# First VRP Progress Report
# July through December 30, 2017

1610 Southland Circle
Atlanta, Georgia

Southland Circle Property (HSI # 10077)

**GHD** | 3075 Breckinridge Boulevard Suite 470 Duluth Georgia USA

018876 | Report No 14 | January 2018

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# 1. Introduction and Background

GHD, on behalf of CBS Corporation (CBS), prepared this First Semi-annual Progress Report for the reporting period of July through December 2017 for the Southland Circle property located at 1610 Southland Circle in Atlanta, Georgia. This Voluntary Investigation and Remediation Plan (VIRP) Progress Report (Progress Report # 1) is prepared to meet requirements outlined in the Georgia Voluntary Remediation Program Act (VRPA). Information and data contained in this Progress Report are provided in a streamlined format and additional information, if required, can be provided to the Georgia Environmental Protection Division (EPD) upon request.

## 1.1 Introduction

GHD, on behalf of CBS, submitted a Voluntary Remediation Program Application, dated November 29, 2011, to Georgia EPD for the property located at 1610 Southland Circle (fkt "Indcon"), Atlanta, Georgia, HSI No. 10077 (qualifying property). The Application was approved by Georgia EPD in a letter dated June 30, 2017 with comments and requests for additional sampling.

CBS is the corporate successor to Westinghouse Electric Corporation (Westinghouse), which occupied the qualifying property from 1965 to 1971. EPD identified Westinghouse as one of several Responsible Parties or Potentially Responsible Parties for the Site under the Georgia Hazardous Sites Response Act (HSRA) program. CBS has not owned or controlled the property or occupied the building since 1971.Several owners or tenants have conducted industrial and commercial activities at the property since the termination of Westinghouse vacated the premises 46 years ago. The property is presently owned and occupied by Guy T Gunter (GTG) & Associates and used as a showroom and warehouse for household appliance retailing. CBS' investigation and remediation activities are being coordinated with the current property owner.

The extent of impact within each of the environmental media except soils, which has been partially delineated, has not been fully established based on historical data. As such and for the purposes of this Report, the investigation area will herein be referred to as the Site when not specifically referencing the qualifying property.

A Site Location Map overlaid on a USGS topographic map is provided as Figure 1 and the Site Layout is provided as Figure 2.

## 1.2 Background

The qualifying property is improved with an approximately 200-foot by 100-foot brick building divided into an open warehouse, showroom, and two stories of office space. This building was constructed for Westinghouse between 1964 and 1965 and has apparently not been significantly altered since that time. Westinghouse occupied the building until 1971 as leased space from Southeastern Facilities Company.

The Westinghouse facility was designed and initially used for repairing and refurbishing electrical apparatus, including fluid-filled transformers. It is believed that the facility handled mostly relatively small mineral oil filled pole-mounted transformers rather than large industrial-sized units. Transformer servicing often involved removal of the dielectric fluid prior to disassembly and repair or replacement of components. Dielectric fluid would be evaluated to determine whether it should

be handled as waste or whether its quality was sufficient for reuse. When servicing was complete, the transformer would be refilled.

A common poly chlorinated biphenyl (PCB) product class used in larger transformers at the time was Askarel. The most common transformer Askarels were composed of 60 percent Aroclor 1260 and 40 percent trichlorobenzene (TCB) (Type A) and 70 percent Aroclor 1254 and 30 percent TCB (Type C). Dielectric fluids in some transformers handled at the facility may have contained these compounds. Because of Federal regulations and voluntary actions by industry, the use of PCB-containing fluids for manufacture of electrical transformers ceased in the 1970s.

The outdoor concrete pad that extends 50 feet beyond and along the entire 100-foot length of the western end of the building (50-foot slab), was presumably used for temporary storage of electrical apparatus received at the facility or awaiting delivery after servicing. Based on the review of historic aerial photographs, a drainage trench (48-inch trench) extended along the western edge of the 50-foot slab. Sometime after 1972, most of the western portion of the property (i.e., west of the 50-foot slab) was paved with asphalt.

The western edge of the 50-foot slab approximates the western edge of the pit from which two underground storage tanks (USTs) were removed during 1993-94 by the then owner of the property. The larger (6,000 gallon) UST was likely a fuel oil tank for heating the building. The other UST (1,250 gallon) was installed sometime after the original facility construction, and is presumed to have been used for fueling vehicles.

The two USTs were removed in July 1994 by Kiber Environmental Services, Inc (Kiber). In the sampling conducted as part of the tank removal project, PCBs were detected in a sample of free-phase oil collected from within the larger UST. The PCBs were reported as greater than 50 milligrams per kilogram (mg/kg) in the sample, and the Site was referred to EPD. The qualifying property was subsequently listed on EPD's Hazardous Site Inventory as Site No. 10077.

Various additional soil and groundwater investigations and extensive Interim Remedial Measures (IRMs) have been conducted at the Site by CBS since 2001. Included in the IRMs is an active pumping system installed in the 50-foot slab area of the Site which is designed to impart hydraulic control of the groundwater within this area and prevent migration of contaminants. Details of the IRMs performed at the Site historically including various soil removal projects, are available in prior Reports.

In addition to the pumping system, Site features associated with investigative and/or remedial efforts at the Site include a groundwater well network of 12 monitoring wells, one recovery well, a piezometer, and a sediment trap for the drainage channel in the northern portion of the qualifying property. Two groundwater monitoring wells (MW-8 and MW-13), which have been sampled historically, have been paved over, abandoned, or destroyed by the property owner and negotiations will begin with the property owner for replacement of those wells.

Concentrations of Site-related constituents of concern (COCs) remaining in soil, sediment, and groundwater following previous corrective actions have been summarized and compared to applicable Risk Reduction Standards (RRS) for purposes of delineation and to identify remaining target remediation areas. Table 1 summarizes the 29 regulated volatile organic compounds (VOCs), eight semi-volatile organic compounds (SVOCs), seven PCB aroclors, and their respective Risk Reduction Standard (RRS) criteria. The RRS tables were updated based on the June 30, 2017 EPD letter. Type 1 and Type 2 RRS (residential properties) will be used as

groundwater and soil delineation criteria, respectively. Type 3 and Type 4 RRS (non-residential properties) will be used for both on-property soil and groundwater as cleanup/remedial standards. Updated calculations and tables are provided in Appendix A.

# 2. Work Performed During Reporting Period

## 2.1 Property Affidavit

The property owner has reportedly filed the required affidavit with Fulton County Superior Court stating that the qualifying property is contaminated.

## 2.2 Response to Comments

Georgia EPD provided comments on the following previously submitted Reports:

- Revised Voluntary Investigation and Remediation Plan dated November 29, 2011
- Progress Report dated October 28, 2011; Progress Report dated April 5, 2012
- Progress Report dated October 12, 2012; Progress Report dated March 28, 2013
- Monitoring Report dated July 26, 2016

These comments have been incorporated into this report as applicable or have been addressed within the response to comments letter submitted in conjunction to this report.

# 3. Sampling and Analysis Plan

The Sampling and Analysis Plan (SAP) presents an approach for collection, analysis and evaluation of samples of each media (soil, groundwater, sediment and surface water) at the Site. This SAP includes sets of baseline samples from each media (soil, sediment, surface water, groundwater, and soil vapor) and a future sampling plan which will be based on results of the baseline sampling.

## 3.1 Soil Delineation

Historical soil investigations conducted at the Site have shown that remaining soils at the property generally comply with the Type 1/4 RRS except for PCBs. PCB concentrations that exceed Type 1/4 RRS occur at various locations beneath and adjacent to the stormwater drainage channel; locations beneath the building footing (Stations 1+75, 2+00, 2+25, 2+50, 2+75, 3+00, 3+50, 3+75, 4+00, and 4+25); isolated locations beneath the west end of the Site (B-38, B-43, B-45, B-49, and B-50); one location in the vicinity of the former indoor trench (BH-8); and near the east side of the building (DP1 7-8' and DP3 7-8'). Additional soil delineation to be conducted as part of the baseline assessment is proposed as follows.

Soil within the upper 2 to 3 feet of the soil column will be collected using a hand auger at five locations along the northern bank of the stormwater drainage channel, approximately five feet above the base of the drainage channel . Each of the collected soil samples will be submitted for laboratory analysis for PCBs aroclor by United States Environmental Protection Agency (USEPA) Method 8082.

One soil boring will be advanced in the northern portion of the 50-foot slab at historical sample locations S-104, S-105 and S-106. Soil samples will be collected from the 0 to 1 foot below grade (bg) interval and from within the two foot interval directly above the water table. The two collected soil samples will be submitted for laboratory analysis for PCBs aroclor by USEPA Method 8082.

One soil boring will be advanced using a direct push technology (DPT) rig within the area of B-16, B-17, and B-18 near the southern boundary. Soil samples will be collected from the 0 to 2 feet bg interval and between 2 feet and the water table. The two collected soil samples will be submitted for laboratory analysis for VOCs by USEPA Method 8260 and PCBs aroclor by USEPA Method 8082.

Locations of the proposed soil boring/sampling points are shown on Figure 3.

Additional soil delineation may be required pending the results of these analyses from the baseline assessment; however, routine soil sample collection during the proposed semiannual events is not anticipated.

## 3.2 Groundwater Delineation

The last round of groundwater monitoring on the property was conducted in May 2016. Monitoring wells MW-8 and MW-13 were not found during this monitoring event as the owner of the property had covered these wells with new asphalt during resurfacing in the parking lot. As requested by EPD, GHD will again try to locate the wells and will work with the property owner to install two replacement groundwater monitoring wells in the vicinity of the destroyed wells MW-8 and MW-13 if those wells cannot be found. GHD will also install one additional bedrock monitoring well (MW-8D) to the top of the bedrock or with screen installed at the approximate depth of monitoring well MW-12D along the eastern boundary of the property, near MW-8, to monitor groundwater in the deep aquifer.

After reconnaissance and/or installation of the above three monitoring wells, semi-annual comprehensive groundwater monitoring event which includes all existing and the new wells will be conducted. Installation of the replacement and new wells and a comprehensive groundwater monitoring event is anticipated to be conducted during the next annual (January through December 2018) reporting period.

The groundwater at this Site has been monitored for several semi-annual events through the years and no drastic changes have been observed. Groundwater sampling of all on-Site monitoring wells will be conducted annually to monitor any changes in groundwater quality. Groundwater sampling procedures will be conducted in general accordance with the EPA Region IV Field Branches Quality System and Technical Procedures (FBQSTP) guidance documents. Water level measurements will be collected during the annual events to generate groundwater potentiometric surface maps.  Locations of the groundwater sampling points are shown on Figure 4.

Groundwater samples collected from each monitoring well will be submitted for laboratory analysis for VOCs by EPA Method 8260 and PCB aroclors by EPA Method 8082 during the next round.

In addition to the sampling efforts, a residential well groundwater use survey will be conducted for the Site vicinity in an effort to identify points of exposure to impacted groundwater at the Site. This will be conducted by reviewing available documentation of the presence of drinking water wells in the area surrounding the Site and the completion of in-person interviews with owners of the surrounding properties, as practicable.

## 3.3 Surface water and Sediment Delineation

Historical surface water investigations conducted at the Site have shown intermittent concentrations of PCB aroclors and perchloroethylene (PCE) in surface water at the Site exceeding the instream water quality standards (ISWQS). ISWQS have historically been used as preliminary screening criteria for any detections in surface water.

Historical sediment investigations conducted at the Site have shown concentrations of PCB aroclors in sediments collected from the on-property upgradient 48-inch storm water culvert and downgradient sediment trap exceeding the Type 1/4 RRS.

As requested by Georgia EPD, a Screening-Level Ecological Risk Assessment (SLERA) will be completed for the Site surface water in order to determine Site-specific risk-based screening criteria. Prior to the completion of the SLERA, ISWQS will continue to be used as screening criteria for any surface water detections and ecological screening values (ESVs) for sediment detections.

Surface water and sediment samples will be collected from the two on-property sampling points. The on-property surface water samples will be collected in the vicinity of the sediment trap (SW-3) at downgradient location of the drainage channel and from upstream location in the drainage channel (SW-1) in the vicinity of the 48-inch storm water culvert. Locations of the proposed on-property surface water and sediment sampling points are shown on Figure 5.

The two surface water and sediment samples collected will be submitted for laboratory analysis for VOCs by EPA Method 8260, and PCB aroclors by EPA Method 8082.

Two rounds of annual sampling events will be conducted at each of the above sample locations to assess current site conditions.

## 3.4 Vapor Intrusion

Historical soil vapor sampling data show the presence of various VOCs in soil vapor in the vicinity of the drainage channel along the north side of the qualifying property and in the 50-foot slab area. Based on these detections and the potential for exposure to the occupants of the qualifying property building, sub-slab soil vapor samples will be collected and analyzed in order to determine potential inhalation risk factors for building occupants.

GHD proposes to install up to six soil vapor sampling points inside the building at the qualifying property at the following locations: northwest building corner, southwest building corner center of the warehouse, southern portion of the showroom, southwestern and northeastern portions of the office area. In the event that the property owner does not consent to the installation of vapor points at any of the interior locations, those vapor points will be moved to nearby locations immediately adjacent to the building on the exterior of the building. Locations of proposed soil vapor sampling points are shown on Figure 6.

A single grab sample will be collected from each sampling point in general accordance with the *EPA Region IV Soil Gas Sampling Operating Procedures*. A single-use 0.5-liter Summa canister will be used to collect each sample, and the samples will be submitted for laboratory analysis for toxic organic compounds by EPA Method TO-15. The analytical results will be entered into the EPA Vapor Intrusion Screening Level (VISL) calculator for comparison to individual and aggregate carcinogenic and non-carcinogenic toxicity risk values.

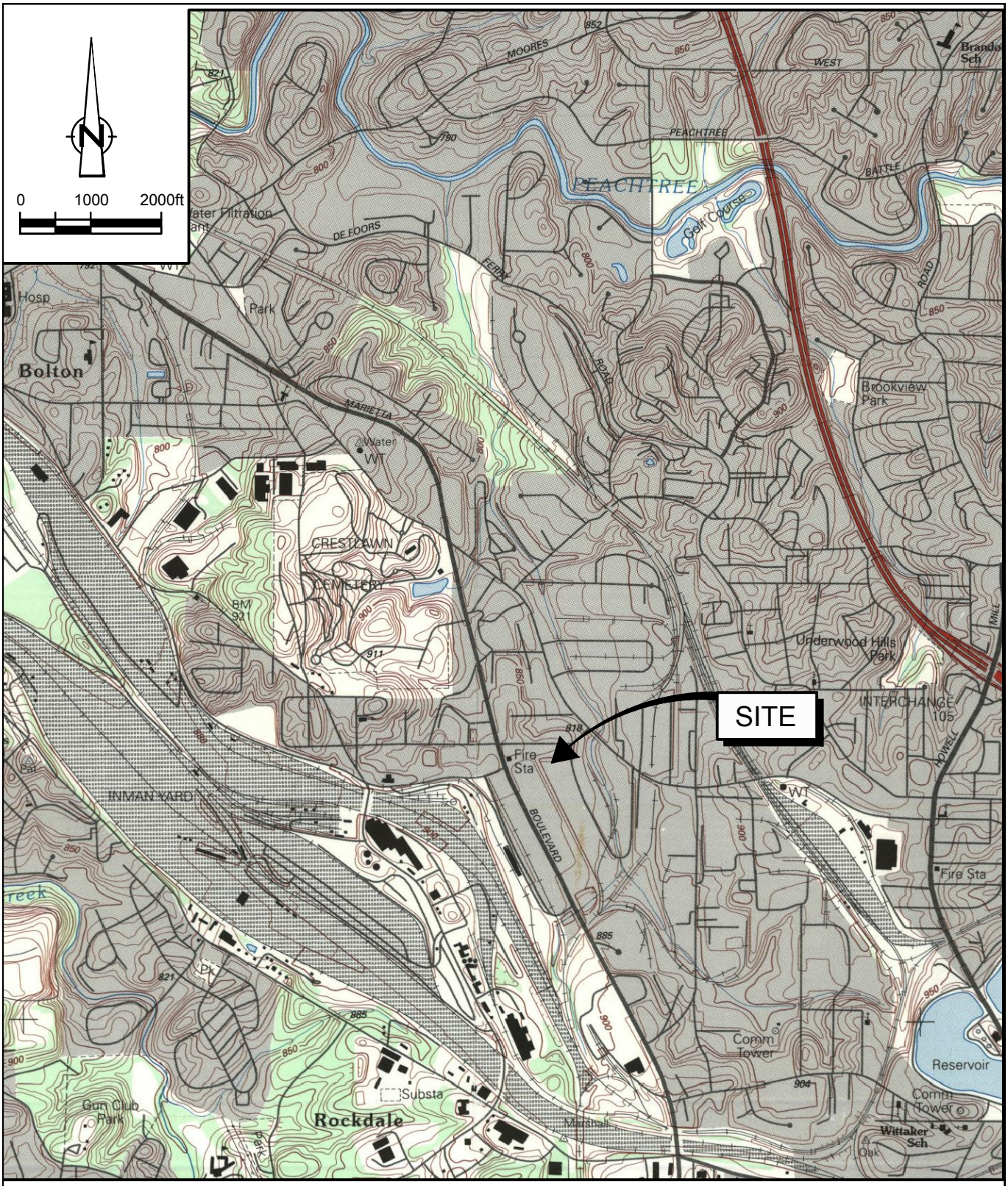
# 4. Next Submittal

The next submittal for this Site will be the Annual Progress Report for the reporting period of January through December 2018. This upcoming Report will detail all activities performed at the Site during the reporting period and provide additional information concerning upcoming investigative or remedial activities.

# 5. Summary of Hours

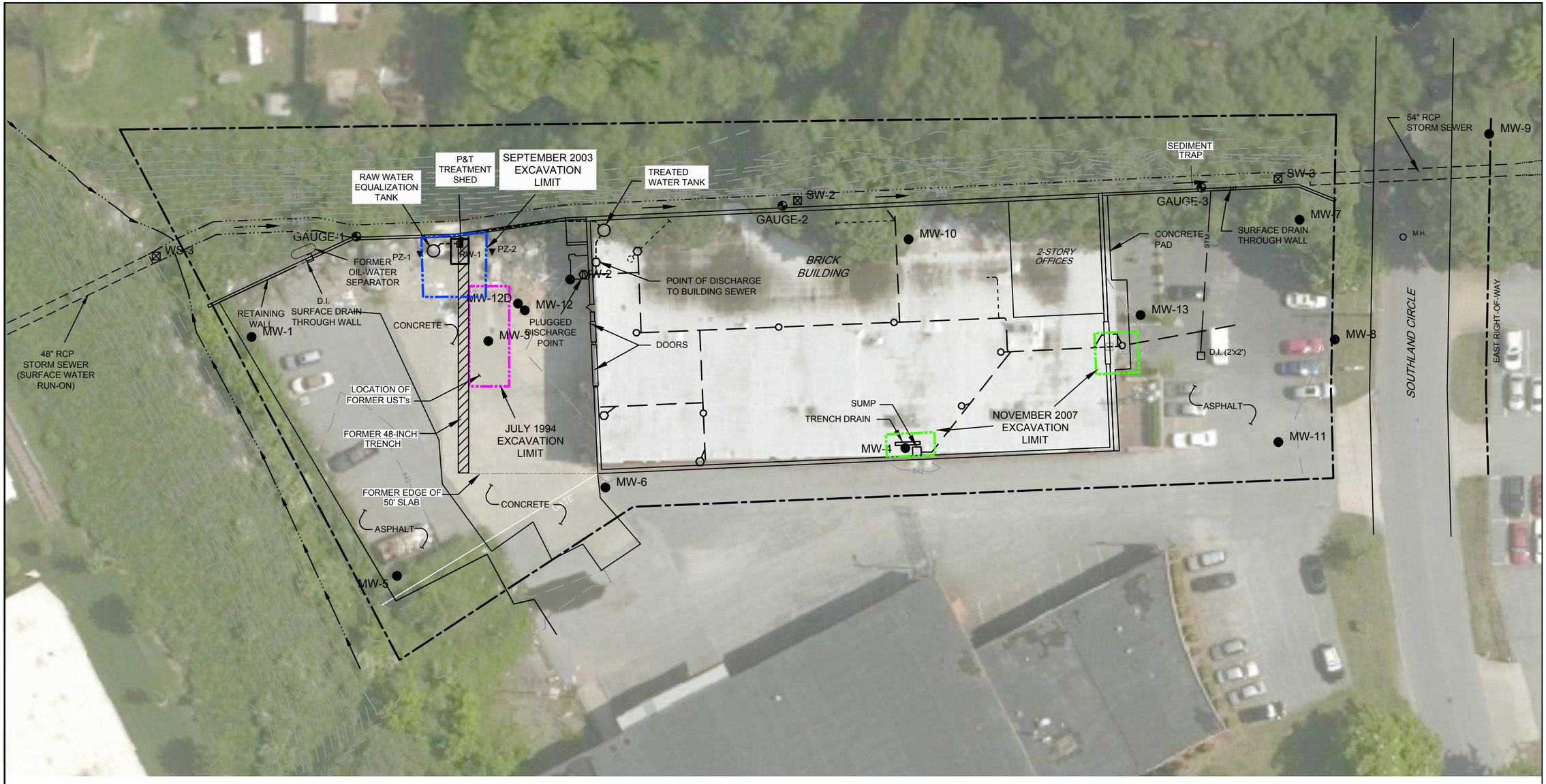
EPD requires that a professional engineer or geologist oversee the implementation of the VIRP in accordance with the provisions, purposes, standards and policies of the Georgia Voluntary Remediation Program Act. A monthly summary of hours and services invoiced for Terefe Mazengia, PG during the period starting from July 1 through December 30, 2017 are provided in Appendix B.

# Figures




SOURCE: USGS QUADRANGLE: NORTHWEST ATLANTA, GA (1993)

Figure 1
SITE LOCATION MAP
FIRST SEMI-ANNUAL PROGRESS REPORT
1610 SOUTHLAND CIRCLE
*Atlanta, Georgia*




LEGEND

- PROPERTY BOUNDARY
- EDGE OF DRAINAGE CHANNEL
- DRAINAGE DITCH (INTERMITTENT)
- CHAIN LINK FENCE
- D.I. DROP INLET
- SANITARY SEWER LINE
- DRAIN INLET
- CLEAN OUT PLUG
- PVC ADDITIONS TO ORIGINAL SYSTEM

N

0 20 40ft

Figure 2
SITE LAYOUT
FIRST SEMI-ANNUAL PROGRESS REPORT
1610 SOUTHLAND CIRCLE PROPERTY
*Atlanta, Georgia*


LEGEND

- PROPERTY BOUNDARY
- EDGE OF DRAINAGE CHANNEL
- DRAINAGE DITCH (INTERMITTENT)
- CHAIN LINK FENCE
- SANITARY SEWER LINE
- PVC ADDITIONS TO ORIGINAL SYSTEM

- D.I. DROP INLET
- DRAIN INLET
- CLEAN OUT PLUG
- MONITORING WELL LOCATION
- GEOPROBE BORING LOCATION BY CRA
- SOIL SAMPLES BY CRA
- IRM CONFIRMATION SAMPLES (NORTH WALL, CENTER-LINE, AND SOUTH WALL)

- 4-FOOT SOIL CORES
- GRAB SOIL SAMPLE
- RECOVERY WELL
- STAFF GAUGE LOCATION
- CHANNEL SAMPLE LOCATION
- GEOPROBE BORING LOCATION BY LAW
- PROPOSED SOIL SAMPLING LOCATION

N

0 20 40ft

GHD

# Figure 3
## SOIL SAMPLING LOCATIONS
## FIRST SEMI-ANNUAL PROGRESS REPORT
## 1610 SOUTHLAND CIRCLE PROPERTY
*Atlanta, Georgia*

18876-2017(015)GN-WA003 DEC 6, 2017


LEGEND

- PROPERTY BOUNDARY
- EDGE OF DRAINAGE CHANNEL
- DRAINAGE DITCH (INTERMITTENT)
- CHAIN LINK FENCE
- SANITARY SEWER LINE
- PVC ADDITIONS TO ORIGINAL SYSTEM
- D.I. DROP INLET
- DRAIN INLET
- CLEAN OUT PLUG
- MONITORING WELL LOCATION
- GEOPROBE BORING LOCATION BY CRA
- RECOVERY WELL
- MW-8R PROPOSED MONITORING WELL LOCATION

N

0 20 40ft

GHD

Figure 4
GROUNDWATER SAMPLING LOCATIONS
FIRST SEMI-ANNUAL PROGRESS REPORT
1610 SOUTHLAND CIRCLE PROPERTY
*Atlanta, Georgia*

18876-2017(015)GN-WA004 DEC 6, 2017


LEGEND

- PROPERTY BOUNDARY
- EDGE OF DRAINAGE CHANNEL
- DRAINAGE DITCH (INTERMITTENT)
- DRAINAGE DITCH (INTERMITTENT)
- STAFF GAUGE LOCATION
- PROPOSED SURFACE WATER AND SEDIMENT SAMPLE LOCATION

N

0 20 40ft

Figure 5
SURFACE WATER AND SEDIMENT SAMPLING LOCATIONS
FIRST SEMI-ANNUAL PROGRESS REPORT
1610 SOUTHLAND CIRCLE PROPERTY
*Atlanta, Georgia*

GHD

18876-2017(015)GN-WA005 JAN 2, 2018


LEGEND

- PROPERTY BOUNDARY
- EDGE OF DRAINAGE CHANNEL
- DRAINAGE DITCH (INTERMITTENT)
- CHAIN LINK FENCE
- SANITARY SEWER LINE
- PVC ADDITIONS TO ORIGINAL SYSTEM
- D.I. DROP INLET
- DRAIN INLET
- CLEAN OUT PLUG
- PROPOSED SOIL VAPOR SAMPLE LOCATION

N

0 20 40ft

GHD

# Figure 6
# SOIL VAPOR SAMPLING LOCATIONS
# FIRST SEMI-ANNUAL PROGRESS REPORT
# 1610 SOUTHLAND CIRCLE PROPERTY
*Atlanta, Georgia*

# Tables

# Table 1

## Generic HSRA Risk Reduction Standards (RRS)
## 1610 Southland Circle E
## Atlanta, Georgia

| Regulated Substances | Type 1/3 RRS for Groundwater (mg/L) | Type 4 RRS for Groundwater (mg/L) | Type 1 RRS for Soil (mg/kg) | Type 3 RRS for Soil (mg/kg) | Type 4 RRS for Soil (mg/kg) | RRS for Surface Water (1) (mg/L) |
|---|---|---|---|---|---|---|
| **VOCS** | | | | | | |
| 1,1,1-Trichloroethane | 2.0E-01 | 1.4E+01 | 2.0E+01 | 2.0E+01 | 2.0E+01 | NV |
| 1,1,2-Trichloroethane | 5.0E-03 | 4.6E-02 | 5.0E-01 | 5.0E-01 | 5.0E-01 | 1.6E-02 |
| 1,1-Dichloroethane | 4.0E+00 | 4.0E+00 | 4.0E+02 | 4.0E+02 | 4.0E+02 | NV |
| 1,1-Dichloroethene | 7.0E-03 | 5.2E-01 | 7.0E-01 | 7.0E-01 | 7.0E-01 | 7.1E+00 |
| 1,2-Dichloroethane | 5.0E-03 | 5.0E-03 | 5.0E-01 | 5.0E-01 | 5.0E-01 | 3.7E-02 |
| Acetone | 4.0E+00 | 4.6E+01 | 4.0E+02 | 4.0E+02 | 4.0E+02 | NV |
| Benzene | 5.0E-03 | 8.7E-03 | 5.0E-01 | 5.0E-01 | 5.0E-01 | 5.1E-02 |
| Bromomethane | 1.0E-02 | 1.3E-02 | 1.0E+00 | 1.0E+00 | 1.0E+00 | 1.5E+00 |
| Carbon disulfide | 4.0E+00 | 4.0E+00 | 4.0E+02 | 4.0E+02 | 4.0E+02 | NV |
| Chlorobenzene | 1.0E-01 | 1.4E-01 | 1.0E+01 | 1.0E+01 | 1.0E+01 | 1.6E+00 |
| Chloroethane | 1.0E-02 | 2.9E+01 | 1.0E+00 | 1.0E+00 | 8.3E+00 | NV |
| Chloroform | 1.0E-01 | 1.0E-01 | 3.9E+00 | 4.9E+00 | 4.9E+00 | 4.7E-01 |
| Chloromethane (methyl chloride) | 3.0E-03 | 2.6E-01 | 3.0E-01 | 3.0E-01 | 3.0E-01 | NV |
| cis-1,2-Dichloroethene | 7.0E-02 | 2.0E-01 | 7.0E+00 | 7.0E+00 | 7.0E+00 | NV |
| Cyclohexane | 5.0E-03 | 1.8E+01 | 2.0E+01 | 2.0E+01 | 2.0E+01 | NV |
| Dibromochloromethane | 1.0E-01 | 3.4E-01 | 1.0E+01 | 1.0E+01 | 1.0E+01 | 1.7E-02 |
| Ethylbenzene | 7.0E-01 | 7.0E-01 | 7.0E+01 | 7.0E+01 | 7.0E+01 | 2.1E+00 |
| Isopropylbenzene (cumene) | 5.0E-03 | 1.0E+00 | 2.2E+01 | 2.2E+01 | 2.2E+01 | NV |
| m-Xylenes | 1.0E+01 | 1.0E+01 | 1.0E+03 | 1.0E+03 | 1.0E+03 | NV |
| Methylene chloride | 5.0E-03 | 4.5E-01 | 5.0E-01 | 5.0E-01 | 5.0E-01 | 5.9E-01 |
| o-Xylene | 1.0E+01 | 1.0E+01 | 1.0E+03 | 1.0E+03 | 1.0E+03 | NV |
| p-Xylenes | 1.0E+01 | 1.0E+01 | 1.0E+03 | 1.0E+03 | 1.0E+03 | NV |
| Tetrachloroethene | 5.0E-03 | 9.8E-02 | 5.0E-01 | 5.0E-01 | 5.0E-01 | 3.3E-03 |
| Toluene | 1.0E+00 | 5.2E+00 | 1.0E+02 | 1.0E+02 | 1.0E+02 | 6.0E+00 |
| trans-1,2-Dichloroethene | 1.0E-01 | 2.0E+00 | 1.0E+01 | 1.0E+01 | 1.0E+01 | 1.0E+01 |
| Trichloroethene | 5.0E-03 | 5.8E-03 | 5.0E-01 | 5.0E-01 | 5.0E-01 | 3.0E-02 |
| Trichlorofluoromethane | 2.0E+00 | 3.1E+01 | 2.0E+02 | 2.0E+02 | 2.0E+02 | NV |
| Vinyl chloride | 2.0E-03 | 3.3E-03 | 2.0E-01 | 2.0E-01 | 2.0E-01 | 2.4E-03 |
| Xylenes (Total) | 1.0E+01 | 1.0E+01 | 1.0E+03 | 1.0E+03 | 1.0E+03 | NV |
| **SVOCs** | | | | | | |
| 1,2,3-Trichlorobenzene | 5.0E-03 | 8.2E-02 | 2.5E+01 | 2.5E+01 | 2.5E+01 | NV |
| 1,2,4-Trichlorobenzene | 7.0E-02 | 7.0E-02 | 1.1E+01 | 1.1E+01 | 1.1E+01 | 7.0E-02 |
| 1,2-Dichlorobenzene | 6.0E-01 | 6.0E-01 | 6.0E+01 | 6.0E+01 | 6.0E+01 | 1.3E+00 |
| 1,3-Dichlorobenzene | 6.0E-01 | 6.0E-01 | 6.0E+01 | 6.0E+01 | 6.0E+01 | 9.6E-01 |
| 1,4-Dichlorobenzene | 7.5E-02 | 7.5E-02 | 7.5E+00 | 7.5E+00 | 7.5E+00 | 1.9E-01 |
| Fluorene | 1.0E+00 | 4.1E+00 | 3.6E+02 | 3.6E+02 | 3.6E+02 | 5.3E+00 |
| Naphthalene | 2.0E-02 | 2.0E-02 | 1.0E+02 | 1.0E+02 | 1.0E+02 | NV |
| Phenanthrene | 1.0E-02 | 1.0E-02 | 1.1E+02 | 1.1E+02 | 1.1E+02 | NV |
| **PCBs** | | | | | | |
| Aroclor-1016 | 5.0E-04 | 3.7E-03 | 1.6E+00 | 1.6E+00 | 1.6E+00 | 6.4E-08 |
| Aroclor-1221 | 5.0E-04 | 5.0E-04 | 1.6E+00 | 1.6E+00 | 1.6E+00 | 6.4E-08 |
| Aroclor-1232 | 5.0E-04 | 5.0E-04 | 1.6E+00 | 1.6E+00 | 1.6E+00 | 6.4E-08 |
| Aroclor-1242 | 5.0E-04 | 5.0E-04 | 1.6E+00 | 1.6E+00 | 1.6E+00 | 6.4E-08 |
| Aroclor-1248 | 5.0E-04 | 5.0E-04 | 1.6E+00 | 1.6E+00 | 1.6E+00 | 6.4E-08 |
| Aroclor-1254 | 5.0E-04 | 5.0E-04 | 1.6E+00 | 1.6E+00 | 1.6E+00 | 6.4E-08 |
| Aroclor-1260 | 5.0E-04 | 5.0E-04 | 1.6E+00 | 1.6E+00 | 1.6E+00 | 6.4E-08 |

**Notes:**

NV - No value established.

(1) GEPD Rule 391-3-6-.03(5), In-Stream Water Quality Criteria (October 2015).

# Appendices

# Appendix A
# Derivation or Risk reduction Standards
# November 2017

# Appendix A

## Table 1
## Generic HSRA Risk Reduction Standards (RRS)
## 1610 Southland Circle E
## Atlanta, Georgia

| Regulated Substances | Type 1/3 RRS for Groundwater (mg/L) | Type 4 RRS for Groundwater (mg/L) | Type 1 RRS for Soil (mg/kg) | Type 3 RRS for Soil (mg/kg) | Type 4 RRS for Soil (mg/kg) | RRS for Surface Water (1) (mg/L) |
|---|---|---|---|---|---|---|
| **VOCS** | | | | | | |
| 1,1,1-Trichloroethane | 2.0E-01 | 1.4E+01 | 2.0E+01 | 2.0E+01 | 2.0E+01 | NV |
| 1,1,2-Trichloroethane | 5.0E-03 | 4.6E-02 | 5.0E-01 | 5.0E-01 | 5.0E-01 | 1.6E-02 |
| 1,1-Dichloroethane | 4.0E+00 | 4.0E+00 | 4.0E+02 | 4.0E+02 | 4.0E+02 | NV |
| 1,1-Dichloroethene | 7.0E-03 | 5.2E-01 | 7.0E-01 | 7.0E-01 | 7.0E-01 | 7.1E+00 |
| 1,2-Dichloroethane | 5.0E-03 | 5.0E-03 | 5.0E-01 | 5.0E-01 | 5.0E-01 | 3.7E-02 |
| Acetone | 4.0E+00 | 4.6E+01 | 4.0E+02 | 4.0E+02 | 4.0E+02 | NV |
| Benzene | 5.0E-03 | 8.7E-03 | 5.0E-01 | 5.0E-01 | 5.0E-01 | 5.1E-02 |
| Bromomethane | 1.0E-02 | 1.3E-02 | 1.0E+00 | 1.0E+00 | 1.0E+00 | 1.5E+00 |
| Carbon disulfide | 4.0E+00 | 4.0E+00 | 4.0E+02 | 4.0E+02 | 4.0E+02 | NV |
| Chlorobenzene | 1.0E-01 | 1.4E-01 | 1.0E+01 | 1.0E+01 | 1.0E+01 | 1.6E+00 |
| Chloroethane | 1.0E-02 | 2.9E+01 | 1.0E+00 | 1.0E+00 | 8.3E+00 | NV |
| Chloroform | 1.0E-01 | 1.0E-01 | 3.9E+00 | 4.9E+00 | 4.9E+00 | 4.7E-01 |
| Chloromethane (methyl chloride) | 3.0E-03 | 2.6E-01 | 3.0E-01 | 3.0E-01 | 3.0E-01 | NV |
| cis-1,2-Dichloroethene | 7.0E-02 | 2.0E-01 | 7.0E+00 | 7.0E+00 | 7.0E+00 | NV |
| Cyclohexane | 5.0E-03 | 1.8E+01 | 2.0E+01 | 2.0E+01 | 2.0E+01 | NV |
| Dibromochloromethane | 1.0E-01 | 3.4E-01 | 1.0E+01 | 1.0E+01 | 1.0E+01 | 1.7E-02 |
| Ethylbenzene | 7.0E-01 | 7.0E-01 | 7.0E+01 | 7.0E+01 | 7.0E+01 | 2.1E+00 |
| Isopropylbenzene (cumene) | 5.0E-03 | 1.0E+00 | 2.2E+01 | 2.2E+01 | 2.2E+01 | NV |
| m-Xylenes | 1.0E+01 | 1.0E+01 | 1.0E+03 | 1.0E+03 | 1.0E+03 | NV |
| Methylene chloride | 5.0E-03 | 4.5E-01 | 5.0E-01 | 5.0E-01 | 5.0E-01 | 5.9E-01 |
| o-Xylene | 1.0E+01 | 1.0E+01 | 1.0E+03 | 1.0E+03 | 1.0E+03 | NV |
| p-Xylenes | 1.0E+01 | 1.0E+01 | 1.0E+03 | 1.0E+03 | 1.0E+03 | NV |
| Tetrachloroethene | 5.0E-03 | 9.8E-02 | 5.0E-01 | 5.0E-01 | 5.0E-01 | 3.3E-03 |
| Toluene | 1.0E+00 | 5.2E+00 | 1.0E+02 | 1.0E+02 | 1.0E+02 | 6.0E+00 |
| trans-1,2-Dichloroethene | 1.0E-01 | 2.0E+00 | 1.0E+01 | 1.0E+01 | 1.0E+01 | 1.0E+01 |
| Trichloroethene | 5.0E-03 | 5.8E-03 | 5.0E-01 | 5.0E-01 | 5.0E-01 | 3.0E-02 |
| Trichlorofluoromethane | 2.0E+00 | 3.1E+01 | 2.0E+02 | 2.0E+02 | 2.0E+02 | NV |
| Vinyl chloride | 2.0E-03 | 3.3E-03 | 2.0E-01 | 2.0E-01 | 2.0E-01 | 2.4E-03 |
| Xylenes (Total) | 1.0E+01 | 1.0E+01 | 1.0E+03 | 1.0E+03 | 1.0E+03 | NV |
| **SVOCs** | | | | | | |
| 1,2,3-Trichlorobenzene | 5.0E-03 | 8.2E-02 | 2.5E+01 | 2.5E+01 | 2.5E+01 | NV |
| 1,2,4-Trichlorobenzene | 7.0E-02 | 7.0E-02 | 1.1E+01 | 1.1E+01 | 1.1E+01 | 7.0E-02 |
| 1,2-Dichlorobenzene | 6.0E-01 | 6.0E-01 | 6.0E+01 | 6.0E+01 | 6.0E+01 | 1.3E+00 |
| 1,3-Dichlorobenzene | 6.0E-01 | 6.0E-01 | 6.0E+01 | 6.0E+01 | 6.0E+01 | 9.6E-01 |
| 1,4-Dichlorobenzene | 7.5E-02 | 7.5E-02 | 7.5E+00 | 7.5E+00 | 7.5E+00 | 1.9E-01 |
| Fluorene | 1.0E+00 | 4.1E+00 | 3.6E+02 | 3.6E+02 | 3.6E+02 | 5.3E+00 |
| Naphthalene | 2.0E-02 | 2.0E-02 | 1.0E+02 | 1.0E+02 | 1.0E+02 | NV |
| Phenanthrene | 1.0E-02 | 1.0E-02 | 1.1E+02 | 1.1E+02 | 1.1E+02 | NV |
| **PCBs** | | | | | | |
| Aroclor-1016 | 5.0E-04 | 3.7E-03 | 1.6E+00 | 1.6E+00 | 1.6E+00 | 6.4E-08 |
| Aroclor-1221 | 5.0E-04 | 5.0E-04 | 1.6E+00 | 1.6E+00 | 1.6E+00 | 6.4E-08 |
| Aroclor-1232 | 5.0E-04 | 5.0E-04 | 1.6E+00 | 1.6E+00 | 1.6E+00 | 6.4E-08 |
| Aroclor-1242 | 5.0E-04 | 5.0E-04 | 1.6E+00 | 1.6E+00 | 1.6E+00 | 6.4E-08 |
| Aroclor-1248 | 5.0E-04 | 5.0E-04 | 1.6E+00 | 1.6E+00 | 1.6E+00 | 6.4E-08 |
| Aroclor-1254 | 5.0E-04 | 5.0E-04 | 1.6E+00 | 1.6E+00 | 1.6E+00 | 6.4E-08 |
| Aroclor-1260 | 5.0E-04 | 5.0E-04 | 1.6E+00 | 1.6E+00 | 1.6E+00 | 6.4E-08 |

**Notes:**
NV - No value established.
(1) GEPD Rule 391-3-6-.03(5), In-Stream Water Quality Criteria (October 2015).

# Appendix A

## Table 2
## Derivation of Generic Type 4 Target Concentrations for Groundwater
## 1610 Southland Circle E
## Atlanta, Georgia

| | | Toxicity Indices | | | | PRGs calculated from RAGS | | | Type 4 will not be less than: | | Type 4 |
|---|---|---|---|---|---|---|---|---|---|---|---|
| Regulated Substances | Toxicity Class | CSFo (Oral) | CSFi (Inhalation) | RfDo (Oral) | RfDi (Inhalation) | Carcinogenic (C) | Non-Carcinogenic (NC) | Lesser of C or NC | Type 1/3 RRS | Detection Limits | RRS Target Concentrations |
| | | (mg/kg-day)$^{-1}$ | (mg/kg-day)$^{-1}$ | (mg/kg-day) | (mg/kg-day) | (mg/L) | (mg/L) | (mg/L) | (mg/L) | (mg/L) | (mg/L) |
| **VOCS** | | | | | | | | | | | |
| 1,1,1-Trichloroethane | D | -- | -- | 2.0E+00 | 1.4E+00 | NV | 1.4E+01 | 1.4E+01 | 2.0E-01 | 5.0E-03 | 1.4E+01 |
| 1,1,2-Trichloroethane | C | 5.7E-02 | 5.6E-02 | 4.0E-03 | 5.7E-05 | 4.6E-02 | 4.1E-01 | 4.6E-02 | 5.0E-03 | 5.0E-03 | 4.6E-02 |
| 1,1-Dichloroethane | C | 5.7E-03 | 5.6E-03 | 2.0E-01 | -- | 4.6E-01 | 2.0E+01 | 4.6E-01 | 4.0E+00 | 5.0E-03 | 4.0E+00 |
| 1,1-Dichloroethene | C | -- | -- | 5.0E-02 | 5.7E-02 | NV | 5.2E-01 | 5.2E-01 | 7.0E-03 | 5.0E-03 | 5.2E-01 |
| 1,2-Dichloroethane | B2 | 9.1E-02 | 9.1E-02 | 6.0E-03 | 2.0E-03 | 2.9E-03 | 2.0E-02 | 2.9E-03 | 5.0E-03 | 5.0E-03 | 5.0E-03 |
| Acetone | D | -- | -- | 9.0E-01 | 8.9E+00 | NV | 4.6E+01 | 4.6E+01 | 4.0E+00 | 5.0E-02 | 4.6E+01 |
| Benzene | A | 5.5E-02 | 2.7E-02 | 4.0E-03 | 8.6E-03 | 8.7E-03 | 7.2E-02 | 8.7E-03 | 5.0E-03 | 5.0E-03 | 8.7E-03 |
| Bromomethane | D | -- | -- | 1.4E-03 | 1.4E-03 | NV | 1.3E-02 | 1.3E-02 | 1.0E-02 | 5.0E-03 | 1.3E-02 |
| Carbon disulfide | -- | -- | -- | 1.0E-01 | 2.0E-01 | NV | 1.7E+00 | 1.7E+00 | 4.0E+00 | 5.0E-03 | 4.0E+00 |
| Chlorobenzene | D | -- | -- | 2.0E-02 | 1.4E-02 | NV | 1.4E-01 | 1.4E-01 | 1.0E-01 | 5.0E-03 | 1.4E-01 |
| Chloroethane | -- | -- | -- | -- | 2.9E+00 | NV | 2.9E+01 | 2.9E+01 | 1.0E-02 | 1.0E-02 | 2.9E+01 |
| Chloroform | B2 | 3.1E-02 | 8.1E-02 | 1.0E-02 | 2.8E-02 | 3.4E-03 | 2.2E-01 | 3.4E-03 | 1.0E-01 | 5.0E-03 | 1.0E-01 |
| Chloromethane (methyl chloride) | D | -- | -- | -- | 2.6E-02 | NV | 2.6E-01 | 2.6E-01 | 3.0E-03 | 1.0E-02 | 2.6E-01 |
| cis-1,2-Dichloroethene | -- | -- | -- | 2.0E-03 | -- | NV | 2.0E-01 | 2.0E-01 | 7.0E-02 | 5.0E-03 | 2.0E-01 |
| Cyclohexane | -- | -- | -- | -- | 1.7E+00 | NV | 1.8E+01 | 1.8E+01 | 5.0E-03 | 5.0E-03 | 1.8E+01 |
| Dibromochloromethane | C | 8.4E-02 | -- | 2.0E-02 | -- | 3.4E-01 | 2.0E+00 | 3.4E-01 | 1.0E-01 | 5.0E-03 | 3.4E-01 |
| Ethylbenzene | D | 1.1E-02 | 8.8E-03 | 1.0E-01 | 2.9E-01 | 2.9E-01 | 2.3E+00 | 2.9E-01 | 7.0E-01 | 5.0E-03 | 7.0E-01 |
| Isopropylbenzene (cumene) | D | -- | -- | 1.0E-01 | 1.1E-01 | NV | 1.0E+00 | 1.0E+00 | 5.0E-03 | 5.0E-03 | 1.0E+00 |
| m-Xylenes | D | -- | -- | 2.0E-01 | 2.9E-02 | NV | 2.9E-01 | 2.9E-01 | 1.0E+01 | 1.0E-02 | 1.0E+01 |
| Methylene chloride | B2 | 2.0E-03 | 3.5E-05 | 6.0E-03 | 1.7E-01 | 1.2E+00 | 4.5E-01 | 4.5E-01 | 5.0E-03 | 5.0E-03 | 4.5E-01 |
| o-Xylene | D | -- | -- | 2.0E-01 | 2.9E-02 | NV | 2.9E-01 | 2.9E-01 | 1.0E+01 | 5.0E-03 | 1.0E+01 |
| p-Xylenes | D | -- | -- | 2.0E-01 | 2.9E-02 | NV | 2.9E-01 | 2.9E-01 | 1.0E+01 | 1.0E-02 | 1.0E+01 |
| Tetrachloroethene | -- | 2.1E-03 | 9.1E-04 | 6.0E-03 | 1.1E-02 | 2.6E-01 | 9.8E-02 | 9.8E-02 | 5.0E-03 | 5.0E-03 | 9.8E-02 |
| Toluene | D | -- | -- | 8.0E-02 | 1.4E+00 | NV | 5.2E+00 | 5.2E+00 | 1.0E+00 | 5.0E-03 | 5.2E+00 |
| trans-1,2-Dichloroethene | D | -- | -- | 2.0E-02 | -- | NV | 2.0E+00 | 2.0E+00 | 1.0E-01 | 5.0E-03 | 2.0E+00 |
| Trichloroethene | -- | 4.6E-02 | 1.4E-02 | 5.0E-04 | 5.7E-04 | 1.5E-02 | 5.8E-03 | 5.8E-03 | 5.0E-03 | 5.0E-03 | 5.8E-03 |
| Trichlorofluoromethane | -- | -- | -- | 3.0E-01 | -- | NV | 3.1E+01 | 3.1E+01 | 2.0E+00 | 5.0E-03 | 3.1E+01 |
| Vinyl chloride | A | 7.2E-01 | 1.5E-02 | 3.0E-03 | 2.9E-02 | 3.3E-03 | 1.5E-01 | 3.3E-03 | 2.0E-03 | 2.0E-03 | 3.3E-03 |
| Xylenes (Total) | D | -- | -- | 2.0E-01 | 2.9E-02 | NV | 2.9E-01 | 2.9E-01 | 1.0E+01 | 5.0E-03 | 1.0E+01 |
| **SVOCs** | | | | | | | | | | | |
| 1,2,3-Trichlorobenzene | -- | -- | -- | 8.0E-04 | -- | NV | 8.2E-02 | 8.2E-02 | 5.0E-03 | 5.0E-03 | 8.2E-02 |
| 1,2,4-Trichlorobenzene | D | 2.9E-02 | -- | 1.0E-02 | 5.7E-04 | 9.9E-01 | 5.8E-03 | 5.8E-03 | 7.0E-02 | 5.0E-03 | 7.0E-02 |
| 1,2-Dichlorobenzene | D | -- | -- | 9.0E-02 | 5.7E-02 | NV | 5.5E-01 | 5.5E-01 | 6.0E-01 | 5.0E-03 | 6.0E-01 |
| 1,3-Dichlorobenzene | D | -- | -- | -- | -- | NV | NV | NV | 6.0E-01 | 5.0E-03 | 6.0E-01 |
| 1,4-Dichlorobenzene | -- | 5.4E-03 | 3.9E-02 | 7.0E-02 | 2.3E-01 | 7.3E-03 | 1.8E+00 | 7.3E-03 | 7.5E-02 | 5.0E-03 | 7.5E-02 |
| Fluorene | D | -- | -- | 4.0E-02 | -- | NV | 4.1E+00 | 4.1E+00 | 1.0E+00 | 1.0E-02 | 4.1E+00 |
| Naphthalene | C | -- | 1.2E-01 | 2.0E-02 | 8.6E-04 | 2.4E-02 | 8.7E-03 | 8.7E-03 | 2.0E-02 | 1.0E-02 | 2.0E-02 |
| Phenanthrene | D | -- | -- | -- | -- | NV | NV | NV | 1.0E-02 | 1.0E-02 | 1.0E-02 |

# Appendix A

## Table 2
## Derivation of Generic Type 4 Target Concentrations for Groundwater
## 1610 Southland Circle E
## Atlanta, Georgia

| Regulated Substances | Toxicity Class | Toxicity Indices: CSFo (Oral) | CSFi (Inhalation) | RfDo (Oral) | RfDi (Inhalation) | PRGs calculated from RAGS: Carcinogenic (C) | Non-Carcinogenic (NC) | Lesser of C or NC | Type 4 will not be less than: Type 1/3 RRS | Detection Limits | Type 4 RRS Target Concentrations |
|---|---|---|---|---|---|---|---|---|---|---|---|
| | | (mg/kg-day)$^{-1}$ | (mg/kg-day)$^{-1}$ | (mg/kg-day) | (mg/kg-day) | (mg/L) | (mg/L) | (mg/L) | (mg/L) | (mg/L) | (mg/L) |
| **PCBs** | | | | | | | | | | | |
| Aroclor-1016 | B2 | 7.0E-02 | 7.0E-02 | 7.0E-05 | -- | 3.7E-03 | 7.2E-03 | 3.7E-03 | 5.0E-04 | 5.0E-04 | 3.7E-03 |
| Aroclor-1221 | B2 | 2.0E+00 | 2.0E+00 | -- | -- | 1.3E-04 | NV | 1.3E-04 | 5.0E-04 | 5.0E-04 | 5.0E-04 |
| Aroclor-1232 | B2 | 2.0E+00 | 2.0E+00 | -- | -- | 1.3E-04 | NV | 1.3E-04 | 5.0E-04 | 5.0E-04 | 5.0E-04 |
| Aroclor-1242 | B2 | 2.0E+00 | 2.0E+00 | -- | -- | 1.3E-04 | NV | 1.3E-04 | 5.0E-04 | 5.0E-04 | 5.0E-04 |
| Aroclor-1248 | B2 | 2.0E+00 | 2.0E+00 | -- | -- | 1.3E-04 | NV | 1.3E-04 | 5.0E-04 | 5.0E-04 | 5.0E-04 |
| Aroclor-1254 | B2 | 2.0E+00 | 2.0E+00 | 2.0E-05 | -- | 1.3E-04 | 2.0E-03 | 1.3E-04 | 5.0E-04 | 5.0E-04 | 5.0E-04 |
| Aroclor-1260 | B2 | 2.0E+00 | 2.0E+00 | -- | -- | 1.3E-04 | NV | 1.3E-04 | 5.0E-04 | 5.0E-04 | 5.0E-04 |

**Notes:**

-- No value available.

NV No value established.

RAGS Risk Assessment Guidance for Superfund, Volume 1, Part B [EPA/540/R-92/003], December, 1991.

**Exposure Equations:**

Carcinogenic Endpoints: $PRG = \frac{TR \times BW \times ATc}{EF \times ED \times [(CSFo \times IR) + (CSFi \times INH \times K)]}$

Non-Carcinogenic Endpoints: $PRG = \frac{TR \times BW \times ATnc}{EF \times ED \times [((1/RfDo) \times IR) + ((1/RfDi) \times INH \times K)]}$

**where :**

| | | | |
|---|---|---|---|
| Preliminary Risk Goal (mg/L) | PRG | calculated | |
| Target Risk Level (unitless) | TR | 1.00E-05 | GEPD, 2003 (Class A/B carcinogens) |
| Target Risk Level (unitless) | TR | 1.00E-04 | GEPD, 2003 (Class C carcinogens) |
| Target Hazard Level (unitless) | THQ | 1.00E+00 | GEPD, 2003 |
| Cancer Slope Factor (per mg/kg-day) | CSF | chemical-specific | RSL, 2011 |
| Reference Dose Factor (mg/kg-day) | RfD | chemical-specific | RSL, 2011 |
| Ingestion Rate (L/day) | IR | 1 | GEPD, 2003 |
| Inhalation Rate ($m^3$/day) | INH | 20 | GEPD, 2003 |
| Exposure Frequency (days/year) | EF | 250 | GEPD, 2003 |
| Exposure Duration (years) | ED | 25 | GEPD, 2003 |
| Body Weight (kg) | BW | 70 | GEPD, 2003 |
| Averaging Time - carc. (days) | ATc | 25,550 | GEPD, 2003 |
| Averaging Time - noncarc. (days) | ATnc | 9,125 | GEPD, 2003 |
| Volatilization Factor ($L/m^3$) | K | 0.5 | GEPD, 2003 |

**References:**

GEPD, 2003: Rule 391-3-19-.07, Risk Reduction Standards, July 23, 2003.

RSL, 2017: Regional Screening Level Table Master, June 2017.

# Appendix A

## Table 3
## Derivation of Generic Type 1 Target Concentrations for Soil
## 1610 Southland Circle E
## Atlanta, Georgia

| Regulated Substances | Toxicity Class | Toxicity Indices: CSFo (Oral) | CSFi (Inhalation) | RfDo (Oral) | RfDi (Inhalation) | Volatilization Factor (VF) | PRGs calculated from RAGS: Carcinogenic (C) | Non-Carcinogenic (NC) | Lesser of C or NC | Notification Concentrations | App III Table 2 Criteria | Type 1 GW x 100 | Maximum Concentration | Type 1 RRS Target Concentrations |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | | $(mg/kg\text{-}day)^{-1}$ | $(mg/kg\text{-}day)^{-1}$ | (mg/kg-day) | (mg/kg-day) | $(m^3/kg)$ | (mg/kg) | (mg/kg) | (mg/kg) | (mg/kg) | (mg/kg) | (mg/kg) | (mg/kg) | (mg/kg) |
| **VOCS** | | | | | | | | | | | | | | |
| 1,1,1-Trichloroethane | D | -- | -- | 2.0E+00 | 1.4E+00 | 1.5E+03 | NV | 1.1E+04 | 1.1E+04 | 5.4E+00 | NV | 2.0E+01 | 2.0E+01 | 2.0E+01 |
| 1,1,2-Trichloroethane | C | 5.7E-02 | 5.6E-02 | 4.0E-03 | 5.7E-05 | 8.8E+03 | 1.7E+02 | 2.6E+03 | 1.7E+02 | 5.0E-01 | NV | 5.0E-01 | 5.0E-01 | 5.0E-01 |
| 1,1-Dichloroethane | C | 5.7E-03 | 5.6E-03 | 2.0E-01 | -- | 2.1E+03 | 4.2E+02 | 1.3E+05 | 4.2E+02 | 3.0E-02 | NV | 4.0E+02 | 4.0E+02 | 4.0E+02 |
| 1,1-Dichloroethene | C | -- | -- | 5.0E-02 | 5.7E-02 | 8.6E+02 | NV | 2.4E+02 | 2.4E+02 | 3.6E-01 | NV | 7.0E-01 | 7.0E-01 | 7.0E-01 |
| 1,2-Dichloroethane | B2 | 9.1E-02 | 9.1E-02 | 6.0E-03 | 2.0E-03 | 5.2E+03 | 6.3E+01 | 5.1E+01 | 5.1E+01 | 2.0E-02 | NV | 5.0E-01 | 5.0E-01 | 5.0E-01 |
| Acetone | D | -- | -- | 9.0E-01 | 8.9E+00 | 6.7E+03 | NV | 1.9E+05 | 1.9E+05 | 2.7E+00 | NV | 4.0E+02 | 4.0E+02 | 4.0E+02 |
| Benzene | A | 5.5E-02 | 2.7E-02 | 4.0E-03 | 8.6E-03 | 4.5E+03 | 1.8E+01 | 1.8E+02 | 1.8E+01 | 2.0E-02 | NV | 5.0E-01 | 5.0E-01 | 5.0E-01 |
| Bromomethane | D | -- | -- | 1.4E-03 | 1.4E-03 | 1.0E+03 | NV | 7.0E+00 | 7.0E+00 | 8.0E-01 | NV | 1.0E+00 | 1.0E+00 | 1.0E+00 |
| Carbon disulfide | -- | -- | -- | 1.0E-01 | 2.0E-01 | 8.8E+02 | NV | 8.5E+02 | 8.5E+02 | 5.0E-03 | NV | 4.0E+02 | 4.0E+02 | 4.0E+02 |
| Chlorobenzene | D | -- | -- | 2.0E-02 | 1.4E-02 | 8.5E+03 | NV | 5.7E+02 | 5.7E+02 | 4.2E+00 | NV | 1.0E+01 | 1.0E+01 | 1.0E+01 |
| Chloroethane | -- | -- | -- | -- | 2.9E+00 | 1.0E+03 | NV | 1.5E+04 | 1.5E+04 | 1.7E-01 | NV | 1.0E+00 | 1.0E+00 | 1.0E+00 |
| Chloroform | B2 | 3.1E-02 | 8.1E-02 | 1.0E-02 | 2.8E-02 | 2.8E+03 | 3.9E+00 | 3.5E+02 | 3.9E+00 | 6.8E-01 | NV | 1.0E+01 | 1.0E+01 | 3.9E+00 |
| Chloromethane (methyl chloride) | D | -- | -- | -- | 2.6E-02 | 8.2E+02 | NV | 1.0E+02 | 1.0E+02 | 4.0E-02 | NV | 3.0E-01 | 3.0E-01 | 3.0E-01 |
| cis-1,2-Dichloroethene | -- | -- | -- | 2.0E-03 | -- | 2.7E+03 | NV | 1.3E+03 | 1.3E+03 | 5.3E-01 | NV | 7.0E+00 | 7.0E+00 | 7.0E+00 |
| Cyclohexane | -- | -- | -- | -- | 1.7E+00 | 7.7E+02 | NV | 6.5E+03 | 6.5E+03 | 2.0E+01 | NV | 5.0E-01 | 2.0E+01 | 2.0E+01 |
| Dibromochloromethane | C | 8.4E-02 | -- | 2.0E-02 | -- | 8.8E+03 | 1.8E+02 | 1.3E+04 | 1.8E+02 | 1.6E+00 | NV | 1.0E+01 | 1.0E+01 | 1.0E+01 |
| Ethylbenzene | D | 1.1E-02 | 8.8E-03 | 1.0E-01 | 2.9E-01 | 7.6E+03 | 9.2E+02 | 9.1E+03 | 9.2E+02 | 2.0E+01 | NV | 7.0E+01 | 7.0E+01 | 7.0E+01 |
| Isopropylbenzene (cumene) | D | -- | -- | 1.0E-01 | 1.1E-01 | 8.4E+03 | NV | 4.4E+03 | 4.4E+03 | 2.2E+01 | NV | 5.0E-01 | 2.2E+01 | 2.2E+01 |
| m-Xylenes | D | -- | -- | 2.0E-01 | 2.9E-02 | 7.3E+03 | NV | 1.0E+03 | 1.0E+03 | 2.0E+01 | NV | 1.0E+03 | 1.0E+03 | 1.0E+03 |
| Methylene chloride | B2 | 2.0E-03 | 3.5E-05 | 6.0E-03 | 1.7E-01 | 2.1E+03 | 3.6E+03 | 1.2E+03 | 1.2E+03 | 8.0E-02 | NV | 5.0E-01 | 5.0E-01 | 5.0E-01 |
| o-Xylene | D | -- | -- | 2.0E-01 | 2.9E-02 | 8.7E+03 | NV | 1.2E+03 | 1.2E+03 | 2.0E+01 | NV | 1.0E+03 | 1.0E+03 | 1.0E+03 |
| p-Xylenes | D | -- | -- | 2.0E-01 | 2.9E-02 | 7.5E+03 | NV | 1.0E+03 | 1.0E+03 | 2.0E+01 | NV | 1.0E+03 | 1.0E+03 | 1.0E+03 |
| Tetrachloroethene | -- | 2.1E-03 | 9.1E-04 | 6.0E-03 | 1.1E-02 | 2.6E+03 | 3.1E+02 | 1.4E+02 | 1.4E+02 | 1.8E-01 | NV | 5.0E-01 | 5.0E-01 | 5.0E-01 |
| Toluene | D | -- | -- | 8.0E-02 | 1.4E+00 | 5.6E+03 | NV | 2.2E+04 | 2.2E+04 | 1.4E+01 | NV | 1.0E+02 | 1.0E+02 | 1.0E+02 |
| trans-1,2-Dichloroethene | D | -- | -- | 2.0E-02 | -- | 1.8E+03 | NV | 1.3E+04 | 1.3E+04 | 5.3E-01 | NV | 1.0E+01 | 1.0E+01 | 1.0E+01 |
| Trichloroethene | -- | 4.6E-02 | 1.4E-02 | 5.0E-04 | 5.7E-04 | 2.4E+03 | 1.8E+01 | 6.8E+00 | 6.8E+00 | 1.3E-01 | NV | 5.0E-01 | 5.0E-01 | 5.0E-01 |
| Trichlorofluoromethane | -- | -- | -- | 3.0E-01 | -- | 5.0E+02 | NV | 1.9E+05 | 1.9E+05 | 7.0E-01 | NV | 2.0E+02 | 2.0E+02 | 2.0E+02 |
| Vinyl chloride | A | 7.2E-01 | 1.5E-02 | 3.0E-03 | 2.9E-02 | 5.8E+02 | 3.5E+00 | 7.7E+01 | 3.5E+00 | 4.0E-02 | NV | 2.0E-01 | 2.0E-01 | 2.0E-01 |
| Xylenes (Total) | D | -- | -- | 2.0E-01 | 2.9E-02 | 7.7E+03 | NV | 1.1E+03 | 1.1E+03 | 2.0E+01 | NV | 1.0E+03 | 1.0E+03 | 1.0E+03 |
| **SVOCs** | | | | | | | | | | | | | | |
| 1,2,3-Trichlorobenzene | -- | -- | -- | 8.0E-04 | -- | 4.4E+04 | NV | 5.1E+02 | 5.1E+02 | 2.5E+01 | NV | 5.0E-01 | 2.5E+01 | 2.5E+01 |
| 1,2,4-Trichlorobenzene | D | 2.9E-02 | -- | 1.0E-02 | 5.7E-04 | 4.1E+04 | 5.2E+03 | 1.1E+02 | 1.1E+02 | 1.1E+01 | NV | 7.0E+00 | 1.1E+01 | 1.1E+01 |
| 1,2-Dichlorobenzene | D | -- | -- | 9.0E-02 | 5.7E-02 | 1.6E+04 | NV | 4.1E+03 | 4.1E+03 | 2.5E+01 | NV | 6.0E+01 | 6.0E+01 | 6.0E+01 |
| 1,3-Dichlorobenzene | D | -- | -- | -- | -- | 1.3E+04 | NV | NV | NV | 2.2E+00 | NV | 6.0E+01 | 6.0E+01 | 6.0E+01 |
| 1,4-Dichlorobenzene | -- | 5.4E-03 | 3.9E-02 | 7.0E-02 | 2.3E-01 | 1.4E+04 | 4.1E+01 | 1.2E+04 | 4.1E+01 | 6.8E+00 | NV | 7.5E+00 | 7.5E+00 | 7.5E+00 |
| Fluorene | D | -- | -- | 4.0E-02 | -- | 3.9E+05 | NV | 2.6E+04 | 2.6E+04 | 3.6E+02 | NV | 1.0E+02 | 3.6E+02 | 3.6E+02 |
| Naphthalene | C | -- | 1.2E-01 | 2.0E-02 | 8.6E-04 | 6.4E+04 | 6.1E+02 | 2.6E+02 | 2.6E+02 | 1.0E+02 | NV | 2.0E+00 | 1.0E+02 | 1.0E+02 |
| Phenanthrene | D | -- | -- | -- | -- | NV | NV | NV | NV | 1.1E+02 | NV | 1.0E+00 | 1.1E+02 | 1.1E+02 |

# Appendix A

## Table 3
## Derivation of Generic Type 1 Target Concentrations for Soil
## 1610 Southland Circle E
## Atlanta, Georgia

| Regulated Substances | Toxicity Class | Toxicity Indices: CSFo (Oral) (mg/kg-day)$^{-1}$ | CSFi (Inhalation) (mg/kg-day)$^{-1}$ | RfDo (Oral) (mg/kg-day) | RfDi (Inhalation) (mg/kg-day) | Volatilization Factor (VF) ($m^3$/kg) | PRGs calculated from RAGS: Carcinogenic (C) (mg/kg) | Non-Carcinogenic (NC) (mg/kg) | Lesser of C or NC (mg/kg) | Notification Concentrations (mg/kg) | App III Table 2 Criteria (mg/kg) | Type 1 GW x 100 (mg/kg) | Maximum Concentration (mg/kg) | Type 1 RRS Target Concentrations (mg/kg) |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| **PCBs** | | | | | | | | | | | | | | |
| Aroclor-1016 | B2 | 7.0E-02 | 7.0E-02 | 7.0E-05 | -- | 9.9E+05 | 2.1E+02 | 4.5E+01 | 4.5E+01 | 1.6E+00 | NV | 5.0E-02 | 1.6E+00 | 1.6E+00 |
| Aroclor-1221 | B2 | 2.0E+00 | 2.0E+00 | -- | -- | 2.8E+05 | 5.1E+00 | NV | 5.1E+00 | 1.6E+00 | NV | 5.0E-02 | 1.6E+00 | 1.6E+00 |
| Aroclor-1232 | B2 | 2.0E+00 | 2.0E+00 | -- | -- | 1.6E+05 | 4.0E+00 | NV | 4.0E+00 | 1.6E+00 | NV | 5.0E-02 | 1.6E+00 | 1.6E+00 |
| Aroclor-1242 | B2 | 2.0E+00 | 2.0E+00 | -- | -- | 8.2E+05 | 7.5E+00 | NV | 7.5E+00 | 1.6E+00 | NV | 5.0E-02 | 1.6E+00 | 1.6E+00 |
| Aroclor-1248 | B2 | 2.0E+00 | 2.0E+00 | -- | -- | 8.7E+05 | 7.5E+00 | NV | 7.5E+00 | 1.6E+00 | NV | 5.0E-02 | 1.6E+00 | 1.6E+00 |
| Aroclor-1254 | B2 | 2.0E+00 | 2.0E+00 | 2.0E-05 | -- | 1.2E+06 | 7.5E+00 | 1.3E+01 | 7.5E+00 | 1.6E+00 | NV | 5.0E-02 | 1.6E+00 | 1.6E+00 |
| Aroclor-1260 | B2 | 2.0E+00 | 2.0E+00 | -- | -- | 1.8E+06 | 7.5E+00 | NV | 7.5E+00 | 1.6E+00 | NV | 5.0E-02 | 1.6E+00 | 1.6E+00 |

**Notes:**

-- No value available.

NV No value established.

RAGS Risk Assessment Guidance for Superfund, Volume 1, Part B [EPA/540/R-92/003], December, 1991.

**Exposure Equations:**

Carcinogenic Endpoints: $$PRG = \frac{TR \times BW \times ATc}{EF \times ED \times [(CSFo \times IR \times CF) + (CSFi \times INH \times (1/PEF \text{ or } VF))]}$$

Non-Carcinogenic Endpoints: $$PRG = \frac{TR \times BW \times ATnc}{EF \times ED \times [((1/RfDo) \times IR \times CF) + ((1/RfDi) \times INH \times (1/PEF \text{ or } VF))]}$$

**where :**

| | | | |
|---|---|---|---|
| Preliminary Risk Goal (mg/kg) | PRG | calculated | |
| Target Risk Level (unitless) | TR | 1.0E-05 | GEPD, 2003 (Class A/B carcinogens) |
| Target Hazard Level (unitless) | TR | 1.0E-04 | GEPD, 2003 (Class C carcinogens) |
| Target Hazard Level (unitless) | THQ | 1 | GEPD, 2003 |
| Cancer Slope Factor (per mg/kg-day) | CSFo | chemical-specific | RSL, 2011 |
| Reference Dose Factor (mg/kg-day) | RfD | chemical-specific | RSL, 2011 |
| Ingestion Rate (mg/day) | IR | 114 | GEPD, 2003 |
| Inhalation Rate ($m^3$/day) | INH | 15 | GEPD, 2003 |
| Exposure Frequency (days/year) | EF | 350 | GEPD, 2003 |
| Exposure Duration (years) | ED | 30 | GEPD, 2003 |
| Body Weight (kg) | BW | 70 | GEPD, 2003 |
| Conversion Factor (kg/mg) | CF | 1.0E-06 | -- |
| Averaging Time - carc. (days) | ATc | 25,550 | GEPD, 2003 |
| Averaging Time - noncarc. (days) | ATnc | 10,950 | GEPD, 2003 |
| Particulate Emission Factor ($m^3$/kg) | PEF | 4.63E+09 | GEPD, 2003 |
| Volatilization Factor ($m^3$/kg) | VF | chemical-specific | Refer to Table 3.7 |

**References:**

GEPD, 2003: Rule 391-3-19-.07, Risk Reduction Standards, July 23, 2003.

RSL, 2017: Regional Screening Level Table Master, June 2017.

# Appendix A

## Table 4
## Derivation of Generic Type 3 Target Concentrations for Soil
## 1610 Southland Circle E
## Atlanta, Georgia

| | | Toxicity Indices | | | | | Longterm On-Site Worker | | | | App III | | | Type 3 |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Regulated Substances | Toxicity Class | CSFo (Oral) | CSFi (Inhalation) | RfDo (Oral) | RfDi (Inhalation) | Volatilization Factor (VF) | Carcinogenic (C) | Non-Carcinogenic (NC) | Lesser of C or NC | Notification Concentration | Table 2 Criteria | Type 1 GW x 100 | Maximum Concentration | RRS Target Concentrations |
| | | $(mg/kg\text{-}day)^{-1}$ | $(mg/kg\text{-}day)^{-1}$ | (mg/kg-day) | (mg/kg-day) | $(m^3/kg)$ | (mg/kg) | (mg/kg) | (mg/kg) | (mg/kg) | (mg/kg) | (mg/kg) | (mg/kg) | (mg/kg) |
| **VOCS** | | | | | | | | | | | | | | |
| 1,1,1-Trichloroethane | D | -- | -- | 2.0E+00 | 1.4E+00 | 1.5E+03 | NV | 1.1E+04 | 1.1E+04 | 5.4E+00 | NV | 2.0E+01 | 2.0E+01 | 2.0E+01 |
| 1,1,2-Trichloroethane | C | 5.7E-02 | 5.6E-02 | 4.0E-03 | 5.7E-05 | 8.8E+03 | 2.2E+02 | 8.2E+03 | 2.2E+02 | 5.0E-01 | NV | 5.0E-01 | 5.0E-01 | 5.0E-01 |
| 1,1-Dichloroethane | C | 5.7E-03 | 5.6E-03 | 2.0E-01 | -- | 2.1E+03 | 5.4E+02 | 4.1E+05 | 5.4E+02 | 3.0E-02 | NV | 4.0E+02 | 4.0E+02 | 4.0E+02 |
| 1,1-Dichloroethene | C | -- | -- | 5.0E-02 | 5.7E-02 | 8.6E+02 | NV | 2.5E+02 | 2.5E+02 | 3.6E-01 | NV | 7.0E-01 | 7.0E-01 | 7.0E-01 |
| 1,2-Dichloroethane | B2 | 9.1E-02 | 9.1E-02 | 6.0E-03 | 2.0E-03 | 5.2E+03 | 8.1E+00 | 5.3E+01 | 8.1E+00 | 2.0E-02 | NV | 5.0E-01 | 5.0E-01 | 5.0E-01 |
| Acetone | D | -- | -- | 9.0E-01 | 8.9E+00 | 6.7E+03 | NV | 2.6E+05 | 2.6E+05 | 2.7E+00 | NV | 4.0E+02 | 4.0E+02 | 4.0E+02 |
| Benzene | A | 5.5E-02 | 2.7E-02 | 4.0E-03 | 8.6E-03 | 4.5E+03 | 2.3E+01 | 1.9E+02 | 2.3E+01 | 2.0E-02 | NV | 5.0E-01 | 5.0E-01 | 5.0E-01 |
| Bromomethane | D | -- | -- | 1.4E-03 | 1.4E-03 | 1.0E+03 | NV | 7.4E+00 | 7.4E+00 | 8.0E-01 | NV | 1.0E+00 | 1.0E+00 | 1.0E+00 |
| Carbon disulfide | -- | -- | -- | 1.0E-01 | 2.0E-01 | 8.8E+02 | NV | 9.0E+02 | 9.0E+02 | 5.0E-03 | NV | 4.0E+02 | 4.0E+02 | 4.0E+02 |
| Chlorobenzene | D | -- | -- | 2.0E-02 | 1.4E-02 | 8.5E+03 | NV | 6.1E+02 | 6.1E+02 | 4.2E+00 | NV | 1.0E+01 | 1.0E+01 | 1.0E+01 |
| Chloroethane | -- | -- | -- | -- | 2.9E+00 | 1.0E+03 | NV | 1.5E+04 | 1.5E+04 | 1.7E-01 | NV | 1.0E+00 | 1.0E+00 | 1.0E+00 |
| Chloroform | B2 | 3.1E-02 | 8.1E-02 | 1.0E-02 | 2.8E-02 | 2.8E+03 | 4.9E+00 | 3.9E+02 | 4.9E+00 | 6.8E-01 | NV | 1.0E+01 | 1.0E+01 | 4.9E+00 |
| Chloromethane (methyl chloride) | D | -- | -- | -- | 2.6E-02 | 8.2E+02 | NV | 1.1E+02 | 1.1E+02 | 4.0E-02 | NV | 3.0E-01 | 3.0E-01 | 3.0E-01 |
| cis-1,2-Dichloroethene | -- | -- | -- | 2.0E-03 | -- | 2.7E+03 | NV | 4.1E+03 | 4.1E+03 | 5.3E-01 | NV | 7.0E+00 | 7.0E+00 | 7.0E+00 |
| Cyclohexane | -- | -- | -- | -- | 1.7E+00 | 7.7E+02 | NV | 6.8E+03 | 6.8E+03 | 2.0E+01 | NV | 5.0E-01 | 2.0E+01 | 2.0E+01 |
| Dibromochloromethane | C | 8.4E-02 | -- | 2.0E-02 | -- | 8.8E+03 | 6.8E+03 | 4.1E+04 | 6.8E+03 | 1.6E+00 | NV | 1.0E+01 | 1.0E+01 | 1.0E+01 |
| Ethylbenzene | D | 1.1E-02 | 8.8E-03 | 1.0E-01 | 2.9E-01 | 7.6E+03 | 1.2E+03 | 1.1E+04 | 1.2E+03 | 2.0E+01 | NV | 7.0E+01 | 7.0E+01 | 7.0E+01 |
| Isopropylbenzene (cumene) | D | -- | -- | 1.0E-01 | 1.1E-01 | 8.4E+03 | NV | 4.8E+03 | 4.8E+03 | 2.2E+01 | NV | 5.0E-01 | 2.2E+01 | 2.2E+01 |
| m-Xylenes | D | -- | -- | 2.0E-01 | 2.9E-02 | 7.3E+03 | NV | 1.1E+03 | 1.1E+03 | 2.0E+01 | NV | 1.0E+03 | 1.0E+03 | 1.0E+03 |
| Methylene chloride | B2 | 2.0E-03 | 3.5E-05 | 6.0E-03 | 1.7E-01 | 2.1E+03 | 6.6E+03 | 1.6E+03 | 1.6E+03 | 8.0E-02 | NV | 5.0E-01 | 5.0E-01 | 5.0E-01 |
| o-Xylene | D | -- | -- | 2.0E-01 | 2.9E-02 | 8.7E+03 | NV | 1.3E+03 | 1.3E+03 | 2.0E+01 | NV | 1.0E+03 | 1.0E+03 | 1.0E+03 |
| p-Xylenes | D | -- | -- | 2.0E-01 | 2.9E-02 | 7.5E+03 | NV | 1.1E+03 | 1.1E+03 | 2.0E+01 | NV | 1.0E+03 | 1.0E+03 | 1.0E+03 |
| Tetrachloroethene | -- | 2.1E-03 | 9.1E-04 | 6.0E-03 | 1.1E-02 | 2.6E+03 | 4.1E+02 | 1.5E+02 | 1.5E+02 | 1.8E-01 | NV | 5.0E-01 | 5.0E-01 | 5.0E-01 |
| Toluene | D | -- | -- | 8.0E-02 | 1.4E+00 | 5.6E+03 | NV | 3.3E+04 | 3.3E+04 | 1.4E+01 | NV | 1.0E+02 | 1.0E+02 | 1.0E+02 |
| trans-1,2-Dichloroethene | D | -- | -- | 2.0E-02 | -- | 1.8E+03 | NV | 4.1E+04 | 4.1E+04 | 5.3E-01 | NV | 1.0E+01 | 1.0E+01 | 1.0E+01 |
| Trichloroethene | -- | 4.6E-02 | 1.4E-02 | 5.0E-04 | 5.7E-04 | 2.4E+03 | 2.4E+01 | 7.1E+00 | 7.1E+00 | 1.3E-01 | NV | 5.0E-01 | 5.0E-01 | 5.0E-01 |
| Trichlorofluoromethane | -- | -- | -- | 3.0E-01 | -- | 5.0E+02 | NV | 6.1E+05 | 6.1E+05 | 7.0E-01 | NV | 2.0E+02 | 2.0E+02 | 2.0E+02 |
| Vinyl chloride | A | 7.2E-01 | 1.5E-02 | 3.0E-03 | 2.9E-02 | 5.8E+02 | 5.0E+00 | 8.3E+01 | 5.0E+00 | 4.0E-02 | NV | 2.0E-01 | 2.0E-01 | 2.0E-01 |
| Xylenes (Total) | D | -- | -- | 2.0E-01 | 2.9E-02 | 7.7E+03 | NV | 1.1E+03 | 1.1E+03 | 2.0E+01 | NV | 1.0E+03 | 1.0E+03 | 1.0E+03 |
| **SVOCs** | | | | | | | | | | | | | | |
| 1,2,3-Trichlorobenzene | -- | -- | -- | 8.0E-04 | -- | 4.4E+04 | NV | 1.6E+03 | 1.6E+03 | 2.5E+01 | NV | 5.0E-01 | 2.5E+01 | 2.5E+01 |
| 1,2,4-Trichlorobenzene | D | 2.9E-02 | -- | 1.0E-02 | 5.7E-04 | 4.1E+04 | 2.0E+04 | 1.2E+02 | 1.2E+02 | 1.1E+01 | NV | 7.0E+00 | 1.1E+01 | 1.1E+01 |
| 1,2-Dichlorobenzene | D | -- | -- | 9.0E-02 | 5.7E-02 | 1.6E+04 | NV | 4.5E+03 | 4.5E+03 | 2.5E+01 | NV | 6.0E+01 | 6.0E+01 | 6.0E+01 |
| 1,3-Dichlorobenzene | D | -- | -- | -- | -- | 1.3E+04 | NV | NV | NV | 2.2E+00 | NV | 6.0E+01 | 6.0E+01 | 6.0E+01 |
| 1,4-Dichlorobenzene | -- | 5.4E-03 | 3.9E-02 | 7.0E-02 | 2.3E-01 | 1.4E+04 | 5.2E+01 | 1.5E+04 | 5.2E+01 | 6.8E+00 | NV | 7.5E+00 | 7.5E+00 | 7.5E+00 |
| Fluorene | D | -- | -- | 4.0E-02 | -- | 3.9E+05 | NV | 8.2E+04 | 8.2E+04 | 3.6E+02 | NV | 1.0E+02 | 3.6E+02 | 3.6E+02 |
| Naphthalene | C | -- | 1.2E-01 | 2.0E-02 | 8.6E-04 | 6.4E+04 | 7.7E+02 | 2.8E+02 | 2.8E+02 | 1.0E+02 | NV | 2.0E+00 | 1.0E+02 | 1.0E+02 |
| Phenanthrene | D | -- | -- | -- | -- | NV | NV | NV | NV | 1.1E+02 | NV | 1.0E+00 | 1.1E+02 | 1.1E+02 |

# Appendix A

## Table 4
## Derivation of Generic Type 3 Target Concentrations for Soil
## 1610 Southland Circle E
## Atlanta, Georgia

| Regulated Substances | Toxicity Class | Toxicity Indices: CSFo (Oral) | CSFi (Inhalation) | RfDo (Oral) | RfDi (Inhalation) | Volatilization Factor (VF) | Longterm On-Site Worker: Carcinogenic (C) | Non-Carcinogenic (NC) | Lesser of C or NC | Notification Concentration | App III Table 2 Criteria | Type 1 GW x 100 | Maximum Concentration | Type 3 RRS Target Concentrations |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | | $(mg/kg\text{-}day)^{-1}$ | $(mg/kg\text{-}day)^{-1}$ | (mg/kg-day) | (mg/kg-day) | $(m^3/kg)$ | (mg/kg) | (mg/kg) | (mg/kg) | (mg/kg) | (mg/kg) | (mg/kg) | (mg/kg) | (mg/kg) |
| **PCBs** | | | | | | | | | | | | | | |
| Aroclor-1016 | B2 | 7.0E-02 | 7.0E-02 | 7.0E-05 | -- | 9.9E+05 | 8.2E+02 | 1.4E+02 | 1.4E+02 | 1.6E+00 | NV | 5.0E-02 | 1.6E+00 | 1.6E+00 |
| Aroclor-1221 | B2 | 2.0E+00 | 2.0E+00 | -- | -- | 2.8E+05 | 1.2E+01 | NV | 1.2E+01 | 1.6E+00 | NV | 5.0E-02 | 1.6E+00 | 1.6E+00 |
| Aroclor-1232 | B2 | 2.0E+00 | 2.0E+00 | -- | -- | 1.6E+05 | 8.0E+00 | NV | 8.0E+00 | 1.6E+00 | NV | 5.0E-02 | 1.6E+00 | 1.6E+00 |
| Aroclor-1242 | B2 | 2.0E+00 | 2.0E+00 | -- | -- | 8.2E+05 | 2.9E+01 | NV | 2.9E+01 | 1.6E+00 | NV | 5.0E-02 | 1.6E+00 | 1.6E+00 |
| Aroclor-1248 | B2 | 2.0E+00 | 2.0E+00 | -- | -- | 8.7E+05 | 2.9E+01 | NV | 2.9E+01 | 1.6E+00 | NV | 5.0E-02 | 1.6E+00 | 1.6E+00 |
| Aroclor-1254 | B2 | 2.0E+00 | 2.0E+00 | 2.0E-05 | -- | 1.2E+06 | 2.9E+01 | 4.1E+01 | 2.9E+01 | 1.6E+00 | NV | 5.0E-02 | 1.6E+00 | 1.6E+00 |
| Aroclor-1260 | B2 | 2.0E+00 | 2.0E+00 | -- | -- | 1.8E+06 | 2.9E+01 | NV | 2.9E+01 | 1.6E+00 | NV | 5.0E-02 | 1.6E+00 | 1.6E+00 |

**Notes:**

-- No value available.
NV No value established.
NR Not regulated.
RAGS Risk Assessment Guidance for Superfund, Volume 1, Part B [EPA/540/R-92/003], December, 1991.

**Exposure Equations:**

Carcinogenic Endpoints: $$PRG = \frac{TR \times BW \times ATc}{EF \times ED \times [(CSFo \times IR \times CF) + (CSFi \times INH \times (1/PEF \text{ or } VF))]}$$

Non-Carcinogenic Endpoints: $$PRG = \frac{TR \times BW \times ATnc}{EF \times ED \times [((1/RfDo) \times IR \times CF) + ((1/RfDi) \times INH \times (1/PEF \text{ or } VF))]}$$

**where :**

| | | | |
|---|---|---|---|
| Preliminary Risk Goal (mg/kg) | PRG | calculated | |
| Target Risk Level (unitless) | TR | 1.0E-05 | GEPD, 2003 (Class A/B carcinogens) |
| Target Hazard Level (unitless) | TR | 1.0E-04 | GEPD, 2003 (Class C carcinogens) |
| Target Hazard Level (unitless) | THQ | 1 | GEPD, 2003 |
| Cancer Slope Factor (per mg/kg-day) | CSF | chemical-specific | RSL, 2011 |
| Reference Dose Factor (mg/kg-day) | RfD | chemical-specific | RSL, 2011 |
| Ingestion Rate (mg/day) | IR | 50 | GEPD, 2003 |
| Inhalation Rate ($m^3$/day) | INH | 20 | GEPD, 2003 |
| Exposure Frequency (days/year) | EF | 250 | GEPD, 2003 |
| Exposure Duration (years) | ED | 25 | GEPD, 2003 |
| Body Weight (kg) | BW | 70 | GEPD, 2003 |
| Conversion Factor (kg/mg) | CF | 1.0E-06 | -- |
| Averaging Time - carc. (days) | ATc | 25,550 | GEPD, 2003 |
| Averaging Time - noncarc. (days) | ATnc | 9,125 | GEPD, 2003 |
| Particulate Emission Factor ($m^3$/kg) | PEF | 4.63E+09 | GEPD, 2003 |
| Volatilization Factor ($m^3$/kg) | VF | chemical-specific | Refer to Table 3.7 |

**References:**

GEPD, 2003: Rule 391-3-19-.07, Risk Reduction Standards, July 23, 2003.
RSL, 2017: Regional Screening Level Table Master, June 2017.

# Appendix A

## Table 5
## Derivation of Generic Type 4 Target Concentrations for Soil
## 1610 Southland Circle E
## Atlanta, Georgia

| Regulated Substances | Leaching Potential criterion d.1 [1] | Toxicity Class | Toxicity Indices CSFo (Oral) | CSFi (Inhalation) | RfDo (Oral) | RfDi (Inhalation) | Volatilization Factor (VF) [2] | Longterm On-Site Worker Carcinogenic criterion d.2 | Non-Carcinogenic criterion d.3 | Least of d.1 thru d.3 | Type 4 will not to be less than: Table 2 App III | Background Conc. | Type 3 RRS | Type 4 RRS Target Concentrations |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | (mg/kg) | | (mg/kg-day)$^{-1}$ | (mg/kg-day)$^{-1}$ | (mg/kg-day) | (mg/kg-day) | (m$^3$/kg) | (mg/kg) | (mg/kg) | (mg/kg) | (mg/kg) | (mg/kg) | (mg/kg) | (mg/kg) |
| **VOCS** | | | | | | | | | | | | | | |
| 1,1,1-Trichloroethane | 4.8E+00 | D | -- | -- | 2.0E+00 | 1.4E+00 | 1.5E+03 | NV | 1.1E+04 | 4.8E+00 | NV | NV | 2.0E+01 | 2.0E+01 |
| 1,1,2-Trichloroethane | 1.5E-02 | C | 5.7E-02 | 5.6E-02 | 4.0E-03 | 5.7E-05 | 8.8E+03 | 2.2E+02 | 8.2E+03 | 1.5E-02 | NV | NV | 5.0E-01 | 5.0E-01 |
| 1,1-Dichloroethane | 1.1E+00 | C | 5.7E-03 | 5.6E-03 | 2.0E-01 | -- | 2.1E+03 | 5.4E+02 | 4.1E+05 | 1.1E+00 | NV | NV | 4.0E+02 | 4.0E+02 |
| 1,1-Dichloroethene | 1.9E-01 | C | -- | -- | 5.0E-02 | 5.7E-02 | 8.6E+02 | NV | 2.5E+02 | 1.9E-01 | NV | NV | 7.0E-01 | 7.0E-01 |
| 1,2-Dichloroethane | 1.4E-03 | B2 | 9.1E-02 | 9.1E-02 | 6.0E-03 | 2.0E-03 | 5.2E+03 | 8.1E+00 | 5.3E+01 | 1.4E-03 | NV | NV | 5.0E-01 | 5.0E-01 |
| Acetone | 9.3E+00 | D | -- | -- | 9.0E-01 | 8.9E+00 | 6.7E+03 | NV | 2.6E+05 | 9.3E+00 | NV | NV | 4.0E+02 | 4.0E+02 |
| Benzene | 4.5E-03 | A | 5.5E-02 | 2.7E-02 | 4.0E-03 | 8.6E-03 | 4.5E+03 | 2.3E+01 | 1.9E+02 | 4.5E-03 | NV | NV | 5.0E-01 | 5.0E-01 |
| Bromomethane | 3.4E-03 | D | -- | -- | 1.4E-03 | 1.4E-03 | 1.0E+03 | NV | 7.4E+00 | 3.4E-03 | NV | NV | 1.0E+00 | 1.0E+00 |
| Carbon disulfide | 1.2E+00 | -- | -- | -- | 1.0E-01 | 2.0E-01 | 8.8E+02 | NV | 9.0E+02 | 1.2E+00 | NV | NV | 4.0E+02 | 4.0E+02 |
| Chlorobenzene | 9.3E-02 | D | -- | -- | 2.0E-02 | 1.4E-02 | 8.5E+03 | NV | 6.1E+02 | 9.3E-02 | NV | NV | 1.0E+01 | 1.0E+01 |
| Chloroethane | 8.3E+00 | -- | -- | -- | -- | 2.9E+00 | 1.0E+03 | NV | 1.5E+04 | 8.3E+00 | NV | NV | 1.0E+00 | 8.3E+00 |
| Chloroform | 2.8E-02 | B2 | 3.1E-02 | 8.1E-02 | 1.0E-02 | 2.8E-02 | 2.8E+03 | 4.9E+00 | 3.9E+02 | 2.8E-02 | NV | NV | 4.9E+00 | 4.9E+00 |
| Chloromethane (methyl chloride) | 6.8E-02 | D | -- | -- | -- | 2.6E-02 | 8.2E+02 | NV | 1.1E+02 | 6.8E-02 | NV | NV | 3.0E-01 | 3.0E-01 |
| cis-1,2-Dichloroethene | 6.0E-02 | -- | -- | -- | 2.0E-03 | -- | 2.7E+03 | NV | 4.1E+03 | 6.0E-02 | NV | NV | 7.0E+00 | 7.0E+00 |
| Cyclohexane | 1.8E+01 | -- | -- | -- | -- | 1.7E+00 | 7.7E+02 | NV | 6.8E+03 | 1.8E+01 | NV | NV | 2.0E+01 | 2.0E+01 |
| Dibromochloromethane | 9.1E-02 | C | 8.4E-02 | -- | 2.0E-02 | -- | 8.8E+03 | 6.8E+03 | 4.1E+04 | 9.1E-02 | NV | NV | 1.0E+01 | 1.0E+01 |
| Ethylbenzene | 7.8E-01 | D | 1.1E-02 | 8.8E-03 | 1.0E-01 | 2.9E-01 | 7.6E+03 | 1.2E+03 | 1.1E+04 | 7.8E-01 | NV | NV | 7.0E+01 | 7.0E+01 |
| Isopropylbenzene (cumene) | 1.7E+00 | D | -- | -- | 1.0E-01 | 1.1E-01 | 8.4E+03 | NV | 4.8E+03 | 1.7E+00 | NV | NV | 2.2E+01 | 2.2E+01 |
| m-Xylenes | 9.8E+00 | D | -- | -- | 2.0E-01 | 2.9E-02 | 7.3E+03 | NV | 1.1E+03 | 9.8E+00 | NV | NV | 1.0E+03 | 1.0E+03 |
| Methylene chloride | 1.2E-01 | B2 | 2.0E-03 | 3.5E-05 | 6.0E-03 | 1.7E-01 | 2.1E+03 | 6.6E+03 | 1.6E+03 | 1.2E-01 | NV | NV | 5.0E-01 | 5.0E-01 |
| o-Xylene | 9.8E+00 | D | -- | -- | 2.0E-01 | 2.9E-02 | 8.7E+03 | NV | 1.3E+03 | 9.8E+00 | NV | NV | 1.0E+03 | 1.0E+03 |
| p-Xylenes | 9.8E+00 | D | -- | -- | 2.0E-01 | 2.9E-02 | 7.5E+03 | NV | 1.1E+03 | 9.8E+00 | NV | NV | 1.0E+03 | 1.0E+03 |
| Tetrachloroethene | 4.5E-02 | -- | 2.1E-03 | 9.1E-04 | 6.0E-03 | 1.1E-02 | 2.6E+03 | 4.1E+02 | 1.5E+02 | 4.5E-02 | NV | NV | 5.0E-01 | 5.0E-01 |
| Toluene | 3.6E+00 | D | -- | -- | 8.0E-02 | 1.4E+00 | 5.6E+03 | NV | 3.3E+04 | 3.6E+00 | NV | NV | 1.0E+02 | 1.0E+02 |
| trans-1,2-Dichloroethene | 6.4E-01 | D | -- | -- | 2.0E-02 | -- | 1.8E+03 | NV | 4.1E+04 | 6.4E-01 | NV | NV | 1.0E+01 | 1.0E+01 |
| Trichloroethene | 2.1E-03 | -- | 4.6E-02 | 1.4E-02 | 5.0E-04 | 5.7E-04 | 2.4E+03 | 2.4E+01 | 7.1E+00 | 2.1E-03 | NV | NV | 5.0E-01 | 5.0E-01 |
| Trichlorofluoromethane | 2.0E+01 | -- | -- | -- | 3.0E-01 | -- | 5.0E+02 | NV | 6.1E+05 | 2.0E+01 | NV | NV | 2.0E+02 | 2.0E+02 |
| Vinyl chloride | 1.1E-03 | A | 7.2E-01 | 1.5E-02 | 3.0E-03 | 2.9E-02 | 5.8E+02 | 5.0E+00 | 8.3E+01 | 1.1E-03 | NV | NV | 2.0E-01 | 2.0E-01 |
| Xylenes (Total) | 9.9E+00 | D | -- | -- | 2.0E-01 | 2.9E-02 | 7.7E+03 | NV | 1.1E+03 | 9.9E+00 | NV | NV | 1.0E+03 | 1.0E+03 |
| **SVOCs** | | | | | | | | | | | | | | |
| 1,2,3-Trichlorobenzene | 2.4E-01 | -- | -- | -- | 8.0E-04 | -- | 4.4E+04 | NV | 1.6E+03 | 2.4E-01 | NV | NV | 2.5E+01 | 2.5E+01 |
| 1,2,4-Trichlorobenzene | 2.0E-01 | D | 2.9E-02 | -- | 1.0E-02 | 5.7E-04 | 4.1E+04 | 2.0E+04 | 1.2E+02 | 2.0E-01 | NV | NV | 1.1E+01 | 1.1E+01 |
| 1,2-Dichlorobenzene | 5.8E-01 | D | -- | -- | 9.0E-02 | 5.7E-02 | 1.6E+04 | NV | 4.5E+03 | 5.8E-01 | NV | NV | 6.0E+01 | 6.0E+01 |
| 1,3-Dichlorobenzene | 5.8E-01 | D | -- | -- | -- | -- | 1.3E+04 | NV | NV | 5.8E-01 | NV | NV | 6.0E+01 | 6.0E+01 |
| 1,4-Dichlorobenzene | 7.2E-02 | -- | 5.4E-03 | 3.9E-02 | 7.0E-02 | 2.3E-01 | 1.4E+04 | 5.2E+01 | 1.5E+04 | 7.2E-02 | NV | NV | 7.5E+00 | 7.5E+00 |
| Fluorene | 7.6E+01 | D | -- | -- | 4.0E-02 | -- | 3.9E+05 | NV | 8.2E+04 | 7.6E+01 | NV | NV | 3.6E+02 | 3.6E+02 |
| Naphthalene | 6.6E-02 | C | -- | 1.2E-01 | 2.0E-02 | 8.6E-04 | 6.4E+04 | 7.7E+02 | 2.8E+02 | 6.6E-02 | NV | NV | 1.0E+02 | 1.0E+02 |
| Phenanthrene | 3.4E-01 | D | -- | -- | -- | -- | NV | NV | NV | 3.4E-01 | NV | NV | 1.1E+02 | 1.1E+02 |

# Appendix A

## Table 5
## Derivation of Generic Type 4 Target Concentrations for Soil
## 1610 Southland Circle E
## Atlanta, Georgia

| Regulated Substances | Leaching Potential criterion d.1 [(1)] (mg/kg) | Toxicity Class | Toxicity Indices: CSFo (Oral) (mg/kg-day)$^{-1}$ | CSFi (Inhalation) (mg/kg-day)$^{-1}$ | RfDo (Oral) (mg/kg-day) | RfDi (Inhalation) (mg/kg-day) | Volatilization Factor (VF) [(2)] ($m^3$/kg) | Longterm On-Site Worker: Carcinogenic criterion d.2 (mg/kg) | Non-Carcinogenic criterion d.3 (mg/kg) | Least of d.1 thru d.3 (mg/kg) | Type 4 will not to be less than: Table 2 App III (mg/kg) | Background Conc. (mg/kg) | Type 3 RRS (mg/kg) | Type 4 RRS Target Concentrations (mg/kg) |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| **PCBs** | | | | | | | | | | | | | | |
| Aroclor-1016 | 3.6E-01 | B2 | 7.0E-02 | 7.0E-02 | 7.0E-05 | -- | 9.9E+05 | 8.2E+02 | 1.4E+02 | 3.6E-01 | NV | NV | 1.6E+00 | 1.6E+00 |
| Aroclor-1221 | 8.5E-03 | B2 | 2.0E+00 | 2.0E+00 | -- | -- | 2.8E+05 | 1.2E+01 | NV | 8.5E-03 | NV | NV | 1.6E+00 | 1.6E+00 |
| Aroclor-1232 | 8.5E-03 | B2 | 2.0E+00 | 2.0E+00 | -- | -- | 1.6E+05 | 8.0E+00 | NV | 8.5E-03 | NV | NV | 1.6E+00 | 1.6E+00 |
| Aroclor-1242 | 7.8E-02 | B2 | 2.0E+00 | 2.0E+00 | -- | -- | 8.2E+05 | 2.9E+01 | NV | 7.8E-02 | NV | NV | 1.6E+00 | 1.6E+00 |
| Aroclor-1248 | 7.7E-02 | B2 | 2.0E+00 | 2.0E+00 | -- | -- | 8.7E+05 | 2.9E+01 | NV | 7.7E-02 | NV | NV | 1.6E+00 | 1.6E+00 |
| Aroclor-1254 | 1.3E-01 | B2 | 2.0E+00 | 2.0E+00 | 2.0E-05 | -- | 1.2E+06 | 2.9E+01 | 4.1E+01 | 1.3E-01 | NV | NV | 1.6E+00 | 1.6E+00 |
| Aroclor-1260 | 3.5E-01 | B2 | 2.0E+00 | 2.0E+00 | -- | -- | 1.8E+06 | 2.9E+01 | NV | 3.5E-01 | NV | NV | 1.6E+00 | 1.6E+00 |

**Notes:**

-- No value available.
NV No value established.
NR Not regulated.
RAGS Risk Assessment Guidance for Superfund, Volume 1, Part B [EPA/540/R-92/003], December, 1991.
(1) See Table 3.6 in derivation of leaching potential (criterion d.1). Note, based on DAF of 1.

**Exposure Equations:**

Carcinogenic Endpoints: $$PRG = \frac{TR \times BW \times ATc}{EF \times ED \times [(CSFo \times IR \times CF) + (CSFi \times INH \times (1/PEF \text{ or } VF))]}$$

Non-Carcinogenic Endpoints: $$PRG = \frac{TR \times BW \times ATnc}{EF \times ED \times [((1/RfDo) \times IR \times CF) + ((1/RfDi) \times INH \times (1/PEF \text{ or } VF))]}$$

**where :**

| | | | |
|---|---|---|---|
| Preliminary Risk Goal (mg/kg) | PRG | calculated | |
| Target Risk Level (unitless) | TR | 1.0E-05 | GEPD, 2003 (Class A/B carcinogens) |
| Target Hazard Level (unitless) | TR | 1.0E-04 | GEPD, 2003 (Class C carcinogens) |
| Target Hazard Level (unitless) | THQ | 1 | GEPD, 2003 |
| Cancer Slope Factor (per mg/kg-day) | CSF | chemical-specific | RSL, 2011 |
| Reference Dose Factor (mg/kg-day) | RfD | chemical-specific | RSL, 2011 |
| Ingestion Rate (mg/day) - adult | IR | 50 | GEPD, 2003 |
| Inhalation Rate ($m^3$/day) | INH | 20 | GEPD, 2003 |
| Exposure Frequency (days/year) | EF | 250 | GEPD, 2003 |
| Exposure Duration (years) - adult | ED | 25 | GEPD, 2003 |
| Body Weight (kg) - adult | BW | 70 | GEPD, 2003 |
| Conversion Factor (kg/mg) | CF | 1.0E-06 | -- |
| Averaging Time - carc. (days) | ATc | 25,550 | GEPD, 2003 |
| Averaging Time - noncarc. (days) | ATnc | 9,125 | GEPD, 2003 |
| Particulate Emission Factor ($m^3$/kg) | PEF | 4.63E+09 | GEPD, 2003 |
| Volatilization Factor ($m^3$/kg) | VF | chemical-specific | Refer to Table 3.7 |

**References:**

GEPD, 2003: Rule 391-3-19-.07, Risk Reduction Standards, July 23, 2003.
RSL, 2017: Regional Screening Level Table Master, June 2017.

# Appendix A

## Table 6
## Calculation of Soil Leaching Criterion (Criterion d.1) for HSRA Soil Target Concentrations
## 1610 Southland Circle E
## Atlanta, Georgia

Soil Leaching Criterion (Criterion d.1); USEPA, 1996 = Cw x [Kd + (Ow + Oa x H)/Pb]

Note: Based on DAF of 1.

*where :*

| | | |
|---|---|---|
| Cw | chemical specific | |
| Kd | chemical specific | = Koc x Foc; where Foc = 0.002 (0.2%) |
| Ow | 0.3 | |
| Oa | n-Ow | 0.13 |
| n | 1-(Pb/Ps) | 0.43 |
| Pb | 1.5 | |
| Ps | 2.65 | |
| H | chemical specific | |

USEPA, 1996: Soil Screening Level Partitioning Equation for Migration to Ground Water, Equation 10, Soil Screening Guidance, 9355.4-23, July 1996.

(1) Chemical-specific parameters were taken from Regional Screening Level (RSL) Chemical-specific Parameters Supporting Table, June 2017.

Exceptions: Values in bold and underline font for **Henry's Law Constant and Koc** were taken from RAIS Website (http://rais.ornl.gov/)

| Parameters | Soil Leaching Criterion d.1 | GW RRSs (Type 3 or 4 RRS) | Partition Coefficient (1) | Koc (1) | Henry Law's Constant |
|---|---|---|---|---|---|
| | mg/kg | mg/L | L/kg | L/kg | dimensionless |
| **VOCS** | | | | | |
| 1,1,1-Trichloroethane | 4.8E+00 | 1.4E+01 | 8.8E-02 | 4.4E+01 | 7.0E-01 |
| 1,1,2-Trichloroethane | 1.5E-02 | 4.6E-02 | 1.2E-01 | 6.1E+01 | 3.4E-02 |
| 1,1-Dichloroethane | 1.1E+00 | 4.0E+00 | 6.4E-02 | 3.2E+01 | 2.3E-01 |
| 1,1-Dichloroethene | 1.9E-01 | 5.2E-01 | 6.4E-02 | 3.2E+01 | 1.1E+00 |
| 1,2-Dichloroethane | 1.4E-03 | 5.0E-03 | 7.9E-02 | 4.0E+01 | 4.8E-02 |
| Acetone | 9.3E+00 | 4.6E+01 | 4.7E-03 | 2.4E+00 | 1.4E-03 |
| Benzene | 4.5E-03 | 8.7E-03 | 2.9E-01 | 1.5E+02 | 2.3E-01 |
| Bromomethane | 3.4E-03 | 1.3E-02 | 2.6E-02 | 1.3E+01 | 3.0E-01 |
| Carbon disulfide | 1.2E+00 | 4.0E+00 | 4.3E-02 | 2.2E+01 | 5.9E-01 |
| Chlorobenzene | 9.3E-02 | 1.4E-01 | 4.7E-01 | 2.3E+02 | 1.3E-01 |
| Chloroethane | 8.3E+00 | 2.9E+01 | 4.3E-02 | 2.2E+01 | 4.5E-01 |
| Chloroform | 2.8E-02 | 1.0E-01 | 6.4E-02 | 3.2E+01 | 1.5E-01 |
| Chloromethane (methyl chloride) | 6.8E-02 | 2.6E-01 | 2.6E-02 | 1.3E+01 | 3.6E-01 |
| cis-1,2-Dichloroethene | 6.0E-02 | 2.0E-01 | 7.9E-02 | 4.0E+01 | 1.7E-01 |
| Cyclohexane | 1.8E+01 | 1.8E+01 | 2.9E-01 | 1.5E+02 | 6.1E+00 |
| Dibromochloromethane | 9.1E-02 | 3.4E-01 | 6.4E-02 | 3.2E+01 | 3.2E-02 |
| Ethylbenzene | 7.8E-01 | 7.0E-01 | 8.9E-01 | 4.5E+02 | 3.2E-01 |
| Isopropylbenzene (cumene) | 1.7E+00 | 1.0E+00 | 1.4E+00 | 7.0E+02 | 4.7E-01 |
| m-Xylenes | 9.8E+00 | 1.0E+01 | 7.5E-01 | 3.8E+02 | 2.9E-01 |
| Methylene chloride | 1.2E-01 | 4.5E-01 | 4.3E-02 | 2.2E+01 | 1.3E-01 |
| o-Xylene | 9.8E+00 | 1.0E+01 | 7.7E-01 | 3.8E+02 | 2.1E-01 |
| p-Xylenes | 9.8E+00 | 1.0E+01 | 7.5E-01 | 3.8E+02 | 2.8E-01 |
| Tetrachloroethene | 4.5E-02 | 9.8E-02 | 1.9E-01 | 9.5E+01 | 7.2E-01 |
| Toluene | 3.6E+00 | 5.2E+00 | 4.7E-01 | 2.3E+02 | 2.7E-01 |
| trans-1,2-Dichloroethene | 6.4E-01 | 2.0E+00 | 7.9E-02 | 4.0E+01 | 3.8E-01 |
| Trichloroethene | 2.1E-03 | 5.8E-03 | 1.2E-01 | 6.1E+01 | 4.0E-01 |
| Trichlorofluoromethane | 2.0E+01 | 3.1E+01 | 8.8E-02 | 4.4E+01 | 4.0E+00 |
| Vinyl chloride | 1.1E-03 | 3.3E-03 | 4.3E-02 | 2.2E+01 | 1.1E+00 |
| Xylenes (Total) | 9.9E+00 | 1.0E+01 | 7.7E-01 | 3.8E+02 | 2.7E-01 |

# Appendix A

## Table 6
## Calculation of Soil Leaching Criterion (Criterion d.1) for HSRA Soil Target Concentrations
## 1610 Southland Circle E
## Atlanta, Georgia

Soil Leaching Criterion (Criterion d.1); USEPA, 1996 = Cw x [Kd + (Ow + Oa x H)/Pb]

Note: Based on DAF of 1.

*where :*

| | | |
|---|---|---|
| Cw | chemical specific | |
| Kd | chemical specific | = Koc x Foc; where Foc = 0.002 (0.2%) |
| Ow | 0.3 | |
| Oa | n-Ow | 0.13 |
| n | 1-(Pb/Ps) | 0.43 |
| Pb | 1.5 | |
| Ps | 2.65 | |
| H | chemical specific | |

USEPA, 1996: Soil Screening Level Partitioning Equation for Migration to Ground Water, Equation 10, Soil Screening Guidance, 9355.4-23, July 1996.

(1) Chemical-specific parameters were taken from Regional Screening Level (RSL) Chemical-specific Parameters Supporting Table, June 2017.

Exceptions: Values in bold and underline font for **Henry's Law Constant and Koc** were taken from RAIS Website (http://rais.ornl.gov/)

| Parameters | Soil Leaching Criterion d.1 | GW RRSs (Type 3 or 4 RRS) | Partition Coefficient (1) | Koc (1) | Henry Law's Constant |
|---|---|---|---|---|---|
| | mg/kg | mg/L | L/kg | L/kg | dimensionless |
| **SVOCs** | | | | | |
| 1,2,3-Trichlorobenzene | 2.4E-01 | 8.2E-02 | 2.8E+00 | 1.4E+03 | 5.1E-02 |
| 1,2,4-Trichlorobenzene | 2.0E-01 | 7.0E-02 | 2.7E+00 | 1.4E+03 | 5.8E-02 |
| 1,2-Dichlorobenzene | 5.8E-01 | 6.0E-01 | 7.7E-01 | 3.8E+02 | 7.8E-02 |
| 1,3-Dichlorobenzene | 5.8E-01 | 6.0E-01 | 7.5E-01 | **3.8E+02** | **1.1E-01** |
| 1,4-Dichlorobenzene | 7.2E-02 | 7.5E-02 | 7.5E-01 | 3.8E+02 | 9.9E-02 |
| Fluorene | 7.6E+01 | 4.1E+00 | 1.8E+01 | 9.2E+03 | 3.9E-03 |
| Naphthalene | 6.6E-02 | 2.0E-02 | 3.1E+00 | 1.5E+03 | 1.8E-02 |
| Phenanthrene | 3.4E-01 | 1.0E-02 | 3.3E+01 | **1.7E+04** | **1.7E-03** |
| **PCBs** | | | | | |
| Aroclor-1016 | 3.6E-01 | 3.7E-03 | 9.5E+01 | 4.8E+04 | 8.2E-03 |
| Aroclor-1221 | 8.5E-03 | 5.0E-04 | 1.7E+01 | 8.4E+03 | 9.3E-03 |
| Aroclor-1232 | 8.5E-03 | 5.0E-04 | 1.7E+01 | 8.4E+03 | 3.0E-02 |
| Aroclor-1242 | 7.8E-02 | 5.0E-04 | 1.6E+02 | 7.8E+04 | 1.4E-02 |
| Aroclor-1248 | 7.7E-02 | 5.0E-04 | 1.5E+02 | 7.7E+04 | 1.8E-02 |
| Aroclor-1254 | 1.3E-01 | 5.0E-04 | 2.6E+02 | 1.3E+05 | 1.2E-02 |
| Aroclor-1260 | 3.5E-01 | 5.0E-04 | 7.0E+02 | 3.5E+05 | 1.4E-02 |

# Appendix A

## Table 7
## Calculation of Volatilization Factor (VF) for HSRA Soil Target Concentrations
## 1610 Southland Circle E
## Atlanta, Georgia

$$VF\ (m^3/kg) = \frac{(LS \times V \times DH)}{A} \times \frac{(3.14 \times alpha \times T)^{1/2}}{(2 \times D_{ei} \times E \times K_{as} \times 10^{-3}\ kg/g)}$$

**where :**

alpha ($cm^2/s$) = $(D_{ei} \times E)/(E + [p_s(1-E)/K_{as}])$
LS/ length of side of contaminated area ($m^2$) = 45
V/ wind speed in mixing zone (m/s) = 2.25
DH/ diffusion height (m) = 2
A/ area of contamination ($cm^2$) = 20300000
T/ exposure interval (s) = 788400000 (= 25 yrs)
$p_s$/ density of soil solids ($g/cm^3$) = 2.65
OC/ soil organic carbon content fraction (unitless) = 0.02
$D_{ei}$/ effective diffusivity ($cm^2/s$) = $D_i \times E^{0.33}$
$D_i$/ Molecular Diffusivity ($cm^2/s$) = chemical specific
E/ total soil porosity (unitless) = 0.35
$K_{as}$/ soil/ air partition coefficient (g soil/ $cm^3$ air) = $(H/K_d) \times 41$
$K_d$/ soil-water partition coefficient ($cm^3/g$) = Koc x Foc; where Foc = 0.02 (2%)
H/ Henry's Law Constant ($atm\text{-}m^3/mol$) = chemical specific
Koc/ organic carbon partition coefficient ($cm^3/g$) = chemical specific

**Assumptions:**

Uses default values from Rule 391-3-19 , Appendix III, Table 3.

(1) Chemical-specific parameters were taken from Regional Screening Level (RSL) Chemical-specific Parameters Supporting Table, June 2017.

Exceptions: Values in bold font for **Di, H, Koc, and Kd** were taken from RAIS Website (http://rais.ornl.gov/)

| Parameters | $D_i$ (1) | $D_{ei}$ | H (1) | Koc (1) | $K_d$ | $K_{as}$ | alpha | VF |
|---|---|---|---|---|---|---|---|---|
| **VOCS** | | | | | | | | |
| 1,1,1-Trichloroethane | 6.5E-02 | 4.6E-02 | 1.7E-02 | 4.4E+01 | 8.8E-01 | 8.0E-01 | 6.4E-03 | 1.5E+03 |
| 1,1,2-Trichloroethane | 6.7E-02 | 4.7E-02 | 8.2E-04 | 6.1E+01 | 1.2E+00 | 2.8E-02 | 2.7E-04 | 8.8E+03 |
| 1,1-Dichloroethane | 8.4E-02 | 5.9E-02 | 5.6E-03 | 3.2E+01 | 6.4E-01 | 3.6E-01 | 4.1E-03 | 2.1E+03 |
| 1,1-Dichloroethene | 8.6E-02 | 6.1E-02 | 2.6E-02 | 3.2E+01 | 6.4E-01 | 1.7E+00 | 1.6E-02 | 8.6E+02 |
| 1,2-Dichloroethane | 8.6E-02 | 6.1E-02 | 1.2E-03 | 4.0E+01 | 7.9E-01 | 6.1E-02 | 7.4E-04 | 5.2E+03 |
| Acetone | 1.1E-01 | 7.5E-02 | 3.5E-05 | 2.4E+00 | 4.7E-02 | 3.0E-02 | 4.6E-04 | 6.7E+03 |
| Benzene | 9.0E-02 | 6.3E-02 | 5.6E-03 | 1.5E+02 | 2.9E+00 | 7.8E-02 | 9.9E-04 | 4.5E+03 |
| Bromomethane | 1.0E-01 | 7.1E-02 | 7.3E-03 | 1.3E+01 | 2.6E-01 | 1.1E+00 | 1.3E-02 | 1.0E+03 |
| Carbon disulfide | 1.1E-01 | 7.5E-02 | 1.4E-02 | 2.2E+01 | 4.3E-01 | 1.4E+00 | 1.6E-02 | 8.8E+02 |
| Chlorobenzene | 7.2E-02 | 5.1E-02 | 3.1E-03 | 2.3E+02 | 4.7E+00 | 2.7E-02 | 2.8E-04 | 8.5E+03 |
| Chloroethane | 1.0E-01 | 7.3E-02 | 1.1E-02 | 2.2E+01 | 4.3E-01 | 1.0E+00 | 1.3E-02 | 1.0E+03 |
| Chloroform | 7.7E-02 | 5.4E-02 | 3.7E-03 | 3.2E+01 | 6.4E-01 | 2.4E-01 | 2.5E-03 | 2.8E+03 |
| Chloromethane (methyl chloride) | 1.2E-01 | 8.8E-02 | 8.8E-03 | 1.3E+01 | 2.6E-01 | 1.4E+00 | 1.9E-02 | 8.2E+02 |
| cis-1,2-Dichloroethene | 8.8E-02 | 6.3E-02 | 4.1E-03 | 4.0E+01 | 7.9E-01 | 2.1E-01 | 2.6E-03 | 2.7E+03 |
| Cyclohexane | 8.0E-02 | 5.7E-02 | 1.5E-01 | 1.5E+02 | 2.9E+00 | 2.1E+00 | 1.7E-02 | 7.7E+02 |
| Dibromochloromethane | 3.7E-02 | 2.6E-02 | 7.8E-04 | 3.2E+01 | 6.4E-01 | 5.0E-02 | 2.6E-04 | 8.8E+03 |
| Ethylbenzene | 6.8E-02 | 4.8E-02 | 7.9E-03 | 4.5E+02 | 8.9E+00 | 3.6E-02 | 3.5E-04 | 7.6E+03 |
| Isopropylbenzene (cumene) | 6.0E-02 | 4.3E-02 | 1.2E-02 | 7.0E+02 | 1.4E+01 | 3.4E-02 | 2.9E-04 | 8.4E+03 |
| m-Xylenes | 6.8E-02 | 4.8E-02 | 7.2E-03 | 3.8E+02 | 7.5E+00 | 3.9E-02 | 3.8E-04 | 7.3E+03 |
| Methylene chloride | 1.0E-01 | 7.1E-02 | 3.3E-03 | 2.2E+01 | 4.3E-01 | 3.1E-01 | 4.1E-03 | 2.1E+03 |
| o-Xylene | 6.9E-02 | 4.9E-02 | 5.2E-03 | 3.8E+02 | 7.7E+00 | 2.8E-02 | 2.7E-04 | 8.7E+03 |
| p-Xylenes | 6.8E-02 | 4.8E-02 | 6.9E-03 | 3.8E+02 | 7.5E+00 | 3.8E-02 | 3.7E-04 | 7.5E+03 |
| Tetrachloroethene | 5.0E-02 | 3.6E-02 | 1.8E-02 | 9.5E+01 | 1.9E+00 | 3.8E-01 | 2.6E-03 | 2.6E+03 |
| Toluene | 7.8E-02 | 5.5E-02 | 6.6E-03 | 2.3E+02 | 4.7E+00 | 5.8E-02 | 6.4E-04 | 5.6E+03 |
| trans-1,2-Dichloroethene | 8.8E-02 | 6.2E-02 | 9.4E-03 | 4.0E+01 | 7.9E-01 | 4.9E-01 | 5.6E-03 | 1.8E+03 |
| Trichloroethene | 6.9E-02 | 4.9E-02 | 9.9E-03 | 6.1E+01 | 1.2E+00 | 3.3E-01 | 3.1E-03 | 2.4E+03 |
| Trichlorofluoromethane | 6.5E-02 | 4.6E-02 | 9.7E-02 | 4.4E+01 | 8.8E-01 | 4.5E+00 | 2.2E-02 | 5.0E+02 |
| Vinyl chloride | 1.1E-01 | 7.6E-02 | 2.8E-02 | 2.2E+01 | 4.3E-01 | 2.6E+00 | 2.6E-02 | 5.8E+02 |
| Xylenes (Total) | 6.9E-02 | 4.8E-02 | 6.6E-03 | 3.8E+02 | 7.7E+00 | 3.5E-02 | 3.5E-04 | 7.7E+03 |

# Appendix A

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## 1610 Southland Circle E
## Atlanta, Georgia

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**where :**

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V/ wind speed in mixing zone (m/s) = 2.25
DH/ diffusion height (m) = 2
A/ area of contamination ($cm^2$) = 20300000
T/ exposure interval (s) = 788400000 (= 25 yrs)
$p_s$/ density of soil solids ($g/cm^3$) = 2.65
OC/ soil organic carbon content fraction (unitless) = 0.02
$D_{ei}$/ effective diffusivity ($cm^2/s$) = $D_i \times E^{0.33}$
$D_i$/ Molecular Diffusivity ($cm^2/s$) = chemical specific
E/ total soil porosity (unitless) = 0.35
$K_{as}$/ soil/ air partition coefficient (g soil/ $cm^3$ air) = $(H/K_d) \times 41$
$K_d$/ soil-water partition coefficient ($cm^3/g$) = Koc x Foc; where Foc = 0.02 (2%)
H/ Henry's Law Constant (atm-$m^3$/mol) = chemical specific
Koc/ organic carbon partition coefficient ($cm^3/g$) = chemical specific

**Assumptions:**

Uses default values from Rule 391-3-19 , Appendix III, Table 3.

(1) Chemical-specific parameters were taken from Regional Screening Level (RSL) Chemical-specific Parameters Supporting Table, June 2017.

Exceptions: Values in bold font for **Di, H, Koc, and Kd** were taken from RAIS Website (http://rais.ornl.gov/)

| Parameters | $D_i$ (1) | $D_{ei}$ | H (1) | Koc (1) | $K_d$ | $K_{as}$ | alpha | VF |
|---|---|---|---|---|---|---|---|---|
| **SVOCs** | | | | | | | | |
| 1,2,3-Trichlorobenzene | 4.0E-02 | 2.8E-02 | 1.3E-03 | 1.4E+03 | 2.8E+01 | 1.9E-03 | 1.1E-05 | 4.4E+04 |
| 1,2,4-Trichlorobenzene | 4.0E-02 | 2.8E-02 | 1.4E-03 | 1.4E+03 | 2.7E+01 | 2.1E-03 | 1.2E-05 | 4.1E+04 |
| 1,2-Dichlorobenzene | 5.6E-02 | 4.0E-02 | 1.9E-03 | 3.8E+02 | 7.7E+00 | 1.0E-02 | 8.3E-05 | 1.6E+04 |
| 1,3-Dichlorobenzene | **5.6E-02** | 3.9E-02 | **2.6E-03** | **3.8E+02** | 7.5E+00 | 1.4E-02 | 1.2E-04 | 1.3E+04 |
| 1,4-Dichlorobenzene | 5.5E-02 | 3.9E-02 | 2.4E-03 | 3.8E+02 | 7.5E+00 | 1.3E-02 | 1.0E-04 | 1.4E+04 |
| Fluorene | 4.4E-02 | 3.1E-02 | 9.6E-05 | 9.2E+03 | 1.8E+02 | 2.2E-05 | 1.4E-07 | 3.9E+05 |
| Naphthalene | 6.0E-02 | 4.3E-02 | 4.4E-04 | 1.5E+03 | 3.1E+01 | 5.8E-04 | 5.1E-06 | 6.4E+04 |
| Phenanthrene | NA | NA | **4.2E-05** | **1.7E+04** | 3.3E+02 | 5.2E-06 | NV | NV |
| **PCBs** | | | | | | | | |
| Aroclor-1016 | 1.7E-02 | 1.2E-02 | 2.0E-04 | 4.8E+04 | 9.5E+02 | 8.6E-06 | 2.1E-08 | 9.9E+05 |
| Aroclor-1221 | 3.2E-02 | 2.3E-02 | 2.3E-04 | 8.4E+03 | 1.7E+02 | 5.6E-05 | 2.6E-07 | 2.8E+05 |
| Aroclor-1232 | 3.3E-02 | 2.4E-02 | 7.4E-04 | 8.4E+03 | 1.7E+02 | 1.8E-04 | 8.6E-07 | 1.6E+05 |
| Aroclor-1242 | 2.4E-02 | 1.7E-02 | 3.4E-04 | 7.8E+04 | 1.6E+03 | 9.0E-06 | 3.1E-08 | 8.2E+05 |
| Aroclor-1248 | 1.6E-02 | 1.2E-02 | 4.4E-04 | 7.7E+04 | 1.5E+03 | 1.2E-05 | 2.8E-08 | 8.7E+05 |
| Aroclor-1254 | 2.4E-02 | 1.7E-02 | 2.8E-04 | 1.3E+05 | 2.6E+03 | 4.4E-06 | 1.5E-08 | 1.2E+06 |
| Aroclor-1260 | 2.2E-02 | 1.6E-02 | 3.4E-04 | 3.5E+05 | 7.0E+03 | 2.0E-06 | 6.2E-09 | 1.8E+06 |

# Appendix B
# Summary of Hours

## Appendix B

## Summary of Monthly Hours
## First VRP Progress Report
## Southland Circle Property (HSI #10077)
## Atlanta, Georgia

| S/N | Description of Tasks | Total Hours Billed | Month (July - December 2017) | | | | | |
|---|---|---|---|---|---|---|---|---|
| | | | July | August | September | October | November | December |
| 1 | Review EPD's June 30, 2017 comments and discuss with client | 0 | 3.5 | 10 | 0 | 0 | 1 | 1 |
| 2 | Meeting with Client | 6 | 0 | 6 | 0 | 0 | 0 | 0 |
| 3 | Prepare response letter to EPD's comments | 15 | 0 | 0 | 0 | 0 | 10 | 5 |
| 4 | Review, update and finalize First VRP Progress Report | 0 | 0 | 0 | 0 | 0 | 4.5 | 15 |
| 5 | Overall Project Management | 0 | 1 | 5 | 0 | 0 | 2 | 0 |
| | **Total Hours** | **21** | | | | | | |

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