Memorandum

February 5, 2019

To:	Peter Ramanauskas, U.S. EPA	Ref. No.:	12609
From:	Andrew LaVine	Tel:	419-609-1339
cc:	Pamela Barnett, RACER Trust		

Subject: **Evaluation of Soil Pile Risks to Human Health and the Environment (Rev. 1)**

RACER Trust Property, Toledo, Ohio

1. Introduction

In 2007 GM constructed a building addition to the former Plant 2 and approximately 10,600 cubic yards of soil was placed on the property that is now owned by RACER Properties, LLC. The property was owned by Remediation and Liability Management Co., Inc. (REALM) a wholly owned subsidiary of General Motors at the time that the soil pile was created. RACER Properties, LLC acquired the property on March 31, 2011.

The stockpiled soil came from final grading around the building addition. The soil was intended to be used as fill for the City of Toledo's construction of a new roadway connecting Laskey and Hydramatic Drive (to provide an access route to landlocked parcels owned by the Toledo Port Authority). However, the City roadway project was never completed and the soil pile remains to this day. The soil stockpile was primarily clean-fill brought on-site by the contractor mixed with some soil formerly underlying a parking lot in the extreme eastern edge along the east side of the property.

GHD (formerly Conestoga-Rovers & Associates [CRA]) collected soil samples from the soil pile in December 2011. GHD collected 43 soil samples and analyzed them for VOCs, SVOCs, and PCBs in accordance with the Work Plan for the Investigation of the Soil Stockpile and Southwest Corner. Analytical results are shown on Table 1.1 and Figure 1.1 respectively.

Due to exceedances to some of the screening levels, GHD reviewed the data more closely with regards to risks to human health and the environment which are described in the following sections.

2. Human Health Risk Screening

The Site is currently vacant; therefore there are no industrial/commercial workers present on the Site and as a result there is no risk associated with the exposure to the soils of the soil stockpile. Therefore, the only potential receptors that maybe exposed to the soil stockpile would be a trespasser on the Site and a construction worker during re-development of the Site. Given the proximity of the site and soil stockpile to any residential area (greater than 2,000 feet), trespassing on the site is not expected to occur very

frequently. However, should trespassing occur, the trespasser would only be exposed to the top 2 feet of the soil in the soil pile.

To determine the potential exposure to the soil stockpile, the soil data from the soil stockpile was screened against the USEPA's Regional Screening Levels (RSLs) (USEPA, 2018) to identify the chemicals of potential concern (COPCs). As shown in Table 2.1, only three COPCs (arsenic, thallium, and benzo(a)pyrene were identified based on an comparison of the maximum soil concentrations to the industrial soil RSLs. Based on the soil data, the exposure point concentration was calculated for each of the COPCs using the USEPA's ProUCL software Version 5.1 (2016). The exposure point concentrations for the COPCs are presented in Table 2.2.

To evaluate the exposure, the trespasser was assumed to be an occasional trespasser aged 7 to 16 years that would trespass on the site for approximately 58 days per year over a period of 10 years. As the exposure frequency for an adolescent trespasser would be equal to or greater than an adult trespasser, only the adolescent trespasser, the more sensitive receptor, was considered. Table 2.3 presents the default USEPA and Ohio EPA exposure assumption used in the evaluation. The trespasser was assumed to be exposed to the soils within the soil stockpile via incidental ingestion, dermal contact, and inhalation of particulate. The ingestion and dermal contact exposures contribute the majority of the risk, with the ingestion contact exposure slightly higher than the dermal exposure. As shown in Table 2.5, the cancer risk is 5E-07 and hazard index is 2E-02, which are below the acceptable levels of 1E-05 and 1, respectively. Also given that the soil stockpile is vegetated, it is anticipated that ingestion and dermal contact with the underlying soils would be less than expected and this is not typically accounted for in the exposure calculations.

Outdoor construction activities may occur during future re-development of the Site. The construction/redevelopment worker receptor consists of an adult that spends a reasonable amount of time at the Site within a limited period (1 year) during the construction activities. Table 2.4 presents the default USEPA and Ohio EPA exposure assumption used in the evaluation. The construction/redevelopment worker was assumed to be exposed to the soils within the soil stockpile via incidental ingestion, dermal contact, and inhalation of particulate. The ingestion and dermal contact exposures contribute the majority of the risk, with the dermal ingestion contact exposure slightly higher than the ingestion dermal exposure. As shown in Table 2.6, the cancer risk is 8E-08 and hazard index is 7E-02, which are below the acceptable levels of 1E-05 and 1, respectively.

Therefore, under current and future site conditions, the soil stockpile is not resulting in risk levels above acceptable levels.

3. Ecological Risk Screening

The potential ecological risks of the soil pile were evaluated using available sample data. For PCBs and VOC, most of the samples were composited subsamples of cores deep within the pile rather than from the surface soil layer (e.g., top foot or so) to which ecological receptors are primarily exposed. However, given how the pile was constructed, it can be assumed that PCB and VOC concentrations in the soil pile are reasonably homogenous. That is, concentrations of chemicals observed deep within the soil pile were

assumed to be representative of those at the surface. This assumption was not necessary for SVOC and metals analyses, as samples for these analytes were primarily taken from the surface soil layers.

Potential ecological risks were briefly assessed in two ways: professional judgment and simple screening of chemicals against ecological screening value. Using the first method, ecological risks can be dismissed based on basic understanding of ecology and consideration of the small area involved, only about ¾ of an acre. Ecological impacts pertain to populations, and there really are no populations of biota that could be impacted by contaminants over such a small area. Thus, for example, Pennsylvania's Brownfield's regulation specifies less than 2 acres as de minimis (Pennsylvania Code 250.311, "Evaluation of ecological receptors"), while Texas EcoRisk guidance specifies less than 1 acre as too small to pose ecological risk (TCEQ 2006). The soil pile is also of de minimis concern in terms of its habitat value. USEPA's guidance states that ecological risk assessments should focus on resources that are ecologically important and of high societal concern (EPA 1998). The habitat and biota associated with the soil pile satisfy neither of these criteria. Similarly, EPA's 1997 guidance also emphasizes that risk assessments should focus on societally and ecologically important resources. The soil pile is an area of disturbed land in the middle of a commercial-industrial area. This degraded, limited habitat is not at all similar to the 31 ecosystems that EPA (1997) guidance lists as important to consider in ecological risk assessments. Ohio EPA's guidance (Ohio EPA 2003) also does not consider most terrestrial areas as "important ecological resources" that should be considered in ecological risk assessments.

Screening of chemical concentrations observed in the soil pile against ecological screening values (ESV) provides another line of evidence for dismissing risks. This screening also provides an estimate of risk if the soil pile were, in the future, to be used as fill and spread out over a larger area than its current de minimis area. ESVs are conservative concentrations below which ecological risks are not likely. Because ESVs are so conservative, exceedance of an ESV does not imply any reasonable potential for risk. As a first choice of ESVs, Ecological Soil Screening Levels (Eco-SSLs) developed by the USEPA (USEPA 2014). These benchmarks have the following advantages. They are intended to be protective of all ecological receptors through both direct toxicity (e.g., toxicity to plants and soil invertebrates) and indirect toxicity by bioaccumulation (e.g., toxicity after bioaccumulation to herbivores and predators). Their derivation is described in detail, and they have undergone limited external review. However, for several of the metals (e.g., antimony, cadmium, lead, manganese, and vanadium), the Eco-SSLs have the disadvantage of being lower, sometimes considerably lower, than naturally occurring background concentrations. ESVs below background concentrations are of limited utility and scientific validity. With respect to their utility, ESVs below background concentrations are ineffective, because they fail to screen out naturally occurring chemicals within the range of background concentrations. For example, soil at virtually all sites in the United States will exceed Eco-SSLs for antimony, lead, and vanadium. With respect to their legitimacy, ESV's below background imply that toxicity occurs to wide-ranging species from naturally occurring, wide-raging soil concentrations.

The Eco-SSL documents for aluminum and iron are narrative descriptions and do not provide specific screening values. According to these narratives, aluminum is assumed to be non-toxic to ecological receptors except at low pH (< 5.5). Iron is also considered to be a non-problematic constituent in soils. Consequently, neither aluminum nor iron was considered problematic in soil.

As a second choice if no Eco-SSLs were available, EPA Region V screening values were used as ESVs with the exception of its ESV for PCBs (0.332 ug/kg). This PCB concentration or even concentrations 100 times higher could not be duplicated with available information of toxicity, bioaccumulation, and exposure. Other evidence suggests that the Region V ESV may be a units error, i.e., incorrect substitution of ug/kg for mg/kg. Notably, ORNL Preliminary Remediation Goal (PRG), which can be duplicated, is almost exactly 1,000 times higher (373 ug/kg or 0.373 mg/kg), even though both the PRG and the Region V value are based on protection of shrews feeding on worms (Efoymonson et al. 1997). Given this problem, the ORNL PRG was used instead of the Region V.

No EVS could be located for methyl acetate. However, a toxicological review by the European Union (2003) concluded that potential ambient concentration of 0.020 mg/kg would not pose risks to terrestrial biota. This value was then used as an ESV.

As can be seen from Table 3.1, only a few chemicals, on average, exceeded the conservative ESVs. When less than detection concentrations were set equal to zero, only the average concentration of thallium meaningfully exceeds its ESV. However, the Region V ESV for thallium (0.06 mg/kg) cannot be duplicated with available information. In addition, this ESV is not useful for screening since it is below most all background concentrations -- generally about 0.1 to 0.5 mg/kg (CCME 1999). In contrast, the derivation of the ORNL PRG for thallium (2.1 mg/kg) is transparent, and the PRG is a useful value that is above most background concentrations. If the PRG is used instead, observed concentrations are well below this alternative ESV. Hence, risks from thallium can also be dismissed.

Thus, the available information suggests no potential for impacts to ecological receptors if the soil pile is left in place. This conclusion is very well supported because

1) the area of the soil pile is too small to cause ecological risk

2) the habitat is low quality and does not warrant sufficient societal concern

3) the concentrations of chemicals are below levels that could potentially cause ecological risk.

Risks would also be considered negligible if the soil pile were spread out and used for cover because of point #3.

4. References

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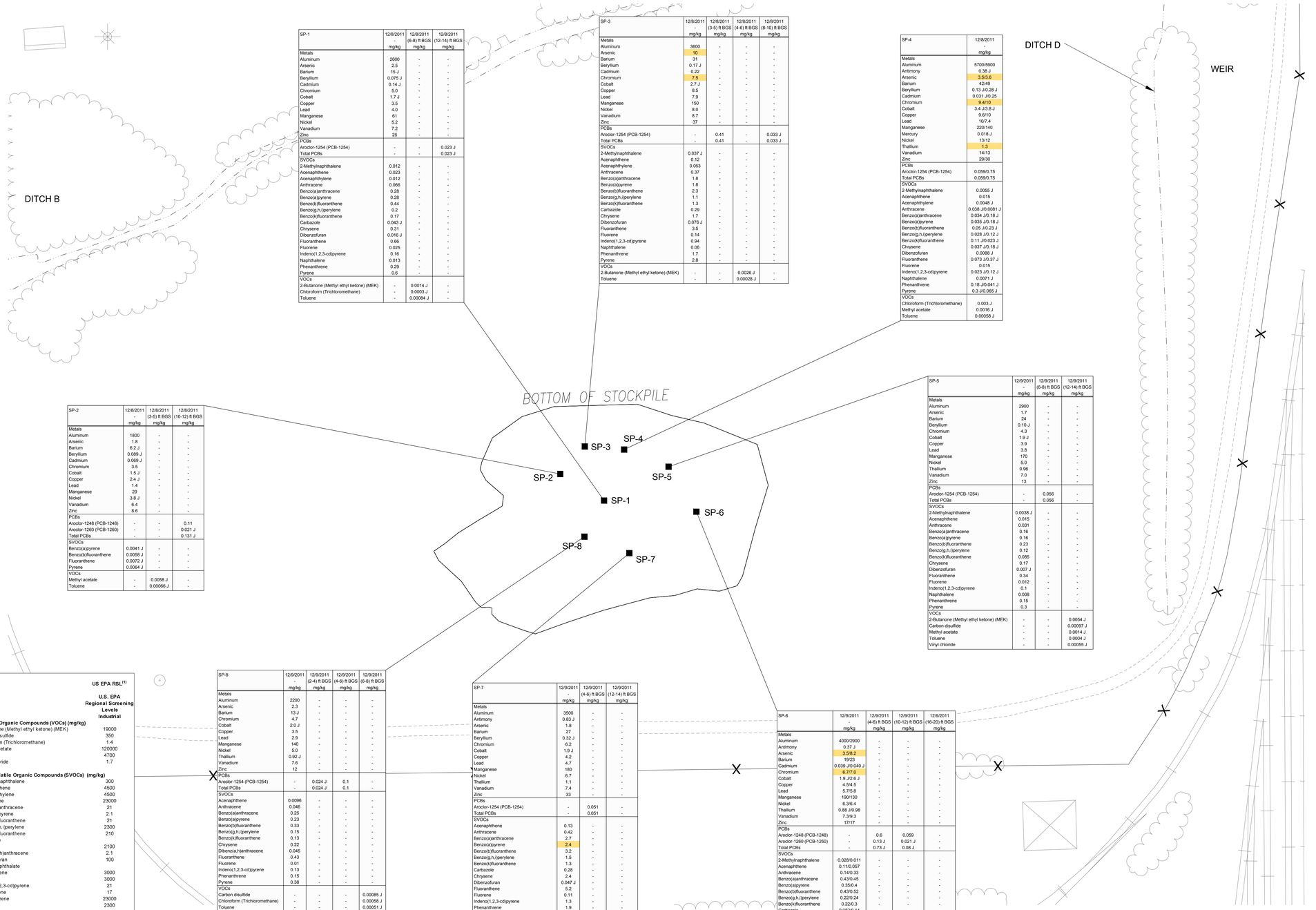

SP-1	12/8/2011 - mg/kg	12/8/2011 (6-8) ft BGS mg/kg	12/8/2011 (12-14) ft BGS mg/kg
Metals			
Aluminum	2600	-	-
Arsenic	2.5	-	-
Barium	15 J	-	-
Beryllium	0.075 J	-	-
Cadmium	0.14 J	-	-
Chromium	5.0	-	-
Cobalt	1.7 J	-	-
Copper	3.5	-	-
Lead	4.0	-	-
Manganese	61	-	-
Nickel	5.2	-	-
Vanadium	7.2	-	-
Zinc	25	-	-
PCBs			
Aroclor-1254 (PCB-1254)	-	-	0.023 J
Total PCBs	-	-	0.023 J
SVOCs			
2-Methylnaphthalene	0.012	-	-
Acenaphthene	0.023	-	-
Acenaphthylene	0.012	-	-
Anthracene	0.066	-	-
Benzo(a)anthracene	0.28	-	-
Benzo(a)pyrene	0.28	-	-
Benzo(b)fluoranthene	0.44	-	-
Benzo(g,h,i)perylene	0.2	-	-
Benzo(k)fluoranthene	0.17	-	-
Carbazole	0.043 J	-	-
Chrysene	0.31	-	-
Dibenzofuran	0.016 J	-	-
Fluoranthene	0.66	-	-
Fluorene	0.025	-	-
Indeno(1,2,3-cd)pyrene	0.16	-	-
Naphthalene	0.013	-	-
Phenanthrene	0.29	-	-
Pyrene	0.6	-	-
VOCs			
2-Butanone (Methyl ethyl ketone) (MEK)	-	0.0014 J	-
Chloroform (Trichloromethane)	-	0.0003 J	-
Toluene	-	0.00084 J	-

SP-3	12/8/2011 - mg/kg	12/8/2011 (3-5) ft BGS mg/kg	12/8/2011 (4-6) ft BGS mg/kg	12/8/2011 (8-10) ft BGS mg/kg
Metals				
Aluminum	3600	-	-	-
Arsenic	10	-	-	-
Barium	31	-	-	-
Beryllium	0.17 J	-	-	-
Cadmium	0.22	-	-	-
Chromium	7.5	-	-	-
Cobalt	2.7 J	-	-	-
Copper	8.5	-	-	-
Lead	7.9	-	-	-
Manganese	150	-	-	-
Nickel	8.0	-	-	-
Vanadium	8.7	-	-	-
Zinc	37	-	-	-
PCBs				
Aroclor-1254 (PCB-1254)	-	0.41	-	0.033 J
Total PCBs	-	0.41	-	0.033 J
SVOCs				
2-Methylnaphthalene	0.037 J	-	-	-
Acenaphthene	0.12	-	-	-
Acenaphthylene	0.053	-	-	-
Anthracene	0.37	-	-	-
Benzo(a)anthracene	1.8	-	-	-
Benzo(a)pyrene	1.8	-	-	-
Benzo(b)fluoranthene	2.3	-	-	-
Benzo(g,h,i)perylene	1.1	-	-	-
Benzo(k)fluoranthene	1.3	-	-	-
Carbazole	0.29	-	-	-
Chrysene	1.7	-	-	-
Dibenzofuran	0.076 J	-	-	-
Fluoranthene	3.5	-	-	-
Fluorene	0.14	-	-	-
Indeno(1,2,3-cd)pyrene	0.94	-	-	-
Naphthalene	0.06	-	-	-
Phenanthrene	1.7	-	-	-
Pyrene	2.8	-	-	-
VOCs				
2-Butanone (Methyl ethyl ketone) (MEK)	-	-	0.0026 J	-
Toluene	-	-	0.00028 J	-

SP-4	12/8/2011 - mg/kg
Metals	
Aluminum	5700/5900
Antimony	0.38 J
Arsenic	3.5/3.6
Barium	42/49
Beryllium	0.13 J/0.28 J
Cadmium	0.031 J/0.25
Chromium	9.4/10
Cobalt	3.4 J/3.8 J
Copper	9.6/10
Lead	10/7.4
Manganese	220/140
Mercury	0.018 J
Nickel	13/12
Thallium	1.3
Vanadium	14/13
Zinc	29/30
PCBs	
Aroclor-1254 (PCB-1254)	0.059/0.75
Total PCBs	0.059/0.75
SVOCs	
2-Methylnaphthalene	0.0055 J
Acenaphthene	0.015
Acenaphthylene	0.0048 J
Anthracene	0.038 J/0.0081 J
Benzo(a)anthracene	0.034 J/0.18 J
Benzo(a)pyrene	0.035 J/0.18 J
Benzo(b)fluoranthene	0.05 J/0.23 J
Benzo(g,h,i)perylene	0.028 J/0.12 J
Benzo(k)fluoranthene	0.11 J/0.023 J
Chrysene	0.037 J/0.18 J
Dibenzofuran	0.0088 J
Fluoranthene	0.073 J/0.37 J
Fluorene	0.015
Indeno(1,2,3-cd)pyrene	0.023 J/0.12 J
Naphthalene	0.0071 J
Phenanthrene	0.18 J/0.041 J
Pyrene	0.3 J/0.065 J
VOCs	
Chloroform (Trichloromethane)	0.003 J
Methyl acetate	0.0016 J
Toluene	0.00058 J

SP-2	12/8/2011 - mg/kg	12/8/2011 (3-5) ft BGS mg/kg	12/8/2011 (10-12) ft BGS mg/kg
Metals			
Aluminum	1800	-	-
Arsenic	1.8	-	-
Barium	6.2 J	-	-
Beryllium	0.089 J	-	-
Cadmium	0.069 J	-	-
Chromium	3.5	-	-
Cobalt	1.5 J	-	-
Copper	2.4 J	-	-
Lead	1.4	-	-
Manganese	29	-	-
Nickel	3.8 J	-	-
Vanadium	6.4	-	-
Zinc	8.6	-	-
PCBs			
Aroclor-1248 (PCB-1248)	-	-	0.11
Aroclor-1260 (PCB-1260)	-	-	0.021 J
Total PCBs	-	-	0.131 J
SVOCs			
Benzo(a)pyrene	0.0041 J	-	-
Benzo(b)fluoranthene	0.0058 J	-	-
Fluoranthene	0.0072 J	-	-
Pyrene	0.0064 J	-	-
VOCs			
Methyl acetate	-	0.0058 J	-
Toluene	-	0.00066 J	-

SP-5	12/9/2011 - mg/kg	12/9/2011 (6-8) ft BGS mg/kg	12/9/2011 (12-14) ft BGS mg/kg
Metals			
Aluminum	2900	-	-
Arsenic	1.7	-	-
Barium	24	-	-
Beryllium	0.10 J	-	-
Chromium	4.3	-	-
Cobalt	1.9 J	-	-
Copper	3.9	-	-
Lead	3.8	-	-
Manganese	170	-	-
Nickel	5.0	-	-
Thallium	0.96	-	-
Vanadium	7.0	-	-
Zinc	13	-	-
PCBs			
Aroclor-1254 (PCB-1254)	-	0.056	-
Total PCBs	-	0.056	-
SVOCs			
2-Methylnaphthalene	0.0038 J	-	-
Acenaphthene	0.015	-	-
Anthracene	0.031	-	-
Benzo(a)anthracene	0.16	-	-
Benzo(a)pyrene	0.16	-	-
Benzo(b)fluoranthene	0.23	-	-
Benzo(g,h,i)perylene	0.12	-	-
Benzo(k)fluoranthene	0.085	-	-
Chrysene	0.17	-	-
Dibenzofuran	0.007 J	-	-
Fluoranthene	0.34	-	-
Fluorene	0.012	-	-
Indeno(1,2,3-cd)pyrene	0.1	-	-
Naphthalene	0.008	-	-
Phenanthrene	0.15	-	-
Pyrene	0.3	-	-
VOCs			
2-Butanone (Methyl ethyl ketone) (MEK)	-	-	0.0054 J
Carbon disulfide	-	-	0.00097 J
Methyl acetate	-	-	0.0014 J
Toluene	-	-	0.0004 J
Vinyl chloride	-	-	0.00055 J

	US EPA RSL[1]
	U.S. EPA Regional Screening Levels Industrial
Volatile Organic Compounds (VOCs) (mg/kg)	
2-Butanone (Methyl ethyl ketone) (MEK)	19000
Carbon disulfide	350
Chloroform (Trichloromethane)	1.4
Methyl acetate	120000
Toluene	4700
Vinyl chloride	1.7
Semi-Volatile Organic Compounds (SVOCs) (mg/kg)	
2-Methylnaphthalene	300
Acenaphthene	4500
Acenaphthylene	4500
Anthracene	23000
Benzo(a)anthracene	21
Benzo(a)pyrene	2.1
Benzo(b)fluoranthene	21
Benzo(g,h,i)perylene	2300
Benzo(k)fluoranthene	210
Carbazole	
Chrysene	2100
Dibenz(a,h)anthracene	2.1
Dibenzofuran	100
Dimethyl phthalate	
Fluoranthene	3000
Fluorene	3000
Indeno(1,2,3-cd)pyrene	21
Naphthalene	17
Phenanthrene	23000
Pyrene	2300
Metals (mg/kg)	
Aluminum	110000
Antimony	47
Arsenic	3
Barium	22000
Beryllium	230
Cadmium	
Chromium	6.3
Cobalt	35
Copper	4700
Lead	800
Manganese	2600
Mercury	4.6
Nickel	2200
Thallium	1.2
Vanadium	580
Zinc	35000
PCBs (mg/kg)	
Aroclor-1248 (PCB-1248)	0.95
Aroclor-1254 (PCB-1254)	0.97
Aroclor-1260 (PCB-1260)	0.99
Total PCBs	0.97

SP-8	12/9/2011 - mg/kg	12/9/2011 (2-4) ft BGS mg/kg	12/9/2011 (4-6) ft BGS mg/kg	12/9/2011 (6-8) ft BGS mg/kg
Metals				
Aluminum	2200	-	-	-
Arsenic	2.3	-	-	-
Barium	13 J	-	-	-
Chromium	4.7	-	-	-
Cobalt	2.0 J	-	-	-
Copper	3.5	-	-	-
Lead	2.9	-	-	-
Manganese	140	-	-	-
Nickel	5.0	-	-	-
Thallium	0.92 J	-	-	-
Vanadium	7.6	-	-	-
Zinc	12	-	-	-
PCBs				
Aroclor-1254 (PCB-1254)	-	0.024 J	0.1	-
Total PCBs	-	0.024 J	0.1	-
SVOCs				
Acenaphthene	0.0096	-	-	-
Anthracene	0.046	-	-	-
Benzo(a)anthracene	0.25	-	-	-
Benzo(a)pyrene	0.23	-	-	-
Benzo(b)fluoranthene	0.33	-	-	-
Benzo(g,h,i)perylene	0.15	-	-	-
Benzo(k)fluoranthene	0.13	-	-	-
Chrysene	0.22	-	-	-
Dibenz(a,h)anthracene	0.045	-	-	-
Fluoranthene	0.43	-	-	-
Fluorene	0.01	-	-	-
Indeno(1,2,3-cd)pyrene	0.13	-	-	-
Phenanthrene	0.15	-	-	-
Pyrene	0.38	-	-	-
VOCs				
Carbon disulfide	-	-	-	0.00085 J
Chloroform (Trichloromethane)	-	-	-	0.00058 J
Toluene	-	-	-	0.00051 J

SP-7	12/9/2011 - mg/kg	12/9/2011 (4-6) ft BGS mg/kg	12/9/2011 (12-14) ft BGS mg/kg
Metals			
Aluminum	3500	-	-
Antimony	0.83 J	-	-
Arsenic	1.8	-	-
Barium	27	-	-
Beryllium	0.32 J	-	-
Chromium	6.2	-	-
Cobalt	1.9 J	-	-
Copper	4.2	-	-
Lead	4.7	-	-
Manganese	180	-	-
Nickel	6.7	-	-
Thallium	1.1	-	-
Vanadium	7.4	-	-
Zinc	33	-	-
PCBs			
Aroclor-1254 (PCB-1254)	-	0.051	-
Total PCBs	-	0.051	-
SVOCs			
Acenaphthene	0.13	-	-
Anthracene	0.42	-	-
Benzo(a)anthracene	2.7	-	-
Benzo(a)pyrene	2.4	-	-
Benzo(b)fluoranthene	3.2	-	-
Benzo(g,h,i)perylene	1.5	-	-
Benzo(k)fluoranthene	1.3	-	-
Carbazole	0.28	-	-
Chrysene	2.4	-	-
Dibenzofuran	0.047 J	-	-
Fluoranthene	5.2	-	-
Fluorene	0.11	-	-
Indeno(1,2,3-cd)pyrene	1.3	-	-
Phenanthrene	1.9	-	-
Pyrene	4.4	-	-
VOCs			
2-Butanone (Methyl ethyl ketone) (MEK)	-	-	0.0021 J
Carbon disulfide	-	-	0.00082 J
Toluene	-	-	0.00025 J

SP-6	12/9/2011 - mg/kg	12/9/2011 (4-6) ft BGS mg/kg	12/9/2011 (10-12) ft BGS mg/kg	12/9/2011 (16-20) ft BGS mg/kg
Metals				
Aluminum	4000/2900	-	-	-
Antimony	0.37 J	-	-	-
Arsenic	3.5/8.2	-	-	-
Barium	19/23	-	-	-
Cadmium	0.039 J/0.040 J	-	-	-
Chromium	6.7/7.0	-	-	-
Cobalt	1.9 J/2.6 J	-	-	-
Copper	4.5/4.5	-	-	-
Lead	5.7/5.8	-	-	-
Manganese	190/130	-	-	-
Nickel	6.3/6.4	-	-	-
Thallium	0.88 J/0.98	-	-	-
Vanadium	7.3/9.3	-	-	-
Zinc	17/17	-	-	-
PCBs				
Aroclor-1248 (PCB-1248)	-	0.6	0.059	-
Aroclor-1260 (PCB-1260)	-	0.13 J	0.021 J	-
Total PCBs	-	0.73 J	0.08 J	-
SVOCs				
2-Methylnaphthalene	0.028/0.011	-	-	-
Acenaphthene	0.11/0.057	-	-	-
Anthracene	0.14/0.33	-	-	-
Benzo(a)anthracene	0.43/0.45	-	-	-
Benzo(a)pyrene	0.35/0.4	-	-	-
Benzo(b)fluoranthene	0.43/0.52	-	-	-
Benzo(g,h,i)perylene	0.22/0.24	-	-	-
Benzo(k)fluoranthene	0.22/0.3	-	-	-
Carbazole	0.082/0.14	-	-	-
Chrysene	0.39/0.46	-	-	-
Dibenz(a,h)anthracene	0.056 J	-	-	-
Dibenzofuran	0.095/0.032 J	-	-	-
Dimethyl phthalate	0.039 J	-	-	-
Fluoranthene	1.2/1.1	-	-	-
Fluorene	0.16/0.068	-	-	-
Indeno(1,2,3-cd)pyrene	0.2/0.23	-	-	-
Naphthalene	0.013 J/0.071 J	-	-	-
Phenanthrene	0.66/1.2	-	-	-
Pyrene	0.87/0.79	-	-	-
VOCs				
Carbon disulfide	-	-	-	0.0011 J
Toluene	-	-	-	0.00059 J

Notes:
U - Not detected at the associated reporting limit.
J - Estimated concentration.
UJ - Not detected, associated reporting limit is estimated.
R - Rejected.

[1] US EPA RSL - US EPA (United States Environmental Protection Agency) Regional Screening Levels (RSL) for Chemical Contaminants at Superfund Sites. Effective November 2018. HQ=0.1

2.9* Bold and boxed denotes exceedance of criteria identified by superscript

No	Revision	Date	Initial

N

0 20 40ft

LEGEND

■ SOIL SAMPLE LOCATION

SAMPLE LOCATION
SP-8 | 04/14/00 — SAMPLE DATE
0-4(ft BGS) — SAMPLE DEPTH
mg/kg — RESULT UNIT
Arsenic | NS — RESULT
PARAMETER

DRAFT
FINAL SURVEY OF BOREHOLE LOCATIONS HAS NOT BEEN COMPLETED.

SCALE VERIFICATION

THIS BAR MEASURES 1" ON ORIGINAL. ADJUST SCALE ACCORDINGLY.

Approved

DRAWING STATUS

Status	Date	Initial

SOIL SAMPLE LOCATIONS EXISTING SOIL STOCKPILE

TOLEDO, OHIO

RACER PROPERTY

GHD

Source Reference:

Project Manager:	Reviewed By:	Date:	
A.L.	A.L.	JANUARY 2019	
Scale: 1:40	Project No: 012609-T01	Report No: MEMO081	Drawing No: figure 1.1

TABLE 1.1
SUMMARY OF ANALYTICAL RESULTS
RISK ASSESSMENT
TOLEDO 103C LANDFILL
TOLEDO, OHIO

Sample Location:		**US EPA RSL[1]**	SP-1	SP-1	SP-1	SP-1	SP-1	SP-2
Sample Identification:		**U.S. EPA**	S-12609-120811-DN-13	S-12609-120811-DN-14	S-12609-120811-DN-17	S-12609-120811-DN-15	S-12609-120811-DN-16	S-12609-120811-DN-18
Sample Date:		**Regional Screening**	12/8/2011	12/8/2011	12/8/2011	12/8/2011	12/8/2011	12/8/2011
Sample Depth:		**Levels**	-	(6-8) ft BGS	(6-8) ft BGS	(12-14) ft BGS	(16-18) ft BGS	-
Sample Type:		**Industrial**						
Parameters	**Units**							
Volatile Organic Compounds (VOCs)								
1,1,1-Trichloroethane	mg/kg	3600	--	--	0.0047 U	--	--	--
1,1,2,2-Tetrachloroethane	mg/kg	2.7	--	--	0.0047 U	--	--	--
1,1,2-Trichloroethane	mg/kg	0.63	--	--	0.0047 U	--	--	--
1,1-Dichloroethane	mg/kg	16	--	--	0.0047 U	--	--	--
1,1-Dichloroethene	mg/kg	100	--	--	0.0047 U	--	--	--
1,2,4-Trichlorobenzene	mg/kg	26	--	--	0.0047 U	--	--	--
1,2-Dibromo-3-chloropropane (DBCP)	mg/kg	0.064	--	--	0.0094 U	--	--	--
1,2-Dibromoethane (Ethylene dibromide)	mg/kg	0.16	--	--	0.0047 U	--	--	--
1,2-Dichlorobenzene	mg/kg	930	--	--	0.0047 U	--	--	--
1,2-Dichloroethane	mg/kg	2	--	--	0.0047 U	--	--	--
1,2-Dichloropropane	mg/kg	6.6	--	--	0.0047 U	--	--	--
1,3-Dichlorobenzene	mg/kg	11	--	--	0.0047 U	--	--	--
1,4-Dichlorobenzene	mg/kg	11	--	--	0.0047 U	--	--	--
2-Butanone (Methyl ethyl ketone) (MEK)	mg/kg	19000	--	--	0.0014 J	--	--	--
2-Hexanone	mg/kg	130	--	--	0.019 U	--	--	--
4-Methyl-2-pentanone (Methyl isobutyl ketone) (MIBK)	mg/kg	14000	--	--	0.019 U	--	--	--
Acetone	mg/kg	67000	--	--	0.019 U	--	--	--
Benzene	mg/kg	5.1	--	--	0.0047 U	--	--	--
Bromodichloromethane	mg/kg	1.3	--	--	0.0047 U	--	--	--
Bromoform	mg/kg	86	--	--	0.0047 U	--	--	--
Bromomethane (Methyl bromide)	mg/kg	3	--	--	0.0047 U	--	--	--
Carbon disulfide	mg/kg	350	--	--	0.0047 U	--	--	--
Carbon tetrachloride	mg/kg	2.9	--	--	0.0047 U	--	--	--
Chlorobenzene	mg/kg	130	--	--	0.0047 U	--	--	--
Chloroethane	mg/kg	5700	--	--	0.0047 U	--	--	--
Chloroform (Trichloromethane)	mg/kg	1.4	--	--	0.0003 J	--	--	--
Chloromethane (Methyl chloride)	mg/kg	46	--	--	0.0047 U	--	--	--
cis-1,2-Dichloroethene	mg/kg	230	--	--	0.0047 U	--	--	--
cis-1,3-Dichloropropene	mg/kg		--	--	0.0047 U	--	--	--
Cyclohexane	mg/kg	2700	--	--	0.0094 U	--	--	--
Dibromochloromethane	mg/kg	39	--	--	0.0047 U	--	--	--
Dichlorodifluoromethane (CFC-12)	mg/kg	37	--	--	0.0047 U	--	--	--
Ethylbenzene	mg/kg	25	--	--	0.0047 U	--	--	--
Isopropyl benzene	mg/kg	990	--	--	0.0047 U	--	--	--
Methyl acetate	mg/kg	120000	--	--	0.0094 U	--	--	--
Methyl cyclohexane	mg/kg		--	--	0.0094 U	--	--	--
Methyl tert butyl ether (MTBE)	mg/kg	210	--	--	0.019 U	--	--	--
Methylene chloride	mg/kg	320	--	--	0.0047 U	--	--	--
Styrene	mg/kg	3500	--	--	0.0047 U	--	--	--
Tetrachloroethene	mg/kg	39	--	--	0.0047 U	--	--	--
Toluene	mg/kg	4700	--	--	0.00084 J	--	--	--
trans-1,2-Dichloroethene	mg/kg	2300	--	--	0.0047 U	--	--	--
trans-1,3-Dichloropropene	mg/kg		--	--	0.0047 U	--	--	--
Trichloroethene	mg/kg	1.9	--	--	0.0047 U	--	--	--
Trichlorofluoromethane (CFC-11)	mg/kg	35000	--	--	0.0047 U	--	--	--
Trifluorotrichloroethane (CFC-113)	mg/kg	2800	--	--	0.0047 U	--	--	--
Vinyl chloride	mg/kg	1.7	--	--	0.0047 U	--	--	--
Xylenes (total)	mg/kg	250	--	--	0.0094 U	--	--	--
Semi-Volatile Organic Compounds (SVOCs)								
2,2'-Oxybis(1-chloropropane) (bis(2-Chloroisopropyl) ether)	mg/kg	4700	0.11 U	--	--	--	--	0.11 U
2,4,5-Trichlorophenol	mg/kg	8200	0.16 U	--	--	--	--	0.17 U

TABLE 1.1
SUMMARY OF ANALYTICAL RESULTS
RISK ASSESSMENT
TOLEDO 103C LANDFILL
TOLEDO, OHIO

Sample Location:		**US EPA RSL[1]**	SP-1	SP-1	SP-1	SP-1	SP-1	SP-2
Sample Identification:		**U.S. EPA**	S-12609-120811-DN-13	S-12609-120811-DN-14	S-12609-120811-DN-17	S-12609-120811-DN-15	S-12609-120811-DN-16	S-12609-120811-DN-18
Sample Date:		**Regional Screening**	12/8/2011	12/8/2011	12/8/2011	12/8/2011	12/8/2011	12/8/2011
Sample Depth:		**Levels**	-	(6-8) ft BGS	(6-8) ft BGS	(12-14) ft BGS	(16-18) ft BGS	-
Sample Type:		**Industrial**						
Parameters	**Units**							
2,4,6-Trichlorophenol	mg/kg	82	0.16 U	--	--	--	--	0.17 U
2,4-Dichlorophenol	mg/kg	250	0.16 U	--	--	--	--	0.17 U
2,4-Dimethylphenol	mg/kg	1600	0.16 U	--	--	--	--	0.17 U
2,4-Dinitrophenol	mg/kg	160	0.36 U	--	--	--	--	0.37 U
2,4-Dinitrotoluene	mg/kg	7.4	0.22 U	--	--	--	--	0.23 U
2,6-Dinitrotoluene	mg/kg	1.5	0.22 U	--	--	--	--	0.23 U
2-Chloronaphthalene	mg/kg	6000	0.055 U	--	--	--	--	0.056 U
2-Chlorophenol	mg/kg	580	0.055 U	--	--	--	--	0.056 U
2-Methylnaphthalene	mg/kg	300	0.012	--	--	--	--	0.0075 U
2-Methylphenol	mg/kg	4100	0.22 U	--	--	--	--	0.23 U
2-Nitroaniline	mg/kg	800	0.22 U	--	--	--	--	0.23 U
2-Nitrophenol	mg/kg		0.055 U	--	--	--	--	0.056 U
3&4-Methylphenol	mg/kg	4100	0.44 U	--	--	--	--	0.45 U
3,3'-Dichlorobenzidine	mg/kg	5.1	0.11 U	--	--	--	--	0.11 U
3-Nitroaniline	mg/kg		0.22 U	--	--	--	--	0.23 U
4,6-Dinitro-2-methylphenol	mg/kg	6.6	0.16 U	--	--	--	--	0.17 U
4-Bromophenyl phenyl ether	mg/kg		0.055 U	--	--	--	--	0.056 U
4-Chloro-3-methylphenol	mg/kg	8200	0.16 U	--	--	--	--	0.17 U
4-Chloroaniline	mg/kg	11	0.16 U	--	--	--	--	0.17 U
4-Chlorophenyl phenyl ether	mg/kg		0.055 U	--	--	--	--	0.056 U
4-Nitroaniline	mg/kg	110	0.22 U	--	--	--	--	0.23 U
4-Nitrophenol	mg/kg		0.36 U	--	--	--	--	0.37 U
Acenaphthene	mg/kg	4500	0.023	--	--	--	--	0.0075 U
Acenaphthylene	mg/kg	4500	0.012	--	--	--	--	0.0075 U
Acetophenone	mg/kg	12000	0.11 U	--	--	--	--	0.11 U
Anthracene	mg/kg	23000	0.066	--	--	--	--	0.0075 U
Atrazine	mg/kg	10	0.22 U	--	--	--	--	0.23 U
Benzaldehyde	mg/kg	820	0.11 U	--	--	--	--	0.11 U
Benzo(a)anthracene	mg/kg	21	0.28	--	--	--	--	0.0075 U
Benzo(a)pyrene	mg/kg	2.1	0.28	--	--	--	--	0.0041 J
Benzo(b)fluoranthene	mg/kg	21	0.44	--	--	--	--	0.0058 J
Benzo(g,h,i)perylene	mg/kg	2300	0.2	--	--	--	--	0.0075 U
Benzo(k)fluoranthene	mg/kg	210	0.17	--	--	--	--	0.0075 U
Biphenyl (1,1-Biphenyl)	mg/kg	20	0.055 U	--	--	--	--	0.056 U
bis(2-Chloroethoxy)methane	mg/kg	250	0.11 U	--	--	--	--	0.11 U
bis(2-Chloroethyl)ether	mg/kg	1	0.11 U	--	--	--	--	0.11 U
bis(2-Ethylhexyl)phthalate (DEHP)	mg/kg	160	0.063 U	--	--	--	--	0.056 U
Butyl benzylphthalate (BBP)	mg/kg	1200	0.055 U	--	--	--	--	0.056 U
Caprolactam	mg/kg	40000	0.36 U	--	--	--	--	0.37 U
Carbazole	mg/kg		0.043 J	--	--	--	--	0.056 U
Chrysene	mg/kg	2100	0.31	--	--	--	--	0.0075 U
Dibenz(a,h)anthracene	mg/kg	2.1	0.0073 U	--	--	--	--	0.0075 U
Dibenzofuran	mg/kg	100	0.016 J	--	--	--	--	0.056 U
Diethyl phthalate	mg/kg	66000	0.055 U	--	--	--	--	0.056 U
Dimethyl phthalate	mg/kg		0.055 U	--	--	--	--	0.056 U
Di-n-butylphthalate (DBP)	mg/kg	8200	0.055 U	--	--	--	--	0.056 U
Di-n-octyl phthalate (DnOP)	mg/kg	820	0.055 U	--	--	--	--	0.056 U
Fluoranthene	mg/kg	3000	0.66	--	--	--	--	0.0072 J
Fluorene	mg/kg	3000	0.025	--	--	--	--	0.0075 U
Hexachlorobenzene	mg/kg	0.96	0.0073 U	--	--	--	--	0.0075 U
Hexachlorobutadiene	mg/kg	5.3	0.055 U	--	--	--	--	0.056 U
Hexachlorocyclopentadiene	mg/kg	0.75	0.36 U	--	--	--	--	0.37 U
Hexachloroethane	mg/kg	8	0.055 U	--	--	--	--	0.056 U
Indeno(1,2,3-cd)pyrene	mg/kg	21	0.16	--	--	--	--	0.0075 U

TABLE 1.1
SUMMARY OF ANALYTICAL RESULTS
RISK ASSESSMENT
TOLEDO 103C LANDFILL
TOLEDO, OHIO

Sample Location:		**US EPA RSL[(1)]**	SP-1	SP-1	SP-1	SP-1	SP-1	SP-2
Sample Identification:		**U.S. EPA**	S-12609-120811-DN-13	S-12609-120811-DN-14	S-12609-120811-DN-17	S-12609-120811-DN-15	S-12609-120811-DN-16	S-12609-120811-DN-18
Sample Date:		**Regional Screening**	12/8/2011	12/8/2011	12/8/2011	12/8/2011	12/8/2011	12/8/2011
Sample Depth:		**Levels**	-	(6-8) ft BGS	(6-8) ft BGS	(12-14) ft BGS	(16-18) ft BGS	-
Sample Type:		**Industrial**						
Parameters	**Units**							
Isophorone	mg/kg	2400	0.055 U	--	--	--	--	0.056 U
Naphthalene	mg/kg	17	0.013	--	--	--	--	0.0075 U
Nitrobenzene	mg/kg	22	0.11 U	--	--	--	--	0.11 U
N-Nitrosodi-n-propylamine	mg/kg	0.33	0.055 U	--	--	--	--	0.056 U
N-Nitrosodiphenylamine	mg/kg	470	0.055 U	--	--	--	--	0.056 U
Pentachlorophenol	mg/kg	4	0.16 U	--	--	--	--	0.17 U
Phenanthrene	mg/kg	23000	0.29	--	--	--	--	0.0075 U
Phenol	mg/kg	25000	0.055 U	--	--	--	--	0.056 U
Pyrene	mg/kg	2300	0.6	--	--	--	--	0.0064 J
Metals								
Aluminum	mg/kg	110000	2600	--	--	--	--	1800
Antimony	mg/kg	47	0.87 U	--	--	--	--	1.0 U
Arsenic	mg/kg	3	2.5	--	--	--	--	1.8
Barium	mg/kg	22000	15 J	--	--	--	--	6.2 J
Beryllium	mg/kg	230	0.075 J	--	--	--	--	0.089 J
Cadmium	mg/kg		0.14 J	--	--	--	--	0.069 J
Chromium	mg/kg	6.3	5.0	--	--	--	--	3.5
Cobalt	mg/kg	35	1.7 J	--	--	--	--	1.5 J
Copper	mg/kg	4700	3.5	--	--	--	--	2.4 J
Lead	mg/kg	800	4.0	--	--	--	--	1.4
Manganese	mg/kg	2600	61	--	--	--	--	29
Mercury	mg/kg	4.6	0.091 U	--	--	--	--	0.084 U
Nickel	mg/kg	2200	5.2	--	--	--	--	3.8 J
Selenium	mg/kg	580	0.43 U	--	--	--	--	0.51 U
Silver	mg/kg	580	0.43 U	--	--	--	--	0.51 U
Thallium	mg/kg	1.2	0.87 U	--	--	--	--	1.0 U
Vanadium	mg/kg	580	7.2	--	--	--	--	6.4
Zinc	mg/kg	35000	25	--	--	--	--	8.6
PCBs								
Aroclor-1016 (PCB-1016)	mg/kg	5.1	--	0.036 U	--	0.037 U	0.038 U	--
Aroclor-1221 (PCB-1221)	mg/kg	0.83	--	0.036 U	--	0.037 U	0.038 U	--
Aroclor-1232 (PCB-1232)	mg/kg	0.72	--	0.036 U	--	0.037 U	0.038 U	--
Aroclor-1242 (PCB-1242)	mg/kg	0.95	--	0.036 U	--	0.037 U	0.038 U	--
Aroclor-1248 (PCB-1248)	mg/kg	0.95	--	0.036 U	--	0.037 U	0.038 U	--
Aroclor-1254 (PCB-1254)	mg/kg	0.97	--	0.036 U	--	0.023 J	0.038 U	--
Aroclor-1260 (PCB-1260)	mg/kg	0.99	--	0.036 U	--	0.037 U	0.038 U	--
Total PCBs	mg/kg	0.97	--	ND	--	0.023 J	ND	--

Notes:

U - Not detected at the associated reporting limit.
J - Estimated concentration.
UJ - Not detected; associated reporting limit is estimated.
R - Rejected.

[(1)] US EPA RSL - US EPA (United States Environmental Protection Agency) Regional Screening Levels (RSL) for Chemical Contaminants at Superfund Sites, Effective November 2018. HQ=0.1

2.5[a] -bold and boxed denotes exceedance of criteria identified by superscript.

TABLE 1.1
SUMMARY OF ANALYTICAL RESULTS
RISK ASSESSMENT
TOLEDO 103C LANDFILL
TOLEDO, OHIO

Sample Location:		SP-2	SP-2	SP-2	SP-2	SP-3	SP-3	SP-3
Sample Identification:		S-12609-120811-DN-19	S-12609-120811-DN-22	S-12609-120811-DN-20	S-12609-120811-DN-21	S-12609-120811-DN-23	S-12609-120811-DN-24	S-12609-120811-DN-27
Sample Date:		12/8/2011	12/8/2011	12/8/2011	12/8/2011	12/8/2011	12/8/2011	12/8/2011
Sample Depth:		(3-5) ft BGS	(3-5) ft BGS	(8-10) ft BGS	(10-12) ft BGS	-	(3-5) ft BGS	(4-6) ft BGS
Sample Type:								
Parameters	**Units**							
Volatile Organic Compounds (VOCs)								
1,1,1-Trichloroethane	mg/kg	--	0.0055 U	--	--	--	--	0.0048 U
1,1,2,2-Tetrachloroethane	mg/kg	--	0.0055 U	--	--	--	--	0.0048 U
1,1,2-Trichloroethane	mg/kg	--	0.0055 U	--	--	--	--	0.0048 U
1,1-Dichloroethane	mg/kg	--	0.0055 U	--	--	--	--	0.0048 U
1,1-Dichloroethene	mg/kg	--	0.0055 U	--	--	--	--	0.0048 U
1,2,4-Trichlorobenzene	mg/kg	--	0.0055 U	--	--	--	--	0.0048 U
1,2-Dibromo-3-chloropropane (DBCP)	mg/kg	--	0.011 U	--	--	--	--	0.0095 U
1,2-Dibromoethane (Ethylene dibromide)	mg/kg	--	0.0055 U	--	--	--	--	0.0048 U
1,2-Dichlorobenzene	mg/kg	--	0.0055 U	--	--	--	--	0.0048 U
1,2-Dichloroethane	mg/kg	--	0.0055 U	--	--	--	--	0.0048 U
1,2-Dichloropropane	mg/kg	--	0.0055 U	--	--	--	--	0.0048 U
1,3-Dichlorobenzene	mg/kg	--	0.0055 U	--	--	--	--	0.0048 U
1,4-Dichlorobenzene	mg/kg	--	0.0055 U	--	--	--	--	0.0048 U
2-Butanone (Methyl ethyl ketone) (MEK)	mg/kg	--	0.022 U	--	--	--	--	0.0026 J
2-Hexanone	mg/kg	--	0.022 U	--	--	--	--	0.019 U
4-Methyl-2-pentanone (Methyl isobutyl ketone) (MIBK)	mg/kg	--	0.022 U	--	--	--	--	0.019 U
Acetone	mg/kg	--	0.022 U	--	--	--	--	0.019 U
Benzene	mg/kg	--	0.0055 U	--	--	--	--	0.0048 U
Bromodichloromethane	mg/kg	--	0.0055 U	--	--	--	--	0.0048 U
Bromoform	mg/kg	--	0.0055 U	--	--	--	--	0.0048 U
Bromomethane (Methyl bromide)	mg/kg	--	0.0055 U	--	--	--	--	0.0048 U
Carbon disulfide	mg/kg	--	0.0055 U	--	--	--	--	0.0048 U
Carbon tetrachloride	mg/kg	--	0.0055 U	--	--	--	--	0.0048 U
Chlorobenzene	mg/kg	--	0.0055 U	--	--	--	--	0.0048 U
Chloroethane	mg/kg	--	0.0055 U	--	--	--	--	0.0048 U
Chloroform (Trichloromethane)	mg/kg	--	0.0055 U	--	--	--	--	0.0048 U
Chloromethane (Methyl chloride)	mg/kg	--	0.0055 U	--	--	--	--	0.0048 U
cis-1,2-Dichloroethene	mg/kg	--	0.0055 U	--	--	--	--	0.0048 U
cis-1,3-Dichloropropene	mg/kg	--	0.0055 U	--	--	--	--	0.0048 U
Cyclohexane	mg/kg	--	0.011 U	--	--	--	--	0.0095 U
Dibromochloromethane	mg/kg	--	0.0055 U	--	--	--	--	0.0048 U
Dichlorodifluoromethane (CFC-12)	mg/kg	--	0.0055 U	--	--	--	--	0.0048 U
Ethylbenzene	mg/kg	--	0.0055 U	--	--	--	--	0.0048 U
Isopropyl benzene	mg/kg	--	0.0055 U	--	--	--	--	0.0048 U
Methyl acetate	mg/kg	--	0.0058 J	--	--	--	--	0.0095 U
Methyl cyclohexane	mg/kg	--	0.011 U	--	--	--	--	0.0095 U
Methyl tert butyl ether (MTBE)	mg/kg	--	0.022 U	--	--	--	--	0.019 U
Methylene chloride	mg/kg	--	0.0055 U	--	--	--	--	0.0048 U
Styrene	mg/kg	--	0.0055 U	--	--	--	--	0.0048 U
Tetrachloroethene	mg/kg	--	0.0055 U	--	--	--	--	0.0048 U
Toluene	mg/kg	--	0.00066 J	--	--	--	--	0.00028 J
trans-1,2-Dichloroethene	mg/kg	--	0.0055 U	--	--	--	--	0.0048 U
trans-1,3-Dichloropropene	mg/kg	--	0.0055 U	--	--	--	--	0.0048 U
Trichloroethene	mg/kg	--	0.0055 U	--	--	--	--	0.0048 U
Trichlorofluoromethane (CFC-11)	mg/kg	--	0.0055 U	--	--	--	--	0.0048 U
Trifluorotrichloroethane (CFC-113)	mg/kg	--	0.0055 U	--	--	--	--	0.0048 U
Vinyl chloride	mg/kg	--	0.0055 U	--	--	--	--	0.0048 U
Xylenes (total)	mg/kg	--	0.011 U	--	--	--	--	0.0095 U
Semi-Volatile Organic Compounds (SVOCs)								
2,2'-Oxybis(1-chloropropane) (bis(2-Chloroisopropyl) ether)	mg/kg	--	--	--	--	0.58 U	--	--
2,4,5-Trichlorophenol	mg/kg	--	--	--	--	0.86 U	--	--

TABLE 1.1
SUMMARY OF ANALYTICAL RESULTS
RISK ASSESSMENT
TOLEDO 103C LANDFILL
TOLEDO, OHIO

Sample Location:		SP-2	SP-2	SP-2	SP-2	SP-3	SP-3	SP-3
Sample Identification:		S-12609-120811-DN-19	S-12609-120811-DN-22	S-12609-120811-DN-20	S-12609-120811-DN-21	S-12609-120811-DN-23	S-12609-120811-DN-24	S-12609-120811-DN-27
Sample Date:		12/8/2011	12/8/2011	12/8/2011	12/8/2011	12/8/2011	12/8/2011	12/8/2011
Sample Depth:		(3-5) ft BGS	(3-5) ft BGS	(8-10) ft BGS	(10-12) ft BGS	-	(3-5) ft BGS	(4-6) ft BGS
Sample Type:								
Parameters	**Units**							
2,4,6-Trichlorophenol	mg/kg	--	--	--	--	0.86 U	--	--
2,4-Dichlorophenol	mg/kg	--	--	--	--	0.86 U	--	--
2,4-Dimethylphenol	mg/kg	--	--	--	--	0.86 U	--	--
2,4-Dinitrophenol	mg/kg	--	--	--	--	1.9 U	--	--
2,4-Dinitrotoluene	mg/kg	--	--	--	--	1.2 U	--	--
2,6-Dinitrotoluene	mg/kg	--	--	--	--	1.2 U	--	--
2-Chloronaphthalene	mg/kg	--	--	--	--	0.29 U	--	--
2-Chlorophenol	mg/kg	--	--	--	--	0.29 U	--	--
2-Methylnaphthalene	mg/kg	--	--	--	--	0.037 J	--	--
2-Methylphenol	mg/kg	--	--	--	--	1.2 U	--	--
2-Nitroaniline	mg/kg	--	--	--	--	1.2 U	--	--
2-Nitrophenol	mg/kg	--	--	--	--	0.29 U	--	--
3&4-Methylphenol	mg/kg	--	--	--	--	2.3 U	--	--
3,3'-Dichlorobenzidine	mg/kg	--	--	--	--	0.58 U	--	--
3-Nitroaniline	mg/kg	--	--	--	--	1.2 U	--	--
4,6-Dinitro-2-methylphenol	mg/kg	--	--	--	--	0.86 U	--	--
4-Bromophenyl phenyl ether	mg/kg	--	--	--	--	0.29 U	--	--
4-Chloro-3-methylphenol	mg/kg	--	--	--	--	0.86 U	--	--
4-Chloroaniline	mg/kg	--	--	--	--	0.86 U	--	--
4-Chlorophenyl phenyl ether	mg/kg	--	--	--	--	0.29 U	--	--
4-Nitroaniline	mg/kg	--	--	--	--	1.2 U	--	--
4-Nitrophenol	mg/kg	--	--	--	--	1.9 U	--	--
Acenaphthene	mg/kg	--	--	--	--	0.12	--	--
Acenaphthylene	mg/kg	--	--	--	--	0.053	--	--
Acetophenone	mg/kg	--	--	--	--	0.58 U	--	--
Anthracene	mg/kg	--	--	--	--	0.37	--	--
Atrazine	mg/kg	--	--	--	--	1.2 U	--	--
Benzaldehyde	mg/kg	--	--	--	--	0.58 U	--	--
Benzo(a)anthracene	mg/kg	--	--	--	--	1.8	--	--
Benzo(a)pyrene	mg/kg	--	--	--	--	1.8	--	--
Benzo(b)fluoranthene	mg/kg	--	--	--	--	2.3	--	--
Benzo(g,h,i)perylene	mg/kg	--	--	--	--	1.1	--	--
Benzo(k)fluoranthene	mg/kg	--	--	--	--	1.3	--	--
Biphenyl (1,1-Biphenyl)	mg/kg	--	--	--	--	0.29 U	--	--
bis(2-Chloroethoxy)methane	mg/kg	--	--	--	--	0.58 U	--	--
bis(2-Chloroethyl)ether	mg/kg	--	--	--	--	0.58 U	--	--
bis(2-Ethylhexyl)phthalate (DEHP)	mg/kg	--	--	--	--	0.29 U	--	--
Butyl benzylphthalate (BBP)	mg/kg	--	--	--	--	0.29 U	--	--
Caprolactam	mg/kg	--	--	--	--	1.9 U	--	--
Carbazole	mg/kg	--	--	--	--	0.29	--	--
Chrysene	mg/kg	--	--	--	--	1.7	--	--
Dibenz(a,h)anthracene	mg/kg	--	--	--	--	0.038 U	--	--
Dibenzofuran	mg/kg	--	--	--	--	0.076 J	--	--
Diethyl phthalate	mg/kg	--	--	--	--	0.29 U	--	--
Dimethyl phthalate	mg/kg	--	--	--	--	0.29 U	--	--
Di-n-butylphthalate (DBP)	mg/kg	--	--	--	--	0.29 U	--	--
Di-n-octyl phthalate (DnOP)	mg/kg	--	--	--	--	0.29 U	--	--
Fluoranthene	mg/kg	--	--	--	--	3.5	--	--
Fluorene	mg/kg	--	--	--	--	0.14	--	--
Hexachlorobenzene	mg/kg	--	--	--	--	0.038 U	--	--
Hexachlorobutadiene	mg/kg	--	--	--	--	0.29 U	--	--
Hexachlorocyclopentadiene	mg/kg	--	--	--	--	1.9 U	--	--
Hexachloroethane	mg/kg	--	--	--	--	0.29 U	--	--
Indeno(1,2,3-cd)pyrene	mg/kg	--	--	--	--	0.94	--	--

TABLE 1.1
SUMMARY OF ANALYTICAL RESULTS
RISK ASSESSMENT
TOLEDO 103C LANDFILL
TOLEDO, OHIO

Sample Location:		SP-2	SP-2	SP-2	SP-2	SP-3	SP-3	SP-3
Sample Identification:		S-12609-120811-DN-19	S-12609-120811-DN-22	S-12609-120811-DN-20	S-12609-120811-DN-21	S-12609-120811-DN-23	S-12609-120811-DN-24	S-12609-120811-DN-27
Sample Date:		12/8/2011	12/8/2011	12/8/2011	12/8/2011	12/8/2011	12/8/2011	12/8/2011
Sample Depth:		(3-5) ft BGS	(3-5) ft BGS	(8-10) ft BGS	(10-12) ft BGS	-	(3-5) ft BGS	(4-6) ft BGS
Sample Type:								
Parameters	**Units**							
Isophorone	mg/kg	--	--	--	--	0.29 U	--	--
Naphthalene	mg/kg	--	--	--	--	0.06	--	--
Nitrobenzene	mg/kg	--	--	--	--	0.58 U	--	--
N-Nitrosodi-n-propylamine	mg/kg	--	--	--	--	0.29 U	--	--
N-Nitrosodiphenylamine	mg/kg	--	--	--	--	0.29 U	--	--
Pentachlorophenol	mg/kg	--	--	--	--	0.86 U	--	--
Phenanthrene	mg/kg	--	--	--	--	1.7	--	--
Phenol	mg/kg	--	--	--	--	0.29 U	--	--
Pyrene	mg/kg	--	--	--	--	2.8	--	--
Metals								
Aluminum	mg/kg	--	--	--	--	3600	--	--
Antimony	mg/kg	--	--	--	--	0.96 U	--	--
Arsenic	mg/kg	--	--	--	--	**10**	--	--
Barium	mg/kg	--	--	--	--	31	--	--
Beryllium	mg/kg	--	--	--	--	0.17 J	--	--
Cadmium	mg/kg	--	--	--	--	0.22	--	--
Chromium	mg/kg	--	--	--	--	**7.5**	--	--
Cobalt	mg/kg	--	--	--	--	2.7 J	--	--
Copper	mg/kg	--	--	--	--	8.5	--	--
Lead	mg/kg	--	--	--	--	7.9	--	--
Manganese	mg/kg	--	--	--	--	150	--	--
Mercury	mg/kg	--	--	--	--	0.095 U	--	--
Nickel	mg/kg	--	--	--	--	8.0	--	--
Selenium	mg/kg	--	--	--	--	0.48 U	--	--
Silver	mg/kg	--	--	--	--	0.48 U	--	--
Thallium	mg/kg	--	--	--	--	0.96 U	--	--
Vanadium	mg/kg	--	--	--	--	8.7	--	--
Zinc	mg/kg	--	--	--	--	37	--	--
PCBs								
Aroclor-1016 (PCB-1016)	mg/kg	0.036 U	--	0.036 U	0.037 U	--	0.19 U	--
Aroclor-1221 (PCB-1221)	mg/kg	0.036 U	--	0.036 U	0.037 U	--	0.19 U	--
Aroclor-1232 (PCB-1232)	mg/kg	0.036 U	--	0.036 U	0.037 U	--	0.19 U	--
Aroclor-1242 (PCB-1242)	mg/kg	0.036 U	--	0.036 U	0.037 U	--	0.19 U	--
Aroclor-1248 (PCB-1248)	mg/kg	0.036 U	--	0.036 U	0.11	--	0.19 U	--
Aroclor-1254 (PCB-1254)	mg/kg	0.036 U	--	0.036 U	0.037 U	--	0.41	--
Aroclor-1260 (PCB-1260)	mg/kg	0.036 U	--	0.036 U	0.021 J	--	0.19 U	--
Total PCBs	mg/kg	ND	--	ND	0.131 J	--	0.41	--

Notes:

U - Not detected at the associated reporting limit.
J - Estimated concentration.
UJ - Not detected; associated reporting limit is estimated.
R - Rejected.

(1) US EPA RSL - US EPA (United States Environmental Protection A

2.5[a] -bold and boxed denotes exceedance of criteria identified by supersc

TABLE 1.1
SUMMARY OF ANALYTICAL RESULTS
RISK ASSESSMENT
TOLEDO 103C LANDFILL
TOLEDO, OHIO

Sample Location:		SP-3	SP-3	SP-4	SP-4	SP-4	SP-4	SP-4
Sample Identification:		S-12609-120811-DN-25	S-12609-120811-DN-26	S-12609-120811-DN-28	S-12609-120811-DN-29	S-12609-120811-DN-30	S-12609-120811-DN-31	S-12609-120811-DN-32
Sample Date:		12/8/2011	12/8/2011	12/8/2011	12/8/2011	12/8/2011	12/8/2011	12/8/2011
Sample Depth:		(8-10) ft BGS	(10-12) ft BGS	-	-	-	-	-
Sample Type:					Duplicate			
Parameters	**Units**							
Volatile Organic Compounds (VOCs)								
1,1,1-Trichloroethane	mg/kg	--	--	--	--	--	--	--
1,1,2,2-Tetrachloroethane	mg/kg	--	--	--	--	--	--	--
1,1,2-Trichloroethane	mg/kg	--	--	--	--	--	--	--
1,1-Dichloroethane	mg/kg	--	--	--	--	--	--	--
1,1-Dichloroethene	mg/kg	--	--	--	--	--	--	--
1,2,4-Trichlorobenzene	mg/kg	--	--	--	--	--	--	--
1,2-Dibromo-3-chloropropane (DBCP)	mg/kg	--	--	--	--	--	--	--
1,2-Dibromoethane (Ethylene dibromide)	mg/kg	--	--	--	--	--	--	--
1,2-Dichlorobenzene	mg/kg	--	--	--	--	--	--	--
1,2-Dichloroethane	mg/kg	--	--	--	--	--	--	--
1,2-Dichloropropane	mg/kg	--	--	--	--	--	--	--
1,3-Dichlorobenzene	mg/kg	--	--	--	--	--	--	--
1,4-Dichlorobenzene	mg/kg	--	--	--	--	--	--	--
2-Butanone (Methyl ethyl ketone) (MEK)	mg/kg	--	--	--	--	--	--	--
2-Hexanone	mg/kg	--	--	--	--	--	--	--
4-Methyl-2-pentanone (Methyl isobutyl ketone) (MIBK)	mg/kg	--	--	--	--	--	--	--
Acetone	mg/kg	--	--	--	--	--	--	--
Benzene	mg/kg	--	--	--	--	--	--	--
Bromodichloromethane	mg/kg	--	--	--	--	--	--	--
Bromoform	mg/kg	--	--	--	--	--	--	--
Bromomethane (Methyl bromide)	mg/kg	--	--	--	--	--	--	--
Carbon disulfide	mg/kg	--	--	--	--	--	--	--
Carbon tetrachloride	mg/kg	--	--	--	--	--	--	--
Chlorobenzene	mg/kg	--	--	--	--	--	--	--
Chloroethane	mg/kg	--	--	--	--	--	--	--
Chloroform (Trichloromethane)	mg/kg	--	--	--	--	--	--	--
Chloromethane (Methyl chloride)	mg/kg	--	--	--	--	--	--	--
cis-1,2-Dichloroethene	mg/kg	--	--	--	--	--	--	--
cis-1,3-Dichloropropene	mg/kg	--	--	--	--	--	--	--
Cyclohexane	mg/kg	--	--	--	--	--	--	--
Dibromochloromethane	mg/kg	--	--	--	--	--	--	--
Dichlorodifluoromethane (CFC-12)	mg/kg	--	--	--	--	--	--	--
Ethylbenzene	mg/kg	--	--	--	--	--	--	--
Isopropyl benzene	mg/kg	--	--	--	--	--	--	--
Methyl acetate	mg/kg	--	--	--	--	--	--	--
Methyl cyclohexane	mg/kg	--	--	--	--	--	--	--
Methyl tert butyl ether (MTBE)	mg/kg	--	--	--	--	--	--	--
Methylene chloride	mg/kg	--	--	--	--	--	--	--
Styrene	mg/kg	--	--	--	--	--	--	--
Tetrachloroethene	mg/kg	--	--	--	--	--	--	--
Toluene	mg/kg	--	--	--	--	--	--	--
trans-1,2-Dichloroethene	mg/kg	--	--	--	--	--	--	--
trans-1,3-Dichloropropene	mg/kg	--	--	--	--	--	--	--
Trichloroethene	mg/kg	--	--	--	--	--	--	--
Trichlorofluoromethane (CFC-11)	mg/kg	--	--	--	--	--	--	--
Trifluorotrichloroethane (CFC-113)	mg/kg	--	--	--	--	--	--	--
Vinyl chloride	mg/kg	--	--	--	--	--	--	--
Xylenes (total)	mg/kg	--	--	--	--	--	--	--
Semi-Volatile Organic Compounds (SVOCs)								
2,2'-Oxybis(1-chloropropane) (bis(2-Chloroisopropyl) ether)	mg/kg	--	--	0.11 U	0.11 U	--	--	--
2,4,5-Trichlorophenol	mg/kg	--	--	0.17 U	0.17 U	--	--	--

TABLE 1.1
SUMMARY OF ANALYTICAL RESULTS
RISK ASSESSMENT
TOLEDO 103C LANDFILL
TOLEDO, OHIO

Sample Location:		SP-3	SP-3	SP-4	SP-4	SP-4	SP-4	SP-4
Sample Identification:		S-12609-120811-DN-25	S-12609-120811-DN-26	S-12609-120811-DN-28	S-12609-120811-DN-29	S-12609-120811-DN-30	S-12609-120811-DN-31	S-12609-120811-DN-32
Sample Date:		12/8/2011	12/8/2011	12/8/2011	12/8/2011	12/8/2011	12/8/2011	12/8/2011
Sample Depth:		(8-10) ft BGS	(10-12) ft BGS	-	-	-	-	-
Sample Type:					Duplicate			
Parameters	**Units**							
2,4,6-Trichlorophenol	mg/kg	--	--	0.17 U	0.17 U	--	--	--
2,4-Dichlorophenol	mg/kg	--	--	0.17 U	0.17 U	--	--	--
2,4-Dimethylphenol	mg/kg	--	--	0.17 U	0.17 U	--	--	--
2,4-Dinitrophenol	mg/kg	--	--	0.37 U	0.38 U	--	--	--
2,4-Dinitrotoluene	mg/kg	--	--	0.23 U	0.23 U	--	--	--
2,6-Dinitrotoluene	mg/kg	--	--	0.23 U	0.23 U	--	--	--
2-Chloronaphthalene	mg/kg	--	--	0.056 U	0.057 U	--	--	--
2-Chlorophenol	mg/kg	--	--	0.056 U	0.057 U	--	--	--
2-Methylnaphthalene	mg/kg	--	--	0.0075 U	0.0055 J	--	--	--
2-Methylphenol	mg/kg	--	--	0.23 U	0.23 U	--	--	--
2-Nitroaniline	mg/kg	--	--	0.23 U	0.23 U	--	--	--
2-Nitrophenol	mg/kg	--	--	0.056 U	0.057 U	--	--	--
3&4-Methylphenol	mg/kg	--	--	0.45 U	0.45 U	--	--	--
3,3'-Dichlorobenzidine	mg/kg	--	--	0.11 U	0.11 U	--	--	--
3-Nitroaniline	mg/kg	--	--	0.23 U	0.23 U	--	--	--
4,6-Dinitro-2-methylphenol	mg/kg	--	--	0.17 U	0.17 U	--	--	--
4-Bromophenyl phenyl ether	mg/kg	--	--	0.056 U	0.057 U	--	--	--
4-Chloro-3-methylphenol	mg/kg	--	--	0.17 U	0.17 U	--	--	--
4-Chloroaniline	mg/kg	--	--	0.17 U	0.17 U	--	--	--
4-Chlorophenyl phenyl ether	mg/kg	--	--	0.056 U	0.057 U	--	--	--
4-Nitroaniline	mg/kg	--	--	0.23 U	0.23 U	--	--	--
4-Nitrophenol	mg/kg	--	--	0.37 U	0.38 U	--	--	--
Acenaphthene	mg/kg	--	--	0.0075 U	0.015	--	--	--
Acenaphthylene	mg/kg	--	--	0.0075 U	0.0048 J	--	--	--
Acetophenone	mg/kg	--	--	0.11 U	0.11 U	--	--	--
Anthracene	mg/kg	--	--	0.0081 J	0.038 J	--	--	--
Atrazine	mg/kg	--	--	0.23 U	0.23 U	--	--	--
Benzaldehyde	mg/kg	--	--	0.11 U	0.11 U	--	--	--
Benzo(a)anthracene	mg/kg	--	--	0.034 J	0.18 J	--	--	--
Benzo(a)pyrene	mg/kg	--	--	0.035 J	0.18 J	--	--	--
Benzo(b)fluoranthene	mg/kg	--	--	0.05 J	0.23 J	--	--	--
Benzo(g,h,i)perylene	mg/kg	--	--	0.028 J	0.12 J	--	--	--
Benzo(k)fluoranthene	mg/kg	--	--	0.023 J	0.11 J	--	--	--
Biphenyl (1,1-Biphenyl)	mg/kg	--	--	0.056 U	0.057 U	--	--	--
bis(2-Chloroethoxy)methane	mg/kg	--	--	0.11 U	0.11 U	--	--	--
bis(2-Chloroethyl)ether	mg/kg	--	--	0.11 U	0.11 U	--	--	--
bis(2-Ethylhexyl)phthalate (DEHP)	mg/kg	--	--	0.056 U	0.057 U	--	--	--
Butyl benzylphthalate (BBP)	mg/kg	--	--	0.056 U	0.057 U	--	--	--
Caprolactam	mg/kg	--	--	0.37 U	0.38 U	--	--	--
Carbazole	mg/kg	--	--	0.056 U	0.057 U	--	--	--
Chrysene	mg/kg	--	--	0.037 J	0.18 J	--	--	--
Dibenz(a,h)anthracene	mg/kg	--	--	0.0075 U	0.0076 U	--	--	--
Dibenzofuran	mg/kg	--	--	0.056 UJ	0.0088 J	--	--	--
Diethyl phthalate	mg/kg	--	--	0.056 U	0.057 U	--	--	--
Dimethyl phthalate	mg/kg	--	--	0.056 U	0.057 U	--	--	--
Di-n-butylphthalate (DBP)	mg/kg	--	--	0.056 U	0.057 U	--	--	--
Di-n-octyl phthalate (DnOP)	mg/kg	--	--	0.056 U	0.057 U	--	--	--
Fluoranthene	mg/kg	--	--	0.073 J	0.37 J	--	--	--
Fluorene	mg/kg	--	--	0.0075 U	0.015	--	--	--
Hexachlorobenzene	mg/kg	--	--	0.0075 U	0.0076 U	--	--	--
Hexachlorobutadiene	mg/kg	--	--	0.056 U	0.057 U	--	--	--
Hexachlorocyclopentadiene	mg/kg	--	--	0.37 U	0.38 U	--	--	--
Hexachloroethane	mg/kg	--	--	0.056 U	0.057 U	--	--	--
Indeno(1,2,3-cd)pyrene	mg/kg	--	--	0.023 J	0.12 J	--	--	--

TABLE 1.1
SUMMARY OF ANALYTICAL RESULTS
RISK ASSESSMENT
TOLEDO 103C LANDFILL
TOLEDO, OHIO

Sample Location:		SP-3	SP-3	SP-4	SP-4	SP-4	SP-4	SP-4
Sample Identification:		S-12609-120811-DN-25	S-12609-120811-DN-26	S-12609-120811-DN-28	S-12609-120811-DN-29	S-12609-120811-DN-30	S-12609-120811-DN-31	S-12609-120811-DN-32
Sample Date:		12/8/2011	12/8/2011	12/8/2011	12/8/2011	12/8/2011	12/8/2011	12/8/2011
Sample Depth:		(8-10) ft BGS	(10-12) ft BGS	-	-	-	-	-
Sample Type:					Duplicate			
Parameters	**Units**							
Isophorone	mg/kg	--	--	0.056 U	0.057 U	--	--	--
Naphthalene	mg/kg	--	--	0.0075 U	0.0071 J	--	--	--
Nitrobenzene	mg/kg	--	--	0.11 U	0.11 U	--	--	--
N-Nitrosodi-n-propylamine	mg/kg	--	--	0.056 U	0.057 U	--	--	--
N-Nitrosodiphenylamine	mg/kg	--	--	0.056 U	0.057 U	--	--	--
Pentachlorophenol	mg/kg	--	--	0.17 U	0.17 U	--	--	--
Phenanthrene	mg/kg	--	--	0.041 J	0.18 J	--	--	--
Phenol	mg/kg	--	--	0.056 U	0.057 U	--	--	--
Pyrene	mg/kg	--	--	0.065 J	0.3 J	--	--	--
Metals								
Aluminum	mg/kg	--	--	5900	5700	--	--	--
Antimony	mg/kg	--	--	0.92 U	0.38 J	--	--	--
Arsenic	mg/kg	--	--	**3.6**	**3.5**	--	--	--
Barium	mg/kg	--	--	42	49	--	--	--
Beryllium	mg/kg	--	--	0.28 J	0.13 J	--	--	--
Cadmium	mg/kg	--	--	0.25	0.031 J	--	--	--
Chromium	mg/kg	--	--	**9.4**	**10**	--	--	--
Cobalt	mg/kg	--	--	3.4 J	3.8 J	--	--	--
Copper	mg/kg	--	--	9.6	10	--	--	--
Lead	mg/kg	--	--	10	7.4	--	--	--
Manganese	mg/kg	--	--	140	220	--	--	--
Mercury	mg/kg	--	--	0.018 J	0.11 U	--	--	--
Nickel	mg/kg	--	--	13	12	--	--	--
Selenium	mg/kg	--	--	0.46 U	0.41 U	--	--	--
Silver	mg/kg	--	--	0.46 U	0.41 U	--	--	--
Thallium	mg/kg	--	--	0.92 U	**1.3**	--	--	--
Vanadium	mg/kg	--	--	14	13	--	--	--
Zinc	mg/kg	--	--	29	30	--	--	--
PCBs								
Aroclor-1016 (PCB-1016)	mg/kg	0.038 U	0.035 U	--	--	0.4 U	0.041 U	0.19 U
Aroclor-1221 (PCB-1221)	mg/kg	0.038 U	0.035 U	--	--	0.4 U	0.041 U	0.19 U
Aroclor-1232 (PCB-1232)	mg/kg	0.038 U	0.035 U	--	--	0.4 U	0.041 U	0.19 U
Aroclor-1242 (PCB-1242)	mg/kg	0.038 U	0.035 U	--	--	0.4 U	0.041 U	0.19 U
Aroclor-1248 (PCB-1248)	mg/kg	0.038 U	0.035 U	--	--	0.4 U	0.041 U	0.19 U
Aroclor-1254 (PCB-1254)	mg/kg	0.033 J	0.035 U	--	--	0.75	0.059	0.19 U
Aroclor-1260 (PCB-1260)	mg/kg	0.038 U	0.035 U	--	--	0.4 U	0.041 U	0.19 U
Total PCBs	mg/kg	0.033 J	ND	--	--	0.75	0.059	ND

Notes:

U - Not detected at the associated reporting limit.
J - Estimated concentration.
UJ - Not detected; associated reporting limit is estimated.
R - Rejected.

(1) US EPA RSL - US EPA (United States Environmental Protection A

2.5[a] -bold and boxed denotes exceedance of criteria identified by supersc

TABLE 1.1
SUMMARY OF ANALYTICAL RESULTS
RISK ASSESSMENT
TOLEDO 103C LANDFILL
TOLEDO, OHIO

Sample Location:		SP-4	SP-5	SP-5	SP-5	SP-5	SP-5	SP-6
Sample Identification:		S-12609-120811-DN-33	S-12609-120911-DN-34	S-12609-120911-DN-35	S-12609-120911-DN-36	S-12609-120911-DN-38	S-12609-120911-DN-37	S-12609-120911-DN-39
Sample Date:		12/8/2011	12/9/2011	12/9/2011	12/9/2011	12/9/2011	12/9/2011	12/9/2011
Sample Depth:		-	-	(6-8) ft BGS	(12-14) ft BGS	(12-14) ft BGS	(16-18) ft BGS	-
Sample Type:								
Parameters	**Units**							
Volatile Organic Compounds (VOCs)								
1,1,1-Trichloroethane	mg/kg	0.0048 U	--	--	--	0.005 U	--	--
1,1,2,2-Tetrachloroethane	mg/kg	0.0048 U	--	--	--	0.005 U	--	--
1,1,2-Trichloroethane	mg/kg	0.0048 U	--	--	--	0.005 U	--	--
1,1-Dichloroethane	mg/kg	0.0048 U	--	--	--	0.005 U	--	--
1,1-Dichloroethene	mg/kg	0.0048 U	--	--	--	0.005 U	--	--
1,2,4-Trichlorobenzene	mg/kg	0.0048 U	--	--	--	0.005 U	--	--
1,2-Dibromo-3-chloropropane (DBCP)	mg/kg	0.0096 U	--	--	--	0.01 U	--	--
1,2-Dibromoethane (Ethylene dibromide)	mg/kg	0.0048 U	--	--	--	0.005 U	--	--
1,2-Dichlorobenzene	mg/kg	0.0048 U	--	--	--	0.005 U	--	--
1,2-Dichloroethane	mg/kg	0.0048 U	--	--	--	0.005 U	--	--
1,2-Dichloropropane	mg/kg	0.0048 U	--	--	--	0.005 U	--	--
1,3-Dichlorobenzene	mg/kg	0.0048 U	--	--	--	0.005 U	--	--
1,4-Dichlorobenzene	mg/kg	0.0048 U	--	--	--	0.005 U	--	--
2-Butanone (Methyl ethyl ketone) (MEK)	mg/kg	0.019 U	--	--	--	0.0054 J	--	--
2-Hexanone	mg/kg	0.019 U	--	--	--	0.02 U	--	--
4-Methyl-2-pentanone (Methyl isobutyl ketone) (MIBK)	mg/kg	0.019 U	--	--	--	0.02 U	--	--
Acetone	mg/kg	0.019 U	--	--	--	0.028 U	--	--
Benzene	mg/kg	0.0048 U	--	--	--	0.005 U	--	--
Bromodichloromethane	mg/kg	0.0048 U	--	--	--	0.005 U	--	--
Bromoform	mg/kg	0.0048 U	--	--	--	0.005 U	--	--
Bromomethane (Methyl bromide)	mg/kg	0.0048 U	--	--	--	0.005 U	--	--
Carbon disulfide	mg/kg	0.0048 U	--	--	--	0.00097 J	--	--
Carbon tetrachloride	mg/kg	0.0048 U	--	--	--	0.005 U	--	--
Chlorobenzene	mg/kg	0.0048 U	--	--	--	0.005 U	--	--
Chloroethane	mg/kg	0.0048 U	--	--	--	0.005 U	--	--
Chloroform (Trichloromethane)	mg/kg	0.003 J	--	--	--	0.005 U	--	--
Chloromethane (Methyl chloride)	mg/kg	0.0048 U	--	--	--	0.005 U	--	--
cis-1,2-Dichloroethene	mg/kg	0.0048 U	--	--	--	0.005 U	--	--
cis-1,3-Dichloropropene	mg/kg	0.0048 U	--	--	--	0.005 U	--	--
Cyclohexane	mg/kg	0.0096 U	--	--	--	0.01 U	--	--
Dibromochloromethane	mg/kg	0.0048 U	--	--	--	0.005 U	--	--
Dichlorodifluoromethane (CFC-12)	mg/kg	0.0048 U	--	--	--	0.005 U	--	--
Ethylbenzene	mg/kg	0.0048 U	--	--	--	0.005 U	--	--
Isopropyl benzene	mg/kg	0.0048 U	--	--	--	0.005 U	--	--
Methyl acetate	mg/kg	0.0016 J	--	--	--	0.0014 J	--	--
Methyl cyclohexane	mg/kg	0.0096 U	--	--	--	0.01 U	--	--
Methyl tert butyl ether (MTBE)	mg/kg	0.019 U	--	--	--	0.02 U	--	--
Methylene chloride	mg/kg	0.0048 U	--	--	--	0.005 U	--	--
Styrene	mg/kg	0.0048 U	--	--	--	0.005 U	--	--
Tetrachloroethene	mg/kg	0.0048 U	--	--	--	0.005 U	--	--
Toluene	mg/kg	0.00058 J	--	--	--	0.0004 J	--	--
trans-1,2-Dichloroethene	mg/kg	0.0048 U	--	--	--	0.005 U	--	--
trans-1,3-Dichloropropene	mg/kg	0.0048 U	--	--	--	0.005 U	--	--
Trichloroethene	mg/kg	0.0048 U	--	--	--	0.005 U	--	--
Trichlorofluoromethane (CFC-11)	mg/kg	0.0048 U	--	--	--	0.005 U	--	--
Trifluorotrichloroethane (CFC-113)	mg/kg	0.0048 U	--	--	--	0.005 U	--	--
Vinyl chloride	mg/kg	0.0048 U	--	--	--	0.00055 J	--	--
Xylenes (total)	mg/kg	0.0096 U	--	--	--	0.01 U	--	--
Semi-Volatile Organic Compounds (SVOCs)								
2,2'-Oxybis(1-chloropropane) (bis(2-Chloroisopropyl) ether)	mg/kg	--	0.1 U	--	--	--	--	0.11 U
2,4,5-Trichlorophenol	mg/kg	--	0.16 U	--	--	--	--	0.16 U

TABLE 1.1
SUMMARY OF ANALYTICAL RESULTS
RISK ASSESSMENT
TOLEDO 103C LANDFILL
TOLEDO, OHIO

Sample Location:		SP-4	SP-5	SP-5	SP-5	SP-5	SP-5	SP-6
Sample Identification:		S-12609-120811-DN-33	S-12609-120911-DN-34	S-12609-120911-DN-35	S-12609-120911-DN-36	S-12609-120911-DN-38	S-12609-120911-DN-37	S-12609-120911-DN-39
Sample Date:		12/8/2011	12/9/2011	12/9/2011	12/9/2011	12/9/2011	12/9/2011	12/9/2011
Sample Depth:		-	-	(6-8) ft BGS	(12-14) ft BGS	(12-14) ft BGS	(16-18) ft BGS	-
Sample Type:								
Parameters	**Units**							
2,4,6-Trichlorophenol	mg/kg	--	0.16 U	--	--	--	--	0.16 U
2,4-Dichlorophenol	mg/kg	--	0.16 U	--	--	--	--	0.16 U
2,4-Dimethylphenol	mg/kg	--	0.16 U	--	--	--	--	0.16 U
2,4-Dinitrophenol	mg/kg	--	0.34 U	--	--	--	--	0.36 U
2,4-Dinitrotoluene	mg/kg	--	0.21 U	--	--	--	--	0.22 U
2,6-Dinitrotoluene	mg/kg	--	0.21 U	--	--	--	--	0.22 U
2-Chloronaphthalene	mg/kg	--	0.052 U	--	--	--	--	0.055 U
2-Chlorophenol	mg/kg	--	0.052 U	--	--	--	--	0.055 U
2-Methylnaphthalene	mg/kg	--	0.0038 J	--	--	--	--	0.011
2-Methylphenol	mg/kg	--	0.21 U	--	--	--	--	0.22 U
2-Nitroaniline	mg/kg	--	0.21 U	--	--	--	--	0.22 U
2-Nitrophenol	mg/kg	--	0.052 U	--	--	--	--	0.055 U
3&4-Methylphenol	mg/kg	--	0.42 U	--	--	--	--	0.44 U
3,3'-Dichlorobenzidine	mg/kg	--	0.1 U	--	--	--	--	0.11 U
3-Nitroaniline	mg/kg	--	0.21 U	--	--	--	--	0.22 U
4,6-Dinitro-2-methylphenol	mg/kg	--	0.16 U	--	--	--	--	0.16 U
4-Bromophenyl phenyl ether	mg/kg	--	0.052 U	--	--	--	--	0.055 U
4-Chloro-3-methylphenol	mg/kg	--	0.16 U	--	--	--	--	0.16 U
4-Chloroaniline	mg/kg	--	0.16 U	--	--	--	--	0.16 U
4-Chlorophenyl phenyl ether	mg/kg	--	0.052 U	--	--	--	--	0.055 U
4-Nitroaniline	mg/kg	--	0.21 U	--	--	--	--	0.22 U
4-Nitrophenol	mg/kg	--	0.34 U	--	--	--	--	0.36 U
Acenaphthene	mg/kg	--	0.015	--	--	--	--	0.057
Acenaphthylene	mg/kg	--	0.0069 U	--	--	--	--	0.0073 U
Acetophenone	mg/kg	--	0.1 U	--	--	--	--	0.11 U
Anthracene	mg/kg	--	0.031	--	--	--	--	0.14
Atrazine	mg/kg	--	0.21 U	--	--	--	--	0.22 U
Benzaldehyde	mg/kg	--	0.1 U	--	--	--	--	0.11 U
Benzo(a)anthracene	mg/kg	--	0.16	--	--	--	--	0.43
Benzo(a)pyrene	mg/kg	--	0.16	--	--	--	--	0.4
Benzo(b)fluoranthene	mg/kg	--	0.23	--	--	--	--	0.52
Benzo(g,h,i)perylene	mg/kg	--	0.12	--	--	--	--	0.24
Benzo(k)fluoranthene	mg/kg	--	0.085	--	--	--	--	0.3
Biphenyl (1,1-Biphenyl)	mg/kg	--	0.052 U	--	--	--	--	0.055 U
bis(2-Chloroethoxy)methane	mg/kg	--	0.1 U	--	--	--	--	0.11 U
bis(2-Chloroethyl)ether	mg/kg	--	0.1 U	--	--	--	--	0.11 U
bis(2-Ethylhexyl)phthalate (DEHP)	mg/kg	--	0.052 U	--	--	--	--	0.055 U
Butyl benzylphthalate (BBP)	mg/kg	--	0.052 U	--	--	--	--	0.055 U
Caprolactam	mg/kg	--	0.34 U	--	--	--	--	0.36 U
Carbazole	mg/kg	--	0.052 U	--	--	--	--	0.082
Chrysene	mg/kg	--	0.17	--	--	--	--	0.46
Dibenz(a,h)anthracene	mg/kg	--	0.0069 U	--	--	--	--	0.056 J
Dibenzofuran	mg/kg	--	0.007 J	--	--	--	--	0.032 J
Diethyl phthalate	mg/kg	--	0.052 U	--	--	--	--	0.055 U
Dimethyl phthalate	mg/kg	--	0.052 U	--	--	--	--	0.055 U
Di-n-butylphthalate (DBP)	mg/kg	--	0.052 U	--	--	--	--	0.055 U
Di-n-octyl phthalate (DnOP)	mg/kg	--	0.052 U	--	--	--	--	0.055 U
Fluoranthene	mg/kg	--	0.34	--	--	--	--	1.1
Fluorene	mg/kg	--	0.012	--	--	--	--	0.068
Hexachlorobenzene	mg/kg	--	0.0069 U	--	--	--	--	0.0073 U
Hexachlorobutadiene	mg/kg	--	0.052 U	--	--	--	--	0.055 U
Hexachlorocyclopentadiene	mg/kg	--	0.34 U	--	--	--	--	0.36 U
Hexachloroethane	mg/kg	--	0.052 U	--	--	--	--	0.055 U
Indeno(1,2,3-cd)pyrene	mg/kg	--	0.1	--	--	--	--	0.23

TABLE 1.1
SUMMARY OF ANALYTICAL RESULTS
RISK ASSESSMENT
TOLEDO 103C LANDFILL
TOLEDO, OHIO

Sample Location:		SP-4	SP-5	SP-5	SP-5	SP-5	SP-5	SP-6
Sample Identification:		S-12609-120811-DN-33	S-12609-120911-DN-34	S-12609-120911-DN-35	S-12609-120911-DN-36	S-12609-120911-DN-38	S-12609-120911-DN-37	S-12609-120911-DN-39
Sample Date:		12/8/2011	12/9/2011	12/9/2011	12/9/2011	12/9/2011	12/9/2011	12/9/2011
Sample Depth:		-	-	(6-8) ft BGS	(12-14) ft BGS	(12-14) ft BGS	(16-18) ft BGS	-
Sample Type:								
Parameters	**Units**							
Isophorone	mg/kg	--	0.052 U	--	--	--	--	0.055 U
Naphthalene	mg/kg	--	0.008	--	--	--	--	0.013 J
Nitrobenzene	mg/kg	--	0.1 U	--	--	--	--	0.11 U
N-Nitrosodi-n-propylamine	mg/kg	--	0.052 U	--	--	--	--	0.055 U
N-Nitrosodiphenylamine	mg/kg	--	0.052 U	--	--	--	--	0.055 U
Pentachlorophenol	mg/kg	--	0.16 U	--	--	--	--	0.16 U
Phenanthrene	mg/kg	--	0.15	--	--	--	--	0.66
Phenol	mg/kg	--	0.052 U	--	--	--	--	0.055 U
Pyrene	mg/kg	--	0.3	--	--	--	--	0.79
Metals								
Aluminum	mg/kg	--	2900	--	--	--	--	2900
Antimony	mg/kg	--	0.85 U	--	--	--	--	0.71 U
Arsenic	mg/kg	--	1.7	--	--	--	--	**3.5**
Barium	mg/kg	--	24	--	--	--	--	19
Beryllium	mg/kg	--	0.10 J	--	--	--	--	0.36 U
Cadmium	mg/kg	--	0.17 U	--	--	--	--	0.040 J
Chromium	mg/kg	--	4.3	--	--	--	--	**7.0**
Cobalt	mg/kg	--	1.9 J	--	--	--	--	1.9 J
Copper	mg/kg	--	3.9	--	--	--	--	4.5
Lead	mg/kg	--	3.8	--	--	--	--	5.7
Manganese	mg/kg	--	170	--	--	--	--	130
Mercury	mg/kg	--	0.099 U	--	--	--	--	0.10 U
Nickel	mg/kg	--	5.0	--	--	--	--	6.4
Selenium	mg/kg	--	0.43 U	--	--	--	--	0.36 U
Silver	mg/kg	--	0.43 U	--	--	--	--	0.36 U
Thallium	mg/kg	--	0.96	--	--	--	--	0.98
Vanadium	mg/kg	--	7.0	--	--	--	--	7.3
Zinc	mg/kg	--	13	--	--	--	--	17
PCBs								
Aroclor-1016 (PCB-1016)	mg/kg	--	--	0.039 U	0.039 U	--	0.036 U	--
Aroclor-1221 (PCB-1221)	mg/kg	--	--	0.039 U	0.039 U	--	0.036 U	--
Aroclor-1232 (PCB-1232)	mg/kg	--	--	0.039 U	0.039 U	--	0.036 U	--
Aroclor-1242 (PCB-1242)	mg/kg	--	--	0.039 U	0.039 U	--	0.036 U	--
Aroclor-1248 (PCB-1248)	mg/kg	--	--	0.039 U	0.039 U	--	0.036 U	--
Aroclor-1254 (PCB-1254)	mg/kg	--	--	0.056	0.039 U	--	0.036 U	--
Aroclor-1260 (PCB-1260)	mg/kg	--	--	0.039 U	0.039 U	--	0.036 U	--
Total PCBs	mg/kg	--	--	0.056	ND	--	ND	--

Notes:

U - Not detected at the associated reporting limit.
J - Estimated concentration.
UJ - Not detected; associated reporting limit is estimated.
R - Rejected.

(1) US EPA RSL - US EPA (United States Environmental Protection A

2.5[a] -bold and boxed denotes exceedance of criteria identified by supersc

TABLE 1.1
SUMMARY OF ANALYTICAL RESULTS
RISK ASSESSMENT
TOLEDO 103C LANDFILL
TOLEDO, OHIO

Sample Location:		SP-6	SP-6	SP-6	SP-6	SP-6	SP-7	SP-7
Sample Identification:		S-12609-120911-DN-40	S-12609-120911-DN-41	S-12609-120911-DN-42	S-12609-120911-DN-44	S-12609-120911-DN-43	S-12609-120911-DN-45	S-12609-120911-DN-48
Sample Date:		12/9/2011	12/9/2011	12/9/2011	12/9/2011	12/9/2011	12/9/2011	12/9/2011
Sample Depth:		-	(4-6) ft BGS	(10-12) ft BGS	(16-20) ft BGS	(24-28) ft BGS	-	(4-6) ft BGS
Sample Type:		Duplicate						
Parameters	**Units**							
Volatile Organic Compounds (VOCs)								
1,1,1-Trichloroethane	mg/kg	--	--	--	0.0056 U	--	--	--
1,1,2,2-Tetrachloroethane	mg/kg	--	--	--	0.0056 U	--	--	--
1,1,2-Trichloroethane	mg/kg	--	--	--	0.0056 U	--	--	--
1,1-Dichloroethane	mg/kg	--	--	--	0.0056 U	--	--	--
1,1-Dichloroethene	mg/kg	--	--	--	0.0056 U	--	--	--
1,2,4-Trichlorobenzene	mg/kg	--	--	--	0.0056 U	--	--	--
1,2-Dibromo-3-chloropropane (DBCP)	mg/kg	--	--	--	0.011 U	--	--	--
1,2-Dibromoethane (Ethylene dibromide)	mg/kg	--	--	--	0.0056 U	--	--	--
1,2-Dichlorobenzene	mg/kg	--	--	--	0.0056 U	--	--	--
1,2-Dichloroethane	mg/kg	--	--	--	0.0056 U	--	--	--
1,2-Dichloropropane	mg/kg	--	--	--	0.0056 U	--	--	--
1,3-Dichlorobenzene	mg/kg	--	--	--	0.0056 U	--	--	--
1,4-Dichlorobenzene	mg/kg	--	--	--	0.0056 U	--	--	--
2-Butanone (Methyl ethyl ketone) (MEK)	mg/kg	--	--	--	0.022 U	--	--	--
2-Hexanone	mg/kg	--	--	--	0.022 U	--	--	--
4-Methyl-2-pentanone (Methyl isobutyl ketone) (MIBK)	mg/kg	--	--	--	0.022 U	--	--	--
Acetone	mg/kg	--	--	--	0.022 U	--	--	--
Benzene	mg/kg	--	--	--	0.0056 U	--	--	--
Bromodichloromethane	mg/kg	--	--	--	0.0056 U	--	--	--
Bromoform	mg/kg	--	--	--	0.0056 U	--	--	--
Bromomethane (Methyl bromide)	mg/kg	--	--	--	0.0056 U	--	--	--
Carbon disulfide	mg/kg	--	--	--	0.0011 J	--	--	--
Carbon tetrachloride	mg/kg	--	--	--	0.0056 U	--	--	--
Chlorobenzene	mg/kg	--	--	--	0.0056 U	--	--	--
Chloroethane	mg/kg	--	--	--	0.0056 U	--	--	--
Chloroform (Trichloromethane)	mg/kg	--	--	--	0.0056 U	--	--	--
Chloromethane (Methyl chloride)	mg/kg	--	--	--	0.0056 U	--	--	--
cis-1,2-Dichloroethene	mg/kg	--	--	--	0.0056 U	--	--	--
cis-1,3-Dichloropropene	mg/kg	--	--	--	0.0056 U	--	--	--
Cyclohexane	mg/kg	--	--	--	0.011 U	--	--	--
Dibromochloromethane	mg/kg	--	--	--	0.0056 U	--	--	--
Dichlorodifluoromethane (CFC-12)	mg/kg	--	--	--	0.0056 U	--	--	--
Ethylbenzene	mg/kg	--	--	--	0.0056 U	--	--	--
Isopropyl benzene	mg/kg	--	--	--	0.0056 U	--	--	--
Methyl acetate	mg/kg	--	--	--	0.011 U	--	--	--
Methyl cyclohexane	mg/kg	--	--	--	0.011 U	--	--	--
Methyl tert butyl ether (MTBE)	mg/kg	--	--	--	0.022 U	--	--	--
Methylene chloride	mg/kg	--	--	--	0.0056 U	--	--	--
Styrene	mg/kg	--	--	--	0.0056 U	--	--	--
Tetrachloroethene	mg/kg	--	--	--	0.0056 U	--	--	--
Toluene	mg/kg	--	--	--	0.00059 J	--	--	--
trans-1,2-Dichloroethene	mg/kg	--	--	--	0.0056 U	--	--	--
trans-1,3-Dichloropropene	mg/kg	--	--	--	0.0056 U	--	--	--
Trichloroethene	mg/kg	--	--	--	0.0056 U	--	--	--
Trichlorofluoromethane (CFC-11)	mg/kg	--	--	--	0.0056 U	--	--	--
Trifluorotrichloroethane (CFC-113)	mg/kg	--	--	--	0.0056 U	--	--	--
Vinyl chloride	mg/kg	--	--	--	0.0056 U	--	--	--
Xylenes (total)	mg/kg	--	--	--	0.011 U	--	--	--
Semi-Volatile Organic Compounds (SVOCs)								
2,2'-Oxybis(1-chloropropane) (bis(2-Chloroisopropyl) ether)	mg/kg	0.11 U	--	--	--	--	0.44 U	--
2,4,5-Trichlorophenol	mg/kg	0.16 U	--	--	--	--	0.66 U	--

TABLE 1.1
SUMMARY OF ANALYTICAL RESULTS
RISK ASSESSMENT
TOLEDO 103C LANDFILL
TOLEDO, OHIO

Sample Location:		SP-6	SP-6	SP-6	SP-6	SP-6	SP-7	SP-7
Sample Identification:		S-12609-120911-DN-40	S-12609-120911-DN-41	S-12609-120911-DN-42	S-12609-120911-DN-44	S-12609-120911-DN-43	S-12609-120911-DN-45	S-12609-120911-DN-48
Sample Date:		12/9/2011	12/9/2011	12/9/2011	12/9/2011	12/9/2011	12/9/2011	12/9/2011
Sample Depth:		-	(4-6) ft BGS	(10-12) ft BGS	(16-20) ft BGS	(24-28) ft BGS	-	(4-6) ft BGS
Sample Type:		Duplicate						
Parameters	**Units**							
2,4,6-Trichlorophenol	mg/kg	0.16 U	--	--	--	--	0.66 U	--
2,4-Dichlorophenol	mg/kg	0.16 U	--	--	--	--	0.66 U	--
2,4-Dimethylphenol	mg/kg	0.16 U	--	--	--	--	0.66 U	--
2,4-Dinitrophenol	mg/kg	0.36 U	--	--	--	--	1.5 U	--
2,4-Dinitrotoluene	mg/kg	0.22 U	--	--	--	--	0.88 U	--
2,6-Dinitrotoluene	mg/kg	0.22 U	--	--	--	--	0.88 U	--
2-Chloronaphthalene	mg/kg	0.054 U	--	--	--	--	0.22 U	--
2-Chlorophenol	mg/kg	0.054 U	--	--	--	--	0.22 U	--
2-Methylnaphthalene	mg/kg	0.028	--	--	--	--	0.029 U	--
2-Methylphenol	mg/kg	0.22 U	--	--	--	--	0.88 U	--
2-Nitroaniline	mg/kg	0.22 U	--	--	--	--	0.88 U	--
2-Nitrophenol	mg/kg	0.054 U	--	--	--	--	0.22 U	--
3&4-Methylphenol	mg/kg	0.43 U	--	--	--	--	1.8 U	--
3,3'-Dichlorobenzidine	mg/kg	0.11 U	--	--	--	--	0.44 U	--
3-Nitroaniline	mg/kg	0.22 U	--	--	--	--	0.88 U	--
4,6-Dinitro-2-methylphenol	mg/kg	0.16 U	--	--	--	--	0.66 U	--
4-Bromophenyl phenyl ether	mg/kg	0.054 U	--	--	--	--	0.22 U	--
4-Chloro-3-methylphenol	mg/kg	0.16 U	--	--	--	--	0.66 U	--
4-Chloroaniline	mg/kg	0.16 U	--	--	--	--	0.66 U	--
4-Chlorophenyl phenyl ether	mg/kg	0.054 U	--	--	--	--	0.22 U	--
4-Nitroaniline	mg/kg	0.22 U	--	--	--	--	0.88 U	--
4-Nitrophenol	mg/kg	0.36 U	--	--	--	--	1.5 U	--
Acenaphthene	mg/kg	0.11	--	--	--	--	0.13	--
Acenaphthylene	mg/kg	0.0072 U	--	--	--	--	0.029 U	--
Acetophenone	mg/kg	0.11 U	--	--	--	--	0.44 U	--
Anthracene	mg/kg	0.33	--	--	--	--	0.42	--
Atrazine	mg/kg	0.22 U	--	--	--	--	0.88 U	--
Benzaldehyde	mg/kg	0.11 U	--	--	--	--	0.44 U	--
Benzo(a)anthracene	mg/kg	0.45	--	--	--	--	2.7	--
Benzo(a)pyrene	mg/kg	0.35	--	--	--	--	**2.4**	--
Benzo(b)fluoranthene	mg/kg	0.43	--	--	--	--	3.2	--
Benzo(g,h,i)perylene	mg/kg	0.22	--	--	--	--	1.5	--
Benzo(k)fluoranthene	mg/kg	0.22	--	--	--	--	1.3	--
Biphenyl (1,1-Biphenyl)	mg/kg	0.054 U	--	--	--	--	0.22 U	--
bis(2-Chloroethoxy)methane	mg/kg	0.11 U	--	--	--	--	0.44 U	--
bis(2-Chloroethyl)ether	mg/kg	0.11 U	--	--	--	--	0.44 U	--
bis(2-Ethylhexyl)phthalate (DEHP)	mg/kg	0.054 U	--	--	--	--	0.22 U	--
Butyl benzylphthalate (BBP)	mg/kg	0.054 U	--	--	--	--	0.22 U	--
Caprolactam	mg/kg	0.36 U	--	--	--	--	1.5 U	--
Carbazole	mg/kg	0.14	--	--	--	--	0.28	--
Chrysene	mg/kg	0.39	--	--	--	--	2.4	--
Dibenz(a,h)anthracene	mg/kg	0.0072 UJ	--	--	--	--	0.029 U	--
Dibenzofuran	mg/kg	0.095	--	--	--	--	0.047 J	--
Diethyl phthalate	mg/kg	0.054 U	--	--	--	--	0.22 U	--
Dimethyl phthalate	mg/kg	0.039 J	--	--	--	--	0.22 U	--
Di-n-butylphthalate (DBP)	mg/kg	0.054 U	--	--	--	--	0.22 U	--
Di-n-octyl phthalate (DnOP)	mg/kg	0.054 U	--	--	--	--	0.22 U	--
Fluoranthene	mg/kg	1.2	--	--	--	--	5.2	--
Fluorene	mg/kg	0.16	--	--	--	--	0.11	--
Hexachlorobenzene	mg/kg	0.0072 U	--	--	--	--	0.029 U	--
Hexachlorobutadiene	mg/kg	0.054 U	--	--	--	--	0.22 U	--
Hexachlorocyclopentadiene	mg/kg	0.36 U	--	--	--	--	1.5 U	--
Hexachloroethane	mg/kg	0.054 U	--	--	--	--	0.22 U	--
Indeno(1,2,3-cd)pyrene	mg/kg	0.2	--	--	--	--	1.3	--

TABLE 1.1
SUMMARY OF ANALYTICAL RESULTS
RISK ASSESSMENT
TOLEDO 103C LANDFILL
TOLEDO, OHIO

Sample Location:		SP-6	SP-6	SP-6	SP-6	SP-6	SP-7	SP-7
Sample Identification:		S-12609-120911-DN-40	S-12609-120911-DN-41	S-12609-120911-DN-42	S-12609-120911-DN-44	S-12609-120911-DN-43	S-12609-120911-DN-45	S-12609-120911-DN-48
Sample Date:		12/9/2011	12/9/2011	12/9/2011	12/9/2011	12/9/2011	12/9/2011	12/9/2011
Sample Depth:		-	(4-6) ft BGS	(10-12) ft BGS	(16-20) ft BGS	(24-28) ft BGS	-	(4-6) ft BGS
Sample Type:		Duplicate						
Parameters	**Units**							
Isophorone	mg/kg	0.054 U	--	--	--	--	0.22 U	--
Naphthalene	mg/kg	0.071 J	--	--	--	--	0.029 U	--
Nitrobenzene	mg/kg	0.11 U	--	--	--	--	0.44 U	--
N-Nitrosodi-n-propylamine	mg/kg	0.054 U	--	--	--	--	0.22 U	--
N-Nitrosodiphenylamine	mg/kg	0.054 U	--	--	--	--	0.22 U	--
Pentachlorophenol	mg/kg	0.16 U	--	--	--	--	0.66 U	--
Phenanthrene	mg/kg	1.2	--	--	--	--	1.9	--
Phenol	mg/kg	0.054 U	--	--	--	--	0.22 U	--
Pyrene	mg/kg	0.87	--	--	--	--	4.4	--
Metals								
Aluminum	mg/kg	4000	--	--	--	--	3500	--
Antimony	mg/kg	0.37 J	--	--	--	--	0.83 J	--
Arsenic	mg/kg	**8.2**	--	--	--	--	1.8	--
Barium	mg/kg	23	--	--	--	--	27	--
Beryllium	mg/kg	0.46 U	--	--	--	--	0.32 J	--
Cadmium	mg/kg	0.039 J	--	--	--	--	0.19 U	--
Chromium	mg/kg	**6.7**	--	--	--	--	6.2	--
Cobalt	mg/kg	2.6 J	--	--	--	--	1.9 J	--
Copper	mg/kg	4.5	--	--	--	--	4.2	--
Lead	mg/kg	5.8	--	--	--	--	4.7	--
Manganese	mg/kg	190	--	--	--	--	180	--
Mercury	mg/kg	0.11 U	--	--	--	--	0.090 U	--
Nickel	mg/kg	6.3	--	--	--	--	6.7	--
Selenium	mg/kg	0.46 U	--	--	--	--	0.49 U	--
Silver	mg/kg	0.46 U	--	--	--	--	0.49 U	--
Thallium	mg/kg	0.88 J	--	--	--	--	1.1	--
Vanadium	mg/kg	9.3	--	--	--	--	7.4	--
Zinc	mg/kg	17	--	--	--	--	33	--
PCBs								
Aroclor-1016 (PCB-1016)	mg/kg	--	0.21 U	0.038 U	--	0.036 U	--	0.036 U
Aroclor-1221 (PCB-1221)	mg/kg	--	0.21 U	0.038 U	--	0.036 U	--	0.036 U
Aroclor-1232 (PCB-1232)	mg/kg	--	0.21 U	0.038 U	--	0.036 U	--	0.036 U
Aroclor-1242 (PCB-1242)	mg/kg	--	0.21 U	0.038 U	--	0.036 U	--	0.036 U
Aroclor-1248 (PCB-1248)	mg/kg	--	0.6	0.059	--	0.036 U	--	0.036 U
Aroclor-1254 (PCB-1254)	mg/kg	--	0.21 U	0.038 U	--	0.036 U	--	0.051
Aroclor-1260 (PCB-1260)	mg/kg	--	0.13 J	0.021 J	--	0.036 U	--	0.036 U
Total PCBs	mg/kg	--	0.73 J	0.08 J	--	ND	--	0.051

Notes:

U - Not detected at the associated reporting limit.
J - Estimated concentration.
UJ - Not detected; associated reporting limit is estimated.
R - Rejected.

(1) US EPA RSL - US EPA (United States Environmental Protection A

2.5[a] -bold and boxed denotes exceedance of criteria identified by supersc

TABLE 1.1
SUMMARY OF ANALYTICAL RESULTS
RISK ASSESSMENT
TOLEDO 103C LANDFILL
TOLEDO, OHIO

Sample Location:		SP-7	SP-7	SP-7	SP-7	SP-8	SP-8	SP-8
Sample Identification:		S-12609-120911-DN-46	S-12609-120911-DN-47	S-12609-120911-DN-50	S-12609-120911-DN-49	S-12609-120911-DN-51	S-12609-120911-DN-52	S-12609-120911-DN-54
Sample Date:		12/9/2011	12/9/2011	12/9/2011	12/9/2011	12/9/2011	12/9/2011	12/9/2011
Sample Depth:		(6-8) ft BGS	(6-8) ft BGS	(12-14) ft BGS	(14-16) ft BGS	-	(2-4) ft BGS	(4-6) ft BGS
Sample Type:			Duplicate					
Parameters	**Units**							
Volatile Organic Compounds (VOCs)								
1,1,1-Trichloroethane	mg/kg	--	--	0.0041 U	--	--	--	--
1,1,2,2-Tetrachloroethane	mg/kg	--	--	0.0041 U	--	--	--	--
1,1,2-Trichloroethane	mg/kg	--	--	0.0041 U	--	--	--	--
1,1-Dichloroethane	mg/kg	--	--	0.0041 U	--	--	--	--
1,1-Dichloroethene	mg/kg	--	--	0.0041 U	--	--	--	--
1,2,4-Trichlorobenzene	mg/kg	--	--	0.0041 U	--	--	--	--
1,2-Dibromo-3-chloropropane (DBCP)	mg/kg	--	--	0.0082 U	--	--	--	--
1,2-Dibromoethane (Ethylene dibromide)	mg/kg	--	--	0.0041 U	--	--	--	--
1,2-Dichlorobenzene	mg/kg	--	--	0.0041 U	--	--	--	--
1,2-Dichloroethane	mg/kg	--	--	0.0041 U	--	--	--	--
1,2-Dichloropropane	mg/kg	--	--	0.0041 U	--	--	--	--
1,3-Dichlorobenzene	mg/kg	--	--	0.0041 U	--	--	--	--
1,4-Dichlorobenzene	mg/kg	--	--	0.0041 U	--	--	--	--
2-Butanone (Methyl ethyl ketone) (MEK)	mg/kg	--	--	0.0021 J	--	--	--	--
2-Hexanone	mg/kg	--	--	0.016 U	--	--	--	--
4-Methyl-2-pentanone (Methyl isobutyl ketone) (MIBK)	mg/kg	--	--	0.016 U	--	--	--	--
Acetone	mg/kg	--	--	0.016 U	--	--	--	--
Benzene	mg/kg	--	--	0.0041 U	--	--	--	--
Bromodichloromethane	mg/kg	--	--	0.0041 U	--	--	--	--
Bromoform	mg/kg	--	--	0.0041 U	--	--	--	--
Bromomethane (Methyl bromide)	mg/kg	--	--	0.0041 U	--	--	--	--
Carbon disulfide	mg/kg	--	--	0.00082 J	--	--	--	--
Carbon tetrachloride	mg/kg	--	--	0.0041 U	--	--	--	--
Chlorobenzene	mg/kg	--	--	0.0041 U	--	--	--	--
Chloroethane	mg/kg	--	--	0.0041 U	--	--	--	--
Chloroform (Trichloromethane)	mg/kg	--	--	0.0041 U	--	--	--	--
Chloromethane (Methyl chloride)	mg/kg	--	--	0.0041 U	--	--	--	--
cis-1,2-Dichloroethene	mg/kg	--	--	0.0041 U	--	--	--	--
cis-1,3-Dichloropropene	mg/kg	--	--	0.0041 U	--	--	--	--
Cyclohexane	mg/kg	--	--	0.0082 U	--	--	--	--
Dibromochloromethane	mg/kg	--	--	0.0041 U	--	--	--	--
Dichlorodifluoromethane (CFC-12)	mg/kg	--	--	0.0041 U	--	--	--	--
Ethylbenzene	mg/kg	--	--	0.0041 U	--	--	--	--
Isopropyl benzene	mg/kg	--	--	0.0041 U	--	--	--	--
Methyl acetate	mg/kg	--	--	0.0082 U	--	--	--	--
Methyl cyclohexane	mg/kg	--	--	0.0082 U	--	--	--	--
Methyl tert butyl ether (MTBE)	mg/kg	--	--	0.016 U	--	--	--	--
Methylene chloride	mg/kg	--	--	0.0041 U	--	--	--	--
Styrene	mg/kg	--	--	0.0041 U	--	--	--	--
Tetrachloroethene	mg/kg	--	--	0.0041 U	--	--	--	--
Toluene	mg/kg	--	--	0.00025 J	--	--	--	--
trans-1,2-Dichloroethene	mg/kg	--	--	0.0041 U	--	--	--	--
trans-1,3-Dichloropropene	mg/kg	--	--	0.0041 U	--	--	--	--
Trichloroethene	mg/kg	--	--	0.0041 U	--	--	--	--
Trichlorofluoromethane (CFC-11)	mg/kg	--	--	0.0041 U	--	--	--	--
Trifluorotrichloroethane (CFC-113)	mg/kg	--	--	0.0041 U	--	--	--	--
Vinyl chloride	mg/kg	--	--	0.0041 U	--	--	--	--
Xylenes (total)	mg/kg	--	--	0.0082 U	--	--	--	--
Semi-Volatile Organic Compounds (SVOCs)								
2,2'-Oxybis(1-chloropropane) (bis(2-Chloroisopropyl) ether)	mg/kg	--	--	--	--	0.11 U	--	--
2,4,5-Trichlorophenol	mg/kg	--	--	--	--	0.17 U	--	--

TABLE 1.1
SUMMARY OF ANALYTICAL RESULTS
RISK ASSESSMENT
TOLEDO 103C LANDFILL
TOLEDO, OHIO

Sample Location:		SP-7	SP-7	SP-7	SP-7	SP-8	SP-8	SP-8
Sample Identification:		S-12609-120911-DN-46	S-12609-120911-DN-47	S-12609-120911-DN-50	S-12609-120911-DN-49	S-12609-120911-DN-51	S-12609-120911-DN-52	S-12609-120911-DN-54
Sample Date:		12/9/2011	12/9/2011	12/9/2011	12/9/2011	12/9/2011	12/9/2011	12/9/2011
Sample Depth:		(6-8) ft BGS	(6-8) ft BGS	(12-14) ft BGS	(14-16) ft BGS	-	(2-4) ft BGS	(4-6) ft BGS
Sample Type:			Duplicate					
Parameters	**Units**							
2,4,6-Trichlorophenol	mg/kg	--	--	--	--	0.17 U	--	--
2,4-Dichlorophenol	mg/kg	--	--	--	--	0.17 U	--	--
2,4-Dimethylphenol	mg/kg	--	--	--	--	0.17 U	--	--
2,4-Dinitrophenol	mg/kg	--	--	--	--	R	--	--
2,4-Dinitrotoluene	mg/kg	--	--	--	--	0.22 U	--	--
2,6-Dinitrotoluene	mg/kg	--	--	--	--	0.22 U	--	--
2-Chloronaphthalene	mg/kg	--	--	--	--	0.055 U	--	--
2-Chlorophenol	mg/kg	--	--	--	--	0.055 U	--	--
2-Methylnaphthalene	mg/kg	--	--	--	--	0.0074 U	--	--
2-Methylphenol	mg/kg	--	--	--	--	0.22 U	--	--
2-Nitroaniline	mg/kg	--	--	--	--	0.22 U	--	--
2-Nitrophenol	mg/kg	--	--	--	--	0.055 U	--	--
3&4-Methylphenol	mg/kg	--	--	--	--	0.44 U	--	--
3,3'-Dichlorobenzidine	mg/kg	--	--	--	--	0.11 U	--	--
3-Nitroaniline	mg/kg	--	--	--	--	0.22 U	--	--
4,6-Dinitro-2-methylphenol	mg/kg	--	--	--	--	0.17 U	--	--
4-Bromophenyl phenyl ether	mg/kg	--	--	--	--	0.055 U	--	--
4-Chloro-3-methylphenol	mg/kg	--	--	--	--	0.17 U	--	--
4-Chloroaniline	mg/kg	--	--	--	--	0.17 U	--	--
4-Chlorophenyl phenyl ether	mg/kg	--	--	--	--	0.055 U	--	--
4-Nitroaniline	mg/kg	--	--	--	--	0.22 U	--	--
4-Nitrophenol	mg/kg	--	--	--	--	0.36 U	--	--
Acenaphthene	mg/kg	--	--	--	--	0.0096	--	--
Acenaphthylene	mg/kg	--	--	--	--	0.0074 U	--	--
Acetophenone	mg/kg	--	--	--	--	0.11 U	--	--
Anthracene	mg/kg	--	--	--	--	0.046	--	--
Atrazine	mg/kg	--	--	--	--	0.22 U	--	--
Benzaldehyde	mg/kg	--	--	--	--	0.11 U	--	--
Benzo(a)anthracene	mg/kg	--	--	--	--	0.25	--	--
Benzo(a)pyrene	mg/kg	--	--	--	--	0.23	--	--
Benzo(b)fluoranthene	mg/kg	--	--	--	--	0.33	--	--
Benzo(g,h,i)perylene	mg/kg	--	--	--	--	0.15	--	--
Benzo(k)fluoranthene	mg/kg	--	--	--	--	0.13	--	--
Biphenyl (1,1-Biphenyl)	mg/kg	--	--	--	--	0.055 U	--	--
bis(2-Chloroethoxy)methane	mg/kg	--	--	--	--	0.11 U	--	--
bis(2-Chloroethyl)ether	mg/kg	--	--	--	--	0.11 U	--	--
bis(2-Ethylhexyl)phthalate (DEHP)	mg/kg	--	--	--	--	0.055 U	--	--
Butyl benzylphthalate (BBP)	mg/kg	--	--	--	--	0.055 U	--	--
Caprolactam	mg/kg	--	--	--	--	0.36 UJ	--	--
Carbazole	mg/kg	--	--	--	--	0.055 U	--	--
Chrysene	mg/kg	--	--	--	--	0.22	--	--
Dibenz(a,h)anthracene	mg/kg	--	--	--	--	0.045	--	--
Dibenzofuran	mg/kg	--	--	--	--	0.055 U	--	--
Diethyl phthalate	mg/kg	--	--	--	--	0.055 U	--	--
Dimethyl phthalate	mg/kg	--	--	--	--	0.055 U	--	--
Di-n-butylphthalate (DBP)	mg/kg	--	--	--	--	0.055 U	--	--
Di-n-octyl phthalate (DnOP)	mg/kg	--	--	--	--	0.055 U	--	--
Fluoranthene	mg/kg	--	--	--	--	0.43	--	--
Fluorene	mg/kg	--	--	--	--	0.01	--	--
Hexachlorobenzene	mg/kg	--	--	--	--	0.0074 U	--	--
Hexachlorobutadiene	mg/kg	--	--	--	--	0.055 U	--	--
Hexachlorocyclopentadiene	mg/kg	--	--	--	--	R	--	--
Hexachloroethane	mg/kg	--	--	--	--	0.055 U	--	--
Indeno(1,2,3-cd)pyrene	mg/kg	--	--	--	--	0.13	--	--

TABLE 1.1
SUMMARY OF ANALYTICAL RESULTS
RISK ASSESSMENT
TOLEDO 103C LANDFILL
TOLEDO, OHIO

Sample Location:		SP-7	SP-7	SP-7	SP-7	SP-8	SP-8	SP-8
Sample Identification:		S-12609-120911-DN-46	S-12609-120911-DN-47	S-12609-120911-DN-50	S-12609-120911-DN-49	S-12609-120911-DN-51	S-12609-120911-DN-52	S-12609-120911-DN-54
Sample Date:		12/9/2011	12/9/2011	12/9/2011	12/9/2011	12/9/2011	12/9/2011	12/9/2011
Sample Depth:		(6-8) ft BGS	(6-8) ft BGS	(12-14) ft BGS	(14-16) ft BGS	-	(2-4) ft BGS	(4-6) ft BGS
Sample Type:			Duplicate					
Parameters	**Units**							
Isophorone	mg/kg	--	--	--	--	0.055 U	--	--
Naphthalene	mg/kg	--	--	--	--	0.0074 U	--	--
Nitrobenzene	mg/kg	--	--	--	--	0.11 U	--	--
N-Nitrosodi-n-propylamine	mg/kg	--	--	--	--	0.055 U	--	--
N-Nitrosodiphenylamine	mg/kg	--	--	--	--	0.055 U	--	--
Pentachlorophenol	mg/kg	--	--	--	--	0.17 U	--	--
Phenanthrene	mg/kg	--	--	--	--	0.15	--	--
Phenol	mg/kg	--	--	--	--	0.055 U	--	--
Pyrene	mg/kg	--	--	--	--	0.38	--	--
Metals								
Aluminum	mg/kg	--	--	--	--	2200	--	--
Antimony	mg/kg	--	--	--	--	0.99 U	--	--
Arsenic	mg/kg	--	--	--	--	2.3	--	--
Barium	mg/kg	--	--	--	--	13 J	--	--
Beryllium	mg/kg	--	--	--	--	0.49 U	--	--
Cadmium	mg/kg	--	--	--	--	0.20 U	--	--
Chromium	mg/kg	--	--	--	--	4.7	--	--
Cobalt	mg/kg	--	--	--	--	2.0 J	--	--
Copper	mg/kg	--	--	--	--	3.5	--	--
Lead	mg/kg	--	--	--	--	2.9	--	--
Manganese	mg/kg	--	--	--	--	140	--	--
Mercury	mg/kg	--	--	--	--	0.11 U	--	--
Nickel	mg/kg	--	--	--	--	5.0	--	--
Selenium	mg/kg	--	--	--	--	0.49 U	--	--
Silver	mg/kg	--	--	--	--	0.49 U	--	--
Thallium	mg/kg	--	--	--	--	0.92 J	--	--
Vanadium	mg/kg	--	--	--	--	7.6	--	--
Zinc	mg/kg	--	--	--	--	12	--	--
PCBs								
Aroclor-1016 (PCB-1016)	mg/kg	0.039 U	0.041 U	--	0.038 U	--	0.036 U	0.037 U
Aroclor-1221 (PCB-1221)	mg/kg	0.039 U	0.041 U	--	0.038 U	--	0.036 U	0.037 U
Aroclor-1232 (PCB-1232)	mg/kg	0.039 U	0.041 U	--	0.038 U	--	0.036 U	0.037 U
Aroclor-1242 (PCB-1242)	mg/kg	0.039 U	0.041 U	--	0.038 U	--	0.036 U	0.037 U
Aroclor-1248 (PCB-1248)	mg/kg	0.039 U	0.041 U	--	0.038 U	--	0.036 U	0.037 U
Aroclor-1254 (PCB-1254)	mg/kg	0.039 U	0.041 U	--	0.038 U	--	0.024 J	0.1
Aroclor-1260 (PCB-1260)	mg/kg	0.039 U	0.041 U	--	0.038 U	--	0.036 U	0.037 U
Total PCBs	mg/kg	ND	ND	--	ND	--	0.024 J	0.1

Notes:

U - Not detected at the associated reporting limit.
J - Estimated concentration.
UJ - Not detected; associated reporting limit is estimated.
R - Rejected.

(1) US EPA RSL - US EPA (United States Environmental Protection A

2.5[a] -bold and boxed denotes exceedance of criteria identified by supersc

TABLE 1.1
SUMMARY OF ANALYTICAL RESULTS
RISK ASSESSMENT
TOLEDO 103C LANDFILL
TOLEDO, OHIO

Sample Location:		SP-8	SP-8
Sample Identification:		S-12609-120911-DN-55	S-12609-120911-DN-53
Sample Date:		12/9/2011	12/9/2011
Sample Depth:		(6-8) ft BGS	(10-12) ft BGS
Sample Type:			
Parameters	**Units**		
Volatile Organic Compounds (VOCs)			
1,1,1-Trichloroethane	mg/kg	0.005 U	--
1,1,2,2-Tetrachloroethane	mg/kg	0.005 U	--
1,1,2-Trichloroethane	mg/kg	0.005 U	--
1,1-Dichloroethane	mg/kg	0.005 U	--
1,1-Dichloroethene	mg/kg	0.005 U	--
1,2,4-Trichlorobenzene	mg/kg	0.005 U	--
1,2-Dibromo-3-chloropropane (DBCP)	mg/kg	0.0099 U	--
1,2-Dibromoethane (Ethylene dibromide)	mg/kg	0.005 U	--
1,2-Dichlorobenzene	mg/kg	0.005 U	--
1,2-Dichloroethane	mg/kg	0.005 U	--
1,2-Dichloropropane	mg/kg	0.005 U	--
1,3-Dichlorobenzene	mg/kg	0.005 U	--
1,4-Dichlorobenzene	mg/kg	0.005 U	--
2-Butanone (Methyl ethyl ketone) (MEK)	mg/kg	0.02 U	--
2-Hexanone	mg/kg	0.02 U	--
4-Methyl-2-pentanone (Methyl isobutyl ketone) (MIBK)	mg/kg	0.02 U	--
Acetone	mg/kg	0.02 U	--
Benzene	mg/kg	0.005 U	--
Bromodichloromethane	mg/kg	0.005 U	--
Bromoform	mg/kg	0.005 U	--
Bromomethane (Methyl bromide)	mg/kg	0.005 U	--
Carbon disulfide	mg/kg	0.00085 J	--
Carbon tetrachloride	mg/kg	0.005 U	--
Chlorobenzene	mg/kg	0.005 U	--
Chloroethane	mg/kg	0.005 U	--
Chloroform (Trichloromethane)	mg/kg	0.00058 J	--
Chloromethane (Methyl chloride)	mg/kg	0.005 U	--
cis-1,2-Dichloroethene	mg/kg	0.005 U	--
cis-1,3-Dichloropropene	mg/kg	0.005 U	--
Cyclohexane	mg/kg	0.0099 U	--
Dibromochloromethane	mg/kg	0.005 U	--
Dichlorodifluoromethane (CFC-12)	mg/kg	0.005 U	--
Ethylbenzene	mg/kg	0.005 U	--
Isopropyl benzene	mg/kg	0.005 U	--
Methyl acetate	mg/kg	0.0099 U	--
Methyl cyclohexane	mg/kg	0.0099 U	--
Methyl tert butyl ether (MTBE)	mg/kg	0.02 U	--
Methylene chloride	mg/kg	0.005 U	--
Styrene	mg/kg	0.005 U	--
Tetrachloroethene	mg/kg	0.005 U	--
Toluene	mg/kg	0.00051 J	--
trans-1,2-Dichloroethene	mg/kg	0.005 U	--
trans-1,3-Dichloropropene	mg/kg	0.005 U	--
Trichloroethene	mg/kg	0.005 U	--
Trichlorofluoromethane (CFC-11)	mg/kg	0.005 U	--
Trifluorotrichloroethane (CFC-113)	mg/kg	0.005 U	--
Vinyl chloride	mg/kg	0.005 U	--
Xylenes (total)	mg/kg	0.0099 U	--
Semi-Volatile Organic Compounds (SVOCs)			
2,2'-Oxybis(1-chloropropane) (bis(2-Chloroisopropyl) ether)	mg/kg	--	--
2,4,5-Trichlorophenol	mg/kg	--	--

TABLE 1.1
SUMMARY OF ANALYTICAL RESULTS
RISK ASSESSMENT
TOLEDO 103C LANDFILL
TOLEDO, OHIO

Sample Location:		SP-8	SP-8
Sample Identification:		S-12609-120911-DN-55	S-12609-120911-DN-53
Sample Date:		12/9/2011	12/9/2011
Sample Depth:		(6-8) ft BGS	(10-12) ft BGS
Sample Type:			
Parameters	**Units**		
2,4,6-Trichlorophenol	mg/kg	--	--
2,4-Dichlorophenol	mg/kg	--	--
2,4-Dimethylphenol	mg/kg	--	--
2,4-Dinitrophenol	mg/kg	--	--
2,4-Dinitrotoluene	mg/kg	--	--
2,6-Dinitrotoluene	mg/kg	--	--
2-Chloronaphthalene	mg/kg	--	--
2-Chlorophenol	mg/kg	--	--
2-Methylnaphthalene	mg/kg	--	--
2-Methylphenol	mg/kg	--	--
2-Nitroaniline	mg/kg	--	--
2-Nitrophenol	mg/kg	--	--
3&4-Methylphenol	mg/kg	--	--
3,3'-Dichlorobenzidine	mg/kg	--	--
3-Nitroaniline	mg/kg	--	--
4,6-Dinitro-2-methylphenol	mg/kg	--	--
4-Bromophenyl phenyl ether	mg/kg	--	--
4-Chloro-3-methylphenol	mg/kg	--	--
4-Chloroaniline	mg/kg	--	--
4-Chlorophenyl phenyl ether	mg/kg	--	--
4-Nitroaniline	mg/kg	--	--
4-Nitrophenol	mg/kg	--	--
Acenaphthene	mg/kg	--	--
Acenaphthylene	mg/kg	--	--
Acetophenone	mg/kg	--	--
Anthracene	mg/kg	--	--
Atrazine	mg/kg	--	--
Benzaldehyde	mg/kg	--	--
Benzo(a)anthracene	mg/kg	--	--
Benzo(a)pyrene	mg/kg	--	--
Benzo(b)fluoranthene	mg/kg	--	--
Benzo(g,h,i)perylene	mg/kg	--	--
Benzo(k)fluoranthene	mg/kg	--	--
Biphenyl (1,1-Biphenyl)	mg/kg	--	--
bis(2-Chloroethoxy)methane	mg/kg	--	--
bis(2-Chloroethyl)ether	mg/kg	--	--
bis(2-Ethylhexyl)phthalate (DEHP)	mg/kg	--	--
Butyl benzylphthalate (BBP)	mg/kg	--	--
Caprolactam	mg/kg	--	--
Carbazole	mg/kg	--	--
Chrysene	mg/kg	--	--
Dibenz(a,h)anthracene	mg/kg	--	--
Dibenzofuran	mg/kg	--	--
Diethyl phthalate	mg/kg	--	--
Dimethyl phthalate	mg/kg	--	--
Di-n-butylphthalate (DBP)	mg/kg	--	--
Di-n-octyl phthalate (DnOP)	mg/kg	--	--
Fluoranthene	mg/kg	--	--
Fluorene	mg/kg	--	--
Hexachlorobenzene	mg/kg	--	--
Hexachlorobutadiene	mg/kg	--	--
Hexachlorocyclopentadiene	mg/kg	--	--
Hexachloroethane	mg/kg	--	--
Indeno(1,2,3-cd)pyrene	mg/kg	--	--

TABLE 1.1
SUMMARY OF ANALYTICAL RESULTS
RISK ASSESSMENT
TOLEDO 103C LANDFILL
TOLEDO, OHIO

Sample Location:		SP-8	SP-8
Sample Identification:		S-12609-120911-DN-55	S-12609-120911-DN-53
Sample Date:		12/9/2011	12/9/2011
Sample Depth:		(6-8) ft BGS	(10-12) ft BGS
Sample Type:			
Parameters	**Units**		
Isophorone	mg/kg	--	--
Naphthalene	mg/kg	--	--
Nitrobenzene	mg/kg	--	--
N-Nitrosodi-n-propylamine	mg/kg	--	--
N-Nitrosodiphenylamine	mg/kg	--	--
Pentachlorophenol	mg/kg	--	--
Phenanthrene	mg/kg	--	--
Phenol	mg/kg	--	--
Pyrene	mg/kg	--	--
Metals			
Aluminum	mg/kg	--	--
Antimony	mg/kg	--	--
Arsenic	mg/kg	--	--
Barium	mg/kg	--	--
Beryllium	mg/kg	--	--
Cadmium	mg/kg	--	--
Chromium	mg/kg	--	--
Cobalt	mg/kg	--	--
Copper	mg/kg	--	--
Lead	mg/kg	--	--
Manganese	mg/kg	--	--
Mercury	mg/kg	--	--
Nickel	mg/kg	--	--
Selenium	mg/kg	--	--
Silver	mg/kg	--	--
Thallium	mg/kg	--	--
Vanadium	mg/kg	--	--
Zinc	mg/kg	--	--
PCBs			
Aroclor-1016 (PCB-1016)	mg/kg	--	0.035 U
Aroclor-1221 (PCB-1221)	mg/kg	--	0.035 U
Aroclor-1232 (PCB-1232)	mg/kg	--	0.035 U
Aroclor-1242 (PCB-1242)	mg/kg	--	0.035 U
Aroclor-1248 (PCB-1248)	mg/kg	--	0.035 U
Aroclor-1254 (PCB-1254)	mg/kg	--	0.035 U
Aroclor-1260 (PCB-1260)	mg/kg	--	0.035 U
Total PCBs	mg/kg	--	ND

Notes:

U - Not detected at the associated reporting limit.
J - Estimated concentration.
UJ - Not detected; associated reporting limit is estimated.
R - Rejected.

(1) US EPA RSL - US EPA (United States Environmental Protection A

2.5[a] -bold and boxed denotes exceedance of criteria identified by supersc

Table 2.1

Occurrence, Distribution, and Selection of Chemicals of Potential Concern in Soil Stockpil
Risk Assessment
Toledo 103C Landfill
Toledo, Ohio

Medium: Soil Stockpile
Exposure Medium: Soil

CAS Number	Contaminant of Potential Concern	Minimum Concentration (1, 2)	Minimum Qualifier	Maximum Concentration (1, 2)	Maximum Qualifier	Units	Location of Maximum Concentration	Detection Frequency (2)	Range of Detection Limits (2)	Concentration Used for Screening (2)	Soil Screening Value (3)		COPC Flag	Rationale for Selection or Deletion (4)
	Metals													
7429-90-5	Aluminum	1800		5900		mg/kg	SP-4 (12/08/11)	8/8	--	5900	110000	N		BSC
7440-36-0	Antimony	0.37	J	0.83	J	mg/kg	SP-7 (12/09/11)	3/8	0.71 - 1	0.83	47	N		BSC
7440-38-2	Arsenic	1.7		10		mg/kg	SP-3 (12/08/11)	8/8	--	10	3	C	X	ASC
7440-39-3	Barium	6.2	J	49		mg/kg	SP-4 (12/08/11)	8/8	--	49	22000	N		BSC
7440-41-7	Beryllium	0.075	J	0.32	J	mg/kg	SP-7 (12/09/11)	6/8	0.36 - 0.49	0.32	230	N		BSC
7440-43-9	Cadmium	0.031	J	0.25		mg/kg	SP-4 (12/08/11)	5/8	0.17 - 0.2	0.25	98	N		BSC
7440-47-3	Chromium	3.5		10		mg/kg	SP-4 (12/08/11)	8/8	--	10	180000	N		BSC
7440-48-4	Cobalt	1.5	J	3.8	J	mg/kg	SP-4 (12/08/11)	8/8	--	3.8	35	N		BSC
7440-50-8	Copper	2.4	J	10		mg/kg	SP-4 (12/08/11)	8/8	--	10	4700	N		BSC
7439-92-1	Lead	1.4		10		mg/kg	SP-4 (12/08/11)	8/8	--	10	800	C		BSC
7439-96-5	Manganese	29		220		mg/kg	SP-4 (12/08/11)	8/8	--	220	2600	N		BSC
7439-97-6	Mercury	0.018	J	0.018	J	mg/kg	SP-4 (12/08/11)	1/8	0.084 - 0.11	0.018	4.6	N		BSC
7440-02-0	Nickel	3.8	J	13		mg/kg	SP-4 (12/08/11)	8/8	--	13	2200	N		BSC
7440-28-0	Thallium	0.88		1.3		mg/kg	SP-4 (12/08/11)	5/8	0.87 - 1	1.3	1.2	N	X	ASC
7440-62-2	Vanadium	6.4		14		mg/kg	SP-4 (12/08/11)	8/8	--	14	580	N		BSC
7440-66-6	Zinc	8.6		37		mg/kg	SP-3 (12/08/11)	8/8	--	37	35000	N		BSC
	PCBs													
1336-36-3	Total PCBs	0.059	J	0.75		mg/kg	SP-4 (12/08/11)	1/1	0.19	0.75	0.94	C		BSC
	SVOCs													
91-57-6	2-Methylnaphthalene	0.0038	J	0.037	J	mg/kg	SP-3 (12/08/11)	5/8	0.0074 - 0.029	0.037	300	N		BSC
83-32-9	Acenaphthene	0.0096		0.13		mg/kg	SP-7 (12/09/11)	7/8	0.0075	0.13	4500	N		BSC
208-96-8	Acenaphthylene	0.0048	J	0.053		mg/kg	SP-3 (12/08/11)	3/8	0.0069 - 0.029	0.053	2300 (5)	N		BSC
120-12-7	Anthracene	0.0038		0.42		mg/kg	SP-7 (12/09/11)	7/8	0.0075	0.42	23000	N		BSC
56-55-3	Benzo(a)anthracene	0.034		2.7		mg/kg	SP-7 (12/09/11)	7/8	0.0075	2.7	21	C		BSC
50-32-8	Benzo(a)pyrene	0.0041	J	2.4		mg/kg	SP-7 (12/09/11)	8/8	--	2.4	2.1	C	X	ASC
205-99-2	Benzo(b)fluoranthene	0.0058	J	3.2		mg/kg	SP-7 (12/09/11)	8/8	--	3.2	21	C		BSC
191-24-2	Benzo(g,h,i)perylene	0.028		1.5		mg/kg	SP-7 (12/09/11)	7/8	0.0075	1.5	2300 (5)	N		BSC
207-08-9	Benzo(k)fluoranthene	0.023		1.3		mg/kg	SP-7 (12/09/11)	7/8	0.0075	1.3	210	C		BSC
117-81-7	bis(2-Ethylhexyl)phthalate (DEHP)	0.031	J	0.11	J	mg/kg	SP-7 (12/09/11)	7/8	0.29	0.11	160	C		BSC

Table 2.1

Occurrence, Distribution, and Selection of Chemicals of Potential Concern in Soil Stockpil
Risk Assessment
Toledo 103C Landfill
Toledo, Ohio

Medium: Soil Stockpile
Exposure Medium: Soil

CAS Number	Contaminant of Potential Concern	Minimum Concentration (1, 2)	Minimum Qualifier	Maximum Concentration (1, 2)	Maximum Qualifier	Units	Location of Maximum Concentration	Detection Frequency (2)	Range of Detection Limits (2)	Concentration Used for Screening (2)	Soil Screening Value (3)		COPC Flag	Rationale for Selection or Deletion (4)
	SVOCs (cont.'d)													
86-74-8	Carbazole	0.043	J	0.29		mg/kg	SP-3 (12/08/11)	4/8	0.052 - 0.057	0.29	--	--		NTX
218-01-9	Chrysene	0.037		2.4		mg/kg	SP-7 (12/09/11)	7/8	0.0075	2.4	2100	C		BSC
53-70-3	Dibenz(a,h)anthracene	0.045		0.056		mg/kg	SP-6 (12/09/11)	2/8	0.0069 - 0.038	0.056	2.1	C		BSC
132-64-9	Dibenzofuran	0.007	J	0.095		mg/kg	SP-6 (12/09/11)	6/8	0.055 - 0.056	0.095	100	N		BSC
131-11-3	Dimethyl phthalate	0.039	J	0.039	J	mg/kg	SP-6 (12/09/11)	1/8	0.052 - 0.29	0.039	66000 (5)	N		BSC
206-44-0	Fluoranthene	0.0072	J	5.2		mg/kg	SP-7 (12/09/11)	8/8	--	5.2	3000	N		BSC
86-73-7	Fluorene	0.01		0.16		mg/kg	SP-6 (12/09/11)	7/8	0.0075	0.16	3000	N		BSC
193-39-5	Indeno(1,2,3-cd)pyrene	0.023		1.3		mg/kg	SP-7 (12/09/11)	7/8	0.0075	1.3	21	C		BSC
91-20-3	Naphthalene	0.0071	J	0.071		mg/kg	SP-6 (12/09/11)	5/8	0.0074 - 0.029	0.071	17	C		BSC
85-01-8	Phenanthrene	0.041		1.9		mg/kg	SP-7 (12/09/11)	7/8	0.0075	1.9	2300 (5)	N		BSC
129-00-0	Pyrene	0.0064	J	4.4		mg/kg	SP-7 (12/09/11)	8/8	--	4.4	2300	N		BSC
	VOCs													
67-66-3	Chloroform (Trichloromethane)	0.003	J	0.003	J	mg/kg	SP-4 (12/08/11)	1/1	0.0041 - 0.0056	0.003	1.4	C		BSC
79-20-9	Methyl acetate	0.0016	J	0.0016	J	mg/kg	SP-4 (12/08/11)	1/1	0.0082 - 0.011	0.0058	120000	N		BSC
108-88-3	Toluene	0.00058	J	0.00058	J	mg/kg	SP-4 (12/08/11)	1/1	--	0.00084	4700	N		BSC

Notes:

(1) Minimum/maximum detected concentration.

(2) Based on data collected from sampling locations: SP-1, SP-2, SP-3, SP-4, SP-5, SP-6, SP-7, SP-8.

(3) Regional Screening Levels (RSL) Summary Table (TR=1E-6, HQ=0.1), Industrial Soil, November 2018.

(4) Rationale Codes
Selection Reason : Maximum detected above Screening Criterion (ASC)
Deletion Reason : Maximum detected below Screening Criterion (BSC)
No Toxicity Data (NTX)

(5) No screening criterion available, surrogate screening criterion implemented as follows:

Chemical		Surrogate
acenaphthylene	-	pyrene
benzo(g,h,i)perylene	-	pyrene
dimethylphthalate	-	diethylphthalate
phenanthrene	-	pyrene

Definitions:

C = Carcinogenic
N = Non-Carcinogenic
-- = Not Available
J = Estimated Value

Table 2.2

Exposure Point Concentration (EPC) Summary for Chemicals of Potential Concern in Soil Stockpile
Risk Assessment
Toledo 103C Landfill
Toledo, Ohio

Medium: Soil Stockpile
Exposure Medium: Soil

Contaminant of Potential Concern	Units	Mean (1)	Data Distribution (2)	Maximum Detected Concentration	EPC Units	Exposure Point Concentration (EPC)		
						Medium EPC Value	Medium EPC Statistic (3)	Medium EPC Rationale
Metals								
Arsenic	mg/kg	3.7E+00	(d)	1.0E+01	mg/kg	5.6E+00	95% Student's-t UCL	(4)
Thallium	mg/kg	9.9E-01	(d)	1.3E+00	mg/kg	1.1E+00	95% KM (t) UCL	(4)
SVOCs								
Benzo(a)pyrene	mg/kg	6.7E-01	(c)	2.4E+00	mg/kg	3.0E+00	95% Adjusted Gamma UCL	(4)

Notes:

(1) The Kaplan-Meier estimation method for non-detects was used, as per USEPA (2013).

(2) Data Distribution (Note: data distribution calculated by ProUCL are based on detected values only):

(a) Data set is neither normally, gamma or lognormally distributed.

(b) Data set is lognormally distributed.

(c) Data set is gamma distributed.

(d) Data set is normally distributed.

(3) Statistics (Note: 95% UCL values are calculated using ProUCL software, Version 5.0. See Appendix A for full ProUCL results):

95% Student's-t UCL = 95% UCL of the mean based upon the student's-t statistic

95% KM (t) UCL = UCL based upon Kaplan-Meier Estimates for non-detects using Student's t-Distribution Critical Value

95% Adjusted Gamma UCL = adjusted gamma UCL using chi-square

(4) ProUCL recommended value is used as the EPC value. In the event of more than one recommended EPC value, the higher EPC value is used.

Table 2.3

Values Used for Daily Intake Calculations for Soil - Trespasser
Risk Assessment
Toledo 103C Landfill
Toledo, Ohio

Scenario Timeframe: Current/Future
Medium: Soil Stockpile
Exposure Medium: Soil
Receptor Population: Trespasser
Receptor Age: Adolescent

Exposure Route	Parameter Code	Parameter Definition	Units	RME Value	RME Rationale/ Reference	Intake Equation/ Model Name
Ingestion	CS	Chemical Concentration in Soil	mg/kg	(1)	(1)	Chronic Daily Intake (CDI) (mg/kg-day) =
	IR	Ingestion Rate of Soil	mg soil/ day	100	Ohio VAP, 2016 (2)	CS x IR x CF x EF x ED x 1/BW x 1/AT x FC
	CF	Conversion Factor	kg/mg	1.00E-06	--	
	EF	Exposure Frequency	days/year	58	USEPA, 2011 (3)	Mutagenic CDI (mg/kg-day) =
	ED	Exposure Duration	years	10	USEPA, 2018 (4)	CS x MF x IR x CF x ABS x EF x ED x 1/BW x 1/AT-C x FC
	BW	Body Weight	kg	45	USEPA, 2018	
	AT-C	Averaging Time (cancer)	days	25,550	Ohio VAP, 2016 (2)	
	AT-N	Averaging Time (non-cancer)	days	3,650	USEPA, 2014	
	MF	Mutagenic Factor	unitless	3	USEPA, 2005 (5)	
	FC	Fraction Contaminated	unitless	0.5	Ohio VAP, 2016	
Dermal	CS	Chemical Concentration in Soil	mg/kg	(1)	(1)	CDI (mg/kg-day) =
	SA	Skin Surface Area Available for Contact	cm^2	5,537	USEPA, 2011 (6)	CS x CF x SA x AF x ABS x EF x EV x ED x 1/BW x 1/AT x FC
	CF	Conversion Factor	kg/mg	1.00E-06	--	
	EF	Exposure Frequency	days/year	58	USEPA, 2011 (3)	Mutagenic CDI (mg/kg-day) =
	EV	Event Frequency	events/day	1	USEPA, 2004	CS x MF x CF x SA x AF x ABS x EF x ED x 1/BW x 1/AT-C x FC
	ED	Exposure Duration	years	10	USEPA, 2018 (4)	
	BW	Body Weight	kg	45	USEPA, 2018	
	AT-C	Averaging Time (cancer)	days	25,550	Ohio VAP, 2016 (2)	
	AT-N	Averaging Time (non-cancer)	days	3,650	USEPA, 2014	
	AF	Soil to Skin Adherence Factor	mg/cm^2 - event	0.07	Ohio VAP, 2016 (2)	
	ABS	Absorption Factor	%/100	chemical specific	Ohio VAP, 2016	
	MF	Mutagenic Factor	unitless	3	USEPA, 2005 (5)	
	FC	Fraction Contaminated	unitless	0.5	Ohio VAP, 2016	
Inhalation	CS	Chemical Concentration in Soil	mg/kg	(1)	(1)	Exposure Concentration (EC) (mg/m^3) =
	FT	Fraction Time Exposed	unitless	3.9/24	USEPA, 2011 (7)	CS x FT x EF x ED x (1/PEF) x 1/AT x FC
	EF	Exposure Frequency	days/year	58	USEPA, 2011 (3)	
	ED	Exposure Duration	years	10	USEPA, 2018 (4)	Mutagenic EC (mg/m^3) =
	AT-C	Averaging Time (cancer)	days	25,550	Ohio VAP, 2016	CS x MF x FT x EF x ED x (1/PEF + 1/VF) x 1/AT-C x FC
	AT-N	Averaging Time (non-cancer)	days	3,650	USEPA, 2014	
	PEF	Particulate Emission Factor	m^3/kg	9.50E+08	Ohio VAP, 2016	
	MF	Mutagenic Factor	unitless	3	USEPA, 2005 (5)	
	FC	Fraction Contaminated	unitless	0.5	Ohio VAP, 2016	

Notes:

(1) For surface soil concentrations, refer to Table 3.2.

(2) Value taken is for adult resident.

(3) The basis for the EF is the average of the mean time spent outdoors for the age groups 6-11 and 11-16 from Table 16-1, Recommended Values for Activity Factors - Time Outdoors (total).
For 6-11 years old, the time spent outdoors of 132 min/day equals an exposure frequency of 33 days/year [(132 min/d /1440 total min/d)*365].
For 11-16 years old, the time spent outdoors of 100 min/day equals an exposure frequency of 25 days/year [(100 min/d /1440 total min/d)*365].
The average of the age groups 6-11 and 11-16 of 29 days/year is a central tendency value that was doubled to 58 days/year to derive the RME value.

(4) Trespasser is a 7 through 16 year old therefore the exposure duration is 10 years, based on USEPA (2018).

(5) Mutagenic ingestion, dermal contact, and inhalation intakes calculated using default age-dependent adjustment factor of 3 for ages >2 to 16 years as applied for carcinogens that act via a mutagenic mode of action.

(6) The basis for SA is the average value for age groups 6 to 11 and 11 to 16 and calculated by summing the mean surface area by body part for face, lower arms, lower legs, feet, and hands from Table 7-2, Recommended Values for Surface Area of Body Parts, Males and Female Children Combined. The surface area of the face was assumed to be one-third the surface area of the head, the surface area of the lower legs was assumed to be 40 percent of the surface area of the legs, and the surface area of the lower arms was assumed to be 45 percent of the surface area of the arms, consistent with USEPA (2004).

(7) The basis for the ET is the average of the mean time spent outdoors for the age groups 6-11 and 11-16 from Table 16-1, Recommended Values for Activity Factors - Time Outdoors
For 6-11 years old, the time spent outdoors of 132 min/day equates to 2.2 hrs [132/60].
For 11-16 years old, the time spent outdoors of 100 min/day equates to 1.7 hrs [100/60].
The average of the 6-11 and 11-16 ages groups of 1.95 hours is a central tendency value that was doubled to 3.9 hours to derive the RME value.

References:

Ohio VAP, 2016: Support Document for the Development of Generic Numerical Standards and Risk Assessment Procedures, Table 4: Summary of all scenario and receptor-specific parameters, May 2016.
USEPA, 2004: Risk Assessment Guidance for Superfund (RAGS):Volume 1 - Human Health Evaluation Manual (Part E, Supplemental Guidance for Dermal Risk Assessment), EPA/540/R/99/005, July 2004.
USEPA, 2005: Guidelines for Carcinogenic Risk Assessment and Supplemental Guidance for Assessing Susceptibility from Early-Life Exposure to Carcinogens, March 2005.
USEPA, 2011: Exposure Factors Handbook 2011 Edition (Final). U.S. Environmental Protection Agency, Washington, DC, EPA/600/R-09/052F, September 2011.
USEPA, 2014: Human Health Evaluation Manual, Supplemental Guidance: Update of Standard Default Exposure Factors, OSWER Directive 9200.1-120, February 2014.
USEPA, 2018: Region 4 Human Health Risk Assessment Bulletins Supplemental Guidance, Section 4.2.2 Trespasser Scenario, March 2018 Update.

Table 2.4

Values Used for Daily Intake Calculations for Soil - Construction/Redevelopment Worker
Risk Assessment
Toledo 103C Landfill
Toledo, Ohio

Scenario Timeframe: Future
Medium: Soil Stockpile
Exposure Medium: Soil
Receptor Population: Construction/Redevelopment Worker
Receptor Age: Adult

Exposure Route	Parameter Code	Parameter Definition	Units	RME Value	RME Rationale/ Reference	Intake Equation/ Model Name
Ingestion	CS	Chemical Concentration in Soil	mg/kg	(1)	(1)	Chronic Daily Intake (CDI) (mg/kg-day) =
	IR	Ingestion Rate of Soil	mg soil/ day	200	Ohio VAP, 2016	CS x IR x CF x EF x ED x 1/BW x 1/AT x FC
	CF	Conversion Factor	kg/mg	1.00E-06	--	
	EF	Exposure Frequency	days/year	120	Ohio VAP, 2016	
	ED	Exposure Duration	years	1	Ohio VAP, 2016	
	BW	Body Weight	kg	70	Ohio VAP, 2016	
	AT-C	Averaging Time (cancer)	days	25,550	Ohio VAP, 2016	
	AT-N	Averaging Time (non-cancer)	days	365	Ohio VAP, 2016	
	FC	Fraction Contaminated	unitless	0.5	Ohio VAP, 2016	
Dermal	CS	Chemical Concentration in Soil	mg/kg	(1)	(1)	CDI (mg/kg-day) =
	SA	Skin Surface Area Available for Contact	cm^2	3,300	Ohio VAP, 2016	CS x CF x SA x AF x ABS x EF x EV x ED x 1/BW x 1/AT x FC
	CF	Conversion Factor	kg/mg	1.00E-06	--	
	EF	Exposure Frequency	days/year	120	Ohio VAP, 2016	
	EV	Event Frequency	events/day	1	USEPA, 2004	
	ED	Exposure Duration	years	1	Ohio VAP, 2016	
	BW	Body Weight	kg	70	Ohio VAP, 2016	
	AT-C	Averaging Time (cancer)	days	25,550	Ohio VAP, 2016	
	AT-N	Averaging Time (non-cancer)	days	365	Ohio VAP, 2016	
	AF	Soil to Skin Adherence Factor	mg/cm^2 - event	0.3	Ohio VAP, 2016	
	ABS	Absorption Factor	%/100	chemical specific	Ohio VAP, 2016	
	FC	Fraction Contaminated	unitless	0.5	Ohio VAP, 2016	
Inhalation	CS	Chemical Concentration in Soil	mg/kg	(1)	(1)	Exposure Concentration (EC) (mg/m^3) =
	FT	Fraction Time Exposed	unitless	8/24	Ohio VAP, 2016	CS x FT x EF x ED x (1/PEF) x 1/AT x FC
	EF	Exposure Frequency	days/year	120	Ohio VAP, 2016	
	ED	Exposure Duration	years	1	Ohio VAP, 2016	
	AT-C	Averaging Time (cancer)	days	25,550	Ohio VAP, 2016	
	AT-N	Averaging Time (non-cancer)	days	365	Ohio VAP, 2016	
	PEF	Particulate Emission Factor	m^3/kg	1.34E+07	Ohio VAP, 2016	
	FC	Fraction Contaminated	unitless	0.5	Ohio VAP, 2016	

Notes:

(1) For soil concentrations, refer to Table

(2) An exposure frequency of 120 days/year for construction/excavation activities was chosen by Ohio EPA on the basis of best professional judgment (Ohio VAP Part C, p. 41).

References:

Ohio VAP, 2016: Suport Document for the Development of Generic Numerical Standards and Risk Assessment Procedures, Table 4: Summary of all scenario and receptor-specific parameters, May 2016.
USEPA, 2004: Risk Assessment Guidance for Superfund (RAGS):Volume 1 - Human Health Evaluation Manual (Part E, Supplemental Guidance for Dermal Risk Assessment), EPA/540/R/99/005, July 2004.

Table 2.5

Calculation of Chemical Cancer Risks and Non-Cancer Hazards for Trespasser
Risk Assessment
Toledo 103C Landfill
Toledo, Ohio

Scenario Timeframe: Current/Future
Receptor Population: Trespasser
Receptor Age: Adolescent

Medium	Exposure Medium	Exposure Point	Exposure Route	Chemicals of Potential Concern	EPC		Cancer Risk Calculations					Non-Cancer Hazard Calculations				
							Intake/Exposure Concentration		CSF/Unit Risk (1)		Cancer	Intake/Exposure Concentration		RfD/RfC (1)		Hazard
					Value	Units	Value	Units	Value	Units	Risk	Value	Units	Value	Units	Quotient
Soil Stockpile	Soil	On-Site	Ingestion	Benzo(a)pyrene	3.0E+00	mg/kg	2.2E-07	mg/kg-d	1.0E+00	$(mg/kg-d)^{-1}$	2E-07	5.2E-07	mg/kg-d	3.0E-04	mg/kg-d	2E-03
				Arsenic	5.6E+00	mg/kg	8.5E-08	mg/kg-d	1.5E+00	$(mg/kg-d)^{-1}$	1E-07	6.0E-07	mg/kg-d	3.0E-04	mg/kg-d	2E-03
				Thallium	1.1E+00	mg/kg	2.7E-08	mg/kg-d	--	$(mg/kg-d)^{-1}$	NC	1.9E-07	mg/kg-d	1.0E-05	mg/kg-d	2E-02
			Exposure Route Total								4E-07					2E-02
			Dermal	Benzo(a)pyrene	3.0E+00	mg/kg	1.2E-07	mg/kg-d	1.0E+00	$(mg/kg-d)^{-1}$	1E-07	2.8E-07	mg/kg-d	3.0E-04	mg/kg-d	9E-04
				Arsenic	5.6E+00	mg/kg	1.7E-08	mg/kg-d	1.5E+00	$(mg/kg-d)^{-1}$	2E-08	1.2E-07	mg/kg-d	3.0E-04	mg/kg-d	4E-04
				Thallium	1.1E+00	mg/kg	0.0E+00	mg/kg-d	--	$(mg/kg-d)^{-1}$	NC	0.0E+00	mg/kg-d	1.0E-05	mg/kg-d	0E+00
			Exposure Route Total								1E-07					1E-03
		Exposure Point Total									5E-07					2E-02
	Exposure Medium Total										5E-07					2E-02
	Ambient Air	On-Site	Inhalation	Benzo(a)pyrene	3.0E+00	mg/kg	1.7E-11	mg/m^3	6.0E-01	$(mg/m^3)^{-1}$	1E-11	4.0E-11	mg/m^3	2.0E-06	mg/m^3	2E-05
				Arsenic	5.6E+00	mg/kg	3.3E-11	mg/m^3	4.3E+00	$(mg/m^3)^{-1}$	1E-10	7.7E-11	mg/m^3	1.5E-05	mg/m^3	5E-06
				Thallium	1.1E+00	mg/kg	6.3E-12	mg/m^3	--	$(mg/m^3)^{-1}$	NC	1.5E-11	mg/m^3	--	mg/m^3	NC
			Exposure Route Total								2E-10					3E-05
		Exposure Point Total									2E-10					3E-05
	Exposure Medium Total										2E-10					3E-05
Medium Total											5E-07					2E-02
Total of Receptor Risk Across All Media											**5E-07**	**Total of Receptor Hazard Across All Media**				**2E-02**

Notes:

NC = Not Calculated
(1) Regional Screening Levels (RSL) Summary Table, November 2018.

Table 2.6

Calculation of Chemical Cancer Risks and Non-Cancer Hazards for Construction/Redevelopment Worker
Risk Assessment
Toledo 103C Landfill
Toledo, Ohio

Scenario Timeframe: Future
Receptor Population: Construction/Redevelopment Worker
Receptor Age: Adult

Medium	Exposure Medium	Exposure Point	Exposure Route	Chemicals of Potential Concern	EPC		Cancer Risk Calculations					Non-Cancer Hazard Calculations				
							Intake/Exposure Concentration		CSF/Unit Risk (1)		Cancer	Intake/Exposure Concentration		RfD/RfC (1)		Hazard
					Value	Units	Value	Units	Value	Units	Risk	Value	Units	Value	Units	Quotient
Soil Stockpile	Soil	On-Site	Ingestion	Benzo(a)pyrene	3.0E+00	mg/kg	2.0E-08	mg/kg-d	1.0E+00	$(mg/kg\text{-}d)^{-1}$	2E-08	1.4E-06	mg/kg-d	3.0E-04	mg/kg-d	5E-03
				Arsenic	5.6E+00	mg/kg	2.3E-08	mg/kg-d	1.5E+00	$(mg/kg\text{-}d)^{-1}$	3E-08	1.6E-06	mg/kg-d	3.0E-04	mg/kg-d	5E-03
				Thallium	1.1E+00	mg/kg	7.3E-09	mg/kg-d	--	$(mg/kg\text{-}d)^{-1}$	NC	5.1E-07	mg/kg-d	1.0E-05	mg/kg-d	5E-02
			Exposure Route Total								5E-08					6E-02
			Dermal	Benzo(a)pyrene	3.0E+00	mg/kg	1.4E-08	mg/kg-d	1.0E+00	$(mg/kg\text{-}d)^{-1}$	1E-08	9.7E-08	mg/kg-d	3.0E-04	mg/kg-d	3E-04
				Arsenic	5.6E+00	mg/kg	5.6E-09	mg/kg-d	1.5E+00	$(mg/kg\text{-}d)^{-1}$	8E-09	3.9E-08	mg/kg-d	3.0E-04	mg/kg-d	1E-04
				Thallium	1.1E+00	mg/kg	0.0E+00	mg/kg-d	--	$(mg/kg\text{-}d)^{-1}$	NC	0.0E+00	mg/kg-d	1.0E-05	mg/kg-d	0E+00
			Exposure Route Total								2E-08					5E-04
		Exposure Point Total									8E-08					6E-02
	Exposure Medium Total										8E-08					6E-02
	Ambient Air	On-Site	Inhalation	Benzo(a)pyrene	3.0E+00	mg/kg	1.7E-10	mg/m^3	6.0E-01	$(mg/m^3)^{-1}$	1E-10	1.2E-08	mg/m^3	2.0E-06	mg/m^3	6E-03
				Arsenic	5.6E+00	mg/kg	3.3E-10	mg/m^3	4.3E+00	$(mg/m^3)^{-1}$	1E-09	2.3E-08	mg/m^3	1.5E-05	mg/m^3	2E-03
				Thallium	1.1E+00	mg/kg	6.4E-11	mg/m^3	--	$(mg/m^3)^{-1}$	NC	4.5E-09	mg/m^3	--	mg/m^3	NC
			Exposure Route Total								2E-09					8E-03
		Exposure Point Total									2E-09					8E-03
	Exposure Medium Total										2E-09					8E-03
Medium Total											8E-08					7E-02
Total of Receptor Risk Across All Media											**8E-08**	**Total of Receptor Hazard Across All Media**				**7E-02**

Notes:

NC = Not Calculated
(1) Regional Screening Levels (RSL) Summary Table, November 2018.

TABLE 3.1
ECOLOGICAL RISK SCREENING
SOIL STOCKPILE
RACER - TOLEDO, OH

		ESV	Source	# of Samples	Freq. of Detection	Max	High Mean, ND = 1/2 DL	Low Mean ND = 0	High Mean SQ	Low Mean SQ
Aluminum	mg/kg	Not Toxic	EcoSSL	10.00	100%	5900.00	3510.00	3510.00		
Antimony	mg/kg	0.27	EcoSSL	10.00	30%	0.83	0.47	0.16	**1.75**	0.59
Arsenic	mg/kg	18.00	EcoSSL	10.00	100%	10.00	3.89	3.89	0.22	0.22
Barium	mg/kg	330.00	EcoSSL	10.00	100%	49.00	24.92	24.92	0.08	0.08
Beryllium	mg/kg	21.00	EcoSSL	10.00	70%	0.32	0.18	0.12	0.01	0.01
Cadmium	mg/kg	0.36	EcoSSL	10.00	70%	0.25	0.11	0.08	0.30	0.22
Chromium	mg/kg	26.00	EcoSSL	10.00	100%	10.00	6.43	6.43	0.25	0.25
Cobalt	mg/kg	13.00	EcoSSL	10.00	100%	3.80	2.34	2.34	0.18	0.18
Copper	mg/kg	28.00	EcoSSL	10.00	100%	10.00	5.46	5.46	0.20	0.20
Lead	mg/kg	11.00	EcoSSL	10.00	100%	10.00	5.36	5.36	0.49	0.49
Manganese	mg/kg	220.00	EcoSSL	10.00	100%	220.00	141.00	141.00	0.64	0.64
Mercury	mg/kg	0.10	EPA V	10.00	10%	0.06	0.05	0.00		
Nickel	mg/kg	38.00	EcoSSL	10.00	100%	13.00	7.14	7.14	0.19	0.19
Selenium	mg/kg	0.52	EcoSSL	10.00	0%	0.26	0.23	0.00	0.43	0.00
Silver	mg/kg	4.20	EcoSSL	10.00	0%	0.26	0.23	0.00	0.05	0.00
Thallium	mg/kg	0.06	EPA V	10.00	60%	1.30	0.80	0.61	**14.31**	**10.96**
Vanadium	mg/kg	7.80	EcoSSL	10.00	100%	14.00	8.79	8.79	**1.13**	**1.13**
Zinc	mg/kg	46.00	EcoSSL	10.00	100%	37.00	22.16	22.16	0.48	0.48
PCBs										
Aroclor-1016 (PCB-1016)	mg/kg	0.37	PRG	25.00	0%	0.20	0.04	0.00	0.10	0.00
Aroclor-1221 (PCB-1221)	mg/kg	0.37	PRG	25.00	0%	0.20	0.04	0.00	0.10	0.00
Aroclor-1232 (PCB-1232)	mg/kg	0.37	PRG	25.00	0%	0.20	0.04	0.00	0.10	0.00
Aroclor-1242 (PCB-1242)	mg/kg	0.37	PRG	25.00	0%	0.20	0.04	0.00	0.10	0.00
Aroclor-1248 (PCB-1248)	mg/kg	0.37	PRG	25.00	12%	0.60	0.06	0.03	0.16	0.08
Aroclor-1254 (PCB-1254)	mg/kg	0.37	PRG	25.00	36%	0.75	0.08	0.06	0.21	0.16
Aroclor-1260 (PCB-1260)	mg/kg	0.37	PRG	25.00	12%	0.20	0.04	0.01	0.10	0.02
Total PCBs	mg/kg	0.37	PRG	25.00	48%	0.75	0.11	0.10	0.30	0.26
Semi-Volatile Organic Compounds										
2-Methylnaphthalene	mg/kg	29.00	EcoSSL	10.00	60%	0.04	0.01	0.01	0.00	0.00
Acenaphthene	mg/kg	29.00	EcoSSL	10.00	80%	0.13	0.05	0.05	0.00	0.00
Acenaphthylene	mg/kg	29.00	EcoSSL	10.00	30%	0.05	0.01	0.01	0.00	0.00
Anthracene	mg/kg	29.00	EcoSSL	10.00	90%	0.42	0.15	0.14	0.01	0.00
Benzo(a)anthracene	mg/kg	1.10	EcoSSL	10.00	90%	2.70	0.63	0.63	0.57	0.57
Benzo(a)pyrene	mg/kg	1.10	EcoSSL	10.00	100%	2.40	0.58	0.58	0.53	0.53
Benzo(b)fluoranthene	mg/kg	1.10	EcoSSL	10.00	100%	3.20	0.77	0.77	0.70	0.70
Benzo(g,h,i)perylene	mg/kg	1.10	EcoSSL	10.00	90%	1.50	0.37	0.37	0.33	0.33
Benzo(k)fluoranthene	mg/kg	1.10	EcoSSL	10.00	90%	1.30	0.36	0.36	0.33	0.33
bis(2-Ethylhexyl)phthalate (DEHP)	mg/kg	0.93	Region V	10.00	90%	0.15	0.06	0.05	0.06	0.05
Carbazole	mg/kg	29.00	See Text	10.00	50%	0.29	0.10	0.08	0.00	0.00
Chrysene	mg/kg	1.10	EcoSSL	10.00	90%	2.40	0.59	0.59	0.53	0.53
Dibenz(a,h)anthracene	mg/kg	1.10	EcoSSL	10.00	20%	0.06	0.02	0.01	0.01	0.01
Dibenzofuran	mg/kg	1.10	EcoSSL	10.00	70%	0.10	0.04	0.03	0.03	0.03
Dimethyl phthalate	mg/kg	0.00	EcoSSL	10.00	10%	0.15	0.05	0.00		
Fluoranthene	mg/kg	1.10	EcoSSL	10.00	100%	5.20	1.29	1.29	**1.17**	**1.17**
Fluorene	mg/kg	1.10	EcoSSL	10.00	80%	0.16	0.05	0.05	0.05	0.05
Indeno(1,2,3-cd)pyrene	mg/kg	1.10	EcoSSL	10.00	90%	1.30	0.32	0.32	0.29	0.29
Naphthalene	mg/kg	1.10	EcoSSL	10.00	60%	0.07	0.02	0.02	0.02	0.02
Phenanthrene	mg/kg	1.10	EcoSSL	10.00	90%	1.90	0.63	0.63	0.57	0.57
Pyrene	mg/kg	1.10	EcoSSL	10.00	100%	4.40	1.05	1.05	0.96	0.96
Sum of HMW PAHs	mg/kg			10.00	100%	22.93	6.19	6.19		
Volatile Organic Compounds										
2-Butanone (Methyl ethyl ketone) (M	mg/kg	89.60	Region V	8.00	50%	0.01	0.01	0.00	0.00	0.00
Acetone	mg/kg	2.50	Region V	8.00	63%	0.03	0.01	0.01	0.01	0.01
Carbon disulfide	mg/kg	0.09	Region V	8.00	75%	0.00	0.00	0.00	0.03	0.01
Chloroform (Trichloromethane)	mg/kg	1.19	Region V	8.00	38%	0.00	0.00	0.00	0.00	0.00
Methyl acetate	mg/kg	0.02	European	8.00	38%	0.01	0.00	0.00	0.29	0.21
Toluene	mg/kg	5.45	Region V	8.00	100%	0.00	0.00	0.00	0.00	0.00
Vinyl chloride	mg/kg	0.65	Region V	8.00	13%	0.00	0.00	0.00	0.00	0.00

ESV - Ecological Screening Value
SQ - Exposure Value / ESV