/A	N/A	--	No	Aroclor data used to evaluate chemical
PCB-83/112	60145-20-2/744~	0.0000063		0.00089		mg/kg	SA-SB319 (11/7/2019)	0.5 - 2	13/14	93%	0.000004 – 0.000004	0.00089	MDC	N/A	See Aroclors		N/A	N/A	--	No	Aroclor data used to evaluate chemical
PCB-83/99	60145-20-2/383~	0.00013		0.077		mg/kg	SB408 (7/16/2021)	0.5 - 2	7/9	78%	0.000018 – 0.000019	0.077	MDC	N/A	See Aroclors		N/A	N/A	--	No	Aroclor data used to evaluate chemical
PCB-84	52663-60-2	0.00000085	J	0.023		mg/kg	SA-SB320 (11/25/2019)	0.5 - 2	16/16	100%	N/A	0.023	MDC	N/A	See Aroclors		N/A	N/A	--	No	Aroclor data used to evaluate chemical
PCB-84/92	52663-60-2/526~	0.0000076		0.0081		mg/kg	SA-SB318 (11/8/2019)	0.5 - 2	14/14	100%	N/A	0.0081	MDC	N/A	See Aroclors		N/A	N/A	--	No	Aroclor data used to evaluate chemical
PCB-85/116	65510-45-4/182~	0.0000033	J	0.018		mg/kg	SB408 (7/16/2021)	0.5 - 2	21/23	91%	0.000027 – 0.000029	0.018	MDC	N/A	See Aroclors		N/A	N/A	--	No	Aroclor data used to evaluate chemical
PCB-85/116/117	TTNUS799	0.00012		0.00093	J	mg/kg	SA-SB320 (11/25/2019)	0.5 - 2	6/7	86%	0.0035 – 0.0035	0.00093	MDC	N/A	See Aroclors		N/A	N/A	--	No	Aroclor data used to evaluate chemical
PCB-86	55312-69-1	N/A		N/A		mg/kg	N/A	N/A	0/14	0%	0.000002 – 0.000002	0.000002	CRQL	N/A	See Aroclors		N/A	N/A	--	No	Aroclor data used to evaluate chemical
PCB-86/87/97/109/119/125	55312-69-1/383~	0.00018		0.098		mg/kg	SA-SB320 (11/25/2019)	0.5 - 2	14/16	88%	0.000054 – 0.000057	0.098	MDC	N/A	See Aroclors		N/A	N/A	--	No	Aroclor data used to evaluate chemical

Table A-2.2
Occurrence, Distribution, and Selection of Constituents of Interest (Direct Contact – Site-Wide; Near Surface Soil, 0.5 – 2 feet)
Reasonable Maximum Exposure
Human Health Risk Assessment
Shaffer Equipment/Arbuckle Creek Area Superfund Site, Minden, West Virginia

Scenario Timeframe: Current and Future
Medium: Soil
Exposure Medium: Soil
Exposure Point: Soil (0.5 – 2 feet)

Chemical	CASRN	Minimum Detected Concentration		Maximum Detected Concentration		Units	Location of Maximum	Depth (ft bgs)	Detection Frequency		Range of Reporting Limits	Screening Concentration		Background Value	Screening Level [1, 2]		Source	Potential ARAR [3]	Source	COPC Flag (Yes/No)	Rationale for Selection/Deletion
PCB-87/117/125	38380-02-8/681~	0.0000066		0.01		mg/kg	SA-SB319 (11/7/2019)	0.5 - 2	14/14	100%	N/A	0.01	MDC	N/A	See Aroclors		N/A	N/A	--	No	Aroclor data used to evaluate chemical
PCB-88/91	55215-17-3/681~	0.00000045	J	0.014		mg/kg	SB408 (7/16/2021)	0.5 - 2	29/30	97%	0.000004 – 0.000004	0.014	MDC	N/A	See Aroclors		N/A	N/A	--	No	Aroclor data used to evaluate chemical
PCB-89	73575-57-2	0.0000013	J	0.0006	J	mg/kg	SA-SB320 (11/25/2019)	0.5 - 2	16/30	53%	0.000002 – 0.0012	0.0006	MDC	N/A	See Aroclors		N/A	N/A	--	No	Aroclor data used to evaluate chemical
PCB-9	34883-39-1	0.00000084	J	0.00082	J	mg/kg	SA-SB320 (11/25/2019)	0.5 - 2	19/30	63%	0.000002 – 0.0012	0.00082	MDC	N/A	See Aroclors		N/A	N/A	--	No	Aroclor data used to evaluate chemical
PCB-90/101	68194-07-0/376~	0.00051		0.44		mg/kg	SB408 (7/16/2021)	0.5 - 2	7/9	78%	0.000027 – 0.000029	0.44	MDC	N/A	See Aroclors		N/A	N/A	--	No	Aroclor data used to evaluate chemical
PCB-90/101/113	TTNUS619	0.002		0.74		mg/kg	SA-SB320 (11/25/2019)	0.5 - 2	7/7	100%	N/A	0.74	MDC	N/A	See Aroclors		N/A	N/A	--	No	Aroclor data used to evaluate chemical
PCB-92	52663-61-3	0.0000018	J	0.071		mg/kg	SA-SB320 (11/25/2019)	0.5 - 2	16/16	100%	N/A	0.071	MDC	N/A	See Aroclors		N/A	N/A	--	No	Aroclor data used to evaluate chemical
PCB-93	73575-56-1	N/A		N/A		mg/kg	N/A	N/A	0/14	0%	0.000002 – 0.000002	0.000002	CRQL	N/A	See Aroclors		N/A	N/A	--	No	Aroclor data used to evaluate chemical
PCB-93/100	73575-56-1/394~	0.0000076		0.0000076		mg/kg	SA-SB322 (11/22/2019)	0.5 - 2	1/7	14%	0.0000039 – 0.0024	0.0000076	MDC	N/A	See Aroclors		N/A	N/A	--	No	Aroclor data used to evaluate chemical
PCB-93/95/98/100/102	73575-56-1/383~	0.00033		0.33		mg/kg	SB408 (7/16/2021)	0.5 - 2	7/9	78%	0.000045 – 0.000048	0.33	MDC	N/A	See Aroclors		N/A	N/A	--	No	Aroclor data used to evaluate chemical
PCB-94	73575-55-0	0.0000019	J	0.00094		mg/kg	SB408 (7/16/2021)	0.5 - 2	17/30	57%	0.000002 – 0.0012	0.00094	MDC	N/A	See Aroclors		N/A	N/A	--	No	Aroclor data used to evaluate chemical
PCB-95	38379-99-6	0.000021		0.58		mg/kg	SA-SB320 (11/25/2019)	0.5 - 2	21/21	100%	N/A	0.58	MDC	N/A	See Aroclors		N/A	N/A	--	No	Aroclor data used to evaluate chemical
PCB-96	73575-54-9	0.0000011	J	0.0011		mg/kg	SB408 (7/16/2021)	0.5 - 2	21/30	70%	0.000002 – 0.0012	0.0011	MDC	N/A	See Aroclors		N/A	N/A	--	No	Aroclor data used to evaluate chemical
PCB-97	41464-51-1	0.0000043		0.0079		mg/kg	SA-SB319 (11/7/2019)	0.5 - 2	14/14	100%	N/A	0.0079	MDC	N/A	See Aroclors		N/A	N/A	--	No	Aroclor data used to evaluate chemical
PCB-98/102	60233-25-2/681~	0.000017		0.00053	J	mg/kg	SA-SB320 (11/25/2019)	0.5 - 2	4/21	19%	0.000004 – 0.0024	0.00053	MDC	N/A	See Aroclors		N/A	N/A	--	No	Aroclor data used to evaluate chemical
PCB-99	38380-01-7	0.0000076		0.014		mg/kg	SA-SB320 (11/25/2019)	0.5 - 2	21/21	100%	N/A	0.014	MDC	N/A	See Aroclors		N/A	N/A	--	No	Aroclor data used to evaluate chemical
PCBC TEQ MAMMAL HALFND	CALC029P	6.38E-08		8.30E-05		mg/kg	SB408 (7/16/2021)	0.5 - 2	30/30	100%	N/A	8.30E-05	MDC	N/A	4.80E-06	*	RSL	N/A	--	Yes	MDC > SL (CRQL N/A)
Total DiCB	25512-42-9	0.0000092	J	0.025	J	mg/kg	SA-SB320 (11/25/2019)	0.5 - 2	26/30	87%	0 – 0.00011	0.025	MDC	N/A	N/A		N/A	N/A	--	No	Qualitative Evaluation
Total HpCB	28655-71-2	0.00026	J	11	J	mg/kg	SA-SB320 (11/25/2019)	0.5 - 2	30/30	100%	N/A	11	MDC	N/A	N/A		N/A	N/A	--	No	Qualitative Evaluation
Total HxCB	26601-64-9	0.00034	J	11	J	mg/kg	SA-SB320 (11/25/2019)	0.5 - 2	30/30	100%	N/A	11	MDC	N/A	N/A		N/A	N/A	--	No	Qualitative Evaluation
Total MoCB	27323-18-8	0.000002	J	0.0033	J	mg/kg	SA-SB320 (11/25/2019)	0.5 - 2	25/30	83%	0 – 0.000029	0.0033	MDC	N/A	N/A		N/A	N/A	--	No	Qualitative Evaluation
Total NoCB	53742-07-7	0.0000055	J	0.15	J	mg/kg	SA-SB320 (11/25/2019)	0.5 - 2	30/30	100%	N/A	0.15	MDC	N/A	N/A		N/A	N/A	--	No	Qualitative Evaluation
Total OcCB	55722-26-4	0.000076	J	2.6	J	mg/kg	SA-SB320 (11/25/2019)	0.5 - 2	30/30	100%	N/A	2.6	MDC	N/A	N/A		N/A	N/A	--	No	Qualitative Evaluation
Total PeCB	25429-29-2	0.000026	J	2.1	J	mg/kg	SA-SB320 (11/25/2019)	0.5 - 2	30/30	100%	N/A	2.1	MDC	N/A	N/A		N/A	N/A	--	No	Qualitative Evaluation
Total TeCB	26914-33-0	0.0000077	J	0.33	J	mg/kg	SB408 (7/16/2021)	0.5 - 2	30/30	100%	N/A	0.33	MDC	N/A	N/A		N/A	N/A	--	No	Qualitative Evaluation
Total TrCB	25323-68-6	0.0000026	J	0.12	J	mg/kg	SB408 (7/16/2021)	0.5 - 2	30/30	100%	N/A	0.12	MDC	N/A	N/A		N/A	N/A	--	No	Qualitative Evaluation
TOTAL PCB HOMOLOGS HALFND	CALCHOMOL	0.0008163		27.1613		mg/kg	SA-SB320 (11/25/2019)	0.5 - 2	30/30	100%	N/A	27.1613	MDC	N/A	N/A		N/A	N/A	--	No	Qualitative Evaluation
Dioxins and Furans																					
1,2,3,4,6,7,8,9-Octachlorodibenzofuran	39001-02-0	0.00000054	JZ	0.00031		mg/kg	SA-SB320 (11/25/2019)	0.5 - 2	22/24	92%	0.0000017 – 0.0000021	0.00031	MDC	N/A	See TEQ		N/A	N/A	--	No	TEQ used to evaluate chemical
1,2,3,4,6,7,8,9-Octachlorodibenzo-p-dioxin	3268-87-9	0.000033		0.0067	J	mg/kg	SB403 (7/16/2021)	0.5 - 2	24/24	100%	N/A	0.0067	MDC	N/A	See TEQ		N/A	N/A	--	No	TEQ used to evaluate chemical
1,2,3,4,6,7,8-Heptachlorodibenzofuran	67562-39-4	0.00000032	JZ	0.00011		mg/kg	SA-SB320 (11/25/2019)	0.5 - 2	23/24	96%	0.000002 – 0.000002	0.00011	MDC	N/A	See TEQ		N/A	N/A	--	No	TEQ used to evaluate chemical
1,2,3,4,6,7,8-Heptachlorodibenzo-p-dioxin	35822-46-9	0.0000018	J	0.00014		mg/kg	SA-SB319 (11/7/2019)	0.5 - 2	24/24	100%	N/A	0.00014	MDC	N/A	See TEQ		N/A	N/A	--	No	TEQ used to evaluate chemical
1,2,3,4,7,8,9-Heptachlorodibenzofuran	55673-89-7	0.00000039	JZ	0.000034		mg/kg	SA-SB320 (11/25/2019)	0.5 - 2	15/24	63%	0.00000016 – 0.0000022	0.000034	MDC	N/A	See TEQ		N/A	N/A	--	No	TEQ used to evaluate chemical
1,2,3,4,7,8-Hexachlorodibenzofuran	70648-26-9	0.00000028	J	0.00011		mg/kg	SA-SB320 (11/25/2019)	0.5 - 2	21/24	88%	0.00000013 – 0.0000015	0.00011	MDC	N/A	See TEQ		N/A	N/A	--	No	TEQ used to evaluate chemical
1,2,3,4,7,8-Hexachlorodibenzo-p-dioxin	39227-28-6	0.00000025	J	0.0000022	J	mg/kg	SA-SB319 (11/7/2019)	0.5 - 2	10/24	42%	0.00000014 – 0.0000015	0.0000022	MDC	N/A	See TEQ		N/A	N/A	--	No	TEQ used to evaluate chemical
1,2,3,6,7,8-Hexachlorodibenzofuran	57117-44-9	0.00000021	J	0.000014		mg/kg	SA-SB320 (11/25/2019)	0.5 - 2	16/24	67%	0.0000093 – 0.0000018	0.000014	MDC	N/A	See TEQ		N/A	N/A	--	No	TEQ used to evaluate chemical
1,2,3,6,7,8-Hexachlorodibenzo-p-dioxin	57653-85-7	0.00000055	J	0.00002		mg/kg	SA-SB327 (11/15/2019)	0.5 - 2	14/24	58%	0.00000014 – 0.0000012	0.00002	MDC	N/A	See TEQ		N/A	N/A	--	No	TEQ used to evaluate chemical
1,2,3,7,8,9-Hexachlorodibenzofuran	72918-21-9	0.00000021	J	0.0000074		mg/kg	SA-SB320 (11/25/2019)	0.5 - 2	14/24	58%	0.00000016 – 0.0000014	0.0000074	MDC	N/A	See TEQ		N/A	N/A	--	No	TEQ used to evaluate chemical
1,2,3,7,8,9-Hexachlorodibenzo-p-dioxin	19408-74-3	0.00000042	J	0.000007		mg/kg	SA-SB327 (11/15/2019)	0.5 - 2	11/24	46%	0.00000015 – 0.0000024	0.000007	MDC	N/A	See TEQ		N/A	N/A	--	No	TEQ used to evaluate chemical
1,2,3,7,8-Pentachlorodibenzofuran	57117-41-6	0.0000006	J	0.000062		mg/kg	Multiple Locations	N/A	20/24	83%	0.00000015 – 0.0000016	0.000062	MDC	N/A	See TEQ		N/A	N/A	--	No	TEQ used to evaluate chemical
1,2,3,7,8-Pentachlorodibenzo-p-dioxin	40321-76-4	0.00000029	J	0.0000077	Z	mg/kg	SB408 (7/16/2021)	0.5 - 2	9/24	38%	0.00000016 – 0.0000019	0.0000077	MDC	N/A	See TEQ		N/A	N/A	--	No	TEQ used to evaluate chemical
2,3,4,6,7,8-Hexachlorodibenzofuran	60851-34-5	0.00000021	J	0.0000095		mg/kg	SA-SB319 (11/7/2019)	0.5 - 2	17/24	71%	0.0000093 – 0.00000093	0.0000095	MDC	N/A	See TEQ		N/A	N/A	--	No	TEQ used to evaluate chemical
2,3,4,7,8-Pentachlorodibenzofuran	57117-31-4	0.00000024	J	0.00002		mg/kg	SA-SB320 (11/25/2019)	0.5 - 2	18/24	75%	0.00000029 – 0.00000099	0.00002	MDC	N/A	See TEQ		N/A	N/A	--	No	TEQ used to evaluate chemical
2,3,7,8-Tetrachlorodibenzofuran	51207-31-9	0.00000021	J	0.0000082		mg/kg	SA-SB320 (11/25/2019)	0.5 - 2	21/24	88%	0.00000016 – 0.00000034	0.0000082	MDC	N/A	See TEQ		N/A	N/A	--	No	TEQ used to evaluate chemical
2,3,7,8-Tetrachlorodibenzo-p-dioxin	1746-01-6	0.00000014	J	0.00000045	J	mg/kg	SA-SB319 (11/7/2019)	0.5 - 2	9/24	38%	0.0000009 7 – 0.00000039	0.00000045	MDC	N/A	See TEQ		N/A	0.0000052	WVDEP	No	TEQ used to evaluate chemical
DIOXIN TEQ MAMMAL HALFND	CALC029D	4.65E-07		2.45E-05		mg/kg	SA-SB320 (11/25/2019)	0.5 - 2	24/24	100%	N/A	2.45E-05	MDC	N/A	4.80E-06	*	RSL	N/A	--	Yes	MDC > SL (CRQL N/A)
Metals																					
Aluminum	7429-90-5	3370		19000		mg/kg	SB405 (7/15/2021)	0.5 - 2	30/30	100%	N/A	19000	MDC	N/A	7700		RSL	77000	WVDEP	Yes	MDC > SL (CRQL N/A)
Antimony	7440-36-0	0.29	J	4.4	J	mg/kg	SA-SB327 (11/15/2019)	0.5 - 2	17/30	57%	0.82 – 7.2	4.4	MDC	N/A	3.1		RSL	31	WVDEP	Yes	MDC > SL
Arsenic	7440-38-2	1.9		82.8		mg/kg	SA-SB317 (11/8/2019)	0.5 - 2	30/30	100%	N/A	82.8	MDC	N/A	0.68		RSL	0.68	WVDEP	Yes	MDC > SL (CRQL N/A)
Barium	7440-39-3	32.2		275		mg/kg	SA-SB310 (11/7/2019)	0.5 - 2	30/30	100%	N/A	275	MDC	N/A	1500		RSL	15000	WVDEP	No	MDC ≤ SL (CRQL N/A)
Beryllium	7440-41-7	0.29	J	1.6		mg/kg	SA-SB316 (11/8/2019)	0.5 - 2	30/30	100%	N/A	1.6	MDC	N/A	16		RSL	160	WVDEP	No	MDC ≤ SL (CRQL N/A)
Cadmium	7440-43-9	0.077	J	2.2		mg/kg	SA-SB319 (11/7/2019)	0.5 - 2	28/30	93%	0.55 – 0.6	2.2	MDC	N/A	0.71		RSL	37	WVDEP	Yes	MDC > SL
Calcium	7440-70-2	546	J	167000		mg/kg	SA-SB366 (11/15/2019)	0.5 - 2	29/30	97%	540 – 540	167000	MDC	N/A	Nutrient		N/A	Nutrient	--	No	Classified as an essential nutrient
Chromium	7440-47-3	5.2		43.9		mg/kg	SA-SB319 (11/7/2019)	0.5 - 2	30/30	100%	N/A	43.9	MDC	N/A	0.3	*	RSL	0.3	WVDEP	Yes	MDC > SL (CRQL N/A)

Table A-2.2
Occurrence, Distribution, and Selection of Constituents of Interest (Direct Contact – Site-Wide; Near Surface Soil, 0.5 – 2 feet)
Reasonable Maximum Exposure
Human Health Risk Assessment
Shaffer Equipment/Arbuckle Creek Area Superfund Site, Minden, West Virginia

Scenario Timeframe: Current and Future
Medium: Soil
Exposure Medium: Soil
Exposure Point: Soil (0.5 – 2 feet)

Chemical	CASRN	Minimum Detected Concentration		Maximum Detected Concentration		Units	Location of Maximum	Depth (ft bgs)	Detection Frequency		Range of Reporting Limits	Screening Concentration		Background Value	Screening Level [1, 2]		Source	Potential ARAR [3]	Source	COPC Flag (Yes/No)	Rationale for Selection/Deletion
Cobalt	7440-48-4	3.7	J	28.1		mg/kg	SA-SB326 (11/15/2019)	0.5 - 2	30/30	100%	N/A	28.1	MDC	N/A	2.3		RSL	23	WVDEP	Yes	MDC > SL (CRQL N/A)
Copper	7440-50-8	3		191		mg/kg	SA-SB318 (11/8/2019)	0.5 - 2	30/30	100%	N/A	191	MDC	N/A	310		RSL	3100	WVDEP	No	MDC ≤ SL (CRQL N/A)
Iron	7439-89-6	8500		60100		mg/kg	SA-SB326 (11/15/2019)	0.5 - 2	29/29	100%	N/A	60100	MDC	N/A	5500		RSL	55000	WVDEP	Yes	MDC > SL (CRQL N/A)
Lead	7439-92-1	5.2		170		mg/kg	SA-SB319 (11/7/2019)	0.5 - 2	30/30	100%	N/A	170	MDC	N/A	400		RSL	400	WVDEP	No	MDC ≤ SL (CRQL N/A)
Magnesium	7439-95-4	522	J	5650		mg/kg	SA-SB366 (11/15/2019)	0.5 - 2	30/30	100%	N/A	5650	MDC	N/A	Nutrient		N/A	Nutrient	--	No	Classified as an essential nutrient
Manganese	7439-96-5	72		2630		mg/kg	SA-SB319 (11/7/2019)	0.5 - 2	30/30	100%	N/A	2630	MDC	N/A	180		RSL	1800	WVDEP	Yes	MDC > SL (CRQL N/A)
Mercury	7439-97-6	0.018	J	0.14		mg/kg	SB452 (7/15/2021)	0.5 - 2	19/30	63%	0.1 – 0.12	0.14	MDC	N/A	1.1	*	RSL	3.1	WVDEP	No	CRQL and MDC ≤ SL
Nickel	7440-02-0	3.4		46.7		mg/kg	SA-SB326 (11/15/2019)	0.5 - 2	30/30	100%	N/A	46.7	MDC	N/A	150		RSL	1500	WVDEP	No	MDC ≤ SL (CRQL N/A)
Potassium	7440-09-7	746		3210		mg/kg	SA-SB316 (11/8/2019)	0.5 - 2	30/30	100%	N/A	3210	MDC	N/A	Nutrient		N/A	Nutrient	--	No	Classified as an essential nutrient
Selenium	7782-49-2	0.3	J	3.1		mg/kg	SA-SB316 (11/8/2019)	0.5 - 2	18/30	60%	2.7 – 4.2	3.1	MDC	N/A	39		RSL	390	WVDEP	No	CRQL and MDC ≤ SL
Silver	7440-22-4	0.047	J	0.37	J	mg/kg	SA-SB321 (11/25/2019)	0.5 - 2	14/30	47%	0.55 – 1.2	0.37	MDC	N/A	39		RSL	390	WVDEP	No	CRQL and MDC ≤ SL
Sodium	7440-23-5	22.3	J	256	J	mg/kg	SA-SB316 (11/8/2019)	0.5 - 2	14/30	47%	515 – 600	256	MDC	N/A	Nutrient		N/A	Nutrient	--	No	Classified as an essential nutrient
Thallium	7440-28-0	0.038	J	0.34	J	mg/kg	SA-SB366 (11/15/2019)	0.5 - 2	10/30	33%	0.51 – 3	0.34	MDC	N/A	0.078		RSL	0.78	WVDEP	Yes	MDC > SL
Vanadium	7440-62-2	4.2		33.2		mg/kg	SA-SB321 (11/25/2019)	0.5 - 2	29/30	97%	2.7 – 2.7	33.2	MDC	N/A	39	*	RSL	460	WVDEP	No	CRQL and MDC ≤ SL
Zinc	7440-66-6	11.1		401		mg/kg	SA-SB319 (11/7/2019)	0.5 - 2	30/30	100%	N/A	401	MDC	N/A	2300		RSL	23000	WVDEP	No	MDC ≤ SL (CRQL N/A)
Cyanide																					
Cyanide	57-12-5	0.024	J	1.5	J-	mg/kg	SA-SB312 (11/7/2019)	0.5 - 2	13/16	81%	0.51 – 0.61	1.5	MDC	N/A	2.3		RSL	N/A	--	No	CRQL and MDC ≤ SL

Notes:
% = Percent
ARAR = Applicable or Relevant and Appropriate Requirements
CASRN = Chemical Abstracts Service Registry Number
COPC = Chemical of Potential Concern
CRQL = Contract Required Quantitation Limit
ft bgs = feet below gound surface
J = Estimated Concentration (+/- indicates a positive or negative bia, respectively)
MDC = Maximum Detected Concentration
mg/kg = milligram per kilogram
N/A = Not Applicable
ND = Non-Detect or Not Detected
RSL = Regional Screening Level
SL = Screening Level
TEQ = Toxicity Equivalence
USEPA = United States Environmental Protection Agency
WVDEP = West Virginia Department of Environmental Protection
(1) Site data screened against USEPA Residential Soil RSLs, last updated November 2021 (TR = 1E-6, THQ = 0.1).
(2) An asterisk,"*", indicates surrogate toxicity information was used to derive a Screening Level (see **Table 2-4**).
(3) As indicated in the WVDEP Voluntary Remediation Program technical guidance, residential soil "De Minimis" values pursuant to 60CSR9 (effective 12/2/2021) were selected as potential ARARs.

Table A-2.3
Occurrence, Distribution, and Selection of Constituents of Interest (Direct Contact – Site-Wide; Subsurface Soil, > 2 feet)
Reasonable Maximum Exposure
Human Health Risk Assessment
Shaffer Equipment/Arbuckle Creek Area Superfund Site, Minden, West Virginia

Scenario Timeframe: Current and Future
Medium: Soil
Exposure Medium: Soil
Exposure Point: Soil (> 2 feet)

Chemical	CASRN	Minimum Detected Concentration		Maximum Detected Concentration		Units	Location of Maximum	Depth (ft bgs)	Detection Frequency		Range of Reporting Limits	Screening Concentration		Background Value	Screening Level [1, 2]		Source	Potential ARAR [3]	Source	COPC Flag (Yes/No)	Rationale for Selection/Deletion
Volatile Organic Compounds (VOCs)																					
1,1,1-Trichloroethane	71-55-6	0.016	J+	0.037	J+	mg/kg	SA-SB325 (11/22/2019)	7 - 8.8	2/20	10%	0.0043 – 0.01	0.037	MDC	N/A	810		RSL	640	WVDEP	No	CRQL and MDC ≤ SL
1,1,2,2-Tetrachloroethane	79-34-5	N/A		N/A		mg/kg	N/A	N/A	0/18	0%	0.0043 – 0.01	0.01	CRQL	N/A	0.6		RSL	0.64	WVDEP	No	100% ND and CRQL ≤ SL
1,1,2-Trichloro-1,2,2-trifluoroethane	76-13-1	N/A		N/A		mg/kg	N/A	N/A	0/21	0%	0.0043 – 0.01	0.01	CRQL	N/A	670		RSL	910	WVDEP	No	100% ND and CRQL ≤ SL
1,1,2-Trichloroethane	79-00-5	N/A		N/A		mg/kg	N/A	N/A	0/18	0%	0.0043 – 0.01	0.01	CRQL	N/A	0.15		RSL	1.2	WVDEP	No	100% ND and CRQL ≤ SL
1,1-Dichloroethane	75-34-3	0.065	J+	0.065	J+	mg/kg	SA-SB366 (11/15/2019)	4 - 6	1/21	5%	0.0043 – 0.01	0.065	MDC	N/A	3.6		RSL	3.8	WVDEP	No	CRQL and MDC ≤ SL
1,1-Dichloroethene	75-35-4	N/A		N/A		mg/kg	N/A	N/A	0/21	0%	0.0043 – 0.01	0.01	CRQL	N/A	23		RSL	240	WVDEP	No	100% ND and CRQL ≤ SL
1,2,3-Trichlorobenzene	87-61-6	N/A		N/A		mg/kg	N/A	N/A	0/16	0%	0.0043 – 0.01	0.01	CRQL	N/A	6.3		RSL	N/A	--	No	100% ND and CRQL ≤ SL
1,2,4-Trichlorobenzene	120-82-1	N/A		N/A		mg/kg	N/A	N/A	0/16	0%	0.0043 – 0.01	0.01	CRQL	N/A	5.8		RSL	24	WVDEP	No	100% ND and CRQL ≤ SL
1,2-Dibromo-3-chloropropane	96-12-8	N/A		N/A		mg/kg	N/A	N/A	0/16	0%	0.0043 – 0.01	0.01	CRQL	N/A	0.0053		RSL	0.0057	WVDEP	See Uncertainty	100% ND and CRQL > SL
1,2-Dibromoethane	106-93-4	N/A		N/A		mg/kg	N/A	N/A	0/18	0%	0.0043 – 0.01	0.01	CRQL	N/A	0.036		RSL	0.039	WVDEP	No	100% ND and CRQL ≤ SL
1,2-Dichlorobenzene	95-50-1	N/A		N/A		mg/kg	N/A	N/A	0/16	0%	0.0043 – 0.01	0.01	CRQL	N/A	180		RSL	380	WVDEP	No	100% ND and CRQL ≤ SL
1,2-Dichloroethane	107-06-2	N/A		N/A		mg/kg	N/A	N/A	0/21	0%	0.0043 – 0.01	0.01	CRQL	N/A	0.46		RSL	0.5	WVDEP	No	100% ND and CRQL ≤ SL
1,2-Dichloropropane	78-87-5	N/A		N/A		mg/kg	N/A	N/A	0/18	0%	0.0043 – 0.01	0.01	CRQL	N/A	1.6		RSL	2.7	WVDEP	No	100% ND and CRQL ≤ SL
1,3-Dichlorobenzene	541-73-1	N/A		N/A		mg/kg	N/A	N/A	0/16	0%	0.0043 – 0.01	0.01	CRQL	N/A	180	*	RSL	N/A	--	No	100% ND and CRQL ≤ SL
1,4-Dichlorobenzene	106-46-7	N/A		N/A		mg/kg	N/A	N/A	0/16	0%	0.0043 – 0.01	0.01	CRQL	N/A	2.6		RSL	2.8	WVDEP	No	100% ND and CRQL ≤ SL
2-Butanone	78-93-3	N/A		N/A		mg/kg	N/A	N/A	0/21	0%	0.0085 – 0.02	0.02	CRQL	N/A	2700		RSL	28000	WVDEP	No	100% ND and CRQL ≤ SL
2-Hexanone	591-78-6	N/A		N/A		mg/kg	N/A	N/A	0/18	0%	0.0085 – 0.02	0.02	CRQL	N/A	20		RSL	N/A	--	No	100% ND and CRQL ≤ SL
4-Methyl-2-pentanone	108-10-1	N/A		N/A		mg/kg	N/A	N/A	0/18	0%	0.0085 – 0.02	0.02	CRQL	N/A	3300		RSL	3400	WVDEP	No	100% ND and CRQL ≤ SL
Acetone	67-64-1	0.0081	J	0.058	J+	mg/kg	SA-SB325 (11/22/2019)	7 - 8.8	11/21	52%	0.0085 – 0.02	0.058	MDC	N/A	7000		RSL	61000	WVDEP	No	CRQL and MDC ≤ SL
Benzene	71-43-2	N/A		N/A		mg/kg	N/A	N/A	0/18	0%	0.0043 – 0.01	0.01	CRQL	N/A	1.2		RSL	1.2	WVDEP	No	100% ND and CRQL ≤ SL
Bromochloromethane	74-97-5	N/A		N/A		mg/kg	N/A	N/A	0/21	0%	0.0043 – 0.01	0.01	CRQL	N/A	15		RSL	N/A	--	No	100% ND and CRQL ≤ SL
Bromodichloromethane	75-27-4	N/A		N/A		mg/kg	N/A	N/A	0/12	0%	0.0043 – 0.0064	0.0064	CRQL	N/A	0.29		RSL	0.31	WVDEP	No	100% ND and CRQL ≤ SL
Bromoform	75-25-2	N/A		N/A		mg/kg	N/A	N/A	0/16	0%	0.0043 – 0.01	0.01	CRQL	N/A	19		RSL	20	WVDEP	No	100% ND and CRQL ≤ SL
Bromomethane	74-83-9	N/A		N/A		mg/kg	N/A	N/A	0/21	0%	0.0043 – 0.01	0.01	CRQL	N/A	0.68		RSL	7.3	WVDEP	No	100% ND and CRQL ≤ SL
Carbon disulfide	75-15-0	N/A		N/A		mg/kg	N/A	N/A	0/21	0%	0.0043 – 0.01	0.01	CRQL	N/A	77		RSL	740	WVDEP	No	100% ND and CRQL ≤ SL
Carbon tetrachloride	56-23-5	N/A		N/A		mg/kg	N/A	N/A	0/18	0%	0.0043 – 0.01	0.01	CRQL	N/A	0.65		RSL	0.7	WVDEP	No	100% ND and CRQL ≤ SL
Chlorobenzene	108-90-7	N/A		N/A		mg/kg	N/A	N/A	0/18	0%	0.0043 – 0.01	0.01	CRQL	N/A	28		RSL	290	WVDEP	No	100% ND and CRQL ≤ SL
Chloroethane	75-00-3	N/A		N/A		mg/kg	N/A	N/A	0/21	0%	0.0043 – 0.01	0.01	CRQL	N/A	540		RSL	2100	WVDEP	No	100% ND and CRQL ≤ SL
Chloroform	67-66-3	N/A		N/A		mg/kg	N/A	N/A	0/21	0%	0.0043 – 0.01	0.01	CRQL	N/A	0.32		RSL	0.34	WVDEP	No	100% ND and CRQL ≤ SL
Chloromethane	74-87-3	N/A		N/A		mg/kg	N/A	N/A	0/21	0%	0.0043 – 0.01	0.01	CRQL	N/A	11		RSL	120	WVDEP	No	100% ND and CRQL ≤ SL
cis-1,2-Dichloroethene	156-59-2	N/A		N/A		mg/kg	N/A	N/A	0/21	0%	0.0043 – 0.01	0.01	CRQL	N/A	16		RSL	17	WVDEP	No	100% ND and CRQL ≤ SL
cis-1,3-Dichloropropene	10061-01-5	N/A		N/A		mg/kg	N/A	N/A	0/18	0%	0.0043 – 0.01	0.01	CRQL	N/A	1.8	*	RSL	N/A	--	No	100% ND and CRQL ≤ SL
Cyclohexane	110-82-7	0.0044	J	0.0044	J	mg/kg	SA-SB325 (11/22/2019)	7 - 8.8	1/19	5%	0.0043 – 0.01	0.0044	MDC	N/A	650		RSL	120	WVDEP	No	CRQL and MDC ≤ SL
Dibromochloromethane	124-48-1	N/A		N/A		mg/kg	N/A	N/A	0/18	0%	0.0043 – 0.01	0.01	CRQL	N/A	8.3		RSL	8.3	WVDEP	No	100% ND and CRQL ≤ SL
Dichlorodifluoromethane	75-71-8	N/A		N/A		mg/kg	N/A	N/A	0/21	0%	0.0043 – 0.01	0.01	CRQL	N/A	8.7		RSL	94	WVDEP	No	100% ND and CRQL ≤ SL
Ethylbenzene	100-41-4	N/A		N/A		mg/kg	N/A	N/A	0/18	0%	0.0043 – 0.01	0.01	CRQL	N/A	5.8		RSL	6.2	WVDEP	No	100% ND and CRQL ≤ SL
Isopropylbenzene	98-82-8	N/A		N/A		mg/kg	N/A	N/A	0/18	0%	0.0043 – 0.01	0.01	CRQL	N/A	190		RSL	270	WVDEP	No	100% ND and CRQL ≤ SL
m,p-Xylene	179601-23-1	0.0019	J	0.0019	J	mg/kg	SA-SB325 (11/22/2019)	7 - 8.8	1/19	5%	0.0043 – 0.01	0.0019	MDC	N/A	58	*	RSL	N/A	--	No	CRQL and MDC ≤ SL
Methyl acetate	79-20-9	N/A		N/A		mg/kg	N/A	N/A	0/21	0%	0.0043 – 0.01	0.01	CRQL	N/A	7800		RSL	23000	WVDEP	No	100% ND and CRQL ≤ SL
Methyl tert-butyl ether	1634-04-4	N/A		N/A		mg/kg	N/A	N/A	0/21	0%	0.0043 – 0.01	0.01	CRQL	N/A	47		RSL	50	WVDEP	No	100% ND and CRQL ≤ SL
Methylcyclohexane	108-87-2	0.0097	J+	0.0097	J+	mg/kg	SA-SB325 (11/22/2019)	7 - 8.8	1/19	5%	0.0043 – 0.01	0.0097	MDC	N/A	650	*	RSL	N/A	--	No	CRQL and MDC ≤ SL
Methylene chloride	75-09-2	0.0045	J	0.0055	J	mg/kg	SA-SB325 (11/22/2019)	7 - 8.8	3/21	14%	0.0043 – 0.01	0.0055	MDC	N/A	35		RSL	58	WVDEP	No	CRQL and MDC ≤ SL
o-Xylene	95-47-6	N/A		N/A		mg/kg	N/A	N/A	0/18	0%	0.0043 – 0.01	0.01	CRQL	N/A	64		RSL	N/A	--	No	100% ND and CRQL ≤ SL
Styrene	100-42-5	N/A		N/A		mg/kg	N/A	N/A	0/18	0%	0.0043 – 0.01	0.01	CRQL	N/A	600		RSL	870	WVDEP	No	100% ND and CRQL ≤ SL
Tetrachloroethene	127-18-4	N/A		N/A		mg/kg	N/A	N/A	0/18	0%	0.0043 – 0.01	0.01	CRQL	N/A	8.1		RSL	25	WVDEP	No	100% ND and CRQL ≤ SL
Toluene	108-88-3	0.0019	J	0.0019	J	mg/kg	SA-SB325 (11/22/2019)	7 - 8.8	1/19	5%	0.0043 – 0.01	0.0019	MDC	N/A	490		RSL	820	WVDEP	No	CRQL and MDC ≤ SL
trans-1,2-Dichloroethene	156-60-5	N/A		N/A		mg/kg	N/A	N/A	0/21	0%	0.0043 – 0.01	0.01	CRQL	N/A	7		RSL	75	WVDEP	No	100% ND and CRQL ≤ SL
trans-1,3-Dichloropropene	10061-02-6	N/A		N/A		mg/kg	N/A	N/A	0/18	0%	0.0043 – 0.01	0.01	CRQL	N/A	1.8	*	RSL	N/A	--	No	100% ND and CRQL ≤ SL
Trichloroethene	79-01-6	N/A		N/A		mg/kg	N/A	N/A	0/9	0%	0.0043 – 0.0064	0.0064	CRQL	N/A	0.41		RSL	1	WVDEP	No	100% ND and CRQL ≤ SL
Trichlorofluoromethane	75-69-4	N/A		N/A		mg/kg	N/A	N/A	0/21	0%	0.0043 – 0.01	0.01	CRQL	N/A	2300		RSL	790	WVDEP	No	100% ND and CRQL ≤ SL
Vinyl chloride	75-01-4	N/A		N/A		mg/kg	N/A	N/A	0/21	0%	0.0043 – 0.01	0.01	CRQL	N/A	0.059		RSL	0.061	WVDEP	No	100% ND and CRQL ≤ SL
Semi-Volatile Organic Compounds (SVOCs)																					
1,1'-Biphenyl	92-52-4	0.018	J	0.05	J	mg/kg	SA-SB314 (11/7/2019)	4 - 6	5/30	17%	0.18 – 0.22	0.05	MDC	N/A	4.7		RSL	51	WVDEP	No	CRQL and MDC ≤ SL
1,2,4,5-Tetrachlorobenzene	95-94-3	0.81		0.81		mg/kg	SB404 (7/16/2021)	2 - 4	1/30	3%	0.18 – 0.22	0.81	MDC	N/A	0.23		RSL	17	WVDEP	**Yes**	MDC > SL

Table A-2.3
Occurrence, Distribution, and Selection of Constituents of Interest (Direct Contact – Site-Wide; Subsurface Soil, > 2 feet)
Reasonable Maximum Exposure
Human Health Risk Assessment
Shaffer Equipment/Arbuckle Creek Area Superfund Site, Minden, West Virginia

Scenario Timeframe: Current and Future
Medium: Soil
Exposure Medium: Soil
Exposure Point: Soil (> 2 feet)

Chemical	CASRN	Minimum Detected Concentration		Maximum Detected Concentration		Units	Location of Maximum	Depth (ft bgs)	Detection Frequency		Range of Reporting Limits	Screening Concentration		Background Value	Screening Level [1, 2]		Source	Potential ARAR [3]	Source	COPC Flag (Yes/No)	Rationale for Selection/Deletion
1,4-Dioxane	123-91-1	N/A		N/A		mg/kg	N/A	N/A	0/30	0%	0.071 – 0.088	0.088	CRQL	N/A	5.3		RSL	5.4	WVDEP	No	100% ND and CRQL ≤ SL
2,2'-Oxybis(1-chloropropane)	108-60-1	N/A		N/A		mg/kg	N/A	N/A	0/30	0%	0.35 – 0.44	0.44	CRQL	N/A	310		RSL	5.1	WVDEP	No	100% ND and CRQL ≤ SL
2,3,4,6-Tetrachlorophenol	58-90-2	N/A		N/A		mg/kg	N/A	N/A	0/30	0%	0.18 – 0.22	0.22	CRQL	N/A	190		RSL	1900	WVDEP	No	100% ND and CRQL ≤ SL
2,4,5-Trichlorophenol	95-95-4	0.088	J	0.088	J	mg/kg	SB404 (7/16/2021)	2 - 4	1/30	3%	0.18 – 0.22	0.088	MDC	N/A	630		RSL	6300	WVDEP	No	CRQL and MDC ≤ SL
2,4,6-Trichlorophenol	88-06-2	N/A		N/A		mg/kg	N/A	N/A	0/30	0%	0.18 – 0.22	0.22	CRQL	N/A	6.3		RSL	49	WVDEP	No	100% ND and CRQL ≤ SL
2,4-Dichlorophenol	120-83-2	N/A		N/A		mg/kg	N/A	N/A	0/30	0%	0.18 – 0.22	0.22	CRQL	N/A	19		RSL	190	WVDEP	No	100% ND and CRQL ≤ SL
2,4-Dimethylphenol	105-67-9	N/A		N/A		mg/kg	N/A	N/A	0/30	0%	0.18 – 0.22	0.22	CRQL	N/A	130		RSL	1300	WVDEP	No	100% ND and CRQL ≤ SL
2,4-Dinitrophenol	51-28-5	N/A		N/A		mg/kg	N/A	N/A	0/30	0%	0.35 – 0.44	0.44	CRQL	N/A	13		RSL	130	WVDEP	No	100% ND and CRQL ≤ SL
2,4-Dinitrotoluene	121-14-2	N/A		N/A		mg/kg	N/A	N/A	0/30	0%	0.18 – 0.22	0.22	CRQL	N/A	1.7		RSL	1.7	WVDEP	No	100% ND and CRQL ≤ SL
2,6-Dinitrotoluene	606-20-2	N/A		N/A		mg/kg	N/A	N/A	0/30	0%	0.18 – 0.22	0.22	CRQL	N/A	0.36		RSL	0.36	WVDEP	No	100% ND and CRQL ≤ SL
2-Chloronaphthalene	91-58-7	N/A		N/A		mg/kg	N/A	N/A	0/30	0%	0.18 – 0.22	0.22	CRQL	N/A	480		RSL	5000	WVDEP	No	100% ND and CRQL ≤ SL
2-Chlorophenol	95-57-8	N/A		N/A		mg/kg	N/A	N/A	0/30	0%	0.18 – 0.22	0.22	CRQL	N/A	39		RSL	340	WVDEP	No	100% ND and CRQL ≤ SL
2-Methylnaphthalene	91-57-6	0.00069	J	0.27		mg/kg	SA-SB314 (11/7/2019)	4 - 6	25/30	83%	0.0038 – 0.21	0.27	MDC	N/A	24		RSL	310	WVDEP	No	CRQL and MDC ≤ SL
2-Methylphenol	95-48-7	N/A		N/A		mg/kg	N/A	N/A	0/30	0%	0.35 – 0.44	0.44	CRQL	N/A	320		RSL	3200	WVDEP	No	100% ND and CRQL ≤ SL
2-Nitroaniline	88-74-4	N/A		N/A		mg/kg	N/A	N/A	0/30	0%	0.18 – 0.22	0.22	CRQL	N/A	63		RSL	630	WVDEP	No	100% ND and CRQL ≤ SL
2-Nitrophenol	88-75-5	N/A		N/A		mg/kg	N/A	N/A	0/30	0%	0.18 – 0.22	0.22	CRQL	N/A	1900	*	RSL	N/A	--	No	100% ND and CRQL ≤ SL
3 & 4 Methylphenol	15831-10-4	N/A		N/A		mg/kg	N/A	N/A	0/21	0%	0.35 – 0.44	0.44	CRQL	N/A	630	*	RSL	3200	WVDEP	No	100% ND and CRQL ≤ SL
3,3'-Dichlorobenzidine	91-94-1	N/A		N/A		mg/kg	N/A	N/A	0/30	0%	0.35 – 0.44	0.44	CRQL	N/A	1.2		RSL	1.2	WVDEP	No	100% ND and CRQL ≤ SL
3-Nitroaniline	99-09-2	N/A		N/A		mg/kg	N/A	N/A	0/30	0%	0.35 – 0.44	0.44	CRQL	N/A	63	*	RSL	N/A	--	No	100% ND and CRQL ≤ SL
4,6-Dinitro-2-methylphenol	534-52-1	N/A		N/A		mg/kg	N/A	N/A	0/30	0%	0.35 – 0.44	0.44	CRQL	N/A	0.51		RSL	N/A	--	No	100% ND and CRQL ≤ SL
4-Bromophenyl-phenylether	101-55-3	N/A		N/A		mg/kg	N/A	N/A	0/30	0%	0.18 – 0.22	0.22	CRQL	N/A	See Rationale		N/A	N/A	--	See Uncertainty	No SL or surrogate toxicity available
4-Chloro-3-methylphenol	59-50-7	N/A		N/A		mg/kg	N/A	N/A	0/30	0%	0.18 – 0.22	0.22	CRQL	N/A	630		RSL	N/A	--	No	100% ND and CRQL ≤ SL
4-Chloroaniline	106-47-8	N/A		N/A		mg/kg	N/A	N/A	0/30	0%	0.35 – 0.44	0.44	CRQL	N/A	2.7		RSL	2.7	WVDEP	No	100% ND and CRQL ≤ SL
4-Chlorophenyl-phenylether	7005-72-3	N/A		N/A		mg/kg	N/A	N/A	0/30	0%	0.18 – 0.22	0.22	CRQL	N/A	See Rationale		N/A	N/A	--	See Uncertainty	No SL or surrogate toxicity available
4-Methylphenol	106-44-5	N/A		N/A		mg/kg	N/A	N/A	0/9	0%	0.37 – 0.42	0.42	CRQL	N/A	130		RSL	6300	WVDEP	No	100% ND and CRQL ≤ SL
4-Nitroaniline	100-01-6	N/A		N/A		mg/kg	N/A	N/A	0/30	0%	0.35 – 0.44	0.44	CRQL	N/A	25		RSL	N/A	--	No	100% ND and CRQL ≤ SL
4-Nitrophenol	100-02-7	N/A		N/A		mg/kg	N/A	N/A	0/30	0%	0.35 – 0.44	0.44	CRQL	N/A	1900	*	RSL	N/A	--	No	100% ND and CRQL ≤ SL
Acenaphthene	83-32-9	0.00085	J	0.2		mg/kg	SA-SB328 (11/15/2019)	2 - 4	17/29	59%	0.0038 – 0.22	0.2	MDC	N/A	360		RSL	4100	WVDEP	No	CRQL and MDC ≤ SL
Acenaphthylene	208-96-8	0.00043	J	0.66		mg/kg	SA-SB314 (11/7/2019)	4 - 6	20/30	67%	0.0037 – 0.22	0.66	MDC	N/A	See Rationale		N/A	4200	WVDEP	See Uncertainty	No SL or surrogate toxicity available
Acetophenone	98-86-2	N/A		N/A		mg/kg	N/A	N/A	0/30	0%	0.35 – 0.44	0.44	CRQL	N/A	780		RSL	2500	WVDEP	No	100% ND and CRQL ≤ SL
Anthracene	120-12-7	0.0019	J	0.64		mg/kg	SA-SB314 (11/7/2019)	4 - 6	19/30	63%	0.0038 – 0.22	0.64	MDC	N/A	1800		RSL	23000	WVDEP	No	CRQL and MDC ≤ SL
Atrazine	1912-24-9	N/A		N/A		mg/kg	N/A	N/A	0/30	0%	0.35 – 0.44	0.44	CRQL	N/A	2.4		RSL	2.4	WVDEP	No	100% ND and CRQL ≤ SL
Benzaldehyde	100-52-7	0.022	J	0.022	J	mg/kg	SA-SB319 (11/7/2019)	5 - 7	1/30	3%	0.35 – 0.44	0.022	MDC	N/A	170		RSL	170	WVDEP	No	CRQL and MDC ≤ SL
Benzo(a)anthracene	56-55-3	0.00041	J	5.7		mg/kg	SA-SB314 (11/7/2019)	4 - 6	24/30	80%	0.0038 – 0.22	5.7	MDC	N/A	1.1		RSL	1.5	WVDEP	Yes	MDC > SL
Benzo(a)pyrene	50-32-8	0.0014	J	6.1		mg/kg	SA-SB314 (11/7/2019)	4 - 6	21/30	70%	0.0038 – 0.22	6.1	MDC	N/A	0.11		RSL	0.11	WVDEP	Yes	MDC > SL
Benzo(b)fluoranthene	205-99-2	0.0013	J	9.5		mg/kg	SA-SB314 (11/7/2019)	4 - 6	24/30	80%	0.0038 – 0.22	9.5	MDC	N/A	1.1		RSL	1.1	WVDEP	Yes	MDC > SL
Benzo(g,h,i)perylene	191-24-2	0.00087	J	1.4		mg/kg	SA-SB314 (11/7/2019)	4 - 6	21/30	70%	0.0038 – 0.22	1.4	MDC	N/A	See Rationale		N/A	1800	WVDEP	See Uncertainty	No SL or surrogate toxicity available
Benzo(k)fluoranthene	207-08-9	0.00082	J	2.4		mg/kg	SA-SB314 (11/7/2019)	4 - 6	21/30	70%	0.0038 – 0.22	2.4	MDC	N/A	11		RSL	11	WVDEP	No	CRQL and MDC ≤ SL
Bis(2-chloroethoxy)methane	111-91-1	N/A		N/A		mg/kg	N/A	N/A	0/30	0%	0.18 – 0.22	0.22	CRQL	N/A	19		RSL	N/A	--	No	100% ND and CRQL ≤ SL
Bis(2-chloroethyl)ether	111-44-4	N/A		N/A		mg/kg	N/A	N/A	0/30	0%	0.35 – 0.44	0.44	CRQL	N/A	0.23		RSL	0.24	WVDEP	See Uncertainty	100% ND and CRQL > SL
Bis(2-ethylhexyl)phthalate	117-81-7	0.019	J	0.17	J	mg/kg	SA-SB319 (11/7/2019)	5 - 7	6/30	20%	0.18 – 0.22	0.17	MDC	N/A	39		RSL	39	WVDEP	No	CRQL and MDC ≤ SL
Butylbenzylphthalate	85-68-7	0.033	J	0.049	J	mg/kg	SA-SB317 (11/8/2019)	5 - 7	2/30	7%	0.18 – 0.22	0.049	MDC	N/A	290		RSL	290	WVDEP	No	CRQL and MDC ≤ SL
Caprolactam	105-60-2	N/A		N/A		mg/kg	N/A	N/A	0/30	0%	0.35 – 0.44	0.44	CRQL	N/A	3100		RSL	31000	WVDEP	No	100% ND and CRQL ≤ SL
Carbazole	86-74-8	0.022	J	0.19	J	mg/kg	SA-SB314 (11/7/2019)	4 - 6	6/30	20%	0.35 – 0.43	0.19	MDC	N/A	See Rationale		N/A	N/A	--	See Uncertainty	No SL or surrogate toxicity available
Chrysene	218-01-9	0.0016	J	6.9		mg/kg	SA-SB314 (11/7/2019)	4 - 6	24/30	80%	0.0038 – 0.22	6.9	MDC	N/A	110		RSL	110	WVDEP	No	CRQL and MDC ≤ SL
Dibenz(a,h)anthracene	53-70-3	0.00095	J	0.71		mg/kg	SA-SB314 (11/7/2019)	4 - 6	10/30	33%	0.0037 – 0.22	0.71	MDC	N/A	0.11		RSL	0.11	WVDEP	Yes	MDC > SL
Dibenzofuran	132-64-9	0.037	J	0.24		mg/kg	SA-SB328 (11/15/2019)	2 - 4	8/30	27%	0.18 – 0.22	0.24	MDC	N/A	7.8		RSL	78	WVDEP	No	CRQL and MDC ≤ SL
Diethylphthalate	84-66-2	0.058	J	0.058	J	mg/kg	SA-SB315 (11/7/2019)	6 - 8	1/30	3%	0.18 – 0.22	0.058	MDC	N/A	5100		RSL	51000	WVDEP	No	CRQL and MDC ≤ SL
Dimethylphthalate	131-11-3	0.18		0.78		mg/kg	SA-SB322 (11/22/2019)	2 - 4	7/30	23%	0.18 – 0.22	0.78	MDC	N/A	See Rationale		N/A	N/A	--	See Uncertainty	No SL or surrogate toxicity available
Di-N-Butylphthalate	84-74-2	0.023	J	0.033	J	mg/kg	SA-SB319 (11/7/2019)	5 - 7	2/30	7%	0.18 – 0.22	0.033	MDC	N/A	630		RSL	6300	WVDEP	No	CRQL and MDC ≤ SL
Di-N-Octyl Phthalate	117-84-0	N/A		N/A		mg/kg	N/A	N/A	0/30	0%	0.35 – 0.44	0.44	CRQL	N/A	63		RSL	N/A	--	No	100% ND and CRQL ≤ SL
Fluoranthene	206-44-0	0.00079	J	7.7		mg/kg	SA-SB314 (11/7/2019)	4 - 6	25/30	83%	0.0038 – 0.41	7.7	MDC	N/A	240		RSL	2400	WVDEP	No	CRQL and MDC ≤ SL
Fluorene	86-73-7	0.00081	J	0.25		mg/kg	SA-SB328 (11/15/2019)	2 - 4	20/29	69%	0.0038 – 0.22	0.25	MDC	N/A	240		RSL	2900	WVDEP	No	CRQL and MDC ≤ SL
Hexachlorobenzene	118-74-1	N/A		N/A		mg/kg	N/A	N/A	0/30	0%	0.18 – 0.22	0.22	CRQL	N/A	0.078		RSL	0.22	WVDEP	See Uncertainty	100% ND and CRQL > SL
Hexachlorobutadiene	87-68-3	N/A		N/A		mg/kg	N/A	N/A	0/30	0%	0.18 – 0.22	0.22	CRQL	N/A	1.2		RSL	1.3	WVDEP	No	100% ND and CRQL ≤ SL

Table A-2.3
Occurrence, Distribution, and Selection of Constituents of Interest (Direct Contact – Site-Wide; Subsurface Soil, > 2 feet)
Reasonable Maximum Exposure
Human Health Risk Assessment
Shaffer Equipment/Arbuckle Creek Area Superfund Site, Minden, West Virginia

Scenario Timeframe: Current and Future
Medium: Soil
Exposure Medium: Soil
Exposure Point: Soil (> 2 feet)

Chemical	CASRN	Minimum Detected Concentration		Maximum Detected Concentration		Units	Location of Maximum	Depth (ft bgs)	Detection Frequency		Range of Reporting Limits	Screening Concentration		Background Value	Screening Level [1, 2]		Source	Potential ARAR [3]	Source	COPC Flag (Yes/No)	Rationale for Selection/Deletion
Hexachlorocyclopentadiene	77-47-4	N/A		N/A		mg/kg	N/A	N/A	0/30	0%	0.35 – 0.44	0.44	CRQL	N/A	0.18		RSL	1.9	WVDEP	See Uncertainty	100% ND and CRQL > SL
Hexachloroethane	67-72-1	N/A		N/A		mg/kg	N/A	N/A	0/30	0%	0.18 – 0.22	0.22	CRQL	N/A	1.8		RSL	2	WVDEP	No	100% ND and CRQL ≤ SL
Indeno(1,2,3-cd)pyrene	193-39-5	0.00083	J	1.7		mg/kg	SA-SB314 (11/7/2019)	4 - 6	21/30	70%	0.0038 – 0.22	1.7	MDC	N/A	1.1		RSL	1.1	WVDEP	Yes	MDC > SL
Isophorone	78-59-1	N/A		N/A		mg/kg	N/A	N/A	0/30	0%	0.18 – 0.22	0.22	CRQL	N/A	570		RSL	570	WVDEP	No	100% ND and CRQL ≤ SL
Naphthalene	91-20-3	0.0015	J	0.23		mg/kg	SA-SB328 (11/15/2019)	2 - 4	21/30	70%	0.0038 – 0.22	0.23	MDC	N/A	2		RSL	2.4	WVDEP	No	CRQL and MDC ≤ SL
Naphthalene, 1-methyl-	90-12-0	0.0038		0.095	J	mg/kg	SB452 (7/15/2021)	2 - 4	6/9	67%	0.0038 – 0.0042	0.095	MDC	N/A	18		RSL	24	WVDEP	No	CRQL and MDC ≤ SL
Nitrobenzene	98-95-3	N/A		N/A		mg/kg	N/A	N/A	0/30	0%	0.18 – 0.22	0.22	CRQL	N/A	5.1		RSL	5.5	WVDEP	No	100% ND and CRQL ≤ SL
N-Nitroso-di-n-propylamine (NDPA)	621-64-7	N/A		N/A		mg/kg	N/A	N/A	0/30	0%	0.18 – 0.22	0.22	CRQL	N/A	0.078		RSL	0.078	WVDEP	See Uncertainty	100% ND and CRQL > SL
N-Nitrosodiphenylamine	86-30-6	N/A		N/A		mg/kg	N/A	N/A	0/30	0%	0.18 – 0.22	0.22	CRQL	N/A	110		RSL	110	WVDEP	No	100% ND and CRQL ≤ SL
Pentachlorophenol	87-86-5	0.00098	J	0.00098	J	mg/kg	SA-SB320 (11/25/2019)	2 - 4	1/30	3%	0.0075 – 0.44	0.00098	MDC	N/A	1		RSL	1	WVDEP	No	CRQL and MDC ≤ SL
Phenanthrene	85-01-8	0.00086	J	1.2		mg/kg	SA-SB314 (11/7/2019)	4 - 6	27/30	90%	0.0038 – 0.21	1.2	MDC	N/A	See Rationale		N/A	23000	WVDEP	See Uncertainty	No SL or surrogate toxicity available
Phenol	108-95-2	0.045	J	0.077	J	mg/kg	SA-SB322 (11/22/2019)	2 - 4	7/30	23%	0.36 – 0.44	0.077	MDC	N/A	1900		RSL	19000	WVDEP	No	CRQL and MDC ≤ SL
Pyrene	129-00-0	0.00067	J	7.3		mg/kg	SA-SB314 (11/7/2019)	4 - 6	25/30	83%	0.0038 – 0.21	7.3	MDC	N/A	180		RSL	2300	WVDEP	No	CRQL and MDC ≤ SL
Pesticides																					
4,4'-DDD	72-54-8	0.00036	J	0.0027	J	mg/kg	SA-SB314 (11/7/2019)	4 - 6	7/29	24%	0.0036 – 0.0043	0.0027	MDC	N/A	0.19		RSL	1.9	WVDEP	No	CRQL and MDC ≤ SL
4,4'-DDE	72-55-9	0.00045	J	0.0012	J	mg/kg	SB403 (7/16/2021)	2 - 4	2/30	7%	0.0035 – 0.0043	0.0012	MDC	N/A	2		RSL	2	WVDEP	No	CRQL and MDC ≤ SL
4,4'-DDT	50-29-3	0.00038	J	0.0089		mg/kg	SA-SB328 (11/15/2019)	2 - 4	4/30	13%	0.0035 – 0.0043	0.0089	MDC	N/A	1.9		RSL	1.9	WVDEP	No	CRQL and MDC ≤ SL
Aldrin	309-00-2	0.00026	J	0.00041	J	mg/kg	SB403 (7/16/2021)	2 - 4	2/30	7%	0.0018 – 0.0022	0.00041	MDC	N/A	0.039		RSL	0.039	WVDEP	No	CRQL and MDC ≤ SL
alpha-BHC	319-84-6	N/A		N/A		mg/kg	N/A	N/A	0/30	0%	0.0018 – 0.0022	0.0022	CRQL	N/A	0.086		RSL	0.086	WVDEP	No	100% ND and CRQL ≤ SL
beta-BHC	319-85-7	0.00025	J	0.0005	J	mg/kg	SB404 (7/16/2021)	2 - 4	3/30	10%	0.0018 – 0.0022	0.0005	MDC	N/A	0.3		RSL	0.3	WVDEP	No	CRQL and MDC ≤ SL
cis-Chlordane	5103-71-9	0.00081	J	0.00092	J	mg/kg	SA-SB328 (11/15/2019)	2 - 4	2/30	7%	0.0018 – 0.0022	0.00092	MDC	N/A	3.6		RSL	N/A	--	No	CRQL and MDC ≤ SL
delta-BHC	319-86-8	0.0004	J	0.0034	J	mg/kg	SB404 (7/16/2021)	2 - 4	2/30	7%	0.0018 – 0.0022	0.0034	MDC	N/A	0.086	*	RSL	N/A	--	No	CRQL and MDC ≤ SL
Dieldrin	60-57-1	0.0017	J	0.75	J	mg/kg	SB404 (7/16/2021)	2 - 4	3/30	10%	0.0035 – 0.0043	0.75	MDC	N/A	0.034		RSL	0.042	WVDEP	Yes	MDC > SL
Endosulfan I	959-98-8	0.00035	J	0.00035	J	mg/kg	SA-SB328 (11/15/2019)	2 - 4	1/30	3%	0.0018 – 0.0022	0.00035	MDC	N/A	47	*	RSL	N/A	--	No	CRQL and MDC ≤ SL
Endosulfan II	33213-65-9	0.00071	J	0.51	J	mg/kg	SB404 (7/16/2021)	2 - 4	4/28	14%	0.0035 – 0.0043	0.51	MDC	N/A	47	*	RSL	N/A	--	No	CRQL and MDC ≤ SL
Endosulfan Sulfate	1031-07-8	0.00088	J	0.00088	J	mg/kg	SA-SB328 (11/15/2019)	2 - 4	1/30	3%	0.0035 – 0.0043	0.00088	MDC	N/A	38		RSL	N/A	--	No	CRQL and MDC ≤ SL
Endrin	72-20-8	0.00024	J	0.63	J	mg/kg	SB404 (7/16/2021)	2 - 4	6/30	20%	0.0036 – 0.0043	0.63	MDC	N/A	1.9		RSL	19	WVDEP	No	CRQL and MDC ≤ SL
Endrin Aldehyde	7421-93-4	0.0011	J	0.0011	J	mg/kg	SA-SB328 (11/15/2019)	2 - 4	1/30	3%	0.0035 – 0.0043	0.0011	MDC	N/A	1.9	*	RSL	N/A	--	No	CRQL and MDC ≤ SL
Endrin Ketone	53494-70-5	N/A		N/A		mg/kg	N/A	N/A	0/30	0%	0.0035 – 0.0043	0.0043	CRQL	N/A	1.9	*	RSL	N/A	--	No	100% ND and CRQL ≤ SL
gamma-BHC (Lindane)	58-89-9	0.0004	J	0.0033	J	mg/kg	SA-SB314 (11/7/2019)	4 - 6	10/29	34%	0.0019 – 0.0022	0.0033	MDC	N/A	0.071		RSL	0.57	WVDEP	No	CRQL and MDC ≤ SL
Heptachlor	76-44-8	0.00058	J	0.00058	J	mg/kg	SA-SB328 (11/15/2019)	2 - 4	1/30	3%	0.0018 – 0.0022	0.00058	MDC	N/A	0.13		RSL	0.14	WVDEP	No	CRQL and MDC ≤ SL
Heptachlor Epoxide	1024-57-3	0.00051	J	0.00051	J	mg/kg	SA-SB328 (11/15/2019)	2 - 4	1/30	3%	0.0018 – 0.0022	0.00051	MDC	N/A	0.07		RSL	0.071	WVDEP	No	CRQL and MDC ≤ SL
Methoxychlor	72-43-5	0.003	J	0.026		mg/kg	SA-SB328 (11/15/2019)	2 - 4	2/30	7%	0.018 – 0.022	0.026	MDC	N/A	32		RSL	320	WVDEP	No	CRQL and MDC ≤ SL
Toxaphene	8001-35-2	N/A		N/A		mg/kg	N/A	N/A	0/30	0%	0.18 – 0.22	0.22	CRQL	N/A	0.49		RSL	0.49	WVDEP	No	100% ND and CRQL ≤ SL
trans-Chlordane	5103-74-2	0.00074	J	1.2		mg/kg	SB404 (7/16/2021)	2 - 4	4/30	13%	0.0018 – 0.0022	1.2	MDC	N/A	3.6		RSL	N/A	--	No	CRQL and MDC ≤ SL
Polychlorinated Biphenyls (PCBs)																					
Aroclor 1016	12674-11-2	N/A		N/A		mg/kg	N/A	N/A	0/30	0%	0.035 – 0.329	0.329	CRQL	N/A	0.41		RSL	5.5	WVDEP	No	100% ND and CRQL ≤ SL
Aroclor 1221	11104-28-2	N/A		N/A		mg/kg	N/A	N/A	0/30	0%	0.035 – 0.658	0.658	CRQL	N/A	0.2		RSL	0.26	WVDEP	See Uncertainty	100% ND and CRQL > SL
Aroclor 1232	11141-16-5	N/A		N/A		mg/kg	N/A	N/A	0/30	0%	0.035 – 0.329	0.329	CRQL	N/A	0.17		RSL	0.22	WVDEP	See Uncertainty	100% ND and CRQL > SL
Aroclor 1242	53469-21-9	N/A		N/A		mg/kg	N/A	N/A	0/30	0%	0.035 – 0.329	0.329	CRQL	N/A	0.23		RSL	0.31	WVDEP	See Uncertainty	100% ND and CRQL > SL
Aroclor 1248	12672-29-6	N/A		N/A		mg/kg	N/A	N/A	0/30	0%	0.035 – 0.329	0.329	CRQL	N/A	0.23		RSL	0.31	WVDEP	See Uncertainty	100% ND and CRQL > SL
Aroclor 1254	11097-69-1	0.0061	J	0.387		mg/kg	SA-SB319 (11/7/2019)	5 - 7	5/30	17%	0.035 – 0.329	0.387	MDC	N/A	0.12		RSL	0.32	WVDEP	Yes	MDC > SL
Aroclor 1260	11096-82-5	0.0069	J	11	C	mg/kg	SA-SB320 (11/25/2019)	2 - 4	13/30	43%	0.04 – 0.329	11	MDC	N/A	0.24		RSL	0.33	WVDEP	Yes	MDC > SL
Aroclor 1262	37324-23-5	N/A		N/A		mg/kg	N/A	N/A	0/30	0%	0.035 – 0.329	0.329	CRQL	N/A	0.23	*	RSL	N/A	--	See Uncertainty	100% ND and CRQL > SL
Aroclor 1268	11100-14-4	N/A		N/A		mg/kg	N/A	N/A	0/30	0%	0.035 – 0.329	0.329	CRQL	N/A	0.23	*	RSL	N/A	--	See Uncertainty	100% ND and CRQL > SL
TOTAL AROCLOR HALFND	CALC021	0.1549		11.16		mg/kg	SA-SB320 (11/25/2019)	2 - 4	30/30	100%	N/A	11.16	MDC	N/A	N/A		N/A	N/A	--	No	Qualitative Evaluation
PCBs - Congeners																					
PCB-1	2051-60-7	0.00000053	J	0.0063		mg/kg	SA-SB317 (11/8/2019)	5 - 7	19/30	63%	0.000002 – 0.0000096	0.0063	MDC	N/A	See Aroclors		N/A	N/A	--	No	Aroclor data used to evaluate chemical
PCB-10	33146-45-1	0.0000012	J	0.00064		mg/kg	SB404 (7/16/2021)	2 - 4	10/30	33%	0.0000019 – 0.000019	0.00064	MDC	N/A	See Aroclors		N/A	N/A	--	No	Aroclor data used to evaluate chemical
PCB-100	39485-83-1	0.0000031		0.000067		mg/kg	SA-SB319 (11/7/2019)	5 - 7	4/14	29%	0.000002 – 0.000002	0.000067	MDC	N/A	See Aroclors		N/A	N/A	--	No	Aroclor data used to evaluate chemical
PCB-101/90	PCB101/90	0.0000062		0.074	J	mg/kg	SA-SB316 (11/8/2019)	2 - 4	13/14	93%	0.000004 – 0.000004	0.074	MDC	N/A	See Aroclors		N/A	N/A	--	No	Aroclor data used to evaluate chemical
PCB-103	60145-21-3	0.000005		0.0027		mg/kg	SB404 (7/16/2021)	2 - 4	11/30	37%	0.0000019 – 0.0011	0.0027	MDC	N/A	See Aroclors		N/A	N/A	--	No	Aroclor data used to evaluate chemical
PCB-104	56558-16-8	0.00000072	J	0.000024	J	mg/kg	SB404 (7/16/2021)	2 - 4	2/30	7%	0.0000019 – 0.0011	0.000024	MDC	N/A	See Aroclors		N/A	N/A	--	No	Aroclor data used to evaluate chemical
PCB-105	32598-14-4	0.00000072	J	0.071		mg/kg	SB404 (7/16/2021)	2 - 4	27/30	90%	0.00000071 – 0.0000042	0.071	MDC	N/A	See TEQ		N/A	N/A	--	No	TEQ used to evaluate chemical
PCB-106	70424-69-0	N/A		N/A		mg/kg	N/A	N/A	0/16	0%	0.0000019 – 0.0011	0.0011	CRQL	N/A	See Aroclors		N/A	N/A	--	No	Aroclor data used to evaluate chemical

Table A-2.3
Occurrence, Distribution, and Selection of Constituents of Interest (Direct Contact – Site-Wide; Subsurface Soil, > 2 feet)
Reasonable Maximum Exposure
Human Health Risk Assessment
Shaffer Equipment/Arbuckle Creek Area Superfund Site, Minden, West Virginia

Scenario Timeframe: Current and Future
Medium: Soil
Exposure Medium: Soil
Exposure Point: Soil (> 2 feet)

Chemical	CASRN	Minimum Detected Concentration		Maximum Detected Concentration		Units	Location of Maximum	Depth (ft bgs)	Detection Frequency		Range of Reporting Limits	Screening Concentration		Background Value	Screening Level [1, 2]		Source	Potential ARAR [3]	Source	COPC Flag (Yes/No)	Rationale for Selection/Deletion
PCB-107	70424-68-9	0.0000015	J	0.0025		mg/kg	SA-SB320 (11/25/2019)	2 - 4	6/7	86%	0.000002 – 0.000002	0.0025	MDC	N/A	See Aroclors		N/A	N/A	--	No	Aroclor data used to evaluate chemical
PCB-107/108	70424-68-9/703~	0.0000026	J	0.0024		mg/kg	SA-SB319 (11/7/2019)	5 - 7	8/14	57%	0.000004 – 0.000004	0.0024	MDC	N/A	See Aroclors		N/A	N/A	--	No	Aroclor data used to evaluate chemical
PCB-107/124	70424-68-9/704~	0.0000015	J	0.01		mg/kg	SB404 (7/16/2021)	2 - 4	5/9	56%	0.000018 – 0.000019	0.01	MDC	N/A	See Aroclors		N/A	N/A	--	No	Aroclor data used to evaluate chemical
PCB-108/124	70362-41-3/704~	0.0000014	J	0.0018	J	mg/kg	SA-SB320 (11/25/2019)	2 - 4	7/7	100%	N/A	0.0018	MDC	N/A	See Aroclors		N/A	N/A	--	No	Aroclor data used to evaluate chemical
PCB-109	74472-35-8	0.00014		0.0078		mg/kg	SB404 (7/16/2021)	2 - 4	4/23	17%	0.000002 – 0.0000096	0.0078	MDC	N/A	See Aroclors		N/A	N/A	--	No	Aroclor data used to evaluate chemical
PCB-11	2050-67-1	0.0000014	J	0.00011		mg/kg	SA-SB319 (11/7/2019)	5 - 7	15/30	50%	0.000002 – 0.0011	0.00011	MDC	N/A	See Aroclors		N/A	N/A	--	No	Aroclor data used to evaluate chemical
PCB-110	38380-03-9	0.0000044		0.058	J	mg/kg	SA-SB316 (11/8/2019)	2 - 4	13/14	93%	0.000002 – 0.000002	0.058	MDC	N/A	See Aroclors		N/A	N/A	--	No	Aroclor data used to evaluate chemical
PCB-110/115	38380-03-9/744~	0.000018		0.96		mg/kg	SB404 (7/16/2021)	2 - 4	14/16	88%	0.000019 – 0.000019	0.96	MDC	N/A	See Aroclors		N/A	N/A	--	No	Aroclor data used to evaluate chemical
PCB-111	39635-32-0	0.00038		0.00038		mg/kg	SB404 (7/16/2021)	2 - 4	1/16	6%	0.0000019 – 0.0011	0.00038	MDC	N/A	See Aroclors		N/A	N/A	--	No	Aroclor data used to evaluate chemical
PCB-111/115	39635-32-0/744~	0.0000033	J	0.00079		mg/kg	SA-SB319 (11/7/2019)	5 - 7	7/14	50%	0.000004 – 0.000004	0.00079	MDC	N/A	See Aroclors		N/A	N/A	--	No	Aroclor data used to evaluate chemical
PCB-112	74472-36-9	N/A		N/A		mg/kg	N/A	N/A	0/16	0%	0.0000019 – 0.0011	0.0011	CRQL	N/A	See Aroclors		N/A	N/A	--	No	Aroclor data used to evaluate chemical
PCB-113	68194-10-5	N/A		N/A		mg/kg	N/A	N/A	0/14	0%	0.000002 – 0.000002	0.000002	CRQL	N/A	See Aroclors		N/A	N/A	--	No	Aroclor data used to evaluate chemical
PCB-114	74472-37-0	0.0000014	J	0.0038		mg/kg	SB404 (7/16/2021)	2 - 4	16/30	53%	0.00000044 – 0.000082	0.0038	MDC	N/A	See TEQ		N/A	N/A	--	No	TEQ used to evaluate chemical
PCB-118	31508-00-6	0.0000051	J	0.33		mg/kg	SB404 (7/16/2021)	2 - 4	15/16	94%	0.0000044 – 0.0000044	0.33	MDC	N/A	See TEQ		N/A	N/A	--	No	TEQ used to evaluate chemical
PCB-118/106	31508-00-6/704~	0.0000025	J	0.036		mg/kg	SA-SB319 (11/7/2019)	5 - 7	13/14	93%	0.00000069 – 0.00000069	0.036	MDC	N/A	See Aroclors		N/A	N/A	--	No	Aroclor data used to evaluate chemical
PCB-119	56558-17-9	0.0000015	J	0.00058		mg/kg	SA-SB319 (11/7/2019)	5 - 7	9/14	64%	0.000002 – 0.000002	0.00058	MDC	N/A	See Aroclors		N/A	N/A	--	No	Aroclor data used to evaluate chemical
PCB-12	2974-92-7	0.0000019	J	0.00018		mg/kg	SA-SB316 (11/8/2019)	2 - 4	6/14	43%	0.000002 – 0.000002	0.00018	MDC	N/A	See Aroclors		N/A	N/A	--	No	Aroclor data used to evaluate chemical
PCB-12/13	2974-92-7/2974~	0.0000046		0.0016		mg/kg	SB404 (7/16/2021)	2 - 4	5/16	31%	0.0000039 – 0.0022	0.0016	MDC	N/A	See Aroclors		N/A	N/A	--	No	Aroclor data used to evaluate chemical
PCB-120	68194-12-7	0.000002		0.014		mg/kg	SB404 (7/16/2021)	2 - 4	13/30	43%	0.0000019 – 0.0011	0.014	MDC	N/A	See Aroclors		N/A	N/A	--	No	Aroclor data used to evaluate chemical
PCB-121	56558-18-0	N/A		N/A		mg/kg	N/A	N/A	0/30	0%	0.0000019 – 0.0011	0.0011	CRQL	N/A	See Aroclors		N/A	N/A	--	No	Aroclor data used to evaluate chemical
PCB-122	76842-07-4	0.0000025		0.00046		mg/kg	SA-SB319 (11/7/2019)	5 - 7	9/30	30%	0.0000019 – 0.0011	0.00046	MDC	N/A	See Aroclors		N/A	N/A	--	No	Aroclor data used to evaluate chemical
PCB-123	65510-44-3	0.0000022		0.0024		mg/kg	SB404 (7/16/2021)	2 - 4	15/30	50%	0.00000043 – 0.00039	0.0024	MDC	N/A	See TEQ		N/A	N/A	--	No	TEQ used to evaluate chemical
PCB-124	70424-70-3	0.0000038		0.0027		mg/kg	SA-SB316 (11/8/2019)	2 - 4	8/14	57%	0.000002 – 0.000002	0.0027	MDC	N/A	See Aroclors		N/A	N/A	--	No	Aroclor data used to evaluate chemical
PCB-126	57465-28-8	0.00000054	Z	0.00057		mg/kg	SB404 (7/16/2021)	2 - 4	15/29	52%	0.00000048 – 0.00047	0.00057	MDC	N/A	See TEQ		N/A	N/A	--	No	TEQ used to evaluate chemical
PCB-127	39635-33-1	0.00000093	J	0.00000093	J	mg/kg	SA-SB323 (11/22/2019)	4 - 6	1/30	3%	0.0000019 – 0.0011	0.00000093	MDC	N/A	See Aroclors		N/A	N/A	--	No	Aroclor data used to evaluate chemical
PCB-128/162	38380-07-3/396~	0.0000017	J	0.023		mg/kg	SA-SB316 (11/8/2019)	2 - 4	13/14	93%	0.000004 – 0.000004	0.023	MDC	N/A	See Aroclors		N/A	N/A	--	No	Aroclor data used to evaluate chemical
PCB-128/166	38380-07-3/414~	0.000028		0.41		mg/kg	SB404 (7/16/2021)	2 - 4	12/16	75%	0.0000039 – 0.000019	0.41	MDC	N/A	See Aroclors		N/A	N/A	--	No	Aroclor data used to evaluate chemical
PCB-129	55215-18-4	0.0000018	J	0.0049		mg/kg	SA-SB316 (11/8/2019)	2 - 4	10/14	71%	0.000002 – 0.000002	0.0049	MDC	N/A	See Aroclors		N/A	N/A	--	No	Aroclor data used to evaluate chemical
PCB-129/138/163	55215-18-4/350~	0.000057		3.1		mg/kg	SB404 (7/16/2021)	2 - 4	15/16	94%	0.000038 – 0.000038	3.1	MDC	N/A	See Aroclors		N/A	N/A	--	No	Aroclor data used to evaluate chemical
PCB-13	2974-90-5	0.0000022		0.00018		mg/kg	SA-SB316 (11/8/2019)	2 - 4	6/14	43%	0.000002 – 0.000002	0.00018	MDC	N/A	See Aroclors		N/A	N/A	--	No	Aroclor data used to evaluate chemical
PCB-130	52663-66-8	0.000002	J	0.2		mg/kg	SB404 (7/16/2021)	2 - 4	25/30	83%	0.000002 – 0.0000096	0.2	MDC	N/A	See Aroclors		N/A	N/A	--	No	Aroclor data used to evaluate chemical
PCB-131	61798-70-7	0.0000022		0.044		mg/kg	SB404 (7/16/2021)	2 - 4	10/16	63%	0.000002 – 0.0000096	0.044	MDC	N/A	See Aroclors		N/A	N/A	--	No	Aroclor data used to evaluate chemical
PCB-131/133	61798-70-7/356~	0.0000045		0.0065		mg/kg	SA-SB316 (11/8/2019)	2 - 4	10/14	71%	0.000004 – 0.000004	0.0065	MDC	N/A	See Aroclors		N/A	N/A	--	No	Aroclor data used to evaluate chemical
PCB-132	38380-05-1	0.000024		1.7		mg/kg	SB404 (7/16/2021)	2 - 4	14/16	88%	0.0000095 – 0.0000095	1.7	MDC	N/A	See Aroclors		N/A	N/A	--	No	Aroclor data used to evaluate chemical
PCB-132/161	38380-05-1/744~	0.0000054		0.097	J	mg/kg	SA-SB316 (11/8/2019)	2 - 4	13/14	93%	0.000004 – 0.000004	0.097	MDC	N/A	See Aroclors		N/A	N/A	--	No	Aroclor data used to evaluate chemical
PCB-133	35694-04-3	0.0000017	J	0.074		mg/kg	SB404 (7/16/2021)	2 - 4	13/16	81%	0.0000095 – 0.0000096	0.074	MDC	N/A	See Aroclors		N/A	N/A	--	No	Aroclor data used to evaluate chemical
PCB-134	52704-70-8	0.000018		0.061		mg/kg	SA-SB320 (11/25/2019)	2 - 4	7/7	100%	N/A	0.061	MDC	N/A	See Aroclors		N/A	N/A	--	No	Aroclor data used to evaluate chemical
PCB-134/143	52704-70-8/681~	0.0000016	J	0.26		mg/kg	SB404 (7/16/2021)	2 - 4	17/23	74%	0.000004 – 0.000019	0.26	MDC	N/A	See Aroclors		N/A	N/A	--	No	Aroclor data used to evaluate chemical
PCB-135	52744-13-5	0.0000026		0.052	J	mg/kg	SA-SB316 (11/8/2019)	2 - 4	13/14	93%	0.000002 – 0.000002	0.052	MDC	N/A	See Aroclors		N/A	N/A	--	No	Aroclor data used to evaluate chemical
PCB-135/151	52744-13-5/526~	0.0000025	J	2.9		mg/kg	SB404 (7/16/2021)	2 - 4	16/16	100%	N/A	2.9	MDC	N/A	See Aroclors		N/A	N/A	--	No	Aroclor data used to evaluate chemical
PCB-136	38411-22-2	0.0000031		1.2		mg/kg	SB404 (7/16/2021)	2 - 4	26/30	87%	0.000002 – 0.0000095	1.2	MDC	N/A	See Aroclors		N/A	N/A	--	No	Aroclor data used to evaluate chemical
PCB-137	35694-06-5	0.00000098	J	0.25		mg/kg	SB403 (7/16/2021)	2 - 4	20/30	67%	0.000002 – 0.000078	0.25	MDC	N/A	See Aroclors		N/A	N/A	--	No	Aroclor data used to evaluate chemical
PCB-138/163/164	35065-28-2/744~	0.00002		0.33	J	mg/kg	SA-SB316 (11/8/2019)	2 - 4	13/14	93%	0.000006 – 0.000006	0.33	MDC	N/A	See Aroclors		N/A	N/A	--	No	Aroclor data used to evaluate chemical
PCB-139/140	56030-56-9/592~	0.0000011	J	0.0055		mg/kg	SB404 (7/16/2021)	2 - 4	8/16	50%	0.0000039 – 0.0022	0.0055	MDC	N/A	See Aroclors		N/A	N/A	--	No	Aroclor data used to evaluate chemical
PCB-139/149	56030-56-9/383~	0.000018		0.35	J	mg/kg	SA-SB316 (11/8/2019)	2 - 4	13/14	93%	0.000004 – 0.000004	0.35	MDC	N/A	See Aroclors		N/A	N/A	--	No	Aroclor data used to evaluate chemical
PCB-14	34883-41-5	N/A		N/A		mg/kg	N/A	N/A	0/30	0%	0.0000019 – 0.0011	0.0011	CRQL	N/A	See Aroclors		N/A	N/A	--	No	Aroclor data used to evaluate chemical
PCB-140	59291-64-4	0.0000015	J	0.00026		mg/kg	SA-SB317 (11/8/2019)	5 - 7	5/14	36%	0.000002 – 0.000002	0.00026	MDC	N/A	See Aroclors		N/A	N/A	--	No	Aroclor data used to evaluate chemical
PCB-141	52712-04-6	0.0000013	J	2		mg/kg	SB404 (7/16/2021)	2 - 4	29/30	97%	0.000002 – 0.000002	2	MDC	N/A	See Aroclors		N/A	N/A	--	No	Aroclor data used to evaluate chemical
PCB-142	41411-61-4	N/A		N/A		mg/kg	N/A	N/A	0/30	0%	0.0000019 – 0.0011	0.0011	CRQL	N/A	See Aroclors		N/A	N/A	--	No	Aroclor data used to evaluate chemical
PCB-143	68194-15-0	N/A		N/A		mg/kg	N/A	N/A	0/7	0%	0.0000019 – 0.0011	0.0011	CRQL	N/A	See Aroclors		N/A	N/A	--	No	Aroclor data used to evaluate chemical
PCB-144	68194-14-9	0.000001	J	0.57		mg/kg	SB404 (7/16/2021)	2 - 4	28/30	93%	0.000002 – 0.0000095	0.57	MDC	N/A	See Aroclors		N/A	N/A	--	No	Aroclor data used to evaluate chemical
PCB-145	74472-40-5	0.000002	J	0.000015		mg/kg	SA-SB316 (11/8/2019)	2 - 4	3/30	10%	0.0000019 – 0.0011	0.000015	MDC	N/A	See Aroclors		N/A	N/A	--	No	Aroclor data used to evaluate chemical
PCB-146	51908-16-8	0.00000092	J	0.76		mg/kg	SB404 (7/16/2021)	2 - 4	16/16	100%	N/A	0.76	MDC	N/A	See Aroclors		N/A	N/A	--	No	Aroclor data used to evaluate chemical
PCB-146/165	51908-16-8/744~	0.0000027	J	0.046	J	mg/kg	SA-SB316 (11/8/2019)	2 - 4	13/14	93%	0.000004 – 0.000004	0.046	MDC	N/A	See Aroclors		N/A	N/A	--	No	Aroclor data used to evaluate chemical
PCB-147	68194-13-8	0.0000017	J	0.001		mg/kg	SA-SB316 (11/8/2019)	2 - 4	9/14	64%	0.000002 – 0.000002	0.001	MDC	N/A	See Aroclors		N/A	N/A	--	No	Aroclor data used to evaluate chemical

Table A-2.3
Occurrence, Distribution, and Selection of Constituents of Interest (Direct Contact – Site-Wide; Subsurface Soil, > 2 feet)
Reasonable Maximum Exposure
Human Health Risk Assessment
Shaffer Equipment/Arbuckle Creek Area Superfund Site, Minden, West Virginia

Scenario Timeframe: Current and Future
Medium: Soil
Exposure Medium: Soil
Exposure Point: Soil (> 2 feet)

Chemical	CASRN	Minimum Detected Concentration		Maximum Detected Concentration		Units	Location of Maximum	Depth (ft bgs)	Detection Frequency		Range of Reporting Limits	Screening Concentration		Background Value	Screening Level [1, 2]		Source	Potential ARAR [3]	Source	COPC Flag (Yes/No)	Rationale for Selection/Deletion
PCB-147/149	68194-13-8/383~	0.000033		3.3		mg/kg	SB404 (7/16/2021)	2 - 4	15/16	94%	0.000019 – 0.000019	3.3	MDC	N/A	See Aroclors		N/A	N/A	--	No	Aroclor data used to evaluate chemical
PCB-148	74472-41-6	0.000001	J	0.0000025		mg/kg	SA-SB321 (11/25/2019)	5 - 7	2/30	7%	0.0000019 – 0.0011	0.0000025	MDC	N/A	See Aroclors		N/A	N/A	--	No	Aroclor data used to evaluate chemical
PCB-15	2050-68-2	0.00000096	J	0.0098		mg/kg	SB404 (7/16/2021)	2 - 4	19/30	63%	0.0000019 – 0.000019	0.0098	MDC	N/A	See Aroclors		N/A	N/A	--	No	Aroclor data used to evaluate chemical
PCB-150	68194-08-1	0.0000012	J	0.0012		mg/kg	SB404 (7/16/2021)	2 - 4	10/30	33%	0.0000019 – 0.0011	0.0012	MDC	N/A	See Aroclors		N/A	N/A	--	No	Aroclor data used to evaluate chemical
PCB-151	52663-63-5	0.000006		0.14	J	mg/kg	SA-SB316 (11/8/2019)	2 - 4	13/14	93%	0.000002 – 0.000002	0.14	MDC	N/A	See Aroclors		N/A	N/A	--	No	Aroclor data used to evaluate chemical
PCB-152	68194-09-2	0.00000057	J	0.00054		mg/kg	SB404 (7/16/2021)	2 - 4	6/30	20%	0.0000019 – 0.0011	0.00054	MDC	N/A	See Aroclors		N/A	N/A	--	No	Aroclor data used to evaluate chemical
PCB-153	35065-27-1	0.000021		0.34	J	mg/kg	SA-SB316 (11/8/2019)	2 - 4	13/14	93%	0.000002 – 0.000002	0.34	MDC	N/A	See Aroclors		N/A	N/A	--	No	Aroclor data used to evaluate chemical
PCB-153/168	35065-27-1/592~	0.000064		3		mg/kg	SB404 (7/16/2021)	2 - 4	15/16	94%	0.000019 – 0.000019	3	MDC	N/A	See Aroclors		N/A	N/A	--	No	Aroclor data used to evaluate chemical
PCB-154	60145-22-4	0.00000061	J	0.00038		mg/kg	SA-SB317 (11/8/2019)	5 - 7	14/21	67%	0.000002 – 0.0011	0.00038	MDC	N/A	See Aroclors		N/A	N/A	--	No	Aroclor data used to evaluate chemical
PCB-155	33979-03-2	N/A		N/A		mg/kg	N/A	N/A	0/30	0%	0.0000019 – 0.0011	0.0011	CRQL	N/A	See Aroclors		N/A	N/A	--	No	Aroclor data used to evaluate chemical
PCB-156	38380-08-4	0.0000015	J	0.0068		mg/kg	SA-SB316 (11/8/2019)	2 - 4	13/14	93%	0.00000055 – 0.00000055	0.0068	MDC	N/A	See TEQ		N/A	N/A	--	No	TEQ used to evaluate chemical
PCB-156/157	38380-08-4/697~	0.0000079	J	0.35		mg/kg	SB404 (7/16/2021)	2 - 4	14/16	88%	0.0000072 – 0.0000072	0.35	MDC	N/A	See TEQ		N/A	N/A	--	No	TEQ used to evaluate chemical
PCB-157	69782-90-7	0.0000011	J	0.0014		mg/kg	SA-SB319 (11/7/2019)	5 - 7	7/14	50%	0.0000006 – 0.0000014	0.0014	MDC	N/A	See TEQ		N/A	N/A	--	No	TEQ used to evaluate chemical
PCB-158	74472-42-7	0.00000061	J	0.56		mg/kg	SB404 (7/16/2021)	2 - 4	16/16	100%	N/A	0.56	MDC	N/A	See Aroclors		N/A	N/A	--	No	Aroclor data used to evaluate chemical
PCB-158/160	74472-42-7/414~	0.0000021	J	0.029		mg/kg	SA-SB316 (11/8/2019)	2 - 4	13/14	93%	0.000004 – 0.000004	0.029	MDC	N/A	See Aroclors		N/A	N/A	--	No	Aroclor data used to evaluate chemical
PCB-159	39635-35-3	0.0000021	J	0.11		mg/kg	SB404 (7/16/2021)	2 - 4	16/30	53%	0.0000019 – 0.0011	0.11	MDC	N/A	See Aroclors		N/A	N/A	--	No	Aroclor data used to evaluate chemical
PCB-16	38444-78-9	0.00000083	J	0.0073		mg/kg	SB404 (7/16/2021)	2 - 4	20/30	67%	0.0000019 – 0.0000096	0.0073	MDC	N/A	See Aroclors		N/A	N/A	--	No	Aroclor data used to evaluate chemical
PCB-160	41411-62-5	N/A		N/A		mg/kg	N/A	N/A	0/7	0%	0.0000019 – 0.0011	0.0011	CRQL	N/A	See Aroclors		N/A	N/A	--	No	Aroclor data used to evaluate chemical
PCB-161	74472-43-8	0.0000083	J	0.000051		mg/kg	SB450 (7/15/2021)	2 - 4	3/16	19%	0.0000019 – 0.0011	0.000051	MDC	N/A	See Aroclors		N/A	N/A	--	No	Aroclor data used to evaluate chemical
PCB-162	39635-34-2	0.0000037		0.0041		mg/kg	SB404 (7/16/2021)	2 - 4	6/16	38%	0.0000019 – 0.0011	0.0041	MDC	N/A	See Aroclors		N/A	N/A	--	No	Aroclor data used to evaluate chemical
PCB-164	74472-45-0	0.0000041	J	0.47		mg/kg	SB404 (7/16/2021)	2 - 4	14/16	88%	0.0000093 – 0.0000095	0.47	MDC	N/A	See Aroclors		N/A	N/A	--	No	Aroclor data used to evaluate chemical
PCB-165	74472-46-1	0.00033		0.037		mg/kg	SB403 (7/16/2021)	2 - 4	2/16	13%	0.0000019 – 0.0011	0.037	MDC	N/A	See Aroclors		N/A	N/A	--	No	Aroclor data used to evaluate chemical
PCB-166	41411-63-6	0.0000024		0.00018		mg/kg	SA-SB319 (11/7/2019)	5 - 7	5/14	36%	0.000002 – 0.000002	0.00018	MDC	N/A	See Aroclors		N/A	N/A	--	No	Aroclor data used to evaluate chemical
PCB-167	52663-72-6	0.0000016	J	0.14		mg/kg	SB404 (7/16/2021)	2 - 4	25/30	83%	0.00000059 – 0.0048	0.14	MDC	N/A	See TEQ		N/A	N/A	--	No	TEQ used to evaluate chemical
PCB-168	59291-65-5	0.0000016	J	0.0000016	J	mg/kg	SA-SB327 (11/15/2019)	6 - 8	1/14	7%	0.000002 – 0.000002	0.0000016	MDC	N/A	See Aroclors		N/A	N/A	--	No	Aroclor data used to evaluate chemical
PCB-169	32774-16-6	0.0000024	Z	0.000096		mg/kg	SA-SB316 (11/8/2019)	2 - 4	6/30	20%	0.00000045 – 0.00053	0.000096	MDC	N/A	See TEQ		N/A	N/A	--	No	TEQ used to evaluate chemical
PCB-17	37680-66-3	0.0000015	J	0.0092		mg/kg	SB404 (7/16/2021)	2 - 4	19/30	63%	0.0000019 – 0.0000096	0.0092	MDC	N/A	See Aroclors		N/A	N/A	--	No	Aroclor data used to evaluate chemical
PCB-170	35065-30-6	0.0000023	J	2.4		mg/kg	SB404 (7/16/2021)	2 - 4	29/30	97%	0.000002 – 0.000002	2.4	MDC	N/A	See Aroclors		N/A	N/A	--	No	Aroclor data used to evaluate chemical
PCB-171	52663-71-5	0.0000027		0.055	J	mg/kg	SA-SB316 (11/8/2019)	2 - 4	13/14	93%	0.000002 – 0.000002	0.055	MDC	N/A	See Aroclors		N/A	N/A	--	No	Aroclor data used to evaluate chemical
PCB-171/173	52663-71-5/681~	0.000015	J	0.92		mg/kg	SB404 (7/16/2021)	2 - 4	14/16	88%	0.000019 – 0.000019	0.92	MDC	N/A	See Aroclors		N/A	N/A	--	No	Aroclor data used to evaluate chemical
PCB-172	52663-74-8	0.0000018	J	0.51		mg/kg	SB404 (7/16/2021)	2 - 4	27/30	90%	0.000002 – 0.0000095	0.51	MDC	N/A	See Aroclors		N/A	N/A	--	No	Aroclor data used to evaluate chemical
PCB-173	68194-16-1	0.000021		0.0042		mg/kg	SA-SB316 (11/8/2019)	2 - 4	7/14	50%	0.000002 – 0.000002	0.0042	MDC	N/A	See Aroclors		N/A	N/A	--	No	Aroclor data used to evaluate chemical
PCB-174	38411-25-5	0.000012		2.3		mg/kg	SB404 (7/16/2021)	2 - 4	28/30	93%	0.000002 – 0.0000095	2.3	MDC	N/A	See Aroclors		N/A	N/A	--	No	Aroclor data used to evaluate chemical
PCB-175	40186-70-7	0.0000022	J	0.13		mg/kg	SB404 (7/16/2021)	2 - 4	23/30	77%	0.000002 – 0.0000096	0.13	MDC	N/A	See Aroclors		N/A	N/A	--	No	Aroclor data used to evaluate chemical
PCB-176	52663-65-7	0.0000014	J	0.43		mg/kg	SB404 (7/16/2021)	2 - 4	27/30	90%	0.000002 – 0.0000095	0.43	MDC	N/A	See Aroclors		N/A	N/A	--	No	Aroclor data used to evaluate chemical
PCB-177	52663-70-4	0.0000018	J	0.52		mg/kg	SA-SB320 (11/25/2019)	2 - 4	29/30	97%	0.000002 – 0.000002	0.52	MDC	N/A	See Aroclors		N/A	N/A	--	No	Aroclor data used to evaluate chemical
PCB-178	52663-67-9	0.0000027		0.6		mg/kg	SB404 (7/16/2021)	2 - 4	28/30	93%	0.000002 – 0.0000095	0.6	MDC	N/A	See Aroclors		N/A	N/A	--	No	Aroclor data used to evaluate chemical
PCB-179	52663-64-6	0.0000046		1.3		mg/kg	SB404 (7/16/2021)	2 - 4	28/30	93%	0.000002 – 0.0000095	1.3	MDC	N/A	See Aroclors		N/A	N/A	--	No	Aroclor data used to evaluate chemical
PCB-18	37680-65-2	0.000011		0.0068		mg/kg	SA-SB316 (11/8/2019)	2 - 4	8/14	57%	0.000002 – 0.000002	0.0068	MDC	N/A	See Aroclors		N/A	N/A	--	No	Aroclor data used to evaluate chemical
PCB-18/30	37680-65-2/356~	0.0000011	J	0.02		mg/kg	SB404 (7/16/2021)	2 - 4	14/16	88%	0.000019 – 0.000019	0.02	MDC	N/A	See Aroclors		N/A	N/A	--	No	Aroclor data used to evaluate chemical
PCB-180	35065-29-3	0.000026		0.52	J	mg/kg	SA-SB316 (11/8/2019)	2 - 4	13/14	93%	0.000002 – 0.000002	0.52	MDC	N/A	See Aroclors		N/A	N/A	--	No	Aroclor data used to evaluate chemical
PCB-180/193	35065-29-3/697~	0.000039		3.2		mg/kg	SB404 (7/16/2021)	2 - 4	15/16	94%	0.000019 – 0.000019	3.2	MDC	N/A	See Aroclors		N/A	N/A	--	No	Aroclor data used to evaluate chemical
PCB-181	74472-47-2	0.00000091	J	0.89		mg/kg	SB404 (7/16/2021)	2 - 4	7/30	23%	0.0000019 – 0.000019	0.89	MDC	N/A	See Aroclors		N/A	N/A	--	No	Aroclor data used to evaluate chemical
PCB-182	60145-23-5	0.00000061	J	0.098		mg/kg	SB403 (7/16/2021)	2 - 4	4/16	25%	0.0000019 – 0.0011	0.098	MDC	N/A	See Aroclors		N/A	N/A	--	No	Aroclor data used to evaluate chemical
PCB-182/187	60145-23-5/526~	0.000012		0.23	J	mg/kg	SA-SB316 (11/8/2019)	2 - 4	13/14	93%	0.000004 – 0.000004	0.23	MDC	N/A	See Aroclors		N/A	N/A	--	No	Aroclor data used to evaluate chemical
PCB-183	52663-69-1	0.0000069		0.12	J	mg/kg	SA-SB316 (11/8/2019)	2 - 4	13/14	93%	0.000002 – 0.000002	0.12	MDC	N/A	See Aroclors		N/A	N/A	--	No	Aroclor data used to evaluate chemical
PCB-183/185	52663-69-1/527~	0.000036		2		mg/kg	SB404 (7/16/2021)	2 - 4	14/16	88%	0.000019 – 0.000019	2	MDC	N/A	See Aroclors		N/A	N/A	--	No	Aroclor data used to evaluate chemical
PCB-184	74472-48-3	0.0000012	J	0.000037		mg/kg	SA-SB316 (11/8/2019)	2 - 4	5/30	17%	0.0000019 – 0.0011	0.000037	MDC	N/A	See Aroclors		N/A	N/A	--	No	Aroclor data used to evaluate chemical
PCB-185	52712-05-7	0.0000015	J	0.026	J	mg/kg	SA-SB316 (11/8/2019)	2 - 4	13/14	93%	0.000002 – 0.000002	0.026	MDC	N/A	See Aroclors		N/A	N/A	--	No	Aroclor data used to evaluate chemical
PCB-186	74472-49-4	N/A		N/A		mg/kg	N/A	N/A	0/30	0%	0.0000019 – 0.0011	0.0011	CRQL	N/A	See Aroclors		N/A	N/A	--	No	Aroclor data used to evaluate chemical
PCB-187	52663-68-0	0.0000042	J	2.5		mg/kg	SB404 (7/16/2021)	2 - 4	16/16	100%	N/A	2.5	MDC	N/A	See Aroclors		N/A	N/A	--	No	Aroclor data used to evaluate chemical
PCB-188	74487-85-7	0.0000011	J	0.00047		mg/kg	SB404 (7/16/2021)	2 - 4	10/30	33%	0.0000019 – 0.0011	0.00047	MDC	N/A	See Aroclors		N/A	N/A	--	No	Aroclor data used to evaluate chemical
PCB-189	39635-31-9	0.000002		0.1		mg/kg	SB404 (7/16/2021)	2 - 4	23/30	77%	0.00000045 – 0.0000043	0.1	MDC	N/A	See TEQ		N/A	N/A	--	No	TEQ used to evaluate chemical
PCB-19	38444-73-4	0.0000025		0.0031		mg/kg	SB404 (7/16/2021)	2 - 4	17/30	57%	0.0000019 – 0.0000096	0.0031	MDC	N/A	See Aroclors		N/A	N/A	--	No	Aroclor data used to evaluate chemical
PCB-190	41411-64-7	0.00000073	J	0.55		mg/kg	SB404 (7/16/2021)	2 - 4	29/30	97%	0.000002 – 0.000002	0.55	MDC	N/A	See Aroclors		N/A	N/A	--	No	Aroclor data used to evaluate chemical

Table A-2.3
Occurrence, Distribution, and Selection of Constituents of Interest (Direct Contact – Site-Wide; Subsurface Soil, > 2 feet)
Reasonable Maximum Exposure
Human Health Risk Assessment
Shaffer Equipment/Arbuckle Creek Area Superfund Site, Minden, West Virginia

Scenario Timeframe: Current and Future
Medium: Soil
Exposure Medium: Soil
Exposure Point: Soil (> 2 feet)

Chemical	CASRN	Minimum Detected Concentration		Maximum Detected Concentration		Units	Location of Maximum	Depth (ft bgs)	Detection Frequency		Range of Reporting Limits	Screening Concentration		Background Value	Screening Level [1, 2]		Source	Potential ARAR [3]	Source	COPC Flag (Yes/No)	Rationale for Selection/Deletion
PCB-191	74472-50-7	0.0000016	J	0.12		mg/kg	SB404 (7/16/2021)	2 - 4	24/30	80%	0.000002 – 0.0000095	0.12	MDC	N/A	See Aroclors		N/A	N/A	--	No	Aroclor data used to evaluate chemical
PCB-192	74472-51-8	N/A		N/A		mg/kg	N/A	N/A	0/30	0%	0.0000019 – 0.0011	0.0011	CRQL	N/A	See Aroclors		N/A	N/A	--	No	Aroclor data used to evaluate chemical
PCB-193	69782-91-8	0.0000013	J	0.023		mg/kg	SA-SB316 (11/8/2019)	2 - 4	13/14	93%	0.000002 – 0.000002	0.023	MDC	N/A	See Aroclors		N/A	N/A	--	No	Aroclor data used to evaluate chemical
PCB-194	35694-08-7	0.0000052		1.1		mg/kg	SB404 (7/16/2021)	2 - 4	28/30	93%	0.000002 – 0.0000095	1.1	MDC	N/A	See Aroclors		N/A	N/A	--	No	Aroclor data used to evaluate chemical
PCB-195	52663-78-2	0.000002		0.54		mg/kg	SB404 (7/16/2021)	2 - 4	28/30	93%	0.000002 – 0.0000095	0.54	MDC	N/A	See Aroclors		N/A	N/A	--	No	Aroclor data used to evaluate chemical
PCB-196	42740-50-1	0.0000045	J	0.64		mg/kg	SB404 (7/16/2021)	2 - 4	15/16	94%	0.0000095 – 0.0000095	0.64	MDC	N/A	See Aroclors		N/A	N/A	--	No	Aroclor data used to evaluate chemical
PCB-196/203	42740-50-1/526~	0.0000051		0.12	J	mg/kg	SA-SB316 (11/8/2019)	2 - 4	13/14	93%	0.000004 – 0.000004	0.12	MDC	N/A	See Aroclors		N/A	N/A	--	No	Aroclor data used to evaluate chemical
PCB-197	33091-17-7	0.0000035		0.0036		mg/kg	SA-SB316 (11/8/2019)	2 - 4	9/14	64%	0.000002 – 0.000002	0.0036	MDC	N/A	See Aroclors		N/A	N/A	--	No	Aroclor data used to evaluate chemical
PCB-197/200	33091-17-7/526~	0.0000016	J	0.17		mg/kg	SB404 (7/16/2021)	2 - 4	15/16	94%	0.000019 – 0.000019	0.17	MDC	N/A	See Aroclors		N/A	N/A	--	No	Aroclor data used to evaluate chemical
PCB-198	68194-17-2	0.0000019	J	0.0044		mg/kg	SA-SB316 (11/8/2019)	2 - 4	10/14	71%	0.000002 – 0.000002	0.0044	MDC	N/A	See Aroclors		N/A	N/A	--	No	Aroclor data used to evaluate chemical
PCB-198/199	68194-17-2/526~	0.000044		0.94		mg/kg	SB404 (7/16/2021)	2 - 4	14/16	88%	0.000019 – 0.000019	0.94	MDC	N/A	See Aroclors		N/A	N/A	--	No	Aroclor data used to evaluate chemical
PCB-199	52663-75-9	0.000005		0.097	J	mg/kg	SA-SB316 (11/8/2019)	2 - 4	13/14	93%	0.000002 – 0.000002	0.097	MDC	N/A	See Aroclors		N/A	N/A	--	No	Aroclor data used to evaluate chemical
PCB-2	2051-61-8	0.0000014	J	0.00041		mg/kg	SB404 (7/16/2021)	2 - 4	17/30	57%	0.000002 – 0.000023	0.00041	MDC	N/A	See Aroclors		N/A	N/A	--	No	Aroclor data used to evaluate chemical
PCB-20/21/33	38444-84-7/557~	0.00000083	J	0.0029		mg/kg	SA-SB316 (11/8/2019)	2 - 4	8/14	57%	0.000006 – 0.000006	0.0029	MDC	N/A	See Aroclors		N/A	N/A	--	No	Aroclor data used to evaluate chemical
PCB-20/28	38444-84-7/701~	0.0000044		0.028		mg/kg	SB404 (7/16/2021)	2 - 4	12/16	75%	0.000018 – 0.000019	0.028	MDC	N/A	See Aroclors		N/A	N/A	--	No	Aroclor data used to evaluate chemical
PCB-200	52663-73-7	0.0000016	J	0.012		mg/kg	SA-SB316 (11/8/2019)	2 - 4	12/14	86%	0.000002 – 0.000002	0.012	MDC	N/A	See Aroclors		N/A	N/A	--	No	Aroclor data used to evaluate chemical
PCB-201	40186-71-8	0.00000062	J	0.13		mg/kg	SB404 (7/16/2021)	2 - 4	26/30	87%	0.000002 – 0.0000095	0.13	MDC	N/A	See Aroclors		N/A	N/A	--	No	Aroclor data used to evaluate chemical
PCB-202	2136-99-4	0.0000017	J	0.16		mg/kg	SB404 (7/16/2021)	2 - 4	27/30	90%	0.000002 – 0.0000095	0.16	MDC	N/A	See Aroclors		N/A	N/A	--	No	Aroclor data used to evaluate chemical
PCB-203	52663-76-0	0.0000086	J	0.68		mg/kg	SB404 (7/16/2021)	2 - 4	15/16	94%	0.0000095 – 0.0000095	0.68	MDC	N/A	See Aroclors		N/A	N/A	--	No	Aroclor data used to evaluate chemical
PCB-204	74472-52-9	0.0000011	J	0.00017		mg/kg	SB404 (7/16/2021)	2 - 4	2/30	7%	0.0000019 – 0.0011	0.00017	MDC	N/A	See Aroclors		N/A	N/A	--	No	Aroclor data used to evaluate chemical
PCB-205	74472-53-0	0.0000021	J	0.054		mg/kg	SB404 (7/16/2021)	2 - 4	23/30	77%	0.000002 – 0.000019	0.054	MDC	N/A	See Aroclors		N/A	N/A	--	No	Aroclor data used to evaluate chemical
PCB-206	40186-72-9	0.0000011	J	0.22		mg/kg	SB404 (7/16/2021)	2 - 4	28/30	93%	0.000002 – 0.0000095	0.22	MDC	N/A	See Aroclors		N/A	N/A	--	No	Aroclor data used to evaluate chemical
PCB-207	52663-79-3	0.000002		0.034		mg/kg	SB404 (7/16/2021)	2 - 4	24/30	80%	0.000002 – 0.0000095	0.034	MDC	N/A	See Aroclors		N/A	N/A	--	No	Aroclor data used to evaluate chemical
PCB-208	52663-77-1	0.0000017	J	0.036		mg/kg	SB404 (7/16/2021)	2 - 4	25/30	83%	0.000002 – 0.0000095	0.036	MDC	N/A	See Aroclors		N/A	N/A	--	No	Aroclor data used to evaluate chemical
PCB-209 (Decachlorobiphenyl)	2051-24-3	0.000001	J	0.0072		mg/kg	SA-SB319 (11/7/2019)	5 - 7	25/30	83%	0.000002 – 0.0000095	0.0072	MDC	N/A	See Aroclors		N/A	N/A	--	No	Aroclor data used to evaluate chemical
PCB-21/33	55702-46-0/384~	0.0000069		0.014		mg/kg	SB404 (7/16/2021)	2 - 4	10/16	63%	0.0000039 – 0.000019	0.014	MDC	N/A	See Aroclors		N/A	N/A	--	No	Aroclor data used to evaluate chemical
PCB-22	38444-85-8	0.00000094	J	0.011		mg/kg	SB404 (7/16/2021)	2 - 4	22/30	73%	0.000002 – 0.0000096	0.011	MDC	N/A	See Aroclors		N/A	N/A	--	No	Aroclor data used to evaluate chemical
PCB-23	55720-44-0	0.0000022	J	0.000041	J	mg/kg	SB404 (7/16/2021)	2 - 4	2/30	7%	0.0000019 – 0.0011	0.000041	MDC	N/A	See Aroclors		N/A	N/A	--	No	Aroclor data used to evaluate chemical
PCB-24	55702-45-9	0.00000047	J	0.0016		mg/kg	SB404 (7/16/2021)	2 - 4	12/30	40%	0.0000019 – 0.0011	0.0016	MDC	N/A	See Aroclors		N/A	N/A	--	No	Aroclor data used to evaluate chemical
PCB-25	55712-37-3	0.00000082	J	0.0026		mg/kg	SB404 (7/16/2021)	2 - 4	17/30	57%	0.0000019 – 0.0000096	0.0026	MDC	N/A	See Aroclors		N/A	N/A	--	No	Aroclor data used to evaluate chemical
PCB-26	38444-81-4	0.0000062		0.0016		mg/kg	SA-SB316 (11/8/2019)	2 - 4	7/14	50%	0.000002 – 0.000002	0.0016	MDC	N/A	See Aroclors		N/A	N/A	--	No	Aroclor data used to evaluate chemical
PCB-26/29	38444-81-4/158~	0.00000069	J	0.0058		mg/kg	SB404 (7/16/2021)	2 - 4	14/16	88%	0.000019 – 0.000019	0.0058	MDC	N/A	See Aroclors		N/A	N/A	--	No	Aroclor data used to evaluate chemical
PCB-27	38444-76-7	0.0000011	J	0.0013		mg/kg	SB404 (7/16/2021)	2 - 4	18/30	60%	0.0000019 – 0.0000096	0.0013	MDC	N/A	See Aroclors		N/A	N/A	--	No	Aroclor data used to evaluate chemical
PCB-28	7012-37-5	0.0000021		0.01		mg/kg	SA-SB316 (11/8/2019)	2 - 4	11/14	79%	0.000002 – 0.000002	0.01	MDC	N/A	See Aroclors		N/A	N/A	--	No	Aroclor data used to evaluate chemical
PCB-29	15862-07-4	0.00000096	J	0.00002		mg/kg	SA-SB316 (11/8/2019)	2 - 4	4/14	29%	0.000002 – 0.000002	0.00002	MDC	N/A	See Aroclors		N/A	N/A	--	No	Aroclor data used to evaluate chemical
PCB-3	2051-62-9	0.00000069	J	0.0028		mg/kg	SB404 (7/16/2021)	2 - 4	20/30	67%	0.000002 – 0.0000096	0.0028	MDC	N/A	See Aroclors		N/A	N/A	--	No	Aroclor data used to evaluate chemical
PCB-30	35693-92-6	N/A		N/A		mg/kg	N/A	N/A	0/14	0%	0.000002 – 0.000002	0.000002	CRQL	N/A	See Aroclors		N/A	N/A	--	No	Aroclor data used to evaluate chemical
PCB-31	16606-02-3	0.0000019	J	0.028		mg/kg	SB404 (7/16/2021)	2 - 4	23/30	77%	0.000002 – 0.0000096	0.028	MDC	N/A	See Aroclors		N/A	N/A	--	No	Aroclor data used to evaluate chemical
PCB-32	38444-77-8	0.0000024		0.0081		mg/kg	SB404 (7/16/2021)	2 - 4	19/30	63%	0.0000019 – 0.0000096	0.0081	MDC	N/A	See Aroclors		N/A	N/A	--	No	Aroclor data used to evaluate chemical
PCB-34	37680-68-5	0.00000041	J	0.00014		mg/kg	SB404 (7/16/2021)	2 - 4	10/30	33%	0.0000019 – 0.0011	0.00014	MDC	N/A	See Aroclors		N/A	N/A	--	No	Aroclor data used to evaluate chemical
PCB-35	37680-69-6	0.0000011	J	0.00024		mg/kg	SA-SB316 (11/8/2019)	2 - 4	7/30	23%	0.0000019 – 0.0011	0.00024	MDC	N/A	See Aroclors		N/A	N/A	--	No	Aroclor data used to evaluate chemical
PCB-36	38444-87-0	0.0000017	J	0.0000017	J	mg/kg	SA-SB319 (11/7/2019)	5 - 7	1/30	3%	0.0000019 – 0.0011	0.0000017	MDC	N/A	See Aroclors		N/A	N/A	--	No	Aroclor data used to evaluate chemical
PCB-37	38444-90-5	0.0000013	J	0.0085		mg/kg	SB404 (7/16/2021)	2 - 4	20/30	67%	0.0000019 – 0.0000096	0.0085	MDC	N/A	See Aroclors		N/A	N/A	--	No	Aroclor data used to evaluate chemical
PCB-38	53555-66-1	0.0000029		0.000039		mg/kg	SA-SB316 (11/8/2019)	2 - 4	4/30	13%	0.0000019 – 0.0011	0.000039	MDC	N/A	See Aroclors		N/A	N/A	--	No	Aroclor data used to evaluate chemical
PCB-39	38444-88-1	0.0000011	J	0.0000099		mg/kg	SB407 (7/15/2021)	2 - 4	3/30	10%	0.0000019 – 0.0011	0.0000099	MDC	N/A	See Aroclors		N/A	N/A	--	No	Aroclor data used to evaluate chemical
PCB-4	13029-08-8	0.0000034		0.013		mg/kg	SB404 (7/16/2021)	2 - 4	15/30	50%	0.0000019 – 0.0000096	0.013	MDC	N/A	See Aroclors		N/A	N/A	--	No	Aroclor data used to evaluate chemical
PCB-40	38444-93-8	0.0000042		0.0029		mg/kg	SA-SB316 (11/8/2019)	2 - 4	8/14	57%	0.000002 – 0.000002	0.0029	MDC	N/A	See Aroclors		N/A	N/A	--	No	Aroclor data used to evaluate chemical
PCB-40/41/71	38444-93-8/526~	0.00015		0.016		mg/kg	SB404 (7/16/2021)	2 - 4	5/9	56%	0.000027 – 0.000029	0.016	MDC	N/A	See Aroclors		N/A	N/A	--	No	Aroclor data used to evaluate chemical
PCB-40/71	NOB20161110_001	0.0000014	J	0.0044		mg/kg	SA-SB320 (11/25/2019)	2 - 4	7/7	100%	N/A	0.0044	MDC	N/A	See Aroclors		N/A	N/A	--	No	Aroclor data used to evaluate chemical
PCB-41	52663-59-9	0.0000015	J	0.0012		mg/kg	SA-SB320 (11/25/2019)	2 - 4	5/7	71%	0.0000019 – 0.000002	0.0012	MDC	N/A	See Aroclors		N/A	N/A	--	No	Aroclor data used to evaluate chemical
PCB-41/64/71/72	52663-59-9/526~	0.0000025	J	0.012		mg/kg	SA-SB316 (11/8/2019)	2 - 4	11/14	79%	0.000008 – 0.000008	0.012	MDC	N/A	See Aroclors		N/A	N/A	--	No	Aroclor data used to evaluate chemical
PCB-42	36559-22-5	0.0000029	J	0.0069		mg/kg	SB404 (7/16/2021)	2 - 4	11/16	69%	0.0000019 – 0.0000096	0.0069	MDC	N/A	See Aroclors		N/A	N/A	--	No	Aroclor data used to evaluate chemical
PCB-42/59	36559-22-5/744~	0.0000016	J	0.0058		mg/kg	SA-SB316 (11/8/2019)	2 - 4	10/14	71%	0.000004 – 0.000004	0.0058	MDC	N/A	See Aroclors		N/A	N/A	--	No	Aroclor data used to evaluate chemical
PCB-43	70362-46-8	0.0000014	J	0.00054	J	mg/kg	SA-SB320 (11/25/2019)	2 - 4	5/16	31%	0.0000019 – 0.000078	0.00054	MDC	N/A	See Aroclors		N/A	N/A	--	No	Aroclor data used to evaluate chemical
PCB-43/49	70362-46-8/414~	0.0000013	J	0.012		mg/kg	SA-SB316 (11/8/2019)	2 - 4	12/14	86%	0.000004 – 0.000004	0.012	MDC	N/A	See Aroclors		N/A	N/A	--	No	Aroclor data used to evaluate chemical

Table A-2.3
Occurrence, Distribution, and Selection of Constituents of Interest (Direct Contact – Site-Wide; Subsurface Soil, > 2 feet)
Reasonable Maximum Exposure
Human Health Risk Assessment
Shaffer Equipment/Arbuckle Creek Area Superfund Site, Minden, West Virginia

Scenario Timeframe: Current and Future
Medium: Soil
Exposure Medium: Soil
Exposure Point: Soil (> 2 feet)

Chemical	CASRN	Minimum Detected Concentration		Maximum Detected Concentration		Units	Location of Maximum	Depth (ft bgs)	Detection Frequency		Range of Reporting Limits	Screening Concentration		Background Value	Screening Level [1, 2]		Source	Potential ARAR [3]	Source	COPC Flag (Yes/No)	Rationale for Selection/Deletion
PCB-44	41464-39-5	0.0000016	J	0.014		mg/kg	SA-SB316 (11/8/2019)	2 - 4	12/14	86%	0.000002 – 0.000002	0.014	MDC	N/A	See Aroclors		N/A	N/A	--	No	Aroclor data used to evaluate chemical
PCB-44/47/65	41464-39-5/243~	0.000015		0.032		mg/kg	SB404 (7/16/2021)	2 - 4	11/16	69%	0.0000058 – 0.000029	0.032	MDC	N/A	See Aroclors		N/A	N/A	--	No	Aroclor data used to evaluate chemical
PCB-45	70362-45-7	0.0000058		0.0033		mg/kg	SA-SB316 (11/8/2019)	2 - 4	8/14	57%	0.000002 – 0.000002	0.0033	MDC	N/A	See Aroclors		N/A	N/A	--	No	Aroclor data used to evaluate chemical
PCB-45/51	70362-45-7/681~	0.000001	J	0.0062		mg/kg	SB404 (7/16/2021)	2 - 4	13/16	81%	0.0000039 – 0.000019	0.0062	MDC	N/A	See Aroclors		N/A	N/A	--	No	Aroclor data used to evaluate chemical
PCB-46	41464-47-5	0.00000049	J	0.002		mg/kg	SB404 (7/16/2021)	2 - 4	17/30	57%	0.0000019 – 0.0011	0.002	MDC	N/A	See Aroclors		N/A	N/A	--	No	Aroclor data used to evaluate chemical
PCB-47	2437-79-8	0.0000016	J	0.0055		mg/kg	SA-SB316 (11/8/2019)	2 - 4	11/14	79%	0.000002 – 0.000002	0.0055	MDC	N/A	See Aroclors		N/A	N/A	--	No	Aroclor data used to evaluate chemical
PCB-48	70362-47-9	0.0000015	J	0.0042		mg/kg	SB404 (7/16/2021)	2 - 4	11/16	69%	0.0000019 – 0.0000096	0.0042	MDC	N/A	See Aroclors		N/A	N/A	--	No	Aroclor data used to evaluate chemical
PCB-48/75	70362-47-9/325~	0.0000033	J	0.002		mg/kg	SA-SB316 (11/8/2019)	2 - 4	8/14	57%	0.000004 – 0.000004	0.002	MDC	N/A	See Aroclors		N/A	N/A	--	No	Aroclor data used to evaluate chemical
PCB-49/69	41464-40-8/602~	0.0000011	J	0.026		mg/kg	SB404 (7/16/2021)	2 - 4	15/16	94%	0.000019 – 0.000019	0.026	MDC	N/A	See Aroclors		N/A	N/A	--	No	Aroclor data used to evaluate chemical
PCB-5	16605-91-7	0.000002		0.019		mg/kg	SB404 (7/16/2021)	2 - 4	4/30	13%	0.0000019 – 0.0011	0.019	MDC	N/A	See Aroclors		N/A	N/A	--	No	Aroclor data used to evaluate chemical
PCB-50	62796-65-0	0.0000014	J	0.000047		mg/kg	SA-SB316 (11/8/2019)	2 - 4	4/14	29%	0.000002 – 0.000002	0.000047	MDC	N/A	See Aroclors		N/A	N/A	--	No	Aroclor data used to evaluate chemical
PCB-50/53	62796-65-0/414~	0.0000005	J	0.0092		mg/kg	SB404 (7/16/2021)	2 - 4	13/16	81%	0.000019 – 0.000019	0.0092	MDC	N/A	See Aroclors		N/A	N/A	--	No	Aroclor data used to evaluate chemical
PCB-51	68194-04-7	0.0000017	J	0.00098		mg/kg	SA-SB316 (11/8/2019)	2 - 4	8/14	57%	0.000002 – 0.000002	0.00098	MDC	N/A	See Aroclors		N/A	N/A	--	No	Aroclor data used to evaluate chemical
PCB-52	35693-99-3	0.000014		0.17		mg/kg	SB404 (7/16/2021)	2 - 4	13/16	81%	0.0000089 – 0.0000095	0.17	MDC	N/A	See Aroclors		N/A	N/A	--	No	Aroclor data used to evaluate chemical
PCB-52/69	35693-99-3/602~	0.0000031	J	0.019		mg/kg	SA-SB316 (11/8/2019)	2 - 4	12/14	86%	0.000004 – 0.000004	0.019	MDC	N/A	See Aroclors		N/A	N/A	--	No	Aroclor data used to evaluate chemical
PCB-53	41464-41-9	0.0000054		0.0033		mg/kg	SA-SB316 (11/8/2019)	2 - 4	8/14	57%	0.000002 – 0.000002	0.0033	MDC	N/A	See Aroclors		N/A	N/A	--	No	Aroclor data used to evaluate chemical
PCB-54	15968-05-5	0.00000031	J	0.00031		mg/kg	SB404 (7/16/2021)	2 - 4	9/30	30%	0.0000019 – 0.0011	0.00031	MDC	N/A	See Aroclors		N/A	N/A	--	No	Aroclor data used to evaluate chemical
PCB-55	74338-24-2	0.00000063	J	0.00035		mg/kg	SA-SB316 (11/8/2019)	2 - 4	12/30	40%	0.0000019 – 0.000078	0.00035	MDC	N/A	See Aroclors		N/A	N/A	--	No	Aroclor data used to evaluate chemical
PCB-56	41464-43-1	0.0000022		0.016		mg/kg	SB404 (7/16/2021)	2 - 4	10/16	63%	0.0000089 – 0.0000096	0.016	MDC	N/A	See Aroclors		N/A	N/A	--	No	Aroclor data used to evaluate chemical
PCB-56/60	41464-43-1/330~	0.0000023	J	0.0093		mg/kg	SA-SB316 (11/8/2019)	2 - 4	11/14	79%	0.000004 – 0.000004	0.0093	MDC	N/A	See Aroclors		N/A	N/A	--	No	Aroclor data used to evaluate chemical
PCB-57	70424-67-8	0.0000054		0.000083		mg/kg	SA-SB316 (11/8/2019)	2 - 4	5/30	17%	0.0000019 – 0.0011	0.000083	MDC	N/A	See Aroclors		N/A	N/A	--	No	Aroclor data used to evaluate chemical
PCB-58	41464-49-7	0.0000016	J	0.00027		mg/kg	SB407 (7/15/2021)	2 - 4	8/30	27%	0.000002 – 0.0011	0.00027	MDC	N/A	See Aroclors		N/A	N/A	--	No	Aroclor data used to evaluate chemical
PCB-59/62/75	74472-33-6/542~	0.0000011	J	0.0017		mg/kg	SB404 (7/16/2021)	2 - 4	10/16	63%	0.0000058 – 0.000029	0.0017	MDC	N/A	See Aroclors		N/A	N/A	--	No	Aroclor data used to evaluate chemical
PCB-6	25569-80-6	0.0000013	J	0.0048		mg/kg	SB404 (7/16/2021)	2 - 4	15/30	50%	0.0000019 – 0.000019	0.0048	MDC	N/A	See Aroclors		N/A	N/A	--	No	Aroclor data used to evaluate chemical
PCB-60	33025-41-1	0.00000099	J	0.008		mg/kg	SB404 (7/16/2021)	2 - 4	12/16	75%	0.0000095 – 0.0000096	0.008	MDC	N/A	See Aroclors		N/A	N/A	--	No	Aroclor data used to evaluate chemical
PCB-61/70	33284-53-6/325~	0.0000035	J	0.061		mg/kg	SB404 (7/16/2021)	2 - 4	17/23	74%	0.000004 – 0.000039	0.061	MDC	N/A	See Aroclors		N/A	N/A	--	No	Aroclor data used to evaluate chemical
PCB-61/70/74/76	TTNUS817	0.000008		0.025		mg/kg	SA-SB320 (11/25/2019)	2 - 4	7/7	100%	N/A	0.025	MDC	N/A	See Aroclors		N/A	N/A	--	No	Aroclor data used to evaluate chemical
PCB-62	54230-22-7	N/A		N/A		mg/kg	N/A	N/A	0/14	0%	0.000002 – 0.000002	0.000002	CRQL	N/A	See Aroclors		N/A	N/A	--	No	Aroclor data used to evaluate chemical
PCB-63	74472-34-7	0.00000088	J	0.001		mg/kg	SB404 (7/16/2021)	2 - 4	16/30	53%	0.0000019 – 0.0000096	0.001	MDC	N/A	See Aroclors		N/A	N/A	--	No	Aroclor data used to evaluate chemical
PCB-64	52663-58-8	0.0000019		0.011		mg/kg	SB404 (7/16/2021)	2 - 4	14/16	88%	0.0000095 – 0.0000095	0.011	MDC	N/A	See Aroclors		N/A	N/A	--	No	Aroclor data used to evaluate chemical
PCB-65	33284-54-7	N/A		N/A		mg/kg	N/A	N/A	0/14	0%	0.000002 – 0.000002	0.000002	CRQL	N/A	See Aroclors		N/A	N/A	--	No	Aroclor data used to evaluate chemical
PCB-66	32598-10-0	0.0000045		0.037		mg/kg	SB404 (7/16/2021)	2 - 4	13/16	81%	0.0000089 – 0.0000095	0.037	MDC	N/A	See Aroclors		N/A	N/A	--	No	Aroclor data used to evaluate chemical
PCB-66/76	32598-10-0/703~	0.0000021	J	0.02		mg/kg	SA-SB316 (11/8/2019)	2 - 4	12/14	86%	0.000004 – 0.000004	0.02	MDC	N/A	See Aroclors		N/A	N/A	--	No	Aroclor data used to evaluate chemical
PCB-67	73575-53-8	0.00000069	J	0.00079		mg/kg	SB404 (7/16/2021)	2 - 4	16/30	53%	0.0000019 – 0.000019	0.00079	MDC	N/A	See Aroclors		N/A	N/A	--	No	Aroclor data used to evaluate chemical
PCB-68	73575-52-7	0.00000067	J	0.00015		mg/kg	SB404 (7/16/2021)	2 - 4	11/30	37%	0.0000019 – 0.0011	0.00015	MDC	N/A	See Aroclors		N/A	N/A	--	No	Aroclor data used to evaluate chemical
PCB-7	33284-50-3	0.0000017	J	0.00078		mg/kg	SB404 (7/16/2021)	2 - 4	10/30	33%	0.0000019 – 0.0011	0.00078	MDC	N/A	See Aroclors		N/A	N/A	--	No	Aroclor data used to evaluate chemical
PCB-72	41464-42-0	0.00000098	J	0.00044		mg/kg	SB404 (7/16/2021)	2 - 4	6/16	38%	0.0000019 – 0.0011	0.00044	MDC	N/A	See Aroclors		N/A	N/A	--	No	Aroclor data used to evaluate chemical
PCB-73	74338-23-1	0.0000014	J	0.00015		mg/kg	SA-SB316 (11/8/2019)	2 - 4	6/30	20%	0.0000019 – 0.0011	0.00015	MDC	N/A	See Aroclors		N/A	N/A	--	No	Aroclor data used to evaluate chemical
PCB-74	32690-93-0	0.0000015	J	0.0082		mg/kg	SA-SB316 (11/8/2019)	2 - 4	12/14	86%	0.000002 – 0.000002	0.0082	MDC	N/A	See Aroclors		N/A	N/A	--	No	Aroclor data used to evaluate chemical
PCB-77	32598-13-3	0.00000067	J	0.0034		mg/kg	SB404 (7/16/2021)	2 - 4	23/30	77%	0.00000042 – 0.0000046	0.0034	MDC	N/A	See TEQ		N/A	N/A	--	No	TEQ used to evaluate chemical
PCB-78	70362-49-1	0.0000029		0.000072		mg/kg	SA-SB319 (11/7/2019)	5 - 7	4/30	13%	0.0000019 – 0.0011	0.000072	MDC	N/A	See Aroclors		N/A	N/A	--	No	Aroclor data used to evaluate chemical
PCB-79	41464-48-6	0.00000063	J	0.0025		mg/kg	SA-SB320 (11/25/2019)	2 - 4	12/30	40%	0.0000019 – 0.000078	0.0025	MDC	N/A	See Aroclors		N/A	N/A	--	No	Aroclor data used to evaluate chemical
PCB-8	34883-43-7	0.00000094	J	0.008		mg/kg	SA-SB320 (11/25/2019)	2 - 4	17/30	57%	0.0000019 – 0.000078	0.008	MDC	N/A	See Aroclors		N/A	N/A	--	No	Aroclor data used to evaluate chemical
PCB-80	33284-52-5	N/A		N/A		mg/kg	N/A	N/A	0/30	0%	0.0000019 – 0.0011	0.0011	CRQL	N/A	See Aroclors		N/A	N/A	--	No	Aroclor data used to evaluate chemical
PCB-81	70362-50-4	0.000001	J	0.0005		mg/kg	SA-SB319 (11/7/2019)	5 - 7	13/30	43%	0.00000036 – 0.0038	0.0005	MDC	N/A	See TEQ		N/A	N/A	--	No	TEQ used to evaluate chemical
PCB-82	52663-62-4	0.00000073	J	0.008		mg/kg	SB404 (7/16/2021)	2 - 4	21/30	70%	0.000002 – 0.0000096	0.008	MDC	N/A	See Aroclors		N/A	N/A	--	No	Aroclor data used to evaluate chemical
PCB-83	60145-20-2	0.000002		0.0078		mg/kg	SA-SB320 (11/25/2019)	2 - 4	7/7	100%	N/A	0.0078	MDC	N/A	See Aroclors		N/A	N/A	--	No	Aroclor data used to evaluate chemical
PCB-83/112	60145-20-2/744~	0.000003	J	0.0015		mg/kg	SA-SB319 (11/7/2019)	5 - 7	8/14	57%	0.000004 – 0.000004	0.0015	MDC	N/A	See Aroclors		N/A	N/A	--	No	Aroclor data used to evaluate chemical
PCB-83/99	60145-20-2/383~	0.00093		0.067		mg/kg	SB404 (7/16/2021)	2 - 4	5/9	56%	0.000018 – 0.000019	0.067	MDC	N/A	See Aroclors		N/A	N/A	--	No	Aroclor data used to evaluate chemical
PCB-84	52663-60-2	0.0000012	J	0.066		mg/kg	SB404 (7/16/2021)	2 - 4	14/16	88%	0.0000095 – 0.0000095	0.066	MDC	N/A	See Aroclors		N/A	N/A	--	No	Aroclor data used to evaluate chemical
PCB-84/92	52663-60-2/526~	0.0000016	J	0.023		mg/kg	SA-SB316 (11/8/2019)	2 - 4	13/14	93%	0.000004 – 0.000004	0.023	MDC	N/A	See Aroclors		N/A	N/A	--	No	Aroclor data used to evaluate chemical
PCB-85/116	65510-45-4/182~	0.0000012	J	0.016		mg/kg	SB404 (7/16/2021)	2 - 4	16/23	70%	0.000004 – 0.000029	0.016	MDC	N/A	See Aroclors		N/A	N/A	--	No	Aroclor data used to evaluate chemical
PCB-85/116/117	TTNUS799	0.0000059		0.0012	J	mg/kg	SA-SB320 (11/25/2019)	2 - 4	6/7	86%	0.0000058 – 0.0000058	0.0012	MDC	N/A	See Aroclors		N/A	N/A	--	No	Aroclor data used to evaluate chemical
PCB-86	55312-69-1	N/A		N/A		mg/kg	N/A	N/A	0/14	0%	0.000002 – 0.000002	0.000002	CRQL	N/A	See Aroclors		N/A	N/A	--	No	Aroclor data used to evaluate chemical
PCB-86/87/97/109/119/125	55312-69-1/383~	0.000029		0.26		mg/kg	SB404 (7/16/2021)	2 - 4	12/16	75%	0.000054 – 0.000058	0.26	MDC	N/A	See Aroclors		N/A	N/A	--	No	Aroclor data used to evaluate chemical

Table A-2.3
Occurrence, Distribution, and Selection of Constituents of Interest (Direct Contact – Site-Wide; Subsurface Soil, > 2 feet)
Reasonable Maximum Exposure
Human Health Risk Assessment
Shaffer Equipment/Arbuckle Creek Area Superfund Site, Minden, West Virginia

Scenario Timeframe: Current and Future
Medium: Soil
Exposure Medium: Soil
Exposure Point: Soil (> 2 feet)

Chemical	CASRN	Minimum Detected Concentration		Maximum Detected Concentration		Units	Location of Maximum	Depth (ft bgs)	Detection Frequency		Range of Reporting Limits	Screening Concentration		Background Value	Screening Level [1, 2]		Source	Potential ARAR [3]	Source	COPC Flag (Yes/No)	Rationale for Selection/Deletion
PCB-87/117/125	38380-02-8/681~	0.0000014	J	0.018		mg/kg	SA-SB319 (11/7/2019)	5 - 7	13/14	93%	0.000006 – 0.000006	0.018	MDC	N/A	See Aroclors		N/A	N/A	--	No	Aroclor data used to evaluate chemical
PCB-88/91	55215-17-3/681~	0.00000077	J	0.01		mg/kg	SB404 (7/16/2021)	2 - 4	24/30	80%	0.000004 – 0.000019	0.01	MDC	N/A	See Aroclors		N/A	N/A	--	No	Aroclor data used to evaluate chemical
PCB-89	73575-57-2	0.0000024		0.00098		mg/kg	SB404 (7/16/2021)	2 - 4	8/30	27%	0.0000019 – 0.0011	0.00098	MDC	N/A	See Aroclors		N/A	N/A	--	No	Aroclor data used to evaluate chemical
PCB-9	34883-39-1	0.0000022		0.0015		mg/kg	SB404 (7/16/2021)	2 - 4	10/30	33%	0.0000019 – 0.0011	0.0015	MDC	N/A	See Aroclors		N/A	N/A	--	No	Aroclor data used to evaluate chemical
PCB-90/101	68194-07-0/376~	0.000064		1.7		mg/kg	SB404 (7/16/2021)	2 - 4	6/9	67%	0.000027 – 0.000028	1.7	MDC	N/A	See Aroclors		N/A	N/A	--	No	Aroclor data used to evaluate chemical
PCB-90/101/113	TTNUS619	0.00012		0.47		mg/kg	SA-SB320 (11/25/2019)	2 - 4	7/7	100%	N/A	0.47	MDC	N/A	See Aroclors		N/A	N/A	--	No	Aroclor data used to evaluate chemical
PCB-92	52663-61-3	0.0000015	J	0.26		mg/kg	SB404 (7/16/2021)	2 - 4	15/16	94%	0.0000095 – 0.0000095	0.26	MDC	N/A	See Aroclors		N/A	N/A	--	No	Aroclor data used to evaluate chemical
PCB-93	73575-56-1	N/A		N/A		mg/kg	N/A	N/A	0/14	0%	0.000002 – 0.000002	0.000002	CRQL	N/A	See Aroclors		N/A	N/A	--	No	Aroclor data used to evaluate chemical
PCB-93/100	73575-56-1/394~	0.00000056	J	0.00000056	J	mg/kg	SA-SB322 (11/22/2019)	2 - 4	1/7	14%	0.0000039 – 0.0022	0.00000056	MDC	N/A	See Aroclors		N/A	N/A	--	No	Aroclor data used to evaluate chemical
PCB-93/95/98/100/102	73575-56-1/383~	0.000051		1.5		mg/kg	SB404 (7/16/2021)	2 - 4	6/9	67%	0.000045 – 0.000047	1.5	MDC	N/A	See Aroclors		N/A	N/A	--	No	Aroclor data used to evaluate chemical
PCB-94	73575-55-0	0.0000018	J	0.00063		mg/kg	SB404 (7/16/2021)	2 - 4	9/30	30%	0.0000019 – 0.0011	0.00063	MDC	N/A	See Aroclors		N/A	N/A	--	No	Aroclor data used to evaluate chemical
PCB-95	38379-99-6	0.0000052		0.38		mg/kg	SA-SB320 (11/25/2019)	2 - 4	20/21	95%	0.000002 – 0.000002	0.38	MDC	N/A	See Aroclors		N/A	N/A	--	No	Aroclor data used to evaluate chemical
PCB-96	73575-54-9	0.00000015	J	0.0011		mg/kg	SB404 (7/16/2021)	2 - 4	13/30	43%	0.0000019 – 0.0011	0.0011	MDC	N/A	See Aroclors		N/A	N/A	--	No	Aroclor data used to evaluate chemical
PCB-97	41464-51-1	0.0000018	J	0.014		mg/kg	SA-SB319 (11/7/2019)	5 - 7	12/14	86%	0.000002 – 0.000002	0.014	MDC	N/A	See Aroclors		N/A	N/A	--	No	Aroclor data used to evaluate chemical
PCB-98/102	60233-25-2/681~	0.0000084		0.00078	J	mg/kg	SA-SB320 (11/25/2019)	2 - 4	4/21	19%	0.0000039 – 0.000004	0.00078	MDC	N/A	See Aroclors		N/A	N/A	--	No	Aroclor data used to evaluate chemical
PCB-99	38380-01-7	0.0000025		0.019		mg/kg	SA-SB319 (11/7/2019)	5 - 7	19/21	90%	0.000002 – 0.000002	0.019	MDC	N/A	See Aroclors		N/A	N/A	--	No	Aroclor data used to evaluate chemical
PCBC TEQ MAMMAL HALFND	CALC029P	4.07E-08		8.80E-05		mg/kg	SB404 (7/16/2021)	2 - 4	29/30	97%	7.10E-07 – 7.10E-07	8.80E-05	MDC	N/A	4.80E-06	*	RSL	N/A	--	Yes	MDC > SL
Total DiCB	25512-42-9	0.0000016	J	0.051	J	mg/kg	SB404 (7/16/2021)	2 - 4	25/30	83%	0 – 0.00012	0.051	MDC	N/A	N/A		N/A	N/A	--	No	Qualitative Evaluation
Total HpCB	28655-71-2	0.000018	J	18	J	mg/kg	SB404 (7/16/2021)	2 - 4	29/30	97%	N/A	18	MDC	N/A	N/A		N/A	N/A	--	No	Qualitative Evaluation
Total HxCB	26601-64-9	0.000027	J	21	J	mg/kg	SB404 (7/16/2021)	2 - 4	29/30	97%	N/A	21	MDC	N/A	N/A		N/A	N/A	--	No	Qualitative Evaluation
Total MoCB	27323-18-8	0.00000053	J	0.0086	J	mg/kg	SA-SB317 (11/8/2019)	5 - 7	21/30	70%	0 – 0.000029	0.0086	MDC	N/A	N/A		N/A	N/A	--	No	Qualitative Evaluation
Total NoCB	53742-07-7	0.0000011	J	0.29	J	mg/kg	SB404 (7/16/2021)	2 - 4	28/30	93%	0 – 0.000028	0.29	MDC	N/A	N/A		N/A	N/A	--	No	Qualitative Evaluation
Total OcCB	55722-26-4	0.0000017	J	4.4	J	mg/kg	SB404 (7/16/2021)	2 - 4	29/30	97%	N/A	4.4	MDC	N/A	N/A		N/A	N/A	--	No	Qualitative Evaluation
Total PeCB	25429-29-2	0.0000067	J	5.4	J	mg/kg	SB404 (7/16/2021)	2 - 4	29/30	97%	N/A	5.4	MDC	N/A	N/A		N/A	N/A	--	No	Qualitative Evaluation
Total TeCB	26914-33-0	0.0000055	J	0.42	J	mg/kg	SB404 (7/16/2021)	2 - 4	28/30	93%	N/A	0.42	MDC	N/A	N/A		N/A	N/A	--	No	Qualitative Evaluation
Total TrCB	25323-68-6	0.00000064	J	0.15	J	mg/kg	SB404 (7/16/2021)	2 - 4	27/30	90%	N/A	0.15	MDC	N/A	N/A		N/A	N/A	--	No	Qualitative Evaluation
TOTAL PCB HOMOLOGS HALFND	CALCHOMOL	0.00014254		49.7189		mg/kg	SB404 (7/16/2021)	2 - 4	30/30	100%	N/A	49.7189	MDC	N/A	N/A		N/A	N/A	--	No	Qualitative Evaluation
Dioxins and Furans																					
1,2,3,4,6,7,8,9-Octachlorodibenzofuran	39001-02-0	0.00000091	J	0.00074		mg/kg	SB404 (7/16/2021)	2 - 4	14/25	56%	0.00000031 – 0.000002	0.00074	MDC	N/A	See TEQ		N/A	N/A	--	No	TEQ used to evaluate chemical
1,2,3,4,6,7,8,9-Octachlorodibenzo-p-dioxin	3268-87-9	0.0000026	J	0.0042	J	mg/kg	SB404 (7/16/2021)	2 - 4	25/25	100%	N/A	0.0042	MDC	N/A	See TEQ		N/A	N/A	--	No	TEQ used to evaluate chemical
1,2,3,4,6,7,8-Heptachlorodibenzofuran	67562-39-4	0.0000004	J	0.00032		mg/kg	SB404 (7/16/2021)	2 - 4	13/25	52%	0.00000017 – 0.0000022	0.00032	MDC	N/A	See TEQ		N/A	N/A	--	No	TEQ used to evaluate chemical
1,2,3,4,6,7,8-Heptachlorodibenzo-p-dioxin	35822-46-9	0.0000018	J	0.00036		mg/kg	SB404 (7/16/2021)	2 - 4	24/25	96%	0.0000011 – 0.0000011	0.00036	MDC	N/A	See TEQ		N/A	N/A	--	No	TEQ used to evaluate chemical
1,2,3,4,7,8,9-Heptachlorodibenzofuran	55673-89-7	0.00000056	J	0.0001		mg/kg	SB404 (7/16/2021)	2 - 4	9/25	36%	0.00000015 – 0.0000022	0.0001	MDC	N/A	See TEQ		N/A	N/A	--	No	TEQ used to evaluate chemical
1,2,3,4,7,8-Hexachlorodibenzofuran	70648-26-9	0.00000069	J	0.00022		mg/kg	SB404 (7/16/2021)	2 - 4	11/25	44%	0.00000013 – 0.0000016	0.00022	MDC	N/A	See TEQ		N/A	N/A	--	No	TEQ used to evaluate chemical
1,2,3,4,7,8-Hexachlorodibenzo-p-dioxin	39227-28-6	0.00000057	J	0.000003	J	mg/kg	SB404 (7/16/2021)	2 - 4	4/25	16%	0.00000014 – 0.0000015	0.000003	MDC	N/A	See TEQ		N/A	N/A	--	No	TEQ used to evaluate chemical
1,2,3,6,7,8-Hexachlorodibenzofuran	57117-44-9	0.00000057	J	0.000038	J-	mg/kg	SB404 (7/16/2021)	2 - 4	9/25	36%	0.000000093 – 0.0000019	0.000038	MDC	N/A	See TEQ		N/A	N/A	--	No	TEQ used to evaluate chemical
1,2,3,6,7,8-Hexachlorodibenzo-p-dioxin	57653-85-7	0.00000025	J	0.000015		mg/kg	SA-SB320 (11/25/2019)	2 - 4	8/25	32%	0.00000014 – 0.0000012	0.000015	MDC	N/A	See TEQ		N/A	N/A	--	No	TEQ used to evaluate chemical
1,2,3,7,8,9-Hexachlorodibenzofuran	72918-21-9	0.00000035	J	0.000016		mg/kg	SB404 (7/16/2021)	2 - 4	6/25	24%	0.00000016 – 0.0000015	0.000016	MDC	N/A	See TEQ		N/A	N/A	--	No	TEQ used to evaluate chemical
1,2,3,7,8,9-Hexachlorodibenzo-p-dioxin	19408-74-3	0.00000021	JZ	0.0000063		mg/kg	SA-SB320 (11/25/2019)	2 - 4	8/25	32%	0.00000015 – 0.0000024	0.0000063	MDC	N/A	See TEQ		N/A	N/A	--	No	TEQ used to evaluate chemical
1,2,3,7,8-Pentachlorodibenzofuran	57117-41-6	0.00000037	J	0.000059	J-	mg/kg	SB403 (7/16/2021)	2 - 4	11/25	44%	0.00000015 – 0.0000016	0.000059	MDC	N/A	See TEQ		N/A	N/A	--	No	TEQ used to evaluate chemical
1,2,3,7,8-Pentachlorodibenzo-p-dioxin	40321-76-4	0.00000048	J	0.000018	Z	mg/kg	SB404 (7/16/2021)	2 - 4	6/25	24%	0.00000017 – 0.0000019	0.000018	MDC	N/A	See TEQ		N/A	N/A	--	No	TEQ used to evaluate chemical
2,3,4,6,7,8-Hexachlorodibenzofuran	60851-34-5	0.00000058	J	0.000038		mg/kg	SB404 (7/16/2021)	2 - 4	9/25	36%	0.000000091 – 0.00000095	0.000038	MDC	N/A	See TEQ		N/A	N/A	--	No	TEQ used to evaluate chemical
2,3,4,7,8-Pentachlorodibenzofuran	57117-31-4	0.0000002	JZ	0.00005		mg/kg	SB404 (7/16/2021)	2 - 4	10/25	40%	0.00000014 – 0.000001	0.00005	MDC	N/A	See TEQ		N/A	N/A	--	No	TEQ used to evaluate chemical
2,3,7,8-Tetrachlorodibenzofuran	51207-31-9	0.00000038	J	0.000024		mg/kg	SB404 (7/16/2021)	2 - 4	14/25	56%	0.000000061 – 0.00000035	0.000024	MDC	N/A	See TEQ		N/A	N/A	--	No	TEQ used to evaluate chemical
2,3,7,8-Tetrachlorodibenzo-p-dioxin	1746-01-6	0.0000002	Z	0.00000032	Z	mg/kg	SA-SB320 (11/25/2019)	2 - 4	3/25	12%	0.000000064 – 0.00000086	0.00000032	MDC	N/A	See TEQ		N/A	0.0000052	WVDEP	No	TEQ used to evaluate chemical
DIOXIN TEQ MAMMAL HALFND	CALC029D	2.97E-07		7.90E-05		mg/kg	SB404 (7/16/2021)	2 - 4	25/25	100%	N/A	7.90E-05	MDC	N/A	4.80E-06	*	RSL	N/A	--	Yes	MDC > SL (CRQL N/A)
Metals																					
Aluminum	7429-90-5	1790		19000		mg/kg	SB450 (7/15/2021)	2 - 4	30/30	100%	N/A	19000	MDC	N/A	7700		RSL	77000	WVDEP	Yes	MDC > SL (CRQL N/A)
Antimony	7440-36-0	0.21	J	1.9		mg/kg	SA-SB310 (11/7/2019)	2 - 4	10/30	33%	1 – 7	1.9	MDC	N/A	3.1		RSL	31	WVDEP	No	MDC ≤ SL < CRQL
Arsenic	7440-38-2	0.7	J	30		mg/kg	SB404 (7/16/2021)	2 - 4	30/30	100%	N/A	30	MDC	N/A	0.68		RSL	0.68	WVDEP	Yes	MDC > SL (CRQL N/A)
Barium	7440-39-3	39.6		274		mg/kg	SA-SB317 (11/8/2019)	5 - 7	30/30	100%	N/A	274	MDC	N/A	1500		RSL	15000	WVDEP	No	MDC ≤ SL (CRQL N/A)
Beryllium	7440-41-7	0.25	J	2.4	J	mg/kg	SA-SB325 (11/22/2019)	7 - 8.8	30/30	100%	N/A	2.4	MDC	N/A	16		RSL	160	WVDEP	No	MDC ≤ SL (CRQL N/A)
Cadmium	7440-43-9	0.067	J	0.72		mg/kg	SA-SB312 (11/7/2019)	2 - 4	21/30	70%	0.51 – 0.6	0.72	MDC	N/A	0.71		RSL	37	WVDEP	Yes	MDC > SL
Calcium	7440-70-2	97	J	40000		mg/kg	SB407 (7/15/2021)	2 - 4	26/30	87%	550 – 590	40000	MDC	N/A	Nutrient		N/A	Nutrient	--	No	Classified as an essential nutrient
Chromium	7440-47-3	4		25.8	J	mg/kg	SA-SB325 (11/22/2019)	7 - 8.8	30/30	100%	N/A	25.8	MDC	N/A	0.3	*	RSL	0.3	WVDEP	Yes	MDC > SL (CRQL N/A)

Table A-2.3
Occurrence, Distribution, and Selection of Constituents of Interest (Direct Contact – Site-Wide; Subsurface Soil, > 2 feet)
Reasonable Maximum Exposure
Human Health Risk Assessment
Shaffer Equipment/Arbuckle Creek Area Superfund Site, Minden, West Virginia

Scenario Timeframe: Current and Future
Medium: Soil
Exposure Medium: Soil
Exposure Point: Soil (> 2 feet)

Chemical	CASRN	Minimum Detected Concentration		Maximum Detected Concentration		Units	Location of Maximum	Depth (ft bgs)	Detection Frequency		Range of Reporting Limits	Screening Concentration		Background Value	Screening Level [1, 2]		Source	Potential ARAR [3]	Source	COPC Flag (Yes/No)	Rationale for Selection/Deletion
Cobalt	7440-48-4	1.6		28.9	J	mg/kg	SA-SB325 (11/22/2019)	7 - 8.8	30/30	100%	N/A	28.9	MDC	N/A	2.3		RSL	23	WVDEP	Yes	MDC > SL (CRQL N/A)
Copper	7440-50-8	2.7	J	210		mg/kg	SB404 (7/16/2021)	2 - 4	30/30	100%	N/A	210	MDC	N/A	310		RSL	3100	WVDEP	No	MDC ≤ SL (CRQL N/A)
Iron	7439-89-6	5300		43800		mg/kg	SA-SB320 (11/25/2019)	2 - 4	30/30	100%	N/A	43800	MDC	N/A	5500		RSL	55000	WVDEP	Yes	MDC > SL (CRQL N/A)
Lead	7439-92-1	5.4		160		mg/kg	SB404 (7/16/2021)	2 - 4	30/30	100%	N/A	160	MDC	N/A	400		RSL	400	WVDEP	No	MDC ≤ SL (CRQL N/A)
Magnesium	7439-95-4	222	J	4700		mg/kg	SB407 (7/15/2021)	2 - 4	28/30	93%	560 – 580	4700	MDC	N/A	Nutrient		N/A	Nutrient	--	No	Classified as an essential nutrient
Manganese	7439-96-5	32.3		815		mg/kg	SA-SB319 (11/7/2019)	5 - 7	30/30	100%	N/A	815	MDC	N/A	180		RSL	1800	WVDEP	Yes	MDC > SL (CRQL N/A)
Mercury	7439-97-6	0.01	J	0.21	J	mg/kg	SA-SB316 (11/8/2019)	2 - 4	19/30	63%	0.04 – 0.12	0.21	MDC	N/A	1.1	*	RSL	3.1	WVDEP	No	CRQL and MDC ≤ SL
Nickel	7440-02-0	3.8		56.7	J	mg/kg	SA-SB325 (11/22/2019)	7 - 8.8	30/30	100%	N/A	56.7	MDC	N/A	150		RSL	1500	WVDEP	No	MDC ≤ SL (CRQL N/A)
Potassium	7440-09-7	620		2800		mg/kg	SB404 (7/16/2021)	2 - 4	24/30	80%	550 – 623	2800	MDC	N/A	Nutrient		N/A	Nutrient	--	No	Classified as an essential nutrient
Selenium	7782-49-2	0.17	J	2.4	J	mg/kg	SA-SB325 (11/22/2019)	7 - 8.8	19/30	63%	2.7 – 4.1	2.4	MDC	N/A	39		RSL	390	WVDEP	No	CRQL and MDC ≤ SL
Silver	7440-22-4	0.061	J	0.16	J	mg/kg	SA-SB369 (11/21/2019)	5 - 7	4/30	13%	0.51 – 1.2	0.16	MDC	N/A	39		RSL	390	WVDEP	No	CRQL and MDC ≤ SL
Sodium	7440-23-5	8.8	J	190	J	mg/kg	SA-SB316 (11/8/2019)	2 - 4	14/30	47%	490 – 607	190	MDC	N/A	Nutrient		N/A	Nutrient	--	No	Classified as an essential nutrient
Thallium	7440-28-0	0.06	J	0.42	J	mg/kg	SA-SB325 (11/22/2019)	7 - 8.8	9/30	30%	0.52 – 2.9	0.42	MDC	N/A	0.078		RSL	0.78	WVDEP	Yes	MDC > SL
Vanadium	7440-62-2	5.1	J	22.6		mg/kg	SA-SB318 (11/8/2019)	4 - 6	30/30	100%	N/A	22.6	MDC	N/A	39	*	RSL	460	WVDEP	No	MDC ≤ SL (CRQL N/A)
Zinc	7440-66-6	9.9		166		mg/kg	SA-SB319 (11/7/2019)	5 - 7	30/30	100%	N/A	166	MDC	N/A	2300		RSL	23000	WVDEP	No	MDC ≤ SL (CRQL N/A)
Cyanide																					
Cyanide	57-12-5	0.053	J	0.76		mg/kg	SA-SB319 (11/7/2019)	5 - 7	14/17	82%	0.51 – 0.57	0.76	MDC	N/A	2.3		RSL	N/A	--	No	CRQL and MDC ≤ SL

Notes:
% = Percent
ARAR = Applicable or Relevant and Appropriate Requirements
CASRN = Chemical Abstracts Service Registry Number
COPC = Chemical of Potential Concern
CRQL = Contract Required Quantitation Limit
ft bgs = feet below gound surface
J = Estimated Concentration (+/- indicates a positive or negative bia, respectively)
MDC = Maximum Detected Concentration
mg/kg = milligram per kilogram
N/A = Not Applicable
ND = Non-Detect or Not Detected
RSL = Regional Screening Level
SL = Screening Level
TEQ = Toxicity Equivalence
USEPA = United States Environmental Protection Agency
WVDEP = West Virginia Department of Environmental Protection
(1) Site data screened against USEPA Residential Soil RSLs, last updated November 2021 (TR = 1E-6, THQ = 0.1).
(2) An asterisk,"*", indicates surrogate toxicity information was used to derive a Screening Level (see **Table 2-4**).
(3) As indicated in the WVDEP Voluntary Remediation Program technical guidance, residential soil "De Minimis" values pursuant to 60CSR9 (effective 12/2/2021) were selected as potential ARARs.

Table A-2.4
Surrogate Chemicals Used within the Human Health Risk Assessment
Reasonable Maximum Exposure
Human Health Risk Assessment
Shaffer Equipment/Arbuckle Creek Area Superfund Site, Minden, West Virginia

Chemical	CASRN	Surrogate	CASRN
1,3-Dichlorobenzene	541-73-1	1,2-Dichlorobenzene	95-50-1
cis-1,3-Dichloropropene	10061-01-5	1,3-Dichloropropene	542-75-6
m,p-Xylene	179601-23-1	Xylenes, Total	1330-20-7
Methylcyclohexane	108-87-2	Cyclohexane	110-82-7
trans-1,3-Dichloropropene	10061-02-6	1,3-Dichloropropene	542-75-6
2-Nitrophenol	88-75-5	Phenol	108-95-2
3 & 4 Methylphenol	15831-10-4	Cresols	1319-77-3
3-Nitroaniline	99-09-2	2-Nitroaniline	88-74-4
4-Nitrophenol	100-02-7	Phenol	108-95-2
delta-BHC	319-86-8	alpha-BHC	319-84-6
Endosulfan I	959-98-8	Endosulfan	115-29-7
Endosulfan II	33213-65-9	Endosulfan	115-29-7
Endrin Aldehyde	7421-93-4	Endrin	72-20-8
Endrin Ketone	53494-70-5	Endrin	72-20-8
Aroclor 1262	37324-23-5	Polychlorinated Biphenyls (high risk)	1336-36-3
Aroclor 1268	11100-14-4	Polychlorinated Biphenyls (high risk)	1336-36-3
PCBC TEQ MAMMAL	CALC016P	2,3,7,8-TCDD	1746-01-6
DIOXIN TEQ MAMMAL	CALC016D	2,3,7,8-TCDD	1746-01-6
Chromium	7440-47-3	Chromium, Hexavalent	18540-29-9
Mercury	7439-97-6	Elemental Mercury	7439-97-6
Vanadium	7440-62-2	Vanadium and Compounds	7440-62-2

Notes:
CASRN = Chemical Abstracts Service Registry Number
PCBC = Polychlorinated Biphenyl Congener
TCDD = Tetrachlorodibenzodioxin
TEQ = Toxicity Equivalence

Table A-3.1
Exposure Point Concentration Summary (Direct Contact – Site-Wide; Surface Soil, 0 – 0.5 feet)
Reasonable Maximum Exposure
Human Health Risk Assessment
Shaffer Equipment/Arbuckle Creek Area Superfund Site, Minden, West Virginia

Scenario Timeframe: Current and Future
Medium: Soil
Exposure Medium: Surface Soil
Exposure Point: 0 – 0.5 feet

COPC	Units	Detection Frequency [1]	Arithmetic Mean [1,2]	95% UCL (Distribution) [1]		Maximum Concentration	Exposure Point Concentration			
							Value	Units	Statistic	Rationale
Semi-Volatile Organic Compounds (SVOCs)										
Benzo(a)pyrene	mg/kg	30/30	0.0741	0.114	(G)	0.29	0.114	mg/kg	UCL	(3)
Polychlorinated Biphenyls (PCBs)										
Aroclor 1260	mg/kg	8/9	0.299	1.659	(G)	1.6	1.6	mg/kg	Max	(4)
PCBs - Congeners										
PCBC TEQ MAMMAL HALFND	mg/kg	30/30	0.000017278	2.9025E-05	(G)	0.000113309	0.000029025	mg/kg	UCL	(3)
Dioxins and Furans										
DIOXIN TEQ MAMMAL HALFND	mg/kg	24/24	0.000013068	2.0772E-05	(G)	0.000090042	0.000020772	mg/kg	UCL	(3)
Metals										
Aluminum	mg/kg	30/30	7565	8541	(N)	15700	8541	mg/kg	UCL	(5)
Arsenic	mg/kg	30/30	7.69	8.639	(N)	14.6	8.639	mg/kg	UCL	(5)
Chromium	mg/kg	30/30	11.61	12.58	(N)	18	12.58	mg/kg	UCL	(5)
Cobalt	mg/kg	30/30	9.613	11.02	(N)	23.6	11.02	mg/kg	UCL	(5)
Iron	mg/kg	30/30	20683	25030	(L)	77700	25030	mg/kg	UCL	(6)
Manganese	mg/kg	30/30	404.4	472.4	(N)	1140	472.4	mg/kg	UCL	(5)
Thallium	mg/kg	10/30	0.11	0.144	(N)	0.25	0.144	mg/kg	UCL	(5)

Notes:
COPC = Chemical of Potential Concern
KM = Kaplan Meier
mg/kg = milligram per kilogram
UCL = Upper Confidence Limit

Distribution Key:
Normal (N)
Gamma (G)
Lognormal (L)

(1) A minimum of five (5) samples with two (2) distinct detects are needed to calculate summary statistics and UCLs but may not be adequate to compute meaningful and reliable results. Therefore, summary statistics and UCLs are only shown if total samples are eight (8) or more with three (3) detections.
(2) If the dataset contains nondetects, summary statistics and UCLs are estimated by the KM method.
(3) Goodness-of-Fit test indicates data are gamma distributed
(4) UCL greater than the maximum detected concentration; maximum detect selected as exposure point concentration.
(5) Goodness-of-Fit test indicates data are normally distributed.
(6) Goodness-of-Fit test indicates data are lognormally distributed.

Table A-3.2a
Exposure Point Concentration Summary (Direct Contact – Site-Wide; Surface and Near Surface Soil, 0 – 2 feet)
Reasonable Maximum Exposure
Human Health Risk Assessment
Shaffer Equipment/Arbuckle Creek Area Superfund Site, Minden, West Virginia

Scenario Timeframe: Future
Medium: Soil
Exposure Medium: Surface and Near Surface Soil
Exposure Point: 0 – 2 feet

COPC	Units	Detection Frequency [1]	Arithmetic Mean [1,2]	95% UCL (Distribution) [1]		Maximum Concentration	Exposure Point Concentration			
							Value	Units	Statistic	Rationale
Semi-Volatile Organic Compounds (SVOCs)										
Benzo(a)anthracene	mg/kg	58/60	0.166	0.329	(L)	3.9	0.329	mg/kg	UCL	(3)
Benzo(a)pyrene	mg/kg	58/60	0.14	0.295	(L)	3.3	0.295	mg/kg	UCL	(3)
Benzo(b)fluoranthene	mg/kg	58/60	0.251	0.531	(L)	5.7	0.531	mg/kg	UCL	(3)
Indeno(1,2,3-cd)pyrene	mg/kg	58/60	0.0778	0.161	(L)	1.5	0.161	mg/kg	UCL	(3)
Polychlorinated Biphenyls (PCBs)										
Aroclor 1254	mg/kg	2/31	N/A	N/A	N/A	0.551	0.551	mg/kg	Max	(1)
Aroclor 1260	mg/kg	24/31	1.177	1.582	(L)	24	1.582	mg/kg	UCL	(3)
PCBs - Congeners										
PCBC TEQ MAMMAL HALFND	mg/kg	60/60	0.000015193	2.1487E-05	(G)	0.000113309	0.000021487	mg/kg	UCL	(5)
Dioxins and Furans										
DIOXIN TEQ MAMMAL HALFND	mg/kg	48/48	9.1678E-06	1.3649E-05	(L)	0.000090042	0.000013649	mg/kg	UCL	(3)
Metals										
Aluminum	mg/kg	60/60	7992	8700	(N)	19000	8700	mg/kg	UCL	(6)
Antimony	mg/kg	33/60	0.828	1.036	(G)	4.4	1.036	mg/kg	UCL	(5)
Arsenic	mg/kg	60/60	11.23	12.98	(L)	82.8	12.98	mg/kg	UCL	(3)
Cadmium	mg/kg	54/60	0.332	0.521	(NP)	2.2	0.521	mg/kg	UCL	(4)
Chromium	mg/kg	60/60	14.37	15.76	(G)	43.9	15.76	mg/kg	UCL	(5)
Cobalt	mg/kg	60/60	10.02	11.15	(G)	28.1	11.15	mg/kg	UCL	(5)
Iron	mg/kg	59/59	21653	24527	(L)	77700	24527	mg/kg	UCL	(3)
Manganese	mg/kg	60/60	424.7	492.2	(G)	2630	492.2	mg/kg	UCL	(5)
Thallium	mg/kg	20/60	0.134	0.164	(N)	0.34	0.164	mg/kg	UCL	(6)

Notes:
COPC = Chemical of Potential Concern
KM = Kaplan Meier
mg/kg = milligram per kilogram
N/A = Not Applicable
UCL = Upper Confidence Limit

Distribution Key:
Normal (N)
Gamma (G)
Lognormal (L)
Non-Parametric (NP)

(1) A minimum of five (5) samples with two (2) distinct detects are needed to calculate summary statistics and UCLs but may not be adequate to compute meaningful and reliable results. Therefore, summary statistics and UCLs are only shown if total samples are eight (8) or more with three (3) detections.
(2) If the dataset contains nondetects, summary statistics and UCLs are estimated by the KM method.
(3) Goodness-of-Fit test indicates data are lognormally distributed.
(4) Goodness-of-Fit test indicates data have no discernible distribution.
(5) Goodness-of-Fit test indicates data are gamma distributed.
(6) Goodness-of-Fit test indicates data are normally distributed.

Table A-3.2b
Exposure Point Concentration Summary (Direct Contact – Site-Wide with Hotspot; Surface and Near Surface Soil, 0 – 2 feet)
Reasonable Maximum Exposure
Human Health Risk Assessment
Shaffer Equipment/Arbuckle Creek Area Superfund Site, Minden, West Virginia

Scenario Timeframe: Future
Medium: Soil
Exposure Medium: Surface and Near Surface Soil
Exposure Point: 0 – 2 feet

COPC	Units	Detection Frequency [1]	Arithmetic Mean [1,2]	95% UCL (Distribution) [1]		Maximum Concentration	Exposure Point Concentration			
							Value	Units	Statistic	Rationale
Semi-Volatile Organic Compounds (SVOCs)										
Benzo(a)anthracene	mg/kg	58/60	0.166	0.329	(L)	3.9	0.329	mg/kg	UCL	(3)
Benzo(a)pyrene	mg/kg	58/60	0.14	0.295	(L)	3.3	0.295	mg/kg	UCL	(3)
Benzo(b)fluoranthene	mg/kg	58/60	0.251	0.531	(L)	5.7	0.531	mg/kg	UCL	(3)
Indeno(1,2,3-cd)pyrene	mg/kg	58/60	0.0778	0.161	(L)	1.5	0.161	mg/kg	UCL	(3)
Polychlorinated Biphenyls (PCBs)										
Aroclor 1254	mg/kg	2/31	N/A	N/A	N/A	0.551	0.551	mg/kg	Max	(1)
Aroclor 1260	mg/kg	24/31	1.177	1.582	(L)	24	24	mg/kg	Max	(4)
PCBs - Congeners										
PCBC TEQ MAMMAL HALFND	mg/kg	60/60	0.000015193	2.1487E-05	(G)	0.000113309	0.000021487	mg/kg	UCL	(6)
Dioxins and Furans										
DIOXIN TEQ MAMMAL HALFND	mg/kg	48/48	9.1678E-06	1.3649E-05	(L)	0.000090042	0.000013649	mg/kg	UCL	(6)
Metals										
Aluminum	mg/kg	60/60	7992	8700	(N)	19000	8700	mg/kg	UCL	(7)
Antimony	mg/kg	33/60	0.828	1.036	(G)	4.4	1.036	mg/kg	UCL	(6)
Arsenic	mg/kg	60/60	11.23	12.98	(L)	82.8	12.98	mg/kg	UCL	(3)
Cadmium	mg/kg	54/60	0.332	0.521	(NP)	2.2	0.521	mg/kg	UCL	(5)
Chromium	mg/kg	60/60	14.37	15.76	(G)	43.9	15.76	mg/kg	UCL	(6)
Cobalt	mg/kg	60/60	10.02	11.15	(G)	28.1	11.15	mg/kg	UCL	(6)
Iron	mg/kg	59/59	21653	24527	(L)	77700	24527	mg/kg	UCL	(3)
Manganese	mg/kg	60/60	424.7	492.2	(G)	2630	492.2	mg/kg	UCL	(6)
Thallium	mg/kg	20/60	0.134	0.164	(N)	0.34	0.164	mg/kg	UCL	(7)

Notes:
COPC = Chemical of Potential Concern
KM = Kaplan Meier
mg/kg = milligram per kilogram
N/A = Not Applicable
UCL = Upper Confidence Limit

Distribution Key:
Normal (N)
Gamma (G)
Lognormal (L)
Non-Parametric (NP)

(1) A minimum of five (5) samples with two (2) distinct detects are needed to calculate summary statistics and UCLs but may not be adequate to compute meaningful and reliable results. Therefore, summary statistics and UCLs are only shown if total samples are eight (8) or more with three (3) detections.
(2) If the dataset contains nondetects, summary statistics and UCLs are estimated by the KM method.
(3) Goodness-of-Fit test indicates data are lognormally distributed.
(4) Maximum detected concentration retained as exposure point concentration to evaluate presence of a potential hot spot.
(5) Goodness-of-Fit test indicates data have no discernible distribution.
(6) Goodness-of-Fit test indicates data are gamma distributed.
(7) Goodness-of-Fit test indicates data are normally distributed.

Table A-3.3a
Exposure Point Concentration Summary (Direct Contact – Site-Wide; Total Soil, 0 – 8.8 feet)
Reasonable Maximum Exposure
Human Health Risk Assessment
Shaffer Equipment/Arbuckle Creek Area Superfund Site, Minden, West Virginia

Scenario Timeframe: Future
Medium: Soil
Exposure Medium: Total Soil
Exposure Point: 0 – 8.8 feet

COPC	Units	Detection Frequency [1]	Arithmetic Mean [1,2]	95% UCL (Distribution) [1]		Maximum Concentration	Exposure Point Concentration			
							Value	Units	Statistic	Rationale
Semi-Volatile Organic Compounds (SVOCs)										
1,2,4,5-Tetrachlorobenzene	mg/kg	2/90	0.0703	0.121	(NP)	0.81	0.121	mg/kg	UCL	(3)
Benzo(a)anthracene	mg/kg	82/90	0.212	0.509	(L)	5.7	0.509	mg/kg	UCL	(4)
Benzo(a)pyrene	mg/kg	79/90	0.196	0.342	(L)	6.1	0.342	mg/kg	UCL	(4)
Benzo(b)fluoranthene	mg/kg	82/90	0.329	0.69	(L)	9.5	0.69	mg/kg	UCL	(4)
Dibenz(a,h)anthracene	mg/kg	39/90	0.0169	0.0151	(L)	0.71	0.0151	mg/kg	UCL	(4)
Indeno(1,2,3-cd)pyrene	mg/kg	79/90	0.0907	0.177	(L)	1.7	0.177	mg/kg	UCL	(4)
Pesticides										
Dieldrin	mg/kg	16/85	0.0113	0.00397	(L)	0.75	0.00397	mg/kg	UCL	(4)
Polychlorinated Biphenyls (PCBs)										
Aroclor 1254	mg/kg	7/61	0.0343	0.0617	(G)	0.551	0.0617	mg/kg	UCL	(5)
Aroclor 1260	mg/kg	37/61	0.865	1.179	(L)	24	1.179	mg/kg	UCL	(4)
PCBs - Congeners										
PCBC TEQ MAMMAL HALFND	mg/kg	89/90	0.00001254	2.2823E-05	(NP)	0.000113309	0.000022823	mg/kg	UCL	(3)
Dioxins and Furans										
DIOXIN TEQ MAMMAL HALFND	mg/kg	73/73	8.1684E-06	1.1892E-05	(L)	0.000090042	0.000011892	mg/kg	UCL	(4)
Metals										
Aluminum	mg/kg	90/90	7896	8507	(N)	19000	8507	mg/kg	UCL	(6)
Antimony	mg/kg	43/90	0.78	0.923	(G)	4.4	0.923	mg/kg	UCL	(5)
Arsenic	mg/kg	90/90	10.46	12.16	(L)	82.8	12.16	mg/kg	UCL	(4)
Cadmium	mg/kg	75/90	0.302	0.332	(L)	2.2	0.332	mg/kg	UCL	(4)
Chromium	mg/kg	90/90	13.79	14.84	(G)	43.9	14.84	mg/kg	UCL	(5)
Cobalt	mg/kg	90/90	9.356	10.32	(G)	28.9	10.32	mg/kg	UCL	(5)
Iron	mg/kg	89/89	20330	22423	(L)	77700	22423	mg/kg	UCL	(4)
Manganese	mg/kg	90/90	371.1	419.8	(G)	2630	419.8	mg/kg	UCL	(5)
Thallium	mg/kg	29/90	0.136	0.152	(G)	0.42	0.152	mg/kg	UCL	(5)

Notes:
COPC = Chemical of Potential Concern
KM = Kaplan Meier
mg/kg = milligram per kilogram
UCL = Upper Confidence Limit

Distribution Key:
Normal (N)
Gamma (G)
Lognormal (L)
Non-Parametric (NP)

(1) A minimum of five (5) samples with two (2) distinct detects are needed to calculate summary statistics and UCLs but may not be adequate to compute meaningful and reliable results. Therefore, summary statistics and UCLs are only shown if total samples are eight (8) or more with three (3) detections.
(2) If the dataset contains nondetects, summary statistics and UCLs are estimated by the KM method.
(3) Goodness-of-Fit test indicates data have no discernible distribution.
(4) Goodness-of-Fit test indicates data are lognormally distributed.
(5) Goodness-of-Fit test indicates data are gamma distributed.
(6) Goodness-of-Fit test indicates data are normally distributed.

Table A-3.3b
Exposure Point Concentration Summary (Direct Contact – Site-Wide with Hotspot; Total Soil, 0 – 8.8 feet)
Reasonable Maximum Exposure
Human Health Risk Assessment
Shaffer Equipment/Arbuckle Creek Area Superfund Site, Minden, West Virginia

Scenario Timeframe: Future
Medium: Soil
Exposure Medium: Total Soil
Exposure Point: 0 – 8.8 feet

COPC	Units	Detection Frequency [1]	Arithmetic Mean [1,2]	95% UCL (Distribution) [1]		Maximum Concentration	Exposure Point Concentration			
							Value	Units	Statistic	Rationale
Semi-Volatile Organic Compounds (SVOCs)										
1,2,4,5-Tetrachlorobenzene	mg/kg	2/90	0.0703	0.121	(NP)	0.81	0.121	mg/kg	UCL	(3)
Benzo(a)anthracene	mg/kg	82/90	0.212	0.509	(L)	5.7	0.509	mg/kg	UCL	(4)
Benzo(a)pyrene	mg/kg	79/90	0.196	0.342	(L)	6.1	0.342	mg/kg	UCL	(4)
Benzo(b)fluoranthene	mg/kg	82/90	0.329	0.69	(L)	9.5	0.69	mg/kg	UCL	(4)
Dibenz(a,h)anthracene	mg/kg	39/90	0.0169	0.0151	(L)	0.71	0.0151	mg/kg	UCL	(4)
Indeno(1,2,3-cd)pyrene	mg/kg	79/90	0.0907	0.177	(L)	1.7	0.177	mg/kg	UCL	(4)
Pesticides										
Dieldrin	mg/kg	16/85	0.0113	0.00397	(L)	0.75	0.00397	mg/kg	UCL	(4)
Polychlorinated Biphenyls (PCBs)										
Aroclor 1254	mg/kg	7/61	0.0343	0.0617	(G)	0.551	0.0617	mg/kg	UCL	(5)
Aroclor 1260	mg/kg	37/61	0.865	1.179	(L)	24	24	mg/kg	Max	(6)
PCBs - Congeners										
PCBC TEQ MAMMAL HALFND	mg/kg	89/90	0.00001254	2.2823E-05	(NP)	0.000113309	0.000022823	mg/kg	UCL	(3)
Dioxins and Furans										
DIOXIN TEQ MAMMAL HALFND	mg/kg	73/73	8.1684E-06	1.1892E-05	(L)	0.000090042	0.000011892	mg/kg	UCL	(4)
Metals										
Aluminum	mg/kg	90/90	7896	8507	(N)	19000	8507	mg/kg	UCL	(7)
Antimony	mg/kg	43/90	0.78	0.923	(G)	4.4	0.923	mg/kg	UCL	(5)
Arsenic	mg/kg	90/90	10.46	12.16	(L)	82.8	12.16	mg/kg	UCL	(4)
Cadmium	mg/kg	75/90	0.302	0.332	(L)	2.2	0.332	mg/kg	UCL	(4)
Chromium	mg/kg	90/90	13.79	14.84	(G)	43.9	14.84	mg/kg	UCL	(5)
Cobalt	mg/kg	90/90	9.356	10.32	(G)	28.9	10.32	mg/kg	UCL	(5)
Iron	mg/kg	89/89	20330	22423	(L)	77700	22423	mg/kg	UCL	(4)
Manganese	mg/kg	90/90	371.1	419.8	(G)	2630	419.8	mg/kg	UCL	(5)
Thallium	mg/kg	29/90	0.136	0.152	(G)	0.42	0.152	mg/kg	UCL	(5)

Notes:
COPC = Chemical of Potential Concern
KM = Kaplan Meier
mg/kg = milligram per kilogram
UCL = Upper Confidence Limit

Distribution Key:
Normal (N)
Gamma (G)
Lognormal (L)
Non-Parametric (NP)

(1) A minimum of five (5) samples with two (2) distinct detects are needed to calculate summary statistics and UCLs but may not be adequate to compute meaningful and reliable results. Therefore, summary statistics and UCLs are only shown if total samples are eight (8) or more with three (3) detections.
(2) If the dataset contains nondetects, summary statistics and UCLs are estimated by the KM method.
(3) Goodness-of-Fit test indicates data have no discernible distribution.
(4) Goodness-of-Fit test indicates data are lognormally distributed.
(5) Goodness-of-Fit test indicates data are gamma distributed.
(6) Maximum detected concentration retained as exposure point concentration to evaluate presence of a potential hot spot.
(7) Goodness-of-Fit test indicates data are normally distributed.

Table A-4.1
Values Used for Daily Intake and Dermally Absorbed Dose Calculations - Incidental Ingestion and Dermal Absorption of Soil
Reasonable Maximum Exposure
Shaffer Equipment/Arbuckle Creek Area Superfund Site, Minden, West Virginia

Scenario Timeframe:	**See Below**
Medium:	**Soil**
Exposure Medium:	**Soil**

Exposure Route	Receptor Population	Receptor Age	Exposure Point	Parameter Code	Parameter Definition	Value	Units	Rationale/ Reference	Intake and Dermally Absorbed Dose Equations/ Model Name
Ingestion	Hypothetical Resident (Future)	Adult	Ingestion of Soil						**Non-Mutagenic Constituents**
				DI	Daily Intake	Calculated	mg/kg-day	See equations	Daily Intake (mg/kg-day) for carcinogens (adult) =
				CS	Exposure Point Concentration, soil	Site-Specific	mg/kg	Presented in Tables A-3.1 through A-3.3	$\frac{CS \times IR\text{-}SA \times RBA \times EF \times FI\text{-}S \times EDa \times CF1}{BWa \times ATc}$
				IR-SA	Ingestion Rate, soil - adult	100	mg/day	USEPA, 2014 (USEPA, 1991; pp 6 and 15)	
				RBA	Relative Bioavailability Factor	Chemical-Specific	unitless	Default of 1 is assumed except for arsenic (RBA = 0.6); USEPA, 2021	Daily Intake (mg/kg-day) for noncarcinogens (adult) =
				FI-S	Fraction Ingested from Source, soil	1	unitless	USEPA, 1989 (Default of 1 (100%) is assumed)	$\frac{CS \times IR\text{-}SA \times RBA \times EF \times FI\text{-}S \times EDa \times CF1}{BWa \times ATnc,a}$
				EF	Exposure Frequency	350	days/year	USEPA, 2014 (USEPA, 1991; pg 15)	
				EDa	Exposure Duration, adult	20	years	USEPA, 2014 (EDr (26 years) - EDc (6 years))	
				BWa	Body Weight, adult	80	kg	USEPA, 2014 (USEPA, 2011; Tables 8-3; weighted mean values adults 21-78)	Daily Intake (mg/kg-day) for carcinogens (lifetime) = [DI for carcinogens (adult) + DI for carcinogens (child)]
				ATc	Averaging Time, carcinogens	25550	days	USEPA, 1989 (ED (70 years) x 365 days/year)	
				ATnc,a	Averaging Time, noncarcinogens - adult	7300	days	USEPA, 1989 (ED x 365 days/year)	
				CF1	Conversion Factor 1	0.000001	kg/mg	-	
Ingestion	Hypothetical Resident (Future)	Child	Ingestion of Soil						**Non-Mutagenic Constituents**
				DI	Daily Intake	Calculated	mg/kg-day	See equations	Daily Intake (mg/kg-day) for carcinogens (child) =
				CS	Exposure Point Concentration, soil	Site-Specific	mg/kg	Presented in Tables A-3.1 through A-3.3	$\frac{CS \times IR\text{-}SC \times RBA \times EF \times FI\text{-}S \times EDc \times CF1}{BWc \times ATc}$
				IR-SC	Ingestion Rate, soil - child	200	mg/day	USEPA, 2014 (USEPA, 2011; Table 5-1; "upper-bound values" accounting for both soil and dust ingestion)	
				RBA	Relative Bioavailability Factor	Chemical-Specific	unitless	Default of 1 is assumed except for arsenic (RBA = 0.6); USEPA, 2021	Daily Intake (mg/kg-day) for noncarcinogens (child) =
				FI-S	Fraction Ingested from Source, soil	1	unitless	USEPA, 1989 (Default of 1 (100%) is assumed)	$\frac{CS \times IR\text{-}SC \times RBA \times EF \times FI\text{-}S \times EDc \times CF1}{BWc \times ATnc,c}$
				EF	Exposure Frequency	350	days/year	USEPA, 2014 (USEPA, 1991; pg 15)	
				EDc	Exposure Duration, child	6	years	USEPA, 2014 (USEPA, 1991; pp 6 and 15)	Daily Intake (mg/kg-day) for carcinogens (lifetime) = [DI for carcinogens (adult) + DI for carcinogens (child)]
				BWc	Body Weight, child	15	kg	USEPA, 2014 (USEPA, 2011; Table 8-1; weighted average of mean body weights (birth to < 6 years))	
				ATc	Averaging Time, carcinogens	25550	days	USEPA, 1989 (ED (70 years) x 365 days/year)	
				ATnc,c	Averaging Time, noncarcinogens - child	2190	days	USEPA, 1989 (ED x 365 days/year)	
				CF1	Conversion Factor 1	0.000001	kg/mg	-	
Ingestion	Hypothetical Resident (Future)	Lifetime	Ingestion of Soil						**Mutagenic Constituents**
				DI	Daily Intake	Calculated	mg/kg-day	See equations	Daily Intake (mg/kg-day) for mutagenic carcinogens (lifetime) =
				CS	Exposure Point Concentration, soil	Site-Specific	mg/kg	Presented in Tables A-3.1 through A-3.3	$\frac{CS \times RBA \times FI\text{-}S \times CF1 \times IFSMadj}{ATc}$
				RBA	Relative Bioavailability Factor	Chemical-Specific	unitless	Default of 1 is assumed except for arsenic (RBA = 0.6); USEPA, 2021	
				FI-S	Fraction Ingested from Source, soil	1	unitless	USEPA, 1989 (Default of 1 (100%) is assumed)	Where IFSMadj (mg/kg) =
				CF1	Conversion Factor 1	0.000001	kg/mg	-	$\frac{EF \times IR\text{-}SC}{BW_c} \times [(ED_{0-2} \times ADAF_{0-2}) + (ED_{2-6} \times ADAF_{2-6})] +$
				IFSMadj	Mutagenic Ingestion Rate - Age-adjusted	166833	mg/kg	See equations	$\frac{EF \times IR\text{-}SA}{BW_a} \times [(ED_{6-16} \times ADAF_{6-16}) + (ED_{16-26} \times ADAF_{16-26})]$
				EF	Exposure Frequency	350	days/year	USEPA, 2014 (USEPA, 1991; pg 15)	
				IR-SA	Ingestion Rate, soil - adult	100	mg/day	USEPA, 2014 (USEPA, 1991; pp 6 and 15)	
				IR-SC	Ingestion Rate, soil - child	200	mg/day	USEPA, 2014 (USEPA, 2011; Table 5-1; "upper-bound values" accounting for both soil and dust ingestion)	
				ED0-2	Exposure Duration, 0-2 years	2	years	USEPA, 2005	
				ED2-6	Exposure Duration, 2-6 years	4	years	USEPA, 2005	
				ED6-16	Exposure Duration, 6-16 years	10	years	USEPA, 2005	
				ED16-26	Exposure Duration, 16-26 years	10	years	USEPA, 2005	
				ADAF0-2	Age Depend. Adjust. Factor, 0-2 years	10	unitless	USEPA, 2005	

Table A-4.1
Values Used for Daily Intake and Dermally Absorbed Dose Calculations - Incidental Ingestion and Dermal Absorption of Soil
Reasonable Maximum Exposure
Shaffer Equipment/Arbuckle Creek Area Superfund Site, Minden, West Virginia

Scenario Timeframe: See Below
Medium: Soil
Exposure Medium: Soil

Exposure Route	Receptor Population	Receptor Age	Exposure Point	Parameter Code	Parameter Definition	Value	Units	Rationale/ Reference	Intake and Dermally Absorbed Dose Equations/ Model Name
Ingestion	Hypothetical Resident (Future)	Lifetime	Ingestion of Soil	ADAF2-6	Age Depend. Adjust. Factor, 2-6 years	3	unitless	USEPA, 2005	
				ADAF6-16	Age Depend. Adjust. Factor, 6-16 years	3	unitless	USEPA, 2005	
				ADAF16-26	Age Depend. Adjust. Factor, 16-26 years	1	unitless	USEPA, 2005	
				BWa	Body Weight, adult	80	kg	USEPA, 2014 (USEPA, 2011; Tables 8-3; weighted mean values adults 21-78)	
				BWc	Body Weight, child	15	kg	USEPA, 2014 (USEPA, 2011; Table 8-1; weighted average of mean body weights (birth to < 6 years))	
				ATc	Averaging Time, carcinogens	25550	days	USEPA, 1989 (ED (70 years) x 365 days/year)	
Ingestion	Recreator (Current/Future)	Adult	Ingestion of Soil						**Non-Mutagenic Constituents**
				DI	Daily Intake	Calculated	mg/kg-day	See equations	Daily Intake (mg/kg-day) for carcinogens (adult) =
				CS	Exposure Point Concentration, soil	Site-Specific	mg/kg	Presented in Tables A-3.1 through A-3.3	$\frac{CS \times IR\text{-}SA \times RBA \times EF \times FI\text{-}S \times EDa \times CF1}{BWa \times ATc}$
				IR-SA	Ingestion Rate, soil - adult	100	mg/day	USEPA, 2014 (USEPA, 1991; pp 6 and 15)	
				RBA	Relative Bioavailability Factor	Chemical-Specific	unitless	Default of 1 is assumed except for arsenic (RBA = 0.6); USEPA, 2021	Daily Intake (mg/kg-day) for noncarcinogens (adult) =
				FI-S	Fraction Ingested from Source, soil	1	unitless	USEPA, 1989 (Default of 1 (100%) is assumed)	$\frac{CS \times IR\text{-}SA \times RBA \times EF \times FI\text{-}S \times EDa \times CF1}{BWa \times ATnc,a}$
				EF	Exposure Frequency	52	days/year	Best professional judgement	
				EDa	Exposure Duration, adult	20	years	USEPA, 2014 (EDr (26 years) - EDc (6 years))	Daily Intake (mg/kg-day) for carcinogens (lifetime) =
				BWa	Body Weight, adult	80	kg	USEPA, 2014 (USEPA, 2011; Tables 8-3; weighted mean values adults 21-78)	[DI for carcinogens (adult) + DI for carcinogens (child)]
				ATc	Averaging Time, carcinogens	25550	days	USEPA, 1989 (ED (70 years) x 365 days/year)	
				ATnc,a	Averaging Time, noncarcinogens - adult	7300	days	USEPA, 1989 (ED x 365 days/year)	
				CF1	Conversion Factor 1	0.000001	kg/mg	-	
Ingestion	Recreator (Current/Future)	Child	Ingestion of Soil						**Non-Mutagenic Constituents**
				DI	Daily Intake	Calculated	mg/kg-day	See equations	Daily Intake (mg/kg-day) for carcinogens (child) =
				CS	Exposure Point Concentration, soil	Site-Specific	mg/kg	Presented in Tables A-3.1 through A-3.3	$\frac{CS \times IR\text{-}SC \times RBA \times EF \times FI\text{-}S \times EDc \times CF1}{BWc \times ATc}$
				IR-SC	Ingestion Rate, soil - child	200	mg/day	USEPA, 2014 (USEPA, 2011; Table 5-1; "upper-bound values" accounting for both soil and dust ingestion)	
				RBA	Relative Bioavailability Factor	Chemical-Specific	unitless	Default of 1 is assumed except for arsenic (RBA = 0.6); USEPA, 2021	Daily Intake (mg/kg-day) for noncarcinogens (child) =
				FI-S	Fraction Ingested from Source, soil	1	unitless	USEPA, 1989 (Default of 1 (100%) is assumed)	$\frac{CS \times IR\text{-}SC \times RBA \times EF \times FI\text{-}S \times EDc \times CF1}{BWc \times ATnc,c}$
				EF	Exposure Frequency	52	days/year	Best professional judgement	
				EDc	Exposure Duration, child	6	years	USEPA, 2014 (USEPA, 1991; pp 6 and 15)	Daily Intake (mg/kg-day) for carcinogens (lifetime) =
				BWc	Body Weight, child	15	kg	USEPA, 2014 (USEPA, 2011; Table 8-1; weighted average of mean body weights (birth to < 6 years))	[DI for carcinogens (adult) + DI for carcinogens (child)]
				ATc	Averaging Time, carcinogens	25550	days	USEPA, 1989 (ED (70 years) x 365 days/year)	
				ATnc,c	Averaging Time, noncarcinogens - child	2190	days	USEPA, 1989 (ED x 365 days/year)	
				CF1	Conversion Factor 1	0.000001	kg/mg	-	
Ingestion	Recreator (Current/Future)	Lifetime	Ingestion of Soil						**Mutagenic Constituents**
				DI	Daily Intake	Calculated	mg/kg-day	See equations	Daily Intake (mg/kg-day) for mutagenic carcinogens (lifetime) =
				CS	Exposure Point Concentration, soil	Site-Specific	mg/kg	Presented in Tables A-3.1 through A-3.3	$\frac{CS \times RBA \times FI\text{-}S \times CF1 \times IFSMadj}{ATc}$
				RBA	Relative Bioavailability Factor	Chemical-Specific	unitless	Default of 1 is assumed except for arsenic (RBA = 0.6); USEPA, 2021	
				FI-S	Fraction Ingested from Source, soil	1	unitless	USEPA, 1989 (Default of 1 (100%) is assumed)	

Table A-4.1
Values Used for Daily Intake and Dermally Absorbed Dose Calculations - Incidental Ingestion and Dermal Absorption of Soil
Reasonable Maximum Exposure
Shaffer Equipment/Arbuckle Creek Area Superfund Site, Minden, West Virginia

Scenario Timeframe:	**See Below**
Medium:	**Soil**
Exposure Medium:	**Soil**

Exposure Route	Receptor Population	Receptor Age	Exposure Point	Parameter Code	Parameter Definition	Value	Units	Rationale/ Reference	Intake and Dermally Absorbed Dose Equations/ Model Name
Ingestion	Recreator (Current/Future)	Lifetime	Ingestion of Soil	CF1	Conversion Factor 1	0.000001	kg/mg	-	Where IFSMadj (mg/kg) =
				IFSMadj	Mutagenic Ingestion Rate - Age-adjusted	24787	mg/kg	See equations	$\frac{EF\times IR\text{-}SC}{BW_c}\times[(ED_{0-2}\times ADAF_{0-2})+(ED_{2-6}\times ADAF_{2-6})]+$
				EF	Exposure Frequency	52	days/year	Best professional judgement	$\frac{EF\times IR\text{-}SA}{BW_a}\times[(ED_{6-16}\times ADAF_{6-16})+(ED_{16-26}\times ADAF_{16-26})$
				IR-SA	Ingestion Rate, soil - adult	100	mg/day	USEPA, 2014 (USEPA, 1991; pp 6 and 15)	
				IR-SC	Ingestion Rate, soil - child	200	mg/day	USEPA, 2014 (USEPA, 2011; Table 5-1; "upper-bound values" accounting for both soil and dust ingestion)	
				ED0-2	Exposure Duration, 0-2 years	2	years	USEPA, 2005	
				ED2-6	Exposure Duration, 2-6 years	4	years	USEPA, 2005	
				ED6-16	Exposure Duration, 6-16 years	10	years	USEPA, 2005	
				ED16-26	Exposure Duration, 16-26 years	10	years	USEPA, 2005	
				ADAF0-2	Age Depend. Adjust. Factor, 0-2 years	10	unitless	USEPA, 2005	
				ADAF2-6	Age Depend. Adjust. Factor, 2-6 years	3	unitless	USEPA, 2005	
				ADAF6-16	Age Depend. Adjust. Factor, 6-16 years	3	unitless	USEPA, 2005	
				ADAF16-26	Age Depend. Adjust. Factor, 16-26 years	1	unitless	USEPA, 2005	
				BWa	Body Weight, adult	80	kg	USEPA, 2014 (USEPA, 2011; Tables 8-3; weighted mean values adults 21-78)	
				BWc	Body Weight, child	15	kg	USEPA, 2014 (USEPA, 2011; Table 8-1; weighted average of mean body weights (birth to < 6 years))	
				ATc	Averaging Time, carcinogens	25550	days	USEPA, 1989 (ED (70 years) x 365 days/year)	
Ingestion	Trespasser (Current/Future)	Adolescent	Ingestion of Soil						**Non-Mutagenic Constituents**
				DI	Daily Intake	Calculated	mg/kg-day	See equations	Daily Intake (mg/kg-day) for carcinogens (adolescent) =
				CS	Exposure Point Concentration, soil	Site-Specific	mg/kg	Presented in Tables A-3.1 through A-3.3	$\frac{CS \times IR\text{-}TP \times RBA \times EF \times FI\text{-}S \times ED \times CF1}{BW \times ATc}$
				RBA	Relative Bioavailability Factor	Chemical-Specific	unitless	Default of 1 is assumed except for arsenic (RBA = 0.6); USEPA, 2021	Daily Intake (mg/kg-day) for noncarcinogens (adolescent) =
				FI-S	Fraction Ingested from Source, soil	1	unitless	USEPA, 1989 (Default of 1 (100%) is assumed)	$\frac{CS \times IR\text{-}TP \times RBA \times EF \times FI\text{-}S \times ED \times CF1}{BW \times ATnc,c}$
				CF1	Conversion Factor 1	0.000001	kg/mg	-	
				IFSMadj	Mutagenic Ingestion Rate - Age-adjusted	513	mg/kg	See equations	**Mutagenic Constituents**
				EF	Exposure Frequency	16	days/year	Best professional judgement	Daily Intake (mg/kg-day) for mutagenic carcinogens =
				IR-TP	Ingestion Rate, soil	50	mg/day	Best professional judgement	$\frac{CS \times RBA \times FI\text{-}S \times CF1 \times IFSMadj}{ATc}$
				ED	Exposure Duration	10	years	Best professional judgement	
				ED6-16	Exposure Duration, 6-16 years	10	years	USEPA, 2005	
				ADAF6-16	Age Depend. Adjust. Factor, 6-16 years	3	unitless	USEPA, 2005	
				BW	Body Weight	46.8	kg	USEPA, 2011 (6-16 years)	Where IFSMadj (mg/kg) =
				ATnc	Averaging Time, noncarcinogens	3650	days	USEPA, 1989 (ED x 365 days/year)	$\frac{EF\times IR}{BW}\times[(ED_{6-16}\times ADAF_{6-16})]$
				ATc	Averaging Time, carcinogens	25550	days	USEPA, 1989 (ED (70 years) x 365 days/year)	
Ingestion	Industrial Worker (Current/Future)	Adult	Ingestion of Soil						**Non-Mutagenic Constituents**
				DI	Daily Intake	Calculated	mg/kg-day	See equations	Daily Intake (mg/kg-day) for carcinogens (adult) =
				CS	Exposure Point Concentration, soil	Site-Specific	mg/kg	Presented in Tables A-3.1 through A-3.3	$\frac{CS \times IR\text{-}S \times RBA \times EF \times FI\text{-}S \times ED \times CF1}{BW \times ATc}$
				IR-S	Ingestion Rate, soil	100	mg/day	USEPA, 2014 (USEPA, 1991; pp 6 and 15)	
				RBA	Relative Bioavailability Factor	Chemical-Specific	unitless	Default of 1 is assumed except for arsenic (RBA = 0.6); USEPA, 2021	Daily Intake (mg/kg-day) for noncarcinogens (adult) =
				FI-S	Fraction Ingested from Source, soil	1	unitless	USEPA, 1989 (Default of 1 (100%) is assumed)	$\frac{CS \times IR\text{-}S \times RBA \times EF \times FI\text{-}S \times ED \times CF1}{BW \times ATnc}$
				EF	Exposure Frequency	250	days/year	USEPA, 2014 (USEPA, 1991; pg 15)	
				ED	Exposure Duration	25	years	USEPA, 2014 (USEPA, 1991; pg 15)	

Table A-4.1
Values Used for Daily Intake and Dermally Absorbed Dose Calculations - Incidental Ingestion and Dermal Absorption of Soil
Reasonable Maximum Exposure
Shaffer Equipment/Arbuckle Creek Area Superfund Site, Minden, West Virginia

Scenario Timeframe:	**See Below**
Medium:	**Soil**
Exposure Medium:	**Soil**

Exposure Route	Receptor Population	Receptor Age	Exposure Point	Parameter Code	Parameter Definition	Value	Units	Rationale/ Reference	Intake and Dermally Absorbed Dose Equations/ Model Name
Ingestion	Industrial Worker (Current/Future)	Adult	Ingestion of Soil	BW	Body Weight	80	kg	USEPA, 2014 (USEPA, 2011; Tables 8-3; weighted mean values adults 21-78)	
				ATc	Averaging Time, carcinogens	25550	days	USEPA, 1989 (ED (70 years) x 365 days/year)	
				ATnc	Averaging Time, noncarcinogens	9125	days	USEPA, 1989 (ED x 365 days/year)	
				CF1	Conversion Factor 1	0.000001	kg/mg	-	
Ingestion	Construction Worker (Future)	Adult	Ingestion of Soil						**Non-Mutagenic Constituents**
				DI	Daily Intake	Calculated	mg/kg-day	See equations	Daily Intake (mg/kg-day) for carcinogens (adult) =
				CS	Exposure Point Concentration, soil	Site-Specific	mg/kg	Presented in Tables A-3.1 through A-3.3	$\frac{CS \times IR\text{-}S \times RBA \times EF \times FI\text{-}S \times ED \times CF1}{BW \times ATc}$
				IR-S	Ingestion Rate, soil	330	mg/day	USEPA, 2002	
				RBA	Relative Bioavailability Factor	Chemical-Specific	unitless	Default of 1 is assumed except for arsenic (RBA = 0.6); USEPA, 2021	Daily Intake (mg/kg-day) for noncarcinogens (adult) =
				FI-S	Fraction Ingested from Source, soil	1	unitless	USEPA, 1989 (Default of 1 (100%) is assumed)	$\frac{CS \times IR\text{-}S \times RBA \times EF \times FI\text{-}S \times ED \times CF1}{BW \times ATnc}$
				EF	Exposure Frequency	250	days/year	Site-specific assumption (1-year construction project (50 weeks x 5 days/week x 1 year))	
				ED	Exposure Duration	1	years	Site-specific assumption (1-year construction project (50 weeks x 5 days/week x 1 year))	
				BW	Body Weight	80	kg	USEPA, 2014 (USEPA, 2011; Tables 8-3; weighted mean values adults 21-78)	
				ATc	Averaging Time, carcinogens	25550	days	USEPA, 1989 (ED (70 years) x 365 days/year)	
				ATnc	Averaging Time, noncarcinogens	365	days	USEPA, 1989 (ED x 365 days/year)	
				CF1	Conversion Factor 1	0.000001	kg/mg	-	
Dermal Absorption	Hypothetical Resident (Future)	Adult	Dermal Absorption of Soil						**Non-Mutagenic Constituents**
				DAD	Dermally Absorbed Dose	Calculated	mg/kg-day	See equations	Dermally Absorbed Dose (mg/kg-day) for carcinogens (adult) =
				DA-event	Absorbed Dose per Event	Calculated	mg/cm²-event	USEPA, 2004	$\frac{DA\text{-}event \times EV \times EF \times FC\text{-}S \times EDa \times SAa}{BWa \times ATc}$
				EV	Event Frequency	1	events/day	USEPA, 2004	
				EF	Exposure Frequency	350	days/year	USEPA, 2014 (USEPA, 1991; pg 15)	
				FC-S	Fraction of Contact from Source, soil	1	unitless	USEPA, 1989 (Default of 1 (100%) is assumed)	Dermally Absorbed Dose (mg/kg-day) for noncarcinogens (adult) =
				EDa	Exposure Duration, adult	20	years	USEPA, 2014 (EDr (26 years) - EDc (6 years))	$\frac{DA\text{-}event \times EV \times EF \times FC\text{-}S \times EDa \times SAa}{BWa \times ATnc,a}$
				SAa	Skin Surface Area, adult	6032	cm²	USEPA, 2014 (USEPA, 2011; Tables 7-12 and 7-13; Weighted average of mean values for head, hands, and forearms (male and female, 21+years))	**Where:**
				BWa	Body Weight, adult	80	kg	USEPA, 2014 (USEPA, 2011; Tables 8-3; weighted mean values adults 21-78)	DA-event (Absorbed Dose per Event [mg/cm²-event]) = CS x CF1 x AFa x ABS
				ATc	Averaging Time, carcinogens	25550	days	USEPA, 1989 (ED (70 years) x 365 days/year)	
				ATnc,a	Averaging Time, noncarcinogens - adult	7300	days	USEPA, 1989 (ED x 365 days/year)	Dermally Absorbed Dose (mg/kg-day) for carcinogens (lifetime) =
				CS	Exposure Point Concentration, soil	Site-Specific	mg/kg	Presented in Tables A-3.1 through A-3.3	[DAD for carcinogens (adult) + DAD for carcinogens (child)]
				CF1	Conversion Factor 1	0.000001	kg/mg	-	
				AFa	Soil-to-skin Adherence Factor, adult	0.07	mg/cm²-event	USEPA, 2014 (USEPA, 2004; Exhibit 3-5; recommended adult value for RME scenario)	
				ABS	Dermal Absorption Factor, soil	Chemical-Specific	unitless	USEPA, 2004; values presented in Table E-1	
Dermal Absorption	Hypothetical Resident (Future)	Child	Dermal Absorption of Soil						**Non-Mutagenic Constituents**
				DAD	Dermally Absorbed Dose	Calculated	mg/kg-day	See equations	Dermally Absorbed Dose (mg/kg-day) for carcinogens (child) =
				DA-event	Absorbed Dose per Event	Calculated	mg/cm²-event	USEPA, 2004	$\frac{DA\text{-}event \times EV \times EF \times FC\text{-}S \times EDc \times SAc}{BWc \times ATc}$
				EV	Event Frequency	1	events/day	USEPA, 2004	
				EF	Exposure Frequency	350	days/year	USEPA, 2014 (USEPA, 1991; pg 15)	

Table A-4.1
Values Used for Daily Intake and Dermally Absorbed Dose Calculations - Incidental Ingestion and Dermal Absorption of Soil
Reasonable Maximum Exposure
Shaffer Equipment/Arbuckle Creek Area Superfund Site, Minden, West Virginia

Scenario Timeframe:	**See Below**
Medium:	**Soil**
Exposure Medium:	**Soil**

Exposure Route	Receptor Population	Receptor Age	Exposure Point	Parameter Code	Parameter Definition	Value	Units	Rationale/ Reference	Intake and Dermally Absorbed Dose Equations/ Model Name
Dermal Absorption	Hypothetical Resident (Future)	Child	Dermal Absorption of Soil	FC-S	Fraction of Contact from Source, soil	1	unitless	USEPA, 1989 (Default of 1 (100%) is assumed)	Dermally Absorbed Dose (mg/kg-day) for noncarcinogens (child) = $\frac{DA\text{-}event \times EV \times EF \times FC\text{-}S \times EDc \times SAc}{BWc \times ATnc,c}$ **Where:** DA-event (Absorbed Dose per Event [mg/cm²-event]) = CS x CF1 x AFc x ABS Dermally Absorbed Dose (mg/kg-day) for carcinogens (lifetime) = [DAD for carcinogens (adult) + DAD for carcinogens (child)]
				EDc	Exposure Duration, child	6	years	USEPA, 2014 (USEPA, 1991; pp 6 and 15)	
				SAc	Skin Surface Area, child	2373	cm²	USEPA, 2014 (USEPA, 2011; Tables 7-2 and 7-8; weighted average of mean values for head, hands, forearms, lower legs, and feet (male and female, birth to < 6 years) (forearm and lower leg-specific data used when available, ratios for nearest available age group used elsewhere))	
				BWc	Body Weight, child	15	kg	USEPA, 2014 (USEPA, 2011; Table 8-1; weighted average of mean body weights (birth to < 6 years))	
				ATc	Averaging Time, carcinogens	25550	days	USEPA, 1989 (ED (70 years) x 365 days/year)	
				ATnc,c	Averaging Time, noncarcinogens - child	2190	days	USEPA, 1989 (ED x 365 days/year)	
				CS	Exposure Point Concentration, soil	Site-Specific	mg/kg	Presented in Tables A-3.1 through A-3.3	
				CF1	Conversion Factor 1	0.000001	kg/mg	-	
				AFc	Soil-to-skin Adherence Factor, child	0.2	mg/cm²-event	USEPA, 2014 (USEPA, 2004; Exhibit 3-5; recommended child value for RME scenario)	
				ABS	Dermal Absorption Factor, soil	Chemical-Specific	unitless	USEPA, 2004; values presented in Table E-1	
Dermal Absorption	Hypothetical Resident (Future)	Lifetime	Dermal Absorption of Soil						**Mutagenic Constituents** Dermally Absorbed Dose (mg/kg-day) for mutagenic carcinogens (lifetime) = $\frac{CS \times ABS \times FC\text{-}S \times CF1 \times DFSMadj}{ATc}$ Where DFSMadj (mg/kg) = $\frac{EF \times AF_c \times SA_c}{BW_c} \times [(ED_{0-2} \times ADAF_{0-2}) + (ED_{2-6} \times ADAF_{2-6})] +$ $\frac{EF \times AF_a \times SA_a}{BW_a} \times [(ED_{6-16} \times ADAF_{6-16}) + (ED_{16-26} \times ADAF_{16-26})]$
				DAD	Dermally Absorbed Dose	Calculated	mg/kg-day	See equations	
				CS	Exposure Point Concentration, soil	Site-Specific	mg/kg	Presented in Tables A-3.1 through A-3.3	
				ABS	Dermal Absorption Factor, soil	Chemical-Specific	unitless	USEPA, 2004; values presented in Table E-1	
				FC-S	Fraction of Contact from Source, soil	1	unitless	USEPA, 1989 (Default of 1 (100%) is assumed)	
				CF1	Conversion Factor 1	0.000001	kg/mg	-	
				DFSMadj	Mutagenic dermal contact factor- age-adjusted	428260	mg/kg	See equations	
				EF	Exposure Frequency	350	days/year	USEPA, 2014 (USEPA, 1991; pg 15)	
				AFc	Soil-to-skin Adherence Factor, child	0.2	mg/cm²-event	USEPA, 2014 (USEPA, 2004; Exhibit 3-5; recommended child value for RME scenario)	
				SAc	Skin Surface Area, child	2373	cm²	USEPA, 2014 (USEPA, 2011; Tables 7-2 and 7-8; weighted average of mean values for head, hands, forearms, lower legs, and feet (male and female, birth to < 6 years) (forearm and lower leg-specific data used when available, ratios for nearest available age group used elsewhere))	
				ED0-2	Exposure Duration, 0-2 years	2	years	USEPA, 2005	
				ED2-6	Exposure Duration, 2-6 years	4	years	USEPA, 2005	
				ADAF0-2	Age Depend. Adjust. Factor, 0-2 years	10	unitless	USEPA, 2005	
				ADAF2-6	Age Depend. Adjust. Factor, 2-6 years	3	unitless	USEPA, 2005	
				BWc	Body Weight, child	15	kg	USEPA, 2014 (USEPA, 2011; Table 8-1; weighted average of mean body weights (birth to < 6 years))	
				AFa	Soil-to-skin Adherence Factor, adult	0.07	mg/cm²-event	USEPA, 2014 (USEPA, 2004; Exhibit 3-5; recommended adult value for RME scenario)	
				SAa	Skin Surface Area, adult	6032	cm²	USEPA, 2014 (USEPA, 2011; Tables 7-12 and 7-13; Weighted average of mean values for head, hands, and forearms (male and female, 21+years))	
				ED6-16	Exposure Duration, 6-16 years	10	years	USEPA, 2005	
				ED16-26	Exposure Duration, 16-26 years	10	years	USEPA, 2005	
				ADAF6-16	Age Depend. Adjust. Factor, 6-16 years	3	unitless	USEPA, 2005	

Table A-4.1
Values Used for Daily Intake and Dermally Absorbed Dose Calculations - Incidental Ingestion and Dermal Absorption of Soil
Reasonable Maximum Exposure
Shaffer Equipment/Arbuckle Creek Area Superfund Site, Minden, West Virginia

Scenario Timeframe:	**See Below**
Medium:	**Soil**
Exposure Medium:	**Soil**

Exposure Route	Receptor Population	Receptor Age	Exposure Point	Parameter Code	Parameter Definition	Value	Units	Rationale/ Reference	Intake and Dermally Absorbed Dose Equations/ Model Name
Dermal Absorption	Hypothetical Resident (Future)	Lifetime	Dermal Absorption of Soil	ADAF16-26	Age Depend. Adjust. Factor, 16-26 years	1	unitless	USEPA, 2005	
				BWa	Body Weight, adult	80	kg	USEPA, 2014 (USEPA, 2011; Tables 8-3; weighted mean values adults 21-78)	
				ATc	Averaging Time, carcinogens	25550	days	USEPA, 1989 (ED (70 years) x 365 days/year)	
Dermal Absorption	Recreator (Current/Future)	Adult	Dermal Absorption of Soil						**Non-Mutagenic Constituents**
				DAD	Dermally Absorbed Dose	Calculated	mg/kg-day	See equations	Dermally Absorbed Dose (mg/kg-day) for carcinogens (adult) =
				DA-event	Absorbed Dose per Event	Calculated	mg/cm²-event	USEPA, 2004	$\frac{\text{DA-event x EV x EF x FC-S x EDa x SAa}}{\text{BWa x ATc}}$
				EV	Event Frequency	1	events/day	USEPA, 2004	
				EF	Exposure Frequency	52	days/year	Best professional judgement	Dermally Absorbed Dose (mg/kg-day) for noncarcinogens (adult) =
				FC-S	Fraction of Contact from Source, soil	1	unitless	USEPA, 1989 (Default of 1 (100%) is assumed)	$\frac{\text{DA-event x EV x EF x FC-S x EDa x SAa}}{\text{BWa x ATnc,a}}$
				EDa	Exposure Duration, adult	20	years	USEPA, 2014 (EDr (26 years) - EDc (6 years))	
				SAa	Skin Surface Area, adult	6032	cm²	USEPA, 2014 (USEPA, 2011; Tables 7-12 and 7-13; Weighted average of mean values for head, hands, and forearms (male and female, 21+years))	**Where:**
				BWa	Body Weight, adult	80	kg	USEPA, 2014 (USEPA, 2011; Tables 8-3; weighted mean values adults 21-78)	DA-event (Absorbed Dose per Event [mg/cm²-event]) = CS x CF1 x AFa x ABS
				ATc	Averaging Time, carcinogens	25550	days	USEPA, 1989 (ED (70 years) x 365 days/year)	Dermally Absorbed Dose (mg/kg-day) for carcinogens (lifetime) =
				ATnc,a	Averaging Time, noncarcinogens - adult	7300	days	USEPA, 1989 (ED x 365 days/year)	[DAD for carcinogens (adult) + DAD for carcinogens (child)]
				CS	Exposure Point Concentration, soil	Site-Specific	mg/kg	Presented in Tables A-3.1 through A-3.3	
				CF1	Conversion Factor 1	0.000001	kg/mg	-	
				AFa	Soil-to-skin Adherence Factor, adult	0.07	mg/cm²-event	USEPA, 2014 (USEPA, 2004; Exhibit 3-5; recommended adult value for RME scenario)	
				ABS	Dermal Absorption Factor, soil	Chemical-Specific	unitless	USEPA, 2004; values presented in Table E-1	
Dermal Absorption	Recreator (Current/Future)	Child	Dermal Absorption of Soil						**Non-Mutagenic Constituents**
				DAD	Dermally Absorbed Dose	Calculated	mg/kg-day	See equations	Dermally Absorbed Dose (mg/kg-day) for carcinogens (child) =
				DA-event	Absorbed Dose per Event	Calculated	mg/cm²-event	USEPA, 2004	$\frac{\text{DA-event x EV x EF x FC-S x EDc x SAc}}{\text{BWc x ATc}}$
				EV	Event Frequency	1	events/day	USEPA, 2004	
				EF	Exposure Frequency	52	days/year	Best professional judgement	Dermally Absorbed Dose (mg/kg-day) for noncarcinogens (child) =
				FC-S	Fraction of Contact from Source, soil	1	unitless	USEPA, 1989 (Default of 1 (100%) is assumed)	$\frac{\text{DA-event x EV x EF x FC-S x EDc x SAc}}{\text{BWc x ATnc,c}}$
				EDc	Exposure Duration, child	6	years	USEPA, 2014 (USEPA, 1991; pp 6 and 15)	
				SAc	Skin Surface Area, child	2373	cm²	USEPA, 2014 (USEPA, 2011; Tables 7-2 and 7-8; weighted average of mean values for head, hands, forearms, lower legs, and feet (male and female, birth to < 6 years) (forearm and lower leg-specific data used when available, ratios for nearest available age group used elsewhere))	**Where:**
				BWc	Body Weight, child	15	kg	USEPA, 2014 (USEPA, 2011; Table 8-1; weighted average of mean body weights (birth to < 6 years))	DA-event (Absorbed Dose per Event [mg/cm²-event]) = CS x CF1 x AFc x ABS
				ATc	Averaging Time, carcinogens	25550	days	USEPA, 1989 (ED (70 years) x 365 days/year)	Dermally Absorbed Dose (mg/kg-day) for carcinogens (lifetime) =
				ATnc,c	Averaging Time, noncarcinogens - child	2190	days	USEPA, 1989 (ED x 365 days/year)	[DAD for carcinogens (adult) + DAD for carcinogens (child)]
				CS	Exposure Point Concentration, soil	Site-Specific	mg/kg	Presented in Tables A-3.1 through A-3.3	

Table A-4.1
Values Used for Daily Intake and Dermally Absorbed Dose Calculations - Incidental Ingestion and Dermal Absorption of Soil
Reasonable Maximum Exposure
Shaffer Equipment/Arbuckle Creek Area Superfund Site, Minden, West Virginia

Scenario Timeframe:	**See Below**
Medium:	**Soil**
Exposure Medium:	**Soil**

Exposure Route	Receptor Population	Receptor Age	Exposure Point	Parameter Code	Parameter Definition	Value	Units	Rationale/ Reference	Intake and Dermally Absorbed Dose Equations/ Model Name
Dermal Absorption	Recreator (Current/Future)	Child	Dermal Absorption of Soil	CF1	Conversion Factor 1	0.000001	kg/mg	-	
				AFc	Soil-to-skin Adherence Factor, child	0.2	mg/cm²-event	USEPA, 2014 (USEPA, 2004; Exhibit 3-5; recommended child value for RME scenario)	
				ABS	Dermal Absorption Factor, soil	Chemical-Specific	unitless	USEPA, 2004; values presented in Table E-1	
Dermal Absorption	Recreator (Current/Future)	Lifetime	Dermal Absorption of Soil						**Mutagenic Constituents**
				DAD	Dermally Absorbed Dose	Calculated	mg/kg-day	See equations	Dermally Absorbed Dose (mg/kg-day) for mutagenic carcinogens (lifetime) = $\frac{CS \times ABS \times FC\text{-}S \times CF1 \times DFSMadj}{ATc}$
				CS	Exposure Point Concentration, soil	Site-Specific	mg/kg	Presented in Tables A-3.1 through A-3.3	
				ABS	Dermal Absorption Factor, soil	Chemical-Specific	unitless	USEPA, 2004; values presented in Table E-1	
				FC-S	Fraction of Contact from Source, soil	1	unitless	USEPA, 1989 (Default of 1 (100%) is assumed)	Where DFSMadj (mg/kg) =
				CF1	Conversion Factor 1	0.000001	kg/mg	-	
				DFSMadj	Mutagenic dermal contact factor- age-adjusted	63627	mg/kg	See equations	$\frac{EF\times AF_c\times SA_c}{BW_c}\times[(ED_{0-2}\times ADAF_{0-2})+(ED_{2-6}\times ADAF_{2-6})]+$
				EF	Exposure Frequency	52	days/year	Best professional judgement	$\frac{EF\times AF_a\times SA_a}{BW_a}\times[(ED_{6-16}\times ADAF_{6-16})+(ED_{16-26}\times ADAF_{16-26})]$
				AFc	Soil-to-skin Adherence Factor, child	0.2	mg/cm²-event	USEPA, 2014 (USEPA, 2004; Exhibit 3-5; recommended child value for RME scenario)	
				SAc	Skin Surface Area, child	2373	cm²	USEPA, 2014 (USEPA, 2011; Tables 7-2 and 7-8; weighted average of mean values for head, hands, forearms, lower legs, and feet (male and female, birth to < 6 years) (forearm and lower leg-specific data used when available, ratios for nearest available age group used elsewhere))	
				ED0-2	Exposure Duration, 0-2 years	2	years	USEPA, 2005	
				ED2-6	Exposure Duration, 2-6 years	4	years	USEPA, 2005	
				ADAF0-2	Age Depend. Adjust. Factor, 0-2 years	10	unitless	USEPA, 2005	
				ADAF2-6	Age Depend. Adjust. Factor, 2-6 years	3	unitless	USEPA, 2005	
				BWc	Body Weight, child	15	kg	USEPA, 2014 (USEPA, 2011; Table 8-1; weighted average of mean body weights (birth to < 6 years))	
				AFa	Soil-to-skin Adherence Factor, adult	0.07	mg/cm²-event	USEPA, 2014 (USEPA, 2004; Exhibit 3-5; recommended adult value for RME scenario)	
				SAa	Skin Surface Area, adult	6032	cm²	USEPA, 2014 (USEPA, 2011; Tables 7-12 and 7-13; Weighted average of mean values for head, hands, and forearms (male and female, 21+years))	
				ED6-16	Exposure Duration, 6-16 years	10	years	USEPA, 2005	
				ED16-26	Exposure Duration, 16-26 years	10	years	USEPA, 2005	
				ADAF6-16	Age Depend. Adjust. Factor, 6-16 years	3	unitless	USEPA, 2005	
				ADAF16-26	Age Depend. Adjust. Factor, 16-26 years	1	unitless	USEPA, 2005	
				BWa	Body Weight, adult	80	kg	USEPA, 2014 (USEPA, 2011; Tables 8-3; weighted mean values adults 21-78)	
				ATc	Averaging Time, carcinogens	25550	days	USEPA, 1989 (ED (70 years) x 365 days/year)	
Dermal Absorption	Trespasser (Current/Future)	Adolescent	Dermal Absorption of Soil						**Non-Mutagenic Constituents**
				DAD	Dermally Absorbed Dose	Calculated	mg/kg-day	See equations	Dermally Absorbed Dose (mg/kg-day) for carcinogens = $\frac{DA\text{-}event \times EV \times EF \times FC\text{-}S \times ED \times SA}{BW \times ATc}$
				DA-event	Absorbed Dose per Event	Calculated	mg/cm²-event	USEPA, 2004	
				EV	Event Frequency	1	events/day	USEPA, 2004	
				CS	Exposure Point Concentration, soil	Site-Specific	mg/kg	Presented in Tables A-3.1 through A-3.3	
				ABS	Dermal Absorption Factor, soil	Chemical-Specific	unitless	USEPA, 2004; values presented in Table E-1	

Table A-4.1
Values Used for Daily Intake and Dermally Absorbed Dose Calculations - Incidental Ingestion and Dermal Absorption of Soil
Reasonable Maximum Exposure
Shaffer Equipment/Arbuckle Creek Area Superfund Site, Minden, West Virginia

Scenario Timeframe: See Below
Medium: Soil
Exposure Medium: Soil

Exposure Route	Receptor Population	Receptor Age	Exposure Point	Parameter Code	Parameter Definition	Value	Units	Rationale/ Reference	Intake and Dermally Absorbed Dose Equations/ Model Name
Dermal Absorption	Trespasser (Current/Future)	Adolescent	Dermal Absorption of Soil	FC-S	Fraction of Contact from Source, soil	1	unitless	USEPA, 1989 (Default of 1 (100%) is assumed)	Dermally Absorbed Dose (mg/kg-day) for noncarcinogens = $\frac{\text{DA-event x EV x EF x FC-S x ED x SA}}{\text{BW x ATnc,c}}$
				CF1	Conversion Factor 1	0.000001	kg/mg	-	
				DFSMadj	Mutagenic dermal contact factor- age-adjusted	3511	mg/kg	See equations	
				EF	Exposure Frequency	16	days/year	Best professional judgement	DA-event (Absorbed Dose per Event [mg/cm²-event]) = CS x CF1 x AFa x ABS
				AFa	Soil-to-skin Adherence Factor, adult	0.07	mg/cm²-event	USEPA, 2014 (USEPA, 2004; Exhibit 3-5; recommended adult value for RME scenario)	**Mutagenic Constituents** Dermally Absorbed Dose (mg/kg-day) for mutagenic carcinogens = $\frac{\text{DA-event x ABS x FC-S x CF1 x DFSMadj}}{\text{ATc}}$
				SA	Skin Surface Area	4890	cm²	USEPA, 2011	
				BW	Body Weight	46.8	kg	USEPA, 2011 (6-16 years)	
				ED	Exposure Duration	10	years	Best professional judgement	
				ED6-16	Exposure Duration, 6-16 years	10	years	USEPA, 2005	
				ADAF6-16	Age Depend. Adjust. Factor, 6-16 years	3	unitless	USEPA, 2005	Where DFSMadj (mg/kg) = $\frac{\text{EF} \times \text{AF}_a \times SA}{BW} \times \left[\left(\text{ED}_{6-16} \times \text{ADAF}_{6-16}\right)\right]$
				ATnc	Averaging Time, noncarcinogens	3650	days	USEPA, 1989 (ED x 365 days/year)	
				ATc	Averaging Time, carcinogens	25550	days	USEPA, 1989 (ED (70 years) x 365 days/year)	
Dermal Absorption	Industrial Worker (Current/Future)	Adult	Dermal Absorption of Soil						**Non-Mutagenic Constituents**
				DAD	Dermally Absorbed Dose	Calculated	mg/kg-day	See equations	Dermally Absorbed Dose (mg/kg-day) for carcinogens (adult) = $\frac{\text{DA-event x EV x EF x FC-S x ED x SA}}{\text{BW x ATc}}$
				DA-event	Absorbed Dose per Event	Calculated	mg/cm²-event	USEPA, 2004	
				EV	Event Frequency	1	events/day	USEPA, 2004	
				EF	Exposure Frequency	250	days/year	USEPA, 2014 (USEPA, 1991; pg 15)	
				FC-S	Fraction of Contact from Source, soil	1	unitless	USEPA, 1989 (Default of 1 (100%) is assumed)	Dermally Absorbed Dose (mg/kg-day) for noncarcinogens (adult) = $\frac{\text{DA-event x EV x EF x FC-S x ED x SA}}{\text{BW x ATnc}}$
				ED	Exposure Duration	25	years	USEPA, 2014 (USEPA, 1991; pg 15)	
				SA	Skin Surface Area	3527	cm²	USEPA, 2014 (USEPA, 2011; Tables 7-12 and 7-13; Weighted average of mean values for head, hands, and forearms (male and female, 21+years))	**Where:**
				BW	Body Weight	80	kg	USEPA, 2014 (USEPA, 2011; Tables 8-3; weighted mean values adults 21-78)	DA-event (Absorbed Dose per Event [mg/cm²-event]) = CS x CF1 x AF x ABS
				ATc	Averaging Time, carcinogens	25550	days	USEPA, 1989 (ED (70 years) x 365 days/year)	
				ATnc	Averaging Time, noncarcinogens	9125	days	USEPA, 1989 (ED x 365 days/year)	
				CS	Exposure Point Concentration, soil	Site-Specific	mg/kg	Presented in Tables A-3.1 through A-3.3	
				CF1	Conversion Factor 1	0.000001	kg/mg	-	
				AF	Soil-to-skin Adherence Factor	0.12	mg/cm²-event	USEPA, 2014 (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 Factor, soil	Chemical-Specific	unitless	USEPA, 2004; values presented in Table E-1	
Dermal Absorption	Construction Worker (Future)	Adult	Dermal Absorption of Soil						**Non-Mutagenic Constituents**
				DAD	Dermally Absorbed Dose	Calculated	mg/kg-day	See equations	Dermally Absorbed Dose (mg/kg-day) for carcinogens (adult) = $\frac{\text{DA-event x EV x EF x FC-S x ED x SA}}{\text{BW x ATc}}$
				DA-event	Absorbed Dose per Event	Calculated	mg/cm²-event	USEPA, 2004	
				EV	Event Frequency	1	events/day	USEPA, 2004	
				EF	Exposure Frequency	250	days/year	Site-specific assumption (1-year construction project (50 weeks x 5 days/week x 1 year))	Dermally Absorbed Dose (mg/kg-day) for noncarcinogens (adult) = $\frac{\text{DA-event x EV x EF x FC-S x ED x SA}}{\text{BW x ATnc}}$
				FC-S	Fraction of Contact from Source, soil	1	unitless	USEPA, 1989 (Default of 1 (100%) is assumed)	
				ED	Exposure Duration	1	years	Site-specific assumption (1-year construction project (50 weeks x 5 days/week x 1 year))	

Table A-4.1
Values Used for Daily Intake and Dermally Absorbed Dose Calculations - Incidental Ingestion and Dermal Absorption of Soil
Reasonable Maximum Exposure
Shaffer Equipment/Arbuckle Creek Area Superfund Site, Minden, West Virginia

Scenario Timeframe:	**See Below**
Medium:	**Soil**
Exposure Medium:	**Soil**

Exposure Route	Receptor Population	Receptor Age	Exposure Point	Parameter Code	Parameter Definition	Value	Units	Rationale/ Reference	Intake and Dermally Absorbed Dose Equations/ Model Name
Dermal Absorption	Construction Worker (Future)	Adult	Dermal Absorption of Soil	SA	Skin Surface Area	3527	cm^2	USEPA, 2014 (USEPA, 2011; Tables 7-12 and 7-13; Weighted average of mean values for head, hands, and forearms (male and female, 21+years)); assume protective work boots are worn)	**Where:** DA-event (Absorbed Dose per Event [mg/cm^2-event]) = CS x CF1 x AF x ABS
				BW	Body Weight	80	kg	USEPA, 2014 (USEPA, 2011; Tables 8-3; weighted mean values adults 21-78)	
				ATc	Averaging Time, carcinogens	25550	days	USEPA, 1989 (ED (70 years) x 365 days/year)	
				ATnc	Averaging Time, noncarcinogens	365	days	USEPA, 1989 (ED x 365 days/year)	
				CS	Exposure Point Concentration, soil	Site-Specific	mg/kg	Presented in Tables A-3.1 through A-3.3	
				CF1	Conversion Factor 1	0.000001	kg/mg	-	
				AF	Soil-to-skin Adherence Factor	0.3	mg/cm^2-event	USEPA, 2004 (Exhibit 3-3; 95th percentile value for construction workers)	
				ABS	Dermal Absorption Factor, soil	Chemical-Specific	unitless	USEPA, 2004; values presented in Table E-1	

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Table A-4.2
Values Used for Daily Intake Calculations
Reasonable Maximum Exposure: Inhalation of Wind-blown Dust and Vapors in Outdoor Air from Soil
Shaffer Equipment/Arbuckle Creek Area Superfund Site
Fayette County, Minden, West Virginia

Scenario Timeframe:	**See Below**
Medium:	**Soil**
Exposure Medium:	**Air**

Exposure Route	Receptor Population (1)	Receptor Age	Exposure Point	Parameter Code	Parameter Definition	Value	Units	Rationale/ Reference	Intake and Dermally Absorbed Dose Equations/ Model Name
Inhalation	Hypothetical Resident (Future)	Adult	Inhalation of Windblown Dust in Outdoor Air						**Non-Mutagenic Constituents**
				CA	Exposure Point Concentration, air	Modeled	µg/m³	-	Exposure concentration (µg/m³) for carcinogens (adult) =
				EF	Exposure Frequency	350	days/year	USEPA, 2014 (USEPA, 1991; pg 15)	$\frac{CA \times EF \times ET \times EDa}{CF1 \times ATc}$
				ET	Exposure Time	24	hours/day	USEPA, 2014	
				EDa	Exposure Duration, adult	20	years	USEPA, 2014 (EDr (26 years) - EDc (6 years))	
				CF1	Conversion Factor 1	24	hours/day	-	Exposure concentration (µg/m³) for non-carcinogens (adult) =
				ATc	Averaging Time, carcinogens	25550	days	USEPA, 1989 (ED (70 years) x 365 days/year)	$\frac{CA \times EF \times ET \times EDa}{CF1 \times ATnc,a}$
				ATnc,a	Averaging Time, noncarcinogens - adult	7300	days	USEPA, 1989 (ED x 365 days/year)	
				CS	Exposure Point Concentration, soil	Site-Specific	mg/kg	Presented in Tables A-3.1 through A-3.3	Where:
				PEF	Particulate Emission Factor	1.36E+09	m³/kg	Default value for West Virginia	CA (µg/m³) = (CS/PEF) x CF2
				CF2	Conversion Factor 2	1000	µg/mg	-	Exposure concentration (µg/m³) for carcinogens (lifetime) =
									[EC for carcinogens (adult) + EC for carcinogens (child)]
Inhalation	Hypothetical Resident (Future)	Child	Inhalation of Windblown Dust in Outdoor Air						**Non-Mutagenic Constituents**
				CA	Exposure Point Concentration, air	Modeled	µg/m³	-	Exposure concentration (µg/m³) for carcinogens (child) =
				EF	Exposure Frequency	350	days/year	USEPA, 2014 (USEPA, 1991; pg 15)	$\frac{CA \times EF \times ET \times EDc}{CF1 \times ATc}$
				ET	Exposure Time	24	hours/day	USEPA, 2014	
				EDc	Exposure Duration, child	6	years	USEPA, 2014 (USEPA, 1991; pp 6 and 15)	
				CF1	Conversion Factor 1	24	hours/day	-	Exposure concentration (µg/m³) for non-carcinogens (child) =
				ATc	Averaging Time, carcinogens	25550	days	USEPA, 1989 (ED (70 years) x 365 days/year)	$\frac{CA \times EF \times ET \times EDc}{CF1 \times ATnc,c}$
				ATnc,c	Averaging Time, noncarcinogens - child	2190	days	USEPA, 1989 (ED x 365 days/year)	
				CS	Exposure Point Concentration, soil	Site-Specific	mg/kg	Presented in Tables A-3.1 through A-3.3	Where:
				PEF	Particulate Emission Factor	1360000000	m³/kg	Default value for West Virginia	CA (µg/m³) = (CS/PEF) x CF2
				CF2	Conversion Factor 2	1000	µg/mg	-	Exposure concentration (µg/m³) for carcinogens (lifetime) =
									[EC for carcinogens (adult) + EC for carcinogens (child)]
Inhalation	Hypothetical Resident (Future)	Lifetime	Inhalation of Windblown Dust in Outdoor Air						**Mutagenic Constituents**
				CA	Exposure Point Concentration, air	Modeled	µg/m³	-	Exposure concentration (µg/m³) for mutagenic carcinogens (lifetime) =
				EF	Exposure Frequency	350	days/year	USEPA, 2014 (USEPA, 1991; pg 15)	$\frac{CA \times EF \times ET}{AT_c \times CF1} \times \left[\left(\frac{ED_{0-2} \times ADAF_{0-2} + ED_{2-6} \times ADAF_{2-6} +}{ED_{6-16} \times ADAF_{6-16} + ED_{16-26} \times ADAF_{16-26}}\right)\right]$
				ET	Exposure Time	24	hours/day	USEPA, 2014	
				ATc	Averaging Time, carcinogens	25550	days	USEPA, 1989 (ED (70 years) x 365 days/year)	
				CF1	Conversion Factor 1	24	hours/day	-	
				ED0-2	Exposure Duration, 0-2 years	2	years	USEPA, 2005	Where:
				ADAF0-2	Age Depend. Adjust. Factor, 0-2 years	10	unitless	USEPA, 2005	CA (µg/m³) = (CS/PEF) x CF2
				ED2-6	Exposure Duration, 2-6 years	4	years	USEPA, 2005	
				ADAF2-6	Age Depend. Adjust. Factor, 2-6 years	3	unitless	USEPA, 2005	
				ED6-16	Exposure Duration, 6-16 years	10	years	USEPA, 2005	
				ADAF6-16	Age Depend. Adjust. Factor, 6-16 years	3	unitless	USEPA, 2005	
				ED16-26	Exposure Duration, 16-26 years	10	years	USEPA, 2005	
				ADAF16-26	Age Depend. Adjust. Factor, 16-26 years	1	unitless	USEPA, 2005	
				CS	Exposure Point Concentration, soil	Site-Specific	mg/kg	Presented in Tables A-3.1 through A-3.3	
				PEF	Particulate Emission Factor	1.36E+09	m³/kg	Default value for West Virginia	
				CF2	Conversion Factor 2	1000	µg/mg	-	

Table A-4.2
Values Used for Daily Intake Calculations
Reasonable Maximum Exposure: Inhalation of Wind-blown Dust and Vapors in Outdoor Air from Soil
Shaffer Equipment/Arbuckle Creek Area Superfund Site
Fayette County, Minden, West Virginia

Scenario Timeframe:	**See Below**
Medium:	**Soil**
Exposure Medium:	**Air**

Exposure Route	Receptor Population (1)	Receptor Age	Exposure Point	Parameter Code	Parameter Definition	Value	Units	Rationale/ Reference	Intake and Dermally Absorbed Dose Equations/ Model Name
Inhalation	Recreator (Current/Future)	Adult	Inhalation of Windblown Dust in Outdoor Air						**Non-Mutagenic Constituents**
				CA	Exposure Point Concentration, air	Modeled	µg/m³	-	Exposure concentration (µg/m³) for carcinogens (adult) = $\frac{CA \times EF \times ET \times EDa}{CF1 \times ATc}$
				EF	Exposure Frequency	52	days/year	Best professional judgement	
				ET	Exposure Time	3.6	hours/day	USEPA, 2011 (Table 16-26; mean value (217.3 min/day x 1 hour/60 min) for time spent for doing outdoor recreational activities in the Southern Region of US)	Exposure concentration (µg/m³) for noncarcinogens (adult) = $\frac{CA \times EF \times ET \times EDa}{CF1 \times ATnc,a}$
				EDa	Exposure Duration, adult	20	years	USEPA, 2014 (EDr (26 years) - EDc (6 years))	
				CF1	Conversion Factor 1	24	hours/day	-	Where:
				ATc	Averaging Time, carcinogens	25550	days	USEPA, 1989 (ED (70 years) x 365 days/year)	$CA\ (\mu g/m^3) = (CS/PEF) \times CF2$
				ATnc,a	Averaging Time, noncarcinogens - adult	7300	days	USEPA, 1989 (ED x 365 days/year)	
				CS	Exposure Point Concentration, soil	Site-Specific	mg/kg	Presented in Tables A-3.1 through A-3.3	Exposure concentration (µg/m³) for carcinogens (lifetime) = [EC for carcinogens (adult) + EC for carcinogens (child)]
				PEF	Particulate Emission Factor	1.36E+09	m³/kg	Default value for West Virginia	
				CF2	Conversion Factor 2	1000	µg/mg	-	
Inhalation	Recreator (Current/Future)	Child	Inhalation of Windblown Dust in Outdoor Air						**Non-Mutagenic Constituents**
				CA	Exposure Point Concentration, air	Modeled	µg/m³	-	Exposure concentration (µg/m³) for carcinogens (child) = $\frac{CA \times EF \times ET \times EDc}{CF1 \times ATc}$
				EF	Exposure Frequency	52	days/year	Best professional judgement	
				ET	Exposure Time	3.6	hours/day	USEPA, 2011 (Table 16-26; mean value (217.3 min/day x 1 hour/60 min) for time spent for doing outdoor recreational activities in the Southern Region of US)	Exposure concentration (µg/m³) for noncarcinogens (child) = $\frac{CA \times EF \times ET \times EDc}{CF1 \times ATnc,c}$
				EDc	Exposure Duration, child	6	years	USEPA, 2014 (USEPA, 1991; pp 6 and 15)	
				CF1	Conversion Factor 1	24	hours/day	-	Where:
				ATc	Averaging Time, carcinogens	25550	days	USEPA, 1989 (ED (70 years) x 365 days/year)	$CA\ (\mu g/m^3) = (CS/PEF) \times CF2$
				ATnc,c	Averaging Time, noncarcinogens - child	2190	days	USEPA, 1989 (ED x 365 days/year)	
				CS	Exposure Point Concentration, soil	Site-Specific	mg/kg	Presented in Tables A-3.1 through A-3.3	Exposure concentration (µg/m³) for carcinogens (lifetime) = [EC for carcinogens (adult) + EC for carcinogens (child)]
				PEF	Particulate Emission Factor	1.36E+09	m³/kg	Default value for West Virginia	
				CF2	Conversion Factor 2	1000	µg/mg	-	
Inhalation	Recreator (Current/Future)	Lifetime	Inhalation of Windblown Dust in Outdoor Air						**Mutagenic Constituents**
				CA	Exposure Point Concentration, air	Modeled	µg/m³	-	Exposure concentration (µg/m³) for mutagenic carcinogens (lifetime) = $\frac{CA \times EF \times ET}{AT_c \times CF1} \times \left[\left(\frac{ED_{0-2} \times ADAF_{0-2} + ED_{2-6} \times ADAF_{2-6}}{ED_{6-16} \times ADAF_{6-16} + ED_{16-26} \times ADAF_{16-26}}\right)\right]$
				EF	Exposure Frequency	52	days/year	Best professional judgement	
				ET	Exposure Time	3.6	hours/day	USEPA, 2011 (Table 16-26; mean value (217.3 min/day x 1 hour/60 min) for time spent for doing outdoor recreational activities in the Southern Region of US)	Where:
				ATc	Averaging Time, carcinogens	25550	days	USEPA, 1989 (ED (70 years) x 365 days/year)	$CA\ (\mu g/m^3) = (CS/PEF) \times CF2$
				CF1	Conversion Factor 1	24	hours/day	-	
				ED0-2	Exposure Duration, 0-2 years	2	years	USEPA, 2005	
				ADAF0-2	Age Depend. Adjust. Factor, 0-2 years	10	unitless	USEPA, 2005	
				ED2-6	Exposure Duration, 2-6 years	4	years	USEPA, 2005	
				ADAF2-6	Age Depend. Adjust. Factor, 2-6 years	3	unitless	USEPA, 2005	
				ED6-16	Exposure Duration, 6-16 years	10	years	USEPA, 2005	

Table A-4.2
Values Used for Daily Intake Calculations
Reasonable Maximum Exposure: Inhalation of Wind-blown Dust and Vapors in Outdoor Air from Soil
Shaffer Equipment/Arbuckle Creek Area Superfund Site
Fayette County, Minden, West Virginia

Scenario Timeframe:	**See Below**
Medium:	**Soil**
Exposure Medium:	**Air**

Exposure Route	Receptor Population (1)	Receptor Age	Exposure Point	Parameter Code	Parameter Definition	Value	Units	Rationale/ Reference	Intake and Dermally Absorbed Dose Equations/ Model Name
Inhalation	Recreator (Current/Future)	Lifetime	Inhalation of Windblown Dust in Outdoor Air	ADAF6-16	Age Depend. Adjust. Factor, 6-16 years	3	unitless	USEPA, 2005	
				ED16-26	Exposure Duration, 16-26 years	10	years	USEPA, 2005	
				ADAF16-26	Age Depend. Adjust. Factor, 16-26 years	1	unitless	USEPA, 2005	
				CS	Exposure Point Concentration, soil	Site-Specific	mg/kg	Presented in Tables A-3.1 through A-3.3	
				PEF	Particulate Emission Factor	1.36E+09	m^3/kg	Default value for West Virginia	
				CF2	Conversion Factor 2	1000	µg/mg	-	
Inhalation	Trespasser (Current/Future)	Adolescent	Inhalation of Windblown Dust in Outdoor Air						**Non-Mutagenic Constituents**
				CA	Exposure Point Concentration, air	Modeled	$\mu g/m^3$	-	Exposure concentration ($\mu g/m^3$) for carcinogens (adolescent) = $\frac{CA \times EF \times ET \times ED}{CF1 \times ATc}$
				EF	Exposure Frequency	16	days/year	Best professional judgement	
				ET	Exposure Time	3.6	hours/day	USEPA, 2011 (Table 16-26; mean value (217.3 min/day x 1 hour/60 min) for time spent for doing outdoor recreational activities in the Southern Region of US)	Exposure concentration ($\mu g/m^3$) for noncarcinogens (adolescent) = $\frac{CA \times EF \times ET \times ED}{CF1 \times ATnc}$
				ATnc	Averaging Time, noncarcinogens	3650	days	USEPA, 1989 (ED x 365 days/year)	
				ATc	Averaging Time, carcinogens	25550	days	USEPA, 1989 (ED (70 years) x 365 days/year)	
				CF1	Conversion Factor 1	24	hours/day	-	
				ED	Exposure Duration	10	years	Best professional judgement	
				ED6-16	Exposure Duration, 6-16 years	10	years	USEPA, 2005	
				ADAF6-16	Age Depend. Adjust. Factor, 6-16 years	3	unitless	USEPA, 2005	**Mutagenic Constituents**
				CS	Exposure Point Concentration, soil	Site-Specific	mg/kg	Presented in Tables A-3.1 through A-3.3	Exposure concentration ($\mu g/m^3$) for mutagenic carcinogens (adolescent) = $\frac{CA \times EF \times ET}{AT_c \times CF1} \times [(ED_{6-16} \times ADAF_{6-16})]$
				PEF	Particulate Emission Factor	1.36E+09	m^3/kg	Default value for West Virginia	
				CF2	Conversion Factor 2	1000	µg/mg	-	Where: $CA (\mu g/m^3) = (CS/PEF) \times CF2$
Inhalation	Industrial Worker (Current/Future)	Adult	Inhalation of Windblown Dust in Outdoor Air						**Non-Mutagenic Constituents**
				CA	Exposure Point Concentration, air	Modeled	$\mu g/m^3$	-	Exposure concentration ($\mu g/m^3$) for carcinogens (adult) = $\frac{CA \times EF \times ET \times ED}{CF1 \times ATc}$
				EF	Exposure Frequency	250	days/year	USEPA, 2014 (USEPA, 1991; pg 15)	
				ET	Exposure Time	8	hours/day	USEPA, 2014 (8-hour work day)	
				ED	Exposure Duration	25	years	USEPA, 2014 (USEPA, 1991; pg 15)	
				CF1	Conversion Factor 1	24	hours/day	-	Exposure concentration ($\mu g/m^3$) for noncarcinogens (adult) = $\frac{CA \times EF \times ET \times ED}{CF1 \times ATnc}$
				ATc	Averaging Time, carcinogens	25550	days	USEPA, 1989 (ED (70 years) x 365 days/year)	
				ATnc	Averaging Time, noncarcinogens	9125	days	USEPA, 1989 (ED x 365 days/year)	
				CS	Exposure Point Concentration, soil	Site-Specific	mg/kg	Presented in Tables A-3.1 through A-3.3	Where: $CA (\mu g/m^3) = (CS/PEF) \times CF2$
				PEF	Particulate Emission Factor	1.36E+09	m^3/kg	Default value for West Virginia	
				CF2	Conversion Factor 2	1000	µg/mg	-	
Inhalation	Construction Worker (Future)	Adult	Inhalation of Windblown Dust in Outdoor Air						**Non-Mutagenic Constituents**
				CA	Exposure Point Concentration, air	Modeled	$\mu g/m^3$	-	Exposure concentration ($\mu g/m^3$) for carcinogens (adult) = $\frac{CA \times EF \times ET \times ED}{CF1 \times ATc}$
				EF	Exposure Frequency	250	days/year	Site-specific assumption (1-year construction project (50 weeks x 5 days/week x 1 year))	
				ET	Exposure Time	8	hours/day	USEPA, 2014 (8-hour work day)	
				ED	Exposure Duration	1	years	Site-specific assumption (1-year construction project (50 weeks x 5 days/week x 1 year))	Exposure concentration ($\mu g/m^3$) for noncarcinogens (adult) = $\frac{CA \times EF \times ET \times ED}{CF1 \times ATnc}$
				CF1	Conversion Factor 1	24	hours/day	-	

Table A-4.2
Values Used for Daily Intake Calculations
Reasonable Maximum Exposure: Inhalation of Wind-blown Dust and Vapors in Outdoor Air from Soil
Shaffer Equipment/Arbuckle Creek Area Superfund Site
Fayette County, Minden, West Virginia

Scenario Timeframe:	**See Below**
Medium:	**Soil**
Exposure Medium:	**Air**

Exposure Route	Receptor Population (1)	Receptor Age	Exposure Point	Parameter Code	Parameter Definition	Value	Units	Rationale/ Reference	Intake and Dermally Absorbed Dose Equations/ Model Name
Inhalation	Construction Worker (Future)	Adult	Inhalation of Windblown Dust in Outdoor Air	ATc	Averaging Time, carcinogens	25550	days	USEPA, 1989 (ED (70 years) x 365 days/year)	Where:
				ATnc	Averaging Time, noncarcinogens	365	days	USEPA, 1989 (ED x 365 days/year)	$CA\ (\mu g/m^3) = (CS/PEF) \times CF2$
				CS	Exposure Point Concentration, soil	Site-Specific	mg/kg	Presented in Tables A-3.1 through A-3.3	
				PEF	Particulate Emission Factor	Site Specific	m^3/kg	USEPA, 2002 (Equations presented with RAGS Support Tables, Appendix F)	
				CF2	Conversion Factor 2	1000	µg/mg	-	
Inhalation	Hypothetical Resident (Future)	Adult	Inhalation of Vapors in Outdoor Air						**Non-Mutagenic Constituents**
				CA	Exposure Point Concentration, air	Modeled	$\mu g/m^3$	-	Exposure concentration ($\mu g/m^3$) for carcinogens (adult) =
				EF	Exposure Frequency	350	days/year	USEPA, 2014 (USEPA, 1991; pg 15)	$\frac{CA \times EF \times ET \times EDa}{CF1 \times ATc}$
				ET	Exposure Time	24	hours/day	USEPA, 2014	
				EDa	Exposure Duration, adult	20	years	USEPA, 2014 (EDr (26 years) - EDc (6 years))	
				CF1	Conversion Factor 1	24	hours/day	-	Exposure concentration ($\mu g/m^3$) for non-carcinogens (adult) =
				ATc	Averaging Time, carcinogens	25550	days	USEPA, 1989 (ED (70 years) x 365 days/year)	$\frac{CA \times EF \times ET \times EDa}{CF1 \times ATnc,a}$
				ATnc,a	Averaging Time, noncarcinogens - adult	7300	days	USEPA, 1989 (ED x 365 days/year)	
				CS	Exposure Point Concentration, soil	Site-Specific	mg/kg	Presented in Tables A-3.1 through A-3.3	Where:
				VF	Volatilization Factor	Calculated	m^3/kg	USEPA, 2002 (Equations presented with RAGS Support Tables, Appendix F)	$CA\ (\mu g/m^3) = (CS/VF) \times CF2$
				CF2	Conversion Factor 2	1000	µg/mg	-	Exposure concentration ($\mu g/m^3$) for carcinogens (lifetime) =
									[EC for carcinogens (adult) + EC for carcinogens (child)]
Inhalation	Hypothetical Resident (Future)	Child	Inhalation of Vapors in Outdoor Air						**Non-Mutagenic Constituents**
				CA	Exposure Point Concentration, air	Modeled	$\mu g/m^3$	-	Exposure concentration ($\mu g/m^3$) for carcinogens (child) =
				EF	Exposure Frequency	350	days/year	USEPA, 2014 (USEPA, 1991; pg 15)	$\frac{CA \times EF \times ET \times EDc}{CF1 \times ATc}$
				ET	Exposure Time	24	hours/day	USEPA, 2014	
				EDc	Exposure Duration, child	6	years	USEPA, 2014 (USEPA, 1991; pp 6 and 15)	
				CF1	Conversion Factor 1	24	hours/day	-	Exposure concentration ($\mu g/m^3$) for non-carcinogens (child) =
				ATc	Averaging Time, carcinogens	25550	days	USEPA, 1989 (ED (70 years) x 365 days/year)	$\frac{CA \times EF \times ET \times EDc}{CF1 \times ATnc,c}$
				ATnc,c	Averaging Time, noncarcinogens - child	2190	days	USEPA, 1989 (ED x 365 days/year)	
				CS	Exposure Point Concentration, soil	Site-Specific	mg/kg	Presented in Tables A-3.1 through A-3.3	Where:
				VF	Volatilization Factor	Calculated	m^3/kg	USEPA, 2002 (Equations presented with RAGS Support Tables, Appendix F)	$CA\ (\mu g/m^3) = (CS/VF) \times CF2$
				CF2	Conversion Factor 2	1000	µg/mg	-	Exposure concentration ($\mu g/m^3$) for carcinogens (lifetime) =
									[EC for carcinogens (adult) + EC for carcinogens (child)]
Inhalation	Hypothetical Resident (Future)	Lifetime	Inhalation of Vapors in Outdoor Air						**Mutagenic Constituents**
				CA	Exposure Point Concentration, air	Modeled	$\mu g/m^3$	-	Exposure concentration ($\mu g/m^3$) for mutagenic carcinogens (lifetime) =
				EF	Exposure Frequency	350	days/year	USEPA, 2014 (USEPA, 1991; pg 15)	$\frac{CA \times EF \times ET}{AT_c \times CF1} \times \left[\left(\frac{ED_{0-2} \times ADAF_{0-2} + ED_{2-6} \times ADAF_{2-6} +}{ED_{6-16} \times ADAF_{6-16} + ED_{16-26} \times ADAF_{16-26}}\right)\right]$
				ET	Exposure Time	24	hours/day	USEPA, 2014	
				ATc	Averaging Time, carcinogens	25550	days	USEPA, 1989 (ED (70 years) x 365 days/year)	
				CF1	Conversion Factor 1	24	hours/day	-	
				ED0-2	Exposure Duration, 0-2 years	2	years	USEPA, 2005	Where:
				ADAF0-2	Age Depend. Adjust. Factor, 0-2 years	10	unitless	USEPA, 2005	$CA\ (\mu g/m^3) = (CS/VF) \times CF2$
				ED2-6	Exposure Duration, 2-6 years	4	years	USEPA, 2005	
				ADAF2-6	Age Depend. Adjust. Factor, 2-6 years	3	unitless	USEPA, 2005	
				ED6-16	Exposure Duration, 6-16 years	10	years	USEPA, 2005	
				ADAF6-16	Age Depend. Adjust. Factor, 6-16 years	3	unitless	USEPA, 2005	
				ED16-26	Exposure Duration, 16-26 years	10	years	USEPA, 2005	

Table A-4.2
Values Used for Daily Intake Calculations
Reasonable Maximum Exposure: Inhalation of Wind-blown Dust and Vapors in Outdoor Air from Soil
Shaffer Equipment/Arbuckle Creek Area Superfund Site
Fayette County, Minden, West Virginia

Scenario Timeframe:	**See Below**
Medium:	**Soil**
Exposure Medium:	**Air**

Exposure Route	Receptor Population (1)	Receptor Age	Exposure Point	Parameter Code	Parameter Definition	Value	Units	Rationale/ Reference	Intake and Dermally Absorbed Dose Equations/ Model Name
Inhalation	Hypothetical Resident (Future)	Lifetime	Inhalation of Vapors in Outdoor Air	ADAF16-26	Age Depend. Adjust. Factor, 16-26 years	1	unitless	USEPA, 2005	
				CS	Exposure Point Concentration, soil	Site-Specific	mg/kg	Presented in Tables A-3.1 through A-3.3	
				VF	Volatilization Factor	Calculated	m^3/kg	USEPA, 2002 (Equations presented with RAGS Support Tables, Appendix F)	
				CF2	Conversion Factor 2	1000	µg/mg	-	
Inhalation	Recreator (Current/Future)	Adult	Inhalation of Vapors in Outdoor Air						**Non-Mutagenic Constituents**
				CA	Exposure Point Concentration, air	Modeled	$µg/m^3$	-	Exposure concentration ($µg/m^3$) for carcinogens (adult) = $\frac{CA \times EF \times ET \times EDa}{CF1 \times ATc}$
				EF	Exposure Frequency	52	days/year	Best professional judgement	
				ET	Exposure Time	3.6	hours/day	USEPA, 2011 (Table 16-26; mean value (217.3 min/day x 1 hour/60 min) for time spent for doing outdoor recreational activities in the Southern Region of US)	Exposure concentration ($µg/m^3$) for noncarcinogens (adult) = $\frac{CA \times EF \times ET \times EDa}{CF1 \times ATnc,a}$
				EDa	Exposure Duration, adult	20	years	USEPA, 2014 (EDr (26 years) - EDc (6 years))	
				CF1	Conversion Factor 1	24	hours/day	-	Where:
				ATc	Averaging Time, carcinogens	25550	days	USEPA, 1989 (ED (70 years) x 365 days/year)	$CA\ (µg/m^3) = (CS/VF) \times CF2$
				ATnc,a	Averaging Time, noncarcinogens - adult	7300	days	USEPA, 1989 (ED x 365 days/year)	
				CS	Exposure Point Concentration, soil	Site-Specific	mg/kg	Presented in Tables A-3.1 through A-3.3	Exposure concentration ($µg/m^3$) for carcinogens (lifetime) = [EC for carcinogens (adult) + EC for carcinogens (child)]
				VF	Volatilization Factor	Calculated	m^3/kg	USEPA, 2002 (Equations presented with RAGS Support Tables, Appendix F)	
				CF2	Conversion Factor 2	1000	µg/mg	-	
Inhalation	Recreator (Current/Future)	Child	Inhalation of Vapors in Outdoor Air						**Non-Mutagenic Constituents**
				CA	Exposure Point Concentration, air	Modeled	$µg/m^3$	-	Exposure concentration ($µg/m^3$) for carcinogens (child) = $\frac{CA \times EF \times ET \times EDc}{CF1 \times ATc}$
				EF	Exposure Frequency	52	days/year	Best professional judgement	
				ET	Exposure Time	3.6	hours/day	USEPA, 2011 (Table 16-26; mean value (217.3 min/day x 1 hour/60 min) for time spent for doing outdoor recreational activities in the Southern Region of US)	Exposure concentration ($µg/m^3$) for noncarcinogens (child) = $\frac{CA \times EF \times ET \times EDc}{CF1 \times ATnc,c}$
				EDc	Exposure Duration, child	6	years	USEPA, 2014 (USEPA, 1991; pp 6 and 15)	
				CF1	Conversion Factor 1	24	hours/day	-	Where:
				ATc	Averaging Time, carcinogens	25550	days	USEPA, 1989 (ED (70 years) x 365 days/year)	$CA\ (µg/m^3) = (CS/VF) \times CF2$
				ATnc,c	Averaging Time, noncarcinogens - child	2190	days	USEPA, 1989 (ED x 365 days/year)	
				CS	Exposure Point Concentration, soil	Site-Specific	mg/kg	Presented in Tables A-3.1 through A-3.3	Exposure concentration ($µg/m^3$) for carcinogens (lifetime) = [EC for carcinogens (adult) + EC for carcinogens (child)]
				VF	Volatilization Factor	Calculated	m^3/kg	USEPA, 2002 (Equations presented with RAGS Support Tables, Appendix F)	
				CF2	Conversion Factor 2	1000	µg/mg	-	
Inhalation	Recreator (Current/Future)	Lifetime	Inhalation of Vapors in Outdoor Air						**Mutagenic Constituents**
				CA	Exposure Point Concentration, air	Modeled	$µg/m^3$	-	Exposure concentration ($µg/m^3$) for mutagenic carcinogens (lifetime) = $\frac{CA \times EF \times ET}{AT_c \times CF1} \times \left[\left(\frac{ED_{0-2} \times ADAF_{0-2} + ED_{2-6} \times ADAF_{2-6} +}{ED_{6-16} \times ADAF_{6-16} + ED_{16-26} \times ADAF_{16-26}}\right)\right]$
				EF	Exposure Frequency	52	days/year	Best professional judgement	
				ET	Exposure Time	3.6	hours/day	USEPA, 2011 (Table 16-26; mean value (217.3 min/day x 1 hour/60 min) for time spent for doing outdoor recreational activities in the Southern Region of US)	Where:
				ATc	Averaging Time, carcinogens	25550	days	USEPA, 1989 (ED (70 years) x 365 days/year)	$CA\ (µg/m^3) = (CS/VF) \times CF2$
				CF1	Conversion Factor 1	24	hours/day	-	

Table A-4.2
Values Used for Daily Intake Calculations
Reasonable Maximum Exposure: Inhalation of Wind-blown Dust and Vapors in Outdoor Air from Soil
Shaffer Equipment/Arbuckle Creek Area Superfund Site
Fayette County, Minden, West Virginia

Scenario Timeframe:	**See Below**
Medium:	**Soil**
Exposure Medium:	**Air**

Exposure Route	Receptor Population (1)	Receptor Age	Exposure Point	Parameter Code	Parameter Definition	Value	Units	Rationale/ Reference	Intake and Dermally Absorbed Dose Equations/ Model Name
Inhalation	Recreator (Current/Future)	Lifetime	Inhalation of Vapors in Outdoor Air	ED0-2	Exposure Duration, 0-2 years	2	years	USEPA, 2005	
				ADAF0-2	Age Depend. Adjust. Factor, 0-2 years	10	unitless	USEPA, 2005	
				ED2-6	Exposure Duration, 2-6 years	4	years	USEPA, 2005	
				ADAF2-6	Age Depend. Adjust. Factor, 2-6 years	3	unitless	USEPA, 2005	
				ED6-16	Exposure Duration, 6-16 years	10	years	USEPA, 2005	
				ADAF6-16	Age Depend. Adjust. Factor, 6-16 years	3	unitless	USEPA, 2005	
				ED16-26	Exposure Duration, 16-26 years	10	years	USEPA, 2005	
				ADAF16-26	Age Depend. Adjust. Factor, 16-26 years	1	unitless	USEPA, 2005	
				CS	Exposure Point Concentration, soil	Site-Specific	mg/kg	Presented in Tables A-3.1 through A-3.3	
				VF	Volatilization Factor	Calculated	m^3/kg	USEPA, 2002 (Equations presented with RAGS Support Tables, Appendix F)	
				CF2	Conversion Factor 2	1000	µg/mg	-	
Inhalation	Trespasser (Current/Future)	Adolescent	Inhalation of Vapors in Outdoor Air						**Non-Mutagenic Constituents**
				CA	Exposure Point Concentration, air	Modeled	$µg/m^3$	-	Exposure concentration ($µg/m^3$) for carcinogens (adolescent) = $\frac{CA \times EF \times ET \times ED}{CF1 \times ATc}$
				EF	Exposure Frequency	16	days/year	Best professional judgement	
				ET	Exposure Time	3.6	hours/day	USEPA, 2011 (Table 16-26; mean value (217.3 min/day x 1 hour/60 min) for time spent for doing outdoor recreational activities in the Southern Region of US)	Exposure concentration ($µg/m^3$) for noncarcinogens (adolescent) = $\frac{CA \times EF \times ET \times ED}{CF1 \times ATnc}$
				ATnc	Averaging Time, noncarcinogens	3650	days	USEPA, 1989 (ED x 365 days/year)	
				ATc	Averaging Time, carcinogens	25550	days	USEPA, 1989 (ED (70 years) x 365 days/year)	
				CF1	Conversion Factor 1	24	hours/day	-	
				ED	Exposure Duration	10	years	Best professional judgement	
				ED6-16	Exposure Duration, 6-16 years	10	years	USEPA, 2005	
				ADAF6-16	Age Depend. Adjust. Factor, 6-16 years	3	unitless	USEPA, 2005	**Mutagenic Constituents**
				CS	Exposure Point Concentration, soil	Site-Specific	mg/kg	Presented in Tables A-3.1 through A-3.3	Exposure concentration ($µg/m^3$) for mutagenic carcinogens (adolescent) = $\frac{CA \times EF \times ET}{AT_c \times CF1} \times [(ED_{6-16} \times ADAF_{6-16})]$
				VF	Volatilization Factor	Calculated	m^3/kg	USEPA, 2002 (Equations presented with RAGS Support Tables, Appendix F)	
				CF2	Conversion Factor 2	1000	µg/mg	-	Where:
									CA ($µg/m^3$) = (CS/VF) x CF2
Inhalation	Industrial Worker (Current/Future)	Adult	Inhalation of Vapors in Outdoor Air						**Non-Mutagenic Constituents**
				CA	Exposure Point Concentration, air	Modeled	$µg/m^3$	-	Exposure concentration ($µg/m^3$) for carcinogens (adult) = $\frac{CA \times EF \times ET \times ED}{CF1 \times ATc}$
				EF	Exposure Frequency	250	days/year	USEPA, 2014 (USEPA, 1991; pg 15)	
				ET	Exposure Time	8	hours/day	USEPA, 2014 (8-hour work day)	
				ED	Exposure Duration	25	years	USEPA, 2014 (USEPA, 1991; pg 15)	
				CF1	Conversion Factor 1	24	hours/day	-	Exposure concentration ($µg/m^3$) for noncarcinogens (adult) = $\frac{CA \times EF \times ET \times ED}{CF1 \times ATnc}$
				ATc	Averaging Time, carcinogens	25550	days	USEPA, 1989 (ED (70 years) x 365 days/year)	
				ATnc	Averaging Time, noncarcinogens	9125	days	USEPA, 1989 (ED x 365 days/year)	
				CS	Exposure Point Concentration, soil	Site-Specific	mg/kg	Presented in Tables A-3.1 through A-3.3	Where:
				VF	Volatilization Factor	Calculated	m^3/kg	USEPA, 2002 (Equations presented with RAGS Support Tables, Appendix F)	CA ($µg/m^3$) = (CS/VF) x CF2
				CF2	Conversion Factor 2	1000	µg/mg	-	

Table A-4.2
Values Used for Daily Intake Calculations
Reasonable Maximum Exposure: Inhalation of Wind-blown Dust and Vapors in Outdoor Air from Soil
Shaffer Equipment/Arbuckle Creek Area Superfund Site
Fayette County, Minden, West Virginia

Scenario Timeframe:	**See Below**
Medium:	**Soil**
Exposure Medium:	**Air**

Exposure Route	Receptor Population (1)	Receptor Age	Exposure Point	Parameter Code	Parameter Definition	Value	Units	Rationale/ Reference	Intake and Dermally Absorbed Dose Equations/ Model Name
Inhalation	Construction Worker (Future)	Adult	Inhalation of Vapors in Outdoor Air						**Non-Mutagenic Constituents**
				CA	Exposure Point Concentration, air	Modeled	µg/m³	-	Exposure concentration (µg/m³) for carcinogens (adult) =
				EF	Exposure Frequency	250	days/year	Site-specific assumption (1-year construction project (50 weeks x 5 days/week x 1 year))	$\frac{CA \times EF \times ET \times ED}{CF1 \times ATc}$
				ET	Exposure Time	8	hours/day	USEPA, 2014 (8-hour work day)	
				ED	Exposure Duration	1	years	Site-specific assumption (1-year construction project (50 weeks x 5 days/week x 1 year))	Exposure concentration (µg/m³) for noncarcinogens (adult) =
									$\frac{CA \times EF \times ET \times ED}{CF1 \times ATnc}$
				CF1	Conversion Factor 1	24	hours/day	-	
				ATc	Averaging Time, carcinogens	25550	days	USEPA, 1989 (ED (70 years) x 365 days/year)	Where:
				ATnc	Averaging Time, noncarcinogens	365	days	USEPA, 1989 (ED x 365 days/year)	$CA\ (\mu g/m^3) = (CS/VF) \times CF2$
				CS	Exposure Point Concentration, soil	Site-Specific	mg/kg	Presented in Tables A-3.1 through A-3.3	
				VF	Volatilization Factor	Calculated	m³/kg	USEPA, 2002 (Equations presented with RAGS Support Tables, Appendix F)	
				CF2	Conversion Factor 2	1000	µg/mg	-	

References:

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Table A-5.1
Non-Cancer Toxicity Data - Oral/Dermal
Human Health Risk Assessment
Shaffer Equipment/Arbuckle Creek Area Superfund Site, Minden, West Virginia

Constituent of Interest	Chronic/ Subchronic [3]	Oral RfD		Oral Absorption Effiency for Dermal [1]	Absorbed RfD for Dermal [2]		Primary Target Organ/System(s)	Combined Uncertainty/ Modifying Factors	RfD: Target Organ(s)	
		Value	Units		Value	Units			Source(s)	Date(s) (MM/DD/YYYY)
Semi-volatile Organic Compounds (SVOCs)										
1,2,4,5-Tetrachlorobenzene	Chronic	0.0003	mg/kg-day	1	0.0003	mg/kg-day	UR	1000	IRIS	4/12/2022
1,2,4,5-Tetrachlorobenzene	Subchronic	0.00003	mg/kg-day	1	0.00003	mg/kg-day	EN	300	PPRTV Current	4/12/2022
Benzo(a)anthracene	Chronic	--	--	--	--	--	--	--	--	4/12/2022
Benzo(a)anthracene	Subchronic	--	--	--	--	--	--	--	--	4/12/2022
Benzo(a)pyrene	Chronic	0.0003	mg/kg-day	1	0.0003	mg/kg-day	DV	300	IRIS	4/12/2022
Benzo(a)pyrene	Subchronic	0.0003	mg/kg-day	1	0.0003	mg/kg-day	DV	300	IRIS	4/12/2022
Benzo(b)fluoranthene	Chronic	--	--	--	--	--	--	--	--	4/12/2022
Benzo(b)fluoranthene	Subchronic	--	--	--	--	--	--	--	--	4/12/2022
Dibenz(a,h)anthracene	Chronic	--	--	--	--	--	--	--	--	4/12/2022
Dibenz(a,h)anthracene	Subchronic	--	--	--	--	--	--	--	--	4/12/2022
Indeno(1,2,3-cd)pyrene	Chronic	--	--	--	--	--	--	--	--	4/12/2022
Indeno(1,2,3-cd)pyrene	Subchronic	--	--	--	--	--	--	--	--	4/12/2022
Pesticides										
Dieldrin	Chronic	0.00005	mg/kg-day	1	0.00005	mg/kg-day	HP	100	IRIS	4/12/2022
Dieldrin	Subchronic	0.00005	mg/kg-day	1	0.00005	mg/kg-day	HP	100	HEAST	7/31/1997
Polychlorinated Biphenyls (PCBs)										
Aroclor 1254	Chronic	0.00002	mg/kg-day	1	0.00002	mg/kg-day	DM; IM; OC	300	IRIS	4/12/2022
Aroclor 1254	Subchronic	0.00003	mg/kg-day	1	0.00003	mg/kg-day	NV	300	ATSDR	2/1/2022
Aroclor 1260	Chronic	--	--	--	--	--	--	--	--	4/12/2022
Aroclor 1260	Subchronic	--	--	--	--	--	--	--	--	4/12/2022
Polychlorinated Biphenyls (PCBs) - Congeners [4]										
PCBC TEQ MAMMAL HALFND	Chronic	7E-10	mg/kg-day	1	7E-10	mg/kg-day	DV; EN; RP	30	IRIS	4/12/2022
PCBC TEQ MAMMAL HALFND	Subchronic	2E-08	mg/kg-day	1	2E-08	mg/kg-day	IM	30	ATSDR Final	2/1/2022
Dioxins and Furans [4]										
DIOXIN TEQ MAMMAL HALFND	Chronic	7E-10	mg/kg-day	1	7E-10	mg/kg-day	DV; EN; RP	30	IRIS	4/12/2022
DIOXIN TEQ MAMMAL HALFND	Subchronic	2E-08	mg/kg-day	1	2E-08	mg/kg-day	IM	30	ATSDR Final	2/1/2022
Metals										
Aluminum	Chronic	1	mg/kg-day	1	1	mg/kg-day	NV	100	PPRTV Current	4/12/2022
Aluminum	Subchronic	1	mg/kg-day	1	1	mg/kg-day	NV	100	ATSDR Final	2/1/2022
Antimony	Chronic	0.0004	mg/kg-day	0.15	0.00006	mg/kg-day	HM; OT	1000	IRIS	4/12/2022
Antimony	Subchronic	0.0004	mg/kg-day	0.15	0.00006	mg/kg-day	OT	1000	PPRTV Current	4/12/2022
Arsenic	Chronic	0.0003	mg/kg-day	1	0.0003	mg/kg-day	CV; DM	3	IRIS	4/12/2022
Arsenic	Subchronic	0.005	mg/kg-day	1	0.005	mg/kg-day	DM	10	PPRTV Archive	4/12/2022
Cadmium (Diet)	Chronic	0.001	mg/kg-day	0.025	0.000025	mg/kg-day	UR	10	IRIS	4/12/2022
Cadmium (Diet)	Subchronic	0.0005	mg/kg-day	0.025	0.0000125	mg/kg-day	MS	100	ATSDR Final	2/1/2022
Chromium, Total	Chronic	0.003	mg/kg-day	0.025	0.000075	mg/kg-day	N/A	900	IRIS	4/12/2022
Chromium, Total	Subchronic	0.005	mg/kg-day	0.025	0.000125	mg/kg-day	HM	100	ATSDR Final	2/1/2022

Table A-5.1
Non-Cancer Toxicity Data - Oral/Dermal
Human Health Risk Assessment
Shaffer Equipment/Arbuckle Creek Area Superfund Site, Minden, West Virginia

Constituent of Interest	Chronic/ Subchronic [3]	Oral RfD		Oral Absorption Effiency for Dermal [1]	Absorbed RfD for Dermal [2]		Primary Target Organ/System(s)	Combined Uncertainty/ Modifying Factors	RfD: Target Organ(s)	
		Value	Units		Value	Units			Source(s)	Date(s) (MM/DD/YYYY)
Cobalt	Chronic	0.0003	mg/kg-day	1	0.0003	mg/kg-day	EN	3000	PPRTV Current	4/12/2022
Cobalt	Subchronic	0.003	mg/kg-day	1	0.003	mg/kg-day	EN	300	PPRTV Current	4/12/2022
Iron	Chronic	0.7	mg/kg-day	1	0.7	mg/kg-day	GI	1.5	PPRTV Current	4/12/2022
Iron	Subchronic	0.7	mg/kg-day	1	0.7	mg/kg-day	GI	1.5	PPRTV Current	4/12/2022
Manganese (Non-Diet)	Chronic	0.024	mg/kg-day	0.04	0.00096	mg/kg-day	NV	3	IRIS	4/12/2022
Manganese (Non-Diet)	Subchronic	0.024	mg/kg-day	0.04	0.00096	mg/kg-day	NV	3	IRIS	4/12/2022
Thallium	Chronic	0.00001	mg/kg-day	1	0.00001	mg/kg-day	DM	3000	PPRTV Screen	4/12/2022
Thallium	Subchronic	0.00004	mg/kg-day	1	0.00004	mg/kg-day	DM	1000	PPRTV Screen	4/12/2022

Notes:

-- = No Value; mg/kg-day = milligrams per kilogram -day; N/A = None Applicable; RfD = Reference Dose

(1) Source: U.S. Environmental Protection Agency (EPA) July 2004. Risk Assessment Guidance for Superfund. Volume 1: Human Health Evaluation Manual (Part E, Supplemental Guidance for Dermal Risk Assessment) Final. Office of Emergency and Remedial Response. Washington D.C. EPA/540/R/99/005.

(2) To derive the Absorbed RfD for Dermal, the oral RfD is multiplied by the oral absorption efficiency.

(3) If no subchronic toxicity value is available, then the chronic value is used in the calculations.

(4) TEQ indicates 2,3,7,8-Tetrachlorodibenzodioxin (TCDD) Toxic Equivalency.

RfD: Target Organ Source Information:

ATSDR = Agency for Toxic Substance & Disease Registry (https://www.atsdr.cdc.gov)
HEAST = Health Effects Assessment Summary Tables (https://rais.ornl.gov/epa/heast/table1.htm)
IRIS = Integrated Risk Information System (https://www.epa.gov/iris)

PPRTV = Provisional Peer-Reviewed Toxicity Values (https://www.hhpprtv.ornl.gov/)

Target Organ Codes:

CV = Cardiovascular	HM = Hematological	OC = Ocular
DM = Dermal	HP = Hepatic	OT = Other
DV = Developmental	IM = Immune	RP = Reproductive
EN = Endocrine	MS = Musculoskeletal	UR = Urinary
GI = Gastrointestinal	NV = Nervous	

Table A-5.2
Non-Cancer Toxicity Data - Inhalation
Human Health Risk Assessment
Shaffer Equipment/Arbuckle Creek Area Superfund Site, Minden, West Virginia

Constituent of Interest	Chronic/ Subchronic [1]	Inhalation RfC		Primary Target Organ/System(s)	Combined Uncertainty/ Modifying Factors	RfC: Target Organ(s)	
		Value	Units			Source(s)	Date(s) (MM/DD/YYYY)
Semi-volatile Organic Compounds (SVOCs)							
1,2,4,5-Tetrachlorobenzene	Chronic	--	--	--	--	--	4/12/2022
1,2,4,5-Tetrachlorobenzene	Subchronic	--	--	--	--	--	4/12/2022
Benzo(a)anthracene	Chronic	--	--	--	--	--	4/12/2022
Benzo(a)anthracene	Subchronic	--	--	--	--	--	4/12/2022
Benzo(a)pyrene	Chronic	0.000002	mg/m³	DV	3000	IRIS	4/12/2022
Benzo(a)pyrene	Subchronic	0.000002	mg/m³	DV	3000	IRIS	4/12/2022
Benzo(b)fluoranthene	Chronic	--	--	--	--	--	4/12/2022
Benzo(b)fluoranthene	Subchronic	--	--	--	--	--	4/12/2022
Dibenz(a,h)anthracene	Chronic	--	--	--	--	--	4/12/2022
Dibenz(a,h)anthracene	Subchronic	--	--	--	--	--	4/12/2022
Indeno(1,2,3-cd)pyrene	Chronic	--	--	--	--	--	4/12/2022
Indeno(1,2,3-cd)pyrene	Subchronic	--	--	--	--	--	4/12/2022
Pesticides							
Dieldrin	Chronic	--	--	--	--	--	4/12/2022
Dieldrin	Subchronic	--	--	--	--	--	4/12/2022
Polychlorinated Biphenyls (PCBs)							
Aroclor 1254	Chronic	--	--	--	--	--	4/12/2022
Aroclor 1254	Subchronic	--	--	--	--	--	4/12/2022
Aroclor 1260	Chronic	--	--	--	--	--	4/12/2022
Aroclor 1260	Subchronic	--	--	--	--	--	4/12/2022
Polychlorinated Biphenyls (PCBs) - Congeners [2]							
PCBC TEQ MAMMAL HALFND	Chronic	0.00000004	mg/m³	DV; EN; HM; HP; RP; RS	N/A	Cal EPA	4/12/2022
PCBC TEQ MAMMAL HALFND	Subchronic	0.00000004	mg/m³	DV; EN; HM; HP; RP; RS	N/A	Cal EPA	4/12/2022
Dioxins and Furans [2]							
DIOXIN TEQ MAMMAL HALFND	Chronic	0.00000004	mg/m³	DV; EN; HM; HP; RP; RS	N/A	Cal EPA	4/12/2022
DIOXIN TEQ MAMMAL HALFND	Subchronic	0.00000004	mg/m³	DV; EN; HM; HP; RP; RS	N/A	Cal EPA	4/12/2022
Metals							
Aluminum	Chronic	0.005	mg/m³	NV	300	PPRTV Current	4/12/2022
Aluminum	Subchronic	0.005	mg/m³	NV	300	PPRTV Current	4/12/2022
Antimony	Chronic	0.0003	mg/m³	RS	30	ATSDR Final	2/1/2022
Antimony	Subchronic	0.001	mg/m³	RS	100	ATSDR Final	2/1/2022
Arsenic	Chronic	0.000015	mg/m³	CV; DM; DV; NV; RP; RS	N/A	Cal EPA	4/12/2022
Arsenic	Subchronic	0.000015	mg/m³	CV; DM; DV; NV; RP; RS	N/A	Cal EPA	4/12/2022
Cadmium (Diet)	Chronic	0.00001	mg/m³	UR	3	ATSDR Final	2/1/2022
Cadmium (Diet)	Subchronic	0.0009	mg/m³	UR	N/A	PPRTV Archive	4/12/2022
Chromium, Total	Chronic	0.0001	mg/m³	RS	300	IRIS	4/12/2022
Chromium, Total	Subchronic	0.0003	mg/m³	RS	30	ATSDR Final	2/1/2022

Table A-5.2
Non-Cancer Toxicity Data - Inhalation
Human Health Risk Assessment
Shaffer Equipment/Arbuckle Creek Area Superfund Site, Minden, West Virginia

Constituent of Interest	Chronic/ Subchronic (1)	Inhalation RfC		Primary Target Organ/System(s)	Combined Uncertainty/ Modifying Factors	RfC: Target Organ(s)	
		Value	Units			Source(s)	Date(s) (MM/DD/YYYY)
Cobalt	Chronic	0.000006	mg/m³	RS	300	PPRTV Current	4/12/2022
Cobalt	Subchronic	0.00002	mg/m³	RS	100	PPRTV Current	4/12/2022
Iron	Chronic	--	--	--	--	--	4/12/2022
Iron	Subchronic	--	--	--	--	--	4/12/2022
Manganese (Non-Diet)	Chronic	0.00005	mg/m³	NV	1000	IRIS	4/12/2022
Manganese (Non-Diet)	Subchronic	0.00005	mg/m³	NV	1000	IRIS	4/12/2022
Thallium	Chronic	--	--	--	--	--	4/12/2022
Thallium	Subchronic	--	--	--	--	--	4/12/2022

Notes:
-- = No Value
N/A = Not Available
RfC = Reference Concentration
mg/m³ = milligrams per cubic meter
(1) If no subchronic toxicity value is available, then the chronic value is used in the calculations.
(2) TEQ indicates 2,3,7,8-Tetrachlorodibenzodioxin (TCDD) Toxic Equivalency.

Target Organ Source Information:
ATSDR = Agency for Toxic Substance & Disease Registry (https://www.atsdr.cdc.gov)
Cal EPA = California Environmental Protection Agency (https://calepa.ca.gov/)
IRIS = Integrated Risk Information System (https://www.epa.gov/iris)
PPRTV = Provisional Peer-Reviewed Toxicity Values (https://www.hhpprtv.ornl.gov/)

Target Organ Codes:
CV = Cardiovascular
DM = Dermal
DV = Developmental
EN = Endocrine
HM = Hematological
HP = Hepatic
NV = Nervous
RP = Reproductive
RS = Respiratory
UR = Urinary

Table A-6.1
Cancer Toxicity Data - Oral/Dermal
Human Health Risk Assessment
Shaffer Equipment/Arbuckle Creek Area Superfund Site, Minden, West Virginia

Constituent of Interest	Oral Cancer Slope Factor		Oral Absorption Effiency for Dermal [1]	Absorbed Cancer Slope Factor for Dermal [2]		Weight of Evidence/ Cancer Guideline Description	Cancer Slope Factor	
	Value	Units		Value	Units		Source(s)	Date(s) (MM/DD/YYYY)
Semi-Volatile Organic Compounds (SVOCs)								
1,2,4,5-Tetrachlorobenzene	--	--	--	--	--	--	--	4/12/2022
Benzo(a)anthracene	0.1	kg-day/mg	1	0.1	kg-day/mg	Carcinogenic to Humans	BaP x TEF	4/12/2022
Benzo(a)pyrene	1	kg-day/mg	1	1	kg-day/mg	Carcinogenic to Humans	IRIS	4/12/2022
Benzo(b)fluoranthene	0.1	kg-day/mg	1	0.1	kg-day/mg	Carcinogenic to Humans	BaP x TEF	4/12/2022
Dibenz(a,h)anthracene	1	kg-day/mg	1	1	kg-day/mg	Carcinogenic to Humans	BaP x TEF	4/12/2022
Indeno(1,2,3-cd)pyrene	0.1	kg-day/mg	1	0.1	kg-day/mg	Carcinogenic to Humans	BaP x TEF	4/12/2022
Pesticides								
Dieldrin	16	kg-day/mg	1	16	kg-day/mg	B2	IRIS	4/12/2022
Polychlorinated Biphenyls (PCBs)								
Aroclor 1254	2	kg-day/mg	1	2	kg-day/mg	B2	IRIS[3]	4/12/2022
Aroclor 1260	2	kg-day/mg	1	2	kg-day/mg	B2	IRIS[3]	4/12/2022
Polychlorinated Biphenyls (PCBs) - Congeners [4]								
PCBC TEQ MAMMAL HALFND	130000	kg-day/mg	1	130000	kg-day/mg	N/A	Cal EPA	4/12/2022
Dioxins and Furans [4]								
DIOXIN TEQ MAMMAL HALFND	130000	kg-day/mg	1	130000	kg-day/mg	N/A	Cal EPA	4/12/2022
Metals								
Aluminum	--	--	--	--	--	--	--	4/12/2022
Antimony	--	--	--	--	--	--	--	4/12/2022
Arsenic	1.5	kg-day/mg	1	1.5	kg-day/mg	A	IRIS	4/12/2022
Cadmium (Diet)	--	--	--	--	--	--	--	4/12/2022
Chromium, Total	0.5	kg-day/mg	0.025	20	kg-day/mg	N/A	Cal EPA	4/12/2022
Cobalt	--	--	--	--	--	--	--	4/12/2022
Iron	--	--	--	--	--	--	--	4/12/2022
Manganese (Non-Diet)	--	--	--	--	--	--	--	4/12/2022
Thallium	--	--	--	--	--	--	--	4/12/2022

Notes:

-- = No Value; $(mg/kg\text{-}day)^{-1}$ = one over milligrams per kilogram-day

(1) Source: U.S. Environmental Protection Agency (EPA) July 2004. Risk Assessment Guidance for Superfund. Volume 1: Human Health Evaluation Manual (Part E, Supplemental Guidance for Dermal Risk Assessment) Final. Office of Emergency and Remedial Response. Washington D.C. EPA/540/R/99/005.

(2) To derive the Absorbed Cancer Slope Factor for Dermal, the oral cancer slope factor is divided by the oral absorption efficiency for dermal.

(3) Surrogate toxciity for PCBs (high toxicity and peristence) selected in IRIS.

(4) TEQ indicates 2,3,7,8-Tetrachlorodibenzodioxin (TCDD) Toxic Equivalency.

Sources:

BaP x TEF = Carcinogencity determined by adjusting benzo(a)pyrene (BaP) by a toxicity equivalence factor (TEF)
TEFs used were 0.1 (benzo[a]anthracene, benzo[b]fluoranthene, indeno[(1,2,3-cd])pyrene) and 1 (dibenz[a,h]anthracene).

Cal EPA = California Environmental Protection Agency (https://calepa.ca.gov/)

IRIS = Integrated Risk Information System (https://www.epa.gov/iris)

USEPA, 1986 = Guidelines for Carcinogen Risk Assessment

USEPA, 2005 = Guidelines for Carcinogen Risk Assessment

Weight of Evidence:

A = Human Carcinogen (USEPA, 1986)

B2 = Probable Human Carcinogen - Based on Sufficient Evidence in Animals (USEPA, 1986)
Carcinogenic to Humans (USEPA, 2005)

N/A = Not Available

Table A-6.2
Cancer Toxicity Data - Inhalation
Human Health Risk Assessment
Shaffer Equipment/Arbuckle Creek Area Superfund Site, Minden, West Virginia

Constituent of Interest	Inhalation Unit Risk		Weight of Evidence/ Cancer Guideline Description	Inhalation Unit Risk	
	Value	Units		Source(s)	Date(s) (MM/DD/YYYY)
Semi-Volatile Organic Compounds (SVOCs)					
1,2,4,5-Tetrachlorobenzene	--	--	--	--	4/12/2022
Benzo(a)anthracene	0.00006	$m^3/\mu g$	Carcinogenic to Humans	BaP x TEF	4/12/2022
Benzo(a)pyrene	0.0006	$m^3/\mu g$	Carcinogenic to Humans	IRIS	4/12/2022
Benzo(b)fluoranthene	0.00006	$m^3/\mu g$	Carcinogenic to Humans	BaP x TEF	4/12/2022
Dibenz(a,h)anthracene	0.0006	$m^3/\mu g$	Carcinogenic to Humans	BaP x TEF	4/12/2022
Indeno(1,2,3-cd)pyrene	0.00006	$m^3/\mu g$	Carcinogenic to Humans	BaP x TEF	4/12/2022
Pesticides					
Dieldrin	0.0046	$m^3/\mu g$	B2	IRIS	4/12/2022
Polychlorinated Biphenyls (PCBs)					
Aroclor 1254	0.000571	$m^3/\mu g$	B2	IRIS(1)	4/12/2022
Aroclor 1260	0.000571	$m^3/\mu g$	B2	IRIS(1)	4/12/2022
Polychlorinated Biphenyls (PCBs) - Congeners (2)					
PCBC TEQ MAMMAL HALFND	38	$m^3/\mu g$	N/A	Cal EPA	4/12/2022
Dioxins and Furans (2)					
DIOXIN TEQ MAMMAL HALFND	38	$m^3/\mu g$	N/A	Cal EPA	4/12/2022
Metals					
Aluminum	--	--	--	--	4/12/2022
Antimony	--	--	--	--	4/12/2022
Arsenic	0.0043	$m^3/\mu g$	A	IRIS	4/12/2022
Cadmium (Diet)	0.0018	$m^3/\mu g$	B1	IRIS	4/12/2022
Chromium, Total	0.084	$m^3/\mu g$	Known/Likely Human Carcinogen	IRIS(3)	4/12/2022
Cobalt	0.009	$m^3/\mu g$	LI	PPRTV Current	4/12/2022
Iron	--	--	--	--	4/12/2022
Manganese (Non-Diet)	--	--	--	--	4/12/2022
Thallium	--	--	--	--	4/12/2022

Notes:

-- = No Value

$(\mu g/m^3)$-1 = one over micrograms per cubic meter

(1) Surrogate toxciity for PCBs (high toxicity and peristence) selected in IRIS.

(2) TEQ indicates 2,3,7,8-Tetrachlorodibenzodioxin (TCDD) Toxic Equivalency.

(3) IRIS IUR (0.012 $m^3/\mu g$) adjusted by a factor of 7 per USEPA RSL guidance.

Sources:

BaP x TEF = Carcinogencity determined by adjusting benzo(a)pyrene (BaP) by a toxicity equivalence factor (TEF)

TEFs used were 0.1 (benzo[a]anthracene, benzo[b]fluoranthene, indeno[(1,2,3-cd])pyrene) and 1 (dibenz[a,h]anthracene).

Cal EPA = California Environmental Protection Agency (https://calepa.ca.gov/)

IRIS = Integrated Risk Information System (https://www.epa.gov/iris)

PPRTV = Provisional Peer Reviewed Toxicity Values for Superfund (https://hhpprtv.ornl.gov/)

USEPA, 1986 = Guidelines for Carcinogen Risk Assessment

USEPA, 1996 = Proposed Guidelines for Carcinogen Risk Assessment

USEPA, 2005 = Guidelines for Carcinogen Risk Assessment

Weight of Evidence:

A = Human Carcinogen (USEPA, 1986)

B1 = Probable Human Carcinogen - Based on Limited Evidence in Humans (USEPA, 1986)

B2 = Probable Human Carcinogen - Based on Sufficient Evidence in Animals (USEPA, 1986)

Carcinogenic to Humans (USEPA, 2005)

Known/Likely Human Carcinogen (USEPA, 1996)

LI = Likely to be Carcinogenic to Humans (PPRTV)

Table A-7.1
Calculation of Chemical Non-Cancer Hazards
Reasonable Maximum Exposure (Site-Wide)
Future On-Site Hypothetical Resident (Adult) - Surface Soil (0 - 0.5 feet)
Human Health Risk Assessment
Shaffer Equipment/Arbuckle Creek Area Superfund Site, Minden, West Virginia

Scenario Timeframe:	Future
Receptor Population:	On-Site Hypothetical Resident
Receptor Age:	Adult

Medium	Exposure Medium	Exposure Point	Exposure Route	Chemical of Potential Concern	EPC		Cancer Risk Calculations					Non-Cancer Hazard Calculations				
					Value	Units	Intake/Exposure Concentration		CSF/Unit Risk		Cancer Risk [1]	Intake/Exposure Concentration		RfD/RfC		Hazard Quotient [1]
							Value	Units	Value	Units		Value	Units	Value	Units	
Soil	Surface Soil	0 - 0.5 feet	Ingestion													
				Semi-volatile Organic Compounds (SVOCs)												
				Benzo(a)pyrene	1.14E-01	mg/kg	(2)	--	--	--	--	1.37E-07	mg/kg-day	3.00E-04	mg/kg-day	0.0005
				Polychlorinated Biphenyls (PCBs)												
				Aroclor 1260	1.60E+00	mg/kg	(2)	--	--	--	--	1.92E-06	mg/kg-day	--	--	--
				Polychlorinated Biphenyls (PCBs) - Congeners												
				PCBC TEQ MAMMAL HALFND	2.90E-05	mg/kg	(2)	--	--	--	--	3.48E-11	mg/kg-day	7.00E-10	mg/kg-day	0.05
				Dioxins and Furans												
				DIOXIN TEQ MAMMAL HALFND	2.08E-05	mg/kg	(2)	--	--	--	--	2.49E-11	mg/kg-day	7.00E-10	mg/kg-day	0.04
				Metals (Total)												
				Aluminum	8.54E+03	mg/kg	(2)	--	--	--	--	1.02E-02	mg/kg-day	1.00E+00	mg/kg-day	0.01
				Arsenic	8.64E+00	mg/kg	(2)	--	--	--	--	6.21E-06	mg/kg-day	3.00E-04	mg/kg-day	0.02
				Chromium, Total	1.26E+01	mg/kg	(2)	--	--	--	--	1.51E-05	mg/kg-day	3.00E-03	mg/kg-day	0.005
				Cobalt	1.10E+01	mg/kg	(2)	--	--	--	--	1.32E-05	mg/kg-day	3.00E-04	mg/kg-day	0.04
				Iron	2.50E+04	mg/kg	(2)	--	--	--	--	3.00E-02	mg/kg-day	7.00E-01	mg/kg-day	0.04
				Manganese (Non-Diet)	4.72E+02	mg/kg	(2)	--	--	--	--	5.66E-04	mg/kg-day	2.40E-02	mg/kg-day	0.02
				Thallium	1.44E-01	mg/kg	(2)	--	--	--	--	1.73E-07	mg/kg-day	1.00E-05	mg/kg-day	0.02
			Exp. Route Total								--					0.2
			Dermal													
				Semi-volatile Organic Compounds (SVOCs)												
				Benzo(a)pyrene	1.14E-01	mg/kg	(2)	--	--	--	--	7.50E-08	mg/kg-day	3.00E-04	mg/kg-day	0.0003
				Polychlorinated Biphenyls (PCBs)												
				Aroclor 1260	1.60E+00	mg/kg	(2)	--	--	--	--	1.13E-06	mg/kg-day	--	--	--
				Polychlorinated Biphenyls (PCBs) - Congeners												
				PCBC TEQ MAMMAL HALFND	2.90E-05	mg/kg	(2)	--	--	--	--	4.41E-12	mg/kg-day	7.00E-10	mg/kg-day	0.006
				Dioxins and Furans												
				DIOXIN TEQ MAMMAL HALFND	2.08E-05	mg/kg	(2)	--	--	--	--	3.15E-12	mg/kg-day	7.00E-10	mg/kg-day	0.005
				Metals (Total)												
				Aluminum	8.54E+03	mg/kg	(2)	--	--	--	--	4.32E-04	mg/kg-day	1.00E+00	mg/kg-day	0.0004
				Arsenic	8.64E+00	mg/kg	(2)	--	--	--	--	1.31E-06	mg/kg-day	3.00E-04	mg/kg-day	0.004
				Chromium, Total	1.26E+01	mg/kg	(2)	--	--	--	--	6.37E-07	mg/kg-day	7.50E-05	mg/kg-day	0.008
				Cobalt	1.10E+01	mg/kg	(2)	--	--	--	--	5.58E-07	mg/kg-day	3.00E-04	mg/kg-day	0.002
				Iron	2.50E+04	mg/kg	(2)	--	--	--	--	1.27E-03	mg/kg-day	7.00E-01	mg/kg-day	0.002
				Manganese (Non-Diet)	4.72E+02	mg/kg	(2)	--	--	--	--	2.39E-05	mg/kg-day	9.60E-04	mg/kg-day	0.02
				Thallium	1.44E-01	mg/kg	(2)	--	--	--	--	7.29E-09	mg/kg-day	1.00E-05	mg/kg-day	0.0007
			Exp. Route Total								--					0.05
		Exp. Point Total									--					0.3
	Exp. Medium Total										--					0.3
	Outdoor Air	Particulates above Site	Inhalation													
				Semi-volatile Organic Compounds (SVOCs)												
				Benzo(a)pyrene	8.38E-08	µg/m³	(2)	--	--	--	--	8.04E-08	µg/m³	2.00E-03	µg/m³	0.00004
				Polychlorinated Biphenyls (PCBs)												
				Aroclor 1260	1.18E-06	µg/m³	(2)	--	--	--	--	1.13E-06	µg/m³	--	--	--
				Polychlorinated Biphenyls (PCBs) - Congeners												
				PCBC TEQ MAMMAL HALFND	2.13E-11	µg/m³	(2)	--	--	--	--	2.05E-11	µg/m³	4.00E-05	µg/m³	0.0000005
				Dioxins and Furans												
				DIOXIN TEQ MAMMAL HALFND	1.53E-11	µg/m³	(2)	--	--	--	--	1.46E-11	µg/m³	4.00E-05	µg/m³	0.0000004

Table A-7.1
Calculation of Chemical Non-Cancer Hazards
Reasonable Maximum Exposure (Site-Wide)
Future On-Site Hypothetical Resident (Adult) - Surface Soil (0 - 0.5 feet)
Human Health Risk Assessment
Shaffer Equipment/Arbuckle Creek Area Superfund Site, Minden, West Virginia

Scenario Timeframe:	Future
Receptor Population:	On-Site Hypothetical Resident
Receptor Age:	Adult

Medium	Exposure Medium	Exposure Point	Exposure Route	Chemical of Potential Concern	EPC		Cancer Risk Calculations					Non-Cancer Hazard Calculations				
					Value	Units	Intake/Exposure Concentration		CSF/Unit Risk		Cancer Risk [1]	Intake/Exposure Concentration		RfD/RfC		Hazard Quotient [1]
							Value	Units	Value	Units		Value	Units	Value	Units	
				Metals (Total)												
				Aluminum	6.28E-03	µg/m³	(2)	--	--	--	--	6.02E-03	µg/m³	5.00E+00	µg/m³	0.001
				Arsenic	6.35E-06	µg/m³	(2)	--	--	--	--	6.09E-06	µg/m³	1.50E-02	µg/m³	0.0004
				Chromium, Total	9.25E-06	µg/m³	(2)	--	--	--	--	8.87E-06	µg/m³	1.00E-01	µg/m³	0.00009
				Cobalt	8.10E-06	µg/m³	(2)	--	--	--	--	7.77E-06	µg/m³	6.00E-03	µg/m³	0.001
				Iron	1.84E-02	µg/m³	(2)	--	--	--	--	1.76E-02	µg/m³	--	--	--
				Manganese (Non-Diet)	3.47E-04	µg/m³	(2)	--	--	--	--	3.33E-04	µg/m³	5.00E-02	µg/m³	0.007
				Thallium	1.06E-07	µg/m³	(2)	--	--	--	--	1.02E-07	µg/m³	--	--	--
			Exp. Route Total								--					0.01
		Exp. Point Total									--					0.01
		Vapors above Site	Inhalation													
				Polychlorinated Biphenyls (PCBs)												
				Aroclor 1260	4.33E-03	µg/m³	(2)	--	--	--	--	4.15E-03	µg/m³	--	--	--
				Polychlorinated Biphenyls (PCBs) - Congeners												
				PCBC TEQ MAMMAL HALFND	1.00E-08	µg/m³	(2)	--	--	--	--	9.62E-09	µg/m³	4.00E-05	µg/m³	0.0002
				Dioxins and Furans												
				DIOXIN TEQ MAMMAL HALFND	7.18E-09	µg/m³	(2)	--	--	--	--	6.89E-09	µg/m³	4.00E-05	µg/m³	0.0002
			Exp. Route Total								--					0.0004
		Exp. Point Total									--					0.0004
	Exp. Medium Total										--					0.01
Medium Total											--					0.3
Notes:											**--**					**0.3**

Total of Receptor Risks Across All Media — **Total of Receptor Hazards Across All Media**

(1) CR and HQs are rounded to one non-zero digit; cumulative totals may be slightly higher or lower depending on degree of rounding.

(2) Cancer risk is only presented for the lifetime receptor, whereas non-cancer hazard is calculated separately for the child and adult receptor.

Table A-7.2
Calculation of Chemical Non-Cancer Hazards
Reasonable Maximum Exposure (Site-Wide)
Future On-Site Hypothetical Resident (Child) - Surface Soil (0 - 0.5 feet)
Human Health Risk Assessment
Shaffer Equipment/Arbuckle Creek Area Superfund Site, Minden, West Virginia

Scenario Timeframe:	Future
Receptor Population:	On-Site Hypothetical Resident
Receptor Age:	Child

Medium	Exposure Medium	Exposure Point	Exposure Route	Chemical of Potential Concern	EPC		Cancer Risk Calculations					Non-Cancer Hazard Calculations				
					Value	Units	Intake/Exposure Concentration		CSF/Unit Risk		Cancer Risk [1]	Intake/Exposure Concentration		RfD/RfC		Hazard Quotient [1]
							Value	Units	Value	Units		Value	Units	Value	Units	
Soil	Surface Soil	0 - 0.5 feet	Ingestion													
				Semi-volatile Organic Compounds (SVOCs)												
				Benzo(a)pyrene	1.14E-01	mg/kg	(2)	--	--	--	--	1.46E-06	mg/kg-day	3.00E-04	mg/kg-day	0.005
				Polychlorinated Biphenyls (PCBs)												
				Aroclor 1260	1.60E+00	mg/kg	(2)	--	--	--	--	2.05E-05	mg/kg-day	--	--	--
				Polychlorinated Biphenyls (PCBs) - Congeners												
				PCBC TEQ MAMMAL HALFND	2.90E-05	mg/kg	(2)	--	--	--	--	3.71E-10	mg/kg-day	7.00E-10	mg/kg-day	0.5
				Dioxins and Furans												
				DIOXIN TEQ MAMMAL HALFND	2.08E-05	mg/kg	(2)	--	--	--	--	2.66E-10	mg/kg-day	7.00E-10	mg/kg-day	0.4
				Metals (Total)												
				Aluminum	8.54E+03	mg/kg	(2)	--	--	--	--	1.09E-01	mg/kg-day	1.00E+00	mg/kg-day	0.1
				Arsenic	8.64E+00	mg/kg	(2)	--	--	--	--	6.63E-05	mg/kg-day	3.00E-04	mg/kg-day	0.2
				Chromium, Total	1.26E+01	mg/kg	(2)	--	--	--	--	1.61E-04	mg/kg-day	3.00E-03	mg/kg-day	0.05
				Cobalt	1.10E+01	mg/kg	(2)	--	--	--	--	1.41E-04	mg/kg-day	3.00E-04	mg/kg-day	0.5
				Iron	2.50E+04	mg/kg	(2)	--	--	--	--	3.20E-01	mg/kg-day	7.00E-01	mg/kg-day	0.5
				Manganese (Non-Diet)	4.72E+02	mg/kg	(2)	--	--	--	--	6.04E-03	mg/kg-day	2.40E-02	mg/kg-day	0.3
				Thallium	1.44E-01	mg/kg	(2)	--	--	--	--	1.84E-06	mg/kg-day	1.00E-05	mg/kg-day	0.2
			Exp. Route Total								--					3
			Dermal													
				Semi-volatile Organic Compounds (SVOCs)												
				Benzo(a)pyrene	1.14E-01	mg/kg	(2)	--	--	--	--	4.50E-07	mg/kg-day	3.00E-04	mg/kg-day	0.001
				Polychlorinated Biphenyls (PCBs)												
				Aroclor 1260	1.60E+00	mg/kg	(2)	--	--	--	--	6.80E-06	mg/kg-day	--	--	--
				Polychlorinated Biphenyls (PCBs) - Congeners												
				PCBC TEQ MAMMAL HALFND	2.90E-05	mg/kg	(2)	--	--	--	--	2.64E-11	mg/kg-day	7.00E-10	mg/kg-day	0.04
				Dioxins and Furans												
				DIOXIN TEQ MAMMAL HALFND	2.08E-05	mg/kg	(2)	--	--	--	--	1.89E-11	mg/kg-day	7.00E-10	mg/kg-day	0.03
				Metals (Total)												
				Aluminum	8.54E+03	mg/kg	(2)	--	--	--	--	2.59E-03	mg/kg-day	1.00E+00	mg/kg-day	0.003
				Arsenic	8.64E+00	mg/kg	(2)	--	--	--	--	7.86E-06	mg/kg-day	3.00E-04	mg/kg-day	0.03
				Chromium, Total	1.26E+01	mg/kg	(2)	--	--	--	--	3.82E-06	mg/kg-day	7.50E-05	mg/kg-day	0.05
				Cobalt	1.10E+01	mg/kg	(2)	--	--	--	--	3.34E-06	mg/kg-day	3.00E-04	mg/kg-day	0.01
				Iron	2.50E+04	mg/kg	(2)	--	--	--	--	7.59E-03	mg/kg-day	7.00E-01	mg/kg-day	0.01
				Manganese (Non-Diet)	4.72E+02	mg/kg	(2)	--	--	--	--	1.43E-04	mg/kg-day	9.60E-04	mg/kg-day	0.1
				Thallium	1.44E-01	mg/kg	(2)	--	--	--	--	4.37E-08	mg/kg-day	1.00E-05	mg/kg-day	0.004
			Exp. Route Total								--					0.3
		Exp. Point Total									--					3
	Exp. Medium Total										--					3
	Outdoor Air	Particulates above Site	Inhalation													
				Semi-volatile Organic Compounds (SVOCs)												
				Benzo(a)pyrene	8.38E-08	µg/m³	(2)	--	--	--	--	8.04E-08	µg/m³	2.00E-03	µg/m³	0.00004
				Polychlorinated Biphenyls (PCBs)												
				Aroclor 1260	1.18E-06	µg/m³	(2)	--	--	--	--	1.13E-06	µg/m³	--	--	--
				Polychlorinated Biphenyls (PCBs) - Congeners												
				PCBC TEQ MAMMAL HALFND	2.13E-11	µg/m³	(2)	--	--	--	--	2.05E-11	µg/m³	4.00E-05	µg/m³	0.0000005
				Dioxins and Furans												
				DIOXIN TEQ MAMMAL HALFND	1.53E-11	µg/m³	(2)	--	--	--	--	1.46E-11	µg/m³	4.00E-05	µg/m³	0.0000004

Table A-7.2
Calculation of Chemical Non-Cancer Hazards
Reasonable Maximum Exposure (Site-Wide)
Future On-Site Hypothetical Resident (Child) - Surface Soil (0 - 0.5 feet)
Human Health Risk Assessment
Shaffer Equipment/Arbuckle Creek Area Superfund Site, Minden, West Virginia

Scenario Timeframe:	Future
Receptor Population:	On-Site Hypothetical Resident
Receptor Age:	Child

Medium	Exposure Medium	Exposure Point	Exposure Route	Chemical of Potential Concern	EPC		Cancer Risk Calculations					Non-Cancer Hazard Calculations				
					Value	Units	Intake/Exposure Concentration		CSF/Unit Risk		Cancer Risk [1]	Intake/Exposure Concentration		RfD/RfC		Hazard Quotient [1]
							Value	Units	Value	Units		Value	Units	Value	Units	
				Metals (Total)												
				Aluminum	6.28E-03	µg/m³	(2)	--	--	--	--	6.02E-03	µg/m³	5.00E+00	µg/m³	0.001
				Arsenic	6.35E-06	µg/m³	(2)	--	--	--	--	6.09E-06	µg/m³	1.50E-02	µg/m³	0.0004
				Chromium, Total	9.25E-06	µg/m³	(2)	--	--	--	--	8.87E-06	µg/m³	1.00E-01	µg/m³	0.00009
				Cobalt	8.10E-06	µg/m³	(2)	--	--	--	--	7.77E-06	µg/m³	6.00E-03	µg/m³	0.001
				Iron	1.84E-02	µg/m³	(2)	--	--	--	--	1.76E-02	µg/m³	--	--	--
				Manganese (Non-Diet)	3.47E-04	µg/m³	(2)	--	--	--	--	3.33E-04	µg/m³	5.00E-02	µg/m³	0.007
				Thallium	1.06E-07	µg/m³	(2)	--	--	--	--	1.02E-07	µg/m³	--	--	--
			Exp. Route Total								--					0.01
		Exp. Point Total									--					0.01
		Vapors above Site	Inhalation													
				Polychlorinated Biphenyls (PCBs)												
				Aroclor 1260	4.33E-03	µg/m³	(2)	--	--	--	--	4.15E-03	µg/m³	--	--	--
				Polychlorinated Biphenyls (PCBs) - Congeners												
				PCBC TEQ MAMMAL HALFND	1.00E-08	µg/m³	(2)	--	--	--	--	9.62E-09	µg/m³	4.00E-05	µg/m³	0.0002
				Dioxins and Furans												
				DIOXIN TEQ MAMMAL HALFND	7.18E-09	µg/m³	(2)	--	--	--	--	6.89E-09	µg/m³	4.00E-05	µg/m³	0.0002
			Exp. Route Total								--					0.0004
		Exp. Point Total									--					0.0004
	Exp. Medium Total										--					0.01
Medium Total											--					3
Notes:											**--**					**3**

Total of Receptor Risks Across All Media | **Total of Receptor Hazards Across All Media**

(1) CR and HQs are rounded to one non-zero digit; cumulative totals may be slightly higher or lower depending on degree of rounding.

(2) Cancer risk is only presented for the lifetime receptor, whereas non-cancer hazard is calculated separately for the child and adult receptor.

Table A-7.3
Calculation of Chemical Cancer Risks
Reasonable Maximum Exposure (Site-Wide)
Future On-Site Hypothetical Resident (Lifetime) - Surface Soil (0 - 0.5 feet)
Human Health Risk Assessment
Shaffer Equipment/Arbuckle Creek Area Superfund Site, Minden, West Virginia

Scenario Timeframe:	Future
Receptor Population:	On-Site Hypothetical Resident
Receptor Age:	Lifetime

Medium	Exposure Medium	Exposure Point	Exposure Route	Chemical of Potential Concern	EPC		Cancer Risk Calculations					Non-Cancer Hazard Calculations				
					Value	Units	Intake/Exposure Concentration		CSF/Unit Risk		Cancer Risk [1]	Intake/Exposure Concentration		RfD/RfC		Hazard Quotient [1]
							Value	Units	Value	Units		Value	Units	Value	Units	
Soil	Surface Soil	0 - 0.5 feet	Ingestion													
				Semi-volatile Organic Compounds (SVOCs)												
				Benzo(a)pyrene	1.14E-01	mg/kg	7.44E-07	mg/kg-day	1.00E+00	1/(mg/kg-day)	7E-07	(2)	--	--	--	--
				Polychlorinated Biphenyls (PCBs)												
				Aroclor 1260	1.60E+00	mg/kg	2.30E-06	mg/kg-day	2.00E+00	1/(mg/kg-day)	5E-06	(2)	--	--	--	--
				Polychlorinated Biphenyls (PCBs) - Congeners												
				PCBC TEQ MAMMAL HALFND	2.90E-05	mg/kg	4.17E-11	mg/kg-day	1.30E+05	1/(mg/kg-day)	5E-06	(2)	--	--	--	--
				Dioxins and Furans												
				DIOXIN TEQ MAMMAL HALFND	2.08E-05	mg/kg	2.99E-11	mg/kg-day	1.30E+05	1/(mg/kg-day)	4E-06	(2)	--	--	--	--
				Metals (Total)												
				Aluminum	8.54E+03	mg/kg	1.23E-02	mg/kg-day	--	--	--	(2)	--	--	--	--
				Arsenic	8.64E+00	mg/kg	7.46E-06	mg/kg-day	1.50E+00	1/(mg/kg-day)	1E-05	(2)	--	--	--	--
				Chromium, Total	1.26E+01	mg/kg	8.21E-05	mg/kg-day	5.00E-01	1/(mg/kg-day)	4E-05	(2)	--	--	--	--
				Cobalt	1.10E+01	mg/kg	1.59E-05	mg/kg-day	--	--	--	(2)	--	--	--	--
				Iron	2.50E+04	mg/kg	3.60E-02	mg/kg-day	--	--	--	(2)	--	--	--	--
				Manganese (Non-Diet)	4.72E+02	mg/kg	6.79E-04	mg/kg-day	--	--	--	(2)	--	--	--	--
				Thallium	1.44E-01	mg/kg	2.07E-07	mg/kg-day	--	--	--	(2)	--	--	--	--
			Exp. Route Total								7E-05					--
			Dermal													
				Semi-volatile Organic Compounds (SVOCs)												
				Benzo(a)pyrene	1.14E-01	mg/kg	2.48E-07	mg/kg-day	1.00E+00	1/(mg/kg-day)	2E-07	(2)	--	--	--	--
				Polychlorinated Biphenyls (PCBs)												
				Aroclor 1260	1.60E+00	mg/kg	9.06E-07	mg/kg-day	2.00E+00	1/(mg/kg-day)	2E-06	(2)	--	--	--	--
				Polychlorinated Biphenyls (PCBs) - Congeners												
				PCBC TEQ MAMMAL HALFND	2.90E-05	mg/kg	3.52E-12	mg/kg-day	1.30E+05	1/(mg/kg-day)	5E-07	(2)	--	--	--	--
				Dioxins and Furans												
				DIOXIN TEQ MAMMAL HALFND	2.08E-05	mg/kg	2.52E-12	mg/kg-day	1.30E+05	1/(mg/kg-day)	3E-07	(2)	--	--	--	--
				Metals (Total)												
				Aluminum	8.54E+03	mg/kg	3.46E-04	mg/kg-day	--	--	--	(2)	--	--	--	--
				Arsenic	8.64E+00	mg/kg	1.05E-06	mg/kg-day	1.50E+00	1/(mg/kg-day)	2E-06	(2)	--	--	--	--
				Chromium, Total	1.26E+01	mg/kg	2.11E-06	mg/kg-day	2.00E+01	1/(mg/kg-day)	4E-05	(2)	--	--	--	--
				Cobalt	1.10E+01	mg/kg	4.46E-07	mg/kg-day	--	--	--	(2)	--	--	--	--
				Iron	2.50E+04	mg/kg	1.01E-03	mg/kg-day	--	--	--	(2)	--	--	--	--
				Manganese (Non-Diet)	4.72E+02	mg/kg	1.91E-05	mg/kg-day	--	--	--	(2)	--	--	--	--
				Thallium	1.44E-01	mg/kg	5.83E-09	mg/kg-day	--	--	--	(2)	--	--	--	--
			Exp. Route Total								5E-05					--
		Exp. Point Total									1E-04					--
	Exp. Medium Total										1E-04					--
	Outdoor Air	Particulates above Site	Inhalation													
				Semi-volatile Organic Compounds (SVOCs)												
				Benzo(a)pyrene	8.38E-08	µg/m³	8.27E-08	µg/m³	6.00E-04	m³/µg	5E-11	(2)	--	--	--	--
				Polychlorinated Biphenyls (PCBs)												
				Aroclor 1260	1.18E-06	µg/m³	4.19E-07	µg/m³	5.71E-04	m³/µg	2E-10	(2)	--	--	--	--
				Polychlorinated Biphenyls (PCBs) - Congeners												
				PCBC TEQ MAMMAL HALFND	2.13E-11	µg/m³	7.60E-12	µg/m³	3.80E+01	m³/µg	3E-10	(2)	--	--	--	--
				Dioxins and Furans												
				DIOXIN TEQ MAMMAL HALFND	1.53E-11	µg/m³	5.44E-12	µg/m³	3.80E+01	m³/µg	2E-10	(2)	--	--	--	--

Table A-7.3
Calculation of Chemical Cancer Risks
Reasonable Maximum Exposure (Site-Wide)
Future On-Site Hypothetical Resident (Lifetime) - Surface Soil (0 - 0.5 feet)
Human Health Risk Assessment
Shaffer Equipment/Arbuckle Creek Area Superfund Site, Minden, West Virginia

Scenario Timeframe:	Future
Receptor Population:	On-Site Hypothetical Resident
Receptor Age:	Lifetime

Medium	Exposure Medium	Exposure Point	Exposure Route	Chemical of Potential Concern	EPC		Cancer Risk Calculations					Non-Cancer Hazard Calculations				
					Value	Units	Intake/Exposure Concentration		CSF/Unit Risk		Cancer Risk [1]	Intake/Exposure Concentration		RfD/RfC		Hazard Quotient [1]
							Value	Units	Value	Units		Value	Units	Value	Units	
				Metals (Total)												
				Aluminum	6.28E-03	µg/m³	2.24E-03	µg/m³	--	--	--	(2)	--	--	--	--
				Arsenic	6.35E-06	µg/m³	2.26E-06	µg/m³	4.30E-03	m³/µg	1E-08	(2)	--	--	--	--
				Chromium, Total	9.25E-06	µg/m³	9.12E-06	µg/m³	8.40E-02	m³/µg	8E-07	(2)	--	--	--	--
				Cobalt	8.10E-06	µg/m³	2.89E-06	µg/m³	9.00E-03	m³/µg	3E-08	(2)	--	--	--	--
				Iron	1.84E-02	µg/m³	6.55E-03	µg/m³	--	--	--	(2)	--	--	--	--
				Manganese (Non-Diet)	3.47E-04	µg/m³	1.24E-04	µg/m³	--	--	--	(2)	--	--	--	--
				Thallium	1.06E-07	µg/m³	3.77E-08	µg/m³	--	--	--	(2)	--	--	--	--
			Exp. Route Total								8E-07					--
		Exp. Point Total									8E-07					--
		Vapors above Site	Inhalation													
				Polychlorinated Biphenyls (PCBs)												
				Aroclor 1260	4.33E-03	µg/m³	1.54E-03	µg/m³	5.71E-04	m³/µg	9E-07	(2)	--	--	--	--
				Polychlorinated Biphenyls (PCBs) - Congeners												
				PCBC TEQ MAMMAL HALFND	1.00E-08	µg/m³	3.57E-09	µg/m³	3.80E+01	m³/µg	1E-07	(2)	--	--	--	--
				Dioxins and Furans												
				DIOXIN TEQ MAMMAL HALFND	7.18E-09	µg/m³	2.56E-09	µg/m³	3.80E+01	m³/µg	1E-07	(2)	--	--	--	--
			Exp. Route Total								1E-06					--
		Exp. Point Total									1E-06					--
	Exp. Medium Total										2E-06					--
Medium Total											1E-04					--
Notes:											**Total of Receptor Risks Across All Media**					**Total of Receptor Hazards Across All Media**
											1E-04					**--**

(1) CR and HQs are rounded to one non-zero digit; cumulative totals may be slightly higher or lower depending on degree of rounding.

(2) Cancer risk is only presented for the lifetime receptor, whereas non-cancer hazard is calculated separately for the child and adult receptor.

Table A-7.4a
Calculation of Chemical Non-Cancer Hazards
Reasonable Maximum Exposure (Site-Wide)
Future On-Site Hypothetical Resident (Adult) - Total Soil (0 - 8.8 feet)
Human Health Risk Assessment
Shaffer Equipment/Arbuckle Creek Area Superfund Site, Minden, West Virginia

Scenario Timeframe:	Future
Receptor Population:	On-Site Hypothetical Resident
Receptor Age:	Adult

Medium	Exposure Medium	Exposure Point	Exposure Route	Chemical of Potential Concern	EPC		Cancer Risk Calculations					Non-Cancer Hazard Calculations				
					Value	Units	Intake/Exposure Concentration		CSF/Unit Risk		Cancer Risk [1]	Intake/Exposure Concentration		RfD/RfC		Hazard Quotient [1]
							Value	Units	Value	Units		Value	Units	Value	Units	
Soil	Total Soil	0 - 8.8 feet	Ingestion													
				Semi-volatile Organic Compounds (SVOCs)												
				1,2,4,5-Tetrachlorobenzene	1.21E-01	mg/kg	(2)	--	--	--	--	1.45E-07	mg/kg-day	3.00E-04	mg/kg-day	0.0005
				Benzo(a)anthracene	5.09E-01	mg/kg	(2)	--	--	--	--	6.10E-07	mg/kg-day	--	--	--
				Benzo(a)pyrene	3.42E-01	mg/kg	(2)	--	--	--	--	4.10E-07	mg/kg-day	3.00E-04	mg/kg-day	0.001
				Benzo(b)fluoranthene	6.90E-01	mg/kg	(2)	--	--	--	--	8.27E-07	mg/kg-day	--	--	--
				Dibenz(a,h)anthracene	1.51E-02	mg/kg	(2)	--	--	--	--	1.81E-08	mg/kg-day	--	--	--
				Indeno(1,2,3-cd)pyrene	1.77E-01	mg/kg	(2)	--	--	--	--	2.12E-07	mg/kg-day	--	--	--
				Pesticides												
				Dieldrin	3.97E-03	mg/kg	(2)	--	--	--	--	4.76E-09	mg/kg-day	5.00E-05	mg/kg-day	0.0001
				Polychlorinated Biphenyls (PCBs)												
				Aroclor 1254	6.17E-02	mg/kg	(2)	--	--	--	--	7.40E-08	mg/kg-day	2.00E-05	mg/kg-day	0.004
				Aroclor 1260	1.18E+00	mg/kg	(2)	--	--	--	--	1.41E-06	mg/kg-day	--	--	--
				Polychlorinated Biphenyls (PCBs) - Congeners												
				PCBC TEQ MAMMAL HALFND	2.28E-05	mg/kg	(2)	--	--	--	--	2.74E-11	mg/kg-day	7.00E-10	mg/kg-day	0.04
				Dioxins and Furans												
				DIOXIN TEQ MAMMAL HALFND	1.19E-05	mg/kg	(2)	--	--	--	--	1.43E-11	mg/kg-day	7.00E-10	mg/kg-day	0.02
				Metals (Total)												
				Aluminum	8.51E+03	mg/kg	(2)	--	--	--	--	1.02E-02	mg/kg-day	1.00E+00	mg/kg-day	0.01
				Antimony	9.23E-01	mg/kg	(2)	--	--	--	--	1.11E-06	mg/kg-day	4.00E-04	mg/kg-day	0.003
				Arsenic	1.22E+01	mg/kg	(2)	--	--	--	--	8.75E-06	mg/kg-day	3.00E-04	mg/kg-day	0.03
				Cadmium (Diet)	3.32E-01	mg/kg	(2)	--	--	--	--	3.98E-07	mg/kg-day	1.00E-03	mg/kg-day	0.0004
				Chromium, Total	1.48E+01	mg/kg	(2)	--	--	--	--	1.78E-05	mg/kg-day	3.00E-03	mg/kg-day	0.006
				Cobalt	1.03E+01	mg/kg	(2)	--	--	--	--	1.24E-05	mg/kg-day	3.00E-04	mg/kg-day	0.04
				Iron	2.24E+04	mg/kg	(2)	--	--	--	--	2.69E-02	mg/kg-day	7.00E-01	mg/kg-day	0.04
				Manganese (Non-Diet)	4.20E+02	mg/kg	(2)	--	--	--	--	5.03E-04	mg/kg-day	2.40E-02	mg/kg-day	0.02
				Thallium	1.52E-01	mg/kg	(2)	--	--	--	--	1.82E-07	mg/kg-day	1.00E-05	mg/kg-day	0.02
			Exp. Route Total								--					0.2
			Dermal													
				Semi-volatile Organic Compounds (SVOCs)												
				1,2,4,5-Tetrachlorobenzene	1.21E-01	mg/kg	(2)	--	--	--	--	6.12E-08	mg/kg-day	3.00E-04	mg/kg-day	0.0002
				Benzo(a)anthracene	5.09E-01	mg/kg	(2)	--	--	--	--	3.35E-07	mg/kg-day	--	--	--
				Benzo(a)pyrene	3.42E-01	mg/kg	(2)	--	--	--	--	2.25E-07	mg/kg-day	3.00E-04	mg/kg-day	0.0008
				Benzo(b)fluoranthene	6.90E-01	mg/kg	(2)	--	--	--	--	4.54E-07	mg/kg-day	--	--	--
				Dibenz(a,h)anthracene	1.51E-02	mg/kg	(2)	--	--	--	--	9.93E-09	mg/kg-day	--	--	--
				Indeno(1,2,3-cd)pyrene	1.77E-01	mg/kg	(2)	--	--	--	--	1.16E-07	mg/kg-day	--	--	--
				Pesticides												
				Dieldrin	3.97E-03	mg/kg	(2)	--	--	--	--	2.01E-09	mg/kg-day	5.00E-05	mg/kg-day	0.00004
				Polychlorinated Biphenyls (PCBs)												
				Aroclor 1254	6.17E-02	mg/kg	(2)	--	--	--	--	4.37E-08	mg/kg-day	2.00E-05	mg/kg-day	0.002
				Aroclor 1260	1.18E+00	mg/kg	(2)	--	--	--	--	8.35E-07	mg/kg-day	--	--	--
				Polychlorinated Biphenyls (PCBs) - Congeners												
				PCBC TEQ MAMMAL HALFND	2.28E-05	mg/kg	(2)	--	--	--	--	3.47E-12	mg/kg-day	7.00E-10	mg/kg-day	0.005
				Dioxins and Furans												
				DIOXIN TEQ MAMMAL HALFND	1.19E-05	mg/kg	(2)	--	--	--	--	1.81E-12	mg/kg-day	7.00E-10	mg/kg-day	0.003

Table A-7.4a
Calculation of Chemical Non-Cancer Hazards
Reasonable Maximum Exposure (Site-Wide)
Future On-Site Hypothetical Resident (Adult) - Total Soil (0 - 8.8 feet)
Human Health Risk Assessment
Shaffer Equipment/Arbuckle Creek Area Superfund Site, Minden, West Virginia

Scenario Timeframe:	Future
Receptor Population:	On-Site Hypothetical Resident
Receptor Age:	Adult

Medium	Exposure Medium	Exposure Point	Exposure Route	Chemical of Potential Concern	EPC		Cancer Risk Calculations					Non-Cancer Hazard Calculations				
					Value	Units	Intake/Exposure Concentration		CSF/Unit Risk		Cancer Risk [1]	Intake/Exposure Concentration		RfD/RfC		Hazard Quotient [1]
							Value	Units	Value	Units		Value	Units	Value	Units	
				Metals (Total)												
				Aluminum	8.51E+03	mg/kg	(2)	--	--	--	--	4.31E-04	mg/kg-day	1.00E+00	mg/kg-day	0.0004
				Antimony	9.23E-01	mg/kg	(2)	--	--	--	--	4.67E-08	mg/kg-day	6.00E-05	mg/kg-day	0.0008
				Arsenic	1.22E+01	mg/kg	(2)	--	--	--	--	1.85E-06	mg/kg-day	3.00E-04	mg/kg-day	0.006
				Cadmium (Diet)	3.32E-01	mg/kg	(2)	--	--	--	--	1.68E-09	mg/kg-day	2.50E-05	mg/kg-day	0.00007
				Chromium, Total	1.48E+01	mg/kg	(2)	--	--	--	--	7.51E-07	mg/kg-day	7.50E-05	mg/kg-day	0.01
				Cobalt	1.03E+01	mg/kg	(2)	--	--	--	--	5.22E-07	mg/kg-day	3.00E-04	mg/kg-day	0.002
				Iron	2.24E+04	mg/kg	(2)	--	--	--	--	1.13E-03	mg/kg-day	7.00E-01	mg/kg-day	0.002
				Manganese (Non-Diet)	4.20E+02	mg/kg	(2)	--	--	--	--	2.12E-05	mg/kg-day	9.60E-04	mg/kg-day	0.02
				Thallium	1.52E-01	mg/kg	(2)	--	--	--	--	7.69E-09	mg/kg-day	1.00E-05	mg/kg-day	0.0008
			Exp. Route Total								--					0.05
		Exp. Point Total									--					0.3
	Exp. Medium Total										--					0.3
	Outdoor Air	Particulates above Site	Inhalation													
				Semi-volatile Organic Compounds (SVOCs)													
				1,2,4,5-Tetrachlorobenzene	8.90E-08	µg/m³	(2)	--	--	--	--	8.53E-08	µg/m³	--	--	--
				Benzo(a)anthracene	3.74E-07	µg/m³	(2)	--	--	--	--	3.59E-07	µg/m³	--	--	--
				Benzo(a)pyrene	2.51E-07	µg/m³	(2)	--	--	--	--	2.41E-07	µg/m³	2.00E-03	µg/m³	0.0001
				Benzo(b)fluoranthene	5.07E-07	µg/m³	(2)	--	--	--	--	4.87E-07	µg/m³	--	--	--
				Dibenz(a,h)anthracene	1.11E-08	µg/m³	(2)	--	--	--	--	1.06E-08	µg/m³	--	--	--
				Indeno(1,2,3-cd)pyrene	1.30E-07	µg/m³	(2)	--	--	--	--	1.25E-07	µg/m³	--	--	--
				Pesticides												
				Dieldrin	2.92E-09	µg/m³	(2)	--	--	--	--	2.80E-09	µg/m³	--	--	--
				Polychlorinated Biphenyls (PCBs)												
				Aroclor 1254	4.54E-08	µg/m³	(2)	--	--	--	--	4.35E-08	µg/m³	--	--	--
				Aroclor 1260	8.67E-07	µg/m³	(2)	--	--	--	--	8.31E-07	µg/m³	--	--	--
				Polychlorinated Biphenyls (PCBs) - Congeners												
				PCBC TEQ MAMMAL HALFND	1.68E-11	µg/m³	(2)	--	--	--	--	1.61E-11	µg/m³	4.00E-05	µg/m³	0.0000004
				Dioxins and Furans												
				DIOXIN TEQ MAMMAL HALFND	8.74E-12	µg/m³	(2)	--	--	--	--	8.38E-12	µg/m³	4.00E-05	µg/m³	0.0000002
				Metals (Total)												
				Aluminum	6.26E-03	µg/m³	(2)	--	--	--	--	6.00E-03	µg/m³	5.00E+00	µg/m³	0.001
				Antimony	6.79E-07	µg/m³	(2)	--	--	--	--	6.51E-07	µg/m³	3.00E-01	µg/m³	0.000002
				Arsenic	8.94E-06	µg/m³	(2)	--	--	--	--	8.57E-06	µg/m³	1.50E-02	µg/m³	0.0006
				Cadmium (Diet)	2.44E-07	µg/m³	(2)	--	--	--	--	2.34E-07	µg/m³	1.00E-02	µg/m³	0.00002
				Chromium, Total	1.09E-05	µg/m³	(2)	--	--	--	--	1.05E-05	µg/m³	1.00E-01	µg/m³	0.0001
				Cobalt	7.59E-06	µg/m³	(2)	--	--	--	--	7.28E-06	µg/m³	6.00E-03	µg/m³	0.001
				Iron	1.65E-02	µg/m³	(2)	--	--	--	--	1.58E-02	µg/m³	--	--	--
				Manganese (Non-Diet)	3.09E-04	µg/m³	(2)	--	--	--	--	2.96E-04	µg/m³	5.00E-02	µg/m³	0.006
				Thallium	1.12E-07	µg/m³	(2)	--	--	--	--	1.07E-07	µg/m³	--	--	--
			Exp. Route Total								--					0.009
		Exp. Point Total									--					0.009
		Vapors above Site	Inhalation													
				Semi-volatile Organic Compounds (SVOCs)												
				1,2,4,5-Tetrachlorobenzene	2.86E-03	µg/m³	(2)	--	--	--	--	2.74E-03	µg/m³	--	--	--
				Benzo(a)anthracene	6.75E-05	µg/m³	(2)	--	--	--	--	6.47E-05	µg/m³	--	--	--

Table A-7.4a
Calculation of Chemical Non-Cancer Hazards
Reasonable Maximum Exposure (Site-Wide)
Future On-Site Hypothetical Resident (Adult) - Total Soil (0 - 8.8 feet)
Human Health Risk Assessment
Shaffer Equipment/Arbuckle Creek Area Superfund Site, Minden, West Virginia

Scenario Timeframe:	Future
Receptor Population:	On-Site Hypothetical Resident
Receptor Age:	Adult

Medium	Exposure Medium	Exposure Point	Exposure Route	Chemical of Potential Concern	EPC		Cancer Risk Calculations					Non-Cancer Hazard Calculations				
					Value	Units	Intake/Exposure Concentration		CSF/Unit Risk		Cancer Risk [1]	Intake/Exposure Concentration		RfD/RfC		Hazard Quotient [1]
							Value	Units	Value	Units		Value	Units	Value	Units	
				Polychlorinated Biphenyls (PCBs)												
				Aroclor 1254	1.88E-04	µg/m³	(2)	--	--	--	--	1.80E-04	µg/m³	--	--	--
				Aroclor 1260	3.19E-03	µg/m³	(2)	--	--	--	--	3.06E-03	µg/m³	--	--	--
				Polychlorinated Biphenyls (PCBs) - Congeners												
				PCBC TEQ MAMMAL HALFND	7.89E-09	µg/m³	(2)	--	--	--	--	7.56E-09	µg/m³	4.00E-05	µg/m³	0.0002
				Dioxins and Furans												
				DIOXIN TEQ MAMMAL HALFND	4.11E-09	µg/m³	(2)	--	--	--	--	3.94E-09	µg/m³	4.00E-05	µg/m³	0.0001
			Exp. Route Total								--					0.0003
		Exp. Point Total									--					0.0003
	Exp. Medium Total										--					0.009
Medium Total											--					0.3
Notes:											**Total of Receptor Risks Across All Media**					**Total of Receptor Hazards Across All Media**
											--					**0.3**

(1) CR and HQs are rounded to one non-zero digit; cumulative totals may be slightly higher or lower depending on degree of rounding.

(2) Cancer risk is only presented for the lifetime receptor, whereas non-cancer hazard is calculated separately for the child and adult receptor.

Table A-7.4b
Calculation of Chemical Non-Cancer Hazards
Reasonable Maximum Exposure (Site-Wide with Hotspot)
Future On-Site Hypothetical Resident (Adult) - Total Soil (0 - 8.8 feet)
Human Health Risk Assessment
Shaffer Equipment/Arbuckle Creek Area Superfund Site, Minden, West Virginia

Scenario Timeframe:	Future
Receptor Population:	On-Site Hypothetical Resident
Receptor Age:	Adult

Medium	Exposure Medium	Exposure Point	Exposure Route	Chemical of Potential Concern	EPC		Cancer Risk Calculations					Non-Cancer Hazard Calculations				
					Value	Units	Intake/Exposure Concentration		CSF/Unit Risk		Cancer Risk [1]	Intake/Exposure Concentration		RfD/RfC		Hazard Quotient [1]
							Value	Units	Value	Units		Value	Units	Value	Units	
Soil	Total Soil	0 - 8.8 feet	Ingestion													
				Semi-volatile Organic Compounds (SVOCs)												
				1,2,4,5-Tetrachlorobenzene	1.21E-01	mg/kg	(2)	--	--	--	--	1.45E-07	mg/kg-day	3.00E-04	mg/kg-day	0.0005
				Benzo(a)anthracene	5.09E-01	mg/kg	(2)	--	--	--	--	6.10E-07	mg/kg-day	--	--	--
				Benzo(a)pyrene	3.42E-01	mg/kg	(2)	--	--	--	--	4.10E-07	mg/kg-day	3.00E-04	mg/kg-day	0.001
				Benzo(b)fluoranthene	6.90E-01	mg/kg	(2)	--	--	--	--	8.27E-07	mg/kg-day	--	--	--
				Dibenz(a,h)anthracene	1.51E-02	mg/kg	(2)	--	--	--	--	1.81E-08	mg/kg-day	--	--	--
				Indeno(1,2,3-cd)pyrene	1.77E-01	mg/kg	(2)	--	--	--	--	2.12E-07	mg/kg-day	--	--	--
				Pesticides												
				Dieldrin	3.97E-03	mg/kg	(2)	--	--	--	--	4.76E-09	mg/kg-day	5.00E-05	mg/kg-day	0.0001
				Polychlorinated Biphenyls (PCBs)												
				Aroclor 1254	6.17E-02	mg/kg	(2)	--	--	--	--	7.40E-08	mg/kg-day	2.00E-05	mg/kg-day	0.004
				Aroclor 1260	2.40E+01	mg/kg	(2)	--	--	--	--	2.88E-05	mg/kg-day	--	--	--
				Polychlorinated Biphenyls (PCBs) - Congeners												
				PCBC TEQ MAMMAL HALFND	2.28E-05	mg/kg	(2)	--	--	--	--	2.74E-11	mg/kg-day	7.00E-10	mg/kg-day	0.04
				Dioxins and Furans												
				DIOXIN TEQ MAMMAL HALFND	1.19E-05	mg/kg	(2)	--	--	--	--	1.43E-11	mg/kg-day	7.00E-10	mg/kg-day	0.02
				Metals (Total)												
				Aluminum	8.51E+03	mg/kg	(2)	--	--	--	--	1.02E-02	mg/kg-day	1.00E+00	mg/kg-day	0.01
				Antimony	9.23E-01	mg/kg	(2)	--	--	--	--	1.11E-06	mg/kg-day	4.00E-04	mg/kg-day	0.003
				Arsenic	1.22E+01	mg/kg	(2)	--	--	--	--	8.75E-06	mg/kg-day	3.00E-04	mg/kg-day	0.03
				Cadmium (Diet)	3.32E-01	mg/kg	(2)	--	--	--	--	3.98E-07	mg/kg-day	1.00E-03	mg/kg-day	0.0004
				Chromium, Total	1.48E+01	mg/kg	(2)	--	--	--	--	1.78E-05	mg/kg-day	3.00E-03	mg/kg-day	0.006
				Cobalt	1.03E+01	mg/kg	(2)	--	--	--	--	1.24E-05	mg/kg-day	3.00E-04	mg/kg-day	0.04
				Iron	2.24E+04	mg/kg	(2)	--	--	--	--	2.69E-02	mg/kg-day	7.00E-01	mg/kg-day	0.04
				Manganese (Non-Diet)	4.20E+02	mg/kg	(2)	--	--	--	--	5.03E-04	mg/kg-day	2.40E-02	mg/kg-day	0.02
				Thallium	1.52E-01	mg/kg	(2)	--	--	--	--	1.82E-07	mg/kg-day	1.00E-05	mg/kg-day	0.02
			Exp. Route Total								--					0.2
			Dermal													
				Semi-volatile Organic Compounds (SVOCs)												
				1,2,4,5-Tetrachlorobenzene	1.21E-01	mg/kg	(2)	--	--	--	--	6.12E-08	mg/kg-day	3.00E-04	mg/kg-day	0.0002
				Benzo(a)anthracene	5.09E-01	mg/kg	(2)	--	--	--	--	3.35E-07	mg/kg-day	--	--	--
				Benzo(a)pyrene	3.42E-01	mg/kg	(2)	--	--	--	--	2.25E-07	mg/kg-day	3.00E-04	mg/kg-day	0.0008
				Benzo(b)fluoranthene	6.90E-01	mg/kg	(2)	--	--	--	--	4.54E-07	mg/kg-day	--	--	--
				Dibenz(a,h)anthracene	1.51E-02	mg/kg	(2)	--	--	--	--	9.93E-09	mg/kg-day	--	--	--
				Indeno(1,2,3-cd)pyrene	1.77E-01	mg/kg	(2)	--	--	--	--	1.16E-07	mg/kg-day	--	--	--
				Pesticides												
				Dieldrin	3.97E-03	mg/kg	(2)	--	--	--	--	2.01E-09	mg/kg-day	5.00E-05	mg/kg-day	0.00004
				Polychlorinated Biphenyls (PCBs)												
				Aroclor 1254	6.17E-02	mg/kg	(2)	--	--	--	--	4.37E-08	mg/kg-day	2.00E-05	mg/kg-day	0.002
				Aroclor 1260	2.40E+01	mg/kg	(2)	--	--	--	--	1.70E-05	mg/kg-day	--	--	--
				Polychlorinated Biphenyls (PCBs) - Congeners												
				PCBC TEQ MAMMAL HALFND	2.28E-05	mg/kg	(2)	--	--	--	--	3.47E-12	mg/kg-day	7.00E-10	mg/kg-day	0.005
				Dioxins and Furans												
				DIOXIN TEQ MAMMAL HALFND	1.19E-05	mg/kg	(2)	--	--	--	--	1.81E-12	mg/kg-day	7.00E-10	mg/kg-day	0.003

Table A-7.4b
Calculation of Chemical Non-Cancer Hazards
Reasonable Maximum Exposure (Site-Wide with Hotspot)
Future On-Site Hypothetical Resident (Adult) - Total Soil (0 - 8.8 feet)
Human Health Risk Assessment
Shaffer Equipment/Arbuckle Creek Area Superfund Site, Minden, West Virginia

Scenario Timeframe:	Future
Receptor Population:	On-Site Hypothetical Resident
Receptor Age:	Adult

Medium	Exposure Medium	Exposure Point	Exposure Route	Chemical of Potential Concern	EPC		Cancer Risk Calculations					Non-Cancer Hazard Calculations				
					Value	Units	Intake/Exposure Concentration		CSF/Unit Risk		Cancer Risk [1]	Intake/Exposure Concentration		RfD/RfC		Hazard Quotient [1]
							Value	Units	Value	Units		Value	Units	Value	Units	
				Metals (Total)												
				Aluminum	8.51E+03	mg/kg	(2)	--	--	--	--	4.31E-04	mg/kg-day	1.00E+00	mg/kg-day	0.0004
				Antimony	9.23E-01	mg/kg	(2)	--	--	--	--	4.67E-08	mg/kg-day	6.00E-05	mg/kg-day	0.0008
				Arsenic	1.22E+01	mg/kg	(2)	--	--	--	--	1.85E-06	mg/kg-day	3.00E-04	mg/kg-day	0.006
				Cadmium (Diet)	3.32E-01	mg/kg	(2)	--	--	--	--	1.68E-09	mg/kg-day	2.50E-05	mg/kg-day	0.00007
				Chromium, Total	1.48E+01	mg/kg	(2)	--	--	--	--	7.51E-07	mg/kg-day	7.50E-05	mg/kg-day	0.01
				Cobalt	1.03E+01	mg/kg	(2)	--	--	--	--	5.22E-07	mg/kg-day	3.00E-04	mg/kg-day	0.002
				Iron	2.24E+04	mg/kg	(2)	--	--	--	--	1.13E-03	mg/kg-day	7.00E-01	mg/kg-day	0.002
				Manganese (Non-Diet)	4.20E+02	mg/kg	(2)	--	--	--	--	2.12E-05	mg/kg-day	9.60E-04	mg/kg-day	0.02
				Thallium	1.52E-01	mg/kg	(2)	--	--	--	--	7.69E-09	mg/kg-day	1.00E-05	mg/kg-day	0.0008
			Exp. Route Total								--					0.05
		Exp. Point Total									--					0.3
	Exp. Medium Total										--					0.3
	Outdoor Air	Particulates above Site	Inhalation													
				Semi-volatile Organic Compounds (SVOCs)													
				1,2,4,5-Tetrachlorobenzene	8.90E-08	µg/m³	(2)	--	--	--	--	8.53E-08	µg/m³	--	--	--
				Benzo(a)anthracene	3.74E-07	µg/m³	(2)	--	--	--	--	3.59E-07	µg/m³	--	--	--
				Benzo(a)pyrene	2.51E-07	µg/m³	(2)	--	--	--	--	2.41E-07	µg/m³	2.00E-03	µg/m³	0.0001
				Benzo(b)fluoranthene	5.07E-07	µg/m³	(2)	--	--	--	--	4.87E-07	µg/m³	--	--	--
				Dibenz(a,h)anthracene	1.11E-08	µg/m³	(2)	--	--	--	--	1.06E-08	µg/m³	--	--	--
				Indeno(1,2,3-cd)pyrene	1.30E-07	µg/m³	(2)	--	--	--	--	1.25E-07	µg/m³	--	--	--
				Pesticides												
				Dieldrin	2.92E-09	µg/m³	(2)	--	--	--	--	2.80E-09	µg/m³	--	--	--
				Polychlorinated Biphenyls (PCBs)												
				Aroclor 1254	4.54E-08	µg/m³	(2)	--	--	--	--	4.35E-08	µg/m³	--	--	--
				Aroclor 1260	1.76E-05	µg/m³	(2)	--	--	--	--	1.69E-05	µg/m³	--	--	--
				Polychlorinated Biphenyls (PCBs) - Congeners												
				PCBC TEQ MAMMAL HALFND	1.68E-11	µg/m³	(2)	--	--	--	--	1.61E-11	µg/m³	4.00E-05	µg/m³	0.0000004
				Dioxins and Furans												
				DIOXIN TEQ MAMMAL HALFND	8.74E-12	µg/m³	(2)	--	--	--	--	8.38E-12	µg/m³	4.00E-05	µg/m³	0.0000002
				Metals (Total)												
				Aluminum	6.26E-03	µg/m³	(2)	--	--	--	--	6.00E-03	µg/m³	5.00E+00	µg/m³	0.001
				Antimony	6.79E-07	µg/m³	(2)	--	--	--	--	6.51E-07	µg/m³	3.00E-01	µg/m³	0.000002
				Arsenic	8.94E-06	µg/m³	(2)	--	--	--	--	8.57E-06	µg/m³	1.50E-02	µg/m³	0.0006
				Cadmium (Diet)	2.44E-07	µg/m³	(2)	--	--	--	--	2.34E-07	µg/m³	1.00E-02	µg/m³	0.00002
				Chromium, Total	1.09E-05	µg/m³	(2)	--	--	--	--	1.05E-05	µg/m³	1.00E-01	µg/m³	0.0001
				Cobalt	7.59E-06	µg/m³	(2)	--	--	--	--	7.28E-06	µg/m³	6.00E-03	µg/m³	0.001
				Iron	1.65E-02	µg/m³	(2)	--	--	--	--	1.58E-02	µg/m³	--	--	--
				Manganese (Non-Diet)	3.09E-04	µg/m³	(2)	--	--	--	--	2.96E-04	µg/m³	5.00E-02	µg/m³	0.006
				Thallium	1.12E-07	µg/m³	(2)	--	--	--	--	1.07E-07	µg/m³	--	--	--
			Exp. Route Total								--					0.009
		Exp. Point Total									--					0.009
		Vapors above Site	Inhalation													
				Semi-volatile Organic Compounds (SVOCs)													
				1,2,4,5-Tetrachlorobenzene	2.86E-03	µg/m³	(2)	--	--	--	--	2.74E-03	µg/m³	--	--	--
				Benzo(a)anthracene	6.75E-05	µg/m³	(2)	--	--	--	--	6.47E-05	µg/m³	--	--	--

Table A-7.4b
Calculation of Chemical Non-Cancer Hazards
Reasonable Maximum Exposure (Site-Wide with Hotspot)
Future On-Site Hypothetical Resident (Adult) - Total Soil (0 - 8.8 feet)
Human Health Risk Assessment
Shaffer Equipment/Arbuckle Creek Area Superfund Site, Minden, West Virginia

Scenario Timeframe:	Future
Receptor Population:	On-Site Hypothetical Resident
Receptor Age:	Adult

Medium	Exposure Medium	Exposure Point	Exposure Route	Chemical of Potential Concern	EPC		Cancer Risk Calculations					Non-Cancer Hazard Calculations				
					Value	Units	Intake/Exposure Concentration		CSF/Unit Risk		Cancer Risk (1)	Intake/Exposure Concentration		RfD/RfC		Hazard Quotient (1)
							Value	Units	Value	Units		Value	Units	Value	Units	
				Polychlorinated Biphenyls (PCBs)												
				Aroclor 1254	1.88E-04	µg/m³	(2)	--	--	--	--	1.80E-04	µg/m³	--	--	--
				Aroclor 1260	6.49E-02	µg/m³	(2)	--	--	--	--	6.22E-02	µg/m³	--	--	--
				Polychlorinated Biphenyls (PCBs) - Congeners												
				PCBC TEQ MAMMAL HALFND	7.89E-09	µg/m³	(2)	--	--	--	--	7.56E-09	µg/m³	4.00E-05	µg/m³	0.0002
				Dioxins and Furans												
				DIOXIN TEQ MAMMAL HALFND	4.11E-09	µg/m³	(2)	--	--	--	--	3.94E-09	µg/m³	4.00E-05	µg/m³	0.0001
			Exp. Route Total								--					0.0003
		Exp. Point Total									--					0.0003
	Exp. Medium Total										--					0.009
Medium Total											--					0.3
Notes:											**Total of Receptor Risks Across All Media**					**Total of Receptor Hazards Across All Media**
											--					**0.3**

(1) CR and HQs are rounded to one non-zero digit; cumulative totals may be slightly higher or lower depending on degree of rounding.

(2) Cancer risk is only presented for the lifetime receptor, whereas non-cancer hazard is calculated separately for the child and adult receptor.

Table A-7.5a
Calculation of Chemical Non-Cancer Hazards
Reasonable Maximum Exposure (Site-Wide)
Future On-Site Hypothetical Resident (Child) - Total Soil (0 - 8.8 feet)
Human Health Risk Assessment
Shaffer Equipment/Arbuckle Creek Area Superfund Site, Minden, West Virginia

Scenario Timeframe:	Future
Receptor Population:	On-Site Hypothetical Resident
Receptor Age:	Child

Medium	Exposure Medium	Exposure Point	Exposure Route	Chemical of Potential Concern	EPC		Cancer Risk Calculations					Non-Cancer Hazard Calculations				
					Value	Units	Intake/Exposure Concentration		CSF/Unit Risk		Cancer Risk [1]	Intake/Exposure Concentration		RfD/RfC		Hazard Quotient [1]
							Value	Units	Value	Units		Value	Units	Value	Units	
Soil	Total Soil	0 - 8.8 feet	Ingestion													
				Semi-volatile Organic Compounds (SVOCs)												
				1,2,4,5-Tetrachlorobenzene	1.21E-01	mg/kg	(2)	--	--	--	--	1.55E-06	mg/kg-day	3.00E-04	mg/kg-day	0.005
				Benzo(a)anthracene	5.09E-01	mg/kg	(2)	--	--	--	--	6.51E-06	mg/kg-day	--	--	--
				Benzo(a)pyrene	3.42E-01	mg/kg	(2)	--	--	--	--	4.37E-06	mg/kg-day	3.00E-04	mg/kg-day	0.01
				Benzo(b)fluoranthene	6.90E-01	mg/kg	(2)	--	--	--	--	8.82E-06	mg/kg-day	--	--	--
				Dibenz(a,h)anthracene	1.51E-02	mg/kg	(2)	--	--	--	--	1.93E-07	mg/kg-day	--	--	--
				Indeno(1,2,3-cd)pyrene	1.77E-01	mg/kg	(2)	--	--	--	--	2.26E-06	mg/kg-day	--	--	--
				Pesticides												
				Dieldrin	3.97E-03	mg/kg	(2)	--	--	--	--	5.08E-08	mg/kg-day	5.00E-05	mg/kg-day	0.001
				Polychlorinated Biphenyls (PCBs)												
				Aroclor 1254	6.17E-02	mg/kg	(2)	--	--	--	--	7.89E-07	mg/kg-day	2.00E-05	mg/kg-day	0.04
				Aroclor 1260	1.18E+00	mg/kg	(2)	--	--	--	--	1.51E-05	mg/kg-day	--	--	--
				Polychlorinated Biphenyls (PCBs) - Congeners												
				PCBC TEQ MAMMAL HALFND	2.28E-05	mg/kg	(2)	--	--	--	--	2.92E-10	mg/kg-day	7.00E-10	mg/kg-day	0.4
				Dioxins and Furans												
				DIOXIN TEQ MAMMAL HALFND	1.19E-05	mg/kg	(2)	--	--	--	--	1.52E-10	mg/kg-day	7.00E-10	mg/kg-day	0.2
				Metals (Total)												
				Aluminum	8.51E+03	mg/kg	(2)	--	--	--	--	1.09E-01	mg/kg-day	1.00E+00	mg/kg-day	0.1
				Antimony	9.23E-01	mg/kg	(2)	--	--	--	--	1.18E-05	mg/kg-day	4.00E-04	mg/kg-day	0.03
				Arsenic	1.22E+01	mg/kg	(2)	--	--	--	--	9.33E-05	mg/kg-day	3.00E-04	mg/kg-day	0.3
				Cadmium (Diet)	3.32E-01	mg/kg	(2)	--	--	--	--	4.24E-06	mg/kg-day	1.00E-03	mg/kg-day	0.004
				Chromium, Total	1.48E+01	mg/kg	(2)	--	--	--	--	1.90E-04	mg/kg-day	3.00E-03	mg/kg-day	0.06
				Cobalt	1.03E+01	mg/kg	(2)	--	--	--	--	1.32E-04	mg/kg-day	3.00E-04	mg/kg-day	0.4
				Iron	2.24E+04	mg/kg	(2)	--	--	--	--	2.87E-01	mg/kg-day	7.00E-01	mg/kg-day	0.4
				Manganese (Non-Diet)	4.20E+02	mg/kg	(2)	--	--	--	--	5.37E-03	mg/kg-day	2.40E-02	mg/kg-day	0.2
				Thallium	1.52E-01	mg/kg	(2)	--	--	--	--	1.94E-06	mg/kg-day	1.00E-05	mg/kg-day	0.2
			Exp. Route Total								--					2
			Dermal													
				Semi-volatile Organic Compounds (SVOCs)												
				1,2,4,5-Tetrachlorobenzene	1.21E-01	mg/kg	(2)	--	--	--	--	3.67E-07	mg/kg-day	3.00E-04	mg/kg-day	0.001
				Benzo(a)anthracene	5.09E-01	mg/kg	(2)	--	--	--	--	2.01E-06	mg/kg-day	--	--	--
				Benzo(a)pyrene	3.42E-01	mg/kg	(2)	--	--	--	--	1.35E-06	mg/kg-day	3.00E-04	mg/kg-day	0.004
				Benzo(b)fluoranthene	6.90E-01	mg/kg	(2)	--	--	--	--	2.72E-06	mg/kg-day	--	--	--
				Dibenz(a,h)anthracene	1.51E-02	mg/kg	(2)	--	--	--	--	5.96E-08	mg/kg-day	--	--	--
				Indeno(1,2,3-cd)pyrene	1.77E-01	mg/kg	(2)	--	--	--	--	6.98E-07	mg/kg-day	--	--	--
				Pesticides												
				Dieldrin	3.97E-03	mg/kg	(2)	--	--	--	--	1.20E-08	mg/kg-day	5.00E-05	mg/kg-day	0.0002
				Polychlorinated Biphenyls (PCBs)												
				Aroclor 1254	6.17E-02	mg/kg	(2)	--	--	--	--	2.62E-07	mg/kg-day	2.00E-05	mg/kg-day	0.01
				Aroclor 1260	1.18E+00	mg/kg	(2)	--	--	--	--	5.01E-06	mg/kg-day	--	--	--
				Polychlorinated Biphenyls (PCBs) - Congeners												
				PCBC TEQ MAMMAL HALFND	2.28E-05	mg/kg	(2)	--	--	--	--	2.08E-11	mg/kg-day	7.00E-10	mg/kg-day	0.03
				Dioxins and Furans												
				DIOXIN TEQ MAMMAL HALFND	1.19E-05	mg/kg	(2)	--	--	--	--	1.08E-11	mg/kg-day	7.00E-10	mg/kg-day	0.02

Table A-7.5a
Calculation of Chemical Non-Cancer Hazards
Reasonable Maximum Exposure (Site-Wide)
Future On-Site Hypothetical Resident (Child) - Total Soil (0 - 8.8 feet)
Human Health Risk Assessment
Shaffer Equipment/Arbuckle Creek Area Superfund Site, Minden, West Virginia

Scenario Timeframe:	Future
Receptor Population:	On-Site Hypothetical Resident
Receptor Age:	Child

Medium	Exposure Medium	Exposure Point	Exposure Route	Chemical of Potential Concern	EPC		Cancer Risk Calculations					Non-Cancer Hazard Calculations				
					Value	Units	Intake/Exposure Concentration		CSF/Unit Risk		Cancer Risk [1]	Intake/Exposure Concentration		RfD/RfC		Hazard Quotient [1]
							Value	Units	Value	Units		Value	Units	Value	Units	
				Metals (Total)												
				Aluminum	8.51E+03	mg/kg	(2)	--	--	--	--	2.58E-03	mg/kg-day	1.00E+00	mg/kg-day	0.003
				Antimony	9.23E-01	mg/kg	(2)	--	--	--	--	2.80E-07	mg/kg-day	6.00E-05	mg/kg-day	0.005
				Arsenic	1.22E+01	mg/kg	(2)	--	--	--	--	1.11E-05	mg/kg-day	3.00E-04	mg/kg-day	0.04
				Cadmium (Diet)	3.32E-01	mg/kg	(2)	--	--	--	--	1.01E-08	mg/kg-day	2.50E-05	mg/kg-day	0.0004
				Chromium, Total	1.48E+01	mg/kg	(2)	--	--	--	--	4.50E-06	mg/kg-day	7.50E-05	mg/kg-day	0.06
				Cobalt	1.03E+01	mg/kg	(2)	--	--	--	--	3.13E-06	mg/kg-day	3.00E-04	mg/kg-day	0.01
				Iron	2.24E+04	mg/kg	(2)	--	--	--	--	6.80E-03	mg/kg-day	7.00E-01	mg/kg-day	0.01
				Manganese (Non-Diet)	4.20E+02	mg/kg	(2)	--	--	--	--	1.27E-04	mg/kg-day	9.60E-04	mg/kg-day	0.1
				Thallium	1.52E-01	mg/kg	(2)	--	--	--	--	4.61E-08	mg/kg-day	1.00E-05	mg/kg-day	0.005
			Exp. Route Total								--					0.3
		Exp. Point Total									--					3
	Exp. Medium Total										--					3
	Outdoor Air	Particulates above Site	Inhalation													
				Semi-volatile Organic Compounds (SVOCs)												
				1,2,4,5-Tetrachlorobenzene	8.90E-08	µg/m³	(2)	--	--	--	--	8.53E-08	µg/m³	--	--	--
				Benzo(a)anthracene	3.74E-07	µg/m³	(2)	--	--	--	--	3.59E-07	µg/m³	--	--	--
				Benzo(a)pyrene	2.51E-07	µg/m³	(2)	--	--	--	--	2.41E-07	µg/m³	2.00E-03	µg/m³	0.0001
				Benzo(b)fluoranthene	5.07E-07	µg/m³	(2)	--	--	--	--	4.87E-07	µg/m³	--	--	--
				Dibenz(a,h)anthracene	1.11E-08	µg/m³	(2)	--	--	--	--	1.06E-08	µg/m³	--	--	--
				Indeno(1,2,3-cd)pyrene	1.30E-07	µg/m³	(2)	--	--	--	--	1.25E-07	µg/m³	--	--	--
				Pesticides												
				Dieldrin	2.92E-09	µg/m³	(2)	--	--	--	--	2.80E-09	µg/m³	--	--	--
				Polychlorinated Biphenyls (PCBs)												
				Aroclor 1254	4.54E-08	µg/m³	(2)	--	--	--	--	4.35E-08	µg/m³	--	--	--
				Aroclor 1260	8.67E-07	µg/m³	(2)	--	--	--	--	8.31E-07	µg/m³	--	--	--
				Polychlorinated Biphenyls (PCBs) - Congeners												
				PCBC TEQ MAMMAL HALFND	1.68E-11	µg/m³	(2)	--	--	--	--	1.61E-11	µg/m³	4.00E-05	µg/m³	0.0000004
				Dioxins and Furans												
				DIOXIN TEQ MAMMAL HALFND	8.74E-12	µg/m³	(2)	--	--	--	--	8.38E-12	µg/m³	4.00E-05	µg/m³	0.0000002
				Metals (Total)												
				Aluminum	6.26E-03	µg/m³	(2)	--	--	--	--	6.00E-03	µg/m³	5.00E+00	µg/m³	0.001
				Antimony	6.79E-07	µg/m³	(2)	--	--	--	--	6.51E-07	µg/m³	3.00E-01	µg/m³	0.000002
				Arsenic	8.94E-06	µg/m³	(2)	--	--	--	--	8.57E-06	µg/m³	1.50E-02	µg/m³	0.0006
				Cadmium (Diet)	2.44E-07	µg/m³	(2)	--	--	--	--	2.34E-07	µg/m³	1.00E-02	µg/m³	0.00002
				Chromium, Total	1.09E-05	µg/m³	(2)	--	--	--	--	1.05E-05	µg/m³	1.00E-01	µg/m³	0.0001
				Cobalt	7.59E-06	µg/m³	(2)	--	--	--	--	7.28E-06	µg/m³	6.00E-03	µg/m³	0.001
				Iron	1.65E-02	µg/m³	(2)	--	--	--	--	1.58E-02	µg/m³	--	--	--
				Manganese (Non-Diet)	3.09E-04	µg/m³	(2)	--	--	--	--	2.96E-04	µg/m³	5.00E-02	µg/m³	0.006
				Thallium	1.12E-07	µg/m³	(2)	--	--	--	--	1.07E-07	µg/m³	--	--	--
			Exp. Route Total								--					0.009
		Exp. Point Total									--					0.009
		Vapors above Site	Inhalation													
				Semi-volatile Organic Compounds (SVOCs)												
				1,2,4,5-Tetrachlorobenzene	2.86E-03	µg/m³	(2)	--	--	--	--	2.74E-03	µg/m³	--	--	--
				Benzo(a)anthracene	6.75E-05	µg/m³	(2)	--	--	--	--	6.47E-05	µg/m³	--	--	--

Table A-7.5a
Calculation of Chemical Non-Cancer Hazards
Reasonable Maximum Exposure (Site-Wide)
Future On-Site Hypothetical Resident (Child) - Total Soil (0 - 8.8 feet)
Human Health Risk Assessment
Shaffer Equipment/Arbuckle Creek Area Superfund Site, Minden, West Virginia

Scenario Timeframe:	Future
Receptor Population:	On-Site Hypothetical Resident
Receptor Age:	Child

Medium	Exposure Medium	Exposure Point	Exposure Route	Chemical of Potential Concern	EPC		Cancer Risk Calculations					Non-Cancer Hazard Calculations				
					Value	Units	Intake/Exposure Concentration		CSF/Unit Risk		Cancer Risk [1]	Intake/Exposure Concentration		RfD/RfC		Hazard Quotient [1]
							Value	Units	Value	Units		Value	Units	Value	Units	
				Polychlorinated Biphenyls (PCBs)												
				Aroclor 1254	1.88E-04	µg/m³	(2)	--	--	--	--	1.80E-04	µg/m³	--	--	--
				Aroclor 1260	3.19E-03	µg/m³	(2)	--	--	--	--	3.06E-03	µg/m³	--	--	--
				Polychlorinated Biphenyls (PCBs) - Congeners												
				PCBC TEQ MAMMAL HALFND	7.89E-09	µg/m³	(2)	--	--	--	--	7.56E-09	µg/m³	4.00E-05	µg/m³	0.0002
				Dioxins and Furans												
				DIOXIN TEQ MAMMAL HALFND	4.11E-09	µg/m³	(2)	--	--	--	--	3.94E-09	µg/m³	4.00E-05	µg/m³	0.0001
			Exp. Route Total								--					0.0003
		Exp. Point Total									--					0.0003
	Exp. Medium Total										--					0.009
Medium Total											--					3
Notes:											**Total of Receptor Risks Across All Media**					**3**

(1) CR and HQs are rounded to one non-zero digit; cumulative totals may be slightly higher or lower depending on degree of rounding.

(2) Cancer risk is only presented for the lifetime receptor, whereas non-cancer hazard is calculated separately for the child and adult receptor.

Table A-7.5b
Calculation of Chemical Non-Cancer Hazards
Reasonable Maximum Exposure (Site-Wide with Hotspot)
Future On-Site Hypothetical Resident (Child) - Total Soil (0 - 8.8 feet)
Human Health Risk Assessment
Shaffer Equipment/Arbuckle Creek Area Superfund Site, Minden, West Virginia

Scenario Timeframe:	Future
Receptor Population:	On-Site Hypothetical Resident
Receptor Age:	Child

Medium	Exposure Medium	Exposure Point	Exposure Route	Chemical of Potential Concern	EPC		Cancer Risk Calculations					Non-Cancer Hazard Calculations				
					Value	Units	Intake/Exposure Concentration		CSF/Unit Risk		Cancer Risk [1]	Intake/Exposure Concentration		RfD/RfC		Hazard Quotient [1]
							Value	Units	Value	Units		Value	Units	Value	Units	
Soil	Total Soil	0 - 8.8 feet	Ingestion													
				Semi-volatile Organic Compounds (SVOCs)												
				1,2,4,5-Tetrachlorobenzene	1.21E-01	mg/kg	(2)	--	--	--	--	1.55E-06	mg/kg-day	3.00E-04	mg/kg-day	0.005
				Benzo(a)anthracene	5.09E-01	mg/kg	(2)	--	--	--	--	6.51E-06	mg/kg-day	--	--	--
				Benzo(a)pyrene	3.42E-01	mg/kg	(2)	--	--	--	--	4.37E-06	mg/kg-day	3.00E-04	mg/kg-day	0.01
				Benzo(b)fluoranthene	6.90E-01	mg/kg	(2)	--	--	--	--	8.82E-06	mg/kg-day	--	--	--
				Dibenz(a,h)anthracene	1.51E-02	mg/kg	(2)	--	--	--	--	1.93E-07	mg/kg-day	--	--	--
				Indeno(1,2,3-cd)pyrene	1.77E-01	mg/kg	(2)	--	--	--	--	2.26E-06	mg/kg-day	--	--	--
				Pesticides												
				Dieldrin	3.97E-03	mg/kg	(2)	--	--	--	--	5.08E-08	mg/kg-day	5.00E-05	mg/kg-day	0.001
				Polychlorinated Biphenyls (PCBs)												
				Aroclor 1254	6.17E-02	mg/kg	(2)	--	--	--	--	7.89E-07	mg/kg-day	2.00E-05	mg/kg-day	0.04
				Aroclor 1260	2.40E+01	mg/kg	(2)	--	--	--	--	3.07E-04	mg/kg-day	--	--	--
				Polychlorinated Biphenyls (PCBs) - Congeners												
				PCBC TEQ MAMMAL HALFND	2.28E-05	mg/kg	(2)	--	--	--	--	2.92E-10	mg/kg-day	7.00E-10	mg/kg-day	0.4
				Dioxins and Furans												
				DIOXIN TEQ MAMMAL HALFND	1.19E-05	mg/kg	(2)	--	--	--	--	1.52E-10	mg/kg-day	7.00E-10	mg/kg-day	0.2
				Metals (Total)												
				Aluminum	8.51E+03	mg/kg	(2)	--	--	--	--	1.09E-01	mg/kg-day	1.00E+00	mg/kg-day	0.1
				Antimony	9.23E-01	mg/kg	(2)	--	--	--	--	1.18E-05	mg/kg-day	4.00E-04	mg/kg-day	0.03
				Arsenic	1.22E+01	mg/kg	(2)	--	--	--	--	9.33E-05	mg/kg-day	3.00E-04	mg/kg-day	0.3
				Cadmium (Diet)	3.32E-01	mg/kg	(2)	--	--	--	--	4.24E-06	mg/kg-day	1.00E-03	mg/kg-day	0.004
				Chromium, Total	1.48E+01	mg/kg	(2)	--	--	--	--	1.90E-04	mg/kg-day	3.00E-03	mg/kg-day	0.06
				Cobalt	1.03E+01	mg/kg	(2)	--	--	--	--	1.32E-04	mg/kg-day	3.00E-04	mg/kg-day	0.4
				Iron	2.24E+04	mg/kg	(2)	--	--	--	--	2.87E-01	mg/kg-day	7.00E-01	mg/kg-day	0.4
				Manganese (Non-Diet)	4.20E+02	mg/kg	(2)	--	--	--	--	5.37E-03	mg/kg-day	2.40E-02	mg/kg-day	0.2
				Thallium	1.52E-01	mg/kg	(2)	--	--	--	--	1.94E-06	mg/kg-day	1.00E-05	mg/kg-day	0.2
			Exp. Route Total								--					2
			Dermal													
				Semi-volatile Organic Compounds (SVOCs)												
				1,2,4,5-Tetrachlorobenzene	1.21E-01	mg/kg	(2)	--	--	--	--	3.67E-07	mg/kg-day	3.00E-04	mg/kg-day	0.001
				Benzo(a)anthracene	5.09E-01	mg/kg	(2)	--	--	--	--	2.01E-06	mg/kg-day	--	--	--
				Benzo(a)pyrene	3.42E-01	mg/kg	(2)	--	--	--	--	1.35E-06	mg/kg-day	3.00E-04	mg/kg-day	0.004
				Benzo(b)fluoranthene	6.90E-01	mg/kg	(2)	--	--	--	--	2.72E-06	mg/kg-day	--	--	--
				Dibenz(a,h)anthracene	1.51E-02	mg/kg	(2)	--	--	--	--	5.96E-08	mg/kg-day	--	--	--
				Indeno(1,2,3-cd)pyrene	1.77E-01	mg/kg	(2)	--	--	--	--	6.98E-07	mg/kg-day	--	--	--
				Pesticides												
				Dieldrin	3.97E-03	mg/kg	(2)	--	--	--	--	1.20E-08	mg/kg-day	5.00E-05	mg/kg-day	0.0002
				Polychlorinated Biphenyls (PCBs)												
				Aroclor 1254	6.17E-02	mg/kg	(2)	--	--	--	--	2.62E-07	mg/kg-day	2.00E-05	mg/kg-day	0.01
				Aroclor 1260	2.40E+01	mg/kg	(2)	--	--	--	--	1.02E-04	mg/kg-day	--	--	--
				Polychlorinated Biphenyls (PCBs) - Congeners												
				PCBC TEQ MAMMAL HALFND	2.28E-05	mg/kg	(2)	--	--	--	--	2.08E-11	mg/kg-day	7.00E-10	mg/kg-day	0.03
				Dioxins and Furans												
				DIOXIN TEQ MAMMAL HALFND	1.19E-05	mg/kg	(2)	--	--	--	--	1.08E-11	mg/kg-day	7.00E-10	mg/kg-day	0.02

Table A-7.5b
Calculation of Chemical Non-Cancer Hazards
Reasonable Maximum Exposure (Site-Wide with Hotspot)
Future On-Site Hypothetical Resident (Child) - Total Soil (0 - 8.8 feet)
Human Health Risk Assessment
Shaffer Equipment/Arbuckle Creek Area Superfund Site, Minden, West Virginia

Scenario Timeframe:	Future
Receptor Population:	On-Site Hypothetical Resident
Receptor Age:	Child

Medium	Exposure Medium	Exposure Point	Exposure Route	Chemical of Potential Concern	EPC		Cancer Risk Calculations					Non-Cancer Hazard Calculations				
					Value	Units	Intake/Exposure Concentration		CSF/Unit Risk		Cancer Risk [1]	Intake/Exposure Concentration		RfD/RfC		Hazard Quotient [1]
							Value	Units	Value	Units		Value	Units	Value	Units	
				Metals (Total)												
				Aluminum	8.51E+03	mg/kg	(2)	--	--	--	--	2.58E-03	mg/kg-day	1.00E+00	mg/kg-day	0.003
				Antimony	9.23E-01	mg/kg	(2)	--	--	--	--	2.80E-07	mg/kg-day	6.00E-05	mg/kg-day	0.005
				Arsenic	1.22E+01	mg/kg	(2)	--	--	--	--	1.11E-05	mg/kg-day	3.00E-04	mg/kg-day	0.04
				Cadmium (Diet)	3.32E-01	mg/kg	(2)	--	--	--	--	1.01E-08	mg/kg-day	2.50E-05	mg/kg-day	0.0004
				Chromium, Total	1.48E+01	mg/kg	(2)	--	--	--	--	4.50E-06	mg/kg-day	7.50E-05	mg/kg-day	0.06
				Cobalt	1.03E+01	mg/kg	(2)	--	--	--	--	3.13E-06	mg/kg-day	3.00E-04	mg/kg-day	0.01
				Iron	2.24E+04	mg/kg	(2)	--	--	--	--	6.80E-03	mg/kg-day	7.00E-01	mg/kg-day	0.01
				Manganese (Non-Diet)	4.20E+02	mg/kg	(2)	--	--	--	--	1.27E-04	mg/kg-day	9.60E-04	mg/kg-day	0.1
				Thallium	1.52E-01	mg/kg	(2)	--	--	--	--	4.61E-08	mg/kg-day	1.00E-05	mg/kg-day	0.005
			Exp. Route Total								--					0.3
		Exp. Point Total									--					3
	Exp. Medium Total										--					3
	Outdoor Air	Particulates above Site	Inhalation													
				Semi-volatile Organic Compounds (SVOCs)												
				1,2,4,5-Tetrachlorobenzene	8.90E-08	µg/m³	(2)	--	--	--	--	8.53E-08	µg/m³	--	--	--
				Benzo(a)anthracene	3.74E-07	µg/m³	(2)	--	--	--	--	3.59E-07	µg/m³	--	--	--
				Benzo(a)pyrene	2.51E-07	µg/m³	(2)	--	--	--	--	2.41E-07	µg/m³	2.00E-03	µg/m³	0.0001
				Benzo(b)fluoranthene	5.07E-07	µg/m³	(2)	--	--	--	--	4.87E-07	µg/m³	--	--	--
				Dibenz(a,h)anthracene	1.11E-08	µg/m³	(2)	--	--	--	--	1.06E-08	µg/m³	--	--	--
				Indeno(1,2,3-cd)pyrene	1.30E-07	µg/m³	(2)	--	--	--	--	1.25E-07	µg/m³	--	--	--
				Pesticides												
				Dieldrin	2.92E-09	µg/m³	(2)	--	--	--	--	2.80E-09	µg/m³	--	--	--
				Polychlorinated Biphenyls (PCBs)												
				Aroclor 1254	4.54E-08	µg/m³	(2)	--	--	--	--	4.35E-08	µg/m³	--	--	--
				Aroclor 1260	1.76E-05	µg/m³	(2)	--	--	--	--	1.69E-05	µg/m³	--	--	--
				Polychlorinated Biphenyls (PCBs) - Congeners												
				PCBC TEQ MAMMAL HALFND	1.68E-11	µg/m³	(2)	--	--	--	--	1.61E-11	µg/m³	4.00E-05	µg/m³	0.0000004
				Dioxins and Furans												
				DIOXIN TEQ MAMMAL HALFND	8.74E-12	µg/m³	(2)	--	--	--	--	8.38E-12	µg/m³	4.00E-05	µg/m³	0.0000002
				Metals (Total)												
				Aluminum	6.26E-03	µg/m³	(2)	--	--	--	--	6.00E-03	µg/m³	5.00E+00	µg/m³	0.001
				Antimony	6.79E-07	µg/m³	(2)	--	--	--	--	6.51E-07	µg/m³	3.00E-01	µg/m³	0.000002
				Arsenic	8.94E-06	µg/m³	(2)	--	--	--	--	8.57E-06	µg/m³	1.50E-02	µg/m³	0.0006
				Cadmium (Diet)	2.44E-07	µg/m³	(2)	--	--	--	--	2.34E-07	µg/m³	1.00E-02	µg/m³	0.00002
				Chromium, Total	1.09E-05	µg/m³	(2)	--	--	--	--	1.05E-05	µg/m³	1.00E-01	µg/m³	0.0001
				Cobalt	7.59E-06	µg/m³	(2)	--	--	--	--	7.28E-06	µg/m³	6.00E-03	µg/m³	0.001
				Iron	1.65E-02	µg/m³	(2)	--	--	--	--	1.58E-02	µg/m³	--	--	--
				Manganese (Non-Diet)	3.09E-04	µg/m³	(2)	--	--	--	--	2.96E-04	µg/m³	5.00E-02	µg/m³	0.006
				Thallium	1.12E-07	µg/m³	(2)	--	--	--	--	1.07E-07	µg/m³	--	--	--
			Exp. Route Total								--					0.009
		Exp. Point Total									--					0.009
		Vapors above Site	Inhalation													
				Semi-volatile Organic Compounds (SVOCs)												
				1,2,4,5-Tetrachlorobenzene	2.86E-03	µg/m³	(2)	--	--	--	--	2.74E-03	µg/m³	--	--	--
				Benzo(a)anthracene	6.75E-05	µg/m³	(2)	--	--	--	--	6.47E-05	µg/m³	--	--	--

Table A-7.5b
Calculation of Chemical Non-Cancer Hazards
Reasonable Maximum Exposure (Site-Wide with Hotspot)
Future On-Site Hypothetical Resident (Child) - Total Soil (0 - 8.8 feet)
Human Health Risk Assessment
Shaffer Equipment/Arbuckle Creek Area Superfund Site, Minden, West Virginia

Scenario Timeframe:	Future
Receptor Population:	On-Site Hypothetical Resident
Receptor Age:	Child

Medium	Exposure Medium	Exposure Point	Exposure Route	Chemical of Potential Concern	EPC		Cancer Risk Calculations					Non-Cancer Hazard Calculations				
					Value	Units	Intake/Exposure Concentration		CSF/Unit Risk		Cancer Risk (1)	Intake/Exposure Concentration		RfD/RfC		Hazard Quotient (1)
							Value	Units	Value	Units		Value	Units	Value	Units	
				Polychlorinated Biphenyls (PCBs)												
				Aroclor 1254	1.88E-04	µg/m³	(2)	--	--	--	--	1.80E-04	µg/m³	--	--	--
				Aroclor 1260	6.49E-02	µg/m³	(2)	--	--	--	--	6.22E-02	µg/m³	--	--	--
				Polychlorinated Biphenyls (PCBs) - Congeners												
				PCBC TEQ MAMMAL HALFND	7.89E-09	µg/m³	(2)	--	--	--	--	7.56E-09	µg/m³	4.00E-05	µg/m³	0.0002
				Dioxins and Furans												
				DIOXIN TEQ MAMMAL HALFND	4.11E-09	µg/m³	(2)	--	--	--	--	3.94E-09	µg/m³	4.00E-05	µg/m³	0.0001
			Exp. Route Total								--					0.0003
		Exp. Point Total									--					0.0003
	Exp. Medium Total										--					0.009
Medium Total											--					3
Notes:											**Total of Receptor Risks Across All Media**					**3**

(1) CR and HQs are rounded to one non-zero digit; cumulative totals may be slightly higher or lower depending on degree of rounding.

(2) Cancer risk is only presented for the lifetime receptor, whereas non-cancer hazard is calculated separately for the child and adult receptor.

Table A-7.6a
Calculation of Chemical Cancer Risks
Reasonable Maximum Exposure (Site-Wide)
Future On-Site Hypothetical Resident (Lifetime) - Total Soil (0 - 8.8 feet)
Human Health Risk Assessment
Shaffer Equipment/Arbuckle Creek Area Superfund Site, Minden, West Virginia

Scenario Timeframe:	Future
Receptor Population:	On-Site Hypothetical Resident
Receptor Age:	Lifetime

Medium	Exposure Medium	Exposure Point	Exposure Route	Chemical of Potential Concern	EPC		Cancer Risk Calculations					Non-Cancer Hazard Calculations				
					Value	Units	Intake/Exposure Concentration		CSF/Unit Risk		Cancer Risk [1]	Intake/Exposure Concentration		RfD/RfC		Hazard Quotient [1]
							Value	Units	Value	Units		Value	Units	Value	Units	
Soil	Total Soil	0 - 8.8 feet	Ingestion													
				Semi-volatile Organic Compounds (SVOCs)												
				1,2,4,5-Tetrachlorobenzene	1.21E-01	mg/kg	1.74E-07	mg/kg-day	--	--	--	(2)	--	--	--	--
				Benzo(a)anthracene	5.09E-01	mg/kg	3.32E-06	mg/kg-day	1.00E-01	1/(mg/kg-day)	3E-07	(2)	--	--	--	--
				Benzo(a)pyrene	3.42E-01	mg/kg	2.23E-06	mg/kg-day	1.00E+00	1/(mg/kg-day)	2E-06	(2)	--	--	--	--
				Benzo(b)fluoranthene	6.90E-01	mg/kg	4.51E-06	mg/kg-day	1.00E-01	1/(mg/kg-day)	5E-07	(2)	--	--	--	--
				Dibenz(a,h)anthracene	1.51E-02	mg/kg	9.86E-08	mg/kg-day	1.00E+00	1/(mg/kg-day)	1E-07	(2)	--	--	--	--
				Indeno(1,2,3-cd)pyrene	1.77E-01	mg/kg	1.16E-06	mg/kg-day	1.00E-01	1/(mg/kg-day)	1E-07	(2)	--	--	--	--
				Pesticides												
				Dieldrin	3.97E-03	mg/kg	5.71E-09	mg/kg-day	1.60E+01	1/(mg/kg-day)	9E-08	(2)	--	--	--	--
				Polychlorinated Biphenyls (PCBs)												
				Aroclor 1254	6.17E-02	mg/kg	8.87E-08	mg/kg-day	2.00E+00	1/(mg/kg-day)	2E-07	(2)	--	--	--	--
				Aroclor 1260	1.18E+00	mg/kg	1.70E-06	mg/kg-day	2.00E+00	1/(mg/kg-day)	3E-06	(2)	--	--	--	--
				Polychlorinated Biphenyls (PCBs) - Congeners												
				PCBC TEQ MAMMAL HALFND	2.28E-05	mg/kg	3.28E-11	mg/kg-day	1.30E+05	1/(mg/kg-day)	4E-06	(2)	--	--	--	--
				Dioxins and Furans												
				DIOXIN TEQ MAMMAL HALFND	1.19E-05	mg/kg	1.71E-11	mg/kg-day	1.30E+05	1/(mg/kg-day)	2E-06	(2)	--	--	--	--
				Metals (Total)												
				Aluminum	8.51E+03	mg/kg	1.22E-02	mg/kg-day	--	--	--	(2)	--	--	--	--
				Antimony	9.23E-01	mg/kg	1.33E-06	mg/kg-day	--	--	--	(2)	--	--	--	--
				Arsenic	1.22E+01	mg/kg	1.05E-05	mg/kg-day	1.50E+00	1/(mg/kg-day)	2E-05	(2)	--	--	--	--
				Cadmium (Diet)	3.32E-01	mg/kg	4.78E-07	mg/kg-day	--	--	--	(2)	--	--	--	--
				Chromium, Total	1.48E+01	mg/kg	9.69E-05	mg/kg-day	5.00E-01	1/(mg/kg-day)	5E-05	(2)	--	--	--	--
				Cobalt	1.03E+01	mg/kg	1.48E-05	mg/kg-day	--	--	--	(2)	--	--	--	--
				Iron	2.24E+04	mg/kg	3.23E-02	mg/kg-day	--	--	--	(2)	--	--	--	--
				Manganese (Non-Diet)	4.20E+02	mg/kg	6.04E-04	mg/kg-day	--	--	--	(2)	--	--	--	--
				Thallium	1.52E-01	mg/kg	2.19E-07	mg/kg-day	--	--	--	(2)	--	--	--	--
			Exp. Route Total								8E-05					--
			Dermal													
				Semi-volatile Organic Compounds (SVOCs)												
				1,2,4,5-Tetrachlorobenzene	1.21E-01	mg/kg	4.90E-08	mg/kg-day	--	--	--	(2)	--	--	--	--
				Benzo(a)anthracene	5.09E-01	mg/kg	1.11E-06	mg/kg-day	1.00E-01	1/(mg/kg-day)	1E-07	(2)	--	--	--	--
				Benzo(a)pyrene	3.42E-01	mg/kg	7.45E-07	mg/kg-day	1.00E+00	1/(mg/kg-day)	7E-07	(2)	--	--	--	--
				Benzo(b)fluoranthene	6.90E-01	mg/kg	1.50E-06	mg/kg-day	1.00E-01	1/(mg/kg-day)	2E-07	(2)	--	--	--	--
				Dibenz(a,h)anthracene	1.51E-02	mg/kg	3.29E-08	mg/kg-day	1.00E+00	1/(mg/kg-day)	3E-08	(2)	--	--	--	--
				Indeno(1,2,3-cd)pyrene	1.77E-01	mg/kg	3.86E-07	mg/kg-day	1.00E-01	1/(mg/kg-day)	4E-08	(2)	--	--	--	--
				Pesticides												
				Dieldrin	3.97E-03	mg/kg	1.61E-09	mg/kg-day	1.60E+01	1/(mg/kg-day)	3E-08	(2)	--	--	--	--
				Polychlorinated Biphenyls (PCBs)												
				Aroclor 1254	6.17E-02	mg/kg	3.50E-08	mg/kg-day	2.00E+00	1/(mg/kg-day)	7E-08	(2)	--	--	--	--
				Aroclor 1260	1.18E+00	mg/kg	6.68E-07	mg/kg-day	2.00E+00	1/(mg/kg-day)	1E-06	(2)	--	--	--	--
				Polychlorinated Biphenyls (PCBs) - Congeners												
				PCBC TEQ MAMMAL HALFND	2.28E-05	mg/kg	2.77E-12	mg/kg-day	1.30E+05	1/(mg/kg-day)	4E-07	(2)	--	--	--	--
				Dioxins and Furans												
				DIOXIN TEQ MAMMAL HALFND	1.19E-05	mg/kg	1.44E-12	mg/kg-day	1.30E+05	1/(mg/kg-day)	2E-07	(2)	--	--	--	--

Table A-7.6a
Calculation of Chemical Cancer Risks
Reasonable Maximum Exposure (Site-Wide)
Future On-Site Hypothetical Resident (Lifetime) - Total Soil (0 - 8.8 feet)
Human Health Risk Assessment
Shaffer Equipment/Arbuckle Creek Area Superfund Site, Minden, West Virginia

Scenario Timeframe:	Future
Receptor Population:	On-Site Hypothetical Resident
Receptor Age:	Lifetime

Medium	Exposure Medium	Exposure Point	Exposure Route	Chemical of Potential Concern	EPC		Cancer Risk Calculations					Non-Cancer Hazard Calculations				
					Value	Units	Intake/Exposure Concentration		CSF/Unit Risk		Cancer Risk [1]	Intake/Exposure Concentration		RfD/RfC		Hazard Quotient [1]
							Value	Units	Value	Units		Value	Units	Value	Units	
				Metals (Total)												
				Aluminum	8.51E+03	mg/kg	3.44E-04	mg/kg-day	--	--	--	(2)	--	--	--	--
				Antimony	9.23E-01	mg/kg	3.73E-08	mg/kg-day	--	--	--	(2)	--	--	--	--
				Arsenic	1.22E+01	mg/kg	1.48E-06	mg/kg-day	1.50E+00	1/(mg/kg-day)	2E-06	(2)	--	--	--	--
				Cadmium (Diet)	3.32E-01	mg/kg	1.34E-09	mg/kg-day	--	--	--	(2)	--	--	--	--
				Chromium, Total	1.48E+01	mg/kg	2.49E-06	mg/kg-day	2.00E+01	1/(mg/kg-day)	5E-05	(2)	--	--	--	--
				Cobalt	1.03E+01	mg/kg	4.18E-07	mg/kg-day	--	--	--	(2)	--	--	--	--
				Iron	2.24E+04	mg/kg	9.07E-04	mg/kg-day	--	--	--	(2)	--	--	--	--
				Manganese (Non-Diet)	4.20E+02	mg/kg	1.70E-05	mg/kg-day	--	--	--	(2)	--	--	--	--
				Thallium	1.52E-01	mg/kg	6.15E-09	mg/kg-day	--	--	--	(2)	--	--	--	--
			Exp. Route Total								6E-05					--
		Exp. Point Total									1E-04					--
	Exp. Medium Total										1E-04					--
	Outdoor Air	Particulates above Site	Inhalation													
				Semi-volatile Organic Compounds (SVOCs)												
				1,2,4,5-Tetrachlorobenzene	8.90E-08	µg/m³	3.17E-08	µg/m³	--	--	--	(2)	--	--	--	--
				Benzo(a)anthracene	3.74E-07	µg/m³	3.69E-07	µg/m³	6.00E-05	m³/µg	2E-11	(2)	--	--	--	--
				Benzo(a)pyrene	2.51E-07	µg/m³	2.48E-07	µg/m³	6.00E-04	m³/µg	1E-10	(2)	--	--	--	--
				Benzo(b)fluoranthene	5.07E-07	µg/m³	5.00E-07	µg/m³	6.00E-05	m³/µg	3E-11	(2)	--	--	--	--
				Dibenz(a,h)anthracene	1.11E-08	µg/m³	1.10E-08	µg/m³	6.00E-04	m³/µg	7E-12	(2)	--	--	--	--
				Indeno(1,2,3-cd)pyrene	1.30E-07	µg/m³	1.28E-07	µg/m³	6.00E-05	m³/µg	8E-12	(2)	--	--	--	--
				Pesticides												
				Dieldrin	2.92E-09	µg/m³	1.04E-09	µg/m³	4.60E-03	m³/µg	5E-12	(2)	--	--	--	--
				Polychlorinated Biphenyls (PCBs)												
				Aroclor 1254	4.54E-08	µg/m³	1.62E-08	µg/m³	5.71E-04	m³/µg	9E-12	(2)	--	--	--	--
				Aroclor 1260	8.67E-07	µg/m³	3.09E-07	µg/m³	5.71E-04	m³/µg	2E-10	(2)	--	--	--	--
				Polychlorinated Biphenyls (PCBs) - Congeners												
				PCBC TEQ MAMMAL HALFND	1.68E-11	µg/m³	5.98E-12	µg/m³	3.80E+01	m³/µg	2E-10	(2)	--	--	--	--
				Dioxins and Furans												
				DIOXIN TEQ MAMMAL HALFND	8.74E-12	µg/m³	3.11E-12	µg/m³	3.80E+01	m³/µg	1E-10	(2)	--	--	--	--
				Metals (Total)												
				Aluminum	6.26E-03	µg/m³	2.23E-03	µg/m³	--	--	--	(2)	--	--	--	--
				Antimony	6.79E-07	µg/m³	2.42E-07	µg/m³	--	--	--	(2)	--	--	--	--
				Arsenic	8.94E-06	µg/m³	3.18E-06	µg/m³	4.30E-03	m³/µg	1E-08	(2)	--	--	--	--
				Cadmium (Diet)	2.44E-07	µg/m³	8.69E-08	µg/m³	1.80E-03	m³/µg	2E-10	(2)	--	--	--	--
				Chromium, Total	1.09E-05	µg/m³	1.08E-05	µg/m³	8.40E-02	m³/µg	9E-07	(2)	--	--	--	--
				Cobalt	7.59E-06	µg/m³	2.70E-06	µg/m³	9.00E-03	m³/µg	2E-08	(2)	--	--	--	--
				Iron	1.65E-02	µg/m³	5.87E-03	µg/m³	--	--	--	(2)	--	--	--	--
				Manganese (Non-Diet)	3.09E-04	µg/m³	1.10E-04	µg/m³	--	--	--	(2)	--	--	--	--
				Thallium	1.12E-07	µg/m³	3.98E-08	µg/m³	--	--	--	(2)	--	--	--	--
			Exp. Route Total								9E-07					--
		Exp. Point Total									9E-07					--
		Vapors above Site	Inhalation													
				Semi-volatile Organic Compounds (SVOCs)												
				1,2,4,5-Tetrachlorobenzene	2.86E-03	µg/m³	1.02E-03	µg/m³	--	--	--	(2)	--	--	--	--
				Benzo(a)anthracene	6.75E-05	µg/m³	6.66E-05	µg/m³	6.00E-05	m³/µg	4E-09	(2)	--	--	--	--

Table A-7.6a
Calculation of Chemical Cancer Risks
Reasonable Maximum Exposure (Site-Wide)
Future On-Site Hypothetical Resident (Lifetime) - Total Soil (0 - 8.8 feet)
Human Health Risk Assessment
Shaffer Equipment/Arbuckle Creek Area Superfund Site, Minden, West Virginia

Scenario Timeframe:	Future
Receptor Population:	On-Site Hypothetical Resident
Receptor Age:	Lifetime

Medium	Exposure Medium	Exposure Point	Exposure Route	Chemical of Potential Concern	EPC		Cancer Risk Calculations					Non-Cancer Hazard Calculations				
					Value	Units	Intake/Exposure Concentration		CSF/Unit Risk		Cancer Risk [1]	Intake/Exposure Concentration		RfD/RfC		Hazard Quotient [1]
							Value	Units	Value	Units		Value	Units	Value	Units	
				Polychlorinated Biphenyls (PCBs)												
				Aroclor 1254	1.88E-04	µg/m³	6.68E-05	µg/m³	5.71E-04	m³/µg	4E-08	(2)	--	--	--	--
				Aroclor 1260	3.19E-03	µg/m³	1.14E-03	µg/m³	5.71E-04	m³/µg	6E-07	(2)	--	--	--	--
				Polychlorinated Biphenyls (PCBs) - Congeners												
				PCBC TEQ MAMMAL HALFND	7.89E-09	µg/m³	2.81E-09	µg/m³	3.80E+01	m³/µg	1E-07	(2)	--	--	--	--
				Dioxins and Furans												
				DIOXIN TEQ MAMMAL HALFND	4.11E-09	µg/m³	1.46E-09	µg/m³	3.80E+01	m³/µg	6E-08	(2)	--	--	--	--
			Exp. Route Total								9E-07					--
		Exp. Point Total									9E-07					--
	Exp. Medium Total										2E-06					--
Medium Total											1E-04					--
Notes:											**Total of Receptor Risks Across All Media**					**Total of Receptor Hazards Across All Media**
											1E-04					**--**

(1) CR and HQs are rounded to one non-zero digit; cumulative totals may be slightly higher or lower depending on degree of rounding.

(2) Cancer risk is only presented for the lifetime receptor, whereas non-cancer hazard is calculated separately for the child and adult receptor.

Table A-7.6b
Calculation of Chemical Cancer Risks
Reasonable Maximum Exposure (Site-Wide with Hotspot)
Future On-Site Hypothetical Resident (Lifetime) - Total Soil (0 - 8.8 feet)
Human Health Risk Assessment
Shaffer Equipment/Arbuckle Creek Area Superfund Site, Minden, West Virginia

Scenario Timeframe:	Future
Receptor Population:	On-Site Hypothetical Resident
Receptor Age:	Lifetime

Medium	Exposure Medium	Exposure Point	Exposure Route	Chemical of Potential Concern	EPC		Cancer Risk Calculations					Non-Cancer Hazard Calculations				
					Value	Units	Intake/Exposure Concentration		CSF/Unit Risk		Cancer Risk [1]	Intake/Exposure Concentration		RfD/RfC		Hazard Quotient [1]
							Value	Units	Value	Units		Value	Units	Value	Units	
Soil	Total Soil	0 - 8.8 feet	Ingestion													
				Semi-volatile Organic Compounds (SVOCs)												
				1,2,4,5-Tetrachlorobenzene	1.21E-01	mg/kg	1.74E-07	mg/kg-day	--	--	--	(2)	--	--	--	--
				Benzo(a)anthracene	5.09E-01	mg/kg	3.32E-06	mg/kg-day	1.00E-01	1/(mg/kg-day)	3E-07	(2)	--	--	--	--
				Benzo(a)pyrene	3.42E-01	mg/kg	2.23E-06	mg/kg-day	1.00E+00	1/(mg/kg-day)	2E-06	(2)	--	--	--	--
				Benzo(b)fluoranthene	6.90E-01	mg/kg	4.51E-06	mg/kg-day	1.00E-01	1/(mg/kg-day)	5E-07	(2)	--	--	--	--
				Dibenz(a,h)anthracene	1.51E-02	mg/kg	9.86E-08	mg/kg-day	1.00E+00	1/(mg/kg-day)	1E-07	(2)	--	--	--	--
				Indeno(1,2,3-cd)pyrene	1.77E-01	mg/kg	1.16E-06	mg/kg-day	1.00E-01	1/(mg/kg-day)	1E-07	(2)	--	--	--	--
				Pesticides												
				Dieldrin	3.97E-03	mg/kg	5.71E-09	mg/kg-day	1.60E+01	1/(mg/kg-day)	9E-08	(2)	--	--	--	--
				Polychlorinated Biphenyls (PCBs)												
				Aroclor 1254	6.17E-02	mg/kg	8.87E-08	mg/kg-day	2.00E+00	1/(mg/kg-day)	2E-07	(2)	--	--	--	--
				Aroclor 1260	2.40E+01	mg/kg	3.45E-05	mg/kg-day	2.00E+00	1/(mg/kg-day)	7E-05	(2)	--	--	--	--
				Polychlorinated Biphenyls (PCBs) - Congeners												
				PCBC TEQ MAMMAL HALFND	2.28E-05	mg/kg	3.28E-11	mg/kg-day	1.30E+05	1/(mg/kg-day)	4E-06	(2)	--	--	--	--
				Dioxins and Furans												
				DIOXIN TEQ MAMMAL HALFND	1.19E-05	mg/kg	1.71E-11	mg/kg-day	1.30E+05	1/(mg/kg-day)	2E-06	(2)	--	--	--	--
				Metals (Total)												
				Aluminum	8.51E+03	mg/kg	1.22E-02	mg/kg-day	--	--	--	(2)	--	--	--	--
				Antimony	9.23E-01	mg/kg	1.33E-06	mg/kg-day	--	--	--	(2)	--	--	--	--
				Arsenic	1.22E+01	mg/kg	1.05E-05	mg/kg-day	1.50E+00	1/(mg/kg-day)	2E-05	(2)	--	--	--	--
				Cadmium (Diet)	3.32E-01	mg/kg	4.78E-07	mg/kg-day	--	--	--	(2)	--	--	--	--
				Chromium, Total	1.48E+01	mg/kg	9.69E-05	mg/kg-day	5.00E-01	1/(mg/kg-day)	5E-05	(2)	--	--	--	--
				Cobalt	1.03E+01	mg/kg	1.48E-05	mg/kg-day	--	--	--	(2)	--	--	--	--
				Iron	2.24E+04	mg/kg	3.23E-02	mg/kg-day	--	--	--	(2)	--	--	--	--
				Manganese (Non-Diet)	4.20E+02	mg/kg	6.04E-04	mg/kg-day	--	--	--	(2)	--	--	--	--
				Thallium	1.52E-01	mg/kg	2.19E-07	mg/kg-day	--	--	--	(2)	--	--	--	--
			Exp. Route Total								1E-04					--
			Dermal													
				Semi-volatile Organic Compounds (SVOCs)												
				1,2,4,5-Tetrachlorobenzene	1.21E-01	mg/kg	4.90E-08	mg/kg-day	--	--	--	(2)	--	--	--	--
				Benzo(a)anthracene	5.09E-01	mg/kg	1.11E-06	mg/kg-day	1.00E-01	1/(mg/kg-day)	1E-07	(2)	--	--	--	--
				Benzo(a)pyrene	3.42E-01	mg/kg	7.45E-07	mg/kg-day	1.00E+00	1/(mg/kg-day)	7E-07	(2)	--	--	--	--
				Benzo(b)fluoranthene	6.90E-01	mg/kg	1.50E-06	mg/kg-day	1.00E-01	1/(mg/kg-day)	2E-07	(2)	--	--	--	--
				Dibenz(a,h)anthracene	1.51E-02	mg/kg	3.29E-08	mg/kg-day	1.00E+00	1/(mg/kg-day)	3E-08	(2)	--	--	--	--
				Indeno(1,2,3-cd)pyrene	1.77E-01	mg/kg	3.86E-07	mg/kg-day	1.00E-01	1/(mg/kg-day)	4E-08	(2)	--	--	--	--
				Pesticides												
				Dieldrin	3.97E-03	mg/kg	1.61E-09	mg/kg-day	1.60E+01	1/(mg/kg-day)	3E-08	(2)	--	--	--	--
				Polychlorinated Biphenyls (PCBs)												
				Aroclor 1254	6.17E-02	mg/kg	3.50E-08	mg/kg-day	2.00E+00	1/(mg/kg-day)	7E-08	(2)	--	--	--	--
				Aroclor 1260	2.40E+01	mg/kg	1.36E-05	mg/kg-day	2.00E+00	1/(mg/kg-day)	3E-05	(2)	--	--	--	--
				Polychlorinated Biphenyls (PCBs) - Congeners												
				PCBC TEQ MAMMAL HALFND	2.28E-05	mg/kg	2.77E-12	mg/kg-day	1.30E+05	1/(mg/kg-day)	4E-07	(2)	--	--	--	--
				Dioxins and Furans												
				DIOXIN TEQ MAMMAL HALFND	1.19E-05	mg/kg	1.44E-12	mg/kg-day	1.30E+05	1/(mg/kg-day)	2E-07	(2)	--	--	--	--

Table A-7.6b
Calculation of Chemical Cancer Risks
Reasonable Maximum Exposure (Site-Wide with Hotspot)
Future On-Site Hypothetical Resident (Lifetime) - Total Soil (0 - 8.8 feet)
Human Health Risk Assessment
Shaffer Equipment/Arbuckle Creek Area Superfund Site, Minden, West Virginia

Scenario Timeframe:	Future
Receptor Population:	On-Site Hypothetical Resident
Receptor Age:	Lifetime

Medium	Exposure Medium	Exposure Point	Exposure Route	Chemical of Potential Concern	EPC		Cancer Risk Calculations					Non-Cancer Hazard Calculations				
					Value	Units	Intake/Exposure Concentration		CSF/Unit Risk		Cancer Risk [1]	Intake/Exposure Concentration		RfD/RfC		Hazard Quotient [1]
							Value	Units	Value	Units		Value	Units	Value	Units	
				Metals (Total)												
				Aluminum	8.51E+03	mg/kg	3.44E-04	mg/kg-day	--	--	--	(2)	--	--	--	--
				Antimony	9.23E-01	mg/kg	3.73E-08	mg/kg-day	--	--	--	(2)	--	--	--	--
				Arsenic	1.22E+01	mg/kg	1.48E-06	mg/kg-day	1.50E+00	1/(mg/kg-day)	2E-06	(2)	--	--	--	--
				Cadmium (Diet)	3.32E-01	mg/kg	1.34E-09	mg/kg-day	--	--	--	(2)	--	--	--	--
				Chromium, Total	1.48E+01	mg/kg	2.49E-06	mg/kg-day	2.00E+01	1/(mg/kg-day)	5E-05	(2)	--	--	--	--
				Cobalt	1.03E+01	mg/kg	4.18E-07	mg/kg-day	--	--	--	(2)	--	--	--	--
				Iron	2.24E+04	mg/kg	9.07E-04	mg/kg-day	--	--	--	(2)	--	--	--	--
				Manganese (Non-Diet)	4.20E+02	mg/kg	1.70E-05	mg/kg-day	--	--	--	(2)	--	--	--	--
				Thallium	1.52E-01	mg/kg	6.15E-09	mg/kg-day	--	--	--	(2)	--	--	--	--
			Exp. Route Total								8E-05					--
		Exp. Point Total									2E-04					--
	Exp. Medium Total										2E-04					--
	Outdoor Air	Particulates above Site	Inhalation													
				Semi-volatile Organic Compounds (SVOCs)												
				1,2,4,5-Tetrachlorobenzene	8.90E-08	µg/m³	3.17E-08	µg/m³	--	--	--	(2)	--	--	--	--
				Benzo(a)anthracene	3.74E-07	µg/m³	3.69E-07	µg/m³	6.00E-05	m³/µg	2E-11	(2)	--	--	--	--
				Benzo(a)pyrene	2.51E-07	µg/m³	2.48E-07	µg/m³	6.00E-04	m³/µg	1E-10	(2)	--	--	--	--
				Benzo(b)fluoranthene	5.07E-07	µg/m³	5.00E-07	µg/m³	6.00E-05	m³/µg	3E-11	(2)	--	--	--	--
				Dibenz(a,h)anthracene	1.11E-08	µg/m³	1.10E-08	µg/m³	6.00E-04	m³/µg	7E-12	(2)	--	--	--	--
				Indeno(1,2,3-cd)pyrene	1.30E-07	µg/m³	1.28E-07	µg/m³	6.00E-05	m³/µg	8E-12	(2)	--	--	--	--
				Pesticides												
				Dieldrin	2.92E-09	µg/m³	1.04E-09	µg/m³	4.60E-03	m³/µg	5E-12	(2)	--	--	--	--
				Polychlorinated Biphenyls (PCBs)												
				Aroclor 1254	4.54E-08	µg/m³	1.62E-08	µg/m³	5.71E-04	m³/µg	9E-12	(2)	--	--	--	--
				Aroclor 1260	1.76E-05	µg/m³	6.29E-06	µg/m³	5.71E-04	m³/µg	4E-09	(2)	--	--	--	--
				Polychlorinated Biphenyls (PCBs) - Congeners												
				PCBC TEQ MAMMAL HALFND	1.68E-11	µg/m³	5.98E-12	µg/m³	3.80E+01	m³/µg	2E-10	(2)	--	--	--	--
				Dioxins and Furans												
				DIOXIN TEQ MAMMAL HALFND	8.74E-12	µg/m³	3.11E-12	µg/m³	3.80E+01	m³/µg	1E-10	(2)	--	--	--	--
				Metals (Total)												
				Aluminum	6.26E-03	µg/m³	2.23E-03	µg/m³	--	--	--	(2)	--	--	--	--
				Antimony	6.79E-07	µg/m³	2.42E-07	µg/m³	--	--	--	(2)	--	--	--	--
				Arsenic	8.94E-06	µg/m³	3.18E-06	µg/m³	4.30E-03	m³/µg	1E-08	(2)	--	--	--	--
				Cadmium (Diet)	2.44E-07	µg/m³	8.69E-08	µg/m³	1.80E-03	m³/µg	2E-10	(2)	--	--	--	--
				Chromium, Total	1.09E-05	µg/m³	1.08E-05	µg/m³	8.40E-02	m³/µg	9E-07	(2)	--	--	--	--
				Cobalt	7.59E-06	µg/m³	2.70E-06	µg/m³	9.00E-03	m³/µg	2E-08	(2)	--	--	--	--
				Iron	1.65E-02	µg/m³	5.87E-03	µg/m³	--	--	--	(2)	--	--	--	--
				Manganese (Non-Diet)	3.09E-04	µg/m³	1.10E-04	µg/m³	--	--	--	(2)	--	--	--	--
				Thallium	1.12E-07	µg/m³	3.98E-08	µg/m³	--	--	--	(2)	--	--	--	--
			Exp. Route Total								9E-07					--
		Exp. Point Total									9E-07					--
		Vapors above Site	Inhalation													
				Semi-volatile Organic Compounds (SVOCs)												
				1,2,4,5-Tetrachlorobenzene	2.86E-03	µg/m³	1.02E-03	µg/m³	--	--	--	(2)	--	--	--	--
				Benzo(a)anthracene	6.75E-05	µg/m³	6.66E-05	µg/m³	6.00E-05	m³/µg	4E-09	(2)	--	--	--	--

Table A-7.6b
Calculation of Chemical Cancer Risks
Reasonable Maximum Exposure (Site-Wide with Hotspot)
Future On-Site Hypothetical Resident (Lifetime) - Total Soil (0 - 8.8 feet)
Human Health Risk Assessment
Shaffer Equipment/Arbuckle Creek Area Superfund Site, Minden, West Virginia

Scenario Timeframe:	Future
Receptor Population:	On-Site Hypothetical Resident
Receptor Age:	Lifetime

Medium	Exposure Medium	Exposure Point	Exposure Route	Chemical of Potential Concern	EPC		Cancer Risk Calculations					Non-Cancer Hazard Calculations				
					Value	Units	Intake/Exposure Concentration		CSF/Unit Risk		Cancer Risk [1]	Intake/Exposure Concentration		RfD/RfC		Hazard Quotient [1]
							Value	Units	Value	Units		Value	Units	Value	Units	
				Polychlorinated Biphenyls (PCBs)												
				Aroclor 1254	1.88E-04	µg/m³	6.68E-05	µg/m³	5.71E-04	m³/µg	4E-08	(2)	--	--	--	--
				Aroclor 1260	6.49E-02	µg/m³	2.31E-02	µg/m³	5.71E-04	m³/µg	1E-05	(2)	--	--	--	--
				Polychlorinated Biphenyls (PCBs) - Congeners												
				PCBC TEQ MAMMAL HALFND	7.89E-09	µg/m³	2.81E-09	µg/m³	3.80E+01	m³/µg	1E-07	(2)	--	--	--	--
				Dioxins and Furans												
				DIOXIN TEQ MAMMAL HALFND	4.11E-09	µg/m³	1.46E-09	µg/m³	3.80E+01	m³/µg	6E-08	(2)	--	--	--	--
			Exp. Route Total								1E-05					--
		Exp. Point Total									1E-05					--
	Exp. Medium Total										1E-05					--
Medium Total											2E-04					--
Notes:											**Total of Receptor Risks Across All Media**					**Total of Receptor Hazards Across All Media**
											2E-04					**--**

(1) CR and HQs are rounded to one non-zero digit; cumulative totals may be slightly higher or lower depending on degree of rounding.

(2) Cancer risk is only presented for the lifetime receptor, whereas non-cancer hazard is calculated separately for the child and adult receptor.

Table A-7.7
Calculation of Chemical Non-Cancer Hazards
Reasonable Maximum Exposure (Site-Wide)
Current/Future On-Site Recreator (Adult) - Surface Soil (0 - 0.5 feet)
Human Health Risk Assessment
Shaffer Equipment/Arbuckle Creek Area Superfund Site, Minden, West Virginia

Scenario Timeframe:	Current/Future
Receptor Population:	On-Site Recreator
Receptor Age:	Adult

Medium	Exposure Medium	Exposure Point	Exposure Route	Chemical of Potential Concern	EPC		Cancer Risk Calculations					Non-Cancer Hazard Calculations				
					Value	Units	Intake/Exposure Concentration		CSF/Unit Risk		Cancer Risk [1]	Intake/Exposure Concentration		RfD/RfC		Hazard Quotient [1]
							Value	Units	Value	Units		Value	Units	Value	Units	
Soil	Surface Soil	0 - 0.5 feet	Ingestion													
				Semi-volatile Organic Compounds (SVOCs)												
				Benzo(a)pyrene	1.14E-01	mg/kg	(2)	--	--	--	--	2.03E-08	mg/kg-day	3.00E-04	mg/kg-day	0.00007
				Polychlorinated Biphenyls (PCBs)												
				Aroclor 1260	1.60E+00	mg/kg	(2)	--	--	--	--	2.85E-07	mg/kg-day	--	--	--
				Polychlorinated Biphenyls (PCBs) - Congeners												
				PCBC TEQ MAMMAL HALFND	2.90E-05	mg/kg	(2)	--	--	--	--	5.17E-12	mg/kg-day	7.00E-10	mg/kg-day	0.007
				Dioxins and Furans												
				DIOXIN TEQ MAMMAL HALFND	2.08E-05	mg/kg	(2)	--	--	--	--	3.70E-12	mg/kg-day	7.00E-10	mg/kg-day	0.005
				Metals (Total)												
				Aluminum	8.54E+03	mg/kg	(2)	--	--	--	--	1.52E-03	mg/kg-day	1.00E+00	mg/kg-day	0.002
				Arsenic	8.64E+00	mg/kg	(2)	--	--	--	--	9.23E-07	mg/kg-day	3.00E-04	mg/kg-day	0.003
				Chromium, Total	1.26E+01	mg/kg	(2)	--	--	--	--	2.24E-06	mg/kg-day	3.00E-03	mg/kg-day	0.0007
				Cobalt	1.10E+01	mg/kg	(2)	--	--	--	--	1.96E-06	mg/kg-day	3.00E-04	mg/kg-day	0.007
				Iron	2.50E+04	mg/kg	(2)	--	--	--	--	4.46E-03	mg/kg-day	7.00E-01	mg/kg-day	0.006
				Manganese (Non-Diet)	4.72E+02	mg/kg	(2)	--	--	--	--	8.41E-05	mg/kg-day	2.40E-02	mg/kg-day	0.004
				Thallium	1.44E-01	mg/kg	(2)	--	--	--	--	2.56E-08	mg/kg-day	1.00E-05	mg/kg-day	0.003
			Exp. Route Total								--					0.04
			Dermal													
				Semi-volatile Organic Compounds (SVOCs)												
				Benzo(a)pyrene	1.14E-01	mg/kg	(2)	--	--	--	--	1.11E-08	mg/kg-day	3.00E-04	mg/kg-day	0.00004
				Polychlorinated Biphenyls (PCBs)												
				Aroclor 1260	1.60E+00	mg/kg	(2)	--	--	--	--	1.68E-07	mg/kg-day	--	--	--
				Polychlorinated Biphenyls (PCBs) - Congeners												
				PCBC TEQ MAMMAL HALFND	2.90E-05	mg/kg	(2)	--	--	--	--	6.55E-13	mg/kg-day	7.00E-10	mg/kg-day	0.0009
				Dioxins and Furans												
				DIOXIN TEQ MAMMAL HALFND	2.08E-05	mg/kg	(2)	--	--	--	--	4.69E-13	mg/kg-day	7.00E-10	mg/kg-day	0.0007
				Metals (Total)												
				Aluminum	8.54E+03	mg/kg	(2)	--	--	--	--	6.42E-05	mg/kg-day	1.00E+00	mg/kg-day	0.00006
				Arsenic	8.64E+00	mg/kg	(2)	--	--	--	--	1.95E-07	mg/kg-day	3.00E-04	mg/kg-day	0.0006
				Chromium, Total	1.26E+01	mg/kg	(2)	--	--	--	--	9.46E-08	mg/kg-day	7.50E-05	mg/kg-day	0.001
				Cobalt	1.10E+01	mg/kg	(2)	--	--	--	--	8.29E-08	mg/kg-day	3.00E-04	mg/kg-day	0.0003
				Iron	2.50E+04	mg/kg	(2)	--	--	--	--	1.88E-04	mg/kg-day	7.00E-01	mg/kg-day	0.0003
				Manganese (Non-Diet)	4.72E+02	mg/kg	(2)	--	--	--	--	3.55E-06	mg/kg-day	9.60E-04	mg/kg-day	0.004
				Thallium	1.44E-01	mg/kg	(2)	--	--	--	--	1.08E-09	mg/kg-day	1.00E-05	mg/kg-day	0.0001
			Exp. Route Total								--					0.008
		Exp. Point Total									--					0.05
	Exp. Medium Total										--					0.05
	Outdoor Air	Particulates above Site	Inhalation													
				Semi-volatile Organic Compounds (SVOCs)												
				Benzo(a)pyrene	8.38E-08	µg/m³	(2)	--	--	--	--	1.79E-09	µg/m³	2.00E-03	µg/m³	0.0000009
				Polychlorinated Biphenyls (PCBs)												
				Aroclor 1260	1.18E-06	µg/m³	(2)	--	--	--	--	2.51E-08	µg/m³	--	--	--
				Polychlorinated Biphenyls (PCBs) - Congeners												
				PCBC TEQ MAMMAL HALFND	2.13E-11	µg/m³	(2)	--	--	--	--	4.56E-13	µg/m³	4.00E-05	µg/m³	0.00000001
				Dioxins and Furans												
				DIOXIN TEQ MAMMAL HALFND	1.53E-11	µg/m³	(2)	--	--	--	--	3.26E-13	µg/m³	4.00E-05	µg/m³	8E-09

Table A-7.7
Calculation of Chemical Non-Cancer Hazards
Reasonable Maximum Exposure (Site-Wide)
Current/Future On-Site Recreator (Adult) - Surface Soil (0 - 0.5 feet)
Human Health Risk Assessment
Shaffer Equipment/Arbuckle Creek Area Superfund Site, Minden, West Virginia

Scenario Timeframe:	Current/Future
Receptor Population:	On-Site Recreator
Receptor Age:	Adult

Medium	Exposure Medium	Exposure Point	Exposure Route	Chemical of Potential Concern	EPC		Cancer Risk Calculations					Non-Cancer Hazard Calculations				
					Value	Units	Intake/Exposure Concentration		CSF/Unit Risk		Cancer Risk [1]	Intake/Exposure Concentration		RfD/RfC		Hazard Quotient [1]
							Value	Units	Value	Units		Value	Units	Value	Units	
				Metals (Total)												
				Aluminum	6.28E-03	µg/m³	(2)	--	--	--	--	1.34E-04	µg/m³	5.00E+00	µg/m³	0.00003
				Arsenic	6.35E-06	µg/m³	(2)	--	--	--	--	1.36E-07	µg/m³	1.50E-02	µg/m³	0.000009
				Chromium, Total	9.25E-06	µg/m³	(2)	--	--	--	--	1.98E-07	µg/m³	1.00E-01	µg/m³	0.000002
				Cobalt	8.10E-06	µg/m³	(2)	--	--	--	--	1.73E-07	µg/m³	6.00E-03	µg/m³	0.00003
				Iron	1.84E-02	µg/m³	(2)	--	--	--	--	3.93E-04	µg/m³	--	--	--
				Manganese (Non-Diet)	3.47E-04	µg/m³	(2)	--	--	--	--	7.42E-06	µg/m³	5.00E-02	µg/m³	0.0001
				Thallium	1.06E-07	µg/m³	(2)	--	--	--	--	2.26E-09	µg/m³	--	--	--
			Exp. Route Total								--					0.0002
		Exp. Point Total									--					0.0002
		Vapors above Site	Inhalation													
				Polychlorinated Biphenyls (PCBs)												
				Aroclor 1260	4.33E-03	µg/m³	(2)	--	--	--	--	9.25E-05	µg/m³	--	--	--
				Polychlorinated Biphenyls (PCBs) - Congeners												
				PCBC TEQ MAMMAL HALFND	1.00E-08	µg/m³	(2)	--	--	--	--	2.14E-10	µg/m³	4.00E-05	µg/m³	0.000005
				Dioxins and Furans												
				DIOXIN TEQ MAMMAL HALFND	7.18E-09	µg/m³	(2)	--	--	--	--	1.53E-10	µg/m³	4.00E-05	µg/m³	0.000004
			Exp. Route Total								--					0.000009
		Exp. Point Total									--					0.000009
	Exp. Medium Total										--					0.0002
Medium Total											--					0.05
Notes:											**Total of Receptor Risks Across All Media**					**Total of Receptor Hazards Across All Media**
											--					**0.05**

(1) CR and HQs are rounded to one non-zero digit; cumulative totals may be slightly higher or lower depending on degree of rounding.

(2) Cancer risk is only presented for the lifetime receptor, whereas non-cancer hazard is calculated separately for the child and adult receptor.

Table A-7.8
Calculation of Chemical Non-Cancer Hazards
Reasonable Maximum Exposure (Site-Wide)
Current/Future On-Site Recreator (Child) - Surface Soil (0 - 0.5 feet)
Human Health Risk Assessment
Shaffer Equipment/Arbuckle Creek Area Superfund Site, Minden, West Virginia

Scenario Timeframe:	Current/Future
Receptor Population:	On-Site Recreator
Receptor Age:	Child

Medium	Exposure Medium	Exposure Point	Exposure Route	Chemical of Potential Concern	EPC		Cancer Risk Calculations					Non-Cancer Hazard Calculations				
					Value	Units	Intake/Exposure Concentration		CSF/Unit Risk		Cancer Risk [1]	Intake/Exposure Concentration		RfD/RfC		Hazard Quotient [1]
							Value	Units	Value	Units		Value	Units	Value	Units	
Soil	Surface Soil	0 - 0.5 feet	Ingestion													
				Semi-volatile Organic Compounds (SVOCs)												
				Benzo(a)pyrene	1.14E-01	mg/kg	(2)	--	--	--	--	2.17E-07	mg/kg-day	3.00E-04	mg/kg-day	0.0007
				Polychlorinated Biphenyls (PCBs)												
				Aroclor 1260	1.60E+00	mg/kg	(2)	--	--	--	--	3.04E-06	mg/kg-day	--	--	--
				Polychlorinated Biphenyls (PCBs) - Congeners												
				PCBC TEQ MAMMAL HALFND	2.90E-05	mg/kg	(2)	--	--	--	--	5.51E-11	mg/kg-day	7.00E-10	mg/kg-day	0.08
				Dioxins and Furans												
				DIOXIN TEQ MAMMAL HALFND	2.08E-05	mg/kg	(2)	--	--	--	--	3.95E-11	mg/kg-day	7.00E-10	mg/kg-day	0.06
				Metals (Total)												
				Aluminum	8.54E+03	mg/kg	(2)	--	--	--	--	1.62E-02	mg/kg-day	1.00E+00	mg/kg-day	0.02
				Arsenic	8.64E+00	mg/kg	(2)	--	--	--	--	9.85E-06	mg/kg-day	3.00E-04	mg/kg-day	0.03
				Chromium, Total	1.26E+01	mg/kg	(2)	--	--	--	--	2.39E-05	mg/kg-day	3.00E-03	mg/kg-day	0.008
				Cobalt	1.10E+01	mg/kg	(2)	--	--	--	--	2.09E-05	mg/kg-day	3.00E-04	mg/kg-day	0.07
				Iron	2.50E+04	mg/kg	(2)	--	--	--	--	4.75E-02	mg/kg-day	7.00E-01	mg/kg-day	0.07
				Manganese (Non-Diet)	4.72E+02	mg/kg	(2)	--	--	--	--	8.97E-04	mg/kg-day	2.40E-02	mg/kg-day	0.04
				Thallium	1.44E-01	mg/kg	(2)	--	--	--	--	2.74E-07	mg/kg-day	1.00E-05	mg/kg-day	0.03
			Exp. Route Total								--					0.4
			Dermal													
				Semi-volatile Organic Compounds (SVOCs)												
				Benzo(a)pyrene	1.14E-01	mg/kg	(2)	--	--	--	--	6.68E-08	mg/kg-day	3.00E-04	mg/kg-day	0.0002
				Polychlorinated Biphenyls (PCBs)												
				Aroclor 1260	1.60E+00	mg/kg	(2)	--	--	--	--	1.01E-06	mg/kg-day	--	--	--
				Polychlorinated Biphenyls (PCBs) - Congeners												
				PCBC TEQ MAMMAL HALFND	2.90E-05	mg/kg	(2)	--	--	--	--	3.93E-12	mg/kg-day	7.00E-10	mg/kg-day	0.006
				Dioxins and Furans												
				DIOXIN TEQ MAMMAL HALFND	2.08E-05	mg/kg	(2)	--	--	--	--	2.81E-12	mg/kg-day	7.00E-10	mg/kg-day	0.004
				Metals (Total)												
				Aluminum	8.54E+03	mg/kg	(2)	--	--	--	--	3.85E-04	mg/kg-day	1.00E+00	mg/kg-day	0.0004
				Arsenic	8.64E+00	mg/kg	(2)	--	--	--	--	1.17E-06	mg/kg-day	3.00E-04	mg/kg-day	0.004
				Chromium, Total	1.26E+01	mg/kg	(2)	--	--	--	--	5.67E-07	mg/kg-day	7.50E-05	mg/kg-day	0.008
				Cobalt	1.10E+01	mg/kg	(2)	--	--	--	--	4.97E-07	mg/kg-day	3.00E-04	mg/kg-day	0.002
				Iron	2.50E+04	mg/kg	(2)	--	--	--	--	1.13E-03	mg/kg-day	7.00E-01	mg/kg-day	0.002
				Manganese (Non-Diet)	4.72E+02	mg/kg	(2)	--	--	--	--	2.13E-05	mg/kg-day	9.60E-04	mg/kg-day	0.02
				Thallium	1.44E-01	mg/kg	(2)	--	--	--	--	6.49E-09	mg/kg-day	1.00E-05	mg/kg-day	0.0006
			Exp. Route Total								--					0.05
		Exp. Point Total									--					0.4
	Exp. Medium Total										--					0.4
	Outdoor Air	Particulates above Site	Inhalation													
				Semi-volatile Organic Compounds (SVOCs)												
				Benzo(a)pyrene	8.38E-08	µg/m³	(2)	--	--	--	--	1.79E-09	µg/m³	2.00E-03	µg/m³	0.0000009
				Polychlorinated Biphenyls (PCBs)												
				Aroclor 1260	1.18E-06	µg/m³	(2)	--	--	--	--	2.51E-08	µg/m³	--	--	--
				Polychlorinated Biphenyls (PCBs) - Congeners												
				PCBC TEQ MAMMAL HALFND	2.13E-11	µg/m³	(2)	--	--	--	--	4.56E-13	µg/m³	4.00E-05	µg/m³	0.00000001
				Dioxins and Furans												
				DIOXIN TEQ MAMMAL HALFND	1.53E-11	µg/m³	(2)	--	--	--	--	3.26E-13	µg/m³	4.00E-05	µg/m³	8E-09

Table A-7.8
Calculation of Chemical Non-Cancer Hazards
Reasonable Maximum Exposure (Site-Wide)
Current/Future On-Site Recreator (Child) - Surface Soil (0 - 0.5 feet)
Human Health Risk Assessment
Shaffer Equipment/Arbuckle Creek Area Superfund Site, Minden, West Virginia

Scenario Timeframe:	Current/Future
Receptor Population:	On-Site Recreator
Receptor Age:	Child

Medium	Exposure Medium	Exposure Point	Exposure Route	Chemical of Potential Concern	EPC		Cancer Risk Calculations					Non-Cancer Hazard Calculations				
					Value	Units	Intake/Exposure Concentration		CSF/Unit Risk		Cancer Risk [1]	Intake/Exposure Concentration		RfD/RfC		Hazard Quotient [1]
							Value	Units	Value	Units		Value	Units	Value	Units	
				Metals (Total)												
				Aluminum	6.28E-03	µg/m³	(2)	--	--	--	--	1.34E-04	µg/m³	5.00E+00	µg/m³	0.00003
				Arsenic	6.35E-06	µg/m³	(2)	--	--	--	--	1.36E-07	µg/m³	1.50E-02	µg/m³	0.000009
				Chromium, Total	9.25E-06	µg/m³	(2)	--	--	--	--	1.98E-07	µg/m³	1.00E-01	µg/m³	0.000002
				Cobalt	8.10E-06	µg/m³	(2)	--	--	--	--	1.73E-07	µg/m³	6.00E-03	µg/m³	0.00003
				Iron	1.84E-02	µg/m³	(2)	--	--	--	--	3.93E-04	µg/m³	--	--	--
				Manganese (Non-Diet)	3.47E-04	µg/m³	(2)	--	--	--	--	7.42E-06	µg/m³	5.00E-02	µg/m³	0.0001
				Thallium	1.06E-07	µg/m³	(2)	--	--	--	--	2.26E-09	µg/m³	--	--	--
			Exp. Route Total								--					0.0002
		Exp. Point Total									--					0.0002
		Vapors above Site	Inhalation													
				Polychlorinated Biphenyls (PCBs)												
				Aroclor 1260	4.33E-03	µg/m³	(2)	--	--	--	--	9.25E-05	µg/m³	--	--	--
				Polychlorinated Biphenyls (PCBs) - Congeners												
				PCBC TEQ MAMMAL HALFND	1.00E-08	µg/m³	(2)	--	--	--	--	2.14E-10	µg/m³	4.00E-05	µg/m³	0.000005
				Dioxins and Furans												
				DIOXIN TEQ MAMMAL HALFND	7.18E-09	µg/m³	(2)	--	--	--	--	1.53E-10	µg/m³	4.00E-05	µg/m³	0.000004
			Exp. Route Total								--					0.000009
		Exp. Point Total									--					0.000009
	Exp. Medium Total										--					0.0002
Medium Total											--					0.4
Notes:											**--**					**0.4**

Total of Receptor Risks Across All Media — **Total of Receptor Hazards Across All Media**

(1) CR and HQs are rounded to one non-zero digit; cumulative totals may be slightly higher or lower depending on degree of rounding.

(2) Cancer risk is only presented for the lifetime receptor, whereas non-cancer hazard is calculated separately for the child and adult receptor.

Table A-7.9
Calculation of Chemical Cancer Risks
Reasonable Maximum Exposure (Site-Wide)
Current/Future On-Site Recreator (Lifetime) - Surface Soil (0 - 0.5 feet)
Human Health Risk Assessment
Shaffer Equipment/Arbuckle Creek Area Superfund Site, Minden, West Virginia

Scenario Timeframe:	Current/Future
Receptor Population:	On-Site Recreator
Receptor Age:	Lifetime

Medium	Exposure Medium	Exposure Point	Exposure Route	Chemical of Potential Concern	EPC		Cancer Risk Calculations					Non-Cancer Hazard Calculations				
					Value	Units	Intake/Exposure Concentration		CSF/Unit Risk		Cancer Risk [1]	Intake/Exposure Concentration		RfD/RfC		Hazard Quotient [1]
							Value	Units	Value	Units		Value	Units	Value	Units	
Soil	Surface Soil	0 - 0.5 feet	Ingestion													
				Semi-volatile Organic Compounds (SVOCs)												
				Benzo(a)pyrene	1.14E-01	mg/kg	1.11E-07	mg/kg-day	1.00E+00	1/(mg/kg-day)	1E-07	(2)	--	--	--	--
				Polychlorinated Biphenyls (PCBs)												
				Aroclor 1260	1.60E+00	mg/kg	3.42E-07	mg/kg-day	2.00E+00	1/(mg/kg-day)	7E-07	(2)	--	--	--	--
				Polychlorinated Biphenyls (PCBs) - Congeners												
				PCBC TEQ MAMMAL HALFND	2.90E-05	mg/kg	6.20E-12	mg/kg-day	1.30E+05	1/(mg/kg-day)	8E-07	(2)	--	--	--	--
				Dioxins and Furans												
				DIOXIN TEQ MAMMAL HALFND	2.08E-05	mg/kg	4.44E-12	mg/kg-day	1.30E+05	1/(mg/kg-day)	6E-07	(2)	--	--	--	--
				Metals (Total)												
				Aluminum	8.54E+03	mg/kg	1.83E-03	mg/kg-day	--	--	--	(2)	--	--	--	--
				Arsenic	8.64E+00	mg/kg	1.11E-06	mg/kg-day	1.50E+00	1/(mg/kg-day)	2E-06	(2)	--	--	--	--
				Chromium, Total	1.26E+01	mg/kg	1.22E-05	mg/kg-day	5.00E-01	1/(mg/kg-day)	6E-06	(2)	--	--	--	--
				Cobalt	1.10E+01	mg/kg	2.35E-06	mg/kg-day	--	--	--	(2)	--	--	--	--
				Iron	2.50E+04	mg/kg	5.35E-03	mg/kg-day	--	--	--	(2)	--	--	--	--
				Manganese (Non-Diet)	4.72E+02	mg/kg	1.01E-04	mg/kg-day	--	--	--	(2)	--	--	--	--
				Thallium	1.44E-01	mg/kg	3.08E-08	mg/kg-day	--	--	--	(2)	--	--	--	--
			Exp. Route Total								1E-05					--
			Dermal													
				Semi-volatile Organic Compounds (SVOCs)												
				Benzo(a)pyrene	1.14E-01	mg/kg	3.69E-08	mg/kg-day	1.00E+00	1/(mg/kg-day)	4E-08	(2)	--	--	--	--
				Polychlorinated Biphenyls (PCBs)												
				Aroclor 1260	1.60E+00	mg/kg	1.35E-07	mg/kg-day	2.00E+00	1/(mg/kg-day)	3E-07	(2)	--	--	--	--
				Polychlorinated Biphenyls (PCBs) - Congeners												
				PCBC TEQ MAMMAL HALFND	2.90E-05	mg/kg	5.23E-13	mg/kg-day	1.30E+05	1/(mg/kg-day)	7E-08	(2)	--	--	--	--
				Dioxins and Furans												
				DIOXIN TEQ MAMMAL HALFND	2.08E-05	mg/kg	3.75E-13	mg/kg-day	1.30E+05	1/(mg/kg-day)	5E-08	(2)	--	--	--	--
				Metals (Total)												
				Aluminum	8.54E+03	mg/kg	5.13E-05	mg/kg-day	--	--	--	(2)	--	--	--	--
				Arsenic	8.64E+00	mg/kg	1.56E-07	mg/kg-day	1.50E+00	1/(mg/kg-day)	2E-07	(2)	--	--	--	--
				Chromium, Total	1.26E+01	mg/kg	3.13E-07	mg/kg-day	2.00E+01	1/(mg/kg-day)	6E-06	(2)	--	--	--	--
				Cobalt	1.10E+01	mg/kg	6.63E-08	mg/kg-day	--	--	--	(2)	--	--	--	--
				Iron	2.50E+04	mg/kg	1.50E-04	mg/kg-day	--	--	--	(2)	--	--	--	--
				Manganese (Non-Diet)	4.72E+02	mg/kg	2.84E-06	mg/kg-day	--	--	--	(2)	--	--	--	--
				Thallium	1.44E-01	mg/kg	8.66E-10	mg/kg-day	--	--	--	(2)	--	--	--	--
			Exp. Route Total								7E-06					--
		Exp. Point Total									2E-05					--
	Exp. Medium Total										2E-05					--
	Outdoor Air	Particulates above Site	Inhalation													
				Semi-volatile Organic Compounds (SVOCs)												
				Benzo(a)pyrene	8.38E-08	µg/m³	1.84E-09	µg/m³	6.00E-04	m³/µg	1E-12	(2)	--	--	--	--
				Polychlorinated Biphenyls (PCBs)												
				Aroclor 1260	1.18E-06	µg/m³	9.34E-09	µg/m³	5.71E-04	m³/µg	5E-12	(2)	--	--	--	--
				Polychlorinated Biphenyls (PCBs) - Congeners												
				PCBC TEQ MAMMAL HALFND	2.13E-11	µg/m³	1.69E-13	µg/m³	3.80E+01	m³/µg	6E-12	(2)	--	--	--	--
				Dioxins and Furans												
				DIOXIN TEQ MAMMAL HALFND	1.53E-11	µg/m³	1.21E-13	µg/m³	3.80E+01	m³/µg	5E-12	(2)	--	--	--	--

Table A-7.9
Calculation of Chemical Cancer Risks
Reasonable Maximum Exposure (Site-Wide)
Current/Future On-Site Recreator (Lifetime) - Surface Soil (0 - 0.5 feet)
Human Health Risk Assessment
Shaffer Equipment/Arbuckle Creek Area Superfund Site, Minden, West Virginia

Scenario Timeframe:	Current/Future
Receptor Population:	On-Site Recreator
Receptor Age:	Lifetime

Medium	Exposure Medium	Exposure Point	Exposure Route	Chemical of Potential Concern	EPC		Cancer Risk Calculations					Non-Cancer Hazard Calculations				
					Value	Units	Intake/Exposure Concentration		CSF/Unit Risk		Cancer Risk [1]	Intake/Exposure Concentration		RfD/RfC		Hazard Quotient [1]
							Value	Units	Value	Units		Value	Units	Value	Units	
				Metals (Total)												
				Aluminum	6.28E-03	µg/m³	4.98E-05	µg/m³	--	--	--	(2)	--	--	--	--
				Arsenic	6.35E-06	µg/m³	5.04E-08	µg/m³	4.30E-03	m³/µg	2E-10	(2)	--	--	--	--
				Chromium, Total	9.25E-06	µg/m³	2.03E-07	µg/m³	8.40E-02	m³/µg	2E-08	(2)	--	--	--	--
				Cobalt	8.10E-06	µg/m³	6.43E-08	µg/m³	9.00E-03	m³/µg	6E-10	(2)	--	--	--	--
				Iron	1.84E-02	µg/m³	1.46E-04	µg/m³	--	--	--	(2)	--	--	--	--
				Manganese (Non-Diet)	3.47E-04	µg/m³	2.76E-06	µg/m³	--	--	--	(2)	--	--	--	--
				Thallium	1.06E-07	µg/m³	8.40E-10	µg/m³	--	--	--	(2)	--	--	--	--
			Exp. Route Total								2E-08					--
		Exp. Point Total									2E-08					--
		Vapors above Site	Inhalation													
				Polychlorinated Biphenyls (PCBs)												
				Aroclor 1260	4.33E-03	µg/m³	3.43E-05	µg/m³	5.71E-04	m³/µg	2E-08	(2)	--	--	--	--
				Polychlorinated Biphenyls (PCBs) - Congeners												
				PCBC TEQ MAMMAL HALFND	1.00E-08	µg/m³	7.96E-11	µg/m³	3.80E+01	m³/µg	3E-09	(2)	--	--	--	--
				Dioxins and Furans												
				DIOXIN TEQ MAMMAL HALFND	7.18E-09	µg/m³	5.70E-11	µg/m³	3.80E+01	m³/µg	2E-09	(2)	--	--	--	--
			Exp. Route Total								2E-08					--
		Exp. Point Total									2E-08					--
	Exp. Medium Total										4E-08					--
Medium Total											2E-05					--
Notes:											**Total of Receptor Risks Across All Media**					**Total of Receptor Hazards Across All Media**
											2E-05					**--**

(1) CR and HQs are rounded to one non-zero digit; cumulative totals may be slightly higher or lower depending on degree of rounding.

(2) Cancer risk is only presented for the lifetime receptor, whereas non-cancer hazard is calculated separately for the child and adult receptor.

Table A-7.10
Calculation of Chemical Cancer Risks and Non-Cancer Hazards
Reasonable Maximum Exposure (Site-Wide)
Current/Future On-Site Trespasser (Adolescent) - Surface Soil (0 - 0.5 feet)
Human Health Risk Assessment
Shaffer Equipment/Arbuckle Creek Area Superfund Site, Minden, West Virginia

Scenario Timeframe:	Current/Future
Receptor Population:	On-Site Trespasser
Receptor Age:	Adolescent

Medium	Exposure Medium	Exposure Point	Exposure Route	Chemical of Potential Concern	EPC		Cancer Risk Calculations					Non-Cancer Hazard Calculations				
					Value	Units	Intake/Exposure Concentration		CSF/Unit Risk		Cancer Risk [1]	Intake/Exposure Concentration		RfD/RfC		Hazard Quotient [1]
							Value	Units	Value	Units		Value	Units	Value	Units	
Soil	Surface Soil	0 - 0.5 feet	Ingestion													
				Semi-volatile Organic Compounds (SVOCs)												
				Benzo(a)pyrene	1.14E-01	mg/kg	2.29E-09	mg/kg-day	1.00E+00	1/(mg/kg-day)	2E-09	5.34E-09	mg/kg-day	3.00E-04	mg/kg-day	0.00002
				Polychlorinated Biphenyls (PCBs)												
				Aroclor 1260	1.60E+00	mg/kg	1.07E-08	mg/kg-day	2.00E+00	1/(mg/kg-day)	2E-08	7.49E-08	mg/kg-day	--	--	--
				Polychlorinated Biphenyls (PCBs) - Congeners												
				PCBC TEQ MAMMAL HALFND	2.90E-05	mg/kg	1.94E-13	mg/kg-day	1.30E+05	1/(mg/kg-day)	3E-08	1.36E-12	mg/kg-day	7.00E-10	mg/kg-day	0.002
				Dioxins and Furans												
				DIOXIN TEQ MAMMAL HALFND	2.08E-05	mg/kg	1.39E-13	mg/kg-day	1.30E+05	1/(mg/kg-day)	2E-08	9.73E-13	mg/kg-day	7.00E-10	mg/kg-day	0.001
				Metals (Total)												
				Aluminum	8.54E+03	mg/kg	5.71E-05	mg/kg-day	--	--	--	4.00E-04	mg/kg-day	1.00E+00	mg/kg-day	0.0004
				Arsenic	8.64E+00	mg/kg	3.47E-08	mg/kg-day	1.50E+00	1/(mg/kg-day)	5E-08	2.43E-07	mg/kg-day	3.00E-04	mg/kg-day	0.0008
				Chromium, Total	1.26E+01	mg/kg	2.53E-07	mg/kg-day	5.00E-01	1/(mg/kg-day)	1E-07	5.89E-07	mg/kg-day	3.00E-03	mg/kg-day	0.0002
				Cobalt	1.10E+01	mg/kg	7.37E-08	mg/kg-day	--	--	--	5.16E-07	mg/kg-day	3.00E-04	mg/kg-day	0.002
				Iron	2.50E+04	mg/kg	1.67E-04	mg/kg-day	--	--	--	1.17E-03	mg/kg-day	7.00E-01	mg/kg-day	0.002
				Manganese (Non-Diet)	4.72E+02	mg/kg	3.16E-06	mg/kg-day	--	--	--	2.21E-05	mg/kg-day	2.40E-02	mg/kg-day	0.0009
				Thallium	1.44E-01	mg/kg	9.63E-10	mg/kg-day	--	--	--	6.74E-09	mg/kg-day	1.00E-05	mg/kg-day	0.0007
			Exp. Route Total								2E-07					0.01
			Dermal													
				Semi-volatile Organic Compounds (SVOCs)												
				Benzo(a)pyrene	1.14E-01	mg/kg	2.04E-09	mg/kg-day	1.00E+00	1/(mg/kg-day)	2E-09	4.75E-09	mg/kg-day	3.00E-04	mg/kg-day	0.00002
				Polychlorinated Biphenyls (PCBs)												
				Aroclor 1260	1.60E+00	mg/kg	1.03E-08	mg/kg-day	2.00E+00	1/(mg/kg-day)	2E-08	7.18E-08	mg/kg-day	--	--	--
				Polychlorinated Biphenyls (PCBs) - Congeners												
				PCBC TEQ MAMMAL HALFND	2.90E-05	mg/kg	3.99E-14	mg/kg-day	1.30E+05	1/(mg/kg-day)	5E-09	2.79E-13	mg/kg-day	7.00E-10	mg/kg-day	0.0004
				Dioxins and Furans												
				DIOXIN TEQ MAMMAL HALFND	2.08E-05	mg/kg	2.85E-14	mg/kg-day	1.30E+05	1/(mg/kg-day)	4E-09	2.00E-13	mg/kg-day	7.00E-10	mg/kg-day	0.0003
				Metals (Total)												
				Aluminum	8.54E+03	mg/kg	3.91E-06	mg/kg-day	--	--	--	2.74E-05	mg/kg-day	1.00E+00	mg/kg-day	0.00003
				Arsenic	8.64E+00	mg/kg	1.19E-08	mg/kg-day	1.50E+00	1/(mg/kg-day)	2E-08	8.31E-08	mg/kg-day	3.00E-04	mg/kg-day	0.0003
				Chromium, Total	1.26E+01	mg/kg	1.73E-08	mg/kg-day	2.00E+01	1/(mg/kg-day)	3E-07	4.03E-08	mg/kg-day	7.50E-05	mg/kg-day	0.0005
				Cobalt	1.10E+01	mg/kg	5.05E-09	mg/kg-day	--	--	--	3.53E-08	mg/kg-day	3.00E-04	mg/kg-day	0.0001
				Iron	2.50E+04	mg/kg	1.15E-05	mg/kg-day	--	--	--	8.03E-05	mg/kg-day	7.00E-01	mg/kg-day	0.0001
				Manganese (Non-Diet)	4.72E+02	mg/kg	2.16E-07	mg/kg-day	--	--	--	1.51E-06	mg/kg-day	9.60E-04	mg/kg-day	0.002
				Thallium	1.44E-01	mg/kg	6.60E-11	mg/kg-day	--	--	--	4.62E-10	mg/kg-day	1.00E-05	mg/kg-day	0.00005
			Exp. Route Total								4E-07					0.003
		Exp. Point Total									6E-07					0.01
	Exp. Medium Total										6E-07					0.01
	Outdoor Air	Particulates above Site	Inhalation													
				Semi-volatile Organic Compounds (SVOCs)												
				Benzo(a)pyrene	8.38E-08	µg/m³	2.36E-10	µg/m³	6.00E-04	m³/µg	1E-13	5.51E-10	µg/m³	2.00E-03	µg/m³	0.0000003
				Polychlorinated Biphenyls (PCBs)												
				Aroclor 1260	1.18E-06	µg/m³	1.11E-09	µg/m³	5.71E-04	m³/µg	6E-13	7.74E-09	µg/m³	--	--	--
				Polychlorinated Biphenyls (PCBs) - Congeners												
				PCBC TEQ MAMMAL HALFND	2.13E-11	µg/m³	2.00E-14	µg/m³	3.80E+01	m³/µg	8E-13	1.40E-13	µg/m³	4.00E-05	µg/m³	4E-09
				Dioxins and Furans												
				DIOXIN TEQ MAMMAL HALFND	1.53E-11	µg/m³	1.43E-14	µg/m³	3.80E+01	m³/µg	5E-13	1.00E-13	µg/m³	4.00E-05	µg/m³	3E-09

Table A-7.10
Calculation of Chemical Cancer Risks and Non-Cancer Hazards
Reasonable Maximum Exposure (Site-Wide)
Current/Future On-Site Trespasser (Adolescent) - Surface Soil (0 - 0.5 feet)
Human Health Risk Assessment
Shaffer Equipment/Arbuckle Creek Area Superfund Site, Minden, West Virginia

Scenario Timeframe:	Current/Future
Receptor Population:	On-Site Trespasser
Receptor Age:	Adolescent

Medium	Exposure Medium	Exposure Point	Exposure Route	Chemical of Potential Concern	EPC		Cancer Risk Calculations					Non-Cancer Hazard Calculations				
					Value	Units	Intake/Exposure Concentration		CSF/Unit Risk		Cancer Risk [1]	Intake/Exposure Concentration		RfD/RfC		Hazard Quotient [1]
							Value	Units	Value	Units		Value	Units	Value	Units	
				Metals (Total)												
				Aluminum	6.28E-03	µg/m³	5.90E-06	µg/m³	--	--	--	4.13E-05	µg/m³	5.00E+00	µg/m³	0.000008
				Arsenic	6.35E-06	µg/m³	5.97E-09	µg/m³	4.30E-03	m³/µg	3E-11	4.18E-08	µg/m³	1.50E-02	µg/m³	0.000003
				Chromium, Total	9.25E-06	µg/m³	2.61E-08	µg/m³	8.40E-02	m³/µg	2E-09	6.08E-08	µg/m³	1.00E-01	µg/m³	0.0000006
				Cobalt	8.10E-06	µg/m³	7.61E-09	µg/m³	9.00E-03	m³/µg	7E-11	5.33E-08	µg/m³	6.00E-03	µg/m³	0.000009
				Iron	1.84E-02	µg/m³	1.73E-05	µg/m³	--	--	--	1.21E-04	µg/m³	--	--	--
				Manganese (Non-Diet)	3.47E-04	µg/m³	3.26E-07	µg/m³	--	--	--	2.28E-06	µg/m³	5.00E-02	µg/m³	0.00005
				Thallium	1.06E-07	µg/m³	9.95E-11	µg/m³	--	--	--	6.96E-10	µg/m³	--	--	--
			Exp. Route Total								2E-09					0.00007
		Exp. Point Total									2E-09					0.00007
		Vapors above Site	Inhalation													
				Polychlorinated Biphenyls (PCBs)												
				Aroclor 1260	6.98E-03	µg/m³	6.55E-06	µg/m³	5.71E-04	m³/µg	4E-09	4.59E-05	µg/m³	--	--	--
				Polychlorinated Biphenyls (PCBs) - Congeners												
				PCBC TEQ MAMMAL HALFND	1.62E-08	µg/m³	1.52E-11	µg/m³	3.80E+01	m³/µg	6E-10	1.06E-10	µg/m³	4.00E-05	µg/m³	0.000003
				Dioxins and Furans												
				DIOXIN TEQ MAMMAL HALFND	1.16E-08	µg/m³	1.09E-11	µg/m³	3.80E+01	m³/µg	4E-10	7.61E-11	µg/m³	4.00E-05	µg/m³	0.000002
			Exp. Route Total								5E-09					0.000005
		Exp. Point Total									5E-09					0.000005
	Exp. Medium Total										7E-09					0.00007
Medium Total											6E-07					0.01
Notes:											**6E-07**					**0.01**

Total of Receptor Risks Across All Media **Total of Receptor Hazards Across All Media**

(1) CR and HQs are rounded to one non-zero digit; cumulative totals may be slightly higher or lower depending on degree of rounding.

Table A-7.11a
Calculation of Chemical Cancer Risks and Non-Cancer Hazards
Reasonable Maximum Exposure (Site-Wide)
Future On-Site Commercial/Industrial Worker - Total Soil (0 - 2 feet)
Human Health Risk Assessment
Shaffer Equipment/Arbuckle Creek Area Superfund Site, Minden, West Virginia

Scenario Timeframe:	Future
Receptor Population:	On-Site Commercial/Industrial Worker
Receptor Age:	Adult

Medium	Exposure Medium	Exposure Point	Exposure Route	Chemical of Potential Concern	EPC		Cancer Risk Calculations					Non-Cancer Hazard Calculations				
					Value	Units	Intake/Exposure Concentration		CSF/Unit Risk		Cancer Risk [1]	Intake/Exposure Concentration		RfD/RfC		Hazard Quotient [1]
							Value	Units	Value	Units		Value	Units	Value	Units	
Soil	Total Soil	0 - 2 feet	Ingestion													
				Semi-volatile Organic Compounds (SVOCs)												
				Benzo(a)anthracene	3.29E-01	mg/kg	1.01E-07	mg/kg-day	1.00E-01	1/(mg/kg-day)	1E-08	2.82E-07	mg/kg-day	--	--	--
				Benzo(a)pyrene	2.95E-01	mg/kg	9.02E-08	mg/kg-day	1.00E+00	1/(mg/kg-day)	9E-08	2.53E-07	mg/kg-day	3.00E-04	mg/kg-day	0.0008
				Benzo(b)fluoranthene	5.31E-01	mg/kg	1.62E-07	mg/kg-day	1.00E-01	1/(mg/kg-day)	2E-08	4.55E-07	mg/kg-day	--	--	--
				Indeno(1,2,3-cd)pyrene	1.61E-01	mg/kg	4.92E-08	mg/kg-day	1.00E-01	1/(mg/kg-day)	5E-09	1.38E-07	mg/kg-day	--	--	--
				Polychlorinated Biphenyls (PCBs)												
				Aroclor 1254	5.51E-01	mg/kg	1.68E-07	mg/kg-day	2.00E+00	1/(mg/kg-day)	3E-07	4.72E-07	mg/kg-day	2.00E-05	mg/kg-day	0.02
				Aroclor 1260	1.58E+00	mg/kg	4.84E-07	mg/kg-day	2.00E+00	1/(mg/kg-day)	1E-06	1.35E-06	mg/kg-day	--	--	--
				Polychlorinated Biphenyls (PCBs) - Congeners												
				PCBC TEQ MAMMAL HALFND	2.15E-05	mg/kg	6.57E-12	mg/kg-day	1.30E+05	1/(mg/kg-day)	9E-07	1.84E-11	mg/kg-day	7.00E-10	mg/kg-day	0.03
				Dioxins and Furans												
				DIOXIN TEQ MAMMAL HALFND	1.36E-05	mg/kg	4.17E-12	mg/kg-day	1.30E+05	1/(mg/kg-day)	5E-07	1.17E-11	mg/kg-day	7.00E-10	mg/kg-day	0.02
				Metals (Total)												
				Aluminum	8.70E+03	mg/kg	2.66E-03	mg/kg-day	--	--	--	7.45E-03	mg/kg-day	1.00E+00	mg/kg-day	0.007
				Antimony	1.04E+00	mg/kg	3.17E-07	mg/kg-day	--	--	--	8.87E-07	mg/kg-day	4.00E-04	mg/kg-day	0.002
				Arsenic	1.30E+01	mg/kg	2.38E-06	mg/kg-day	1.50E+00	1/(mg/kg-day)	4E-06	6.67E-06	mg/kg-day	3.00E-04	mg/kg-day	0.02
				Cadmium (Diet)	5.21E-01	mg/kg	1.59E-07	mg/kg-day	--	--	--	4.46E-07	mg/kg-day	1.00E-03	mg/kg-day	0.0004
				Chromium, Total	1.58E+01	mg/kg	4.82E-06	mg/kg-day	5.00E-01	1/(mg/kg-day)	2E-06	1.35E-05	mg/kg-day	3.00E-03	mg/kg-day	0.004
				Cobalt	1.12E+01	mg/kg	3.41E-06	mg/kg-day	--	--	--	9.55E-06	mg/kg-day	3.00E-04	mg/kg-day	0.03
				Iron	2.45E+04	mg/kg	7.50E-03	mg/kg-day	--	--	--	2.10E-02	mg/kg-day	7.00E-01	mg/kg-day	0.03
				Manganese (Non-Diet)	4.92E+02	mg/kg	1.51E-04	mg/kg-day	--	--	--	4.21E-04	mg/kg-day	2.40E-02	mg/kg-day	0.02
				Thallium	1.64E-01	mg/kg	5.01E-08	mg/kg-day	--	--	--	1.40E-07	mg/kg-day	1.00E-05	mg/kg-day	0.01
			Exp. Route Total								9E-06					0.2
			Dermal													
				Semi-volatile Organic Compounds (SVOCs)												
				Benzo(a)anthracene	3.29E-01	mg/kg	5.54E-08	mg/kg-day	1.00E-01	1/(mg/kg-day)	6E-09	1.55E-07	mg/kg-day	--	--	--
				Benzo(a)pyrene	2.95E-01	mg/kg	4.96E-08	mg/kg-day	1.00E+00	1/(mg/kg-day)	5E-08	1.39E-07	mg/kg-day	3.00E-04	mg/kg-day	0.0005
				Benzo(b)fluoranthene	5.31E-01	mg/kg	8.93E-08	mg/kg-day	1.00E-01	1/(mg/kg-day)	9E-09	2.50E-07	mg/kg-day	--	--	--
				Indeno(1,2,3-cd)pyrene	1.61E-01	mg/kg	2.71E-08	mg/kg-day	1.00E-01	1/(mg/kg-day)	3E-09	7.58E-08	mg/kg-day	--	--	--
				Polychlorinated Biphenyls (PCBs)												
				Aroclor 1254	5.51E-01	mg/kg	9.98E-08	mg/kg-day	2.00E+00	1/(mg/kg-day)	2E-07	2.80E-07	mg/kg-day	2.00E-05	mg/kg-day	0.01
				Aroclor 1260	1.58E+00	mg/kg	2.87E-07	mg/kg-day	2.00E+00	1/(mg/kg-day)	6E-07	8.03E-07	mg/kg-day	--	--	--
				Polychlorinated Biphenyls (PCBs) - Congeners												
				PCBC TEQ MAMMAL HALFND	2.15E-05	mg/kg	8.34E-13	mg/kg-day	1.30E+05	1/(mg/kg-day)	1E-07	2.34E-12	mg/kg-day	7.00E-10	mg/kg-day	0.003
				Dioxins and Furans												
				DIOXIN TEQ MAMMAL HALFND	1.36E-05	mg/kg	5.30E-13	mg/kg-day	1.30E+05	1/(mg/kg-day)	7E-08	1.48E-12	mg/kg-day	7.00E-10	mg/kg-day	0.002
				Metals (Total)												
				Aluminum	8.70E+03	mg/kg	1.13E-04	mg/kg-day	--	--	--	3.15E-04	mg/kg-day	1.00E+00	mg/kg-day	0.0003
				Antimony	1.04E+00	mg/kg	1.34E-08	mg/kg-day	--	--	--	3.75E-08	mg/kg-day	6.00E-05	mg/kg-day	0.0006
				Arsenic	1.30E+01	mg/kg	5.04E-07	mg/kg-day	1.50E+00	1/(mg/kg-day)	8E-07	1.41E-06	mg/kg-day	3.00E-04	mg/kg-day	0.005
				Cadmium (Diet)	5.21E-01	mg/kg	6.74E-10	mg/kg-day	--	--	--	1.89E-09	mg/kg-day	2.50E-05	mg/kg-day	0.00008
				Chromium, Total	1.58E+01	mg/kg	2.04E-07	mg/kg-day	2.00E+01	1/(mg/kg-day)	4E-06	5.71E-07	mg/kg-day	7.50E-05	mg/kg-day	0.008
				Cobalt	1.12E+01	mg/kg	1.44E-07	mg/kg-day	--	--	--	4.04E-07	mg/kg-day	3.00E-04	mg/kg-day	0.001
				Iron	2.45E+04	mg/kg	3.17E-04	mg/kg-day	--	--	--	8.89E-04	mg/kg-day	7.00E-01	mg/kg-day	0.001
				Manganese (Non-Diet)	4.92E+02	mg/kg	6.37E-06	mg/kg-day	--	--	--	1.78E-05	mg/kg-day	9.60E-04	mg/kg-day	0.02
				Thallium	1.64E-01	mg/kg	2.12E-09	mg/kg-day	--	--	--	5.94E-09	mg/kg-day	1.00E-05	mg/kg-day	0.0006
			Exp. Route Total								6E-06					0.06
		Exp. Point Total									1E-05					0.3

Table A-7.11a
Calculation of Chemical Cancer Risks and Non-Cancer Hazards
Reasonable Maximum Exposure (Site-Wide)
Future On-Site Commercial/Industrial Worker - Total Soil (0 - 2 feet)
Human Health Risk Assessment
Shaffer Equipment/Arbuckle Creek Area Superfund Site, Minden, West Virginia

Scenario Timeframe:	Future
Receptor Population:	On-Site Commercial/Industrial Worker
Receptor Age:	Adult

Medium	Exposure Medium	Exposure Point	Exposure Route	Chemical of Potential Concern	EPC		Cancer Risk Calculations					Non-Cancer Hazard Calculations				
					Value	Units	Intake/Exposure Concentration		CSF/Unit Risk		Cancer Risk [1]	Intake/Exposure Concentration		RfD/RfC		Hazard Quotient [1]
							Value	Units	Value	Units		Value	Units	Value	Units	
	Exp. Medium Total										1E-05					0.3
	Outdoor Air	Particulates above Site	Inhalation													
				Semi-volatile Organic Compounds (SVOCs)												
				Benzo(a)anthracene	2.42E-07	µg/m³	1.97E-08	µg/m³	6.00E-05	m³/µg	1E-12	5.52E-08	µg/m³	--	--	--
				Benzo(a)pyrene	2.17E-07	µg/m³	1.77E-08	µg/m³	6.00E-04	m³/µg	1E-11	4.95E-08	µg/m³	2.00E-03	µg/m³	0.00002
				Benzo(b)fluoranthene	3.90E-07	µg/m³	3.18E-08	µg/m³	6.00E-05	m³/µg	2E-12	8.91E-08	µg/m³	--	--	--
				Indeno(1,2,3-cd)pyrene	1.18E-07	µg/m³	9.65E-09	µg/m³	6.00E-05	m³/µg	6E-13	2.70E-08	µg/m³	--	--	--
				Polychlorinated Biphenyls (PCBs)												
				Aroclor 1254	4.05E-07	µg/m³	3.30E-08	µg/m³	5.71E-04	m³/µg	2E-11	9.25E-08	µg/m³	--	--	--
				Aroclor 1260	1.16E-06	µg/m³	9.48E-08	µg/m³	5.71E-04	m³/µg	5E-11	2.66E-07	µg/m³	--	--	--
				Polychlorinated Biphenyls (PCBs) - Congeners												
				PCBC TEQ MAMMAL HALFND	1.58E-11	µg/m³	1.29E-12	µg/m³	3.80E+01	m³/µg	5E-11	3.61E-12	µg/m³	4.00E-05	µg/m³	0.00000009
				Dioxins and Furans												
				DIOXIN TEQ MAMMAL HALFND	1.00E-11	µg/m³	8.18E-13	µg/m³	3.80E+01	m³/µg	3E-11	2.29E-12	µg/m³	4.00E-05	µg/m³	0.00000006
				Metals (Total)												
				Aluminum	6.40E-03	µg/m³	5.22E-04	µg/m³	--	--	--	1.46E-03	µg/m³	5.00E+00	µg/m³	0.0003
				Antimony	7.62E-07	µg/m³	6.21E-08	µg/m³	--	--	--	1.74E-07	µg/m³	3.00E-01	µg/m³	0.0000006
				Arsenic	9.54E-06	µg/m³	7.78E-07	µg/m³	4.30E-03	m³/µg	3E-09	2.18E-06	µg/m³	1.50E-02	µg/m³	0.0001
				Cadmium (Diet)	3.83E-07	µg/m³	3.12E-08	µg/m³	1.80E-03	m³/µg	6E-11	8.75E-08	µg/m³	1.00E-02	µg/m³	0.000009
				Chromium, Total	1.16E-05	µg/m³	9.45E-07	µg/m³	8.40E-02	m³/µg	8E-08	2.65E-06	µg/m³	1.00E-01	µg/m³	0.00003
				Cobalt	8.20E-06	µg/m³	6.69E-07	µg/m³	9.00E-03	m³/µg	6E-09	1.87E-06	µg/m³	6.00E-03	µg/m³	0.0003
				Iron	1.80E-02	µg/m³	1.47E-03	µg/m³	--	--	--	4.12E-03	µg/m³	--	--	--
				Manganese (Non-Diet)	3.62E-04	µg/m³	2.95E-05	µg/m³	--	--	--	8.26E-05	µg/m³	5.00E-02	µg/m³	0.002
				Thallium	1.21E-07	µg/m³	9.83E-09	µg/m³	--	--	--	2.75E-08	µg/m³	--	--	--
			Exp. Route Total								9E-08					0.002
		Exp. Point Total									9E-08					0.002
		Vapors above Site	Inhalation													
				Semi-volatile Organic Compounds (SVOCs)												
				Benzo(a)anthracene	4.45E-05	µg/m³	3.63E-06	µg/m³	6.00E-05	m³/µg	2E-10	1.02E-05	µg/m³	--	--	--
				Polychlorinated Biphenyls (PCBs)												
				Aroclor 1254	1.71E-03	µg/m³	1.39E-04	µg/m³	5.71E-04	m³/µg	8E-08	3.90E-04	µg/m³	--	--	--
				Aroclor 1260	4.36E-03	µg/m³	3.56E-04	µg/m³	5.71E-04	m³/µg	2E-07	9.96E-04	µg/m³	--	--	--
				Polychlorinated Biphenyls (PCBs) - Congeners												
				PCBC TEQ MAMMAL HALFND	7.57E-09	µg/m³	6.18E-10	µg/m³	3.80E+01	m³/µg	2E-08	1.73E-09	µg/m³	4.00E-05	µg/m³	0.00004
				Dioxins and Furans												
				DIOXIN TEQ MAMMAL HALFND	4.81E-09	µg/m³	3.92E-10	µg/m³	3.80E+01	m³/µg	1E-08	1.10E-09	µg/m³	4.00E-05	µg/m³	0.00003
			Exp. Route Total								3E-07					0.00007
		Exp. Point Total									3E-07					0.00007
	Exp. Medium Total										4E-07					0.003
Medium Total											2E-05					0.3
Notes:											**Total of Receptor Risks Across All Media**					**Total of Receptor Hazards Across All Media**
											2E-05					**0.3**

(1) CR and HQs are rounded to one non-zero digit; cumulative totals may be slightly higher or lower depending on degree of rounding.

Table A-7.11b
Calculation of Chemical Cancer Risks and Non-Cancer Hazards
Reasonable Maximum Exposure (Site-Wide with Hotspot)
Future On-Site Commercial/Industrial Worker - Total Soil (0 - 2 feet)
Human Health Risk Assessment
Shaffer Equipment/Arbuckle Creek Area Superfund Site, Minden, West Virginia

Scenario Timeframe:	Future
Receptor Population:	On-Site Commercial/Industrial Worker
Receptor Age:	Adult

Medium	Exposure Medium	Exposure Point	Exposure Route	Chemical of Potential Concern	EPC		Cancer Risk Calculations					Non-Cancer Hazard Calculations				
					Value	Units	Intake/Exposure Concentration		CSF/Unit Risk		Cancer Risk [1]	Intake/Exposure Concentration		RfD/RfC		Hazard Quotient [1]
							Value	Units	Value	Units		Value	Units	Value	Units	
Soil	Total Soil	0 - 2 feet	Ingestion													
				Semi-volatile Organic Compounds (SVOCs)												
				Benzo(a)anthracene	3.29E-01	mg/kg	1.01E-07	mg/kg-day	1.00E-01	1/(mg/kg-day)	1E-08	2.82E-07	mg/kg-day	--	--	--
				Benzo(a)pyrene	2.95E-01	mg/kg	9.02E-08	mg/kg-day	1.00E+00	1/(mg/kg-day)	9E-08	2.53E-07	mg/kg-day	3.00E-04	mg/kg-day	0.0008
				Benzo(b)fluoranthene	5.31E-01	mg/kg	1.62E-07	mg/kg-day	1.00E-01	1/(mg/kg-day)	2E-08	4.55E-07	mg/kg-day	--	--	--
				Indeno(1,2,3-cd)pyrene	1.61E-01	mg/kg	4.92E-08	mg/kg-day	1.00E-01	1/(mg/kg-day)	5E-09	1.38E-07	mg/kg-day	--	--	--
				Polychlorinated Biphenyls (PCBs)												
				Aroclor 1254	5.51E-01	mg/kg	1.68E-07	mg/kg-day	2.00E+00	1/(mg/kg-day)	3E-07	4.72E-07	mg/kg-day	2.00E-05	mg/kg-day	0.02
				Aroclor 1260	2.40E+01	mg/kg	7.34E-06	mg/kg-day	2.00E+00	1/(mg/kg-day)	1E-05	2.05E-05	mg/kg-day	--	--	--
				Polychlorinated Biphenyls (PCBs) - Congeners												
				PCBC TEQ MAMMAL HALFND	2.15E-05	mg/kg	6.57E-12	mg/kg-day	1.30E+05	1/(mg/kg-day)	9E-07	1.84E-11	mg/kg-day	7.00E-10	mg/kg-day	0.03
				Dioxins and Furans												
				DIOXIN TEQ MAMMAL HALFND	1.36E-05	mg/kg	4.17E-12	mg/kg-day	1.30E+05	1/(mg/kg-day)	5E-07	1.17E-11	mg/kg-day	7.00E-10	mg/kg-day	0.02
				Metals (Total)												
				Aluminum	8.70E+03	mg/kg	2.66E-03	mg/kg-day	--	--	--	7.45E-03	mg/kg-day	1.00E+00	mg/kg-day	0.007
				Antimony	1.04E+00	mg/kg	3.17E-07	mg/kg-day	--	--	--	8.87E-07	mg/kg-day	4.00E-04	mg/kg-day	0.002
				Arsenic	1.30E+01	mg/kg	2.38E-06	mg/kg-day	1.50E+00	1/(mg/kg-day)	4E-06	6.67E-06	mg/kg-day	3.00E-04	mg/kg-day	0.02
				Cadmium (Diet)	5.21E-01	mg/kg	1.59E-07	mg/kg-day	--	--	--	4.46E-07	mg/kg-day	1.00E-03	mg/kg-day	0.0004
				Chromium, Total	1.58E+01	mg/kg	4.82E-06	mg/kg-day	5.00E-01	1/(mg/kg-day)	2E-06	1.35E-05	mg/kg-day	3.00E-03	mg/kg-day	0.004
				Cobalt	1.12E+01	mg/kg	3.41E-06	mg/kg-day	--	--	--	9.55E-06	mg/kg-day	3.00E-04	mg/kg-day	0.03
				Iron	2.45E+04	mg/kg	7.50E-03	mg/kg-day	--	--	--	2.10E-02	mg/kg-day	7.00E-01	mg/kg-day	0.03
				Manganese (Non-Diet)	4.92E+02	mg/kg	1.51E-04	mg/kg-day	--	--	--	4.21E-04	mg/kg-day	2.40E-02	mg/kg-day	0.02
				Thallium	1.64E-01	mg/kg	5.01E-08	mg/kg-day	--	--	--	1.40E-07	mg/kg-day	1.00E-05	mg/kg-day	0.01
			Exp. Route Total								2E-05					0.2
			Dermal													
				Semi-volatile Organic Compounds (SVOCs)												
				Benzo(a)anthracene	3.29E-01	mg/kg	5.54E-08	mg/kg-day	1.00E-01	1/(mg/kg-day)	6E-09	1.55E-07	mg/kg-day	--	--	--
				Benzo(a)pyrene	2.95E-01	mg/kg	4.96E-08	mg/kg-day	1.00E+00	1/(mg/kg-day)	5E-08	1.39E-07	mg/kg-day	3.00E-04	mg/kg-day	0.0005
				Benzo(b)fluoranthene	5.31E-01	mg/kg	8.93E-08	mg/kg-day	1.00E-01	1/(mg/kg-day)	9E-09	2.50E-07	mg/kg-day	--	--	--
				Indeno(1,2,3-cd)pyrene	1.61E-01	mg/kg	2.71E-08	mg/kg-day	1.00E-01	1/(mg/kg-day)	3E-09	7.58E-08	mg/kg-day	--	--	--
				Polychlorinated Biphenyls (PCBs)												
				Aroclor 1254	5.51E-01	mg/kg	9.98E-08	mg/kg-day	2.00E+00	1/(mg/kg-day)	2E-07	2.80E-07	mg/kg-day	2.00E-05	mg/kg-day	0.01
				Aroclor 1260	2.40E+01	mg/kg	4.35E-06	mg/kg-day	2.00E+00	1/(mg/kg-day)	9E-06	1.22E-05	mg/kg-day	--	--	--
				Polychlorinated Biphenyls (PCBs) - Congeners												
				PCBC TEQ MAMMAL HALFND	2.15E-05	mg/kg	8.34E-13	mg/kg-day	1.30E+05	1/(mg/kg-day)	1E-07	2.34E-12	mg/kg-day	7.00E-10	mg/kg-day	0.003
				Dioxins and Furans												
				DIOXIN TEQ MAMMAL HALFND	1.36E-05	mg/kg	5.30E-13	mg/kg-day	1.30E+05	1/(mg/kg-day)	7E-08	1.48E-12	mg/kg-day	7.00E-10	mg/kg-day	0.002
				Metals (Total)												
				Aluminum	8.70E+03	mg/kg	1.13E-04	mg/kg-day	--	--	--	3.15E-04	mg/kg-day	1.00E+00	mg/kg-day	0.0003
				Antimony	1.04E+00	mg/kg	1.34E-08	mg/kg-day	--	--	--	3.75E-08	mg/kg-day	6.00E-05	mg/kg-day	0.0006
				Arsenic	1.30E+01	mg/kg	5.04E-07	mg/kg-day	1.50E+00	1/(mg/kg-day)	8E-07	1.41E-06	mg/kg-day	3.00E-04	mg/kg-day	0.005
				Cadmium (Diet)	5.21E-01	mg/kg	6.74E-10	mg/kg-day	--	--	--	1.89E-09	mg/kg-day	2.50E-05	mg/kg-day	0.00008
				Chromium, Total	1.58E+01	mg/kg	2.04E-07	mg/kg-day	2.00E+01	1/(mg/kg-day)	4E-06	5.71E-07	mg/kg-day	7.50E-05	mg/kg-day	0.008
				Cobalt	1.12E+01	mg/kg	1.44E-07	mg/kg-day	--	--	--	4.04E-07	mg/kg-day	3.00E-04	mg/kg-day	0.001
				Iron	2.45E+04	mg/kg	3.17E-04	mg/kg-day	--	--	--	8.89E-04	mg/kg-day	7.00E-01	mg/kg-day	0.001
				Manganese (Non-Diet)	4.92E+02	mg/kg	6.37E-06	mg/kg-day	--	--	--	1.78E-05	mg/kg-day	9.60E-04	mg/kg-day	0.02
				Thallium	1.64E-01	mg/kg	2.12E-09	mg/kg-day	--	--	--	5.94E-09	mg/kg-day	1.00E-05	mg/kg-day	0.0006
			Exp. Route Total								1E-05					0.06
		Exp. Point Total									4E-05					0.3

Table A-7.11b
Calculation of Chemical Cancer Risks and Non-Cancer Hazards
Reasonable Maximum Exposure (Site-Wide with Hotspot)
Future On-Site Commercial/Industrial Worker - Total Soil (0 - 2 feet)
Human Health Risk Assessment
Shaffer Equipment/Arbuckle Creek Area Superfund Site, Minden, West Virginia

Scenario Timeframe:	Future
Receptor Population:	On-Site Commercial/Industrial Worker
Receptor Age:	Adult

Medium	Exposure Medium	Exposure Point	Exposure Route	Chemical of Potential Concern	EPC		Cancer Risk Calculations					Non-Cancer Hazard Calculations				
					Value	Units	Intake/Exposure Concentration		CSF/Unit Risk		Cancer Risk [1]	Intake/Exposure Concentration		RfD/RfC		Hazard Quotient [1]
							Value	Units	Value	Units		Value	Units	Value	Units	
	Exp. Medium Total										4E-05					0.3
	Outdoor Air	Particulates above Site	Inhalation													
				Semi-volatile Organic Compounds (SVOCs)												
				Benzo(a)anthracene	2.42E-07	µg/m³	1.97E-08	µg/m³	6.00E-05	m³/µg	1E-12	5.52E-08	µg/m³	--	--	--
				Benzo(a)pyrene	2.17E-07	µg/m³	1.77E-08	µg/m³	6.00E-04	m³/µg	1E-11	4.95E-08	µg/m³	2.00E-03	µg/m³	0.00002
				Benzo(b)fluoranthene	3.90E-07	µg/m³	3.18E-08	µg/m³	6.00E-05	m³/µg	2E-12	8.91E-08	µg/m³	--	--	--
				Indeno(1,2,3-cd)pyrene	1.18E-07	µg/m³	9.65E-09	µg/m³	6.00E-05	m³/µg	6E-13	2.70E-08	µg/m³	--	--	--
				Polychlorinated Biphenyls (PCBs)												
				Aroclor 1254	4.05E-07	µg/m³	3.30E-08	µg/m³	5.71E-04	m³/µg	2E-11	9.25E-08	µg/m³	--	--	--
				Aroclor 1260	1.76E-05	µg/m³	1.44E-06	µg/m³	5.71E-04	m³/µg	8E-10	4.03E-06	µg/m³	--	--	--
				Polychlorinated Biphenyls (PCBs) - Congeners												
				PCBC TEQ MAMMAL HALFND	1.58E-11	µg/m³	1.29E-12	µg/m³	3.80E+01	m³/µg	5E-11	3.61E-12	µg/m³	4.00E-05	µg/m³	0.00000009
				Dioxins and Furans												
				DIOXIN TEQ MAMMAL HALFND	1.00E-11	µg/m³	8.18E-13	µg/m³	3.80E+01	m³/µg	3E-11	2.29E-12	µg/m³	4.00E-05	µg/m³	0.00000006
				Metals (Total)												
				Aluminum	6.40E-03	µg/m³	5.22E-04	µg/m³	--	--	--	1.46E-03	µg/m³	5.00E+00	µg/m³	0.0003
				Antimony	7.62E-07	µg/m³	6.21E-08	µg/m³	--	--	--	1.74E-07	µg/m³	3.00E-01	µg/m³	0.0000006
				Arsenic	9.54E-06	µg/m³	7.78E-07	µg/m³	4.30E-03	m³/µg	3E-09	2.18E-06	µg/m³	1.50E-02	µg/m³	0.0001
				Cadmium (Diet)	3.83E-07	µg/m³	3.12E-08	µg/m³	1.80E-03	m³/µg	6E-11	8.75E-08	µg/m³	1.00E-02	µg/m³	0.000009
				Chromium, Total	1.16E-05	µg/m³	9.45E-07	µg/m³	8.40E-02	m³/µg	8E-08	2.65E-06	µg/m³	1.00E-01	µg/m³	0.00003
				Cobalt	8.20E-06	µg/m³	6.69E-07	µg/m³	9.00E-03	m³/µg	6E-09	1.87E-06	µg/m³	6.00E-03	µg/m³	0.0003
				Iron	1.80E-02	µg/m³	1.47E-03	µg/m³	--	--	--	4.12E-03	µg/m³	--	--	--
				Manganese (Non-Diet)	3.62E-04	µg/m³	2.95E-05	µg/m³	--	--	--	8.26E-05	µg/m³	5.00E-02	µg/m³	0.002
				Thallium	1.21E-07	µg/m³	9.83E-09	µg/m³	--	--	--	2.75E-08	µg/m³	--	--	--
			Exp. Route Total								9E-08					0.002
		Exp. Point Total									9E-08					0.002
		Vapors above Site	Inhalation													
				Semi-volatile Organic Compounds (SVOCs)												
				Benzo(a)anthracene	4.45E-05	µg/m³	3.63E-06	µg/m³	6.00E-05	m³/µg	2E-10	1.02E-05	µg/m³	--	--	--
				Polychlorinated Biphenyls (PCBs)												
				Aroclor 1254	1.71E-03	µg/m³	1.39E-04	µg/m³	5.71E-04	m³/µg	8E-08	3.90E-04	µg/m³	--	--	--
				Aroclor 1260	6.62E-02	µg/m³	5.40E-03	µg/m³	5.71E-04	m³/µg	3E-06	1.51E-02	µg/m³	--	--	--
				Polychlorinated Biphenyls (PCBs) - Congeners												
				PCBC TEQ MAMMAL HALFND	7.57E-09	µg/m³	6.18E-10	µg/m³	3.80E+01	m³/µg	2E-08	1.73E-09	µg/m³	4.00E-05	µg/m³	0.00004
				Dioxins and Furans												
				DIOXIN TEQ MAMMAL HALFND	4.81E-09	µg/m³	3.92E-10	µg/m³	3.80E+01	m³/µg	1E-08	1.10E-09	µg/m³	4.00E-05	µg/m³	0.00003
			Exp. Route Total								3E-06					0.00007
		Exp. Point Total									3E-06					0.00007
	Exp. Medium Total										3E-06					0.003
Medium Total											4E-05					0.3
Notes:											**Total of Receptor Risks Across All Media**					**Total of Receptor Hazards Across All Media**
											4E-05					**0.3**

(1) CR and HQs are rounded to one non-zero digit; cumulative totals may be slightly higher or lower depending on degree of rounding.

Table A-7.12a
Calculation of Chemical Cancer Risks and Non-Cancer Hazards
Reasonable Maximum Exposure (Site-Wide)
Future On-Site Construction Worker - Total Soil (0 - 8.8 feet)
Human Health Risk Assessment
Shaffer Equipment/Arbuckle Creek Area Superfund Site, Minden, West Virginia

Scenario Timeframe:	Future
Receptor Population:	On-Site Construction Worker
Receptor Age:	Adult

Medium	Exposure Medium	Exposure Point	Exposure Route	Chemical of Potential Concern	EPC		Cancer Risk Calculations					Non-Cancer Hazard Calculations				
					Value	Units	Intake/Exposure Concentration		CSF/Unit Risk		Cancer Risk [1]	Intake/Exposure Concentration		RfD/RfC		Hazard Quotient [1]
							Value	Units	Value	Units		Value	Units	Value	Units	
Soil	Total Soil	0 - 8.8 feet	Ingestion													
				Semi-volatile Organic Compounds (SVOCs)												
				1,2,4,5-Tetrachlorobenzene	1.21E-01	mg/kg	4.88E-09	mg/kg-day	--	--	--	3.42E-07	mg/kg-day	3.00E-05	mg/kg-day	0.01
				Benzo(a)anthracene	5.09E-01	mg/kg	2.05E-08	mg/kg-day	1.00E-01	1/(mg/kg-day)	2E-09	1.44E-06	mg/kg-day	--	--	--
				Benzo(a)pyrene	3.42E-01	mg/kg	1.38E-08	mg/kg-day	1.00E+00	1/(mg/kg-day)	1E-08	9.66E-07	mg/kg-day	3.00E-04	mg/kg-day	0.003
				Benzo(b)fluoranthene	6.90E-01	mg/kg	2.78E-08	mg/kg-day	1.00E-01	1/(mg/kg-day)	3E-09	1.95E-06	mg/kg-day	--	--	--
				Dibenz(a,h)anthracene	1.51E-02	mg/kg	6.09E-10	mg/kg-day	1.00E+00	1/(mg/kg-day)	6E-10	4.27E-08	mg/kg-day	--	--	--
				Indeno(1,2,3-cd)pyrene	1.77E-01	mg/kg	7.14E-09	mg/kg-day	1.00E-01	1/(mg/kg-day)	7E-10	5.00E-07	mg/kg-day	--	--	--
				Pesticides												
				Dieldrin	3.97E-03	mg/kg	1.60E-10	mg/kg-day	1.60E+01	1/(mg/kg-day)	3E-09	1.12E-08	mg/kg-day	5.00E-05	mg/kg-day	0.0002
				Polychlorinated Biphenyls (PCBs)												
				Aroclor 1254	6.17E-02	mg/kg	2.49E-09	mg/kg-day	2.00E+00	1/(mg/kg-day)	5E-09	1.74E-07	mg/kg-day	3.00E-05	mg/kg-day	0.006
				Aroclor 1260	1.18E+00	mg/kg	4.76E-08	mg/kg-day	2.00E+00	1/(mg/kg-day)	1E-07	3.33E-06	mg/kg-day	--	--	--
				Polychlorinated Biphenyls (PCBs) - Congeners												
				PCBC TEQ MAMMAL HALFND	2.28E-05	mg/kg	9.21E-13	mg/kg-day	1.30E+05	1/(mg/kg-day)	1E-07	6.45E-11	mg/kg-day	2.00E-08	mg/kg-day	0.003
				Dioxins and Furans												
				DIOXIN TEQ MAMMAL HALFND	1.19E-05	mg/kg	4.80E-13	mg/kg-day	1.30E+05	1/(mg/kg-day)	6E-08	3.36E-11	mg/kg-day	2.00E-08	mg/kg-day	0.002
				Metals (Total)												
				Aluminum	8.51E+03	mg/kg	3.43E-04	mg/kg-day	--	--	--	2.40E-02	mg/kg-day	1.00E+00	mg/kg-day	0.02
				Antimony	9.23E-01	mg/kg	3.73E-08	mg/kg-day	--	--	--	2.61E-06	mg/kg-day	4.00E-04	mg/kg-day	0.007
				Arsenic	1.22E+01	mg/kg	2.94E-07	mg/kg-day	1.50E+00	1/(mg/kg-day)	4E-07	2.06E-05	mg/kg-day	5.00E-03	mg/kg-day	0.004
				Cadmium (Diet)	3.32E-01	mg/kg	1.34E-08	mg/kg-day	--	--	--	9.38E-07	mg/kg-day	5.00E-04	mg/kg-day	0.002
				Chromium, Total	1.48E+01	mg/kg	5.99E-07	mg/kg-day	5.00E-01	1/(mg/kg-day)	3E-07	4.19E-05	mg/kg-day	5.00E-03	mg/kg-day	0.008
				Cobalt	1.03E+01	mg/kg	4.17E-07	mg/kg-day	--	--	--	2.92E-05	mg/kg-day	3.00E-03	mg/kg-day	0.01
				Iron	2.24E+04	mg/kg	9.05E-04	mg/kg-day	--	--	--	6.34E-02	mg/kg-day	7.00E-01	mg/kg-day	0.09
				Manganese (Non-Diet)	4.20E+02	mg/kg	1.69E-05	mg/kg-day	--	--	--	1.19E-03	mg/kg-day	2.40E-02	mg/kg-day	0.05
				Thallium	1.52E-01	mg/kg	6.14E-09	mg/kg-day	--	--	--	4.29E-07	mg/kg-day	4.00E-05	mg/kg-day	0.01
			Exp. Route Total								1E-06					0.2
			Dermal													
				Semi-volatile Organic Compounds (SVOCs)												
				1,2,4,5-Tetrachlorobenzene	1.21E-01	mg/kg	1.57E-09	mg/kg-day	--	--	--	1.10E-07	mg/kg-day	3.00E-05	mg/kg-day	0.004
				Benzo(a)anthracene	5.09E-01	mg/kg	8.56E-09	mg/kg-day	1.00E-01	1/(mg/kg-day)	9E-10	5.99E-07	mg/kg-day	--	--	--
				Benzo(a)pyrene	3.42E-01	mg/kg	5.75E-09	mg/kg-day	1.00E+00	1/(mg/kg-day)	6E-09	4.03E-07	mg/kg-day	3.00E-04	mg/kg-day	0.001
				Benzo(b)fluoranthene	6.90E-01	mg/kg	1.16E-08	mg/kg-day	1.00E-01	1/(mg/kg-day)	1E-09	8.13E-07	mg/kg-day	--	--	--
				Dibenz(a,h)anthracene	1.51E-02	mg/kg	2.54E-10	mg/kg-day	1.00E+00	1/(mg/kg-day)	3E-10	1.78E-08	mg/kg-day	--	--	--
				Indeno(1,2,3-cd)pyrene	1.77E-01	mg/kg	2.98E-09	mg/kg-day	1.00E-01	1/(mg/kg-day)	3E-10	2.08E-07	mg/kg-day	--	--	--
				Pesticides												
				Dieldrin	3.97E-03	mg/kg	5.14E-11	mg/kg-day	1.60E+01	1/(mg/kg-day)	8E-10	3.60E-09	mg/kg-day	5.00E-05	mg/kg-day	0.00007
				Polychlorinated Biphenyls (PCBs)												
				Aroclor 1254	6.17E-02	mg/kg	1.12E-09	mg/kg-day	2.00E+00	1/(mg/kg-day)	2E-09	7.83E-08	mg/kg-day	3.00E-05	mg/kg-day	0.003
				Aroclor 1260	1.18E+00	mg/kg	2.14E-08	mg/kg-day	2.00E+00	1/(mg/kg-day)	4E-08	1.50E-06	mg/kg-day	--	--	--
				Polychlorinated Biphenyls (PCBs) - Congeners												
				PCBC TEQ MAMMAL HALFND	2.28E-05	mg/kg	8.86E-14	mg/kg-day	1.30E+05	1/(mg/kg-day)	1E-08	6.20E-12	mg/kg-day	2.00E-08	mg/kg-day	0.0003
				Dioxins and Furans												
				DIOXIN TEQ MAMMAL HALFND	1.19E-05	mg/kg	4.62E-14	mg/kg-day	1.30E+05	1/(mg/kg-day)	6E-09	3.23E-12	mg/kg-day	2.00E-08	mg/kg-day	0.0002

Table A-7.12a
Calculation of Chemical Cancer Risks and Non-Cancer Hazards
Reasonable Maximum Exposure (Site-Wide)
Future On-Site Construction Worker - Total Soil (0 - 8.8 feet)
Human Health Risk Assessment
Shaffer Equipment/Arbuckle Creek Area Superfund Site, Minden, West Virginia

Scenario Timeframe:	Future
Receptor Population:	On-Site Construction Worker
Receptor Age:	Adult

Medium	Exposure Medium	Exposure Point	Exposure Route	Chemical of Potential Concern	EPC		Cancer Risk Calculations					Non-Cancer Hazard Calculations				
					Value	Units	Intake/Exposure Concentration		CSF/Unit Risk		Cancer Risk [1]	Intake/Exposure Concentration		RfD/RfC		Hazard Quotient [1]
							Value	Units	Value	Units		Value	Units	Value	Units	
				Metals (Total)												
				Aluminum	8.51E+03	mg/kg	1.10E-05	mg/kg-day	--	--	--	7.71E-04	mg/kg-day	1.00E+00	mg/kg-day	0.0008
				Antimony	9.23E-01	mg/kg	1.19E-09	mg/kg-day	--	--	--	8.36E-08	mg/kg-day	6.00E-05	mg/kg-day	0.001
				Arsenic	1.22E+01	mg/kg	4.72E-08	mg/kg-day	1.50E+00	1/(mg/kg-day)	7E-08	3.30E-06	mg/kg-day	5.00E-03	mg/kg-day	0.0007
				Cadmium (Diet)	3.32E-01	mg/kg	4.30E-11	mg/kg-day	--	--	--	3.01E-09	mg/kg-day	1.25E-05	mg/kg-day	0.0002
				Chromium, Total	1.48E+01	mg/kg	1.92E-08	mg/kg-day	2.00E+01	1/(mg/kg-day)	4E-07	1.34E-06	mg/kg-day	1.25E-04	mg/kg-day	0.01
				Cobalt	1.03E+01	mg/kg	1.34E-08	mg/kg-day	--	--	--	9.35E-07	mg/kg-day	3.00E-03	mg/kg-day	0.0003
				Iron	2.24E+04	mg/kg	2.90E-05	mg/kg-day	--	--	--	2.03E-03	mg/kg-day	7.00E-01	mg/kg-day	0.003
				Manganese (Non-Diet)	4.20E+02	mg/kg	5.43E-07	mg/kg-day	--	--	--	3.80E-05	mg/kg-day	9.60E-04	mg/kg-day	0.04
				Thallium	1.52E-01	mg/kg	1.97E-10	mg/kg-day	--	--	--	1.38E-08	mg/kg-day	4.00E-05	mg/kg-day	0.0003
			Exp. Route Total								5E-07					0.07
		Exp. Point Total									2E-06					0.3
	Exp. Medium Total										2E-06					0.3
	Outdoor Air	Particulates above Site	Inhalation													
				Semi-volatile Organic Compounds (SVOCs)												
				1,2,4,5-Tetrachlorobenzene	1.60E-05	µg/m³	5.22E-08	µg/m³	--	--	--	3.65E-06	µg/m³	--	--	--
				Benzo(a)anthracene	6.73E-05	µg/m³	2.19E-07	µg/m³	6.00E-05	m³/µg	1E-11	1.54E-05	µg/m³	--	--	--
				Benzo(a)pyrene	4.52E-05	µg/m³	1.47E-07	µg/m³	6.00E-04	m³/µg	9E-11	1.03E-05	µg/m³	2.00E-03	µg/m³	0.005
				Benzo(b)fluoranthene	9.12E-05	µg/m³	2.97E-07	µg/m³	6.00E-05	m³/µg	2E-11	2.08E-05	µg/m³	--	--	--
				Dibenz(a,h)anthracene	2.00E-06	µg/m³	6.51E-09	µg/m³	6.00E-04	m³/µg	4E-12	4.56E-07	µg/m³	--	--	--
				Indeno(1,2,3-cd)pyrene	2.34E-05	µg/m³	7.63E-08	µg/m³	6.00E-05	m³/µg	5E-12	5.34E-06	µg/m³	--	--	--
				Pesticides												
				Dieldrin	5.25E-07	µg/m³	1.71E-09	µg/m³	4.60E-03	m³/µg	8E-12	1.20E-07	µg/m³	--	--	--
				Polychlorinated Biphenyls (PCBs)												
				Aroclor 1254	8.15E-06	µg/m³	2.66E-08	µg/m³	5.71E-04	m³/µg	2E-11	1.86E-06	µg/m³	--	--	--
				Aroclor 1260	1.56E-04	µg/m³	5.08E-07	µg/m³	5.71E-04	m³/µg	3E-10	3.56E-05	µg/m³	--	--	--
				Polychlorinated Biphenyls (PCBs) - Congeners												
				PCBC TEQ MAMMAL HALFND	3.02E-09	µg/m³	9.84E-12	µg/m³	3.80E+01	m³/µg	4E-10	6.89E-10	µg/m³	4.00E-05	µg/m³	0.00002
				Dioxins and Furans												
				DIOXIN TEQ MAMMAL HALFND	1.57E-09	µg/m³	5.13E-12	µg/m³	3.80E+01	m³/µg	2E-10	3.59E-10	µg/m³	4.00E-05	µg/m³	0.000009
				Metals (Total)												
				Aluminum	1.12E+00	µg/m³	3.67E-03	µg/m³	--	--	--	2.57E-01	µg/m³	5.00E+00	µg/m³	0.05
				Antimony	1.22E-04	µg/m³	3.98E-07	µg/m³	--	--	--	2.78E-05	µg/m³	1.00E+00	µg/m³	0.00003
				Arsenic	1.61E-03	µg/m³	5.24E-06	µg/m³	4.30E-03	m³/µg	2E-08	3.67E-04	µg/m³	1.50E-02	µg/m³	0.02
				Cadmium (Diet)	4.39E-05	µg/m³	1.43E-07	µg/m³	1.80E-03	m³/µg	3E-10	1.00E-05	µg/m³	9.00E-01	µg/m³	0.00001
				Chromium, Total	1.96E-03	µg/m³	6.40E-06	µg/m³	8.40E-02	m³/µg	5E-07	4.48E-04	µg/m³	3.00E-01	µg/m³	0.001
				Cobalt	1.36E-03	µg/m³	4.45E-06	µg/m³	9.00E-03	m³/µg	4E-08	3.11E-04	µg/m³	2.00E-02	µg/m³	0.02
				Iron	2.96E+00	µg/m³	9.66E-03	µg/m³	--	--	--	6.77E-01	µg/m³	--	--	--
				Manganese (Non-Diet)	5.55E-02	µg/m³	1.81E-04	µg/m³	--	--	--	1.27E-02	µg/m³	5.00E-02	µg/m³	0.3
				Thallium	2.01E-05	µg/m³	6.55E-08	µg/m³	--	--	--	4.59E-06	µg/m³	--	--	--
			Exp. Route Total								6E-07					0.4
		Exp. Point Total									6E-07					0.4
		Vapors above Site	Inhalation													
				Semi-volatile Organic Compounds (SVOCs)												
				1,2,4,5-Tetrachlorobenzene	1.12E-02	µg/m³	3.65E-05	µg/m³	--	--	--	2.55E-03	µg/m³	--	--	--
				Benzo(a)anthracene	2.64E-04	µg/m³	8.62E-07	µg/m³	6.00E-05	m³/µg	5E-11	6.04E-05	µg/m³	--	--	--

Table A-7.12a
Calculation of Chemical Cancer Risks and Non-Cancer Hazards
Reasonable Maximum Exposure (Site-Wide)
Future On-Site Construction Worker - Total Soil (0 - 8.8 feet)
Human Health Risk Assessment
Shaffer Equipment/Arbuckle Creek Area Superfund Site, Minden, West Virginia

Scenario Timeframe:	Future
Receptor Population:	On-Site Construction Worker
Receptor Age:	Adult

Medium	Exposure Medium	Exposure Point	Exposure Route	Chemical of Potential Concern	EPC		Cancer Risk Calculations					Non-Cancer Hazard Calculations				
					Value	Units	Intake/Exposure Concentration		CSF/Unit Risk		Cancer Risk [1]	Intake/Exposure Concentration		RfD/RfC		Hazard Quotient [1]
							Value	Units	Value	Units		Value	Units	Value	Units	
				Polychlorinated Biphenyls (PCBs)												
				Aroclor 1254	7.34E-04	µg/m³	2.39E-06	µg/m³	5.71E-04	m³/µg	1E-09	1.68E-04	µg/m³	--	--	--
				Aroclor 1260	1.25E-02	µg/m³	4.07E-05	µg/m³	5.71E-04	m³/µg	2E-08	2.85E-03	µg/m³	--	--	--
				Polychlorinated Biphenyls (PCBs) - Congeners												
				PCBC TEQ MAMMAL HALFND	3.09E-08	µg/m³	1.01E-10	µg/m³	3.80E+01	m³/µg	4E-09	7.05E-09	µg/m³	4.00E-05	µg/m³	0.0002
				Dioxins and Furans												
				DIOXIN TEQ MAMMAL HALFND	1.61E-08	µg/m³	5.25E-11	µg/m³	3.80E+01	m³/µg	2E-09	3.67E-09	µg/m³	4.00E-05	µg/m³	0.00009
			Exp. Route Total								3E-08					0.0003
		Exp. Point Total									3E-08					0.0003
	Exp. Medium Total										6E-07					0.4
Medium Total											2E-06					0.6
Notes:											**Total of Receptor Risks Across All Media**					**Total of Receptor Hazards Across All Media**
											2E-06					**0.6**

(1) CR and HQs are rounded to one non-zero digit; cumulative totals may be slightly higher or lower depending on degree of rounding.

Table A-7.12b
Calculation of Chemical Cancer Risks and Non-Cancer Hazards
Reasonable Maximum Exposure (Site-Wide with Hotspot)
Future On-Site Construction Worker - Total Soil (0 - 8.8 feet)
Human Health Risk Assessment
Shaffer Equipment/Arbuckle Creek Area Superfund Site, Minden, West Virginia

Scenario Timeframe:	Future
Receptor Population:	On-Site Construction Worker
Receptor Age:	Adult

Medium	Exposure Medium	Exposure Point	Exposure Route	Chemical of Potential Concern	EPC		Cancer Risk Calculations					Non-Cancer Hazard Calculations				
					Value	Units	Intake/Exposure Concentration		CSF/Unit Risk		Cancer Risk [1]	Intake/Exposure Concentration		RfD/RfC		Hazard Quotient [1]
							Value	Units	Value	Units		Value	Units	Value	Units	
Soil	Total Soil	0 - 8.8 feet	Ingestion													
				Semi-volatile Organic Compounds (SVOCs)												
				1,2,4,5-Tetrachlorobenzene	1.21E-01	mg/kg	4.88E-09	mg/kg-day	--	--	--	3.42E-07	mg/kg-day	3.00E-05	mg/kg-day	0.01
				Benzo(a)anthracene	5.09E-01	mg/kg	2.05E-08	mg/kg-day	1.00E-01	1/(mg/kg-day)	2E-09	1.44E-06	mg/kg-day	--	--	--
				Benzo(a)pyrene	3.42E-01	mg/kg	1.38E-08	mg/kg-day	1.00E+00	1/(mg/kg-day)	1E-08	9.66E-07	mg/kg-day	3.00E-04	mg/kg-day	0.003
				Benzo(b)fluoranthene	6.90E-01	mg/kg	2.78E-08	mg/kg-day	1.00E-01	1/(mg/kg-day)	3E-09	1.95E-06	mg/kg-day	--	--	--
				Dibenz(a,h)anthracene	1.51E-02	mg/kg	6.09E-10	mg/kg-day	1.00E+00	1/(mg/kg-day)	6E-10	4.27E-08	mg/kg-day	--	--	--
				Indeno(1,2,3-cd)pyrene	1.77E-01	mg/kg	7.14E-09	mg/kg-day	1.00E-01	1/(mg/kg-day)	7E-10	5.00E-07	mg/kg-day	--	--	--
				Pesticides												
				Dieldrin	3.97E-03	mg/kg	1.60E-10	mg/kg-day	1.60E+01	1/(mg/kg-day)	3E-09	1.12E-08	mg/kg-day	5.00E-05	mg/kg-day	0.0002
				Polychlorinated Biphenyls (PCBs)												
				Aroclor 1254	6.17E-02	mg/kg	2.49E-09	mg/kg-day	2.00E+00	1/(mg/kg-day)	5E-09	1.74E-07	mg/kg-day	3.00E-05	mg/kg-day	0.006
				Aroclor 1260	2.40E+01	mg/kg	9.69E-07	mg/kg-day	2.00E+00	1/(mg/kg-day)	2E-06	6.78E-05	mg/kg-day	--	--	--
				Polychlorinated Biphenyls (PCBs) - Congeners												
				PCBC TEQ MAMMAL HALFND	2.28E-05	mg/kg	9.21E-13	mg/kg-day	1.30E+05	1/(mg/kg-day)	1E-07	6.45E-11	mg/kg-day	2.00E-08	mg/kg-day	0.003
				Dioxins and Furans												
				DIOXIN TEQ MAMMAL HALFND	1.19E-05	mg/kg	4.80E-13	mg/kg-day	1.30E+05	1/(mg/kg-day)	6E-08	3.36E-11	mg/kg-day	2.00E-08	mg/kg-day	0.002
				Metals (Total)												
				Aluminum	8.51E+03	mg/kg	3.43E-04	mg/kg-day	--	--	--	2.40E-02	mg/kg-day	1.00E+00	mg/kg-day	0.02
				Antimony	9.23E-01	mg/kg	3.73E-08	mg/kg-day	--	--	--	2.61E-06	mg/kg-day	4.00E-04	mg/kg-day	0.007
				Arsenic	1.22E+01	mg/kg	2.94E-07	mg/kg-day	1.50E+00	1/(mg/kg-day)	4E-07	2.06E-05	mg/kg-day	5.00E-03	mg/kg-day	0.004
				Cadmium (Diet)	3.32E-01	mg/kg	1.34E-08	mg/kg-day	--	--	--	9.38E-07	mg/kg-day	5.00E-04	mg/kg-day	0.002
				Chromium, Total	1.48E+01	mg/kg	5.99E-07	mg/kg-day	5.00E-01	1/(mg/kg-day)	3E-07	4.19E-05	mg/kg-day	5.00E-03	mg/kg-day	0.008
				Cobalt	1.03E+01	mg/kg	4.17E-07	mg/kg-day	--	--	--	2.92E-05	mg/kg-day	3.00E-03	mg/kg-day	0.01
				Iron	2.24E+04	mg/kg	9.05E-04	mg/kg-day	--	--	--	6.34E-02	mg/kg-day	7.00E-01	mg/kg-day	0.09
				Manganese (Non-Diet)	4.20E+02	mg/kg	1.69E-05	mg/kg-day	--	--	--	1.19E-03	mg/kg-day	2.40E-02	mg/kg-day	0.05
				Thallium	1.52E-01	mg/kg	6.14E-09	mg/kg-day	--	--	--	4.29E-07	mg/kg-day	4.00E-05	mg/kg-day	0.01
			Exp. Route Total								3E-06					0.2
			Dermal													
				Semi-volatile Organic Compounds (SVOCs)												
				1,2,4,5-Tetrachlorobenzene	1.21E-01	mg/kg	1.57E-09	mg/kg-day	--	--	--	1.10E-07	mg/kg-day	3.00E-05	mg/kg-day	0.004
				Benzo(a)anthracene	5.09E-01	mg/kg	8.56E-09	mg/kg-day	1.00E-01	1/(mg/kg-day)	9E-10	5.99E-07	mg/kg-day	--	--	--
				Benzo(a)pyrene	3.42E-01	mg/kg	5.75E-09	mg/kg-day	1.00E+00	1/(mg/kg-day)	6E-09	4.03E-07	mg/kg-day	3.00E-04	mg/kg-day	0.001
				Benzo(b)fluoranthene	6.90E-01	mg/kg	1.16E-08	mg/kg-day	1.00E-01	1/(mg/kg-day)	1E-09	8.13E-07	mg/kg-day	--	--	--
				Dibenz(a,h)anthracene	1.51E-02	mg/kg	2.54E-10	mg/kg-day	1.00E+00	1/(mg/kg-day)	3E-10	1.78E-08	mg/kg-day	--	--	--
				Indeno(1,2,3-cd)pyrene	1.77E-01	mg/kg	2.98E-09	mg/kg-day	1.00E-01	1/(mg/kg-day)	3E-10	2.08E-07	mg/kg-day	--	--	--
				Pesticides												
				Dieldrin	3.97E-03	mg/kg	5.14E-11	mg/kg-day	1.60E+01	1/(mg/kg-day)	8E-10	3.60E-09	mg/kg-day	5.00E-05	mg/kg-day	0.00007
				Polychlorinated Biphenyls (PCBs)												
				Aroclor 1254	6.17E-02	mg/kg	1.12E-09	mg/kg-day	2.00E+00	1/(mg/kg-day)	2E-09	7.83E-08	mg/kg-day	3.00E-05	mg/kg-day	0.003
				Aroclor 1260	2.40E+01	mg/kg	4.35E-07	mg/kg-day	2.00E+00	1/(mg/kg-day)	9E-07	3.04E-05	mg/kg-day	--	--	--
				Polychlorinated Biphenyls (PCBs) - Congeners												
				PCBC TEQ MAMMAL HALFND	2.28E-05	mg/kg	8.86E-14	mg/kg-day	1.30E+05	1/(mg/kg-day)	1E-08	6.20E-12	mg/kg-day	2.00E-08	mg/kg-day	0.0003
				Dioxins and Furans												
				DIOXIN TEQ MAMMAL HALFND	1.19E-05	mg/kg	4.62E-14	mg/kg-day	1.30E+05	1/(mg/kg-day)	6E-09	3.23E-12	mg/kg-day	2.00E-08	mg/kg-day	0.0002

Table A-7.12b
Calculation of Chemical Cancer Risks and Non-Cancer Hazards
Reasonable Maximum Exposure (Site-Wide with Hotspot)
Future On-Site Construction Worker - Total Soil (0 - 8.8 feet)
Human Health Risk Assessment
Shaffer Equipment/Arbuckle Creek Area Superfund Site, Minden, West Virginia

Scenario Timeframe:	Future
Receptor Population:	On-Site Construction Worker
Receptor Age:	Adult

Medium	Exposure Medium	Exposure Point	Exposure Route	Chemical of Potential Concern	EPC		Cancer Risk Calculations					Non-Cancer Hazard Calculations				
					Value	Units	Intake/Exposure Concentration		CSF/Unit Risk		Cancer Risk [1]	Intake/Exposure Concentration		RfD/RfC		Hazard Quotient [1]
							Value	Units	Value	Units		Value	Units	Value	Units	
				Metals (Total)												
				Aluminum	8.51E+03	mg/kg	1.10E-05	mg/kg-day	--	--	--	7.71E-04	mg/kg-day	1.00E+00	mg/kg-day	0.0008
				Antimony	9.23E-01	mg/kg	1.19E-09	mg/kg-day	--	--	--	8.36E-08	mg/kg-day	6.00E-05	mg/kg-day	0.001
				Arsenic	1.22E+01	mg/kg	4.72E-08	mg/kg-day	1.50E+00	1/(mg/kg-day)	7E-08	3.30E-06	mg/kg-day	5.00E-03	mg/kg-day	0.0007
				Cadmium (Diet)	3.32E-01	mg/kg	4.30E-11	mg/kg-day	--	--	--	3.01E-09	mg/kg-day	1.25E-05	mg/kg-day	0.0002
				Chromium, Total	1.48E+01	mg/kg	1.92E-08	mg/kg-day	2.00E+01	1/(mg/kg-day)	4E-07	1.34E-06	mg/kg-day	1.25E-04	mg/kg-day	0.01
				Cobalt	1.03E+01	mg/kg	1.34E-08	mg/kg-day	--	--	--	9.35E-07	mg/kg-day	3.00E-03	mg/kg-day	0.0003
				Iron	2.24E+04	mg/kg	2.90E-05	mg/kg-day	--	--	--	2.03E-03	mg/kg-day	7.00E-01	mg/kg-day	0.003
				Manganese (Non-Diet)	4.20E+02	mg/kg	5.43E-07	mg/kg-day	--	--	--	3.80E-05	mg/kg-day	9.60E-04	mg/kg-day	0.04
				Thallium	1.52E-01	mg/kg	1.97E-10	mg/kg-day	--	--	--	1.38E-08	mg/kg-day	4.00E-05	mg/kg-day	0.0003
			Exp. Route Total								1E-06					0.07
		Exp. Point Total									4E-06					0.3
	Exp. Medium Total										4E-06					0.3
	Outdoor Air	Particulates above Site	Inhalation													
				Semi-volatile Organic Compounds (SVOCs)													
				1,2,4,5-Tetrachlorobenzene	1.60E-05	µg/m³	5.22E-08	µg/m³	--	--	--	3.65E-06	µg/m³	--	--	--
				Benzo(a)anthracene	6.73E-05	µg/m³	2.19E-07	µg/m³	6.00E-05	m³/µg	1E-11	1.54E-05	µg/m³	--	--	--
				Benzo(a)pyrene	4.52E-05	µg/m³	1.47E-07	µg/m³	6.00E-04	m³/µg	9E-11	1.03E-05	µg/m³	2.00E-03	µg/m³	0.005
				Benzo(b)fluoranthene	9.12E-05	µg/m³	2.97E-07	µg/m³	6.00E-05	m³/µg	2E-11	2.08E-05	µg/m³	--	--	--
				Dibenz(a,h)anthracene	2.00E-06	µg/m³	6.51E-09	µg/m³	6.00E-04	m³/µg	4E-12	4.56E-07	µg/m³	--	--	--
				Indeno(1,2,3-cd)pyrene	2.34E-05	µg/m³	7.63E-08	µg/m³	6.00E-05	m³/µg	5E-12	5.34E-06	µg/m³	--	--	--
				Pesticides												
				Dieldrin	5.25E-07	µg/m³	1.71E-09	µg/m³	4.60E-03	m³/µg	8E-12	1.20E-07	µg/m³	--	--	--
				Polychlorinated Biphenyls (PCBs)												
				Aroclor 1254	8.15E-06	µg/m³	2.66E-08	µg/m³	5.71E-04	m³/µg	2E-11	1.86E-06	µg/m³	--	--	--
				Aroclor 1260	3.17E-03	µg/m³	1.03E-05	µg/m³	5.71E-04	m³/µg	6E-09	7.24E-04	µg/m³	--	--	--
				Polychlorinated Biphenyls (PCBs) - Congeners												
				PCBC TEQ MAMMAL HALFND	3.02E-09	µg/m³	9.84E-12	µg/m³	3.80E+01	m³/µg	4E-10	6.89E-10	µg/m³	4.00E-05	µg/m³	0.00002
				Dioxins and Furans												
				DIOXIN TEQ MAMMAL HALFND	1.57E-09	µg/m³	5.13E-12	µg/m³	3.80E+01	m³/µg	2E-10	3.59E-10	µg/m³	4.00E-05	µg/m³	0.000009
				Metals (Total)												
				Aluminum	1.12E+00	µg/m³	3.67E-03	µg/m³	--	--	--	2.57E-01	µg/m³	5.00E+00	µg/m³	0.05
				Antimony	1.22E-04	µg/m³	3.98E-07	µg/m³	--	--	--	2.78E-05	µg/m³	1.00E+00	µg/m³	0.00003
				Arsenic	1.61E-03	µg/m³	5.24E-06	µg/m³	4.30E-03	m³/µg	2E-08	3.67E-04	µg/m³	1.50E-02	µg/m³	0.02
				Cadmium (Diet)	4.39E-05	µg/m³	1.43E-07	µg/m³	1.80E-03	m³/µg	3E-10	1.00E-05	µg/m³	9.00E-01	µg/m³	0.00001
				Chromium, Total	1.96E-03	µg/m³	6.40E-06	µg/m³	8.40E-02	m³/µg	5E-07	4.48E-04	µg/m³	3.00E-01	µg/m³	0.001
				Cobalt	1.36E-03	µg/m³	4.45E-06	µg/m³	9.00E-03	m³/µg	4E-08	3.11E-04	µg/m³	2.00E-02	µg/m³	0.02
				Iron	2.96E+00	µg/m³	9.66E-03	µg/m³	--	--	--	6.77E-01	µg/m³	--	--	--
				Manganese (Non-Diet)	5.55E-02	µg/m³	1.81E-04	µg/m³	--	--	--	1.27E-02	µg/m³	5.00E-02	µg/m³	0.3
				Thallium	2.01E-05	µg/m³	6.55E-08	µg/m³	--	--	--	4.59E-06	µg/m³	--	--	--
			Exp. Route Total								6E-07					0.4
		Exp. Point Total									6E-07					0.4
		Vapors above Site	Inhalation													
				Semi-volatile Organic Compounds (SVOCs)												
				1,2,4,5-Tetrachlorobenzene	1.12E-02	µg/m³	3.65E-05	µg/m³	--	--	--	2.55E-03	µg/m³	--	--	--
				Benzo(a)anthracene	2.64E-04	µg/m³	8.62E-07	µg/m³	6.00E-05	m³/µg	5E-11	6.04E-05	µg/m³	--	--	--

Table A-7.12b
Calculation of Chemical Cancer Risks and Non-Cancer Hazards
Reasonable Maximum Exposure (Site-Wide with Hotspot)
Future On-Site Construction Worker - Total Soil (0 - 8.8 feet)
Human Health Risk Assessment
Shaffer Equipment/Arbuckle Creek Area Superfund Site, Minden, West Virginia

Scenario Timeframe:	Future
Receptor Population:	On-Site Construction Worker
Receptor Age:	Adult

Medium	Exposure Medium	Exposure Point	Exposure Route	Chemical of Potential Concern	EPC		Cancer Risk Calculations					Non-Cancer Hazard Calculations				
					Value	Units	Intake/Exposure Concentration		CSF/Unit Risk		Cancer Risk [1]	Intake/Exposure Concentration		RfD/RfC		Hazard Quotient [1]
							Value	Units	Value	Units		Value	Units	Value	Units	
				Polychlorinated Biphenyls (PCBs)												
				Aroclor 1254	7.34E-04	µg/m³	2.39E-06	µg/m³	5.71E-04	m³/µg	1E-09	1.68E-04	µg/m³	--	--	--
				Aroclor 1260	2.54E-01	µg/m³	8.29E-04	µg/m³	5.71E-04	m³/µg	5E-07	5.80E-02	µg/m³	--	--	--
				Polychlorinated Biphenyls (PCBs) - Congeners												
				PCBC TEQ MAMMAL HALFND	3.09E-08	µg/m³	1.01E-10	µg/m³	3.80E+01	m³/µg	4E-09	7.05E-09	µg/m³	4.00E-05	µg/m³	0.0002
				Dioxins and Furans												
				DIOXIN TEQ MAMMAL HALFND	1.61E-08	µg/m³	5.25E-11	µg/m³	3.80E+01	m³/µg	2E-09	3.67E-09	µg/m³	4.00E-05	µg/m³	0.00009
			Exp. Route Total								5E-07					0.0003
		Exp. Point Total									5E-07					0.0003
	Exp. Medium Total										1E-06					0.4
Medium Total											5E-06					0.6
Notes:											**Total of Receptor Risks Across All Media**					**Total of Receptor Hazards Across All Media**
											5E-06					**0.6**

(1) CR and HQs are rounded to one non-zero digit; cumulative totals may be slightly higher or lower depending on degree of rounding.

Table A-9.1
Summary of Chemical Non-Cancer Hazards for COPCs
Reasonable Maximum Exposure (Site-Wide)
Future On-Site Hypothetical Resident (Adult) - Surface Soil (0 - 0.5 feet)
Human Health Risk Assessment
Shaffer Equipment/Arbuckle Creek Area Superfund Site, Minden, West Virginia

Scenario Timeframe:	Future
Receptor Population:	On-Site Hypothetical Resident
Receptor Age:	Adult

Medium	Exposure Medium	Exposure Point	Chemical of Potential Concern	Thresholds: Chemical-specific (1E-06) and Cumulative (1E-04)[1]				Thresholds: Chemical-specific, Target Organ and Cumulative (HQ > 1)[1]				
				Carcinogenic Risk [2]				Non-Carcinogenic Hazard Quotient [2]				
				Ingestion	Dermal	Inhalation	Exposure Routes Total	Primary Target Organs	Ingestion	Dermal	Inhalation	Exposure Routes Total
Soil	Surface Soil	0 - 0.5 feet										
			Semi-volatile Organic Compounds (SVOCs)									
			Benzo(a)pyrene	--	--	--	--	DV	0.0005	0.0003	--	0.0007
			Polychlorinated Biphenyls (PCBs)									
			Aroclor 1260	--	--	--	--	--	--	--	--	--
			Polychlorinated Biphenyls (PCBs) - Congeners									
			PCBC TEQ MAMMAL HALFND	--	--	--	--	DV; EN; RP	0.05	0.006	--	0.06
			Dioxins and Furans									
			DIOXIN TEQ MAMMAL HALFND	--	--	--	--	DV; EN; RP	0.04	0.005	--	0.04
			Metals (Total)									
			Aluminum	--	--	--	--	NV	0.01	0.0004	--	0.01
			Arsenic	--	--	--	--	CV; DM	0.02	0.004	--	0.03
			Chromium, Total	--	--	--	--	N/A	0.005	0.008	--	0.01
			Cobalt	--	--	--	--	EN	0.04	0.002	--	0.05
			Iron	--	--	--	--	GI	0.04	0.002	--	0.04
			Manganese (Non-Diet)	--	--	--	--	NV	0.02	0.02	--	0.05
			Thallium	--	--	--	--	DM	0.02	0.0007	--	0.02
			Chemical Total	--	--	--	--		**0.2**	**0.05**	--	**0.3**
		Exposure Point Total					--					**0.3**
	Exposure Medium Total						--					**0.3**
	Outdoor Air	Particulates above Site										
			Semi-volatile Organic Compounds (SVOCs)									
			Benzo(a)pyrene	--	--	--	--	DV	--	--	0.00004	0.00004
			Polychlorinated Biphenyls (PCBs)									
			Aroclor 1260	--	--	--	--	--	--	--	--	--
			Polychlorinated Biphenyls (PCBs) - Congeners									
			PCBC TEQ MAMMAL HALFND	--	--	--	--	DV; EN; HM; HP; RP; RS	--	--	0.0000005	0.0000005
			Dioxins and Furans									
			DIOXIN TEQ MAMMAL HALFND	--	--	--	--	DV; EN; HM; HP; RP; RS	--	--	0.0000004	0.0000004
			Metals (Total)									
			Aluminum	--	--	--	--	NV	--	--	0.001	0.001
			Arsenic	--	--	--	--	CV; DM; DV; NV; RP; RS	--	--	0.0004	0.0004
			Chromium, Total	--	--	--	--	RS	--	--	0.00009	0.00009
			Cobalt	--	--	--	--	RS	--	--	0.001	0.001
			Iron	--	--	--	--	--	--	--	--	--
			Manganese (Non-Diet)	--	--	--	--	NV	--	--	0.007	0.007
			Thallium	--	--	--	--	--	--	--	--	--
			Chemical Total	--	--	--	--		--	--	**0.01**	**0.01**
		Exposure Point Total					--					**0.01**

Table A-9.1
Summary of Chemical Non-Cancer Hazards for COPCs
Reasonable Maximum Exposure (Site-Wide)
Future On-Site Hypothetical Resident (Adult) - Surface Soil (0 - 0.5 feet)
Human Health Risk Assessment
Shaffer Equipment/Arbuckle Creek Area Superfund Site, Minden, West Virginia

Scenario Timeframe:	Future
Receptor Population:	On-Site Hypothetical Resident
Receptor Age:	Adult

Medium	Exposure Medium	Exposure Point	Chemical of Potential Concern	Thresholds: Chemical-specific (1E-06) and Cumulative (1E-04)[1] Carcinogenic Risk[2]				Thresholds: Chemical-specific, Target Organ and Cumulative (HQ > 1)[1] Non-Carcinogenic Hazard Quotient[2]				
				Ingestion	Dermal	Inhalation	Exposure Routes Total	Primary Target Organs	Ingestion	Dermal	Inhalation	Exposure Routes Total
		Vapors above Site										
			Polychlorinated Biphenyls (PCBs)									
			Aroclor 1260	--	--	--	--	--	--	--	--	--
			Polychlorinated Biphenyls (PCBs) - Congeners									
			PCBC TEQ MAMMAL HALFND	--	--	--	--	DV; EN; HM; HP; RP; RS	--	--	0.0002	0.0002
			Dioxins and Furans									
			DIOXIN TEQ MAMMAL HALFND	--	--	--	--	DV; EN; HM; HP; RP; RS	--	--	0.0002	0.0002
			Chemical Total	--	--	--	--		--	--	**0.0004**	**0.0004**
		Exposure Point Total					--					**0.0004**
	Exposure Medium Total						--					**0.01**
Medium Total							--					**0.3**
Notes:						**Receptor Risk Total**	--				**Receptor Hazard Index (HI)**	**0.3**

(1) Exceedances of the carcinogenic and non-carcinogenic identified above are indicated (if applicable) with **red bold text**.

(2) CR and HQs are rounded to one non-zero digit; cumulative totals may be slightly higher or lower depending on degree of rounding.

Total Cardiovascular (CV) HI across All Media =	**0.03**
Total Dermal (DM) HI across All Media =	**0.04**
Total Developmental (DV) HI across All Media =	**0.1**
Total Endocrine (EN) HI across All Media =	**0.1**
Total Gastrointestinal (GI) HI across All Media =	**0.04**
Total Hematological (HM) HI across All Media =	**0.0004**
Total Hepatic (HP) HI across All Media =	**0.0004**
Total Nervous (NV) HI across All Media =	**0.07**
Total Reproductive (RP) HI across All Media =	**0.1**
Total Respiratory (RS) HI across All Media =	**0.002**

Table A-9.2
Summary of Chemical Non-Cancer Hazards for COPCs
Reasonable Maximum Exposure (Site-Wide)
Future On-Site Hypothetical Resident (Child) - Surface Soil (0 - 0.5 feet)
Human Health Risk Assessment
Shaffer Equipment/Arbuckle Creek Area Superfund Site, Minden, West Virginia

Scenario Timeframe:	Future
Receptor Population:	On-Site Hypothetical Resident
Receptor Age:	Child

Medium	Exposure Medium	Exposure Point	Chemical of Potential Concern	Thresholds: Chemical-specific (1E-06) and Cumulative (1E-04)[1]				Thresholds: Chemical-specific, Target Organ and Cumulative (HQ > 1)[1]				
				Carcinogenic Risk [2]				Non-Carcinogenic Hazard Quotient [2]				
				Ingestion	Dermal	Inhalation	Exposure Routes Total	Primary Target Organs	Ingestion	Dermal	Inhalation	Exposure Routes Total
Soil	Surface Soil	0 - 0.5 feet										
			Semi-volatile Organic Compounds (SVOCs)									
			Benzo(a)pyrene	--	--	--	--	DV	0.005	0.001	--	0.006
			Polychlorinated Biphenyls (PCBs)									
			Aroclor 1260	--	--	--	--	--	--	--	--	--
			Polychlorinated Biphenyls (PCBs) - Congeners									
			PCBC TEQ MAMMAL HALFND	--	--	--	--	DV; EN; RP	0.5	0.04	--	0.6
			Dioxins and Furans									
			DIOXIN TEQ MAMMAL HALFND	--	--	--	--	DV; EN; RP	0.4	0.03	--	0.4
			Metals (Total)									
			Aluminum	--	--	--	--	NV	0.1	0.003	--	0.1
			Arsenic	--	--	--	--	CV; DM	0.2	0.03	--	0.2
			Chromium, Total	--	--	--	--	N/A	0.05	0.05	--	0.1
			Cobalt	--	--	--	--	EN	0.5	0.01	--	0.5
			Iron	--	--	--	--	GI	0.5	0.01	--	0.5
			Manganese (Non-Diet)	--	--	--	--	NV	0.3	0.1	--	0.4
			Thallium	--	--	--	--	DM	0.2	0.004	--	0.2
			Chemical Total	--	--	--	--		3	**0.3**	--	3
		Exposure Point Total					--					3
	Exposure Medium Total						--					3
	Outdoor Air	Particulates above Site										
			Semi-volatile Organic Compounds (SVOCs)									
			Benzo(a)pyrene	--	--	--	--	DV	--	--	0.00004	0.00004
			Polychlorinated Biphenyls (PCBs)									
			Aroclor 1260	--	--	--	--	--	--	--	--	--
			Polychlorinated Biphenyls (PCBs) - Congeners									
			PCBC TEQ MAMMAL HALFND	--	--	--	--	DV; EN; HM; HP; RP; RS	--	--	0.0000005	0.0000005
			Dioxins and Furans									
			DIOXIN TEQ MAMMAL HALFND	--	--	--	--	DV; EN; HM; HP; RP; RS	--	--	0.0000004	0.0000004
			Metals (Total)									
			Aluminum	--	--	--	--	NV	--	--	0.001	0.001
			Arsenic	--	--	--	--	CV; DM; DV; NV; RP; RS	--	--	0.0004	0.0004
			Chromium, Total	--	--	--	--	RS	--	--	0.00009	0.00009
			Cobalt	--	--	--	--	RS	--	--	0.001	0.001
			Iron	--	--	--	--	--	--	--	--	--
			Manganese (Non-Diet)	--	--	--	--	NV	--	--	0.007	0.007
			Thallium	--	--	--	--	--	--	--	--	--
			Chemical Total	--	--	--	--		--	--	**0.01**	**0.01**
		Exposure Point Total					--					**0.01**
		Vapors above Site										
			Polychlorinated Biphenyls (PCBs)									
			Aroclor 1260	--	--	--	--	--	--	--	--	--
			Polychlorinated Biphenyls (PCBs) - Congeners									
			PCBC TEQ MAMMAL HALFND	--	--	--	--	DV; EN; HM; HP; RP; RS	--	--	0.0002	0.0002

Table A-9.2
Summary of Chemical Non-Cancer Hazards for COPCs
Reasonable Maximum Exposure (Site-Wide)
Future On-Site Hypothetical Resident (Child) - Surface Soil (0 - 0.5 feet)
Human Health Risk Assessment
Shaffer Equipment/Arbuckle Creek Area Superfund Site, Minden, West Virginia

Scenario Timeframe:	Future
Receptor Population:	On-Site Hypothetical Resident
Receptor Age:	Child

Medium	Exposure Medium	Exposure Point	Chemical of Potential Concern	Thresholds: Chemical-specific (1E-06) and Cumulative (1E-04)[1] Carcinogenic Risk[2]				Thresholds: Chemical-specific, Target Organ and Cumulative (HQ > 1)[1] Non-Carcinogenic Hazard Quotient[2]				
				Ingestion	Dermal	Inhalation	Exposure Routes Total	Primary Target Organs	Ingestion	Dermal	Inhalation	Exposure Routes Total
			Dioxins and Furans									
			DIOXIN TEQ MAMMAL HALFND	--	--	--	--	DV; EN; HM; HP; RP; RS	--	--	0.0002	0.0002
			Chemical Total	**--**	**--**	**--**	**--**		**--**	**--**	**0.0004**	**0.0004**
		Exposure Point Total					**--**					**0.0004**
	Exposure Medium Total						**--**					**0.01**
Medium Total							**--**					**3**
Notes:							**Receptor Risk Total**	**--**			**Receptor Hazard Index (HI)**	**3**

(1) Exceedances of the carcinogenic and non-carcinogenic identified above are indicated (if applicable) with **red bold text**.

(2) CR and HQs are rounded to one non-zero digit; cumulative totals may be slightly higher or lower depending on degree of rounding.

Total Cardiovascular (CV) HI across All Media =	**0.2**
Total Dermal (DM) HI across All Media =	**0.4**
Total Developmental (DV) HI across All Media =	**1**
Total Endocrine (EN) HI across All Media =	**2**
Total Gastrointestinal (GI) HI across All Media =	**0.5**
Total Hematological (HM) HI across All Media =	**0.0004**
Total Hepatic (HP) HI across All Media =	**0.0004**
Total Nervous (NV) HI across All Media =	**0.5**
Total Reproductive (RP) HI across All Media =	**1**
Total Respiratory (RS) HI across All Media =	**0.002**

Table A-9.3
Summary of Chemical Cancer Risks for COPCs
Reasonable Maximum Exposure (Site-Wide)
Future On-Site Hypothetical Resident (Lifetime) - Surface Soil (0 - 0.5 feet)
Human Health Risk Assessment
Shaffer Equipment/Arbuckle Creek Area Superfund Site, Minden, West Virginia

Scenario Timeframe:	Future
Receptor Population:	On-Site Hypothetical Resident
Receptor Age:	Lifetime

Medium	Exposure Medium	Exposure Point	Chemical of Potential Concern	Thresholds: Chemical-specific (1E-06) and Cumulative (1E-04)[1]				Thresholds: Chemical-specific, Target Organ and Cumulative (HQ > 1)[1]				
				Carcinogenic Risk [2]				Non-Carcinogenic Hazard Quotient [2]				
				Ingestion	Dermal	Inhalation	Exposure Routes Total	Primary Target Organs	Ingestion	Dermal	Inhalation	Exposure Routes Total
Soil	Surface Soil	0 - 0.5 feet										
			Semi-volatile Organic Compounds (SVOCs)									
			Benzo(a)pyrene	7E-07	2E-07	--	1E-06	--	--	--	--	--
			Polychlorinated Biphenyls (PCBs)									
			Aroclor 1260	**5E-06**	**2E-06**	--	**6E-06**	--	--	--	--	--
			Polychlorinated Biphenyls (PCBs) - Congeners									
			PCBC TEQ MAMMAL HALFND	**5E-06**	5E-07	--	**6E-06**	--	--	--	--	--
			Dioxins and Furans									
			DIOXIN TEQ MAMMAL HALFND	**4E-06**	3E-07	--	**4E-06**	--	--	--	--	--
			Metals (Total)									
			Aluminum	--	--	--	--	--	--	--	--	--
			Arsenic	**1E-05**	**2E-06**	--	**1E-05**	--	--	--	--	--
			Chromium, Total	**4E-05**	**4E-05**	--	**8E-05**	--	--	--	--	--
			Cobalt	--	--	--	--	--	--	--	--	--
			Iron	--	--	--	--	--	--	--	--	--
			Manganese (Non-Diet)	--	--	--	--	--	--	--	--	--
			Thallium	--	--	--	--	--	--	--	--	--
			Chemical Total	**7E-05**	**5E-05**	**--**	**1E-04**		**--**	**--**	**--**	**--**
		Exposure Point Total					**1E-04**					**--**
	Exposure Medium Total						**1E-04**					**--**
	Outdoor Air	Particulates above Site										
			Semi-volatile Organic Compounds (SVOCs)									
			Benzo(a)pyrene	--	--	5E-11	5E-11	--	--	--	--	--
			Polychlorinated Biphenyls (PCBs)									
			Aroclor 1260	--	--	2E-10	2E-10	--	--	--	--	--
			Polychlorinated Biphenyls (PCBs) - Congeners									
			PCBC TEQ MAMMAL HALFND	--	--	3E-10	3E-10	--	--	--	--	--
			Dioxins and Furans									
			DIOXIN TEQ MAMMAL HALFND	--	--	2E-10	2E-10	--	--	--	--	--
			Metals (Total)									
			Aluminum	--	--	--	--	--	--	--	--	--
			Arsenic	--	--	1E-08	1E-08	--	--	--	--	--
			Chromium, Total	--	--	8E-07	8E-07	--	--	--	--	--
			Cobalt	--	--	3E-08	3E-08	--	--	--	--	--
			Iron	--	--	--	--	--	--	--	--	--
			Manganese (Non-Diet)	--	--	--	--	--	--	--	--	--
			Thallium	--	--	--	--	--	--	--	--	--
			Chemical Total	**--**	**--**	**8E-07**	**8E-07**		**--**	**--**	**--**	**--**
		Exposure Point Total					**8E-07**					**--**

Table A-9.3
Summary of Chemical Cancer Risks for COPCs
Reasonable Maximum Exposure (Site-Wide)
Future On-Site Hypothetical Resident (Lifetime) - Surface Soil (0 - 0.5 feet)
Human Health Risk Assessment
Shaffer Equipment/Arbuckle Creek Area Superfund Site, Minden, West Virginia

Scenario Timeframe:	Future
Receptor Population:	On-Site Hypothetical Resident
Receptor Age:	Lifetime

Medium	Exposure Medium	Exposure Point	Chemical of Potential Concern	Thresholds: Chemical-specific (1E-06) and Cumulative (1E-04)[1]				Thresholds: Chemical-specific, Target Organ and Cumulative (HQ > 1)[1]				
				Carcinogenic Risk [2]				Non-Carcinogenic Hazard Quotient [2]				
				Ingestion	Dermal	Inhalation	Exposure Routes Total	Primary Target Organs	Ingestion	Dermal	Inhalation	Exposure Routes Total
		Vapors above Site										
			Polychlorinated Biphenyls (PCBs)									
			Aroclor 1260	--	--	9E-07	9E-07	--	--	--	--	--
			Polychlorinated Biphenyls (PCBs) - Congeners									
			PCBC TEQ MAMMAL HALFND	--	--	1E-07	1E-07	--	--	--	--	--
			Dioxins and Furans									
			DIOXIN TEQ MAMMAL HALFND	--	--	1E-07	1E-07	--	--	--	--	--
			Chemical Total	**--**	**--**	**1E-06**	**1E-06**		**--**	**--**	**--**	**--**
		Exposure Point Total					**1E-06**					**--**
	Exposure Medium Total						**2E-06**					**--**
Medium Total							**1E-04**					**--**
Notes:						**Receptor Risk Total**	**1E-04**				**Receptor Hazard Index (HI)**	**--**

(1) Exceedances of the carcinogenic and non-carcinogenic identified above are indicated (if applicable) with **red bold text**.

(2) CR and HQs are rounded to one non-zero digit; cumulative totals may be slightly higher or lower depending on degree of rounding.

Table A-9.4a
Summary of Chemical Non-Cancer Hazards for COPCs
Reasonable Maximum Exposure (Site-Wide)
Future On-Site Hypothetical Resident (Adult) - Total Soil (0 - 8.8 feet)
Human Health Risk Assessment
Shaffer Equipment/Arbuckle Creek Area Superfund Site, Minden, West Virginia

Scenario Timeframe:	Future
Receptor Population:	On-Site Hypothetical Resident
Receptor Age:	Adult

Medium	Exposure Medium	Exposure Point	Chemical of Potential Concern	Thresholds: Chemical-specific (1E-06) and Cumulative (1E-04)[1]				Thresholds: Chemical-specific, Target Organ and Cumulative (HQ > 1)[1]				
				Carcinogenic Risk [2]				Non-Carcinogenic Hazard Quotient [2]				
				Ingestion	Dermal	Inhalation	Exposure Routes Total	Primary Target Organs	Ingestion	Dermal	Inhalation	Exposure Routes Total
Soil	Total Soil	0 - 8.8 feet										
			Semi-volatile Organic Compounds (SVOCs)									
			1,2,4,5-Tetrachlorobenzene	--	--	--	--	UR	0.0005	0.0002	--	0.0007
			Benzo(a)anthracene	--	--	--	--	--	--	--	--	--
			Benzo(a)pyrene	--	--	--	--	DV	0.001	0.0008	--	0.002
			Benzo(b)fluoranthene	--	--	--	--	--	--	--	--	--
			Dibenz(a,h)anthracene	--	--	--	--	--	--	--	--	--
			Indeno(1,2,3-cd)pyrene	--	--	--	--	--	--	--	--	--
			Pesticides									
			Dieldrin	--	--	--	--	HP	0.0001	0.00004	--	0.0001
			Polychlorinated Biphenyls (PCBs)									
			Aroclor 1254	--	--	--	--	DM; IM; OC	0.004	0.002	--	0.006
			Aroclor 1260	--	--	--	--	--	--	--	--	--
			Polychlorinated Biphenyls (PCBs) - Congeners									
			PCBC TEQ MAMMAL HALFND	--	--	--	--	DV; EN; RP	0.04	0.005	--	0.04
			Dioxins and Furans									
			DIOXIN TEQ MAMMAL HALFND	--	--	--	--	DV; EN; RP	0.02	0.003	--	0.02
			Metals (Total)									
			Aluminum	--	--	--	--	NV	0.01	0.0004	--	0.01
			Antimony	--	--	--	--	HM; OT	0.003	0.0008	--	0.004
			Arsenic	--	--	--	--	CV; DM	0.03	0.006	--	0.04
			Cadmium (Diet)	--	--	--	--	UR	0.0004	0.00007	--	0.0005
			Chromium, Total	--	--	--	--	N/A	0.006	0.01	--	0.02
			Cobalt	--	--	--	--	EN	0.04	0.002	--	0.04
			Iron	--	--	--	--	GI	0.04	0.002	--	0.04
			Manganese (Non-Diet)	--	--	--	--	NV	0.02	0.02	--	0.04
			Thallium	--	--	--	--	DM	0.02	0.0008	--	0.02
			Chemical Total	--	--	--	--		**0.2**	**0.05**	--	**0.3**
		Exposure Point Total					--					**0.3**
	Exposure Medium Total						--					**0.3**
	Outdoor Air	Particulates above Site										
			Semi-volatile Organic Compounds (SVOCs)									
			1,2,4,5-Tetrachlorobenzene	--	--	--	--	--	--	--	--	--
			Benzo(a)anthracene	--	--	--	--	--	--	--	--	--
			Benzo(a)pyrene	--	--	--	--	DV	--	--	0.0001	0.0001
			Benzo(b)fluoranthene	--	--	--	--	--	--	--	--	--
			Dibenz(a,h)anthracene	--	--	--	--	--	--	--	--	--
			Indeno(1,2,3-cd)pyrene	--	--	--	--	--	--	--	--	--
			Pesticides									
			Dieldrin	--	--	--	--	--	--	--	--	--
			Polychlorinated Biphenyls (PCBs)									
			Aroclor 1254	--	--	--	--	--	--	--	--	--
			Aroclor 1260	--	--	--	--	--	--	--	--	--
			Polychlorinated Biphenyls (PCBs) - Congeners									
			PCBC TEQ MAMMAL HALFND	--	--	--	--	DV; EN; HM; HP; RP; RS	--	--	0.0000004	0.0000004
			Dioxins and Furans									
			DIOXIN TEQ MAMMAL HALFND	--	--	--	--	DV; EN; HM; HP; RP; RS	--	--	0.0000002	0.0000002

Table A-9.4a
Summary of Chemical Non-Cancer Hazards for COPCs
Reasonable Maximum Exposure (Site-Wide)
Future On-Site Hypothetical Resident (Adult) - Total Soil (0 - 8.8 feet)
Human Health Risk Assessment
Shaffer Equipment/Arbuckle Creek Area Superfund Site, Minden, West Virginia

Scenario Timeframe:	Future
Receptor Population:	On-Site Hypothetical Resident
Receptor Age:	Adult

Medium	Exposure Medium	Exposure Point	Chemical of Potential Concern	Thresholds: Chemical-specific (1E-06) and Cumulative (1E-04)[1] Carcinogenic Risk[2]				Thresholds: Chemical-specific, Target Organ and Cumulative (HQ > 1)[1] Non-Carcinogenic Hazard Quotient[2]				
				Ingestion	Dermal	Inhalation	Exposure Routes Total	Primary Target Organs	Ingestion	Dermal	Inhalation	Exposure Routes Total
			Metals (Total)									
			Aluminum	--	--	--	--	NV	--	--	0.001	0.001
			Antimony	--	--	--	--	RS	--	--	0.000002	0.000002
			Arsenic	--	--	--	--	CV; DM; DV; NV; RP; RS	--	--	0.0006	0.0006
			Cadmium (Diet)	--	--	--	--	UR	--	--	0.00002	0.00002
			Chromium, Total	--	--	--	--	RS	--	--	0.0001	0.0001
			Cobalt	--	--	--	--	RS	--	--	0.001	0.001
			Iron	--	--	--	--	--	--	--	--	--
			Manganese (Non-Diet)	--	--	--	--	NV	--	--	0.006	0.006
			Thallium	--	--	--	--	--	--	--	--	--
			Chemical Total	--	--	--	--		--	--	**0.009**	**0.009**
		Exposure Point Total					--					**0.009**
		Vapors above Site										
			Semi-volatile Organic Compounds (SVOCs)									
			1,2,4,5-Tetrachlorobenzene	--	--	--	--	--	--	--	--	--
			Benzo(a)anthracene	--	--	--	--	--	--	--	--	--
			Polychlorinated Biphenyls (PCBs)									
			Aroclor 1254	--	--	--	--	--	--	--	--	--
			Aroclor 1260	--	--	--	--	--	--	--	--	--
			Polychlorinated Biphenyls (PCBs) - Congeners									
			PCBC TEQ MAMMAL HALFND	--	--	--	--	DV; EN; HM; HP; RP; RS	--	--	0.0002	0.0002
			Dioxins and Furans									
			DIOXIN TEQ MAMMAL HALFND	--	--	--	--	DV; EN; HM; HP; RP; RS	--	--	0.0001	0.0001
			Chemical Total	--	--	--	--		--	--	**0.0003**	**0.0003**
		Exposure Point Total					--					**0.0003**
	Exposure Medium Total						--					**0.009**
Medium Total							--					**0.3**
Notes:						**Receptor Risk Total**	--				**Receptor Hazard Index (HI)**	**0.3**

(1) Exceedances of the carcinogenic and non-carcinogenic identified above are indicated (if applicable) with **red bold text**.

(2) CR and HQs are rounded to one non-zero digit; cumulative totals may be slightly higher or lower depending on degree of rounding.

Total Cardiovascular (CV) HI across All Media =	**0.04**
Total Dermal (DM) HI across All Media =	**0.06**
Total Developmental (DV) HI across All Media =	**0.07**
Total Endocrine (EN) HI across All Media =	**0.1**
Total Gastrointestinal (GI) HI across All Media =	**0.04**
Total Hematological (HM) HI across All Media =	**0.004**
Total Hepatic (HP) HI across All Media =	**0.0004**
Total Immune (IM) HI across All Media =	**0.006**
Total Nervous (NV) HI across All Media =	**0.06**
Total Ocular (OC) HI across All Media =	**0.006**
Total Other (OT) HI across All Media =	**0.004**
Total Reproductive (RP) HI across All Media =	**0.07**
Total Respiratory (RS) HI across All Media =	**0.002**
Total Urinary (UR) HI across All Media =	**0.001**

Table A-9.4b
Summary of Chemical Non-Cancer Hazards for COPCs
Reasonable Maximum Exposure (Site-Wide with Hotspot)
Future On-Site Hypothetical Resident (Adult) - Total Soil (0 - 8.8 feet)
Human Health Risk Assessment
Shaffer Equipment/Arbuckle Creek Area Superfund Site, Minden, West Virginia

Scenario Timeframe:	Future
Receptor Population:	On-Site Hypothetical Resident
Receptor Age:	Adult

Medium	Exposure Medium	Exposure Point	Chemical of Potential Concern	Thresholds: Chemical-specific (1E-06) and Cumulative (1E-04)[1]				Thresholds: Chemical-specific, Target Organ and Cumulative (HQ > 1)[1]				
				Carcinogenic Risk [2]				Non-Carcinogenic Hazard Quotient [2]				
				Ingestion	Dermal	Inhalation	Exposure Routes Total	Primary Target Organs	Ingestion	Dermal	Inhalation	Exposure Routes Total
Soil	Total Soil	0 - 8.8 feet										
			Semi-volatile Organic Compounds (SVOCs)									
			1,2,4,5-Tetrachlorobenzene	--	--	--	--	UR	0.0005	0.0002	--	0.0007
			Benzo(a)anthracene	--	--	--	--	--	--	--	--	--
			Benzo(a)pyrene	--	--	--	--	DV	0.001	0.0008	--	0.002
			Benzo(b)fluoranthene	--	--	--	--	--	--	--	--	--
			Dibenz(a,h)anthracene	--	--	--	--	--	--	--	--	--
			Indeno(1,2,3-cd)pyrene	--	--	--	--	--	--	--	--	--
			Pesticides									
			Dieldrin	--	--	--	--	HP	0.0001	0.00004	--	0.0001
			Polychlorinated Biphenyls (PCBs)									
			Aroclor 1254	--	--	--	--	DM; IM; OC	0.004	0.002	--	0.006
			Aroclor 1260	--	--	--	--	--	--	--	--	--
			Polychlorinated Biphenyls (PCBs) - Congeners									
			PCBC TEQ MAMMAL HALFND	--	--	--	--	DV; EN; RP	0.04	0.005	--	0.04
			Dioxins and Furans									
			DIOXIN TEQ MAMMAL HALFND	--	--	--	--	DV; EN; RP	0.02	0.003	--	0.02
			Metals (Total)									
			Aluminum	--	--	--	--	NV	0.01	0.0004	--	0.01
			Antimony	--	--	--	--	HM; OT	0.003	0.0008	--	0.004
			Arsenic	--	--	--	--	CV; DM	0.03	0.006	--	0.04
			Cadmium (Diet)	--	--	--	--	UR	0.0004	0.00007	--	0.0005
			Chromium, Total	--	--	--	--	N/A	0.006	0.01	--	0.02
			Cobalt	--	--	--	--	EN	0.04	0.002	--	0.04
			Iron	--	--	--	--	GI	0.04	0.002	--	0.04
			Manganese (Non-Diet)	--	--	--	--	NV	0.02	0.02	--	0.04
			Thallium	--	--	--	--	DM	0.02	0.0008	--	0.02
			Chemical Total	--	--	--	--		**0.2**	**0.05**	--	**0.3**
		Exposure Point Total					--					**0.3**
	Exposure Medium Total						--					**0.3**
	Outdoor Air	Particulates above Site										
			Semi-volatile Organic Compounds (SVOCs)									
			1,2,4,5-Tetrachlorobenzene	--	--	--	--	--	--	--	--	--
			Benzo(a)anthracene	--	--	--	--	--	--	--	--	--
			Benzo(a)pyrene	--	--	--	--	DV	--	--	0.0001	0.0001
			Benzo(b)fluoranthene	--	--	--	--	--	--	--	--	--
			Dibenz(a,h)anthracene	--	--	--	--	--	--	--	--	--
			Indeno(1,2,3-cd)pyrene	--	--	--	--	--	--	--	--	--
			Pesticides									
			Dieldrin	--	--	--	--	--	--	--	--	--
			Polychlorinated Biphenyls (PCBs)									
			Aroclor 1254	--	--	--	--	--	--	--	--	--
			Aroclor 1260	--	--	--	--	--	--	--	--	--
			Polychlorinated Biphenyls (PCBs) - Congeners									
			PCBC TEQ MAMMAL HALFND	--	--	--	--	DV; EN; HM; HP; RP; RS	--	--	0.0000004	0.0000004
			Dioxins and Furans									
			DIOXIN TEQ MAMMAL HALFND	--	--	--	--	DV; EN; HM; HP; RP; RS	--	--	0.0000002	0.0000002

Table A-9.4b
Summary of Chemical Non-Cancer Hazards for COPCs
Reasonable Maximum Exposure (Site-Wide with Hotspot)
Future On-Site Hypothetical Resident (Adult) - Total Soil (0 - 8.8 feet)
Human Health Risk Assessment
Shaffer Equipment/Arbuckle Creek Area Superfund Site, Minden, West Virginia

Scenario Timeframe:	Future
Receptor Population:	On-Site Hypothetical Resident
Receptor Age:	Adult

Medium	Exposure Medium	Exposure Point	Chemical of Potential Concern	Thresholds: Chemical-specific (1E-06) and Cumulative (1E-04)[1] Carcinogenic Risk[2]				Thresholds: Chemical-specific, Target Organ and Cumulative (HQ > 1)[1] Non-Carcinogenic Hazard Quotient[2]				
				Ingestion	Dermal	Inhalation	Exposure Routes Total	Primary Target Organs	Ingestion	Dermal	Inhalation	Exposure Routes Total
			Metals (Total)									
			Aluminum	--	--	--	--	NV	--	--	0.001	0.001
			Antimony	--	--	--	--	RS	--	--	0.000002	0.000002
			Arsenic	--	--	--	--	CV; DM; DV; NV; RP; RS	--	--	0.0006	0.0006
			Cadmium (Diet)	--	--	--	--	UR	--	--	0.00002	0.00002
			Chromium, Total	--	--	--	--	RS	--	--	0.0001	0.0001
			Cobalt	--	--	--	--	RS	--	--	0.001	0.001
			Iron	--	--	--	--	--	--	--	--	--
			Manganese (Non-Diet)	--	--	--	--	NV	--	--	0.006	0.006
			Thallium	--	--	--	--	--	--	--	--	--
			Chemical Total	--	--	--	--		--	--	**0.009**	**0.009**
		Exposure Point Total					--					**0.009**
		Vapors above Site										
			Semi-volatile Organic Compounds (SVOCs)									
			1,2,4,5-Tetrachlorobenzene	--	--	--	--	--	--	--	--	--
			Benzo(a)anthracene	--	--	--	--	--	--	--	--	--
			Polychlorinated Biphenyls (PCBs)									
			Aroclor 1254	--	--	--	--	--	--	--	--	--
			Aroclor 1260	--	--	--	--	--	--	--	--	--
			Polychlorinated Biphenyls (PCBs) - Congeners									
			PCBC TEQ MAMMAL HALFND	--	--	--	--	DV; EN; HM; HP; RP; RS	--	--	0.0002	0.0002
			Dioxins and Furans									
			DIOXIN TEQ MAMMAL HALFND	--	--	--	--	DV; EN; HM; HP; RP; RS	--	--	0.0001	0.0001
			Chemical Total	--	--	--	--		--	--	**0.0003**	**0.0003**
		Exposure Point Total					--					**0.0003**
	Exposure Medium Total						--					**0.009**
Medium Total							--					**0.3**
Notes:						**Receptor Risk Total**	--				**Receptor Hazard Index (HI)**	**0.3**

(1) Exceedances of the carcinogenic and non-carcinogenic identified above are indicated (if applicable) with **red bold text**.

(2) CR and HQs are rounded to one non-zero digit; cumulative totals may be slightly higher or lower depending on degree of rounding.

Total Cardiovascular (CV) HI across All Media =	**0.04**
Total Dermal (DM) HI across All Media =	**0.06**
Total Developmental (DV) HI across All Media =	**0.07**
Total Endocrine (EN) HI across All Media =	**0.1**
Total Gastrointestinal (GI) HI across All Media =	**0.04**
Total Hematological (HM) HI across All Media =	**0.004**
Total Hepatic (HP) HI across All Media =	**0.0004**
Total Immune (IM) HI across All Media =	**0.006**
Total Nervous (NV) HI across All Media =	**0.06**
Total Ocular (OC) HI across All Media =	**0.006**
Total Other (OT) HI across All Media =	**0.004**
Total Reproductive (RP) HI across All Media =	**0.07**
Total Respiratory (RS) HI across All Media =	**0.002**
Total Urinary (UR) HI across All Media =	**0.001**

Table A-9.5a
Summary of Chemical Non-Cancer Hazards for COPCs
Reasonable Maximum Exposure (Site-Wide)
Future On-Site Hypothetical Resident (Child) - Total Soil (0 - 8.8 feet)
Human Health Risk Assessment
Shaffer Equipment/Arbuckle Creek Area Superfund Site, Minden, West Virginia

Scenario Timeframe:	Future
Receptor Population:	On-Site Hypothetical Resident
Receptor Age:	Child

Medium	Exposure Medium	Exposure Point	Chemical of Potential Concern	Thresholds: Chemical-specific (1E-06) and Cumulative (1E-04)[1]				Thresholds: Chemical-specific, Target Organ and Cumulative (HQ > 1)[1]				
				Carcinogenic Risk [2]				Non-Carcinogenic Hazard Quotient [2]				
				Ingestion	Dermal	Inhalation	Exposure Routes Total	Primary Target Organs	Ingestion	Dermal	Inhalation	Exposure Routes Total
Soil	Total Soil	0 - 8.8 feet										
			Semi-volatile Organic Compounds (SVOCs)									
			1,2,4,5-Tetrachlorobenzene	--	--	--	--	UR	0.005	0.001	--	0.006
			Benzo(a)anthracene	--	--	--	--	--	--	--	--	--
			Benzo(a)pyrene	--	--	--	--	DV	0.01	0.004	--	0.02
			Benzo(b)fluoranthene	--	--	--	--	--	--	--	--	--
			Dibenz(a,h)anthracene	--	--	--	--	--	--	--	--	--
			Indeno(1,2,3-cd)pyrene	--	--	--	--	--	--	--	--	--
			Pesticides									
			Dieldrin	--	--	--	--	HP	0.001	0.0002	--	0.001
			Polychlorinated Biphenyls (PCBs)									
			Aroclor 1254	--	--	--	--	DM; IM; OC	0.04	0.01	--	0.05
			Aroclor 1260	--	--	--	--	--	--	--	--	--
			Polychlorinated Biphenyls (PCBs) - Congeners									
			PCBC TEQ MAMMAL HALFND	--	--	--	--	DV; EN; RP	0.4	0.03	--	0.4
			Dioxins and Furans									
			DIOXIN TEQ MAMMAL HALFND	--	--	--	--	DV; EN; RP	0.2	0.02	--	0.2
			Metals (Total)									
			Aluminum	--	--	--	--	NV	0.1	0.003	--	0.1
			Antimony	--	--	--	--	HM; OT	0.03	0.005	--	0.03
			Arsenic	--	--	--	--	CV; DM	0.3	0.04	--	0.3
			Cadmium (Diet)	--	--	--	--	UR	0.004	0.0004	--	0.005
			Chromium, Total	--	--	--	--	N/A	0.06	0.06	--	0.1
			Cobalt	--	--	--	--	EN	0.4	0.01	--	0.5
			Iron	--	--	--	--	GI	0.4	0.01	--	0.4
			Manganese (Non-Diet)	--	--	--	--	NV	0.2	0.1	--	0.4
			Thallium	--	--	--	--	DM	0.2	0.005	--	0.2
			Chemical Total	--	--	--	--		2	0.3	--	3
		Exposure Point Total					--					3
	Exposure Medium Total						--					3
	Outdoor Air	Particulates above Site										
			Semi-volatile Organic Compounds (SVOCs)									
			1,2,4,5-Tetrachlorobenzene	--	--	--	--	--	--	--	--	--
			Benzo(a)anthracene	--	--	--	--	--	--	--	--	--
			Benzo(a)pyrene	--	--	--	--	DV	--	--	0.0001	0.0001
			Benzo(b)fluoranthene	--	--	--	--	--	--	--	--	--
			Dibenz(a,h)anthracene	--	--	--	--	--	--	--	--	--
			Indeno(1,2,3-cd)pyrene	--	--	--	--	--	--	--	--	--
			Pesticides									
			Dieldrin	--	--	--	--	--	--	--	--	--
			Polychlorinated Biphenyls (PCBs)									
			Aroclor 1254	--	--	--	--	--	--	--	--	--
			Aroclor 1260	--	--	--	--	--	--	--	--	--
			Polychlorinated Biphenyls (PCBs) - Congeners									
			PCBC TEQ MAMMAL HALFND	--	--	--	--	DV; EN; HM; HP; RP; RS	--	--	0.0000004	0.0000004
			Dioxins and Furans									
			DIOXIN TEQ MAMMAL HALFND	--	--	--	--	DV; EN; HM; HP; RP; RS	--	--	0.0000002	0.0000002

Table A-9.5a
Summary of Chemical Non-Cancer Hazards for COPCs
Reasonable Maximum Exposure (Site-Wide)
Future On-Site Hypothetical Resident (Child) - Total Soil (0 - 8.8 feet)
Human Health Risk Assessment
Shaffer Equipment/Arbuckle Creek Area Superfund Site, Minden, West Virginia

Scenario Timeframe:	Future
Receptor Population:	On-Site Hypothetical Resident
Receptor Age:	Child

Medium	Exposure Medium	Exposure Point	Chemical of Potential Concern	Thresholds: Chemical-specific (1E-06) and Cumulative (1E-04)[1] Carcinogenic Risk[2]				Thresholds: Chemical-specific, Target Organ and Cumulative (HQ > 1)[1] Non-Carcinogenic Hazard Quotient[2]				
				Ingestion	Dermal	Inhalation	Exposure Routes Total	Primary Target Organs	Ingestion	Dermal	Inhalation	Exposure Routes Total
			Metals (Total)									
			Aluminum	--	--	--	--	NV	--	--	0.001	0.001
			Antimony	--	--	--	--	RS	--	--	0.000002	0.000002
			Arsenic	--	--	--	--	CV; DM; DV; NV; RP; RS	--	--	0.0006	0.0006
			Cadmium (Diet)	--	--	--	--	UR	--	--	0.00002	0.00002
			Chromium, Total	--	--	--	--	RS	--	--	0.0001	0.0001
			Cobalt	--	--	--	--	RS	--	--	0.001	0.001
			Iron	--	--	--	--	--	--	--	--	--
			Manganese (Non-Diet)	--	--	--	--	NV	--	--	0.006	0.006
			Thallium	--	--	--	--	--	--	--	--	--
			Chemical Total	--	--	--	--		--	--	**0.009**	**0.009**
		Exposure Point Total					--					**0.009**
		Vapors above Site										
			Semi-volatile Organic Compounds (SVOCs)									
			1,2,4,5-Tetrachlorobenzene	--	--	--	--	--	--	--	--	--
			Benzo(a)anthracene	--	--	--	--	--	--	--	--	--
			Polychlorinated Biphenyls (PCBs)									
			Aroclor 1254	--	--	--	--	--	--	--	--	--
			Aroclor 1260	--	--	--	--	--	--	--	--	--
			Polychlorinated Biphenyls (PCBs) - Congeners									
			PCBC TEQ MAMMAL HALFND	--	--	--	--	DV; EN; HM; HP; RP; RS	--	--	0.0002	0.0002
			Dioxins and Furans									
			DIOXIN TEQ MAMMAL HALFND	--	--	--	--	DV; EN; HM; HP; RP; RS	--	--	0.0001	0.0001
			Chemical Total	--	--	--	--		--	--	**0.0003**	**0.0003**
		Exposure Point Total					--					**0.0003**
	Exposure Medium Total						--					**0.009**
Medium Total							--					3
Notes:							**Receptor Risk Total** --					**Receptor Hazard Index (HI)** 3

(1) Exceedances of the carcinogenic and non-carcinogenic identified above are indicated (if applicable) with **red bold text**.

(2) CR and HQs are rounded to one non-zero digit; cumulative totals may be slightly higher or lower depending on degree of rounding.

Total Cardiovascular (CV) HI across All Media =	**0.3**
Total Dermal (DM) HI across All Media =	**0.6**
Total Developmental (DV) HI across All Media =	**0.7**
Total Endocrine (EN) HI across All Media =	**1**
Total Gastrointestinal (GI) HI across All Media =	**0.4**
Total Hematological (HM) HI across All Media =	**0.03**
Total Hepatic (HP) HI across All Media =	**0.002**
Total Immune (IM) HI across All Media =	**0.05**
Total Nervous (NV) HI across All Media =	**0.5**
Total Ocular (OC) HI across All Media =	**0.05**
Total Other (OT) HI across All Media =	**0.03**
Total Reproductive (RP) HI across All Media =	**0.7**
Total Respiratory (RS) HI across All Media =	**0.002**
Total Urinary (UR) HI across All Media =	**0.01**

Table A-9.5b
Summary of Chemical Non-Cancer Hazards for COPCs
Reasonable Maximum Exposure (Site-Wide with Hotspot)
Future On-Site Hypothetical Resident (Child) - Total Soil (0 - 8.8 feet)
Human Health Risk Assessment
Shaffer Equipment/Arbuckle Creek Area Superfund Site, Minden, West Virginia

Scenario Timeframe:	Future
Receptor Population:	On-Site Hypothetical Resident
Receptor Age:	Child

Medium	Exposure Medium	Exposure Point	Chemical of Potential Concern	Thresholds: Chemical-specific (1E-06) and Cumulative (1E-04)[1] Carcinogenic Risk[2]				Thresholds: Chemical-specific, Target Organ and Cumulative (HQ > 1)[1] Non-Carcinogenic Hazard Quotient[2]				
				Ingestion	Dermal	Inhalation	Exposure Routes Total	Primary Target Organs	Ingestion	Dermal	Inhalation	Exposure Routes Total
Soil	Total Soil	0 - 8.8 feet										
			Semi-volatile Organic Compounds (SVOCs)									
			1,2,4,5-Tetrachlorobenzene	--	--	--	--	UR	0.005	0.001	--	0.006
			Benzo(a)anthracene	--	--	--	--	--	--	--	--	--
			Benzo(a)pyrene	--	--	--	--	DV	0.01	0.004	--	0.02
			Benzo(b)fluoranthene	--	--	--	--	--	--	--	--	--
			Dibenz(a,h)anthracene	--	--	--	--	--	--	--	--	--
			Indeno(1,2,3-cd)pyrene	--	--	--	--	--	--	--	--	--
			Pesticides									
			Dieldrin	--	--	--	--	HP	0.001	0.0002	--	0.001
			Polychlorinated Biphenyls (PCBs)									
			Aroclor 1254	--	--	--	--	DM; IM; OC	0.04	0.01	--	0.05
			Aroclor 1260	--	--	--	--	--	--	--	--	--
			Polychlorinated Biphenyls (PCBs) - Congeners									
			PCBC TEQ MAMMAL HALFND	--	--	--	--	DV; EN; RP	0.4	0.03	--	0.4
			Dioxins and Furans									
			DIOXIN TEQ MAMMAL HALFND	--	--	--	--	DV; EN; RP	0.2	0.02	--	0.2
			Metals (Total)									
			Aluminum	--	--	--	--	NV	0.1	0.003	--	0.1
			Antimony	--	--	--	--	HM; OT	0.03	0.005	--	0.03
			Arsenic	--	--	--	--	CV; DM	0.3	0.04	--	0.3
			Cadmium (Diet)	--	--	--	--	UR	0.004	0.0004	--	0.005
			Chromium, Total	--	--	--	--	N/A	0.06	0.06	--	0.1
			Cobalt	--	--	--	--	EN	0.4	0.01	--	0.5
			Iron	--	--	--	--	GI	0.4	0.01	--	0.4
			Manganese (Non-Diet)	--	--	--	--	NV	0.2	0.1	--	0.4
			Thallium	--	--	--	--	DM	0.2	0.005	--	0.2
			Chemical Total	--	--	--	--		2	0.3	--	3
		Exposure Point Total					--					3
	Exposure Medium Total						--					3
	Outdoor Air	Particulates above Site										
			Semi-volatile Organic Compounds (SVOCs)									
			1,2,4,5-Tetrachlorobenzene	--	--	--	--	--	--	--	--	--
			Benzo(a)anthracene	--	--	--	--	--	--	--	--	--
			Benzo(a)pyrene	--	--	--	--	DV	--	--	0.0001	0.0001
			Benzo(b)fluoranthene	--	--	--	--	--	--	--	--	--
			Dibenz(a,h)anthracene	--	--	--	--	--	--	--	--	--
			Indeno(1,2,3-cd)pyrene	--	--	--	--	--	--	--	--	--
			Pesticides									
			Dieldrin	--	--	--	--	--	--	--	--	--
			Polychlorinated Biphenyls (PCBs)									
			Aroclor 1254	--	--	--	--	--	--	--	--	--
			Aroclor 1260	--	--	--	--	--	--	--	--	--
			Polychlorinated Biphenyls (PCBs) - Congeners									
			PCBC TEQ MAMMAL HALFND	--	--	--	--	DV; EN; HM; HP; RP; RS	--	--	0.0000004	0.0000004
			Dioxins and Furans									
			DIOXIN TEQ MAMMAL HALFND	--	--	--	--	DV; EN; HM; HP; RP; RS	--	--	0.0000002	0.0000002

Table A-9.5b
Summary of Chemical Non-Cancer Hazards for COPCs
Reasonable Maximum Exposure (Site-Wide with Hotspot)
Future On-Site Hypothetical Resident (Child) - Total Soil (0 - 8.8 feet)
Human Health Risk Assessment
Shaffer Equipment/Arbuckle Creek Area Superfund Site, Minden, West Virginia

Scenario Timeframe:	Future
Receptor Population:	On-Site Hypothetical Resident
Receptor Age:	Child

Medium	Exposure Medium	Exposure Point	Chemical of Potential Concern	Thresholds: Chemical-specific (1E-06) and Cumulative (1E-04)[1] Carcinogenic Risk[2]				Thresholds: Chemical-specific, Target Organ and Cumulative (HQ > 1)[1] Non-Carcinogenic Hazard Quotient[2]				
				Ingestion	Dermal	Inhalation	Exposure Routes Total	Primary Target Organs	Ingestion	Dermal	Inhalation	Exposure Routes Total
			Metals (Total)									
			Aluminum	--	--	--	--	NV	--	--	0.001	0.001
			Antimony	--	--	--	--	RS	--	--	0.000002	0.000002
			Arsenic	--	--	--	--	CV; DM; DV; NV; RP; RS	--	--	0.0006	0.0006
			Cadmium (Diet)	--	--	--	--	UR	--	--	0.00002	0.00002
			Chromium, Total	--	--	--	--	RS	--	--	0.0001	0.0001
			Cobalt	--	--	--	--	RS	--	--	0.001	0.001
			Iron	--	--	--	--	--	--	--	--	--
			Manganese (Non-Diet)	--	--	--	--	NV	--	--	0.006	0.006
			Thallium	--	--	--	--	--	--	--	--	--
			Chemical Total	--	--	--	--		--	--	**0.009**	**0.009**
		Exposure Point Total					--					**0.009**
		Vapors above Site										
			Semi-volatile Organic Compounds (SVOCs)									
			1,2,4,5-Tetrachlorobenzene	--	--	--	--	--	--	--	--	--
			Benzo(a)anthracene	--	--	--	--	--	--	--	--	--
			Polychlorinated Biphenyls (PCBs)									
			Aroclor 1254	--	--	--	--	--	--	--	--	--
			Aroclor 1260	--	--	--	--	--	--	--	--	--
			Polychlorinated Biphenyls (PCBs) - Congeners									
			PCBC TEQ MAMMAL HALFND	--	--	--	--	DV; EN; HM; HP; RP; RS	--	--	0.0002	0.0002
			Dioxins and Furans									
			DIOXIN TEQ MAMMAL HALFND	--	--	--	--	DV; EN; HM; HP; RP; RS	--	--	0.0001	0.0001
			Chemical Total	--	--	--	--		--	--	**0.0003**	**0.0003**
		Exposure Point Total					--					**0.0003**
	Exposure Medium Total						--					**0.009**
Medium Total							--					3
Notes:							**Receptor Risk Total** --					**Receptor Hazard Index (HI)** 3

(1) Exceedances of the carcinogenic and non-carcinogenic identified above are indicated (if applicable) with **red bold text**.

(2) CR and HQs are rounded to one non-zero digit; cumulative totals may be slightly higher or lower depending on degree of rounding.

Total Cardiovascular (CV) HI across All Media =	**0.3**
Total Dermal (DM) HI across All Media =	**0.6**
Total Developmental (DV) HI across All Media =	**0.7**
Total Endocrine (EN) HI across All Media =	**1**
Total Gastrointestinal (GI) HI across All Media =	**0.4**
Total Hematological (HM) HI across All Media =	**0.03**
Total Hepatic (HP) HI across All Media =	**0.002**
Total Immune (IM) HI across All Media =	**0.05**
Total Nervous (NV) HI across All Media =	**0.5**
Total Ocular (OC) HI across All Media =	**0.05**
Total Other (OT) HI across All Media =	**0.03**
Total Reproductive (RP) HI across All Media =	**0.7**
Total Respiratory (RS) HI across All Media =	**0.002**
Total Urinary (UR) HI across All Media =	**0.01**

Table A-9.6a
Summary of Chemical Cancer Risks for COPCs
Reasonable Maximum Exposure (Site-Wide)
Future On-Site Hypothetical Resident (Lifetime) - Total Soil (0 - 8.8 feet)
Human Health Risk Assessment
Shaffer Equipment/Arbuckle Creek Area Superfund Site, Minden, West Virginia

Scenario Timeframe:	Future
Receptor Population:	On-Site Hypothetical Resident
Receptor Age:	Lifetime

Medium	Exposure Medium	Exposure Point	Chemical of Potential Concern	Thresholds: Chemical-specific (1E-06) and Cumulative (1E-04)[1]				Thresholds: Chemical-specific, Target Organ and Cumulative (HQ > 1)[1]				
				Carcinogenic Risk [2]				Non-Carcinogenic Hazard Quotient [2]				
				Ingestion	Dermal	Inhalation	Exposure Routes Total	Primary Target Organs	Ingestion	Dermal	Inhalation	Exposure Routes Total
Soil	Total Soil	0 - 8.8 feet										
			Semi-volatile Organic Compounds (SVOCs)									
			1,2,4,5-Tetrachlorobenzene	--	--	--	--	--	--	--	--	--
			Benzo(a)anthracene	3E-07	1E-07	--	4E-07	--	--	--	--	--
			Benzo(a)pyrene	**2E-06**	7E-07	--	**3E-06**	--	--	--	--	--
			Benzo(b)fluoranthene	5E-07	2E-07	--	6E-07	--	--	--	--	--
			Dibenz(a,h)anthracene	1E-07	3E-08	--	1E-07	--	--	--	--	--
			Indeno(1,2,3-cd)pyrene	1E-07	4E-08	--	2E-07	--	--	--	--	--
			Pesticides									
			Dieldrin	9E-08	3E-08	--	1E-07	--	--	--	--	--
			Polychlorinated Biphenyls (PCBs)									
			Aroclor 1254	2E-07	7E-08	--	2E-07	--	--	--	--	--
			Aroclor 1260	**3E-06**	1E-06	--	**5E-06**	--	--	--	--	--
			Polychlorinated Biphenyls (PCBs) - Congeners									
			PCBC TEQ MAMMAL HALFND	**4E-06**	4E-07	--	**5E-06**	--	--	--	--	--
			Dioxins and Furans									
			DIOXIN TEQ MAMMAL HALFND	**2E-06**	2E-07	--	**2E-06**	--	--	--	--	--
			Metals (Total)									
			Aluminum	--	--	--	--	--	--	--	--	--
			Antimony	--	--	--	--	--	--	--	--	--
			Arsenic	**2E-05**	**2E-06**	--	**2E-05**	--	--	--	--	--
			Cadmium (Diet)	--	--	--	--	--	--	--	--	--
			Chromium, Total	**5E-05**	**5E-05**	--	**1E-04**	--	--	--	--	--
			Cobalt	--	--	--	--	--	--	--	--	--
			Iron	--	--	--	--	--	--	--	--	--
			Manganese (Non-Diet)	--	--	--	--	--	--	--	--	--
			Thallium	--	--	--	--	--	--	--	--	--
			Chemical Total	**8E-05**	**6E-05**	--	**1E-04**		--	--	--	--
		Exposure Point Total					**1E-04**					--
	Exposure Medium Total						**1E-04**					--
	Outdoor Air	Particulates above Site										
			Semi-volatile Organic Compounds (SVOCs)									
			1,2,4,5-Tetrachlorobenzene	--	--	--	--	--	--	--	--	--
			Benzo(a)anthracene	--	--	2E-11	2E-11	--	--	--	--	--
			Benzo(a)pyrene	--	--	1E-10	1E-10	--	--	--	--	--
			Benzo(b)fluoranthene	--	--	3E-11	3E-11	--	--	--	--	--
			Dibenz(a,h)anthracene	--	--	7E-12	7E-12	--	--	--	--	--
			Indeno(1,2,3-cd)pyrene	--	--	8E-12	8E-12	--	--	--	--	--
			Pesticides									
			Dieldrin	--	--	5E-12	5E-12	--	--	--	--	--
			Polychlorinated Biphenyls (PCBs)									
			Aroclor 1254	--	--	9E-12	9E-12	--	--	--	--	--
			Aroclor 1260	--	--	2E-10	2E-10	--	--	--	--	--
			Polychlorinated Biphenyls (PCBs) - Congeners									
			PCBC TEQ MAMMAL HALFND	--	--	2E-10	2E-10	--	--	--	--	--
			Dioxins and Furans									
			DIOXIN TEQ MAMMAL HALFND	--	--	1E-10	1E-10	--	--	--	--	--

Table A-9.6a
Summary of Chemical Cancer Risks for COPCs
Reasonable Maximum Exposure (Site-Wide)
Future On-Site Hypothetical Resident (Lifetime) - Total Soil (0 - 8.8 feet)
Human Health Risk Assessment
Shaffer Equipment/Arbuckle Creek Area Superfund Site, Minden, West Virginia

Scenario Timeframe:	Future
Receptor Population:	On-Site Hypothetical Resident
Receptor Age:	Lifetime

Medium	Exposure Medium	Exposure Point	Chemical of Potential Concern	Thresholds: Chemical-specific (1E-06) and Cumulative (1E-04)[1]				Thresholds: Chemical-specific, Target Organ and Cumulative (HQ > 1)[1]				
				Carcinogenic Risk [2]				Non-Carcinogenic Hazard Quotient [2]				
				Ingestion	Dermal	Inhalation	Exposure Routes Total	Primary Target Organs	Ingestion	Dermal	Inhalation	Exposure Routes Total
			Metals (Total)									
			Aluminum	--	--	--	--	--	--	--	--	--
			Antimony	--	--	--	--	--	--	--	--	--
			Arsenic	--	--	1E-08	1E-08	--	--	--	--	--
			Cadmium (Diet)	--	--	2E-10	2E-10	--	--	--	--	--
			Chromium, Total	--	--	9E-07	9E-07	--	--	--	--	--
			Cobalt	--	--	2E-08	2E-08	--	--	--	--	--
			Iron	--	--	--	--	--	--	--	--	--
			Manganese (Non-Diet)	--	--	--	--	--	--	--	--	--
			Thallium	--	--	--	--	--	--	--	--	--
			Chemical Total	--	--	9E-07	9E-07		--	--	--	--
		Exposure Point Total					9E-07					--
		Vapors above Site										
			Semi-volatile Organic Compounds (SVOCs)									
			1,2,4,5-Tetrachlorobenzene	--	--	--	--	--	--	--	--	--
			Benzo(a)anthracene	--	--	4E-09	4E-09	--	--	--	--	--
			Polychlorinated Biphenyls (PCBs)									
			Aroclor 1254	--	--	4E-08	4E-08	--	--	--	--	--
			Aroclor 1260	--	--	6E-07	6E-07	--	--	--	--	--
			Polychlorinated Biphenyls (PCBs) - Congeners									
			PCBC TEQ MAMMAL HALFND	--	--	1E-07	1E-07	--	--	--	--	--
			Dioxins and Furans									
			DIOXIN TEQ MAMMAL HALFND	--	--	6E-08	6E-08	--	--	--	--	--
			Chemical Total	--	--	9E-07	9E-07		--	--	--	--
		Exposure Point Total					9E-07					--
	Exposure Medium Total						2E-06					--
Medium Total							1E-04					--
Notes:						**Receptor Risk Total**	1E-04				**Receptor Hazard Index (HI)**	--

(1) Exceedances of the carcinogenic and non-carcinogenic identified above are indicated (if applicable) with **red bold text**.

(2) CR and HQs are rounded to one non-zero digit; cumulative totals may be slightly higher or lower depending on degree of rounding.

Table A-9.6b
Summary of Chemical Cancer Risks for COPCs
Reasonable Maximum Exposure (Site-Wide with Hotspot)
Future On-Site Hypothetical Resident (Lifetime) - Total Soil (0 - 8.8 feet)
Human Health Risk Assessment
Shaffer Equipment/Arbuckle Creek Area Superfund Site, Minden, West Virginia

Scenario Timeframe:	Future
Receptor Population:	On-Site Hypothetical Resident
Receptor Age:	Lifetime

Medium	Exposure Medium	Exposure Point	Chemical of Potential Concern	Thresholds: Chemical-specific (1E-06) and Cumulative (1E-04)[1]				Thresholds: Chemical-specific, Target Organ and Cumulative (HQ > 1)[1]				
				Carcinogenic Risk [2]				Non-Carcinogenic Hazard Quotient [2]				
				Ingestion	Dermal	Inhalation	Exposure Routes Total	Primary Target Organs	Ingestion	Dermal	Inhalation	Exposure Routes Total
Soil	Total Soil	0 - 8.8 feet										
			Semi-volatile Organic Compounds (SVOCs)									
			1,2,4,5-Tetrachlorobenzene	--	--	--	--	--	--	--	--	--
			Benzo(a)anthracene	3E-07	1E-07	--	4E-07	--	--	--	--	--
			Benzo(a)pyrene	**2E-06**	7E-07	--	**3E-06**	--	--	--	--	--
			Benzo(b)fluoranthene	5E-07	2E-07	--	6E-07	--	--	--	--	--
			Dibenz(a,h)anthracene	1E-07	3E-08	--	1E-07	--	--	--	--	--
			Indeno(1,2,3-cd)pyrene	1E-07	4E-08	--	2E-07	--	--	--	--	--
			Pesticides									
			Dieldrin	9E-08	3E-08	--	1E-07	--	--	--	--	--
			Polychlorinated Biphenyls (PCBs)									
			Aroclor 1254	2E-07	7E-08	--	2E-07	--	--	--	--	--
			Aroclor 1260	**7E-05**	**3E-05**	--	**1E-04**	--	--	--	--	--
			Polychlorinated Biphenyls (PCBs) - Congeners									
			PCBC TEQ MAMMAL HALFND	**4E-06**	4E-07	--	**5E-06**	--	--	--	--	--
			Dioxins and Furans									
			DIOXIN TEQ MAMMAL HALFND	**2E-06**	2E-07	--	**2E-06**	--	--	--	--	--
			Metals (Total)									
			Aluminum	--	--	--	--	--	--	--	--	--
			Antimony	--	--	--	--	--	--	--	--	--
			Arsenic	**2E-05**	**2E-06**	--	**2E-05**	--	--	--	--	--
			Cadmium (Diet)	--	--	--	--	--	--	--	--	--
			Chromium, Total	**5E-05**	**5E-05**	--	**1E-04**	--	--	--	--	--
			Cobalt	--	--	--	--	--	--	--	--	--
			Iron	--	--	--	--	--	--	--	--	--
			Manganese (Non-Diet)	--	--	--	--	--	--	--	--	--
			Thallium	--	--	--	--	--	--	--	--	--
			Chemical Total	**1E-04**	**8E-05**	--	**2E-04**		--	--	--	--
		Exposure Point Total					**2E-04**					--
Exposure Medium Total							**2E-04**					--
	Outdoor Air	Particulates above Site										
			Semi-volatile Organic Compounds (SVOCs)									
			1,2,4,5-Tetrachlorobenzene	--	--	--	--	--	--	--	--	--
			Benzo(a)anthracene	--	--	2E-11	2E-11	--	--	--	--	--
			Benzo(a)pyrene	--	--	1E-10	1E-10	--	--	--	--	--
			Benzo(b)fluoranthene	--	--	3E-11	3E-11	--	--	--	--	--
			Dibenz(a,h)anthracene	--	--	7E-12	7E-12	--	--	--	--	--
			Indeno(1,2,3-cd)pyrene	--	--	8E-12	8E-12	--	--	--	--	--
			Pesticides									
			Dieldrin	--	--	5E-12	5E-12	--	--	--	--	--
			Polychlorinated Biphenyls (PCBs)									
			Aroclor 1254	--	--	9E-12	9E-12	--	--	--	--	--
			Aroclor 1260	--	--	4E-09	4E-09	--	--	--	--	--
			Polychlorinated Biphenyls (PCBs) - Congeners									
			PCBC TEQ MAMMAL HALFND	--	--	2E-10	2E-10	--	--	--	--	--
			Dioxins and Furans									
			DIOXIN TEQ MAMMAL HALFND	--	--	1E-10	1E-10	--	--	--	--	--

Table A-9.6b
Summary of Chemical Cancer Risks for COPCs
Reasonable Maximum Exposure (Site-Wide with Hotspot)
Future On-Site Hypothetical Resident (Lifetime) - Total Soil (0 - 8.8 feet)
Human Health Risk Assessment
Shaffer Equipment/Arbuckle Creek Area Superfund Site, Minden, West Virginia

Scenario Timeframe:	Future
Receptor Population:	On-Site Hypothetical Resident
Receptor Age:	Lifetime

Medium	Exposure Medium	Exposure Point	Chemical of Potential Concern	Thresholds: Chemical-specific (1E-06) and Cumulative (1E-04)[1]				Thresholds: Chemical-specific, Target Organ and Cumulative (HQ > 1)[1]				
				Carcinogenic Risk [2]				Non-Carcinogenic Hazard Quotient [2]				
				Ingestion	Dermal	Inhalation	Exposure Routes Total	Primary Target Organs	Ingestion	Dermal	Inhalation	Exposure Routes Total
			Metals (Total)									
			Aluminum	--	--	--	--	--	--	--	--	--
			Antimony	--	--	--	--	--	--	--	--	--
			Arsenic	--	--	1E-08	1E-08	--	--	--	--	--
			Cadmium (Diet)	--	--	2E-10	2E-10	--	--	--	--	--
			Chromium, Total	--	--	9E-07	9E-07	--	--	--	--	--
			Cobalt	--	--	2E-08	2E-08	--	--	--	--	--
			Iron	--	--	--	--	--	--	--	--	--
			Manganese (Non-Diet)	--	--	--	--	--	--	--	--	--
			Thallium	--	--	--	--	--	--	--	--	--
			Chemical Total	--	--	9E-07	9E-07		--	--	--	--
		Exposure Point Total					9E-07					--
		Vapors above Site										
			Semi-volatile Organic Compounds (SVOCs)									
			1,2,4,5-Tetrachlorobenzene	--	--	--	--	--	--	--	--	--
			Benzo(a)anthracene	--	--	4E-09	4E-09	--	--	--	--	--
			Polychlorinated Biphenyls (PCBs)									
			Aroclor 1254	--	--	4E-08	4E-08	--	--	--	--	--
			Aroclor 1260	--	--	**1E-05**	**1E-05**	--	--	--	--	--
			Polychlorinated Biphenyls (PCBs) - Congeners									
			PCBC TEQ MAMMAL HALFND	--	--	1E-07	1E-07	--	--	--	--	--
			Dioxins and Furans									
			DIOXIN TEQ MAMMAL HALFND	--	--	6E-08	6E-08	--	--	--	--	--
			Chemical Total	--	--	**1E-05**	**1E-05**		--	--	--	--
		Exposure Point Total					**1E-05**					--
	Exposure Medium Total						**1E-05**					--
Medium Total							**2E-04**					--
Notes:						**Receptor Risk Total**	**2E-04**				**Receptor Hazard Index (HI)**	--

(1) Exceedances of the carcinogenic and non-carcinogenic identified above are indicated (if applicable) with **red bold text**.

(2) CR and HQs are rounded to one non-zero digit; cumulative totals may be slightly higher or lower depending on degree of rounding.

Table A-9.7
Summary of Chemical Non-Cancer Hazards for COPCs
Reasonable Maximum Exposure (Site-Wide)
Current/Future On-Site Recreator (Adult) - Surface Soil (0 - 0.5 feet)
Human Health Risk Assessment
Shaffer Equipment/Arbuckle Creek Area Superfund Site, Minden, West Virginia

Scenario Timeframe:	Current/Future
Receptor Population:	On-Site Recreator
Receptor Age:	Adult

Medium	Exposure Medium	Exposure Point	Chemical of Potential Concern	Thresholds: Chemical-specific (1E-06) and Cumulative (1E-04)[1]				Thresholds: Chemical-specific, Target Organ and Cumulative (HQ > 1)[1]				
				Carcinogenic Risk [2]				Non-Carcinogenic Hazard Quotient [2]				
				Ingestion	Dermal	Inhalation	Exposure Routes Total	Primary Target Organs	Ingestion	Dermal	Inhalation	Exposure Routes Total
Soil	Surface Soil	0 - 0.5 feet										
			Semi-volatile Organic Compounds (SVOCs)									
			Benzo(a)pyrene	--	--	--	--	DV	0.00007	0.00004	--	0.0001
			Polychlorinated Biphenyls (PCBs)									
			Aroclor 1260	--	--	--	--	--	--	--	--	--
			Polychlorinated Biphenyls (PCBs) - Congeners									
			PCBC TEQ MAMMAL HALFND	--	--	--	--	DV; EN; RP	0.007	0.0009	--	0.008
			Dioxins and Furans									
			DIOXIN TEQ MAMMAL HALFND	--	--	--	--	DV; EN; RP	0.005	0.0007	--	0.006
			Metals (Total)									
			Aluminum	--	--	--	--	NV	0.002	0.00006	--	0.002
			Arsenic	--	--	--	--	CV; DM	0.003	0.0006	--	0.004
			Chromium, Total	--	--	--	--	N/A	0.0007	0.001	--	0.002
			Cobalt	--	--	--	--	EN	0.007	0.0003	--	0.007
			Iron	--	--	--	--	GI	0.006	0.0003	--	0.007
			Manganese (Non-Diet)	--	--	--	--	NV	0.004	0.004	--	0.007
			Thallium	--	--	--	--	DM	0.003	0.0001	--	0.003
			Chemical Total	--	--	--	--		**0.04**	**0.008**	--	**0.05**
		Exposure Point Total					--					**0.05**
	Exposure Medium Total						--					**0.05**
	Outdoor Air	Particulates above Site										
			Semi-volatile Organic Compounds (SVOCs)									
			Benzo(a)pyrene	--	--	--	--	DV	--	--	0.0000009	0.0000009
			Polychlorinated Biphenyls (PCBs)									
			Aroclor 1260	--	--	--	--	--	--	--	--	--
			Polychlorinated Biphenyls (PCBs) - Congeners									
			PCBC TEQ MAMMAL HALFND	--	--	--	--	DV; EN; HM; HP; RP; RS	--	--	0.00000001	0.00000001
			Dioxins and Furans									
			DIOXIN TEQ MAMMAL HALFND	--	--	--	--	DV; EN; HM; HP; RP; RS	--	--	0.000000008	0.000000008
			Metals (Total)									
			Aluminum	--	--	--	--	NV	--	--	0.00003	0.00003
			Arsenic	--	--	--	--	CV; DM; DV; NV; RP; RS	--	--	0.000009	0.000009
			Chromium, Total	--	--	--	--	RS	--	--	0.000002	0.000002
			Cobalt	--	--	--	--	RS	--	--	0.00003	0.00003
			Iron	--	--	--	--	--	--	--	--	--
			Manganese (Non-Diet)	--	--	--	--	NV	--	--	0.0001	0.0001
			Thallium	--	--	--	--	--	--	--	--	--
			Chemical Total	--	--	--	--		--	--	**0.0002**	**0.0002**
		Exposure Point Total					--					**0.0002**

Table A-9.7
Summary of Chemical Non-Cancer Hazards for COPCs
Reasonable Maximum Exposure (Site-Wide)
Current/Future On-Site Recreator (Adult) - Surface Soil (0 - 0.5 feet)
Human Health Risk Assessment
Shaffer Equipment/Arbuckle Creek Area Superfund Site, Minden, West Virginia

Scenario Timeframe:	Current/Future
Receptor Population:	On-Site Recreator
Receptor Age:	Adult

Medium	Exposure Medium	Exposure Point	Chemical of Potential Concern	Thresholds: Chemical-specific (1E-06) and Cumulative (1E-04)[1] Carcinogenic Risk[2]				Thresholds: Chemical-specific, Target Organ and Cumulative (HQ > 1)[1] Non-Carcinogenic Hazard Quotient[2]				
				Ingestion	Dermal	Inhalation	Exposure Routes Total	Primary Target Organs	Ingestion	Dermal	Inhalation	Exposure Routes Total
		Vapors above Site										
			Polychlorinated Biphenyls (PCBs)									
			Aroclor 1260	--	--	--	--	--	--	--	--	--
			Polychlorinated Biphenyls (PCBs) - Congeners									
			PCBC TEQ MAMMAL HALFND	--	--	--	--	DV; EN; HM; HP; RP; RS	--	--	0.000005	0.000005
			Dioxins and Furans									
			DIOXIN TEQ MAMMAL HALFND	--	--	--	--	DV; EN; HM; HP; RP; RS	--	--	0.000004	0.000004
			Chemical Total	--	--	--	--		--	--	**0.000009**	**0.000009**
		Exposure Point Total					--					**0.000009**
	Exposure Medium Total						--					**0.0002**
Medium Total							--					**0.05**
Notes:						**Receptor Risk Total**	--				**Receptor Hazard Index (HI)**	**0.05**

(1) Exceedances of the carcinogenic and non-carcinogenic identified above are indicated (if applicable) with **red bold text**.

(2) CR and HQs are rounded to one non-zero digit; cumulative totals may be slightly higher or lower depending on degree of rounding.

Total Cardiovascular (CV) HI across All Media =	**0.004**
Total Dermal (DM) HI across All Media =	**0.006**
Total Developmental (DV) HI across All Media =	**0.01**
Total Endocrine (EN) HI across All Media =	**0.02**
Total Gastrointestinal (GI) HI across All Media =	**0.007**
Total Hematological (HM) HI across All Media =	**0.000009**
Total Hepatic (HP) HI across All Media =	**0.000009**
Total Nervous (NV) HI across All Media =	**0.009**
Total Reproductive (RP) HI across All Media =	**0.01**
Total Respiratory (RS) HI across All Media =	**0.00005**

Table A-9.8
Summary of Chemical Non-Cancer Hazards for COPCs
Reasonable Maximum Exposure (Site-Wide)
Current/Future On-Site Recreator (Child) - Surface Soil (0 - 0.5 feet)
Human Health Risk Assessment
Shaffer Equipment/Arbuckle Creek Area Superfund Site, Minden, West Virginia

Scenario Timeframe:	Current/Future
Receptor Population:	On-Site Recreator
Receptor Age:	Child

Medium	Exposure Medium	Exposure Point	Chemical of Potential Concern	Thresholds: Chemical-specific (1E-06) and Cumulative (1E-04)[1]				Thresholds: Chemical-specific, Target Organ and Cumulative (HQ > 1)[1]				
				Carcinogenic Risk [2]				Non-Carcinogenic Hazard Quotient [2]				
				Ingestion	Dermal	Inhalation	Exposure Routes Total	Primary Target Organs	Ingestion	Dermal	Inhalation	Exposure Routes Total
Soil	Surface Soil	0 - 0.5 feet										
			Semi-volatile Organic Compounds (SVOCs)									
			Benzo(a)pyrene	--	--	--	--	DV	0.0007	0.0002	--	0.0009
			Polychlorinated Biphenyls (PCBs)									
			Aroclor 1260	--	--	--	--	--	--	--	--	--
			Polychlorinated Biphenyls (PCBs) - Congeners									
			PCBC TEQ MAMMAL HALFND	--	--	--	--	DV; EN; RP	0.08	0.006	--	0.08
			Dioxins and Furans									
			DIOXIN TEQ MAMMAL HALFND	--	--	--	--	DV; EN; RP	0.06	0.004	--	0.06
			Metals (Total)									
			Aluminum	--	--	--	--	NV	0.02	0.0004	--	0.02
			Arsenic	--	--	--	--	CV; DM	0.03	0.004	--	0.04
			Chromium, Total	--	--	--	--	N/A	0.008	0.008	--	0.02
			Cobalt	--	--	--	--	EN	0.07	0.002	--	0.07
			Iron	--	--	--	--	GI	0.07	0.002	--	0.07
			Manganese (Non-Diet)	--	--	--	--	NV	0.04	0.02	--	0.06
			Thallium	--	--	--	--	DM	0.03	0.0006	--	0.03
			Chemical Total	--	--	--	--		**0.4**	**0.05**	--	**0.4**
		Exposure Point Total					--					**0.4**
	Exposure Medium Total						--					**0.4**
	Outdoor Air	Particulates above Site										
			Semi-volatile Organic Compounds (SVOCs)									
			Benzo(a)pyrene	--	--	--	--	DV	--	--	0.0000009	0.0000009
			Polychlorinated Biphenyls (PCBs)									
			Aroclor 1260	--	--	--	--	--	--	--	--	--
			Polychlorinated Biphenyls (PCBs) - Congeners									
			PCBC TEQ MAMMAL HALFND	--	--	--	--	DV; EN; HM; HP; RP; RS	--	--	0.00000001	0.00000001
			Dioxins and Furans									
			DIOXIN TEQ MAMMAL HALFND	--	--	--	--	DV; EN; HM; HP; RP; RS	--	--	0.000000008	0.000000008
			Metals (Total)									
			Aluminum	--	--	--	--	NV	--	--	0.00003	0.00003
			Arsenic	--	--	--	--	CV; DM; DV; NV; RP; RS	--	--	0.000009	0.000009
			Chromium, Total	--	--	--	--	RS	--	--	0.000002	0.000002
			Cobalt	--	--	--	--	RS	--	--	0.00003	0.00003
			Iron	--	--	--	--	--	--	--	--	--
			Manganese (Non-Diet)	--	--	--	--	NV	--	--	0.0001	0.0001
			Thallium	--	--	--	--	--	--	--	--	--
			Chemical Total	--	--	--	--		--	--	**0.0002**	**0.0002**
		Exposure Point Total					--					**0.0002**

Table A-9.8
Summary of Chemical Non-Cancer Hazards for COPCs
Reasonable Maximum Exposure (Site-Wide)
Current/Future On-Site Recreator (Child) - Surface Soil (0 - 0.5 feet)
Human Health Risk Assessment
Shaffer Equipment/Arbuckle Creek Area Superfund Site, Minden, West Virginia

Scenario Timeframe:	Current/Future
Receptor Population:	On-Site Recreator
Receptor Age:	Child

Medium	Exposure Medium	Exposure Point	Chemical of Potential Concern	Thresholds: Chemical-specific (1E-06) and Cumulative (1E-04)[1] Carcinogenic Risk [2]				Thresholds: Chemical-specific, Target Organ and Cumulative (HQ > 1)[1] Non-Carcinogenic Hazard Quotient [2]				
				Ingestion	Dermal	Inhalation	Exposure Routes Total	Primary Target Organs	Ingestion	Dermal	Inhalation	Exposure Routes Total
		Vapors above Site										
			Polychlorinated Biphenyls (PCBs)									
			Aroclor 1260	--	--	--	--	--	--	--	--	--
			Polychlorinated Biphenyls (PCBs) - Congeners									
			PCBC TEQ MAMMAL HALFND	--	--	--	--	DV; EN; HM; HP; RP; RS	--	--	0.000005	0.000005
			Dioxins and Furans									
			DIOXIN TEQ MAMMAL HALFND	--	--	--	--	DV; EN; HM; HP; RP; RS	--	--	0.000004	0.000004
			Chemical Total	--	--	--	--		--	--	**0.000009**	**0.000009**
		Exposure Point Total					--					**0.000009**
	Exposure Medium Total						--					**0.0002**
Medium Total							--					**0.4**
Notes:						**Receptor Risk Total**	--				**Receptor Hazard Index (HI)**	**0.4**

(1) Exceedances of the carcinogenic and non-carcinogenic identified above are indicated (if applicable) with **red bold text**.

(2) CR and HQs are rounded to one non-zero digit; cumulative totals may be slightly higher or lower depending on degree of rounding.

Total Cardiovascular (CV) HI across All Media =	**0.04**
Total Dermal (DM) HI across All Media =	**0.06**
Total Developmental (DV) HI across All Media =	**0.1**
Total Endocrine (EN) HI across All Media =	**0.2**
Total Gastrointestinal (GI) HI across All Media =	**0.07**
Total Hematological (HM) HI across All Media =	**0.000009**
Total Hepatic (HP) HI across All Media =	**0.000009**
Total Nervous (NV) HI across All Media =	**0.08**
Total Reproductive (RP) HI across All Media =	**0.1**
Total Respiratory (RS) HI across All Media =	**0.00005**

Table A-9.9
Summary of Chemical Cancer Risks for COPCs
Reasonable Maximum Exposure (Site-Wide)
Current/Future On-Site Recreator (Lifetime) - Surface Soil (0 - 0.5 feet)
Human Health Risk Assessment
Shaffer Equipment/Arbuckle Creek Area Superfund Site, Minden, West Virginia

Scenario Timeframe:	Current/Future
Receptor Population:	On-Site Recreator
Receptor Age:	Lifetime

Medium	Exposure Medium	Exposure Point	Chemical of Potential Concern	Thresholds: Chemical-specific (1E-06) and Cumulative (1E-04)[1] — Carcinogenic Risk[2]				Thresholds: Chemical-specific, Target Organ and Cumulative (HQ > 1)[1] — Non-Carcinogenic Hazard Quotient[2]				
				Ingestion	Dermal	Inhalation	Exposure Routes Total	Primary Target Organs	Ingestion	Dermal	Inhalation	Exposure Routes Total
Soil	Surface Soil	0 - 0.5 feet										
			Semi-volatile Organic Compounds (SVOCs)									
			Benzo(a)pyrene	1E-07	4E-08	--	1E-07	--	--	--	--	--
			Polychlorinated Biphenyls (PCBs)									
			Aroclor 1260	7E-07	3E-07	--	1E-06	--	--	--	--	--
			Polychlorinated Biphenyls (PCBs) - Congeners									
			PCBC TEQ MAMMAL HALFND	8E-07	7E-08	--	9E-07	--	--	--	--	--
			Dioxins and Furans									
			DIOXIN TEQ MAMMAL HALFND	6E-07	5E-08	--	6E-07	--	--	--	--	--
			Metals (Total)									
			Aluminum	--	--	--	--	--	--	--	--	--
			Arsenic	2E-06	2E-07	--	2E-06	--	--	--	--	--
			Chromium, Total	6E-06	6E-06	--	1E-05	--	--	--	--	--
			Cobalt	--	--	--	--	--	--	--	--	--
			Iron	--	--	--	--	--	--	--	--	--
			Manganese (Non-Diet)	--	--	--	--	--	--	--	--	--
			Thallium	--	--	--	--	--	--	--	--	--
			Chemical Total	1E-05	7E-06	--	2E-05		--	--	--	--
		Exposure Point Total					2E-05					--
	Exposure Medium Total						2E-05					--
	Outdoor Air	Particulates above Site										
			Semi-volatile Organic Compounds (SVOCs)									
			Benzo(a)pyrene	--	--	1E-12	1E-12	--	--	--	--	--
			Polychlorinated Biphenyls (PCBs)									
			Aroclor 1260	--	--	5E-12	5E-12	--	--	--	--	--
			Polychlorinated Biphenyls (PCBs) - Congeners									
			PCBC TEQ MAMMAL HALFND	--	--	6E-12	6E-12	--	--	--	--	--
			Dioxins and Furans									
			DIOXIN TEQ MAMMAL HALFND	--	--	5E-12	5E-12	--	--	--	--	--
			Metals (Total)									
			Aluminum	--	--	--	--	--	--	--	--	--
			Arsenic	--	--	2E-10	2E-10	--	--	--	--	--
			Chromium, Total	--	--	2E-08	2E-08	--	--	--	--	--
			Cobalt	--	--	6E-10	6E-10	--	--	--	--	--
			Iron	--	--	--	--	--	--	--	--	--
			Manganese (Non-Diet)	--	--	--	--	--	--	--	--	--
			Thallium	--	--	--	--	--	--	--	--	--
			Chemical Total	--	--	2E-08	2E-08		--	--	--	--
		Exposure Point Total					2E-08					--

Table A-9.9
Summary of Chemical Cancer Risks for COPCs
Reasonable Maximum Exposure (Site-Wide)
Current/Future On-Site Recreator (Lifetime) - Surface Soil (0 - 0.5 feet)
Human Health Risk Assessment
Shaffer Equipment/Arbuckle Creek Area Superfund Site, Minden, West Virginia

Scenario Timeframe:	Current/Future
Receptor Population:	On-Site Recreator
Receptor Age:	Lifetime

Medium	Exposure Medium	Exposure Point	Chemical of Potential Concern	Thresholds: Chemical-specific (1E-06) and Cumulative (1E-04)[1] Carcinogenic Risk[2]				Thresholds: Chemical-specific, Target Organ and Cumulative (HQ > 1)[1] Non-Carcinogenic Hazard Quotient[2]				
				Ingestion	Dermal	Inhalation	Exposure Routes Total	Primary Target Organs	Ingestion	Dermal	Inhalation	Exposure Routes Total
		Vapors above Site										
			Polychlorinated Biphenyls (PCBs)									
			Aroclor 1260	--	--	2E-08	2E-08	--	--	--	--	--
			Polychlorinated Biphenyls (PCBs) - Congeners									
			PCBC TEQ MAMMAL HALFND	--	--	3E-09	3E-09	--	--	--	--	--
			Dioxins and Furans									
			DIOXIN TEQ MAMMAL HALFND	--	--	2E-09	2E-09	--	--	--	--	--
			Chemical Total	--	--	**2E-08**	**2E-08**		--	--	--	--
		Exposure Point Total					**2E-08**					--
	Exposure Medium Total						**4E-08**					--
Medium Total							**2E-05**					--
Notes:						**Receptor Risk Total**	**2E-05**				**Receptor Hazard Index (HI)**	--

(1) Exceedances of the carcinogenic and non-carcinogenic identified above are indicated (if applicable) with **red bold text**.

(2) CR and HQs are rounded to one non-zero digit; cumulative totals may be slightly higher or lower depending on degree of rounding.

Table A-9.10
Summary of Chemical Cancer Risks and Non-Cancer Hazards for COPCs
Reasonable Maximum Exposure (Site-Wide)
Current/Future On-Site Trespasser (Adolescent) - Surface Soil (0 - 0.5 feet)
Human Health Risk Assessment
Shaffer Equipment/Arbuckle Creek Area Superfund Site, Minden, West Virginia

Scenario Timeframe:	Current/Future
Receptor Population:	On-Site Trespasser
Receptor Age:	Adolescent

Medium	Exposure Medium	Exposure Point	Chemical of Potential Concern	Thresholds: Chemical-specific (1E-06) and Cumulative (1E-04)[1]				Thresholds: Chemical-specific, Target Organ and Cumulative (HQ > 1)[1]				
				Carcinogenic Risk [2]				Non-Carcinogenic Hazard Quotient [2]				
				Ingestion	Dermal	Inhalation	Exposure Routes Total	Primary Target Organs	Ingestion	Dermal	Inhalation	Exposure Routes Total
Soil	Surface Soil	0 - 0.5 feet										
			Semi-volatile Organic Compounds (SVOCs)									
			Benzo(a)pyrene	2E-09	2E-09	--	4E-09	DV	0.00002	0.00002	--	0.00003
			Polychlorinated Biphenyls (PCBs)									
			Aroclor 1260	2E-08	2E-08	--	4E-08	--	--	--	--	--
			Polychlorinated Biphenyls (PCBs) - Congeners									
			PCBC TEQ MAMMAL HALFND	3E-08	5E-09	--	3E-08	DV; EN; RP	0.002	0.0004	--	0.002
			Dioxins and Furans									
			DIOXIN TEQ MAMMAL HALFND	2E-08	4E-09	--	2E-08	DV; EN; RP	0.001	0.0003	--	0.002
			Metals (Total)									
			Aluminum	--	--	--	--	NV	0.0004	0.00003	--	0.0004
			Arsenic	5E-08	2E-08	--	7E-08	CV; DM	0.0008	0.0003	--	0.001
			Chromium, Total	1E-07	3E-07	--	5E-07	N/A	0.0002	0.0005	--	0.0007
			Cobalt	--	--	--	--	EN	0.002	0.0001	--	0.002
			Iron	--	--	--	--	GI	0.002	0.0001	--	0.002
			Manganese (Non-Diet)	--	--	--	--	NV	0.0009	0.002	--	0.002
			Thallium	--	--	--	--	DM	0.0007	0.00005	--	0.0007
			Chemical Total	**2E-07**	**4E-07**	**--**	**6E-07**		**0.01**	**0.003**	**--**	**0.01**
		Exposure Point Total					**6E-07**					**0.01**
	Exposure Medium Total						**6E-07**					**0.01**
	Outdoor Air	Particulates above Site										
			Semi-volatile Organic Compounds (SVOCs)									
			Benzo(a)pyrene	--	--	1E-13	1E-13	DV	--	--	0.0000003	0.0000003
			Polychlorinated Biphenyls (PCBs)									
			Aroclor 1260	--	--	6E-13	6E-13	--	--	--	--	--
			Polychlorinated Biphenyls (PCBs) - Congeners									
			PCBC TEQ MAMMAL HALFND	--	--	8E-13	8E-13	DV; EN; HM; HP; RP; RS	--	--	0.000000004	0.000000004
			Dioxins and Furans									
			DIOXIN TEQ MAMMAL HALFND	--	--	5E-13	5E-13	DV; EN; HM; HP; RP; RS	--	--	0.000000003	0.000000003
			Metals (Total)									
			Aluminum	--	--	--	--	NV	--	--	0.000008	0.000008
			Arsenic	--	--	3E-11	3E-11	CV; DM; DV; NV; RP; RS	--	--	0.000003	0.000003
			Chromium, Total	--	--	2E-09	2E-09	RS	--	--	0.0000006	0.0000006
			Cobalt	--	--	7E-11	7E-11	RS	--	--	0.000009	0.000009
			Iron	--	--	--	--	--	--	--	--	--
			Manganese (Non-Diet)	--	--	--	--	NV	--	--	0.00005	0.00005
			Thallium	--	--	--	--	--	--	--	--	--
			Chemical Total	**--**	**--**	**2E-09**	**2E-09**		**--**	**--**	**0.00007**	**0.00007**
		Exposure Point Total					**2E-09**					**0.00007**

Table A-9.10
Summary of Chemical Cancer Risks and Non-Cancer Hazards for COPCs
Reasonable Maximum Exposure (Site-Wide)
Current/Future On-Site Trespasser (Adolescent) - Surface Soil (0 - 0.5 feet)
Human Health Risk Assessment
Shaffer Equipment/Arbuckle Creek Area Superfund Site, Minden, West Virginia

Scenario Timeframe:	Current/Future
Receptor Population:	On-Site Trespasser
Receptor Age:	Adolescent

Medium	Exposure Medium	Exposure Point	Chemical of Potential Concern	Thresholds: Chemical-specific (1E-06) and Cumulative (1E-04)[1] Carcinogenic Risk [2]				Thresholds: Chemical-specific, Target Organ and Cumulative (HQ > 1)[1] Non-Carcinogenic Hazard Quotient [2]				
				Ingestion	Dermal	Inhalation	Exposure Routes Total	Primary Target Organs	Ingestion	Dermal	Inhalation	Exposure Routes Total
		Vapors above Site										
			Polychlorinated Biphenyls (PCBs)									
			Aroclor 1260	--	--	4E-09	4E-09	--	--	--	--	--
			Polychlorinated Biphenyls (PCBs) - Congeners									
			PCBC TEQ MAMMAL HALFND	--	--	6E-10	6E-10	DV; EN; HM; HP; RP; RS	--	--	0.000003	0.000003
			Dioxins and Furans									
			DIOXIN TEQ MAMMAL HALFND	--	--	4E-10	4E-10	DV; EN; HM; HP; RP; RS	--	--	0.000002	0.000002
			Chemical Total	**--**	**--**	**5E-09**	**5E-09**		**--**	**--**	**0.000005**	**0.000005**
		Exposure Point Total					**5E-09**					**0.000005**
	Exposure Medium Total						**7E-09**					**0.00007**
Medium Total							**6E-07**					**0.01**
Notes:						**Receptor Risk Total**	**6E-07**				**Receptor Hazard Index (HI)**	**0.01**

(1) Exceedances of the carcinogenic and non-carcinogenic identified above are indicated (if applicable) with **red bold text**.

(2) CR and HQs are rounded to one non-zero digit; cumulative totals may be slightly higher or lower depending on degree of rounding.

Total Cardiovascular (CV) HI across All Media =	**0.001**
Total Dermal (DM) HI across All Media =	**0.002**
Total Developmental (DV) HI across All Media =	**0.004**
Total Endocrine (EN) HI across All Media =	**0.006**
Total Gastrointestinal (GI) HI across All Media =	**0.002**
Total Hematological (HM) HI across All Media =	**0.000005**
Total Hepatic (HP) HI across All Media =	**0.000005**
Total Nervous (NV) HI across All Media =	**0.003**
Total Reproductive (RP) HI across All Media =	**0.004**
Total Respiratory (RS) HI across All Media =	**0.00002**

Table A-9.11a
Summary of Chemical Cancer Risks and Non-Cancer Hazards for COPCs
Reasonable Maximum Exposure (Site-Wide)
Future On-Site Commercial/Industrial Worker - Total Soil (0 - 2 feet)
Human Health Risk Assessment
Shaffer Equipment/Arbuckle Creek Area Superfund Site, Minden, West Virginia

Scenario Timeframe:	Future
Receptor Population:	On-Site Commercial/Industrial Worker
Receptor Age:	Adult

Medium	Exposure Medium	Exposure Point	Chemical of Potential Concern	Thresholds: Chemical-specific (1E-06) and Cumulative (1E-04)[1]				Thresholds: Chemical-specific, Target Organ and Cumulative (HQ > 1)[1]				
				Carcinogenic Risk [2]				Non-Carcinogenic Hazard Quotient [2]				
				Ingestion	Dermal	Inhalation	Exposure Routes Total	Primary Target Organs	Ingestion	Dermal	Inhalation	Exposure Routes Total
Soil	Total Soil	0 - 2 feet										
			Semi-volatile Organic Compounds (SVOCs)									
			Benzo(a)anthracene	1E-08	6E-09	--	2E-08	--	--	--	--	--
			Benzo(a)pyrene	9E-08	5E-08	--	1E-07	DV	0.0008	0.0005	--	0.001
			Benzo(b)fluoranthene	2E-08	9E-09	--	3E-08	--	--	--	--	--
			Indeno(1,2,3-cd)pyrene	5E-09	3E-09	--	8E-09	--	--	--	--	--
			Polychlorinated Biphenyls (PCBs)									
			Aroclor 1254	3E-07	2E-07	--	5E-07	DM; IM; OC	0.02	0.01	--	0.04
			Aroclor 1260	1E-06	6E-07	--	2E-06	--	--	--	--	--
			Polychlorinated Biphenyls (PCBs) - Congeners									
			PCBC TEQ MAMMAL HALFND	9E-07	1E-07	--	1E-06	DV; EN; RP	0.03	0.003	--	0.03
			Dioxins and Furans									
			DIOXIN TEQ MAMMAL HALFND	5E-07	7E-08	--	6E-07	DV; EN; RP	0.02	0.002	--	0.02
			Metals (Total)									
			Aluminum	--	--	--	--	NV	0.007	0.0003	--	0.008
			Antimony	--	--	--	--	HM; OT	0.002	0.0006	--	0.003
			Arsenic	4E-06	8E-07	--	4E-06	CV; DM	0.02	0.005	--	0.03
			Cadmium (Diet)	--	--	--	--	UR	0.0004	0.00008	--	0.0005
			Chromium, Total	2E-06	4E-06	--	6E-06	N/A	0.004	0.008	--	0.01
			Cobalt	--	--	--	--	EN	0.03	0.001	--	0.03
			Iron	--	--	--	--	GI	0.03	0.001	--	0.03
			Manganese (Non-Diet)	--	--	--	--	NV	0.02	0.02	--	0.04
			Thallium	--	--	--	--	DM	0.01	0.0006	--	0.01
			Chemical Total	9E-06	6E-06	--	1E-05		**0.2**	**0.06**	--	**0.3**
		Exposure Point Total					1E-05					**0.3**
	Exposure Medium Total						1E-05					**0.3**
	Outdoor Air	Particulates above Site										
			Semi-volatile Organic Compounds (SVOCs)									
			Benzo(a)anthracene	--	--	1E-12	1E-12	--	--	--	--	--
			Benzo(a)pyrene	--	--	1E-11	1E-11	DV	--	--	0.00002	0.00002
			Benzo(b)fluoranthene	--	--	2E-12	2E-12	--	--	--	--	--
			Indeno(1,2,3-cd)pyrene	--	--	6E-13	6E-13	--	--	--	--	--
			Polychlorinated Biphenyls (PCBs)									
			Aroclor 1254	--	--	2E-11	2E-11	--	--	--	--	--
			Aroclor 1260	--	--	5E-11	5E-11	--	--	--	--	--
			Polychlorinated Biphenyls (PCBs) - Congeners									
			PCBC TEQ MAMMAL HALFND	--	--	5E-11	5E-11	DV; EN; HM; HP; RP; RS	--	--	0.00000009	0.00000009
			Dioxins and Furans									
			DIOXIN TEQ MAMMAL HALFND	--	--	3E-11	3E-11	DV; EN; HM; HP; RP; RS	--	--	0.00000006	0.00000006
			Metals (Total)									
			Aluminum	--	--	--	--	NV	--	--	0.0003	0.0003
			Antimony	--	--	--	--	RS	--	--	0.0000006	0.0000006
			Arsenic	--	--	3E-09	3E-09	CV; DM; DV; NV; RP; RS	--	--	0.0001	0.0001
			Cadmium (Diet)	--	--	6E-11	6E-11	UR	--	--	0.000009	0.000009
			Chromium, Total	--	--	8E-08	8E-08	RS	--	--	0.00003	0.00003
			Cobalt	--	--	6E-09	6E-09	RS	--	--	0.0003	0.0003
			Iron	--	--	--	--	--	--	--	--	--
			Manganese (Non-Diet)	--	--	--	--	NV	--	--	0.002	0.002

Table A-9.11a
Summary of Chemical Cancer Risks and Non-Cancer Hazards for COPCs
Reasonable Maximum Exposure (Site-Wide)
Future On-Site Commercial/Industrial Worker - Total Soil (0 - 2 feet)
Human Health Risk Assessment
Shaffer Equipment/Arbuckle Creek Area Superfund Site, Minden, West Virginia

Scenario Timeframe:	Future
Receptor Population:	On-Site Commercial/Industrial Worker
Receptor Age:	Adult

Medium	Exposure Medium	Exposure Point	Chemical of Potential Concern	Thresholds: Chemical-specific (1E-06) and Cumulative (1E-04)[1] Carcinogenic Risk[2]				Thresholds: Chemical-specific, Target Organ and Cumulative (HQ > 1)[1] Non-Carcinogenic Hazard Quotient[2]				
				Ingestion	Dermal	Inhalation	Exposure Routes Total	Primary Target Organs	Ingestion	Dermal	Inhalation	Exposure Routes Total
			Thallium	--	--	--	--	--	--	--	--	--
			Chemical Total	--	--	9E-08	9E-08		--	--	0.002	0.002
		Exposure Point Total					9E-08					0.002
		Vapors above Site										
			Semi-volatile Organic Compounds (SVOCs)									
			Benzo(a)anthracene	--	--	2E-10	2E-10	--	--	--	--	--
			Polychlorinated Biphenyls (PCBs)									
			Aroclor 1254	--	--	8E-08	8E-08	--	--	--	--	--
			Aroclor 1260	--	--	2E-07	2E-07	--	--	--	--	--
			Polychlorinated Biphenyls (PCBs) - Congeners									
			PCBC TEQ MAMMAL HALFND	--	--	2E-08	2E-08	DV; EN; HM; HP; RP; RS	--	--	0.00004	0.00004
			Dioxins and Furans									
			DIOXIN TEQ MAMMAL HALFND	--	--	1E-08	1E-08	DV; EN; HM; HP; RP; RS	--	--	0.00003	0.00003
			Chemical Total	--	--	3E-07	3E-07		--	--	0.00007	0.00007
		Exposure Point Total					3E-07					0.00007
	Exposure Medium Total						4E-07					0.003
Medium Total							2E-05					0.3
Notes:							Receptor Risk Total 2E-05				Receptor Hazard Index (HI)	0.3

(1) Exceedances of the carcinogenic and non-carcinogenic identified above are indicated (if applicable) with **red bold text**.

(2) CR and HQs are rounded to one non-zero digit; cumulative totals may be slightly higher or lower depending on degree of rounding.

Total Cardiovascular (CV) HI across All Media =	0.03
Total Dermal (DM) HI across All Media =	0.08
Total Developmental (DV) HI across All Media =	0.05
Total Endocrine (EN) HI across All Media =	0.08
Total Gastrointestinal (GI) HI across All Media =	0.03
Total Hematological (HM) HI across All Media =	0.003
Total Hepatic (HP) HI across All Media =	0.00007
Total Immune (IM) HI across All Media =	0.04
Total Nervous (NV) HI across All Media =	0.05
Total Ocular (OC) HI across All Media =	0.04
Total Other (OT) HI across All Media =	0.003
Total Reproductive (RP) HI across All Media =	0.05
Total Respiratory (RS) HI across All Media =	0.0006
Total Urinary (UR) HI across All Media =	0.0005

Table A-9.11b
Summary of Chemical Cancer Risks and Non-Cancer Hazards for COPCs
Reasonable Maximum Exposure (Site-Wide with Hotspot)
Future On-Site Commercial/Industrial Worker - Total Soil (0 - 2 feet)
Human Health Risk Assessment
Shaffer Equipment/Arbuckle Creek Area Superfund Site, Minden, West Virginia

Scenario Timeframe:	Future
Receptor Population:	On-Site Commercial/Industrial Worker
Receptor Age:	Adult

Medium	Exposure Medium	Exposure Point	Chemical of Potential Concern	Thresholds: Chemical-specific (1E-06) and Cumulative (1E-04)[1]				Thresholds: Chemical-specific, Target Organ and Cumulative (HQ > 1)[1]				
				Carcinogenic Risk [2]				Non-Carcinogenic Hazard Quotient [2]				
				Ingestion	Dermal	Inhalation	Exposure Routes Total	Primary Target Organs	Ingestion	Dermal	Inhalation	Exposure Routes Total
Soil	Total Soil	0 - 2 feet										
			Semi-volatile Organic Compounds (SVOCs)									
			Benzo(a)anthracene	1E-08	6E-09	--	2E-08	--	--	--	--	--
			Benzo(a)pyrene	9E-08	5E-08	--	1E-07	DV	0.0008	0.0005	--	0.001
			Benzo(b)fluoranthene	2E-08	9E-09	--	3E-08	--	--	--	--	--
			Indeno(1,2,3-cd)pyrene	5E-09	3E-09	--	8E-09	--	--	--	--	--
			Polychlorinated Biphenyls (PCBs)									
			Aroclor 1254	3E-07	2E-07	--	5E-07	DM; IM; OC	0.02	0.01	--	0.04
			Aroclor 1260	1E-05	9E-06	--	2E-05	--	--	--	--	--
			Polychlorinated Biphenyls (PCBs) - Congeners									
			PCBC TEQ MAMMAL HALFND	9E-07	1E-07	--	1E-06	DV; EN; RP	0.03	0.003	--	0.03
			Dioxins and Furans									
			DIOXIN TEQ MAMMAL HALFND	5E-07	7E-08	--	6E-07	DV; EN; RP	0.02	0.002	--	0.02
			Metals (Total)									
			Aluminum	--	--	--	--	NV	0.007	0.0003	--	0.008
			Antimony	--	--	--	--	HM; OT	0.002	0.0006	--	0.003
			Arsenic	4E-06	8E-07	--	4E-06	CV; DM	0.02	0.005	--	0.03
			Cadmium (Diet)	--	--	--	--	UR	0.0004	0.00008	--	0.0005
			Chromium, Total	2E-06	4E-06	--	6E-06	N/A	0.004	0.008	--	0.01
			Cobalt	--	--	--	--	EN	0.03	0.001	--	0.03
			Iron	--	--	--	--	GI	0.03	0.001	--	0.03
			Manganese (Non-Diet)	--	--	--	--	NV	0.02	0.02	--	0.04
			Thallium	--	--	--	--	DM	0.01	0.0006	--	0.01
			Chemical Total	2E-05	1E-05	--	4E-05		**0.2**	**0.06**	--	**0.3**
		Exposure Point Total					4E-05					**0.3**
	Exposure Medium Total						4E-05					**0.3**
	Outdoor Air	Particulates above Site										
			Semi-volatile Organic Compounds (SVOCs)									
			Benzo(a)anthracene	--	--	1E-12	1E-12	--	--	--	--	--
			Benzo(a)pyrene	--	--	1E-11	1E-11	DV	--	--	0.00002	0.00002
			Benzo(b)fluoranthene	--	--	2E-12	2E-12	--	--	--	--	--
			Indeno(1,2,3-cd)pyrene	--	--	6E-13	6E-13	--	--	--	--	--
			Polychlorinated Biphenyls (PCBs)									
			Aroclor 1254	--	--	2E-11	2E-11	--	--	--	--	--
			Aroclor 1260	--	--	8E-10	8E-10	--	--	--	--	--
			Polychlorinated Biphenyls (PCBs) - Congeners									
			PCBC TEQ MAMMAL HALFND	--	--	5E-11	5E-11	DV; EN; HM; HP; RP; RS	--	--	0.00000009	0.00000009
			Dioxins and Furans									
			DIOXIN TEQ MAMMAL HALFND	--	--	3E-11	3E-11	DV; EN; HM; HP; RP; RS	--	--	0.00000006	0.00000006
			Metals (Total)									
			Aluminum	--	--	--	--	NV	--	--	0.0003	0.0003
			Antimony	--	--	--	--	RS	--	--	0.0000006	0.0000006
			Arsenic	--	--	3E-09	3E-09	CV; DM; DV; NV; RP; RS	--	--	0.0001	0.0001
			Cadmium (Diet)	--	--	6E-11	6E-11	UR	--	--	0.000009	0.000009
			Chromium, Total	--	--	8E-08	8E-08	RS	--	--	0.00003	0.00003
			Cobalt	--	--	6E-09	6E-09	RS	--	--	0.0003	0.0003
			Iron	--	--	--	--	--	--	--	--	--
			Manganese (Non-Diet)	--	--	--	--	NV	--	--	0.002	0.002

Table A-9.11b
Summary of Chemical Cancer Risks and Non-Cancer Hazards for COPCs
Reasonable Maximum Exposure (Site-Wide with Hotspot)
Future On-Site Commercial/Industrial Worker - Total Soil (0 - 2 feet)
Human Health Risk Assessment
Shaffer Equipment/Arbuckle Creek Area Superfund Site, Minden, West Virginia

Scenario Timeframe:	Future
Receptor Population:	On-Site Commercial/Industrial Worker
Receptor Age:	Adult

Medium	Exposure Medium	Exposure Point	Chemical of Potential Concern	Thresholds: Chemical-specific (1E-06) and Cumulative (1E-04)[1] Carcinogenic Risk[2]				Thresholds: Chemical-specific, Target Organ and Cumulative (HQ > 1)[1] Non-Carcinogenic Hazard Quotient[2]				
				Ingestion	Dermal	Inhalation	Exposure Routes Total	Primary Target Organs	Ingestion	Dermal	Inhalation	Exposure Routes Total
			Thallium	--	--	--	--	--	--	--	--	--
			Chemical Total	--	--	9E-08	9E-08		--	--	0.002	0.002
		Exposure Point Total					9E-08					0.002
		Vapors above Site										
			Semi-volatile Organic Compounds (SVOCs)									
			Benzo(a)anthracene	--	--	2E-10	2E-10	--	--	--	--	--
			Polychlorinated Biphenyls (PCBs)									
			Aroclor 1254	--	--	8E-08	8E-08	--	--	--	--	--
			Aroclor 1260	--	--	**3E-06**	**3E-06**	--	--	--	--	--
			Polychlorinated Biphenyls (PCBs) - Congeners									
			PCBC TEQ MAMMAL HALFND	--	--	2E-08	2E-08	DV; EN; HM; HP; RP; RS	--	--	0.00004	0.00004
			Dioxins and Furans									
			DIOXIN TEQ MAMMAL HALFND	--	--	1E-08	1E-08	DV; EN; HM; HP; RP; RS	--	--	0.00003	0.00003
			Chemical Total	--	--	**3E-06**	**3E-06**		--	--	**0.00007**	**0.00007**
		Exposure Point Total					**3E-06**					**0.00007**
	Exposure Medium Total						**3E-06**					**0.003**
Medium Total							**4E-05**					**0.3**
Notes:						**Receptor Risk Total**	**4E-05**				**Receptor Hazard Index (HI)**	**0.3**

(1) Exceedances of the carcinogenic and non-carcinogenic identified above are indicated (if applicable) with **red bold text**.

(2) CR and HQs are rounded to one non-zero digit; cumulative totals may be slightly higher or lower depending on degree of rounding.

Total Cardiovascular (CV) HI across All Media =	**0.03**
Total Dermal (DM) HI across All Media =	**0.08**
Total Developmental (DV) HI across All Media =	**0.05**
Total Endocrine (EN) HI across All Media =	**0.08**
Total Gastrointestinal (GI) HI across All Media =	**0.03**
Total Hematological (HM) HI across All Media =	**0.003**
Total Hepatic (HP) HI across All Media =	**0.00007**
Total Immune (IM) HI across All Media =	**0.04**
Total Nervous (NV) HI across All Media =	**0.05**
Total Ocular (OC) HI across All Media =	**0.04**
Total Other (OT) HI across All Media =	**0.003**
Total Reproductive (RP) HI across All Media =	**0.05**
Total Respiratory (RS) HI across All Media =	**0.0006**
Total Urinary (UR) HI across All Media =	**0.0005**

Table A-9.12a
Summary of Chemical Cancer Risks and Non-Cancer Hazards for COPCs
Reasonable Maximum Exposure (Site-Wide)
Future On-Site Construction Worker - Total Soil (0 - 8.8 feet)
Human Health Risk Assessment
Shaffer Equipment/Arbuckle Creek Area Superfund Site, Minden, West Virginia

Scenario Timeframe:	Future
Receptor Population:	On-Site Construction Worker
Receptor Age:	Adult

Medium	Exposure Medium	Exposure Point	Chemical of Potential Concern	Thresholds: Chemical-specific (1E-06) and Cumulative (1E-04)[1]				Thresholds: Chemical-specific, Target Organ and Cumulative (HQ > 1)[1]				
				Carcinogenic Risk [2]				Non-Carcinogenic Hazard Quotient [2]				
				Ingestion	Dermal	Inhalation	Exposure Routes Total	Primary Target Organs	Ingestion	Dermal	Inhalation	Exposure Routes Total
Soil	Total Soil	0 - 8.8 feet										
			Semi-volatile Organic Compounds (SVOCs)									
			1,2,4,5-Tetrachlorobenzene	--	--	--	--	EN	0.01	0.004	--	0.02
			Benzo(a)anthracene	2E-09	9E-10	--	3E-09	--	--	--	--	--
			Benzo(a)pyrene	1E-08	6E-09	--	2E-08	DV	0.003	0.001	--	0.005
			Benzo(b)fluoranthene	3E-09	1E-09	--	4E-09	--	--	--	--	--
			Dibenz(a,h)anthracene	6E-10	3E-10	--	9E-10	--	--	--	--	--
			Indeno(1,2,3-cd)pyrene	7E-10	3E-10	--	1E-09	--	--	--	--	--
			Pesticides									
			Dieldrin	3E-09	8E-10	--	3E-09	HP	0.0002	0.00007	--	0.0003
			Polychlorinated Biphenyls (PCBs)									
			Aroclor 1254	5E-09	2E-09	--	7E-09	NV	0.006	0.003	--	0.008
			Aroclor 1260	1E-07	4E-08	--	1E-07	--	--	--	--	--
			Polychlorinated Biphenyls (PCBs) - Congeners									
			PCBC TEQ MAMMAL HALFND	1E-07	1E-08	--	1E-07	IM	0.003	0.0003	--	0.004
			Dioxins and Furans									
			DIOXIN TEQ MAMMAL HALFND	6E-08	6E-09	--	7E-08	IM	0.002	0.0002	--	0.002
			Metals (Total)									
			Aluminum	--	--	--	--	NV	0.02	0.0008	--	0.02
			Antimony	--	--	--	--	OT	0.007	0.001	--	0.008
			Arsenic	4E-07	7E-08	--	5E-07	DM	0.004	0.0007	--	0.005
			Cadmium (Diet)	--	--	--	--	MS	0.002	0.0002	--	0.002
			Chromium, Total	3E-07	4E-07	--	7E-07	HM	0.008	0.01	--	0.02
			Cobalt	--	--	--	--	EN	0.01	0.0003	--	0.01
			Iron	--	--	--	--	GI	0.09	0.003	--	0.09
			Manganese (Non-Diet)	--	--	--	--	NV	0.05	0.04	--	0.09
			Thallium	--	--	--	--	DM	0.01	0.0003	--	0.01
			Chemical Total	**1E-06**	**5E-07**	**--**	**2E-06**		**0.2**	**0.07**	**--**	**0.3**
		Exposure Point Total					**2E-06**					**0.3**
	Exposure Medium Total						**2E-06**					**0.3**
	Outdoor Air	Particulates above Site										
			Semi-volatile Organic Compounds (SVOCs)									
			1,2,4,5-Tetrachlorobenzene	--	--	--	--	--	--	--	--	--
			Benzo(a)anthracene	--	--	1E-11	1E-11	--	--	--	--	--
			Benzo(a)pyrene	--	--	9E-11	9E-11	DV	--	--	0.005	0.005
			Benzo(b)fluoranthene	--	--	2E-11	2E-11	--	--	--	--	--
			Dibenz(a,h)anthracene	--	--	4E-12	4E-12	--	--	--	--	--
			Indeno(1,2,3-cd)pyrene	--	--	5E-12	5E-12	--	--	--	--	--
			Pesticides									
			Dieldrin	--	--	8E-12	8E-12	--	--	--	--	--
			Polychlorinated Biphenyls (PCBs)									
			Aroclor 1254	--	--	2E-11	2E-11	--	--	--	--	--
			Aroclor 1260	--	--	3E-10	3E-10	--	--	--	--	--
			Polychlorinated Biphenyls (PCBs) - Congeners									
			PCBC TEQ MAMMAL HALFND	--	--	4E-10	4E-10	DV; EN; HM; HP; RP; RS	--	--	0.00002	0.00002
			Dioxins and Furans									
			DIOXIN TEQ MAMMAL HALFND	--	--	2E-10	2E-10	DV; EN; HM; HP; RP; RS	--	--	0.000009	0.000009

Table A-9.12a
Summary of Chemical Cancer Risks and Non-Cancer Hazards for COPCs
Reasonable Maximum Exposure (Site-Wide)
Future On-Site Construction Worker - Total Soil (0 - 8.8 feet)
Human Health Risk Assessment
Shaffer Equipment/Arbuckle Creek Area Superfund Site, Minden, West Virginia

Scenario Timeframe:	Future
Receptor Population:	On-Site Construction Worker
Receptor Age:	Adult

Medium	Exposure Medium	Exposure Point	Chemical of Potential Concern	Thresholds: Chemical-specific (1E-06) and Cumulative (1E-04)[1] Carcinogenic Risk[2]				Thresholds: Chemical-specific, Target Organ and Cumulative (HQ > 1)[1] Non-Carcinogenic Hazard Quotient[2]				
				Ingestion	Dermal	Inhalation	Exposure Routes Total	Primary Target Organs	Ingestion	Dermal	Inhalation	Exposure Routes Total
			Metals (Total)									
			Aluminum	--	--	--	--	NV	--	--	0.05	0.05
			Antimony	--	--	--	--	RS	--	--	0.00003	0.00003
			Arsenic	--	--	2E-08	2E-08	CV; DM; DV; NV; RP; RS	--	--	0.02	0.02
			Cadmium (Diet)	--	--	3E-10	3E-10	UR	--	--	0.00001	0.00001
			Chromium, Total	--	--	5E-07	5E-07	RS	--	--	0.001	0.001
			Cobalt	--	--	4E-08	4E-08	RS	--	--	0.02	0.02
			Iron	--	--	--	--	--	--	--	--	--
			Manganese (Non-Diet)	--	--	--	--	NV	--	--	0.3	0.3
			Thallium	--	--	--	--	--	--	--	--	--
			Chemical Total	--	--	**6E-07**	**6E-07**		--	--	**0.4**	**0.4**
		Exposure Point Total					**6E-07**					**0.4**
		Vapors above Site										
			Semi-volatile Organic Compounds (SVOCs)									
			1,2,4,5-Tetrachlorobenzene	--	--	--	--	--	--	--	--	--
			Benzo(a)anthracene	--	--	5E-11	5E-11	--	--	--	--	--
			Polychlorinated Biphenyls (PCBs)									
			Aroclor 1254	--	--	1E-09	1E-09	--	--	--	--	--
			Aroclor 1260	--	--	2E-08	2E-08	--	--	--	--	--
			Polychlorinated Biphenyls (PCBs) - Congeners									
			PCBC TEQ MAMMAL HALFND	--	--	4E-09	4E-09	DV; EN; HM; HP; RP; RS	--	--	0.0002	0.0002
			Dioxins and Furans									
			DIOXIN TEQ MAMMAL HALFND	--	--	2E-09	2E-09	DV; EN; HM; HP; RP; RS	--	--	0.00009	0.00009
			Chemical Total	--	--	**3E-08**	**3E-08**		--	--	**0.0003**	**0.0003**
		Exposure Point Total					**3E-08**					**0.0003**
	Exposure Medium Total						**6E-07**					**0.4**
Medium Total							**2E-06**					**0.6**
Notes:						**Receptor Risk Total**	**2E-06**				**Receptor Hazard Index (HI)**	**0.6**

(1) Exceedances of the carcinogenic and non-carcinogenic identified above are indicated (if applicable) with **red bold text**.

(2) CR and HQs are rounded to one non-zero digit; cumulative totals may be slightly higher or lower depending on degree of rounding.

Total Cardiovascular (CV) HI across All Media =	**0.02**
Total Dermal (DM) HI across All Media =	**0.04**
Total Developmental (DV) HI across All Media =	**0.03**
Total Endocrine (EN) HI across All Media =	**0.03**
Total Gastrointestinal (GI) HI across All Media =	**0.09**
Total Hematological (HM) HI across All Media =	**0.02**
Total Hepatic (HP) HI across All Media =	**0.0006**
Total Immune (IM) HI across All Media =	**0.005**
Total Musculoskeletal (MS) HI across All Media =	**0.002**
Total Nervous (NV) HI across All Media =	**0.5**
Total Other (OT) HI across All Media =	**0.008**
Total Reproductive (RP) HI across All Media =	**0.02**
Total Respiratory (RS) HI across All Media =	**0.04**
Total Urinary (UR) HI across All Media =	**0.00001**

Table A-9.12b
Summary of Chemical Cancer Risks and Non-Cancer Hazards for COPCs
Reasonable Maximum Exposure (Site-Wide with Hotspot)
Future On-Site Construction Worker - Total Soil (0 - 8.8 feet)
Human Health Risk Assessment
Shaffer Equipment/Arbuckle Creek Area Superfund Site, Minden, West Virginia

Scenario Timeframe:	Future
Receptor Population:	On-Site Construction Worker
Receptor Age:	Adult

Medium	Exposure Medium	Exposure Point	Chemical of Potential Concern	Thresholds: Chemical-specific (1E-06) and Cumulative (1E-04)[1]				Thresholds: Chemical-specific, Target Organ and Cumulative (HQ > 1)[1]				
				Carcinogenic Risk [2]				Non-Carcinogenic Hazard Quotient [2]				
				Ingestion	Dermal	Inhalation	Exposure Routes Total	Primary Target Organs	Ingestion	Dermal	Inhalation	Exposure Routes Total
Soil	Total Soil	0 - 8.8 feet										
			Semi-volatile Organic Compounds (SVOCs)									
			1,2,4,5-Tetrachlorobenzene	--	--	--	--	EN	0.01	0.004	--	0.02
			Benzo(a)anthracene	2E-09	9E-10	--	3E-09	--	--	--	--	--
			Benzo(a)pyrene	1E-08	6E-09	--	2E-08	DV	0.003	0.001	--	0.005
			Benzo(b)fluoranthene	3E-09	1E-09	--	4E-09	--	--	--	--	--
			Dibenz(a,h)anthracene	6E-10	3E-10	--	9E-10	--	--	--	--	--
			Indeno(1,2,3-cd)pyrene	7E-10	3E-10	--	1E-09	--	--	--	--	--
			Pesticides									
			Dieldrin	3E-09	8E-10	--	3E-09	HP	0.0002	0.00007	--	0.0003
			Polychlorinated Biphenyls (PCBs)									
			Aroclor 1254	5E-09	2E-09	--	7E-09	NV	0.006	0.003	--	0.008
			Aroclor 1260	2E-06	9E-07	--	3E-06	--	--	--	--	--
			Polychlorinated Biphenyls (PCBs) - Congeners									
			PCBC TEQ MAMMAL HALFND	1E-07	1E-08	--	1E-07	IM	0.003	0.0003	--	0.004
			Dioxins and Furans									
			DIOXIN TEQ MAMMAL HALFND	6E-08	6E-09	--	7E-08	IM	0.002	0.0002	--	0.002
			Metals (Total)									
			Aluminum	--	--	--	--	NV	0.02	0.0008	--	0.02
			Antimony	--	--	--	--	OT	0.007	0.001	--	0.008
			Arsenic	4E-07	7E-08	--	5E-07	DM	0.004	0.0007	--	0.005
			Cadmium (Diet)	--	--	--	--	MS	0.002	0.0002	--	0.002
			Chromium, Total	3E-07	4E-07	--	7E-07	HM	0.008	0.01	--	0.02
			Cobalt	--	--	--	--	EN	0.01	0.0003	--	0.01
			Iron	--	--	--	--	GI	0.09	0.003	--	0.09
			Manganese (Non-Diet)	--	--	--	--	NV	0.05	0.04	--	0.09
			Thallium	--	--	--	--	DM	0.01	0.0003	--	0.01
			Chemical Total	**3E-06**	**1E-06**	**--**	**4E-06**		**0.2**	**0.07**	**--**	**0.3**
		Exposure Point Total					**4E-06**					**0.3**
	Exposure Medium Total						**4E-06**					**0.3**
	Outdoor Air	Particulates above Site										
			Semi-volatile Organic Compounds (SVOCs)									
			1,2,4,5-Tetrachlorobenzene	--	--	--	--	--	--	--	--	--
			Benzo(a)anthracene	--	--	1E-11	1E-11	--	--	--	--	--
			Benzo(a)pyrene	--	--	9E-11	9E-11	DV	--	--	0.005	0.005
			Benzo(b)fluoranthene	--	--	2E-11	2E-11	--	--	--	--	--
			Dibenz(a,h)anthracene	--	--	4E-12	4E-12	--	--	--	--	--
			Indeno(1,2,3-cd)pyrene	--	--	5E-12	5E-12	--	--	--	--	--
			Pesticides									
			Dieldrin	--	--	8E-12	8E-12	--	--	--	--	--
			Polychlorinated Biphenyls (PCBs)									
			Aroclor 1254	--	--	2E-11	2E-11	--	--	--	--	--
			Aroclor 1260	--	--	6E-09	6E-09	--	--	--	--	--
			Polychlorinated Biphenyls (PCBs) - Congeners									
			PCBC TEQ MAMMAL HALFND	--	--	4E-10	4E-10	DV; EN; HM; HP; RP; RS	--	--	0.00002	0.00002
			Dioxins and Furans									
			DIOXIN TEQ MAMMAL HALFND	--	--	2E-10	2E-10	DV; EN; HM; HP; RP; RS	--	--	0.000009	0.000009

Table A-9.12b
Summary of Chemical Cancer Risks and Non-Cancer Hazards for COPCs
Reasonable Maximum Exposure (Site-Wide with Hotspot)
Future On-Site Construction Worker - Total Soil (0 - 8.8 feet)
Human Health Risk Assessment
Shaffer Equipment/Arbuckle Creek Area Superfund Site, Minden, West Virginia

Scenario Timeframe:	Future
Receptor Population:	On-Site Construction Worker
Receptor Age:	Adult

Medium	Exposure Medium	Exposure Point	Chemical of Potential Concern	Thresholds: Chemical-specific (1E-06) and Cumulative (1E-04)[1] Carcinogenic Risk[2]				Thresholds: Chemical-specific, Target Organ and Cumulative (HQ > 1)[1] Non-Carcinogenic Hazard Quotient[2]				
				Ingestion	Dermal	Inhalation	Exposure Routes Total	Primary Target Organs	Ingestion	Dermal	Inhalation	Exposure Routes Total
			Metals (Total)									
			Aluminum	--	--	--	--	NV	--	--	0.05	0.05
			Antimony	--	--	--	--	RS	--	--	0.00003	0.00003
			Arsenic	--	--	2E-08	2E-08	CV; DM; DV; NV; RP; RS	--	--	0.02	0.02
			Cadmium (Diet)	--	--	3E-10	3E-10	UR	--	--	0.00001	0.00001
			Chromium, Total	--	--	5E-07	5E-07	RS	--	--	0.001	0.001
			Cobalt	--	--	4E-08	4E-08	RS	--	--	0.02	0.02
			Iron	--	--	--	--	--	--	--	--	--
			Manganese (Non-Diet)	--	--	--	--	NV	--	--	0.3	0.3
			Thallium	--	--	--	--	--	--	--	--	--
			Chemical Total	--	--	6E-07	6E-07		--	--	0.4	0.4
		Exposure Point Total					6E-07					0.4
		Vapors above Site										
			Semi-volatile Organic Compounds (SVOCs)									
			1,2,4,5-Tetrachlorobenzene	--	--	--	--	--	--	--	--	--
			Benzo(a)anthracene	--	--	5E-11	5E-11	--	--	--	--	--
			Polychlorinated Biphenyls (PCBs)									
			Aroclor 1254	--	--	1E-09	1E-09	--	--	--	--	--
			Aroclor 1260	--	--	5E-07	5E-07	--	--	--	--	--
			Polychlorinated Biphenyls (PCBs) - Congeners									
			PCBC TEQ MAMMAL HALFND	--	--	4E-09	4E-09	DV; EN; HM; HP; RP; RS	--	--	0.0002	0.0002
			Dioxins and Furans									
			DIOXIN TEQ MAMMAL HALFND	--	--	2E-09	2E-09	DV; EN; HM; HP; RP; RS	--	--	0.00009	0.00009
			Chemical Total	--	--	5E-07	5E-07		--	--	0.0003	0.0003
		Exposure Point Total					5E-07					0.0003
	Exposure Medium Total						1E-06					0.4
Medium Total							5E-06					0.6
Notes:							Receptor Risk Total 5E-06					Receptor Hazard Index (HI) 0.6

(1) Exceedances of the carcinogenic and non-carcinogenic identified above are indicated (if applicable) with **red bold text**.

(2) CR and HQs are rounded to one non-zero digit; cumulative totals may be slightly higher or lower depending on degree of rounding.

Total Cardiovascular (CV) HI across All Media =	**0.02**
Total Dermal (DM) HI across All Media =	**0.04**
Total Developmental (DV) HI across All Media =	**0.03**
Total Endocrine (EN) HI across All Media =	**0.03**
Total Gastrointestinal (GI) HI across All Media =	**0.09**
Total Hematological (HM) HI across All Media =	**0.02**
Total Hepatic (HP) HI across All Media =	**0.0006**
Total Immune (IM) HI across All Media =	**0.005**
Total Musculoskeletal (MS) HI across All Media =	**0.002**
Total Nervous (NV) HI across All Media =	**0.5**
Total Other (OT) HI across All Media =	**0.008**
Total Reproductive (RP) HI across All Media =	**0.02**
Total Respiratory (RS) HI across All Media =	**0.04**
Total Urinary (UR) HI across All Media =	**0.00001**

Table A-10.1
Risk Summary
Reasonable Maximum Exposure (Site-Wide)
Current/Future On-Site Hypothetical Resident (Child) - Surface Soil (0 - 0.5 feet)
Human Health Risk Assessment
Shaffer Equipment/Arbuckle Creek Area Superfund Site, Minden, West Virginia

Scenario Timeframe:	Future
Receptor Population:	On-Site Hypothetical Resident
Receptor Age:	Child

Medium	Exposure Medium	Exposure Point	Chemical of Potential Concern	Thresholds: Chemical-specific (1E-06) and Cumulative (1E-04)				Thresholds: Chemical-specific, Target Organ and Cumulative (HQ > 1)				
				Carcinogenic Risk [1]				Non-Carcinogenic Hazard Quotient [1]				
				Ingestion	Dermal	Inhalation	Exposure Routes Total	Primary Target Organs	Ingestion	Dermal	Inhalation	Exposure Routes Total
Soil	Surface Soil	0 - 0.5 feet	**Polychlorinated Biphenyls (PCBs) - Congeners**									
			PCBC TEQ MAMMAL HALFND	--	--	--	--	DV; EN; RP	0.5	0.04	--	0.6
			Dioxins and Furans									
			DIOXIN TEQ MAMMAL HALFND	--	--	--	--	DV; EN; RP	0.4	0.03	--	0.4
			Metals (Total)									
			Cobalt	--	--	--	--	EN	0.5	0.01	--	0.5
			Chemical Total	**--**	**--**	**--**	**--**		**1**	**0.08**	**--**	**2**
		Exposure Point Total					**--**					**2**
	Exposure Medium Total						**--**					**2**
	Outdoor Air	Particulates above Site	**Polychlorinated Biphenyls (PCBs) - Congeners**									
			PCBC TEQ MAMMAL HALFND	--	--	--	--	DV; EN; HM; HP; RP; RS	--	--	0.0000005	0.0000005
			Dioxins and Furans									
			DIOXIN TEQ MAMMAL HALFND	--	--	--	--	DV; EN; HM; HP; RP; RS	--	--	0.0000004	0.0000004
			Chemical Total	**--**	**--**	**--**	**--**		**--**	**--**	**0.0000009**	**0.0000009**
		Exposure Point Total					**--**					**0.0000009**
		Vapors above Site	**Polychlorinated Biphenyls (PCBs) - Congeners**									
			PCBC TEQ MAMMAL HALFND	--	--	--	--	DV; EN; HM; HP; RP; RS	--	--	0.0002	0.0002
			Dioxins and Furans									
			DIOXIN TEQ MAMMAL HALFND	--	--	--	--	DV; EN; HM; HP; RP; RS	--	--	0.0002	0.0002
			Chemical Total	**--**	**--**	**--**	**--**		**--**	**--**	**0.0004**	**0.0004**
		Exposure Point Total					**--**					**0.0004**
	Exposure Medium Total						**--**					**0.0004**
Medium Total							**--**					**2**
Notes:						**Receptor Risk Total**	**--**				**Receptor Hazard Index (HI)**	**2**

(1) CR and HQs are rounded to one non-zero digit; cumulative totals may be slightly higher or lower depending on degree of rounding.

(2) Thresholds were used to determine which chemical/pathway specific exposure routes would be evaluated in the RAGS Table 10s. For carcinogenic risk, chemical/pathway specific exposure routes with a risk greater than 1E-06 were evaluated. For non-carcinogenic hazard, the target organ HIs greater than 1 from the RAGS Table 9s were evaluated in the RAGS Table 10s.

Total Cardiovascular (CV) HI across All Media =	**--**
Total Dermal (DM) HI across All Media =	**--**
Total Developmental (DV) HI across All Media =	**1**
Total Endocrine (EN) HI across All Media =	**2**
Total Gastrointestinal (GI) HI across All Media =	**--**
Total Hematological (HM) HI across All Media =	**0.0004**
Total Hepatic (HP) HI across All Media =	**0.0004**
Total Nervous (NV) HI across All Media =	**--**
Total Reproductive (RP) HI across All Media =	**1**
Total Respiratory (RS) HI across All Media =	**0.0004**

Table A-10.2
Risk Summary
Reasonable Maximum Exposure (Site-Wide with Hotspot)
Future On-Site Hypothetical Resident (Lifetime) - Total Soil (0 - 8.8 feet)
Human Health Risk Assessment
Shaffer Equipment/Arbuckle Creek Area Superfund Site, Minden, West Virginia

Scenario Timeframe:	Future
Receptor Population:	On-Site Hypothetical Resident
Receptor Age:	Lifetime

Medium	Exposure Medium	Exposure Point	Chemical of Potential Concern	Thresholds: Chemical-specific (1E-06) and Cumulative (1E-04)				Thresholds: Chemical-specific, Target Organ and Cumulative (HQ > 1)				
				Carcinogenic Risk [1]				Non-Carcinogenic Hazard Quotient [1]				
				Ingestion	Dermal	Inhalation	Exposure Routes Total	Primary Target Organs	Ingestion	Dermal	Inhalation	Exposure Routes Total
Soil	Total Soil	0 - 8.8 feet										
			Semi-volatile Organic Compounds (SVOCs)									
			Benzo(a)pyrene	2E-06	--	--	2E-06	--	--	--	--	--
			Polychlorinated Biphenyls (PCBs)									
			Aroclor 1260	7E-05	3E-05	--	1E-04	--	--	--	--	--
			Polychlorinated Biphenyls (PCBs) - Congeners									
			PCBC TEQ MAMMAL HALFND	4E-06	--	--	4E-06	--	--	--	--	--
			Dioxins and Furans									
			DIOXIN TEQ MAMMAL HALFND	2E-06	--	--	2E-06	--	--	--	--	--
			Metals (Total)									
			Arsenic	2E-05	2E-06	--	2E-05	--	--	--	--	--
			Chromium, Total	5E-05	5E-05	--	1E-04	--	--	--	--	--
			Chemical Total	1E-04	8E-05	--	2E-04		--	--	--	--
		Exposure Point Total					2E-04					--
	Exposure Medium Total						2E-04					--
	Outdoor Air	Vapors above Site										
			Polychlorinated Biphenyls (PCBs)									
			Aroclor 1260	--	--	1E-05	1E-05	--	--	--	--	--
			Chemical Total	--	--	1E-05	1E-05		--	--	--	--
		Exposure Point Total					1E-05					--
	Exposure Medium Total						1E-05					--
Medium Total							2E-04					--
Notes:						**Receptor Risk Total**	2E-04				**Receptor Hazard Index (HI)**	--

(1) CR and HQs are rounded to one non-zero digit; cumulative totals may be slightly higher or lower depending on degree of rounding.

(2) Thresholds were used to determine which chemical/pathway specific exposure routes would be evaluated in the RAGS Table 10s. For carcinogenic risk, chemical/pathway specific exposure routes with a risk greater than 1E-06 were evaluated. For non-carcinogenic hazard, the target organ HIs greater than 1 from the RAGS Table 9s were evaluated in the RAGS Table 10s.

APPENDIX C

DETAILED COST ESTIMATE

TABLE C-4
REMEDIAL ALTERNATIVES CAPITAL COSTS
FOCUSED FEASIBILITY STUDY
SHAFFER EQUIPMENT COMPANY PROPERTY
SHAFFER EQUIPMENT/ARBUCKLE CREEK AREA SUPERFUND SITE
MINDEN, WEST VIRGINIA

	DESCRIPTION	UNIT	UNIT COST[1]	QUANTITY			TOTAL COST		
				Alt 1	Alt 2	Alt 3	Alt 1	Alt 2	Alt 3
1.0	**Mobilization/Demobilization**								
1.1	Equipment Mobilization/Demobilization	LS	$43,392	0	1	1	$0	$43,392	$43,392
1.2	Field Support Facilities	LS	$10,800	0	1	1	$0	$10,800	$10,800
1.3	Monthly Costs associated with Field Support	MONTH	$86,474	0	4	12	$0	$345,896	$1,037,688
	Subtotal						**$0**	**$400,088**	**$1,091,880**
2.0	**Site Preparation**								
2.1	Site Access Road Construction	SY	$12.36	0	1,600	1,600	$0	$19,776	$19,776
2.2	Clear and Grub	ACRE	$6,896.00	0	1.2	3	$0	$8,275	$20,688
2.3	Preconstruction Survey	EA	$15,384.00	0	1	1	$0	$15,384	$15,384
2.4	Private Utility Locating	LS	$41,202.00	0	0	1	$0	$0	$41,202
2.5	Construct Staging Area	LS	$6,403.00	0	1	1	$0	$6,403	$6,403
2.6	Decontamination Facilities & Services	LS	$8,371	0	1	1	$0	$8,371	$8,371
2.7	Install Stormwater Management System	LS	$81,750	0	1	1	$0	$81,750	$81,750
2.8	Install Erosion and Sedimentation Controls	LF	$11	0	2,082	2,230	$0	$23,485	$25,154
2.9	Install Fence and signage[2]	LF	$20.39	0	2,186	2,186	$0	$44,573	$44,573
2.10	Well Decommissioning	EA	$1,172.00	0	4	8	$0	$4,688	$9,376
	Subtotal						**$0**	**$212,704**	**$272,676**
3.0	**Interim Construction Monitoring**								
3.1	Stormwater	HR	$186.00	0	240	640	$0	$44,640	$119,040
3.2	Air	HR	$186.00	0	0	960	$0	$0	$178,560
3.3	Groundwater	LS	$32,820.00	0	0	8	$0	$0	$262,560
	Subtotal						**$0**	**$44,640**	**$560,160**
4.0	**Excavation**								
4.1	Excavation[3]	CY	$2.66	0	0	37,918	$0	$0	$100,862
4.2	PCB Confirmation Sampling[4]	EA	$77.00	0	0	173	$0	$0	$13,315
4.3	Shoring	SF	$44.68	0	0	10,500	$0	$0	$469,140
4.4	Onsite Hauling (0.5 miles round trip)[5]	CY	$2.78	0	0	37,918	$0	$0	$105,412
4.5	Dewatering	DAY	$325.30	0	0	31	$0	$0	$9,950
4.6	Dust suppression and monitoring	DAY	$1,075.87	0	0	240	$0	$0	$258,209
4.7	Stockpile Management	EA	$206.01	0	0	95	$0	$0	$19,529
4.8	Perimeter Air Sampling	EA	$202.74	0	0	480	$0	$0	$97,315
4.9	Equipment Decontamination	HR	$150.98	0	0	1,185	$0	$0	$178,908
	Subtotal						**$0**	**$0**	**$1,252,640**

TABLE C-4
REMEDIAL ALTERNATIVES CAPITAL COSTS
FOCUSED FEASIBILITY STUDY
SHAFFER EQUIPMENT COMPANY PROPERTY
SHAFFER EQUIPMENT/ARBUCKLE CREEK AREA SUPERFUND SITE
MINDEN, WEST VIRGINIA

	DESCRIPTION	UNIT	UNIT COST[1]	QUANTITY			TOTAL COST		
				Alt 1	Alt 2	Alt 3	Alt 1	Alt 2	Alt 3
5.0	**Construct Low-Permeability Cap/Restoration Activities**								
5.1	Install Low Permeable Clay Layer (18")	CY	$40.89	0	5,072	0	$0	$207,381	$0
5.2	Install 40 mil HDPE liner	SF	$3.11	0	91,290	0	$0	$283,913	$0
5.3	Install PVC Piping	LF	$6.29	0	2,000	0	$0	$12,580	$0
5.4	Furnish, Spread, and Compact Soil Layer (12")[6]	CY	$40.55	0	3,719	0	$0	$150,815	$0
5.5	Install Nonwoven Geotextile Delineation/Warning Layer	SY	$2.53	0	10,042	5,201	$0	$25,406	$13,159
5.6	Furnish, Spread, and Compact Clean Gravel Below Water Table	CY	$46.20	0	0	4,588	$0	$0	$211,970
5.7	Clean Fill, Delivered, Dumped, Spread, and Compacted[6]	CY	$51.49	0	0	30,170	$0	$0	$1,553,461
5.8	Furnish, Place, and Spread Topsoil (6")[6]	CY	$40.37	0	2,840	4,245	$0	$114,656	$171,383
5.9	Hydroseeding with Mulch and Fertilizer	MSF	$123.44	0	128	191	$0	$15,776	$23,582
5.10	Site Cleanup	LS	$9,440.00	0	1	1	$0	$9,440	$9,440
5.11	Institutional Controls	LS	$27,000.00	0	1	0	$0	$27,000	$0
5.12	As-Built Survey	ACRE	$3,546.00	0	5	5	$0	$17,730	$17,730
	Subtotal						**$0**	**$865,943**	**$2,000,724**
6.0	**Offsite Transporation and Disposal**								
6.1	Stockpile Characterization	EA	$1,670.42	0	0	95	$0	$0	$158,348
6.2	TSCA Solids T&D	TON	$368.00	0	0	22,175	$0	$0	$8,160,494
6.3	Non-TSCA Solids T&D	TON	$131.25	0	0	16,729	$0	$0	$2,195,642
6.4	Non-TSCA Water T&D	GALLON	$0.99	0	0	55,000	$0	$0	$54,450
6.5	Waste Profiling	LS	$4,601.00	0	0	1	$0	$0	$4,601
	Subtotal						**$0**	**$0**	**$10,573,536**
TOTAL DIRECT COSTS							**$0**	**$1,523,375**	**$15,751,617**

TABLE C-4
REMEDIAL ALTERNATIVES CAPITAL COSTS
FOCUSED FEASIBILITY STUDY
SHAFFER EQUIPMENT COMPANY PROPERTY
SHAFFER EQUIPMENT/ARBUCKLE CREEK AREA SUPERFUND SITE
MINDEN, WEST VIRGINIA

DESCRIPTION		UNIT	UNIT COST[1]	QUANTITY			TOTAL COST		
				Alt 1	Alt 2	Alt 3	Alt 1	Alt 2	Alt 3
7.0 Other Costs									
7.1	Project Management (5% of direct costs)						$0	$76,169	$787,581
7.2	Engineering and Design (8% direct costs)						$0	$121,870	$1,260,129
7.3	Construction management (6% of direct costs)						$0	$91,402	$945,097
7.4	Location Adjustment (5%)						$0	$76,169	$787,581
7.5	Contingency (Bid and Scope 20%)						$0	$304,675	$3,150,323
TOTAL OTHER COSTS							**$0**	**$670,285**	**$6,930,711**
TOTAL CAPITAL COST							**$0**	**$2,193,660**	**$22,682,328**

Notes:

[1] For source information regarding unit pricing - refer to Table C-6 for Cost Assumptions.

[2] Assume fencing and signage to be maintained for Alt. 2 only - all other fencing and signage would be temporary and required during construction activities for site security only.

[3] Represents in situ estimate of PCB-contaminated soil > 1 mg/kg to be excavated.

[4] The unit cost includes analytical and shipping cost per sample.

[5] Volume for hauling soil includes a bulking factor of 1.2.

[6] Backfill volumes were estimated volumetrically and include a 10% increase to account for compaction during placement.

LS = lump sum
HR = hour
EA = each
MSF = thousand square feet
SF = square feet
LF = linear foot
CY = cubic yard
SY = square yard

Actual volumes may vary during implementation based upon the final extent of excavation.

TABLE C-5
REMEDIAL ALTERNATIVES OPERATIONS AND MAINTENANCE COSTS
FOCUSED FEASIBILITY STUDY
SHAFFER EQUIPMENT COMPANY PROPERTY
SHAFFER EQUIPMENT/ARBUCKLE CREEK AREA SUPERFUND SITE
MINDEN, WEST VIRGINIA

	DESCRIPTION	UNIT	UNIT COST[1]	QUANTITY			TOTAL COST		
				Alt 1	Alt 2	Alt 3	Alt 1	Alt 2	Alt 3
OM.1.0	**Groundwater Monitoring (per event)**								
OM.1.1	Sampling Equipment Rental and Expendables	LS	$1,500	0	1	0	$0	$1,500	$0
OM.1.2	Sampling Labor - FOL	HR	$118	0	80	0	$0	$9,440	$0
OM.1.3	Sampling Labor - Sampler	HR	$114	0	300	0	$0	$34,200	$0
OM.1.4	Analytical Costs[2]	EA	$73.50	0	20	0	$0	$1,470	$0
OM.1.5	Data Validation	HR	$150	0	20	0	$0	$3,000	$0
OM.1.6	Report Preparation	LS	$5,024	0	1	0	$0	$5,024	$0
OM 1.7	Mobilization/Demobilization	LS	$16,350	0	1	0	$0	$16,350	$0
	Subtotal						**$0**	**$70,984**	**$0**
OM.2.0	**Ground Surface Inspections, Maintenance, and Repairs (per year)**								
OM.2.1	Inspections	HR	$118.00	0	140	0	$0	$16,520	$0
OM.2.2	Mowing (twice per year)	MSF	$64.52	0	268	0	$0	$17,271	$0
OM.2.3	Revegetation (1% per year)	MSF	$123.44	0	1	0	$0	$165	$0
OM 2.5	Fence Repair (5% per year)	LF	$20.39	0	109	0	$0	$2,229	$0
OM 2.6	Sign Replacement (up to 5 per year)	EA	$50.00	0	5	0	$0	$250	$0
OM.2.7	Reporting (annual)	LS	$10,900.00	0	1	0	$0	$10,900	$0
OM 2.8	Topsoil replacement (1% per year)	CY	$40.37	0	26	0	$0	$1,047	$0
OM 2.9	Cap/Culvert/Streambank Repairs (2% per year of capital costs)	LS	$27,258.51	0	1	0	$0	$27,259	$0
OM 2.10	Contractor mobilizations	LS	$350.71	0	3	0	$0	$1,052	$0
	Subtotal						**$0**	**$76,692**	**$0**
OM.3.0	**Deed Restrictions**								
OM.3.1	Inspection (annual)	HR	$118.00	0	10	0	$0	$1,180	$0
OM.3.2	Deed Restriction Reporting (annual)	EA	$5,450.00	0	1	0	$0	$5,450	$0
	Subtotal						**$0**	**$6,630**	**$0**
OM, 4.0	**Other Costs**								
	Project Management (5% of direct costs)						**$0**	**$7,715**	**$0**
	Contingency (Bid and Scope 20%)						**$0**	**$30,861**	**$0**
ANNUAL O&M COSTS ALT. 2 (YEARS 1-30)[3]							--	**$192,883**	--

Notes:

[1] For source information regarding unit pricing - refer to Table C-6 for Cost Assumptions (labor and lump sum estimates for reporting are engineering estimates).

[2] Analytical costs are for PCB Aroclors only. The unit cost includes analytical and shipping cost per sample.

[3] O&M for Years 1 - 30 include annual groundwater monitoring, monthly ground surface and fence/sign inspections with annual repairs, annual deed inspections and one annual report for all O&M activities.