APPENDIX G
PRELIMINARY WASTE CHARACTERIZATION FOR SOIL
PASCO LANDFILL NPL SITE

Prepared for

Industrial Waste Area Generator Group III

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LIST OF ACRONYMS AND ABBREVIATIONS

bgs	below ground surface
CFR	Code of Federal Regulations
Ecology	Washington State Department of Ecology
EPI	Environmental Partners, Inc.
FFS	Focused Feasibility Study
HOC	halogenated organic compound
IWA	Industrial Waste Area
PAH	polycyclic aromatic hydrocarbon
PCB	polychlorinated biphenyl
PCE	perchloroethylene
PSC	Philip Services Corporation
PSL Property	Pasco Sanitary Landfill Property
RCRA	Resource Conservation and Recovery Act
RI	Remedial Investigation
TC	toxicity characteristic
TCE	trichloroethene
TCLP	toxicity characteristic leaching procedure
UTS	Universal Treatment Standards
WAC	Washington Administrative Code

1 INTRODUCTION AND OBJECTIVES

This report provides the results of the preliminary waste characterization in support of the 2017 Draft Final Focused Feasibility Study (FFS) for the Pasco Sanitary Landfill National Priorities List Site (Site). The preliminary waste characterization was conducted to meet the following objectives:

- Support the evaluation of remedial alternatives for Zones A, C/D, and E regarding soil disposal costs.
- Evaluate disposal options in the Draft Final FFS for remedial alternatives that include soil excavation as part of their cleanup action components.

2 SITE BACKGROUND

The Pasco Sanitary Landfill Property (PSL Property), located in the northern portion of the Site, is approximately 1.5 miles northeast of the City of Pasco and occupies a 200-acre area consisting of gently rolling hills surrounded by irrigated cropland. Waste disposal operations took place on the property from 1972 to 2001.

Industrial waste was accepted at the PSL Property from April 1972 through 1975 and included primarily bulk sludges and drummed wastes. Industrial wastes were segregated into five primary Industrial Waste Areas (IWAs), designated as Zones A, B, C, D, and E. Figure 1 shows the locations of the IWAs of interest in this report (Zones A, C/D, and E). Additional waste management zones used on a temporary basis also existed at the PSL Property.

Although interim closure of the industrial part of the PSL Property began in 1975, municipal landfill operations continued during this period. Inert waste was segregated and disposed of in the area southeast of Zone A from approximately 1986 until the municipal landfill closed in mid-1993. New Waste, Inc., built and operated lined municipal solid waste cells just north of the Site from 1993 until those cells closed in 2001. Since 2001, the only operations on the PSL Property have been related to Site cleanup.

Previous work conducted at the PSL Property includes but is not limited to the following investigations:

- Phase I and Phase II Remedial Investigations (RIs) completed by Burlington Environmental, Inc., in 1993 (Burlington Environmental 1993) and Philip Services Corporation (PSC) in 1998 (PSC 1998)
- Feasibility Study completed by PSC in 1999 (PSC 1999)
- Sub-Zone A Investigation completed by Environmental Partners, Inc. (EPI), in 2012 (EPI 2012)

3 DATA AVAILABILITY

To support the cleanup action components of the remedial alternatives developed in the Draft Final FFS, Anchor QEA, LLC, evaluated historical soil chemistry data from IWA Zones A, C/D, and E. Data availability for each zone is summarized in the following list. Soil sample locations and boring IDs are shown in Figure 1 for historical vertical and horizontal soil borings.

- **Zone A.** Soil chemistry data are available for 131 samples (including field duplicates) from 12 borings, consisting of 8 vertical borings[1] and 4 horizontal borings[2,3] (see Table 1). Sample collection was conducted by EPI in 2010 to support the Sub-Zone A Investigation (EPI 2012). Soil samples were collected at approximately 5-foot intervals from as shallow as 17 feet below ground surface (bgs) to as deep as 76.5 feet bgs.
- **Zones C/D.** Soil chemistry data are available for 23 samples (including field duplicates) from four soil borings (see Table 2). Borings B-01 and B-02 were collected in 1993 by Burlington Environmental to support the Phase I RI. Borings B-19 and

[1] Three vertical borings from the Sub-Zone A Investigation (EPI 2012) were added to the soil dataset for Zone A in response to Comment No. 36 (provided on June 13, 2016, by the Washington State Department of Ecology [Ecology]) on the 2014 Draft FFS. A total of 16 samples have been added to Table 1 of this appendix.
[2] All horizontal borings from the Sub-Zone A Investigation (EPI 2012) were added to the soil dataset for Zone A in response to Comment No. 36 (provided on June 13, 2016, by Ecology) on the 2014 Draft FFS. A total of 52 samples have been added to Table 1 of this appendix.
[3] The vertical depths of horizontal boring sample locations are approximate, per the Sub-Zone A Investigation (EPI 2012): "… During horizontal drilling, soil samples were collected at approximately 30-foot horizontal intervals; however, minor deviations from the 30-foot interval were occasionally necessary based upon field conditions and sample recovery."

B-20 were collected in 1996 by PSC to support the Phase II RI. Soil samples were collected every 15 to 19 feet from 11 to 60 feet bgs.

- **Zone E**. Soil chemistry data are available for 17 samples (including field duplicates) from seven locations (see Table 3) as follows:
  - Samples from the B-series soil borings (B-03, B-04, and B-11) were collected in 1993 by Burlington Environmental to support the Phase I RI. Soil samples were collected every 15 to 19 feet from approximately 11 to 60 feet bgs.
  - LS-series samples (LS-17, LS-18, and LS-20) were collected in 1992 by Burlington Environmental to support the Phase I RI. A single surface soil sample (0.5 foot bgs) was collected at each location.
  - One subsurface soil sample (60 feet bgs) from the boring of monitoring well MW-27S was collected in 1995 by PSC to support the Phase II RI.

4 RESULTS

To support the evaluation of remedial alternatives for Zones A, C/D, and E, specifically the development of options and costs for impacted soil disposal, the operational history was reviewed, and historical soil data were compared to Washington State and federal criteria to characterize the waste as hazardous or non-hazardous. Potentially applicable waste codes and treatment standards were identified for hazardous wastes, and treatment and disposal options were evaluated.

None of the federal hazardous waste codes for listed waste apply to the impacted soil at the Site. The products that may have been placed in the landfill, the specific processes and industries that generated the waste, and the source of detected constituents in the soil are unknown. Therefore, the results of chemical analyses of the soil were evaluated to assess whether the soil may exhibit toxicity characteristics (TC). Because no samples were subjected to leachate testing, concentrations of constituents in the soil were compared to regulatory levels for toxicity characteristic leachate procedure (TCLP) by multiplying the regulatory levels by 20, which corresponds to the dilution ratio. This method is a very conservative screening, as the constituents in the soil would need to completely leach into the aqueous phase to show in leachate test results that correspond to the screening values.

Soil data from Zones A, C/D, and E were screened against the following criteria:

- Washington State Dangerous Waste Criteria for total polycyclic aromatic hydrocarbons (PAHs) and halogenated organic compounds (HOCs) (Washington Administrative Code [WAC] 173-303-100)
- Federal TC limits – (TCLP; Title 40 Part 261.24 of the Code of Federal Regulations [CFR])
- Federal remediation waste criteria for polychlorinated biphenyls (PCBs) (40 CFR 761.61)

The comparison of soil chemistry data from Zones A, C/D, and E to Washington State and federal waste designation criteria are presented in Tables 1, 2, and 3. For completeness, the total number of samples analyzed per compound, the total number of samples with detected compounds above screening levels (i.e., exceedances, shown as yellow-highlighted cells) and below screening levels, the total number of samples with undetected compounds, and maximum concentrations for each analyte are also provided in these tables. The locations and depths of samples exceeding the screening for individual waste codes are shown in Figures 2 through 10. The waste codes assigned to the soil samples captured by the screening are summarized in Table 4. Percent exceedance, calculated as the number of soil samples exceeding screening criteria over the total number of samples in a zone for a given soil layer, is presented in Table 5. The Universal Treatment Standards (UTS) and applicable treatment standards are summarized in Table 6.

4.1 Waste Characterization Results

4.1.1 Zone A

Soil concentrations in 17 samples from 7 of the 12 borings in Zone A exceeded one or more of the waste designation criteria (see Table 1). Samples from borings MW-52S and VEW-07D exceeded the Washington State dangerous waste criteria for total HOCs, as well as the federal TC limit for 1,2-dichloroethane, perchloroethylene (PCE), trichloroethene (TCE), chromium, and lead. Samples from boring VEW-07D also exceeded the federal TC limit for benzene. Samples from borings MW-53S, HB-1.5W, and HB-1N exceeded the dangerous waste criteria for total HOCs and the federal TC limit for PCE and TCE. Samples from borings HB-1S and HB-2SR exceeded the dangerous waste criteria for total HOCs and the

federal TC limit for TCE. Finally, one sample from boring VMW-51D exceeded the federal TC limit for lead. The locations and depths of the samples exceeding waste designation criteria are shown for the chemicals described in this section in Figures 2 through 10.

Soil samples exceeding the dangerous waste criteria or screening levels were preliminarily characterized as dangerous waste (WAC 173-303) and/or characteristic waste (40 CFR 261) and were assigned waste codes specific to the criteria that were exceeded. The waste codes for each soil sample are presented in Table 4.

Following the evaluation of individual samples, percent exceedance was calculated for each of the soil layers identified in Zone A. Percent exceedance was the highest in the mixed soil and debris layer and the Touchet Beds layer (40% and 23%, respectively) and lowest (5%) in the Upper Pasco Gravels layer (see Table 5). There were no exceedances in the fill layer or the transition zone layer. Overall, 14% of the soil samples in Zone A exceeded waste designation screening levels.

4.1.2 Zones C/D

There were no exceedances of waste designation screening levels in Zones C/D. The screening results are presented in Table 2.

4.1.3 Zone E

Soil concentrations from two samples from two of the seven borings in Zone E exceeded the federal TC limit for mercury (see Table 3 and Figure 8). The soil samples were preliminarily identified as characteristic waste (40 CFR 261) for this evaluation and were assigned the waste code specific to the criterion that was exceeded. The waste code for each soil sample is presented in Table 4.

Following the evaluation of individual samples, percent exceedance was calculated for the two soil layers identified in Zone E. Percent exceedance was the highest in the Touchet Beds at 22% (see Table 5); there were no exceedances in the Upper Pasco Gravels. Overall, 13% of the soil samples in Zone E exceeded waste designation criteria.

4.2 Treatment and Disposal Options

Under the Resource Conservation and Recovery Act (RCRA), characteristically toxic wastes, including contaminated environmental media, require treatment prior to land disposal in a facility permitted under Subtitle C of RCRA to manage hazardous waste if concentrations exceed the UTS. Waste that is not designated as hazardous waste can be disposed of without treatment at a facility permitted by the state for the management of non-hazardous waste (i.e., Subtitle D facility).

The two most viable treatment options for soil classified as hazardous waste that requires treatment prior to land disposal are stabilization and incineration with stabilization. Stabilization chemically immobilizes hazardous materials or reduces their solubility through a chemical reaction and involves treating the waste with reagents (such as Portland cement, lime, and other compounds) that can enhance the set/cure time or compressive strength or reduce the leachability of metals or other hazardous constituents. The incineration option involves burning the waste at high temperatures to destroy contaminants and solidifying the ash to treat for remaining metals. After treatment (stabilization or incineration), the waste would be eligible for disposal at a permitted hazardous waste facility. Of the two treatment options, stabilization is likely the most economical, but both have been carried forward in the remedial alternatives for Zones A, C/D, and E that involve soil excavation as part of their cleanup action components. For FFS costing purposes, specific percentages of the waste were assumed to require stabilization or incineration, depending on the zone (see Appendix E of the Draft Final FFS).

Under RCRA, the applicable treatment standard is ten times the UTS (40 CFR 268.48) or a 90% reduction in soil concentration, whichever is higher. The UTS, 90% soil concentrations, and applicable treatment standards are presented in Table 6.

Both treatment/disposal options for soil classified as hazardous waste are viable for the Site and have been included in the remedial alternatives of Zones A, C/D, and E that involve soil excavation as part of their cleanup action components. The cost of TCLP and other waste characterization requirements may also be considered prior to selecting a disposal option because theses analytical testing requirements may exceed the benefit of reduced disposal costs.

5 SUMMARY AND CONCLUSIONS

The following conclusions can be derived from the results of the preliminary waste characterization for Zones A, C/D, and E at the Site:

- Based on the screening results, 14% of all soil samples from Zone A and 13% of all soil samples from Zone E were preliminarily characterized as hazardous waste.
  - Soil samples from Zone A exceeded the federal TC limit for 1,2-dichloroethane, TCE, PCE, chromium, lead, and benzene (per 40 CFR 261.24) and/or the Washington State Dangerous Waste Criteria for HOCs (per WAC 173-303-100).
  - Soil samples from Zones C/D did not exceed any of the waste designation screening levels.
  - Soil samples from Zone E exceeded the federal TC limit for mercury (per 40 CFR 261.24).
  - Due to the limited existing dataset for Zones C/D and E, there is a high level of uncertainty with the preliminary waste characterization conducted in this appendix for these zones. A conservative methodology has been used in this analysis by comparing soil concentrations to 20 times the TC limits. No compounds have reached ground water at levels that would exceed Model Toxics Control Act Method B levels since 2007; however, there are historical detections of chemicals in soil that could represent potential future impacts in ground water downgradient of Zones C/D and E. These potential future ground water impacts are addressed in the Draft Final FFS with a contingent action in the Central Area Alternative ONP-1 (downgradient of Zones C/D and E), which includes focused soil vapor extraction treatment to capture low-level volatile organic compounds in soil gas and does not include any soil excavation (see Section 5.8.1.1 of the Draft Final FFS).
- Treatment options for soil designated as hazardous waste include stabilization or incineration with stabilization. Stabilization is likely the more economical treatment option.
  - Both treatment options have been carried forward in the remedial alternatives of Zones A, C/D, and E that involve soil excavation as part of their cleanup action components.

  - The remedial alternatives for Zones C/D and E assume in the Draft Final FFS that all waste in these zones is hazardous and therefore, if excavated, would be disposed in a Subtitle C landfill with a portion of the soil excavated needing treatment (see Section 5 of the Draft Final FFS).
  - For FFS costing purposes, specific percentages of the waste were assumed to require stabilization or incineration, depending on the zone (see Appendix E).

- Disposal options for soil designated as hazardous waste include off-site land disposal of treated waste at a permitted hazardous waste facility; this has been carried forward in the remedial alternatives of Zones A, C/D, and E that involve soil excavation as part of their cleanup action components. Further testing to determine if the treated waste meets applicable treatment standards could be evaluated during the remedial design phase, although the analytical testing requirements may exceed the benefit of reduced disposal costs.

6 REFERENCES

Burlington Environmental (Burlington Environmental, Inc.), 1993. *Final Draft Phase I Remedial Investigation, Pasco Landfill*. Prepared for Pasco Landfill PLP Group. December 1993.

EPI (Environmental Partners, Inc.), 2012. *Revised Phase II Additional Interim Actions – Sub-Zone A Investigation and Downgradient Well Installation Report*. Pasco Landfill Site. Prepared for IWAG Group III, c/o Mr. Will Ernst. May 2012.

PSC (Philip Services Corporation), 1998. *Final Phase II Remedial Investigation Report, Pasco Landfill, Pasco, Washington*. Prepared for Pasco Landfill PLP Group. March 1998.

PSC, 1999. *Final Draft Feasibility Study Report, Pasco Landfill, Pasco, Washington*. Prepared for Pasco Landfill PLP Group. April 1999.

TABLES

Table 1
Soil Data Screening – Zone A

Analyte	Ecology Dangerous Waste Designation Criteria (1%)[1]	Ecology Dangerous Waste Designation Criteria (0.01%)[1]	Federal TC Limit - TCLP[2,3]	PCB Federal Remediation Waste Criteria[4]	Location ID	HB-1.5W120	HB-1.5W150	HB-1.5W180	HB-1.5W90	HB-1N0	HB-1N120	HB-1N150	HB-1N180	HB-1N180	HB-1N30	HB-1N60	HB-1N90	HB-1S0	HB-1S120
					Sample ID	HB-1.5W120	HB-1.5W150	HB-1.5W180	HB-1.5W90	HB-1N0	HB-1N120	HB-1N150	HB-1N180	HB-91N_FDUP	HB-1N30	HB-1N60	HB-1N90	HB-1S0	HB-1S120
					Sample Date	5/17/2011	5/17/2011	5/18/2011	5/16/2011	3/29/2011	3/30/2011	3/30/2011	3/31/2011	3/31/2011	3/29/2011	3/29/2011	3/30/2011	4/6/2011	4/4/2011
					Depth	33 - 33 ft	33 - 33 ft	33 - 33 ft	33 - 33 ft	29 - 29 ft	29 - 29 ft	29 - 29 ft	29 - 29 ft	29 - 29 ft	29 - 29 ft	29 - 29 ft	29 - 29 ft	29 - 29 ft	29 - 29 ft
					Sample Type	N	N	N	N	N	N	N	N	FD	N	N	N	N	N
Metals (mg/kg)																			
Arsenic			100			**1.9**	--	**4.4**	--	**6.1**	**4**	--	**2.6**	**2.6**	--	**5.1**	--	**9.8**	**4.6**
Cadmium			20			0.1 U	--	0.1 U	--	0.1 U	0.1 U	--	0.1 U	0.1 U	--	0.1 U	--	**0.1**	0.1 U
Chromium			100			**5.6**	--	**6.1**	--	**10.5**	**8.3**	--	**6.7**	**6.9**	--	**7.7**	--	**14**	**8**
Lead			100			**3.3**	--	**3.7**	--	**6.2**	**4.7**	--	**3.7**	**3.7**	--	**3.8**	--	**10**	**4**
Mercury			4			0.02 U	--	0.03 U	--	0.02 U	0.03 U	--	0.02 U	0.02 U	--	0.03 U	--	0.03 U	0.02 U
Selenium			20			0.6 U	--	0.6 U	--	0.6 U	0.6 U	--	0.5 U	0.5 U	--	0.6 U	--	0.6 U	0.6 U
Silver			100			0.2 U	--	0.2 U	--	0.2 U	0.2 U	--	0.2 U	0.2 U	--	0.2 U	--	0.2 U	0.2 U
Volatile Organics (µg/kg)																			
1,1-Dichloroethene			14000			10 U	10 U	10 U	10 U	10 U	10 U	**55**	10 U	10 U	10 U	10 U	10 U	10 U	**22**
1,2-Dichloroethane			10000			10 U	10 U	**2200**	**220**	10 U	**450**	**8500**	10 U	10 U	**66**	**320**	**130**	10 U	**640**
Benzene			10000			5 U	5 U	**300**	**120**	5 U	**15**	**770**	5 U	5 U	5 U	**7.9**	**9.2**	5 U	**390**
Carbon tetrachloride (Tetrachloromethane)			10000			10 U	10 U	57 U	47 U	10 U	72 U	50 U	38 U	45 U	10 U	58 U	59 U	10 U	46 U
Chlorobenzene			2000000			10 U	10 U	**350**	**1000**	10 U	76 U	**330**	41 U	47 U	10 U	61 U	63 U	10 U	**190**
Chloroform			120000			10 U	10 U	56 U	46 U	10 U	71 U	**340**	38 U	44 U	10 U	57 U	58 U	10 U	**51**
Hexachlorobutadiene (Hexachloro-1,3-butadiene)			10000			10 U	10 U	66 U	53 U	10 U	83 U	58 U	44 U	51 U	10 U	67 U	68 U	10 U	52 U
Methyl ethyl ketone (2-Butanone)			4000000			**1600**	**23000**	**450000**	**3100**	50 U	**610000**	**540000**	**81000**	**100000**	**55000**	**320000**	**100000**	**390**	**60000**
Perchloroethylene (PCE)			14000			10 U	10 U	**16000**	**3400**	10 U	**260**	**120000**	10 U	10 U	10 U	**67**	**580**	10 U	**9100**
Trichloroethene (TCE)			10000			10 U	10 U	**47000**	**18000**	10 U	**1500**	**140000**	**14**	**15**	**36**	**290**	**1100**	10 U	**37000**
Vinyl chloride			4000			10 U	10 U	10 U	10 U	10 U	10 U	10 U	10 U	10 U	10 U	10 U	10 U	10 U	10 U
Semivolatile Organics (µg/kg)																			
1,4-Dichlorobenzene			150000			10 U	10 U	**110**	**910**	10 U	74 U	**680**	40 U	46 U	10 U	60 U	61 U	10 U	**870**
2,4,5-Trichlorophenol			8000000			100 U	--	1000 U	--	100 U	100 U	--	100 U	100 U	--	100 U	--	100 U	2000 U
2,4,6-Trichlorophenol			40000			100 U	--	1000 U	--	100 U	100 U	--	100 U	100 U	--	100 U	--	100 U	2000 U
2,4-Dinitrotoluene			2600			250 U	--	2500 U	--	250 U	250 U	--	250 U	250 U	--	250 U	--	250 U	5000 U
2-Methylphenol (o-Cresol)			4000000			100 U	--	**5000**	--	100 U	**570**	--	100 U	100 U	--	**180**	--	100 U	2000 U
3-Methylphenol & 4-Methylphenol (m&p-Cresol)			4000000			**100**	--	**10000**	--	100 U	**1500**	--	**350**	**340**	--	**350**	--	100 U	**2900**
Hexachlorobenzene			2600			100 U	--	1000 U	--	100 U	100 U	--	100 U	100 U	--	100 U	--	100 U	2000 U
Hexachloroethane			60000			100 U	--	1000 U	--	100 U	100 U	--	100 U	100 U	--	100 U	--	100 U	2000 U
Nitrobenzene			40000			100 U	--	1000 U	--	100 U	100 U	--	100 U	100 U	--	100 U	--	100 U	2000 U
Pentachlorophenol			2000000			19 U	--	37 U	--	20 U	20 U	--	17 U	17 U	--	20 U	--	20 U	18 U
Pyridine			100000			200 U	--	2000 U	--	200 U	200 U	--	200 U	200 U	--	200 U	--	200 U	4000 U
Polycyclic Aromatic Hydrocarbons (µg/kg)																			
Total PAH (20 Dangerous Waste Regulations) (U = 1/2)	10000000					100 U	--	**7638**	--	100 U	100 U	--	100 U	100 U	--	100 U	--	100 U	2000 U
Total PAH (20 Dangerous Waste Regulations) (U = 0)	10000000					100 U	--	**4618**	--	100 U	100 U	--	100 U	100 U	--	100 U	--	100 U	2000 U
Herbicides (µg/kg)																			
2,4,5-TP (Silvex)			20000			7.7 U	--	15 U	--	7.9 U	8 U	--	6.8 U	6.7 U	--	8.2 U	--	7.8 U	7.3 U
2,4-D (2,4-Dichlorophenoxyacetic acid)			200000			7.7 U	--	15 U	--	7.9 U	8 U	--	6.8 U	6.7 U	--	8.2 U	--	7.8 U	7.3 U
PCB Aroclors (µg/kg)																			
Total PCB Aroclors (U = 1/2)				50000		**460**	--	**24700**	--	100 U	**1330**	--	100 U	--	--	100 U	--	100 U	**30500**
Total PCB Aroclors (U = 0)				50000		**110**	--	**7200**	--	100 U	**1030**	--	100 U	--	--	100 U	--	100 U	**13000**
Halogenated Organic Compounds (µg/kg)																			
Total Halogenated Organic Compounds (U = 1/2)	10000000	100000				**2169.6**	50 U	**129595**	**40985.5**	500 U	**8619**	**314896.5**	**4276.4**	**4362.6**	**464.5**	**4609.7**	**3682.5**	680 U	**124467.1**
Total Halogenated Organic Compounds (U = 0)	10000000	100000				**161**	50 U	**96552**	**40258**	500 U	**5441**	**314167**	**1534**	**1915**	**242**	**1657**	**2607**	680 U	**79018**

Table 1
Soil Data Screening – Zone A

Analyte	Ecology Dangerous Waste Designation Criteria (1%)[1]	Ecology Dangerous Waste Designation Criteria (0.01%)[1]	Federal TC Limit - TCLP[2,3]	PCB Federal Remediation Waste Criteria[4]	Location ID	HB-1S150	HB-1S180	HB-1S30	HB-1S60	HB-1S90	HB-1W0	HB-1W120	HB-1W120	HB-1W30	HB-1W60	HB-1W90	HB-2N0	HB-2N120
					Sample ID	HB-1S150	HB-1S180	HB-1S30	HB-1S60	HB-1S90	HB-1W0	HB-1W120	HB-91W120_FDUP	HB-1W30	HB-1W60	HB-1W90	HB-2N0	HB-2N120
					Sample Date	4/1/2011	3/31/2011	4/5/2011	4/5/2011	4/5/2011	5/10/2011	5/13/2011	5/13/2011	5/11/2011	5/11/2011	5/12/2011	4/12/2011	4/19/2011
					Depth	29 - 29 ft	29 - 29 ft	29 - 29 ft	29 - 29 ft	29 - 29 ft	26 - 26 ft	26 - 26 ft	26 - 26 ft	26 - 26 ft	26 - 26 ft	26 - 26 ft		
					Sample Type	N	N	N	N	N	N	N	FD	N	N	N	N	N
Metals (mg/kg)																		
Arsenic			100		--	**2.5**	--	**5.7**	--	**6.9**	**5.1**	**6.6**	--	**7.9**	--	**1.7**	**1.2**
Cadmium			20		--	0.1 U	--	0.1 U	--	0.1 U	0.1 U	**0.5**	--	**0.1**	--	0.1 U	0.1 U
Chromium			100		--	**5.8**	--	**10**	--	**12.4**	**8.3**	**11.7**	--	**10.2**	--	**5.2**	**5.1**
Lead			100		--	**3.4**	--	**5.8**	--	**5.7**	**5.3**	**17.8**	--	**6.9**	--	**3**	**2.4**
Mercury			4		--	0.02 U	--	0.03 U	--	0.02 U	0.02 U	**0.31**	--	0.02 U	--	0.02 U	0.03 U
Selenium			20		--	0.5 U	--	0.7 U	--	0.6 U	0.6 U	0.6 U	--	0.6 U	--	0.5 U	0.6 U
Silver			100		--	0.2 U	--	0.3 U	--	0.2 U	0.2 U	0.2 U	--	0.2 U	--	0.2 U	0.2 U
Volatile Organics (µg/kg)																		
1,1-Dichloroethene			14000		10 U	10 U	10 U	10 U	10 U	10 U	10 U	10 U	10 U	10 U	10 U	10 U	10 U
1,2-Dichloroethane			10000		**51**	**11**	10 U	**38**	**47**	10 U	**39**	10 U	**260**	**580**	**53**	10 U	10 U
Benzene			10000		**12**	5 U	5 U	**8.7**	**6.2**	5 U	5 U	5 U	5 U	5 U	5 U	5 U	5 U
Carbon tetrachloride (Tetrachloromethane)			10000		83 U	35 U	10 U	62 U	53 U	10 U	66 U	52 U	61 U	69 U	71 U	10 U	10 U
Chlorobenzene			2000000		87 U	37 U	10 U	65 U	56 U	10 U	69 U	55 U	64 U	73 U	75 U	10 U	10 U
Chloroform			120000		81 U	35 U	10 U	60 U	52 U	10 U	65 U	51 U	59 U	68 U	69 U	10 U	10 U
Hexachlorobutadiene (Hexachloro-1,3-butadiene)			10000		95 U	41 U	10 U	71 U	61 U	10 U	76 U	59 U	70 U	80 U	81 U	10 U	10 U
Methyl ethyl ketone (2-Butanone)			4000000		**6400**	**57000**	**580**	**84000**	**160000**	50 U	**41000**	**880**	**57000**	**760000**	**3800**	50 U	50 U
Perchloroethylene (PCE)			14000		**900**	10 U	10 U	**46**	**42**	10 U	**210**	10 U	**910**	**390**	**92**	10 U	10 U
Trichloroethene (TCE)			10000		**2000**	**60**	**10**	**260**	**240**	10 U	**730**	10 U	**1100**	**890**	**370**	10 U	10 U
Vinyl chloride			4000		10 U	10 U	10 U	10 U	10 U	10 U	10 U	10 U	10 U	10 U	10 U	10 U	10 U
Semivolatile Organics (µg/kg)																		
1,4-Dichlorobenzene			150000		**490**	**49**	10 U	64 U	55 U	10 U	68 U	53 U	63 U	72 U	73 U	10 U	10 U
2,4,5-Trichlorophenol			8000000		--	100 U	--	100 U	--	100 U	100 U	100 U	--	200 U	--	100 U	100 U
2,4,6-Trichlorophenol			40000		--	100 U	--	100 U	--	100 U	100 U	100 U	--	200 U	--	100 U	100 U
2,4-Dinitrotoluene			2600		--	250 U	--	250 U	--	250 U	250 U	250 U	--	500 U	--	250 U	250 U
2-Methylphenol (o-Cresol)			4000000		--	**160**	--	100 U	--	100 U	100 U	100 U	--	**450**	--	100 U	100 U
3-Methylphenol & 4-Methylphenol (m&p-Cresol)			4000000		--	**1500**	--	120 U	--	100 U	**140**	100 U	--	**5000**	--	100 U	100 U
Hexachlorobenzene			2600		--	100 U	--	100 U	--	100 U	100 U	100 U	--	200 U	--	100 U	100 U
Hexachloroethane			60000		--	100 U	--	100 U	--	100 U	100 U	100 U	--	200 U	--	100 U	100 U
Nitrobenzene			40000		--	100 U	--	100 U	--	100 U	100 U	100 U	--	200 U	--	100 U	100 U
Pentachlorophenol			2000000		--	19 U	--	22 U	--	21 U	19 U	18 U	--	21 U	--	19 U	20 U
Pyridine			100000		--	200 U	--	200 U	--	200 U	200 U	200 U	--	400 U	--	200 U	200 U
Polycyclic Aromatic Hydrocarbons (µg/kg)																		
Total PAH (20 Dangerous Waste Regulations) (U = 1/2)	10000000				--	**2700**	--	110 U	--	100 U	100 U	100 U	--	200 U	--	100 U	100 U
Total PAH (20 Dangerous Waste Regulations) (U = 0)	10000000				--	**2330**	--	110 U	--	100 U	100 U	100 U	--	200 U	--	100 U	100 U
Herbicides (µg/kg)																		
2,4,5-TP (Silvex)			20000		--	7.4 U	--	8.9 U	--	8.4 U	7.6 U	7.1 U	--	8.2 U	--	7.5 U	7.9 U
2,4-D (2,4-Dichlorophenoxyacetic acid)			200000		--	7.4 U	--	8.9 U	--	8.4 U	7.6 U	7.1 U	--	**340**	--	7.5 U	7.9 U
PCB Aroclors (µg/kg)																		
Total PCB Aroclors (U = 1/2)				50000	--	**470**	--	**690**	--	100 U	**10800**	100 U	--	**890**	--	100 U	100 U
Total PCB Aroclors (U = 0)				50000	--	**120**	--	**340**	--	100 U	**3800**	100 U	--	**540**	--	100 U	100 U
Halogenated Organic Compounds (µg/kg)																		
Total Halogenated Organic Compounds (U = 1/2)	10000000	100000			**10068.5**	**3910.4**	**242.5**	**4719.15**	**2325.5**	**2102.9**	**15083.6**	500 U	**3550**	**8421.1**	**2636.5**	870 U	790 U
Total Halogenated Organic Compounds (U = 0)	10000000	100000			**8571**	**1390**	**10**	**1374**	**1249**	**14**	**5329**	500 U	**2270**	**3550**	**1215**	870 U	790 U

Table 1
Soil Data Screening – Zone A

Analyte	Ecology Dangerous Waste Designation Criteria (1%)[1]	Ecology Dangerous Waste Designation Criteria (0.01%)[1]	Federal TC Limit - TCLP[2,3]	PCB Federal Remediation Waste Criteria[4]	Location ID	HB-2N150	HB-2N180	HB-2N30	HB-2N60	HB-2N90	HB-2NR0	HB-2NR120	HB-2NR150	HB-2NR180	HB-2NR30	HB-2NR60	HB-2NR90	HB-2S115	HB-2S150
					Sample ID	HB-2N150	HB-2N180	HB-2N30	HB-2N60	HB-2N90	HB-2NR0	HB-2NR120	HB-2NR150	HB-2NR180	HB-2NR30	HB-2NR60	HB-2NR90	HB-2S115	HB-2S150
					Sample Date	4/19/2011	4/20/2011	4/12/2011	4/13/2011	4/19/2011	5/23/2011	5/25/2011	5/26/2011	5/26/2011	5/24/2011	5/24/2011	5/25/2011	4/21/2011	4/21/2011
					Depth						45 - 45 ft	45 - 45 ft	45 - 45 ft	45 - 45 ft	45 - 45 ft	45 - 45 ft	45 - 45 ft		
					Sample Type	N	N	N	N	N	N	N	N	N	N	N	N	N	N
Metals (mg/kg)																			
Arsenic			100		--	**1.1**	--	**1.8**	--	**0.8**	**0.8**	--	**0.9**	--	**1.6**	--	**0.9**	--
Cadmium			20		--	0.1 U	--	0.1 U	--	0.1 U	0.1 U	--	0.1 U	--	0.1 U	--	0.1 U	--
Chromium			100		--	**5.2**	--	**6.4**	--	**5.6**	**5.3**	--	**4.3**	--	**4.6**	--	**4.6**	--
Lead			100		--	**2.8**	--	**4.4**	--	**3.3**	**2.5**	--	**3.1**	--	**5.1**	--	**2.3**	--
Mercury			4		--	0.02 U	--	0.02 U	--	0.03 U	0.02 U	--	0.02 U	--	0.02 U	--	0.02 U	--
Selenium			20		--	0.6 U	--	0.6 U	--	0.6 U	0.6 U	--	0.6 U	--	0.6 U	--	0.5 U	--
Silver			100		--	0.2 U	--	0.2 U	--	0.2 U	0.2 U	--	0.2 U	--	0.2 U	--	0.2 U	--
Volatile Organics (µg/kg)																			
1,1-Dichloroethene			14000		10 U	10 U	10 U	10 U	10 U	10 U	10 U	10 U	10 U	10 U	10 U	10 U	10 U	10 U
1,2-Dichloroethane			10000		10 U	10 U	10 U	10 U	10 U	10 U	10 U	10 U	10 U	10 U	10 U	10 U	10 U	10 U
Benzene			10000		5 U	5 U	5 U	5 U	5 U	5 U	5 U	5 U	5 U	5 U	5 U	5 U	5 U	5 U
Carbon tetrachloride (Tetrachloromethane)			10000		10 U	10 U	10 U	10 U	10 U	10 U	10 U	10 U	10 U	10 U	10 U	10 U	10 U	10 U
Chlorobenzene			2000000		10 U	10 U	10 U	10 U	10 U	10 U	10 U	10 U	10 U	10 U	10 U	10 U	10 U	10 U
Chloroform			120000		10 U	10 U	10 U	10 U	10 U	10 U	10 U	10 U	10 U	10 U	10 U	10 U	10 U	10 U
Hexachlorobutadiene (Hexachloro-1,3-butadiene)			10000		10 U	10 U	10 U	10 U	10 U	10 U	10 U	10 U	10 U	10 U	10 U	10 U	10 U	10 U
Methyl ethyl ketone (2-Butanone)			4000000		**260**	**540**	50 U	50 U	50 U	50 U	**940**	50 U	50 U	50 U	50 U	**280**	50 U	50 U
Perchloroethylene (PCE)			14000		10 U	10 U	10 U	10 U	10 U	10 U	10 U	10 U	10 U	10 U	10 U	10 U	10 U	10 U
Trichloroethene (TCE)			10000		10 U	10 U	10 U	10 U	10 U	10 U	10 U	10 U	10 U	**11**	10 U	10 U	10 U	10 U
Vinyl chloride			4000		10 U	10 U	10 U	10 U	10 U	10 U	10 U	10 U	10 U	10 U	10 U	10 U	10 U	10 U
Semivolatile Organics (µg/kg)																			
1,4-Dichlorobenzene			150000		10 U	10 U	10 U	10 U	10 U	10 U	10 U	10 U	10 U	10 U	10 U	10 U	10 U	10 U
2,4,5-Trichlorophenol			8000000		--	100 U	--	100 U	--	100 U	100 U	--	100 U	--	100 U	--	100 U	--
2,4,6-Trichlorophenol			40000		--	100 U	--	100 U	--	100 U	100 U	--	100 U	--	100 U	--	100 U	--
2,4-Dinitrotoluene			2600		--	250 U	--	250 U	--	250 U	250 U	--	250 U	--	250 U	--	250 U	--
2-Methylphenol (o-Cresol)			4000000		--	100 U	--	100 U	--	100 U	100 U	--	100 U	--	100 U	--	100 U	--
3-Methylphenol & 4-Methylphenol (m&p-Cresol)			4000000		--	100 U	--	100 U	--	100 U	100 U	--	100 U	--	100 U	--	100 U	--
Hexachlorobenzene			2600		--	100 U	--	100 U	--	100 U	100 U	--	100 U	--	100 U	--	100 U	--
Hexachloroethane			60000		--	100 U	--	100 U	--	100 U	100 U	--	100 U	--	100 U	--	100 U	--
Nitrobenzene			40000		--	100 U	--	100 U	--	100 U	100 U	--	100 U	--	100 U	--	100 U	--
Pentachlorophenol			2000000		20 U	19 U	--	20 U	--	20 U	20 U	19 U	21 U	--	19 U	--	18 U	21 U
Pyridine			100000		--	200 U	--	200 U	--	200 U	200 U	--	200 U	--	200 U	--	200 U	--
Polycyclic Aromatic Hydrocarbons (µg/kg)																			
Total PAH (20 Dangerous Waste Regulations) (U = 1/2)	10000000				--	100 U	--	100 U	--	100 U	100 U	--	100 U	--	100 U	--	100 U	--
Total PAH (20 Dangerous Waste Regulations) (U = 0)	10000000				--	100 U	--	100 U	--	100 U	100 U	--	100 U	--	100 U	--	100 U	--
Herbicides (µg/kg)																			
2,4,5-TP (Silvex)			20000		8.1 U	7.7 U	--	8 U	--	8.1 U	8.1 U	7.6 U	8.4 U	--	7.5 U	--	7.4 U	8.3 U
2,4-D (2,4-Dichlorophenoxyacetic acid)			200000		8.1 U	7.7 U	--	8 U	--	8.1 U	8.1 U	**7.6**	**8.4**	--	7.5 U	--	7.4 U	8.3 U
PCB Aroclors (µg/kg)																			
Total PCB Aroclors (U = 1/2)				50000	--	100 U	--	100 U	--	100 U	100 U	--	100 U	--	100 U	--	100 U	--
Total PCB Aroclors (U = 0)				50000	--	100 U	--	100 U	--	100 U	100 U	--	100 U	--	100 U	--	100 U	--
Halogenated Organic Compounds (µg/kg)																			
Total Halogenated Organic Compounds (U = 1/2)	10000000	100000			50 U	**2291.6**	50 U	740 U	50 U	500 U	500 U	**310.9**	**2088.1**	**243.5**	500 U	50 U	500 U	50 U
Total Halogenated Organic Compounds (U = 0)	10000000	100000			50 U	**43**	50 U	740 U	50 U	500 U	500 U	**7.6**	**8.4**	**11**	500 U	50 U	500 U	50 U

Table 1
Soil Data Screening – Zone A

Analyte	Ecology Dangerous Waste Designation Criteria (1%)[1]	Ecology Dangerous Waste Designation Criteria (0.01%)[1]	Federal TC Limit - TCLP[2,3]	PCB Federal Remediation Waste Criteria[4]	Location ID	HB-2S180	HB-2S60	HB-2S90	HB-2SR0	HB-2SR120	HB-2SR150	HB-2SR180	HB-2SR180	HB-2SR30	HB-2SR60	HB-2SR90	MW-11I	MW-50S
					Sample ID	HB-2S180	HB-2S60	HB-2S90	HB-2SR0	HB-2SR120	HB-2SR150	HB-2SR180	HB-92SR180_FDUP	HB-2SR30	HB-2SR60	HB-2SR90	MW11I@67-021511	MW-50S@17
					Sample Date	4/20/2011	4/25/2011	4/25/2011	6/3/2011	6/1/2011	5/26/2011	5/26/2011	5/26/2011	6/2/2011	6/2/2011	6/1/2011	2/15/2011	1/4/2010
					Depth				45 - 45 ft	45 - 45 ft	45 - 45 ft	45 - 45 ft	45 - 45 ft	45 - 45 ft	45 - 45 ft	45 - 45 ft	67 - 67 ft	17 - 17 ft
					Sample Type	N	N	N	N	N	N	N	FD	N	N	N	N	N
Metals (mg/kg)																		
Arsenic			100		**0.8**	**1.6**	--	**1.2**	**0.9**	--	**1.8**	**1**	--	**1.3**	--	--	--
Cadmium			20		0.1 U	0.1 U	--	0.1 U	0.1 U	--	0.1 U	0.1 U	--	0.1 U	--	--	--
Chromium			100		**7.3**	**4.8**	--	**8**	**5.6**	--	**5.3**	**8.5**	--	**5.1**	--	--	--
Lead			100		**2.7**	**2.9**	--	**3.4**	**3.2**	--	**3.7**	**2.9**	--	**3.5**	--	--	--
Mercury			4		0.02 U	0.02 U	--	0.03 U	0.03 U	--	0.03 U	0.02 U	--	0.02 U	--	--	--
Selenium			20		0.6 U	0.6 U	--	0.6 U	0.5 U	--	0.6 U	0.5 U	--	0.6 U	--	--	--
Silver			100		0.2 U	0.2 U	--	0.2 U	0.2 U	--	0.2 U	0.2 U	--	0.2 U	--	--	--
Volatile Organics (µg/kg)																		
1,1-Dichloroethene			14000		10 U	10 U	10 U	10 U	10 U	10 U	10 U	10 U	10 U	10 U	**50**	10 U	10 U
1,2-Dichloroethane			10000		10 U	10 U	10 U	10 U	**16**	10 U	10 U	10 U	10 U	10 U	**260**	10 U	10 U
Benzene			10000		5 U	5 U	5 U	5 U	5 U	5 U	5 U	5 U	5 U	5 U	**170**	5 U	10 U
Carbon tetrachloride (Tetrachloromethane)			10000		10 U	10 U	10 U	10 U	10 U	10 U	10 U	10 U	10 U	10 U	59 U	10 U	10 U
Chlorobenzene			2000000		10 U	10 U	10 U	10 U	10 U	10 U	10 U	10 U	10 U	10 U	**260**	10 U	10 U
Chloroform			120000		10 U	10 U	10 U	10 U	10 U	10 U	10 U	10 U	10 U	10 U	**110**	10 U	10 U
Hexachlorobutadiene (Hexachloro-1,3-butadiene)			10000		10 U	10 U	10 U	10 U	10 U	10 U	10 U	10 U	10 U	10 U	68 U	10 U	10 U
Methyl ethyl ketone (2-Butanone)			4000000		**450**	50 U	**960**	50 U	**24000**	**1000**	**530**	**580**	**3100**	**890**	**11000**	50 U	50 U
Perchloroethylene (PCE)			14000		10 U	10 U	10 U	10 U	10 U	10 U	10 U	10 U	**25**	**130**	**6500**	10 U	10 U
Trichloroethene (TCE)			10000		**14**	10 U	10 U	10 U	**84**	10 U	10 U	10 U	**25**	**310**	**28000**	10 U	10 U
Vinyl chloride			4000		10 U	10 U	10 U	10 U	10 U	10 U	10 U	10 U	10 U	10 U	10 U	10 U	10 U
Semivolatile Organics (µg/kg)																		
1,4-Dichlorobenzene			150000		**21**	10 U	10 U	10 U	10 U	10 U	10 U	10 U	10 U	10 U	**150**	10 U	10 U
2,4,5-Trichlorophenol			8000000		100 U	100 U	--	100 U	100 U	--	100 U	100 U	--	100 U	--	--	--
2,4,6-Trichlorophenol			40000		100 U	100 U	--	100 U	100 U	--	100 U	100 U	--	100 U	--	--	--
2,4-Dinitrotoluene			2600		250 U	250 U	--	250 U	250 U	--	250 U	250 U	--	250 U	--	--	--
2-Methylphenol (o-Cresol)			4000000		100 U	100 U	--	100 U	100 U	--	100 U	100 U	--	100 U	--	--	--
3-Methylphenol & 4-Methylphenol (m&p-Cresol)			4000000		100 U	100 U	--	100 U	100 U	--	100 U	100 U	--	100 U	--	--	--
Hexachlorobenzene			2600		100 U	100 U	--	100 U	100 U	--	100 U	100 U	--	100 U	--	--	--
Hexachloroethane			60000		100 U	100 U	--	100 U	100 U	--	100 U	100 U	--	100 U	--	--	--
Nitrobenzene			40000		100 U	100 U	--	100 U	100 U	--	100 U	100 U	--	100 U	--	--	--
Pentachlorophenol			2000000		20 U	20 U	--	22 U	19 U	21 U	20 U	21 U	--	20 U	--	--	--
Pyridine			100000		200 U	200 U	--	200 U	200 U	--	200 U	200 U	--	200 U	--	--	--
Polycyclic Aromatic Hydrocarbons (µg/kg)																		
Total PAH (20 Dangerous Waste Regulations) (U = 1/2)	10000000				100 U	100 U	--	100 U	100 U	--	100 U	100 U	--	100 U	--	--	--
Total PAH (20 Dangerous Waste Regulations) (U = 0)	10000000				100 U	100 U	--	100 U	100 U	--	100 U	100 U	--	100 U	--	--	--
Herbicides (µg/kg)																		
2,4,5-TP (Silvex)			20000		8.2 U	8.1 U	--	8.8 U	7.5 U	8.3 U	8.2 U	8.2 U	--	8.1 U	--	--	--
2,4-D (2,4-Dichlorophenoxyacetic acid)			200000		8.2 U	8.1 U	--	8.8 U	7.5 U	**8.3**	**8.2**	**8.2**	--	8.1 U	--	--	--
PCB Aroclors (µg/kg)																		
Total PCB Aroclors (U = 1/2)				50000	100 U	100 U	--	100 U	100 U	--	100 U	100 U	--	100 U	--	--	--
Total PCB Aroclors (U = 0)				50000	100 U	100 U	--	100 U	100 U	--	100 U	100 U	--	100 U	--	--	--
Halogenated Organic Compounds (µg/kg)																		
Total Halogenated Organic Compounds (U = 1/2)	10000000	100000			**2712.7**	500 U	50 U	500 U	**2373.25**	**317.7**	**2075.8**	**2072.3**	**277.5**	**2532.85**	**43931.5**	50 U	50 U
Total Halogenated Organic Compounds (U = 0)	10000000	100000			**661**	500 U	50 U	500 U	**342**	**8.3**	**8.2**	**8.2**	**50**	**482**	**43012**	50 U	50 U

Table 1
Soil Data Screening – Zone A

Analyte	Ecology Dangerous Waste Designation Criteria (1%)[1]	Ecology Dangerous Waste Designation Criteria (0.01%)[1]	Federal TC Limit - TCLP[2,3]	PCB Federal Remediation Waste Criteria[4]	Location ID	MW-50S	MW-50S	MW-50S	MW-50S	MW-50S	MW-50S	MW-51S	MW-51S	MW-51S	MW-51S	MW-51S	MW-51S	MW-51S
					Sample ID	MW-50S@27	MW-50S@37	MW-50S@47	MW-50S@57	MW-50S@65	MW-50S@7	MW-51S@17	MW-51S@27	MW-51S@37	MW-51S@47	MW-51S@57	MW-51S@67	MW-51S@7
					Sample Date	1/4/2010	1/4/2010	1/4/2010	1/4/2010	1/4/2010	1/4/2010	1/4/2010	1/4/2010	1/4/2010	1/4/2010	1/4/2010	1/4/2010	1/4/2010
					Depth	27 - 27 ft	37 - 37 ft	47 - 47 ft	57 - 57 ft	65 - 65 ft	7 - 7 ft	17 - 17 ft	27 - 27 ft	37 - 37 ft	47 - 47 ft	57 - 57 ft	67 - 67 ft	7 - 7 ft
					Sample Type	N	N	N	N	N	N	N	N	N	N	N	N	N
Metals (mg/kg)																		
Arsenic			100		--	--	--	--	--	--	--	--	--	--	--	--	--	--
Cadmium			20		--	--	--	--	--	--	--	--	--	--	--	--	--	--
Chromium			100		--	--	--	--	--	--	--	--	--	--	--	--	--	--
Lead			100		--	--	--	--	--	--	--	--	--	--	--	--	--	--
Mercury			4		--	--	--	--	--	--	--	--	--	--	--	--	--	--
Selenium			20		--	--	--	--	--	--	--	--	--	--	--	--	--	--
Silver			100		--	--	--	--	--	--	--	--	--	--	--	--	--	--
Volatile Organics (µg/kg)																		
1,1-Dichloroethene			14000		10 U	10 U	10 U	10 U	10 U	10 U	10 U	10 U	10 U	10 U	10 U	10 U	10 U	10 U
1,2-Dichloroethane			10000		10 U	10 U	10 U	10 U	10 U	10 U	10 U	10 U	10 U	10 U	10 U	10 U	10 U	10 U
Benzene			10000		10 U	10 U	10 U	10 U	10 U	10 U	10 U	10 U	10 U	10 U	10 U	10 U	10 U	10 U
Carbon tetrachloride (Tetrachloromethane)			10000		10 U	10 U	10 U	10 U	10 U	10 U	10 U	10 U	10 U	10 U	10 U	10 U	10 U	10 U
Chlorobenzene			2000000		10 U	10 U	10 U	10 U	10 U	10 U	10 U	10 U	10 U	10 U	10 U	10 U	10 U	10 U
Chloroform			120000		10 U	10 U	10 U	10 U	10 U	10 U	10 U	10 U	10 U	10 U	10 U	10 U	10 U	10 U
Hexachlorobutadiene (Hexachloro-1,3-butadiene)			10000		10 U	10 U	10 U	10 U	10 U	10 U	10 U	10 U	10 U	10 U	10 U	10 U	10 U	10 U
Methyl ethyl ketone (2-Butanone)			4000000		50 U	50 U	50 U	50 U	50 U	50 U	50 U	50 U	50 U	50 U	50 U	50 U	50 U	50 U
Perchloroethylene (PCE)			14000		10 U	10 U	10 U	10 U	10 U	10 U	10 U	10 U	10 U	10 U	10 U	10 U	10 U	10 U
Trichloroethene (TCE)			10000		10 U	10 U	10 U	10 U	10 U	10 U	10 U	10 U	10 U	10 U	10 U	10 U	10 U	10 U
Vinyl chloride			4000		10 U	10 U	10 U	10 U	10 U	10 U	10 U	10 U	10 U	10 U	10 U	10 U	10 U	10 U
Semivolatile Organics (µg/kg)																		
1,4-Dichlorobenzene			150000		10 U	10 U	10 U	10 U	10 U	10 U	10 U	10 U	10 U	10 U	10 U	10 U	10 U	10 U
2,4,5-Trichlorophenol			8000000		--	--	--	--	--	--	--	--	--	--	--	--	--	--
2,4,6-Trichlorophenol			40000		--	--	--	--	--	--	--	--	--	--	--	--	--	--
2,4-Dinitrotoluene			2600		--	--	--	--	--	--	--	--	--	--	--	--	--	--
2-Methylphenol (o-Cresol)			4000000		--	--	--	--	--	--	--	--	--	--	--	--	--	--
3-Methylphenol & 4-Methylphenol (m&p-Cresol)			4000000		--	--	--	--	--	--	--	--	--	--	--	--	--	--
Hexachlorobenzene			2600		--	--	--	--	--	--	--	--	--	--	--	--	--	--
Hexachloroethane			60000		--	--	--	--	--	--	--	--	--	--	--	--	--	--
Nitrobenzene			40000		--	--	--	--	--	--	--	--	--	--	--	--	--	--
Pentachlorophenol			2000000		--	--	--	--	--	--	--	--	--	--	--	--	--	--
Pyridine			100000		--	--	--	--	--	--	--	--	--	--	--	--	--	--
Polycyclic Aromatic Hydrocarbons (µg/kg)																		
Total PAH (20 Dangerous Waste Regulations) (U = 1/2)	10000000				--	--	--	--	--	--	--	--	--	--	--	--	--	--
Total PAH (20 Dangerous Waste Regulations) (U = 0)	10000000				--	--	--	--	--	--	--	--	--	--	--	--	--	--
Herbicides (µg/kg)																		
2,4,5-TP (Silvex)			20000		--	--	--	--	--	--	--	--	--	--	--	--	--	--
2,4-D (2,4-Dichlorophenoxyacetic acid)			200000		--	--	--	--	--	--	--	--	--	--	--	--	--	--
PCB Aroclors (µg/kg)																		
Total PCB Aroclors (U = 1/2)				50000	--	--	--	--	--	--	--	--	--	--	--	--	--	--
Total PCB Aroclors (U = 0)				50000	--	--	--	--	--	--	--	--	--	--	--	--	--	--
Halogenated Organic Compounds (µg/kg)																		
Total Halogenated Organic Compounds (U = 1/2)	10000000	100000			50 U	50 U	50 U	50 U	50 U	50 U	50 U	50 U	50 U	50 U	50 U	50 U	50 U	50 U
Total Halogenated Organic Compounds (U = 0)	10000000	100000			50 U	50 U	50 U	50 U	50 U	50 U	50 U	50 U	50 U	50 U	50 U	50 U	50 U	50 U

Table 1
Soil Data Screening – Zone A

Analyte	Ecology Dangerous Waste Designation Criteria (1%)[1]	Ecology Dangerous Waste Designation Criteria (0.01%)[1]	Federal TC Limit - TCLP[2,3]	PCB Federal Remediation Waste Criteria[4]	Location ID	MW-51S	MW-52S	MW-52S	MW-52S	MW-52S	MW-52S	MW-52S	MW-52S
					Sample ID	MW-51S@75	MW52S@19.5-092710	MW52S@26.5-092710	MW52S@31.5-092710	MW52S@36.5-092710	MW52S@41.5-092710	MW52S@46.5-092710	MW52S@51.5-092710
					Sample Date	1/4/2010	9/27/2010	9/27/2010	9/27/2010	9/27/2010	9/27/2010	9/27/2010	9/27/2010
					Depth	75 - 75 ft	19.5 - 19.5 ft	26.5 - 26.5 ft	31.5 - 31.5 ft	36.5 - 36.5 ft	41.5 - 41.5 ft	46.5 - 46.5 ft	51.5 - 51.5 ft
					Sample Type	N	N	N	N	N	N	N	N
Metals (mg/kg)													
Arsenic			100		--	**3.1**	--	**4.2**	--	**5.1**	--	**3.7**
Cadmium			20		--	**0.3**	--	**0.2**	--	0.2 U	--	0.2 U
Chromium			100		--	**10**	--	**149**	--	**9**	--	**7**
Lead			100		--	**51**	--	**107**	--	**7**	--	**4**
Mercury			4		--	**0.05**	--	0.02 U	--	**0.04**	--	0.02 U
Selenium			20		--	0.5 U	--	0.5 U	--	0.5 U	--	0.5 U
Silver			100		--	0.2 U	--	0.2 U	--	0.2 U	--	0.2 U
Volatile Organics (µg/kg)													
1,1-Dichloroethene			14000		10 U	10 U	**160**	10 U	10 U	10 U	10 U	10 U
1,2-Dichloroethane			10000		10 U	10 U	**22000**	**190**	**98**	**12000**	**87**	**64**
Benzene			10000		10 U	5 U	**1300**	5 U	5 U	**2000**	5 U	5 U
Carbon tetrachloride (Tetrachloromethane)			10000		10 U	10 U	160 U	99 U	120 U	110 U	89 U	96 U
Chlorobenzene			2000000		10 U	10 U	**720**	100 U	120 U	**3100**	94 U	100 U
Chloroform			120000		10 U	10 U	150 U	97 U	110 U	**580**	87 U	94 U
Hexachlorobutadiene (Hexachloro-1,3-butadiene)			10000		10 U	10 U	180 U	110 U	130 U	130 U	100 U	110 U
Methyl ethyl ketone (2-Butanone)			4000000		50 U	50 U	**2500000**	**310000**	**310000**	**990000**	**370000**	**990000**
Perchloroethylene (PCE)			14000		10 U	10 U	**14000**	**57**	10 U	**110000**	**260**	10 U
Trichloroethene (TCE)			10000		10 U	10 U	**130000**	**280**	10 U	**380000**	**430**	10 U
Vinyl chloride			4000		10 U	10 U	**76**	10 U	10 U	10 U	10 U	10 U
Semivolatile Organics (µg/kg)													
1,4-Dichlorobenzene			150000		10 U	10 U	**710**	100 U	120 U	**2400**	92 U	99 U
2,4,5-Trichlorophenol			8000000		--	100 U	--	200 U	--	770 U	--	100 U
2,4,6-Trichlorophenol			40000		--	100 U	--	200 U	--	520 U	--	100 U
2,4-Dinitrotoluene			2600		--	250 U	--	500 U	--	1200 U	--	250 U
2-Methylphenol (o-Cresol)			4000000		--	100 U	--	**1300**	--	**4800**	--	100 U
3-Methylphenol & 4-Methylphenol (m&p-Cresol)			4000000		--	100 U	--	**3300**	--	**9400**	--	100 U
Hexachlorobenzene			2600		--	100 U	--	200 U	--	630 U	--	100 U
Hexachloroethane			60000		--	100 U	--	200 U	--	500 U	--	100 U
Nitrobenzene			40000		--	100 U	--	200 U	--	600 U	--	100 U
Pentachlorophenol			2000000		--	18 U	--	**20**	--	**350**	--	18 U
Pyridine			100000		--	200 U	--	400 U	--	1000 U	--	200 U
Polycyclic Aromatic Hydrocarbons (µg/kg)													
Total PAH (20 Dangerous Waste Regulations) (U = 1/2)	10000000				--	100 U	--	200 U	--	**4819**	--	100 U
Total PAH (20 Dangerous Waste Regulations) (U = 0)	10000000				--	100 U	--	200 U	--	**2819**	--	100 U
Herbicides (µg/kg)													
2,4,5-TP (Silvex)			20000		--	7 U	--	7 U	--	7.1 U	--	7.1 U
2,4-D (2,4-Dichlorophenoxyacetic acid)			200000		--	7 U	--	7 U	--	7.1 U	--	7.1 U
PCB Aroclors (µg/kg)													
Total PCB Aroclors (U = 1/2)				50000	--	100 U	--	**9600**	--	**46000**	--	100 U
Total PCB Aroclors (U = 0)				50000	--	100 U	--	**2600**	--	**31000**	--	100 U
Halogenated Organic Compounds (µg/kg)													
Total Halogenated Organic Compounds (U = 1/2)	10000000	100000			50 U	500 U	**358958.6**	**16266.5**	**2542.5**	**630520.9**	**2656**	**3907.8**
Total Halogenated Organic Compounds (U = 0)	10000000	100000			50 U	500 U	**356486**	**4670**	**98**	**603920**	**777**	**75**

Table 1
Soil Data Screening – Zone A

Analyte	Ecology Dangerous Waste Designation Criteria (1%)[1]	Ecology Dangerous Waste Designation Criteria (0.01%)[1]	Federal TC Limit - TCLP[2,3]	PCB Federal Remediation Waste Criteria[4]	Location ID	MW-52S	MW-52S	MW-52S	MW-52S	MW-52S	MW-53S	MW-53S	MW-53S
					Sample ID	MW52S@56.5-092810	MW52S@61.5-092810	MW52S@66.5-092810	MW52S@71.5-092810	MW52S@76.5-092810	MW53S@22-092110	MW53S@26.5-092110	MW53S@31.5-092110
					Sample Date	9/28/2010	9/28/2010	9/28/2010	9/28/2010	9/28/2010	9/21/2010	9/21/2010	9/21/2010
					Depth	56.5 - 56.5 ft	61.5 - 61.5 ft	66.5 - 66.5 ft	71.5 - 71.5 ft	76.5 - 76.5 ft	22 - 22 ft	26.5 - 26.5 ft	31.5 - 31.5 ft
					Sample Type	N	N	N	N	N	N	N	N
Metals (mg/kg)													
Arsenic			100		--	**1.4**	--	**1.7**	--	**3.2**	--	**6**
Cadmium			20		--	0.2 U	--	0.2 U	--	0.2 U	--	0.2 U
Chromium			100		--	**4**	--	**7**	--	**7.7**	--	**9**
Lead			100		--	**2**	--	**3**	--	**23**	--	**8**
Mercury			4		--	0.02 U	--	0.02 U	--	**0.06**	--	0.02 U
Selenium			20		--	0.5 U	--	0.5 U	--	0.5 U	--	0.5 U
Silver			100		--	0.2 U	--	0.2 U	--	0.2 U	--	0.2 U
Volatile Organics (µg/kg)													
1,1-Dichloroethene			14000		10 U	10 U	10 U	10 U	10 U	10 U	13 U	10 U
1,2-Dichloroethane			10000		10 U	10 U	10 U	10 U	10 U	10 U	**1600**	**53**
Benzene			10000		5 U	5 U	5 U	5 U	5 U	5 U	**150**	6.3 U
Carbon tetrachloride (Tetrachloromethane)			10000		86 U	100 U	100 U	10 U	10 U	10 U	310 U	200 U
Chlorobenzene			2000000		91 U	110 U	110 U	10 U	10 U	10 U	**1700**	210 U
Chloroform			120000		85 U	99 U	99 U	10 U	10 U	10 U	300 U	190 U
Hexachlorobutadiene (Hexachloro-1,3-butadiene)			10000		99 U	120 U	120 U	10 U	10 U	10 U	350 U	230 U
Methyl ethyl ketone (2-Butanone)			4000000		**190000**	**110000**	**11000**	**530**	50 U	50 U	**770000**	**240000**
Perchloroethylene (PCE)			14000		10 U	10 U	10 U	10 U	10 U	10 U	**7300**	**29**
Trichloroethene (TCE)			10000		10 U	10 U	10 U	10 U	10 U	10 U	**15000**	**47**
Vinyl chloride			4000		10 U	10 U	10 U	10 U	10 U	10 U	13 U	10 U
Semivolatile Organics (µg/kg)													
1,4-Dichlorobenzene			150000		89 U	100 U	100 U	10 U	10 U	10 U	**570**	200 U
2,4,5-Trichlorophenol			8000000		--	100 U	--	100 U	--	100 U	--	100 U
2,4,6-Trichlorophenol			40000		--	100 U	--	100 U	--	100 U	--	100 U
2,4-Dinitrotoluene			2600		--	250 U	--	250 U	--	250 U	--	250 U
2-Methylphenol (o-Cresol)			4000000		--	100 U	--	100 U	--	100 U	--	**110**
3-Methylphenol & 4-Methylphenol (m&p-Cresol)			4000000		--	100 U	--	100 U	--	100 U	--	**170**
Hexachlorobenzene			2600		--	100 U	--	100 U	--	100 U	--	100 U
Hexachloroethane			60000		--	100 U	--	100 U	--	100 U	--	100 U
Nitrobenzene			40000		--	100 U	--	100 U	--	100 U	--	100 U
Pentachlorophenol			2000000		--	16 U	--	16 U	--	17 UJ	--	17 UJ
Pyridine			100000		--	200 U	--	200 U	--	200 U	--	200 U
Polycyclic Aromatic Hydrocarbons (µg/kg)													
Total PAH (20 Dangerous Waste Regulations) (U = 1/2)	10000000				--	100 U	--	100 U	--	100 U	--	100 U
Total PAH (20 Dangerous Waste Regulations) (U = 0)	10000000				--	100 U	--	100 U	--	100 U	--	100 U
Herbicides (µg/kg)													
2,4,5-TP (Silvex)			20000		--	6.5 U	--	6.6 U	--	6.9 U	--	6.9 U
2,4-D (2,4-Dichlorophenoxyacetic acid)			200000		--	6.5 U	--	6.6 U	--	6.9 U	--	6.9 U
PCB Aroclors (µg/kg)													
Total PCB Aroclors (U = 1/2)				50000	--	100 U	--	100 U	--	100 U	--	100 U
Total PCB Aroclors (U = 0)				50000	--	100 U	--	100 U	--	100 U	--	100 U
Halogenated Organic Compounds (µg/kg)													
Total Halogenated Organic Compounds (U = 1/2)	10000000	100000			170 U	**3934**	200 U	**2043.8**	50 U	500 UJ	**37948**	**6119.9 J**
Total Halogenated Organic Compounds (U = 0)	10000000	100000			170 U	**22**	200 U	**15**	50 U	500 UJ	**32270**	**239 J**

Table 1
Soil Data Screening – Zone A

Analyte	Ecology Dangerous Waste Designation Criteria (1%)[1]	Ecology Dangerous Waste Designation Criteria (0.01%)[1]	Federal TC Limit - TCLP[2,3]									
Location ID					MW-53S	MW-53S	MW-53S	MW-53S	MW-53S	MW-53S	MW-53S	MW-53S
Sample ID					MW53S@36.5-092110	MW53S@41.5-092110	MW53S@46.5-092110	MW53S@51.5-092110	MW53S@51.5-092210	MW53S@56.5-092210	MW53S@61.5-092110	MW53S@61.5-092210
Sample Date					9/21/2010	9/21/2010	9/21/2010	9/21/2010	9/21/2010	9/22/2010	9/22/2010	9/22/2010
Depth					36.5 - 36.5 ft	41.5 - 41.5 ft	46.5 - 46.5 ft	51.5 - 51.5 ft	51.5 - 51.5 ft	56.5 - 56.5 ft	61.5 - 61.5 ft	61.5 - 61.5 ft
Sample Type					N	N	N	N	N	N	N	N
PCB Federal Remediation Waste Criteria[4]												
Metals (mg/kg)												
Arsenic			100		--	**3**	--	--	**1.3**	--	--	**2.1**
Cadmium			20		--	0.2 U	--	--	0.2 U	--	--	0.2 U
Chromium			100		--	**6.3**	--	--	**5.7**	--	--	**9.4**
Lead			100		--	**4**	--	--	**3**	--	--	**3**
Mercury			4		--	0.02 U	--	--	0.02 U	--	--	0.02 U
Selenium			20		--	0.5 U	--	--	0.5 U	--	--	0.5 U
Silver			100		--	0.2 U	--	--	0.2 U	--	--	0.2 U
Volatile Organics (µg/kg)												
1,1-Dichloroethene			14000		10 U	10 U	10 U	--	10 U	10 U	--	10 U
1,2-Dichloroethane			10000		**4300**	**65**	10 U	--	10 U	**130**	--	10 U
Benzene			10000		**1000**	6.1 U	5.5 U	--	5.5 U	5.1 U	--	5.6 U
Carbon tetrachloride (Tetrachloromethane)			10000		180 U	190 U	170 U	--	170 U	160 U	--	180 U
Chlorobenzene			2000000		**2700**	200 U	180 U	--	180 U	**2400**	--	180 U
Chloroform			120000		170 U	190 U	170 U	--	170 U	160 U	--	170 U
Hexachlorobutadiene (Hexachloro-1,3-butadiene)			10000		200 U	220 U	200 U	--	200 U	180 U	--	200 U
Methyl ethyl ketone (2-Butanone)			4000000		**1600000**	**220000**	**300000**	--	**340000**	**40000**	--	**2700**
Perchloroethylene (PCE)			14000		**64000**	**1100**	**160**	--	11 U	**24000**	--	11 U
Trichloroethene (TCE)			10000		**150000**	**1600**	**130**	--	12 U	**9400**	--	12 U
Vinyl chloride			4000		10 U	10 U	10 U	--	10 U	10 U	--	10 U
Semivolatile Organics (µg/kg)												
1,4-Dichlorobenzene			150000		**510**	200 U	180 U	--	180 U	**290**	--	180 U
2,4,5-Trichlorophenol			8000000		--	1000 U	--	--	500 U	--	--	100 U
2,4,6-Trichlorophenol			40000		--	1000 U	--	--	500 U	--	--	100 U
2,4-Dinitrotoluene			2600		--	2500 U	--	--	1200 U	--	--	250 U
2-Methylphenol (o-Cresol)			4000000		--	1000 U	--	--	500 U	--	--	100 U
3-Methylphenol & 4-Methylphenol (m&p-Cresol)			4000000		--	**1900**	--	--	500 U	--	--	100 U
Hexachlorobenzene			2600		--	1000 U	--	--	500 U	--	--	100 U
Hexachloroethane			60000		--	1000 U	--	--	500 U	--	--	100 U
Nitrobenzene			40000		--	1000 U	--	--	500 U	--	--	100 U
Pentachlorophenol			2000000		--	17 UJ	--	17 UJ	--	--	17 UJ	--
Pyridine			100000		--	2000 U	--	--	1000 U	--	--	200 U
Polycyclic Aromatic Hydrocarbons (µg/kg)												
Total PAH (20 Dangerous Waste Regulations) (U = 1/2)	10000000				--	**4103**	--	--	500 U	--	--	100 U
Total PAH (20 Dangerous Waste Regulations) (U = 0)	10000000				--	**43**	--	--	500 U	--	--	100 U
Herbicides (µg/kg)												
2,4,5-TP (Silvex)			20000		--	6.8 U	--	6.8 U	--	--	6.8 U	--
2,4-D (2,4-Dichlorophenoxyacetic acid)			200000		--	6.8 U	--	6.8 U	--	--	6.8 U	--
PCB Aroclors (µg/kg)												
Total PCB Aroclors (U = 1/2)				50000	--	500 U	--	--	100 U	--	--	100 U
Total PCB Aroclors (U = 0)				50000	--	500 U	--	--	100 U	--	--	100 U
Halogenated Organic Compounds (µg/kg)												
Total Halogenated Organic Compounds (U = 1/2)	10000000	100000			**253027.9**	**20620 J**	**3902.9**	25 UJ	2500 U	**41842.7**	26 UJ	500 U
Total Halogenated Organic Compounds (U = 0)	10000000	100000			**250110**	**2765 J**	**290**	25 UJ	2500 U	**38900**	26 UJ	500 U

Table 1
Soil Data Screening – Zone A

Analyte	Ecology Dangerous Waste Designation Criteria (1%)[1]	Ecology Dangerous Waste Designation Criteria (0.01%)[1]	Federal TC Limit - TCLP[2,3]	Location ID	MW-53S	MW-53S	MW-53S	VEW-06D	VEW-06D	VEW-06D	VEW-06D
				Sample ID	MW53S@66.5-092210	MW53S@71.5-092110	MW53S@71.5-092210	VEW06D@17.5-092910	VEW06D@21.5-092910	VEW06D@26.5-092910	VEW06D@31.5-092910
				Sample Date	9/22/2010	9/22/2010	9/22/2010	9/29/2010	9/29/2010	9/29/2010	9/29/2010
				Depth	66.5 - 66.5 ft	71.5 - 71.5 ft	71.5 - 71.5 ft	17.5 - 17.5 ft	21.5 - 21.5 ft	26.5 - 26.5 ft	31.5 - 31.5 ft
				Sample Type	N	N	N	N	N	N	N
				PCB Federal Remediation Waste Criteria[4]							
Metals (mg/kg)											
Arsenic			100		--	--	--	**5.1**	**5**	--	**9.5**
Cadmium			20		--	--	--	0.2 U	0.2 U	--	0.2 U
Chromium			100		--	--	--	**9**	**15**	--	**11**
Lead			100		--	--	--	**72**	**42**	--	**12**
Mercury			4		--	--	--	0.02 U	0.02 U	--	0.02 U
Selenium			20		--	--	--	0.5 U	0.5 U	--	0.5 U
Silver			100		--	--	--	0.2 U	0.2 U	--	0.2 U
Volatile Organics (µg/kg)											
1,1-Dichloroethene			14000		10 U	--	10 U	10 U	10 U	10 U	10 U
1,2-Dichloroethane			10000		10 U	--	10 U	10 U	10 U	**530**	**220**
Benzene			10000		5 U	--	5 U	5 U	5 U	**47**	5 U
Carbon tetrachloride (Tetrachloromethane)			10000		10 U	--	10 U	10 U	130 U	120 U	100 U
Chlorobenzene			2000000		10 U	--	10 U	10 U	140 U	120 U	110 U
Chloroform			120000		10 U	--	10 U	10 U	130 U	110 U	99 U
Hexachlorobutadiene (Hexachloro-1,3-butadiene)			10000		10 U	--	10 U	10 U	150 U	130 U	120 U
Methyl ethyl ketone (2-Butanone)			4000000		**730**	--	50 U	50 U	**30000**	**89000**	**200000**
Perchloroethylene (PCE)			14000		10 U	--	10 U	10 U	10 U	**2000**	**83**
Trichloroethene (TCE)			10000		10 U	--	10 U	10 U	**270**	**7900**	**530**
Vinyl chloride			4000		10 U	--	10 U	10 U	10 U	10 U	10 U
Semivolatile Organics (µg/kg)											
1,4-Dichlorobenzene			150000		10 U	--	10 U	10 U	130 U	120 U	100 U
2,4,5-Trichlorophenol			8000000		--	--	100 U	100 U	100 U	--	100 U
2,4,6-Trichlorophenol			40000		--	--	100 U	100 U	100 U	--	100 U
2,4-Dinitrotoluene			2600		--	--	250 U	250 U	250 U	--	250 U
2-Methylphenol (o-Cresol)			4000000		--	--	100 U	100 U	100 U	--	**120**
3-Methylphenol & 4-Methylphenol (m&p-Cresol)			4000000		--	--	100 U	100 U	**1300**	--	**590**
Hexachlorobenzene			2600		--	--	100 U	100 U	100 U	--	100 U
Hexachloroethane			60000		--	--	100 U	100 U	100 U	--	100 U
Nitrobenzene			40000		--	--	100 U	100 U	100 U	--	100 U
Pentachlorophenol			2000000		--	17 UJ	--	17 U	18 U	--	19 U
Pyridine			100000		--	--	200 U	200 U	200 U	--	200 U
Polycyclic Aromatic Hydrocarbons (µg/kg)											
Total PAH (20 Dangerous Waste Regulations) (U = 1/2)	10000000				--	--	100 U	100 U	100 U	--	100 U
Total PAH (20 Dangerous Waste Regulations) (U = 0)	10000000				--	--	100 U	100 U	100 U	--	100 U
Herbicides (µg/kg)											
2,4,5-TP (Silvex)			20000		--	6.6 U	--	7 U	7.1 U	--	7.4 U
2,4-D (2,4-Dichlorophenoxyacetic acid)			200000		--	6.6 U	--	7 U	7.1 U	--	7.4 U
PCB Aroclors (µg/kg)											
Total PCB Aroclors (U = 1/2)				50000	--	--	100 U	100 U	100 U	--	100 U
Total PCB Aroclors (U = 0)				50000	--	--	100 U	100 U	100 U	--	100 U
Halogenated Organic Compounds (µg/kg)											
Total Halogenated Organic Compounds (U = 1/2)	10000000	100000			50 U	25 UJ	500 U	500 U	**5437.85**	**15804.5**	**5117.9**
Total Halogenated Organic Compounds (U = 0)	10000000	100000			50 U	25 UJ	500 U	500 U	**1060**	**13670**	**1383**

Table 1
Soil Data Screening – Zone A

Analyte	Ecology Dangerous Waste Designation Criteria (1%)[1]	Ecology Dangerous Waste Designation Criteria (0.01%)[1]	Federal TC Limit - TCLP[2,3]	Location ID	VEW-06D	VEW-06D	VEW-06D	VEW-06D	VEW-06D	VEW-06D	VEW-06D
				Sample ID	VEW06D@36.5-092910	VEW06D@41.5-092910	VEW06D@46.5-092910	VEW06D@51.5-092910	VEW06D@56.5-092910	VEW06D@60.5-092910	VEW06D@66.5-093010
				Sample Date	9/29/2010	9/29/2010	9/29/2010	9/29/2010	9/29/2010	9/29/2010	9/30/2010
				Depth	36.5 - 36.5 ft	41.5 - 41.5 ft	46.5 - 46.5 ft	51.5 - 51.5 ft	56.5 - 56.5 ft	60.5 - 60.5 ft	66.5 - 66.5 ft
				Sample Type	N	N	N	N	N	N	N
				PCB Federal Remediation Waste Criteria[4]							
Metals (mg/kg)											
Arsenic			100		--	**9.5**	--	**6.2**	--	**1.4**	--
Cadmium			20		--	0.2 U	--	0.2 U	--	0.2 U	--
Chromium			100		--	**11**	--	**9**	--	**12**	--
Lead			100		--	**12**	--	**5**	--	**3**	--
Mercury			4		--	0.02 U	--	0.02 U	--	0.02 U	--
Selenium			20		--	0.6 U	--	0.5 U	--	0.5 U	--
Silver			100		--	0.2 U	--	0.2 U	--	**0.3**	--
Volatile Organics (µg/kg)											
1,1-Dichloroethene			14000		10 U	10 U	10 U	10 U	10 U	10 U	10 U
1,2-Dichloroethane			10000		10 U	**200**	10 U	10 U	10 U	10 U	10 U
Benzene			10000		5 U	5 U	5 U	5 U	5 U	5 U	5 U
Carbon tetrachloride (Tetrachloromethane)			10000		110 U	100 U	96 U	100 U	90 U	31 U	10 U
Chlorobenzene			2000000		120 U	110 U	100 U	110 U	95 U	32 U	10 U
Chloroform			120000		110 U	99 U	94 U	100 U	88 U	30 U	10 U
Hexachlorobutadiene (Hexachloro-1,3-butadiene)			10000		130 U	120 U	110 U	120 U	100 U	35 U	10 U
Methyl ethyl ketone (2-Butanone)			4000000		**140000**	**390000**	**250000**	**960000**	**23000**	**3700**	50 U
Perchloroethylene (PCE)			14000		10 U	10 U	10 U	10 U	10 U	10 U	10 U
Trichloroethene (TCE)			10000		10 U	**250**	10 U	10 U	10 U	10 U	10 U
Vinyl chloride			4000		10 U	10 U	10 U	10 U	10 U	10 U	10 U
Semivolatile Organics (µg/kg)											
1,4-Dichlorobenzene			150000		110 U	100 U	99 U	110 U	93 U	32 U	10 U
2,4,5-Trichlorophenol			8000000		--	100 U	--	100 U	--	100 U	--
2,4,6-Trichlorophenol			40000		--	100 U	--	100 U	--	100 U	--
2,4-Dinitrotoluene			2600		--	250 U	--	250 U	--	250 U	--
2-Methylphenol (o-Cresol)			4000000		--	**110**	--	**110**	--	100 U	--
3-Methylphenol & 4-Methylphenol (m&p-Cresol)			4000000		--	**790**	--	**340**	--	100 U	--
Hexachlorobenzene			2600		--	100 U	--	100 U	--	100 U	--
Hexachloroethane			60000		--	100 U	--	100 U	--	100 U	--
Nitrobenzene			40000		--	100 U	--	100 U	--	100 U	--
Pentachlorophenol			2000000		--	20 U	--	18 U	--	17 U	--
Pyridine			100000		--	200 U	--	200 U	--	200 U	--
Polycyclic Aromatic Hydrocarbons (µg/kg)											
Total PAH (20 Dangerous Waste Regulations) (U = 1/2)	10000000				--	100 U	--	100 U	--	100 U	--
Total PAH (20 Dangerous Waste Regulations) (U = 0)	10000000				--	100 U	--	100 U	--	100 U	--
Herbicides (µg/kg)											
2,4,5-TP (Silvex)			20000		--	7.9 U	--	7 U	--	6.6 U	--
2,4-D (2,4-Dichlorophenoxyacetic acid)			200000		--	7.9 U	--	7 U	--	6.6 U	--
PCB Aroclors (µg/kg)											
Total PCB Aroclors (U = 1/2)				50000	--	100 U	--	100 U	--	100 U	--
Total PCB Aroclors (U = 0)				50000	--	100 U	--	100 U	--	100 U	--
Halogenated Organic Compounds (µg/kg)											
Total Halogenated Organic Compounds (U = 1/2)	10000000	100000			220 U	**4712.2**	190 U	**4041**	180 U	**2576.1**	50 U
Total Halogenated Organic Compounds (U = 0)	10000000	100000			220 U	**912**	190 U	**129**	180 U	**110**	50 U

Table 1
Soil Data Screening – Zone A

Analyte	Ecology Dangerous Waste Designation Criteria (1%)[1]	Ecology Dangerous Waste Designation Criteria (0.01%)[1]	Federal TC Limit - TCLP[2,3]	PCB Federal Remediation Waste Criteria[4]	Location ID	VEW-07D	VEW-07D	VEW-07D	VEW-07D	VEW-07D	VEW-07D	VEW-07D
					Sample ID	VEW07D@18-092310	VEW07D@21.5-092310	VEW07D@26.5-092310	VEW07D@27.5-092310	VEW07D@27.5-092310R	VEW07D@31-092310	VEW07D@36.5-092410
					Sample Date	9/23/2010	9/23/2010	9/23/2010	9/23/2010	9/23/2010	9/23/2010	9/24/2010
					Depth	18 - 18 ft	21.5 - 21.5 ft	26.5 - 26.5 ft	27.5 - 27.5 ft	27.5 - 27.5 ft	31 - 31 ft	36.5 - 36.5 ft
					Sample Type	N	N	N	N	N	N	N
Metals (mg/kg)												
Arsenic			100		**4**	**4.4**	--	--	**1.4**	**8**	**6.8**
Cadmium			20		0.2 U	0.2 U	--	--	0.2 U	0.2 U	0.2 U
Chromium			100		**8.8**	**11.3**	--	--	**861**	**13.1**	**44.4**
Lead			100		**56**	**117**	--	--	**5**	**47**	**59**
Mercury			4		**0.02**	**0.14**	--	--	0.02 U	**0.05**	**0.28**
Selenium			20		0.5 U	0.6 U	--	--	1 U	0.5 U	0.6 U
Silver			100		0.2 U	0.2 U	--	--	**1.4**	0.2 U	0.2 U
Volatile Organics (µg/kg)												
1,1-Dichloroethene			14000		10 U	10 U	10 U	20 U	--	10 U	**540**
1,2-Dichloroethane			10000		10 U	**2000**	**4000**	20 U	--	**1300**	**35000**
Benzene			10000		5 U	**280**	**1200**	10 U	--	**210**	**11000**
Carbon tetrachloride (Tetrachloromethane)			10000		10 U	160 U	150 U	220 U	--	100 U	110 U
Chlorobenzene			2000000		10 U	170 U	**400**	230 U	--	**160**	**1800**
Chloroform			120000		10 U	150 U	140 U	210 U	--	99 U	**4300**
Hexachlorobutadiene (Hexachloro-1,3-butadiene)			10000		10 U	180 U	170 U	250 U	--	120 U	120 U
Methyl ethyl ketone (2-Butanone)			4000000		50 U	**5400**	**920000**	**2800**	--	**780000**	**1200000**
Perchloroethylene (PCE)			14000		10 U	**2700**	**15000**	**140**	--	**6700**	**970000**
Trichloroethene (TCE)			10000		10 U	**18000**	**190000**	**320**	--	**38000**	**1800000**
Vinyl chloride			4000		10 U	10 U	10 U	20 U	--	10 U	10 U
Semivolatile Organics (µg/kg)												
1,4-Dichlorobenzene			150000		10 U	160 U	**180**	220 U	--	**100**	**780**
2,4,5-Trichlorophenol			8000000		100 U	500 U	--	200 U	--	200 U	3200 U
2,4,6-Trichlorophenol			40000		100 U	500 U	--	200 U	--	200 U	2500 U
2,4-Dinitrotoluene			2600		250 U	1200 U	--	500 U	--	500 U	6200 U
2-Methylphenol (o-Cresol)			4000000		100 U	500 U	--	200 U	--	200 U	**5400**
3-Methylphenol & 4-Methylphenol (m&p-Cresol)			4000000		**100**	**57000**	--	200 U	--	**3900**	**18000**
Hexachlorobenzene			2600		100 U	500 U	--	200 U	--	200 U	2700 U
Hexachloroethane			60000		100 U	500 U	--	200 U	--	200 U	2500 U
Nitrobenzene			40000		100 U	500 U	--	200 U	--	200 U	2500 U
Pentachlorophenol			2000000		17 UJ	23 UJ	--	--	17 UJ	18 UJ	19 UJ
Pyridine			100000		200 U	1000 U	--	400 U	--	400 U	5000 U
Polycyclic Aromatic Hydrocarbons (µg/kg)												
Total PAH (20 Dangerous Waste Regulations) (U = 1/2)	10000000				100 U	**2284**	--	**980**	--	**2170**	3500 U
Total PAH (20 Dangerous Waste Regulations) (U = 0)	10000000				100 U	**274**	--	**210**	--	**1400**	3500 U
Herbicides (µg/kg)												
2,4,5-TP (Silvex)			20000		7 U	9.2 U	--	--	6.6 U	7.3 U	7.7 U
2,4-D (2,4-Dichlorophenoxyacetic acid)			200000		7 U	9.2 U	--	--	6.6 U	7.3 U	7.7 UJ
PCB Aroclors (µg/kg)												
Total PCB Aroclors (U = 1/2)				50000	100 U	**520**	--	100 U	--	**1060**	**22800**
Total PCB Aroclors (U = 0)				50000	100 U	**170**	--	100 U	--	**360**	**16800**
Halogenated Organic Compounds (µg/kg)												
Total Halogenated Organic Compounds (U = 1/2)	10000000	100000			500 UJ	**44001.8 J**	**249307.5**	**8440**	25 UJ	**59802.55 J**	**3294112.1 J**
Total Halogenated Organic Compounds (U = 0)	10000000	100000			500 UJ	**33850 J**	**246910**	**930**	25 UJ	**54650 J**	**3240460 J**

Table 1
Soil Data Screening – Zone A

Analyte	Ecology Dangerous Waste Designation Criteria (1%)[1]	Ecology Dangerous Waste Designation Criteria (0.01%)[1]	Federal TC Limit - TCLP[2,3]	Location ID	VEW-07D	VEW-07D	VEW-07D	VEW-07D	VEW-07D	VEW-07D	VMW-51D
				Sample ID	VEW07D@41.5-092410	VEW07D@46.5-092410	VEW07D@51.5-092410	VEW07D@56.5-092410	VEW07D@61.5-092410	VEW907D@61.5-092410_FDUP	VMW51D@17-093010
				Sample Date	9/24/2010	9/24/2010	9/24/2010	9/24/2010	9/24/2010	9/24/2010	9/30/2010
				Depth	41.5 - 41.5 ft	46.5 - 46.5 ft	51.5 - 51.5 ft	56.5 - 56.5 ft	61.5 - 61.5 ft	61.5 - 61.5 ft	17.0 - 17.0 ft
				Sample Type	N	N	N	N	N	FD	N
				PCB Federal Remediation Waste Criteria[4]							
Metals (mg/kg)											
Arsenic			100		**3.4**	--	**2.1**	--	**1.1**	**1.1**	**3.3**
Cadmium			20		0.2 U	--	0.2 U	--	0.2 U	0.2 U	**0.4**
Chromium			100		**6.5**	--	**5.5**	--	**4.6**	**4.6**	**25**
Lead			100		**4**	--	**3**	--	**2**	**2**	**381**
Mercury			4		0.02 U	--	0.02 U	--	0.02 U	0.02 U	**0.16**
Selenium			20		0.5 U	--	0.5 U	--	0.5 U	0.5 U	0.5 U
Silver			100		0.2 U	--	0.2 U	--	0.2 U	0.2 U	0.2 U
Volatile Organics (µg/kg)											
1,1-Dichloroethene			14000		10 U	10 U	10 U	10 U	10 U	10 U	10 U
1,2-Dichloroethane			10000		**190**	**140**	**86**	**46**	10 U	10 U	10 U
Benzene			10000		5 U	5 U	5 U	5 U	5 U	5 U	5 U
Carbon tetrachloride (Tetrachloromethane)			10000		100 U	95 U	98 U	100 U	86 U	85 U	32 U
Chlorobenzene			2000000		110 U	100 U	100 U	110 U	91 U	90 U	33 U
Chloroform			120000		100 U	93 U	96 U	98 U	84 U	84 U	31 U
Hexachlorobutadiene (Hexachloro-1,3-butadiene)			10000		120 U	110 U	110 U	110 U	99 U	98 U	36 U
Methyl ethyl ketone (2-Butanone)			4000000		**490000**	**520000**	**460000**	**380000**	**24000**	**22000**	50 U
Perchloroethylene (PCE)			14000		**1800**	**410**	**120**	**42**	**20**	10 U	10 U
Trichloroethene (TCE)			10000		**1900**	**630**	**180**	**63**	10 U	10 U	10 U
Vinyl chloride			4000		10 U	10 U	10 U	10 U	10 U	10 U	10 U
Semivolatile Organics (µg/kg)											
1,4-Dichlorobenzene			150000		110 U	98 U	100 U	100 U	89 U	88 U	33 U
2,4,5-Trichlorophenol			8000000		100 U	--	100 U	--	100 U	100 U	200 U
2,4,6-Trichlorophenol			40000		100 U	--	100 U	--	100 U	100 U	200 U
2,4-Dinitrotoluene			2600		250 U	--	250 U	--	250 U	250 U	500 U
2-Methylphenol (o-Cresol)			4000000		**110**	--	100 U	--	100 U	100 U	200 U
3-Methylphenol & 4-Methylphenol (m&p-Cresol)			4000000		**1200**	--	**220**	--	**110**	**120**	**370**
Hexachlorobenzene			2600		100 U	--	100 U	--	100 U	100 U	200 U
Hexachloroethane			60000		100 U	--	100 U	--	100 U	100 U	200 U
Nitrobenzene			40000		100 U	--	100 U	--	100 U	100 U	200 U
Pentachlorophenol			2000000		**34 J**	--	**69 J**	--	**51 J**	**57 J**	19 U
Pyridine			100000		200 U	--	200 U	--	200 U	200 U	400 U
Polycyclic Aromatic Hydrocarbons (µg/kg)											
Total PAH (20 Dangerous Waste Regulations) (U = 1/2)	10000000				100 U	--	100 U	--	100 U	100 U	**918**
Total PAH (20 Dangerous Waste Regulations) (U = 0)	10000000				100 U	--	100 U	--	100 U	100 U	**68**
Herbicides (µg/kg)											
2,4,5-TP (Silvex)			20000		7 U	--	6.9 U	--	6.9 U	6.7 U	7.5 U
2,4-D (2,4-Dichlorophenoxyacetic acid)			200000		7 U	--	6.9 U	--	6.9 U	6.7 U	7.5 U
PCB Aroclors (µg/kg)											
Total PCB Aroclors (U = 1/2)				50000	**580**	--	100 U	--	100 U	**510**	**5800**
Total PCB Aroclors (U = 0)				50000	**230**	--	100 U	--	100 U	**210**	**2300**
Halogenated Organic Compounds (µg/kg)											
Total Halogenated Organic Compounds (U = 1/2)	10000000	100000			**8593.5 J**	**3186**	**4296.2 J**	**2250**	**3912.7 J**	**4117.1 J**	**9664.8**
Total Halogenated Organic Compounds (U = 0)	10000000	100000			**4900 J**	**1180**	**469 J**	**151**	**311 J**	**637 J**	**2757**

Table 1
Soil Data Screening – Zone A

Analyte	Ecology Dangerous Waste Designation Criteria (1%)[1]	Ecology Dangerous Waste Designation Criteria (0.01%)[1]	Federal TC Limit - TCLP[2,3]	Location ID	VMW-51D	VMW-51D	VMW-51D	VMW-51D	VMW-51D	VMW-51D	VMW-51D
				Sample ID	VMW51D@21.5-093010	VMW51D@28.5-093010	VMW51D@31.5-093010	VMW51D@36.5-093010	VMW51D@41.5-100110	VMW51D@46.5-100110	VMW51D@51.5-100110
				Sample Date	9/30/2010	9/30/2010	9/30/2010	9/30/2010	10/1/2010	10/1/2010	10/1/2010
				Depth	21.5 - 21.5 ft	28.5 - 28.5 ft	31.5 - 31.5 ft	36.5 - 36.5 ft	41.5 - 41.5 ft	46.5 - 46.5 ft	51.5 - 51.5 ft
				Sample Type	N	N	N	N	N	N	N
				PCB Federal Remediation Waste Criteria[4]							
Metals (mg/kg)											
Arsenic			100		**3.9**	--	**5.2**	--	**2.3**	--	**1.5**
Cadmium			20		**0.3**	--	0.2 U	--	0.2 U	--	0.2 U
Chromium			100		**10**	--	**11**	--	**6**	--	**7**
Lead			100		**29**	--	**7**	--	**3**	--	**3**
Mercury			4		**0.08**	--	0.02 U	--	0.02 U	--	0.02 U
Selenium			20		0.5 U	--	0.5 U	--	0.5 U	--	0.5 U
Silver			100		0.2 U	--	0.2 U	--	0.2 U	--	0.2 U
Volatile Organics (µg/kg)											
1,1-Dichloroethene			14000		10 U	10 U	10 U	10 U	10 U	10 U	10 U
1,2-Dichloroethane			10000		10 U	10 U	10 U	10 U	10 U	10 U	10 U
Benzene			10000		5 U	5 U	5 U	5 U	5 U	5 U	5 U
Carbon tetrachloride (Tetrachloromethane)			10000		26 U	26 U	25 U	27 U	10 U	99 U	10 U
Chlorobenzene			2000000		27 U	27 U	27 U	28 U	10 U	100 U	10 U
Chloroform			120000		25 U	25 U	25 U	26 U	10 U	97 U	10 U
Hexachlorobutadiene (Hexachloro-1,3-butadiene)			10000		30 U	29 U	29 U	31 U	10 U	110 U	10 U
Methyl ethyl ketone (2-Butanone)			4000000		**150**	**270**	**1500**	**1900**	50 U	**11000**	**460**
Perchloroethylene (PCE)			14000		10 U	10 U	10 U	10 U	10 U	10 U	10 U
Trichloroethene (TCE)			10000		10 U	10 U	10 U	10 U	10 U	10 U	10 U
Vinyl chloride			4000		10 U	10 U	10 U	10 U	10 U	10 U	10 U
Semivolatile Organics (µg/kg)											
1,4-Dichlorobenzene			150000		27 U	**63**	26 U	28 U	10 U	100 U	10 U
2,4,5-Trichlorophenol			8000000		100 U	--	100 U	--	100 U	--	100 U
2,4,6-Trichlorophenol			40000		100 U	--	100 U	--	100 U	--	100 U
2,4-Dinitrotoluene			2600		250 U	--	250 U	--	250 U	--	250 U
2-Methylphenol (o-Cresol)			4000000		100 U	--	100 U	--	100 U	--	100 U
3-Methylphenol & 4-Methylphenol (m&p-Cresol)			4000000		**6700**	--	**5100**	--	**170**	--	100 U
Hexachlorobenzene			2600		100 U	--	100 U	--	100 U	--	100 U
Hexachloroethane			60000		100 U	--	100 U	--	100 U	--	100 U
Nitrobenzene			40000		100 U	--	100 U	--	100 U	--	100 U
Pentachlorophenol			2000000		17 U	--	17 U	--	16 U	--	17 U
Pyridine			100000		200 U	--	200 U	--	200 U	--	200 U
Polycyclic Aromatic Hydrocarbons (µg/kg)											
Total PAH (20 Dangerous Waste Regulations) (U = 1/2)	10000000				**530**	--	100 U	--	100 U	--	100 U
Total PAH (20 Dangerous Waste Regulations) (U = 0)	10000000				**110**	--	100 U	--	100 U	--	100 U
Herbicides (µg/kg)											
2,4,5-TP (Silvex)			20000		6.9 U	--	6.9 U	--	6.6 U	--	6.6 U
2,4-D (2,4-Dichlorophenoxyacetic acid)			200000		6.9 U	--	6.9 U	--	6.6 U	--	6.6 U
PCB Aroclors (µg/kg)											
Total PCB Aroclors (U = 1/2)				50000	2000 U	--	100 U	--	100 U	--	100 U
Total PCB Aroclors (U = 0)				50000	2000 U	--	100 U	--	100 U	--	100 U
Halogenated Organic Compounds (µg/kg)											
Total Halogenated Organic Compounds (U = 1/2)	10000000	100000			2000 U	**31057**	**2428.15**	53 U	500 U	190 U	500 U
Total Halogenated Organic Compounds (U = 0)	10000000	100000			2000 U	**30542**	**76**	53 U	500 U	190 U	500 U

Table 1
Soil Data Screening – Zone A

Analyte	Ecology Dangerous Waste Designation Criteria (1%)[1]	Ecology Dangerous Waste Designation Criteria (0.01%)[1]	Federal TC Limit - TCLP[2,3]	Location ID	VMW-51D	VMW-51D	VMW-51D	VMW-51D	VMW-51D
				Sample ID	VMW51D@56.5-100110	VMW51D@61.5-100110	VMW51D@63-100110	VMW951D@31.5-093010_FDUP	VMW951D@61.5-100110_FDUP
				Sample Date	10/1/2010	10/1/2010	10/1/2010	9/30/2010	10/1/2010
				Depth	56.5 - 56.5 ft	61.5 - 61.5 ft	63 - 63 ft	31.5 - 31.5 ft	61.5 - 61.5 ft
				Sample Type	N	N	N	FD	FD
				PCB Federal Remediation Waste Criteria[4]					
Metals (mg/kg)									
Arsenic			100		--	**1.1**	--	--	**1.2**
Cadmium			20		--	0.2 U	--	--	0.2 U
Chromium			100		--	**7**	--	--	**7**
Lead			100		--	**2**	--	--	**3**
Mercury			4		--	0.02 U	--	--	0.02 U
Selenium			20		--	0.5 U	--	--	0.5 U
Silver			100		--	0.2 U	--	--	0.2 U
Volatile Organics (µg/kg)									
1,1-Dichloroethene			14000		10 U	10 U	10 U	10 U	10 U
1,2-Dichloroethane			10000		10 U	10 U	10 U	10 U	10 U
Benzene			10000		5 U	5 U	5 U	5 U	5 U
Carbon tetrachloride (Tetrachloromethane)			10000		10 U	10 U	10 U	30 U	10 U
Chlorobenzene			2000000		10 U	10 U	10 U	31 U	10 U
Chloroform			120000		10 U	10 U	10 U	29 U	10 U
Hexachlorobutadiene (Hexachloro-1,3-butadiene)			10000		10 U	10 U	10 U	34 U	10 U
Methyl ethyl ketone (2-Butanone)			4000000		50 U	50 U	50 U	**1600**	50 U
Perchloroethylene (PCE)			14000		10 U	10 U	10 U	10 U	10 U
Trichloroethene (TCE)			10000		10 U	10 U	10 U	10 U	10 U
Vinyl chloride			4000		10 U	10 U	10 U	10 U	10 U
Semivolatile Organics (µg/kg)									
1,4-Dichlorobenzene			150000		10 U	10 U	10 U	31 U	10 U
2,4,5-Trichlorophenol			8000000		--	100 U	--	--	100 U
2,4,6-Trichlorophenol			40000		--	100 U	--	--	100 U
2,4-Dinitrotoluene			2600		--	250 U	--	--	250 U
2-Methylphenol (o-Cresol)			4000000		--	100 U	--	--	100 U
3-Methylphenol & 4-Methylphenol (m&p-Cresol)			4000000		--	100 U	--	--	100 U
Hexachlorobenzene			2600		--	100 U	--	--	100 U
Hexachloroethane			60000		--	100 U	--	--	100 U
Nitrobenzene			40000		--	100 U	--	--	100 U
Pentachlorophenol			2000000		--	17 U	--	--	17 U
Pyridine			100000		--	200 U	--	--	200 U
Polycyclic Aromatic Hydrocarbons (µg/kg)									
Total PAH (20 Dangerous Waste Regulations) (U = 1/2)	10000000				--	100 U	--	--	100 U
Total PAH (20 Dangerous Waste Regulations) (U = 0)	10000000				--	100 U	--	--	100 U
Herbicides (µg/kg)									
2,4,5-TP (Silvex)			20000		--	6.6 U	--	--	6.8 U
2,4-D (2,4-Dichlorophenoxyacetic acid)			200000		--	6.6 U	--	--	6.8 U
PCB Aroclors (µg/kg)									
Total PCB Aroclors (U = 1/2)				50000	--	100 U	--	--	100 U
Total PCB Aroclors (U = 0)				50000	--	100 U	--	--	100 U
Halogenated Organic Compounds (µg/kg)									
Total Halogenated Organic Compounds (U = 1/2)	10000000	100000			50 U	500 U	50 U	**695.5**	500 U
Total Halogenated Organic Compounds (U = 0)	10000000	100000			50 U	500 U	50 U	**54**	500 U

Table 1
Soil Data Screening – Zone A

Analyte	Ecology Dangerous Waste Designation Criteria (1%)[1]	Ecology Dangerous Waste Designation Criteria (0.01%)[1]	Federal TC Limit - TCLP[2,3]	Location ID / Sample ID / Sample Date / Depth / Sample Type / PCB Federal Remediation Waste Criteria[4]	Total Number of Samples Analyzed[5]	Number of Samples Detected Above Screening Level	Number of Samples Detected Below Screening Level	Number of Samples Not Detected	Maximum Detected Concentration
Metals (mg/kg)									
Arsenic			100		**64**	**0**	**64**	**0**	**9.8**
Cadmium			20		**64**	**0**	**7**	**57**	**0.5**
Chromium			100		**64**	**2**	**62**	**0**	**861**
Lead			100		**64**	**3**	**61**	**0**	**381**
Mercury			4		**64**	**0**	**10**	**54**	**0.31**
Selenium			20		**64**	**0**	**0**	**64**	**0**
Silver			100		**64**	**0**	**2**	**62**	**1.4**
Volatile Organics (µg/kg)									
1,1-Dichloroethene			14000		**127**	**0**	**5**	**122**	**540**
1,2-Dichloroethane			10000		**127**	**3**	**37**	**87**	**35000**
Benzene			10000		**127**	**1**	**19**	**107**	**11000**
Carbon tetrachloride (Tetrachloromethane)			10000		**127**	**0**	**0**	**127**	**0**
Chlorobenzene			2000000		**127**	**0**	**13**	**114**	**3100**
Chloroform			120000		**127**	**0**	**5**	**122**	**4300**
Hexachlorobutadiene (Hexachloro-1,3-butadiene)			10000		**127**	**0**	**0**	**127**	**0**
Methyl ethyl ketone (2-Butanone)			4000000		**127**	**0**	**82**	**45**	**2500000**
Perchloroethylene (PCE)			14000		**127**	**7**	**32**	**88**	**970000**
Trichloroethene (TCE)			10000		**127**	**13**	**35**	**79**	**1800000**
Vinyl chloride			4000		**127**	**0**	**1**	**126**	**76**
Semivolatile Organics (µg/kg)									
1,4-Dichlorobenzene			150000		**127**	**0**	**17**	**110**	**2400**
2,4,5-Trichlorophenol			8000000		**65**	**0**	**0**	**65**	**0**
2,4,6-Trichlorophenol			40000		**65**	**0**	**0**	**65**	**0**
2,4-Dinitrotoluene			2600		**65**	**0**	**0**	**65**	**0**
2-Methylphenol (o-Cresol)			4000000		**65**	**0**	**13**	**52**	**5400**
3-Methylphenol & 4-Methylphenol (m&p-Cresol)			4000000		**65**	**0**	**30**	**35**	**57000**
Hexachlorobenzene			2600		**65**	**0**	**0**	**65**	**0**
Hexachloroethane			60000		**65**	**0**	**0**	**65**	**0**
Nitrobenzene			40000		**65**	**0**	**0**	**65**	**0**
Pentachlorophenol			2000000		**69**	**0**	**6**	**63**	**350**
Pyridine			100000		**65**	**0**	**0**	**65**	**0**
Polycyclic Aromatic Hydrocarbons (µg/kg)									
Total PAH (20 Dangerous Waste Regulations) (U = 1/2)	10000000				**65**	**0**	**9**	**56**	**7638**
Total PAH (20 Dangerous Waste Regulations) (U = 0)	10000000				**65**	**0**	**9**	**56**	**4618**
Herbicides (µg/kg)									
2,4,5-TP (Silvex)			20000		**69**	**0**	**0**	**69**	**0**
2,4-D (2,4-Dichlorophenoxyacetic acid)			200000		**69**	**0**	**6**	**63**	**340**
PCB Aroclors (µg/kg)									
Total PCB Aroclors (U = 1/2)				50000	**64**	**0**	**16**	**48**	**46000**
Total PCB Aroclors (U = 0)				50000	**64**	**0**	**16**	**48**	**31000**
Halogenated Organic Compounds (µg/kg)									
Total Halogenated Organic Compounds (U = 1/2)	10000000	100000			**131**	**8**	**60**	**63**	**3294112.1 J**
Total Halogenated Organic Compounds (U = 0)	10000000	100000			**131**	**6**	**62**	**63**	**3240460 J**

Table 1
Soil Data Screening – Zone A

Notes:
= Detected concentration is greater than screening level
Bold = Detected result
J = Estimated value
U = Compound analyzed, but not detected above detection limit
UJ = Compound analyzed, but not detected above estimated detection limit
Footnotes:
1. See Washington Administrative Code (WAC) 173-303-100.
2. See 40 CFR 261.24.
3. TCLP criteria were multiplied by 20.
4. See 40 CFR 761.61.
5. Includes field duplicates.
µg/kg = micrograms per kilogram
CFR = Code of Federal Regulations
Ecology = Washington State Department of Ecology
FD = field duplicate
ft = feet
mg/kg = milligrams per kilogram
N = normal
PCB = polychlorinated biphenyl
TC = toxicity characteristic
TCLP = toxicity characteristic leaching procedure

Table 2
Soil Data Screening – Zones C/D

Analyte	Ecology Dangerous Waste Designation Criteria (1%)[1]	Ecology Dangerous Waste Designation Criteria (0.01%)[1]	Location ID	B-01	B-01	B-01	B-01	B-02	B-02	B-02	B-02
			Sample Date	01/25/1993	01/25/1993	01/25/1993	01/25/1993	01/26/1993	01/26/1993	01/26/1993	01/26/1993
			Depth	11 - 11 ft	26 - 26 ft	41 - 41 ft	60 - 60 ft	11 - 11 ft	26 - 26 ft	41 - 41 ft	50 - 50 ft
			Sample Type	N	N	N	N	N	N	N	N
			Federal TC Limit – TCLP[2,3]								
Total solids				**91.8**	**74.2**	**86.3**	**96.8**	**92.7**	**90.4**	**86.9**	**95.2**
Metals (mg/kg)											
Arsenic			100	**6.2**	**6.1**	4 U	2.8 U	**4.6**	**5.5**	**4.3**	3.6 U
Arsenic				**0.08**	**0.04**	0.01 U	0.01 U	**0.07**	0.01 U	0.01 U	0.01 U
Cadmium			20	**2.2**	**2**	**2.4**	**2.4**	**2.1**	**2.5**	**2.4**	**2.4**
Chromium			100	**9.9**	**10**	**8.5**	**4.2**	**11.7**	**12.1**	**8.3**	**5.4**
Copper				**15.8**	**16.4**	**14.2**	**13.9**	**15.4**	**17.3**	**13.7**	**11.5**
Lead			100	**9.8**	**12.7**	**8.8**	**7**	**10.6**	**17.3**	**8.2**	**8.7**
Mercury			4	**0.12**	**0.12**	**0.11**	**0.09**	**0.12**	**0.12**	**0.1**	**0.1**
Nickel				**13.7**	**13.4**	**13.3**	**9.6**	**15.6**	**15.7**	**13.6**	**9.7**
Silver			100	**1.6**	**1.3**	**1.8**	**2.5**	**1.3**	**1.4**	**1.2**	**2.1**
Zinc				**46.2**	**49.5**	**45.9**	**49**	**47.7**	**53.3**	**43.4**	**40.8**
Volatile Organics (µg/kg)											
2-Butanone (MEK)			4000000	--	--	--	--	25 U	27 U	27 U	26 U
Acetone				--	--	--	--	**75**	**73**	**88**	**63**
Dichloromethane (Methylene chloride)				--	--	--	--	**74**	**57**	**62**	**56**
Methyl isobutyl ketone (4-Methyl-2-pentanone or (MIBK))				--	--	--	--	5 U	5 U	5 U	5 U
o-Xylene				--	--	--	--	--	--	--	--
Toluene				--	--	--	--	**4 J**	**3 J**	**3 J**	**3 J**
Total xylene (reported, not calculated)				--	--	--	--	10 U	11 U	11 U	10 U
Total Xylene (U = 1/2)				--	--	--	--	--	--	--	--
Total Xylene (U = 0)				--	--	--	--	--	--	--	--
Halogenated Organic Compounds (µg/kg)											
Total Halogenated Organic Compounds (U = 1/2)	10000000	100000		1800 U	2200 U	2200 U	8600 U	**5114 J**	**5649**	**5844**	**5331**
Total Halogenated Organic Compounds (U = 0)	10000000	100000		1800 U	2200 U	2200 U	8600 U	**174 J**	**57**	**62**	**56**

Table 2
Soil Data Screening – Zones C/D

Analyte	Ecology Dangerous Waste Designation Criteria (1%)[1]	Ecology Dangerous Waste Designation Criteria (0.01%)[1]	Location ID	B-19	B-19	B-19	B-19	B-19	B-19	B-19
			Sample Date	05/15/1996	05/16/1996	05/16/1996	05/16/1996	05/16/1996	05/16/1996	05/16/1996
			Depth	14 - 14 ft	16 - 16 ft	26 - 26 ft	36 - 36 ft	46 - 46 ft	56 - 56 ft	60 - 60 ft
			Sample Type	N	N	N	N	N	N	N
			Federal TC Limit – TCLP[2,3]							
Total solids				--	--	--	--	--	--	--
Metals (mg/kg)										
Arsenic			100	--	--	--	--	--	--	--
Arsenic				--	--	--	--	--	--	--
Cadmium			20	--	--	--	--	--	--	--
Chromium			100	--	--	--	--	--	--	--
Copper				--	--	--	--	--	--	--
Lead			100	--	--	--	--	--	--	--
Mercury			4	--	--	--	--	--	--	--
Nickel				--	--	--	--	--	--	--
Silver			100	--	--	--	--	--	--	--
Zinc				--	--	--	--	--	--	--
Volatile Organics (µg/kg)										
2-Butanone (MEK)			4000000	**1500**	**1700**	**990**	**2700**	**100**	52 U	51 U
Acetone				**9400**	57 U	**5700**	**14000**	**470**	**340**	**2200**
Dichloromethane (Methylene chloride)				5.5 U	5.7 U	5.3 U	5.8 U	5.3 U	5.2 U	5.1 U
Methyl isobutyl ketone (4-Methyl-2-pentanone or (MIBK))				**450**	**520**	**130**	**1100**	53 U	52 U	51 U
o-Xylene				**8.5**	5.7 U	5.3 U	5.8 U	5.3 U	5.2 U	5.1 U
Toluene				**49**	**7.9**	5.3 U	5.8 U	5.3 U	5.2 U	5.1 U
Total xylene (reported, not calculated)				**8.3**	5.7 U	5.3 U	5.8 U	5.3 U	5.2 U	5.1 U
Total Xylene (U = 1/2)				**8.5**	5.7 U	5.3 U	5.8 U	5.3 U	5.2 U	5.1 U
Total Xylene (U = 0)				**8.5**	5.7 U	5.3 U	5.8 U	5.3 U	5.2 U	5.1 U
Halogenated Organic Compounds (µg/kg)										
Total Halogenated Organic Compounds (U = 1/2)	10000000	100000		11 UJ	11 UJ	11 UJ	12 UJ	11 UJ	10 UJ	10 UJ
Total Halogenated Organic Compounds (U = 0)	10000000	100000		11 UJ	11 UJ	11 UJ	12 UJ	11 UJ	10 UJ	10 UJ

Table 2
Soil Data Screening – Zones C/D

Analyte	Ecology Dangerous Waste Designation Criteria (1%)[1]	Ecology Dangerous Waste Designation Criteria (0.01%)[1]	Location ID	B-20	B-20	B-20	B-20	B-20	B-20	B-20	B-20
			Sample Date	05/16/1996	05/15/1996	05/16/1996	05/16/1996	05/16/1996	05/16/1996	05/16/1996	05/16/1996
			Depth	46 - 46 ft	11 - 11 ft	16 - 16 ft	26 - 26 ft	36 - 36 ft	56 - 56 ft	60 - 60 ft	26 - 26 ft
			Sample Type	N	N	N	N	N	N	N	FD
			Federal TC Limit – TCLP[2,3]								
Total solids				--	--	--	--	--	--	--	--
Metals (mg/kg)											
Arsenic			100	--	--	--	--	--	--	--	--
Arsenic				--	--	--	--	--	--	--	--
Cadmium			20	--	--	--	--	--	--	--	--
Chromium			100	--	--	--	--	--	--	--	--
Copper				--	--	--	--	--	--	--	--
Lead			100	--	--	--	--	--	--	--	--
Mercury			4	--	--	--	--	--	--	--	--
Nickel				--	--	--	--	--	--	--	--
Silver			100	--	--	--	--	--	--	--	--
Zinc				--	--	--	--	--	--	--	--
Volatile Organics (µg/kg)											
2-Butanone (MEK)			4000000	**21**	**1100**	**440**	**400**	**420**	**15**	**73**	**750**
Acetone				**3600**	**490000**	**370000**	**630000**	**250000**	**370**	**1700**	**710000**
Dichloromethane (Methylene chloride)				5.2 U	5.3 U	5.3 U	5.6 U	5.8 U	5.1 U	5.2 U	5.7 U
Methyl isobutyl ketone (4-Methyl-2-pentanone or (MIBK))				52 U	**15**	53 U	56 U	58 U	51 U	52 U	57 U
o-Xylene				5.2 U	5.3 U	5.3 U	5.6 U	5.8 U	5.1 U	5.2 U	5.7 U
Toluene				5.2 U	**78**	**19**	5.6 U	5.8 U	5.1 U	5.2 U	5.7 U
Total xylene (reported, not calculated)				5.2 U	5.3 U	5.3 U	5.6 U	5.8 U	5.1 U	5.2 U	5.7 U
Total Xylene (U = 1/2)				5.2 U	5.3 U	5.3 U	5.6 U	5.8 U	5.1 U	5.2 U	5.7 U
Total Xylene (U = 0)				5.2 U	5.3 U	5.3 U	5.6 U	5.8 U	5.1 U	5.2 U	5.7 U
Halogenated Organic Compounds (µg/kg)											
Total Halogenated Organic Compounds (U = 1/2)	10000000	100000		10 UJ	11 UJ	11 UJ	11 UJ	12 UJ	10 UJ	10 UJ	11 U
Total Halogenated Organic Compounds (U = 0)	10000000	100000		10 UJ	11 UJ	11 UJ	11 UJ	12 UJ	10 UJ	10 UJ	11 U

Table 2
Soil Data Screening – Zones C/D

Analyte	Ecology Dangerous Waste Designation Criteria (1%)[1]	Ecology Dangerous Waste Designation Criteria (0.01%)[1]	Location ID / Sample Date / Depth / Sample Type / Federal TC Limit – TCLP[2,3]	Total Number of Samples Analyzed[4]	Number of Samples Detected Above Screening Level	Number of Samples Detected Below Screening Level	Number of Samples Not Detected	Maximum Detected Concentration
Total solids				**8**	**0**	**8**	**0**	**96.8**
Metals (mg/kg)								
Arsenic			100	**8**	**0**	**5**	**3**	**6.2**
Arsenic				**8**	**0**	**3**	**5**	**0.08**
Cadmium			20	**8**	**0**	**8**	**0**	**2.5**
Chromium			100	**8**	**0**	**8**	**0**	**12.1**
Copper				**8**	**0**	**8**	**0**	**17.3**
Lead			100	**8**	**0**	**8**	**0**	**17.3**
Mercury			4	**8**	**0**	**8**	**0**	**0.12**
Nickel				**8**	**0**	**8**	**0**	**15.7**
Silver			100	**8**	**0**	**8**	**0**	**2.5**
Zinc				**8**	**0**	**8**	**0**	**53.3**
Volatile Organics (µg/kg)								
2-Butanone (MEK)			4000000	**19**	**0**	**13**	**6**	**2700**
Acetone				**19**	**0**	**18**	**1**	**710000**
Dichloromethane (Methylene chloride)				**19**	**0**	**4**	**15**	**74**
Methyl isobutyl ketone (4-Methyl-2-pentanone or (MIBK))				**19**	**0**	**5**	**14**	**1100**
o-Xylene				**15**	**0**	**1**	**14**	**8.5**
Toluene				**19**	**0**	**8**	**11**	**78**
Total xylene (reported, not calculated)				**19**	**0**	**1**	**18**	**8.3**
Total Xylene (U = 1/2)				**15**	**0**	**1**	**14**	**8.5**
Total Xylene (U = 0)				**15**	**0**	**1**	**14**	**8.5**
Halogenated Organic Compounds (µg/kg)								
Total Halogenated Organic Compounds (U = 1/2)	10000000	100000		**23**	**0**	**4**	**19**	**5844**
Total Halogenated Organic Compounds (U = 0)	10000000	100000		**23**	**0**	**4**	**19**	**174**

Table 2
Soil Data Screening – Zones C/D

Notes:
Bold = Detected result
J = Estimated value
U = Compound analyzed, but not detected above detection limit
UJ = Compound analyzed, but not detected above estimated detection limit
Footnotes:
1. See Washington Administrative Code (WAC) 173-303-100.
2. See 40 CFR 261.24.
3. TCLP criteria were multiplied by 20.
4. Includes field duplicates.
µg/kg = micrograms per kilogram
CFR = Code of Federal Regulations
Ecology = Washington State Department of Ecology
FD = field duplicate
ft = feet
mg/kg = milligrams per kilogram
N (Sample Type) = normal
PCB = polychlorinated biphenyl
TC = toxicity characteristic
TCLP = toxicity characteristic leaching procedure

Table 3
Soil Data Screening – Zone E

Analyte	Ecology Dangerous Waste Designation Criteria (1%)[1]	Ecology Dangerous Waste Designation Criteria (0.01%)[1]	Location ID	B-03	B-03	B-03	B-03	B-04	B-04	B-04	B-04
			Sample Date	01/22/1993	01/22/1993	01/22/1993	01/22/1993	01/22/1993	01/22/1993	01/22/1993	01/22/1993
			Depth	26 - 26 ft	41 - 41 ft	61 - 61 ft	8.8 - 8.8 ft	11 - 11 ft	26 - 26 ft	46 - 46 ft	64 - 64 ft
			Sample Type	N	N	N	N	N	N	N	N
			Federal TC Limit – TCLP[2,3]								
Conventional Parameters (pct)											
Moisture, percent				--	--	--	--	--	--	--	--
Total organic carbon				--	--	--	--	--	--	--	--
Total solids				**88.4**	**83.9**	**96.6**	**81.9**	**92**	**93.1**	**89.1**	**91.2**
Metals (mg/kg)											
Antimony				5.2 UN	4.7 UN	4 UN	5.2 UN	5 UN	4.9 UN	5.3 UN	4.7 UN
Arsenic			100	**9.4**	**11.5**	**3.1**	3.9 U	**7.7**	**6.5**	**7.5**	**3.5**
Beryllium				**0.04**	0.01 U	0.01 U	0.01 U	**0.46**	0.01 U	0.01 U	0.01 U
Cadmium			20	**2.5**	**2.4**	**2.6**	**2**	**3**	**2.7**	**2.5**	**2.4**
Chromium			100	**7.8**	**8.4**	**3.4**	**8.4**	**9.4**	**8.4**	**7.8**	**4.6**
Copper				**20.7**	**24.5**	**15.4**	**33.3**	**17.2**	**19**	**18.1**	**14.9**
Lead			100	**9.7**	**14.5**	**5.5**	**26.8**	**11.2**	**10.7**	**7.9**	**6.5**
Mercury			4	**2.6**	0.4 U	**0.13**	**180**	**15.6**	**2.4**	0.04 U	0.04 U
Nickel				**13.2**	**12.4**	**9**	**12.2**	**13.3**	**12.5**	**12.5**	**9.1**
Silver			100	**1.6**	**1.7**	**1.9**	**1.2**	**2**	**1.5**	**1.7**	**1.8**
Zinc				**45.1**	**53.4**	**39.3**	**66.6**	**48.5**	**48.7**	**49.2**	**39.9**
Volatile Organics (µg/kg)											
Acetone				--	--	--	--	--	--	--	--
Dichloromethane (Methylene chloride)				--	--	--	--	--	--	--	--
Toluene				--	--	--	--	--	--	--	--
Semivolatile Organics (µg/kg)											
bis(2-Ethylhexyl)phthalate				370 U	**13 J**	340 U	**90 J**	350 U	350 U	370 U	360 U
Di-n-butyl phthalate				**550**	**630**	**410**	**120 J**	**370**	**210 J**	**200 J**	**160 J**
Hexachlorobenzene			2600	370 U	390 U	340 U	**160 J**	350 U	350 U	370 U	360 U
Hexachloroethane			60000	370 U	390 U	340 U	**66 J**	**85 J**	350 U	370 U	360 U
Radionuclides (pci/g)											
Actinium 228				--	--	--	--	--	--	--	--
Bismuth 214				--	--	--	--	--	--	--	--
Gross alpha activity				--	--	--	--	--	--	--	--
Gross beta activity				--	--	--	--	--	--	--	--
Lead 212				--	--	--	--	--	--	--	--
Lead 214				--	--	--	--	--	--	--	--
Potassium 40				--	--	--	--	--	--	--	--
Thallium 208				--	--	--	--	--	--	--	--
Halogenated Organic Compounds (µg/kg)											
Total Halogenated Organic Compounds (U = 1/2)	10000000	100000		1900 U	1900 U	1700 U	**5926 J**	**5200 J**	1800 U	1800 U	1800 U
Total Halogenated Organic Compounds (U = 0)	10000000	100000		1900 U	1900 U	1700 U	**226 J**	**85 J**	1800 U	1800 U	1800 U

Table 3
Soil Data Screening – Zone E

Analyte	Ecology Dangerous Waste Designation Criteria (1%)[1]	Ecology Dangerous Waste Designation Criteria (0.01%)[1]	Location ID	B-11	B-11	B-11	B-11	B-11	LS-17	LS-18	LS-20	MW-27S
			Sample Date	01/26/1993	01/26/1993	01/26/1993	01/26/1993	01/26/1993	12/05/1992	12/05/1992	12/05/1992	05/30/1995
			Depth	11 - 11 ft	26 - 26 ft	41 - 41 ft	61 - 61 ft	61 - 61 ft	0.5 - 0.5 ft	0.5 - 0.5 ft	0.5 - 0.5 ft	60 - 60 ft
			Sample Type	N	N	N	N	FD	N	N	N	N
			Federal TC Limit – TCLP[2,3]									
Conventional Parameters (pct)												
Moisture, percent				**12.06**	**5.2**	**10.14**	**4.16**	**4.37**	**9.67**	**10.13**	**9.55**	--
Total organic carbon				--	--	--	--	--	**0.11**	--	--	--
Total solids				**87.9**	**94.8**	**89.9**	**95.8**	**95.6**	**90.3**	**89.9**	**90.4**	--
Metals (mg/kg)												
Antimony				4.8 UN	4.8 UN	5 UN	4.5 UN	4.7 U	1.3 UN	1.1 UN	**1.5 N**	0.1 U
Arsenic			100	**11.8**	**7.9**	**5**	3.4 U	**9.3**	**6.7**	**8.2**	**5.9**	**1.1**
Beryllium				**0.05**	0.01 U	**0.1**	0.01 U	0.01 U	0.13 U	0.11 U	0.09 U	**0.12**
Cadmium			20	**2.5**	**1.5**	**2.2**	**3**	**5.7**	**1**	**1**	**2**	0.1 U
Chromium			100	**10.7**	**7.9**	**12.1**	**6**	**11.1**	**5.5**	**5.8**	**5.5**	**4.2**
Copper				**19.5**	**14.2**	**17.2**	**14.4**	**24.5**	**12.1**	**11.5**	**11.9**	**9.5**
Lead			100	**13.3**	**9.6**	**11.3**	**6.7**	**14.3**	**7.2**	**6.4**	**8.8**	**2.5**
Mercury			4	**0.12**	**0.1**	**0.11**	**0.12**	**0.13**	0.1 U	0.1 U	0.1 U	--
Nickel				**14.9**	**11.7**	**15.4**	**10.8**	**20.7**	**8.7**	**8.5**	**8.7**	**5.5**
Silver			100	**1.6**	**1.7**	**1.2**	**2.5**	**4.7**	**0.83**	**1.1**	**1.3**	**0.12**
Zinc				**53.1**	**41.3**	**52**	**48.7**	**89.8**	**34.2**	**34.6**	**36.1**	**35**
Volatile Organics (µg/kg)												
Acetone				**400 J**	**170 J**	**200 J**	**43**	**56**	--	--	--	--
Dichloromethane (Methylene chloride)				**340 J**	**290 J**	**290 J**	**49**	**48**	--	--	--	--
Toluene				220 U	200 U	220 U	**3 J**	5 UJ	--	--	--	--
Semivolatile Organics (µg/kg)												
bis(2-Ethylhexyl)phthalate				380 U	350 U	370 U	340 U	340 U	370 U	360 U	370 U	--
Di-n-butyl phthalate				**310 J**	**410**	**360 J**	**320 J**	**340**	**140 J**	**160 J**	**610**	--
Hexachlorobenzene			2600	380 U	350 U	370 U	340 U	340 U	370 U	360 U	370 U	--
Hexachloroethane			60000	380 U	350 U	370 U	340 U	340 U	370 U	360 U	370 U	--
Radionuclides (pci/g)												
Actinium 228				--	--	--	--	**0.8**	--	--	--	--
Bismuth 214				--	--	--	--	**0.7**	--	--	--	--
Gross alpha activity				--	--	--	--	**2.8**	--	--	--	--
Gross beta activity				--	--	--	--	**14**	--	--	--	--
Lead 212				--	--	--	--	**0.7**	--	--	--	--
Lead 214				--	--	--	--	**0.5**	--	--	--	--
Potassium 40				--	--	--	--	**13**	--	--	--	--
Thallium 208				--	--	--	--	**0.24**	--	--	--	--
Halogenated Organic Compounds (µg/kg)												
Total Halogenated Organic Compounds (U = 1/2)	10000000	100000		**9214.4 J**	**8424.92 J**	**8973.29 J**	**5497.42**	**5508.61**	1800 U	1800 U	1800 U	46 UJ
Total Halogenated Organic Compounds (U = 0)	10000000	100000		**340 J**	**290 J**	**290 J**	**49**	**48**	1800 U	1800 U	1800 U	46 UJ

Table 3
Soil Data Screening – Zone E

Analyte	Ecology Dangerous Waste Designation Criteria (1%)[1]	Ecology Dangerous Waste Designation Criteria (0.01%)[1]	Location ID / Sample Date / Depth / Sample Type / Federal TC Limit – TCLP[2,3]	Total Number of Samples Analyzed[4]	Number of Samples Detected Above Screening Level	Number of Samples Detected Below Screening Level	Number of Samples Not Detected	Maximum Detected Concentration
Conventional Parameters (pct)								
Moisture, percent				**8**	**0**	**8**	**0**	**12.06**
Total organic carbon				**1**	**0**	**1**	**0**	**0.11**
Total solids				**16**	**0**	**16**	**0**	**96.6**
Metals (mg/kg)								
Antimony				**17**	**0**	**0**	**17**	**1.5 N**
Arsenic			100	**17**	**0**	**15**	**2**	**11.8**
Beryllium				**17**	**0**	**5**	**12**	**0.46**
Cadmium			20	**17**	**0**	**16**	**1**	**5.7**
Chromium			100	**17**	**0**	**17**	**0**	**12.1**
Copper				**17**	**0**	**17**	**0**	**33.3**
Lead			100	**17**	**0**	**17**	**0**	**26.8**
Mercury			4	**16**	**2**	**8**	**6**	**180**
Nickel				**17**	**0**	**17**	**0**	**20.7**
Silver			100	**17**	**0**	**17**	**0**	**4.7**
Zinc				**17**	**0**	**17**	**0**	**89.8**
Volatile Organics (µg/kg)								
Acetone				**5**	**0**	**5**	**0**	**400 J**
Dichloromethane (Methylene chloride)				**5**	**0**	**5**	**0**	**340 J**
Toluene				**5**	**0**	**1**	**4**	**3J**
Semivolatile Organics (µg/kg)								
bis(2-Ethylhexyl)phthalate				**16**	**0**	**2**	**14**	**90 J**
Di-n-butyl phthalate				**16**	**0**	**16**	**0**	**630**
Hexachlorobenzene			2600	**16**	**0**	**1**	**15**	**160J**
Hexachloroethane			60000	**16**	**0**	**2**	**14**	**85 J**
Radionuclides (pci/g)								
Actinium 228				**1**	**0**	**1**	**0**	**0.8**
Bismuth 214				**1**	**0**	**1**	**0**	**0.7**
Gross alpha activity				**1**	**0**	**1**	**0**	**2.8**
Gross beta activity				**1**	**0**	**1**	**0**	**14**
Lead 212				**1**	**0**	**1**	**0**	**0.7**
Lead 214				**1**	**0**	**1**	**0**	**0.5**
Potassium 40				**1**	**0**	**1**	**0**	**13**
Thallium 208				**1**	**0**	**1**	**0**	**0.24**
Halogenated Organic Compounds (µg/kg)								
Total Halogenated Organic Compounds (U = 1/2)	10000000	100000		**17**	**0**	**7**	**10**	**9214.4 J**
Total Halogenated Organic Compounds (U = 0)	10000000	100000		**17**	**0**	**7**	**10**	**340 J**

Table 3
Soil Data Screening – Zone E

Notes:
= Detected concentration is greater than screening level
Bold = Detected result
J = Estimated value
N = Presumptive evidence
U = Compound analyzed, but not detected above detection limit
UJ = Compound analyzed, but not detected above estimated detection limit
UN = Compound analyzed, but not detected above detection limit, with presumptive evidence of the presence
Footnotes:
1. See Washington Administrative Code (WAC) 173-303-100.
2. See 40 CFR 261.24.
3. TCLP criteria were multiplied by 20.
4. Includes field duplicates.
µg/kg = micrograms per kilogram
CFR = Code of Federal Regulations
Ecology = Washington State Department of Ecology
FD = field duplicate
ft = feet
mg/kg = milligrams per kilogram
N (Sample Type) = normal
PCB = polychlorinated biphenyl
pci/g = picocuries per gram
pct = percent
TC = toxicity characteristic
TCLP = toxicity characteristic leaching procedure

Table 4
Waste Code Assignments for Soil

Zone	Location	Sample Date	End Depth of Sample (feet)	Estimated Elevation Above Mean Sea Level (feet)	Waste Designation	Criteria Exceeded: Analyte	Sample Layer
Zone A	HB-1.5W	5/18/2011	33	380	D039	Federal TC Limit: PCE	Upper Pasco Gravels
					D040	Federal TC Limit: TCE	
					DW, WP02	WA State DW Criteria: HOC greater than 0.01%	
		5/16/2011	33	380	D040	Federal TC Limit: TCE	Upper Pasco Gravels
	HB-1N	3/30/2011	29	386.4	D039	Federal TC Limit: PCE	Touchet Beds
					D040	Federal TC Limit: TCE	
					DW, WP02	WA State DW Criteria: HOC greater than 0.01%	
	HB-1S	4/4/2011	29	386.9	D040	Federal TC Limit: TCE	Touchet Beds
					DW, WP02	WA State DW Criteria: HOC greater than 0.01%	
	HB-2SR	6/1/2011	45	370.9	D040	Federal TC Limit: TCE	Upper Pasco Gravels
	MW-52S	9/27/2010	26.5	401.8	D028	Federal TC: 1,2-Dichloroethane	Mixed Soil and Debris
					D040	Federal TC Limit: TCE	
					DW, WP02	WA State DW Criteria: HOC greater than 0.01%	
		9/27/2010	31.5	396.8	D007	Federal TC: Chromium	Touchet Beds
					D008	Federal TC: Lead	
		9/27/2010	41.5	386.8	D028	Federal TC: 1,2-Dichloroethane	Touchet Beds
					D039	Federal TC Limit: PCE	
					D040	Federal TC Limit: TCE	
					DW, WP02	WA State DW Criteria: HOC greater than 0.01%	
	MW-53S	9/21/2010	26.5	400	D040	Federal TC Limit: TCE	Mixed Soil and Debris
		9/21/2010	36.5	389.5	D039	Federal TC Limit: PCE	Mixed Soil and Debris
					D040	Federal TC Limit: TCE	
					DW, WP02	WA State DW Criteria: HOC greater than 0.01%	
		9/22/2010	56.5	369.3	D039	Federal TC Limit: PCE	Upper Pasco Gravels
	VEW-07D	9/23/2010	21.5	405.7	D008	Federal TC: Lead	Mixed Soil and Debris
					D040	Federal TC Limit: TCE	
		9/23/2010	26.5	399.5	D039	Federal TC Limit: PCE	Mixed Soil and Debris
					D040	Federal TC Limit: TCE	
					DW, WP02	WA State DW Criteria: HOC greater than 0.01%	
		9/23/2010	27.5	398.2	D007	Federal TC Limit: Chromium	Touchet Beds
		9/23/2010	31	395.5	D040	Federal TC Limit: TCE	Touchet Beds
		9/24/2010	36.5	390.5	D028	Federal TC: 1,2-Dichloroethane	Touchet Beds
					D018	Federal TC: Benzene	
					D039	Federal TC Limit: PCE	
					D040	Federal TC Limit: TCE	
					DW, WP02	WA State DW Criteria: HOC greater than 0.01%	
	VMW-51D	9/30/2010	17	407	D008	Federal TC: Lead	Mixed Soil and Debris
Zone E	B-03	1/22/1993	8.8	416	D009	Federal TC: Mercury	Touchet Beds
	B-04	1/22/1993	11	419	D009	Federal TC: Mercury	Touchet Beds

Notes:
DW = dangerous waste
HOC = halogenated organic compound
PCE = perchloroethylene
TC = toxicity characteristic
TCE = trichloroethene
WA = Washington

Table 5

Percent Exceedance of Waste Screening Criteria in Zones A, C/D, and E

Zone and Layer	Sample Count[1]	Count of Exceedances[2]	Percent Exceedance[2]
Zone A[3]			
Fill	3	0	0
Mixed Soil and Debris	15	6	40
Touchet Beds	31	7	23
Transition Zone[4]	3	0	0
Upper Pasco Gravels	73	4	5
Zone A Total	***125***	***17***	***14***
Zones C/D			
Zones C/D Total	***22***	***0***	***0***
Zone E			
Touchet Beds	9	2	22
Upper Pasco Gravels	7	0	0
Zone E Total	***16***	***2***	***13***

Notes:

1. Sample count does not include field duplicates.
2. Exceedance results based on soil data available in Tables 1 through 3.
3. Layers are based on the Lithologic Unit described in Table 1 of Sub-Zone A Investigation (EPI 2012).
4. Samples were collected at the transition zone elevation in the berm between the stacked drums.

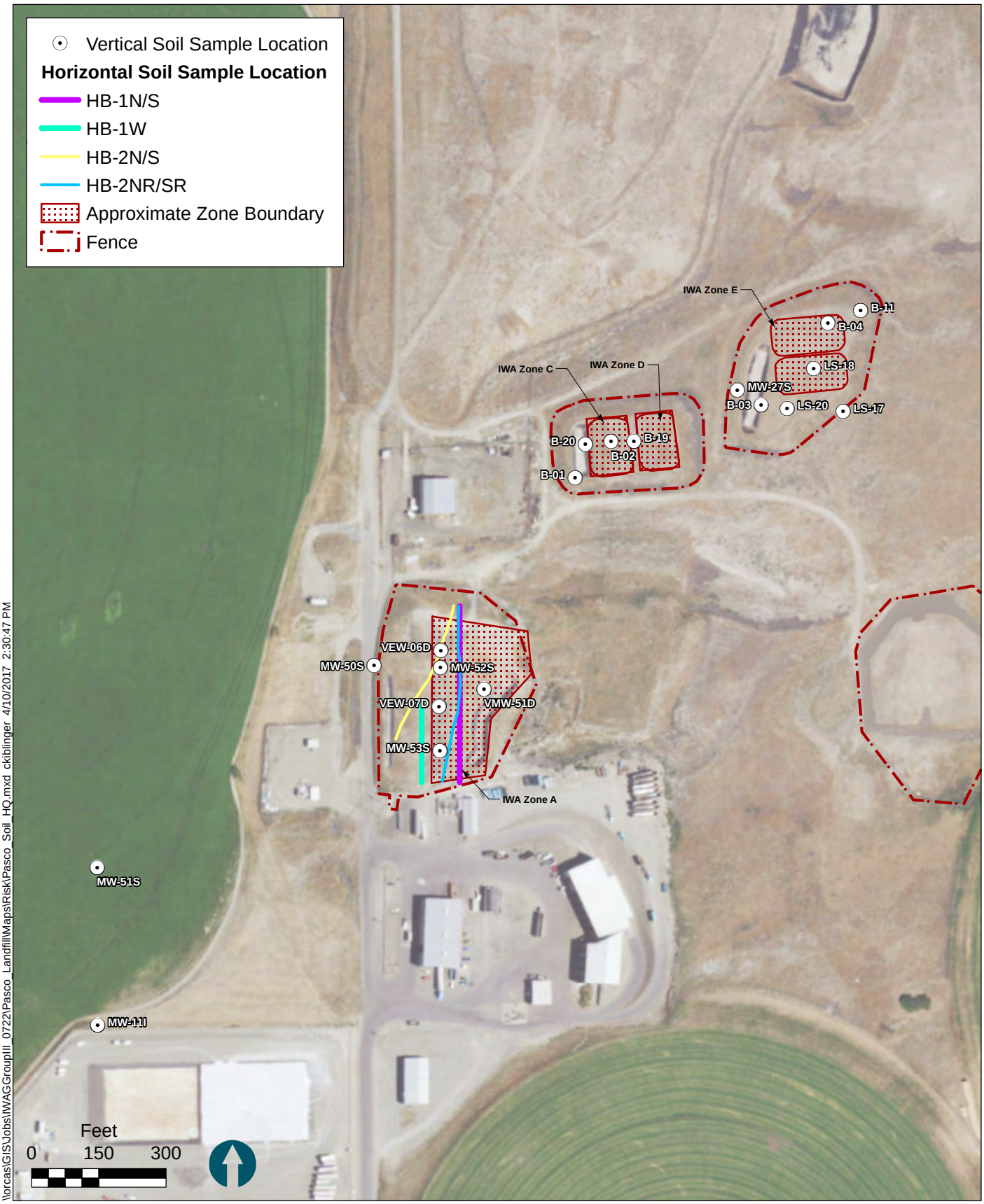
Table 6
Soil Treatment Standard Summary

Zone	Location	Date	Sample End Depth (feet)	Chemical	Result	Unit	Waste Designation[1]			Treatment Standards[3]			
							Federal TC Limit - Adjusted Soil Concentration[2]	WA State Dangerous Waste Criteria (0.01%)	Waste Code	UTS	10xUTS Adjusted to Soil Concentration[4]	90% Reduction in Soil Concentration	Applicable Treatment Standard
Zone A	HB-1.5W	5/18/2011	33	Perchloroethylene (PCE)	16,000	µg/kg	14,000	--	D039	6,000	60,000	6,400	60,000
				Trichloroethene (TCE)	47,000	µg/kg	10,000	--	D040	6,000	60,000	15,000	60,000
				Total HOCs (U = 1/2)	129,595	µg/kg	--	100,000	DW, WP02	--	--	--	--
		5/16/2011	33	Trichloroethene (TCE)	18,000	µg/kg	10,000	--	D040	6,000	60,000	15,000	60,000
	HB-1N	3/30/2011	29	Perchloroethylene (PCE)	120,000	µg/kg	14,000	--	D039	6,000	60,000	6,400	60,000
				Trichloroethene (TCE)	140,000	µg/kg	10,000	--	D040	6,000	60,000	15,000	60,000
				Total HOCs (U = 1/2)	314,897	µg/kg	--	100,000	DW, WP02	--	--	--	--
	HB-1S	4/4/2011	29	Trichloroethene (TCE)	37,000	µg/kg	10,000	--	D040	6,000	60,000	15,000	60,000
				Total HOCs (U = 1/2)	124,467	µg/kg	--	100,000	DW, WP02	--	--	--	--
	HB-2SR	6/1/2011	45	Trichloroethene (TCE)	28,000	µg/kg	10,000	--	D040	6,000	60,000	15,000	60,000
	MW-52S	9/27/2010	26.5	1,2-Dichloroethane	22,000	µg/kg	10,000	--	D028	6,000	60,000	2,200	60,000
				Trichloroethene (TCE)	130,000	µg/kg	10,000	--	D040	6,000	60,000	13,000	60,000
				Total HOCs (U = 1/2)	358,959	µg/kg	--	100,000	DW, WP02	--	--	--	--
		9/27/2010	31.5	Chromium	149	mg/kg	100	--	D007	0.6 mg/L TCLP	120	14.9	120
				Lead	107	mg/kg	100	--	D008	0.75 mg/L TCLP	150	10.7	150
		9/27/2010	41.5	1,2-Dichloroethane	12,000	µg/kg	10,000	--	D028	6,000	60,000	1,200	60,000
				Perchloroethylene (PCE)	110,000	µg/kg	14,000	--	D039	6,000	60,000	11,000	60,000
				Trichloroethene (TCE)	380,000	µg/kg	10,000	--	D040	6,000	60,000	38,000	60,000
				Total HOCs (U = 1/2)	630,521	µg/kg	--	100,000	DW, WP02	--	--	--	--
	MW-53S	9/21/2010	26.5	Trichloroethene (TCE)	15,000	µg/kg	10,000	--	D040	6,000	60,000	1,500	60,000
		9/21/2010	36.5	Perchloroethylene (PCE)	64,000	µg/kg	14,000	--	D039	6,000	60,000	6,400	60,000
				Trichloroethene (TCE)	150,000	µg/kg	10,000	--	D040	6,000	60,000	15,000	60,000
				Total HOCs (U = 1/2)	253,028	µg/kg	--	100,000	DW, WP02	--	--	--	--
		9/22/2010	56.5	Perchloroethylene (PCE)	24,000	µg/kg	14,000	--	D039	6,000	60,000	2,400	60,000
	VEW-07D	9/23/2010	21.5	Lead	117	mg/kg	100	--	D008	0.75 mg/L TCLP	150	11.7	150
				Trichloroethene (TCE)	18,000	µg/kg	10,000	--	D040	6,000	60,000	1,800	60,000
		9/23/2010	26.5	Perchloroethylene (PCE)	15,000	µg/kg	14,000	--	D039	6,000	60,000	1,500	60,000
				Trichloroethene (TCE)	190,000	µg/kg	10,000	--	D040	6,000	60,000	19,000	60,000
				Total HOCs (U = 1/2)	249,308	µg/kg	--	100,000	DW, WP02	--	--	--	--
		9/23/2010	27.5	Chromium	861	mg/kg	100	--	D007	0.6 mg/L TCLP	120	86.1	120
		9/23/2010	31	Trichloroethene (TCE)	38,000	µg/kg	10,000	--	D040	6,000	60,000	3,800	60,000
		9/24/2010	36.5	1,2-Dichloroethane	35,000	µg/kg	10,000	--	D028	6,000	60,000	3,500	60,000
				Benzene	11,000	µg/kg	10,000	--	D018	10,000	100,000	1,100	100,000
				Perchloroethylene (PCE)	970,000	µg/kg	14,000	--	D039	6,000	60,000	97,000	97,000
				Trichloroethene (TCE)	1,800,000	µg/kg	10,000	--	D040	6,000	60,000	180,000	180,000
				Total HOCs (U = 1/2)	3,294,112	µg/kg	--	100,000	DW, WP02	--	--	--	--
	VMW-51D	9/30/2010	17	Lead	381	mg/kg	100	--	D008	0.75 mg/L TCLP	150	38.1	150
Zone E	B-03	1/22/1993	8.8	Mercury	180	mg/kg	4	--	D009	0.025 mg/L TCLP	5	18	18
	B-04	1/22/1993	11	Mercury	16	mg/kg	4	--	D009	0.025 mg/L TCLP	5	1.56	5

Table 6
Soil Treatment Standard Summary

Notes:
1. Only waste designation criteria that were exceeded at any location or depth are reported in this table.
2. Federal TC limits have been multiplied by 20.
3. Contaminated soil must be treated to 90% of the concentration of the chemical exceeding the TC limit or 10 times the UTS, whichever is higher.
4. UTS noted as "mg/L TCLP" were adjusted to the soil concentration prior to selection of the applicable treatment standard.
µg/kg = micrograms per kilogram
HOC = halogenated organic compound
mg/kg = milligrams per kilogram
mg/L = milligrams per liter
TC = toxicity characteristic
TCLP = toxicity characteristic leaching procedure
UTS = Universal Treatment Standard
WA = Washington

FIGURES



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ANCHOR QEA

Figure 1
Historical Soil Sample ID Map
Preliminary Waste Characterization for Soil
Pasco Landfill Site

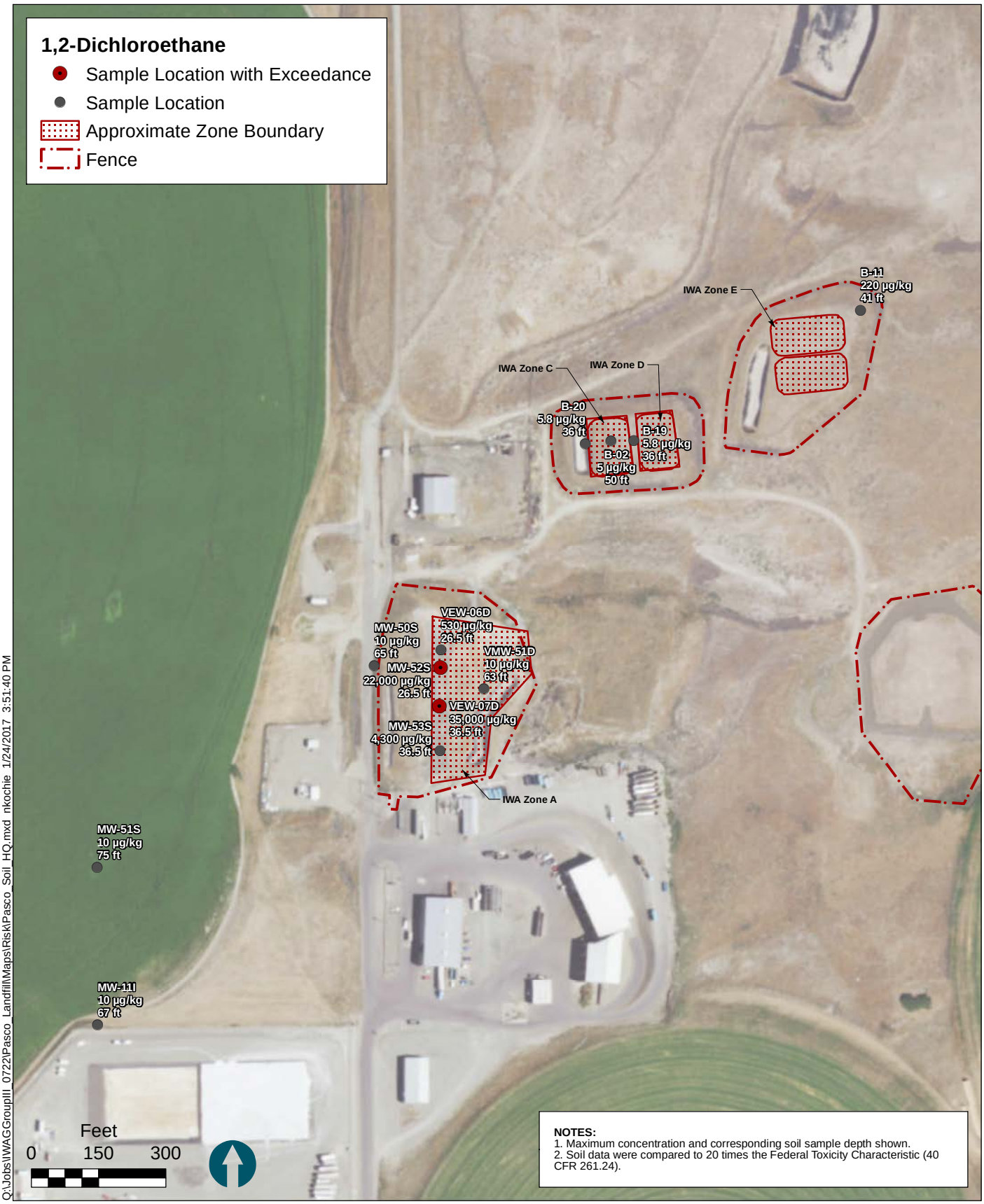
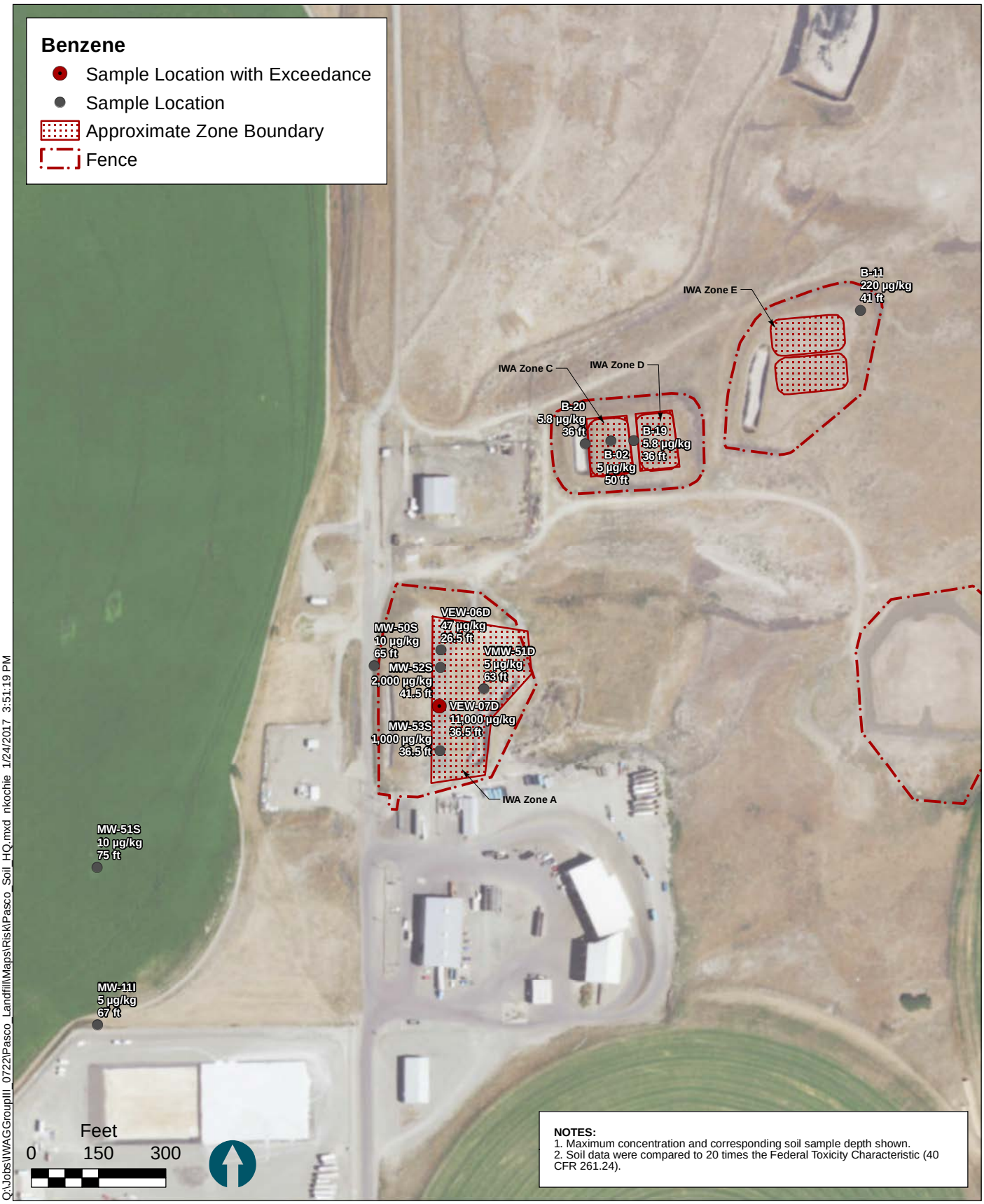


Figure 2
Waste Screening Results for 1,2-Dichloroethane in Soil
Preliminary Waste Characterization for Soil
Pasco Landfill Site



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ANCHOR QEA

Figure 3
Waste Screening Results for Benzene in Soil
Preliminary Waste Characterization for Soil
Pasco Landfill Site

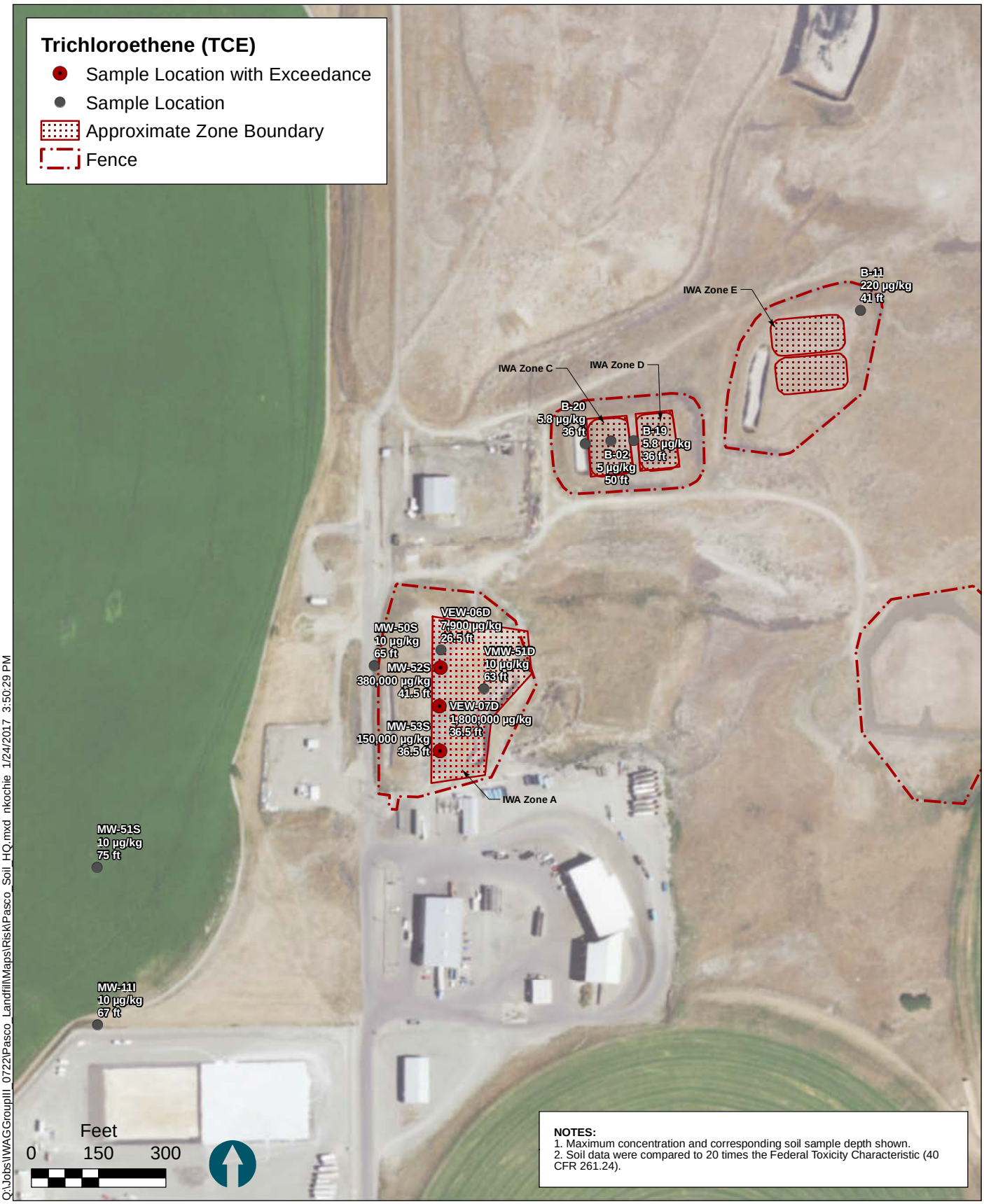


Figure 4
Waste Screening Results for Trichloroethene (TCE) in Soil
Preliminary Waste Characterization for Soil
Pasco Landfill Site

ANCHOR QEA

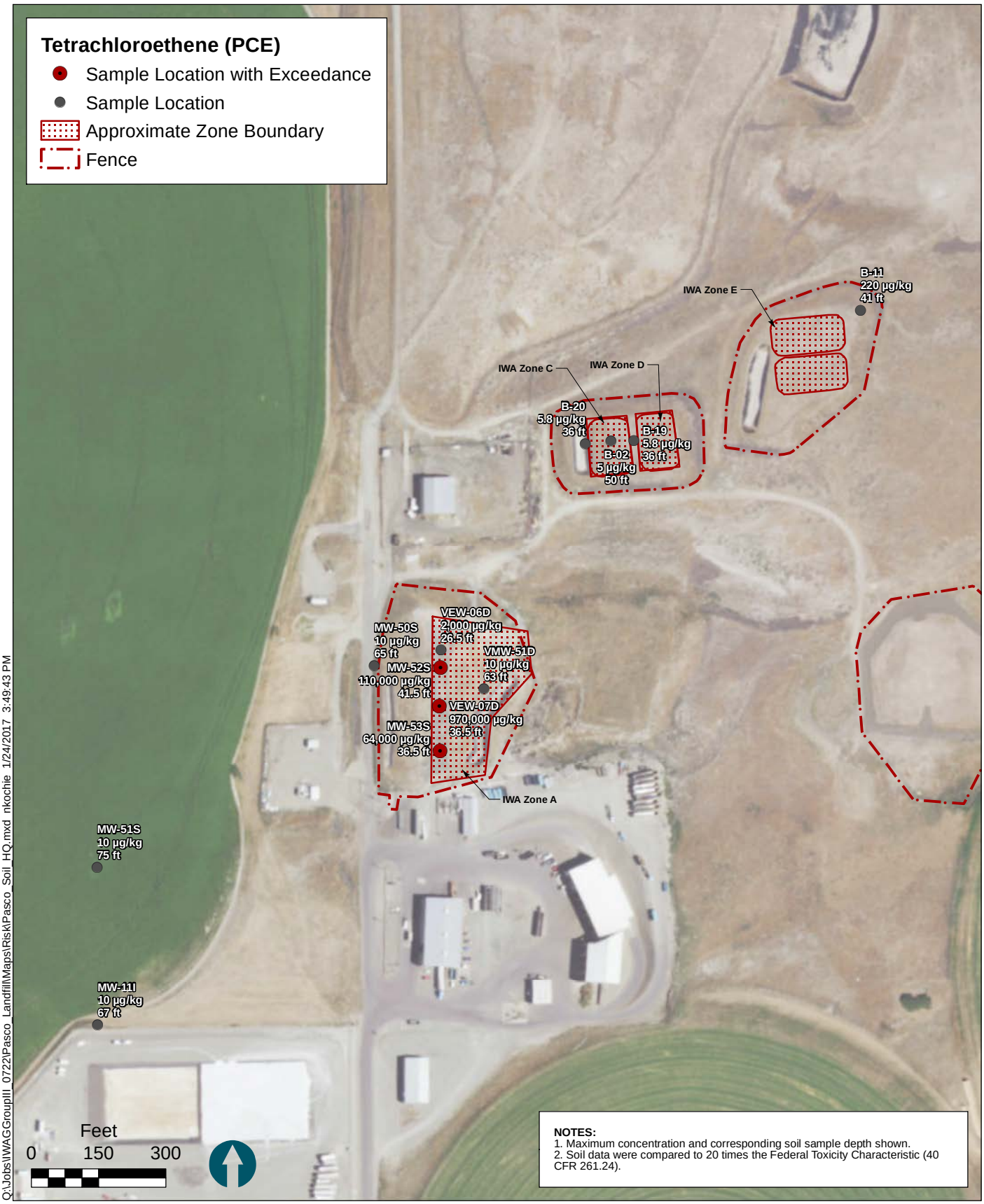


Figure 5
Waste Screening Results for Tetrachloroethene (PCE) in Soil
Preliminary Waste Characterization for Soil
Pasco Landfill Site

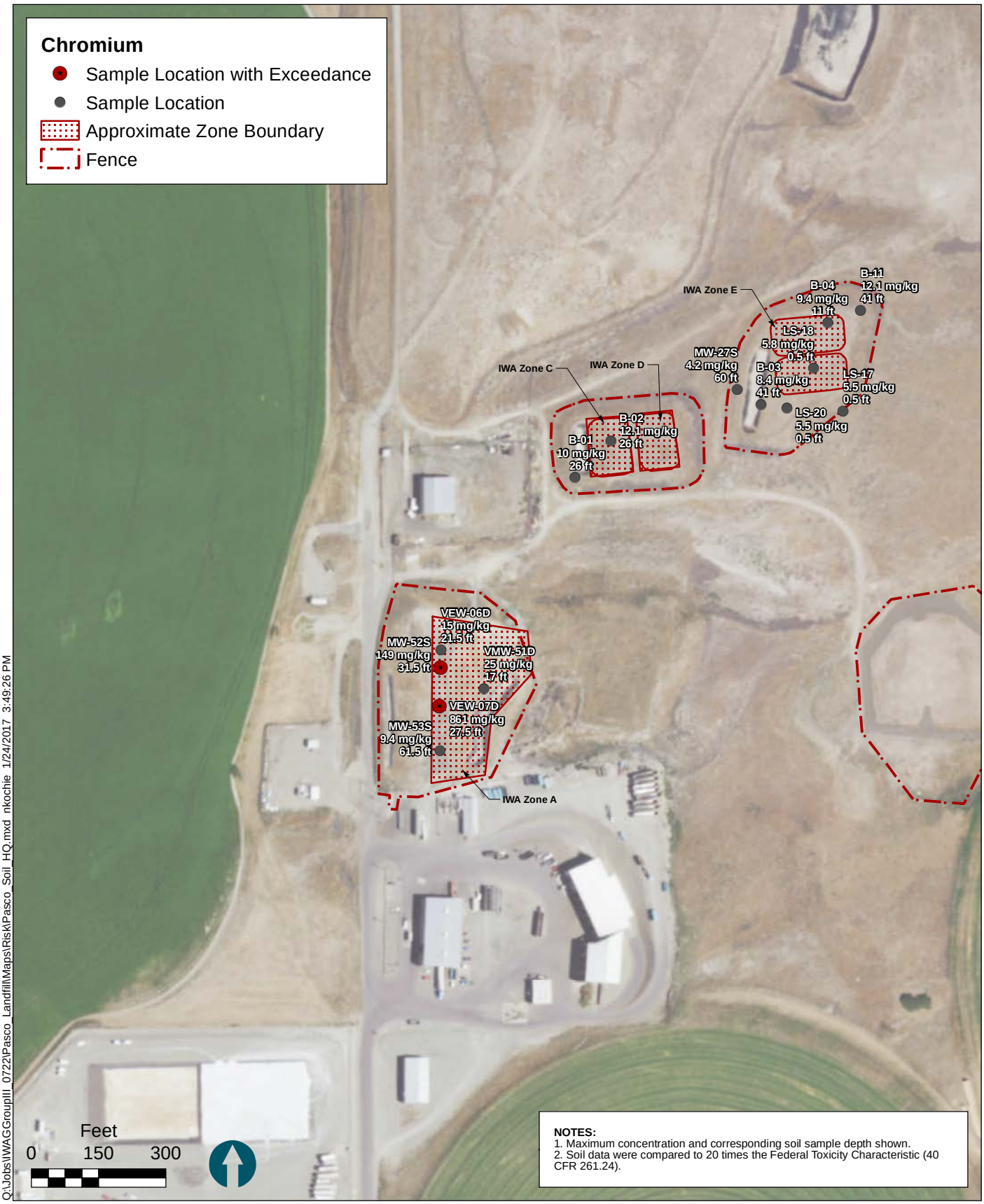
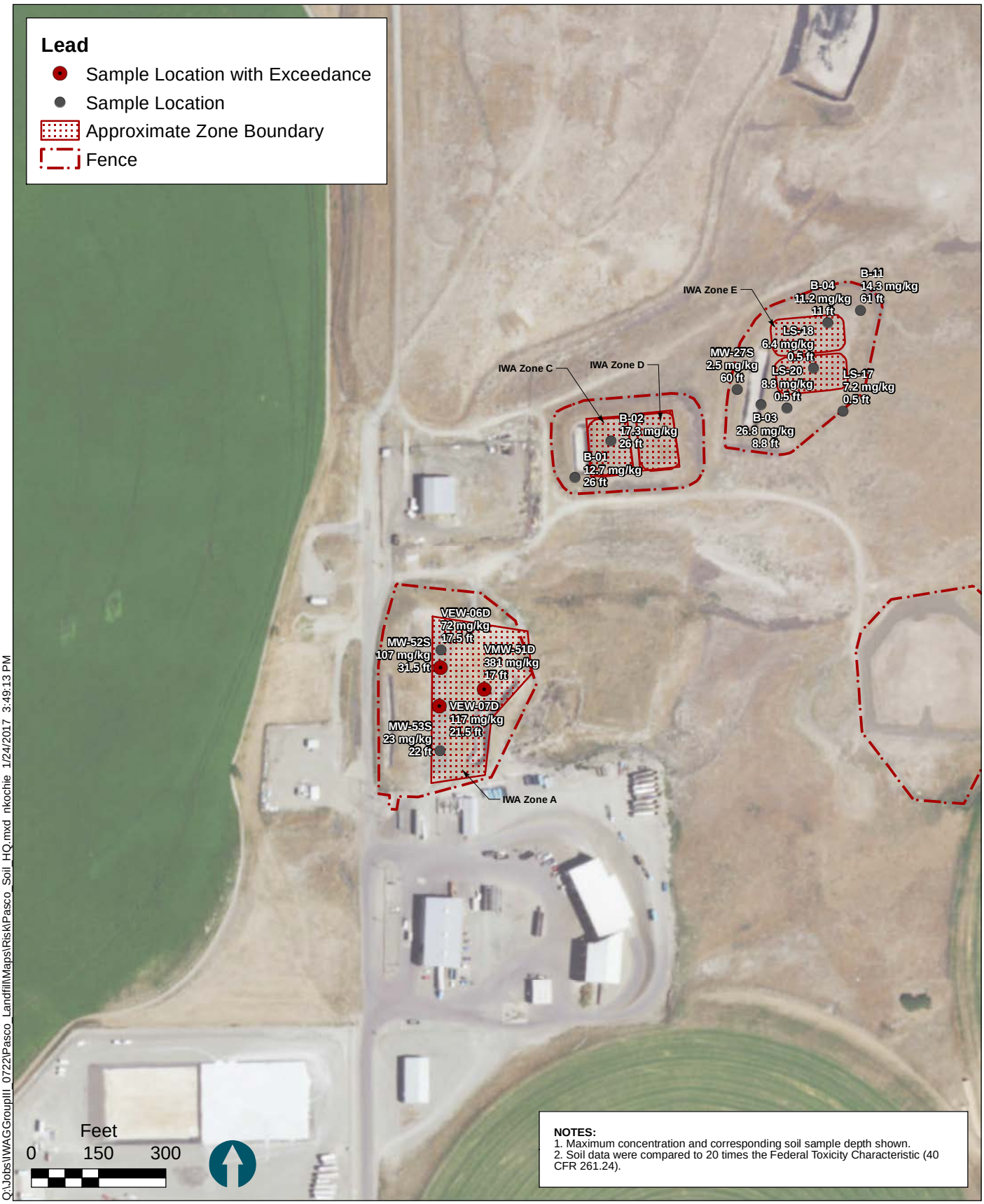


Figure 6
Waste Screening Results for Chromium in Soil
Preliminary Waste Characterization for Soil
Pasco Landfill Site

ANCHOR QEA



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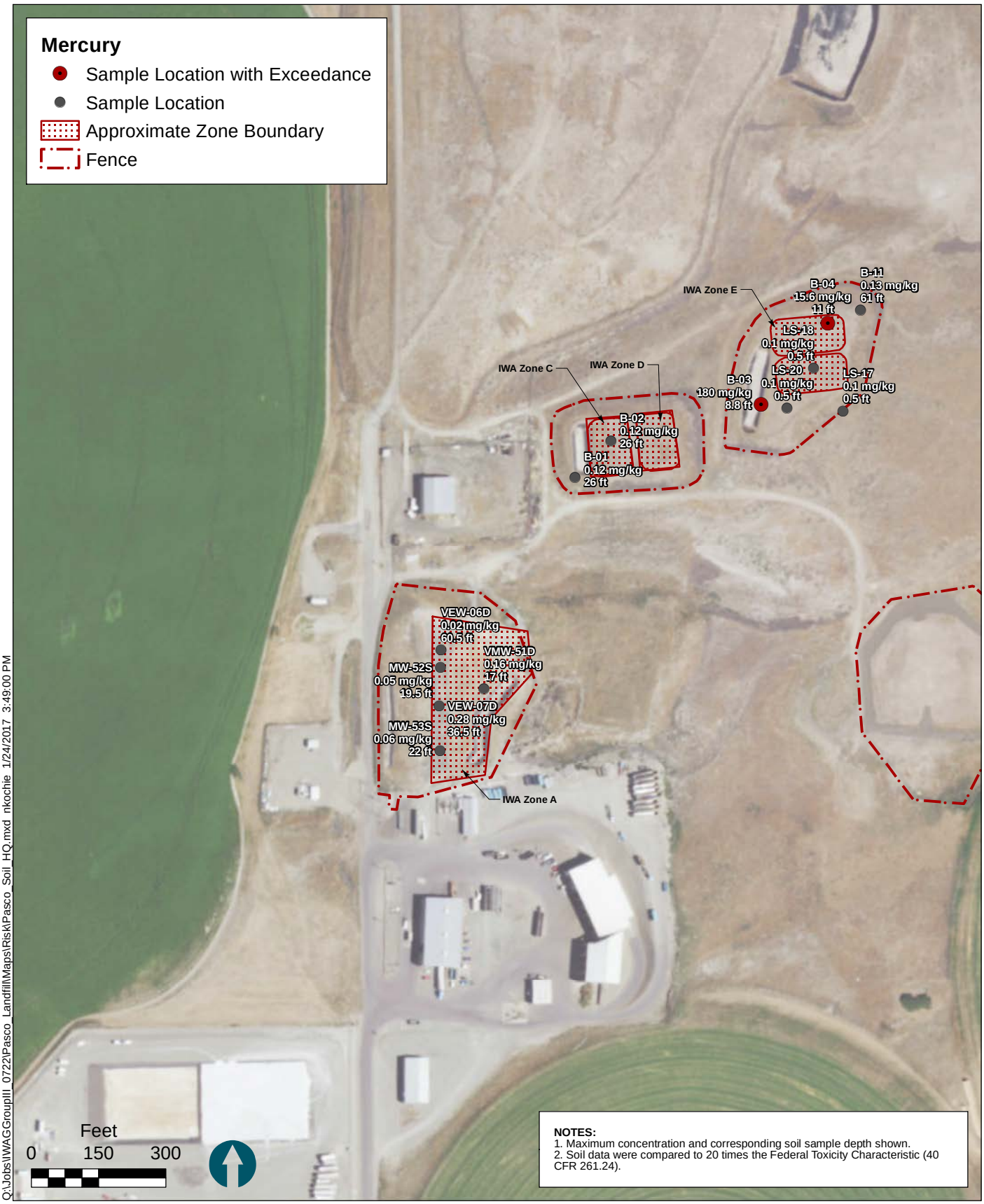
ANCHOR QEA

Figure 7
Waste Screening Results for Lead in Soil
Preliminary Waste Characterization for Soil
Pasco Landfill Site



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ANCHOR QEA

Figure 8
Waste Screening Results for Mercury in Soil
Preliminary Waste Characterization for Soil
Pasco Landfill Site

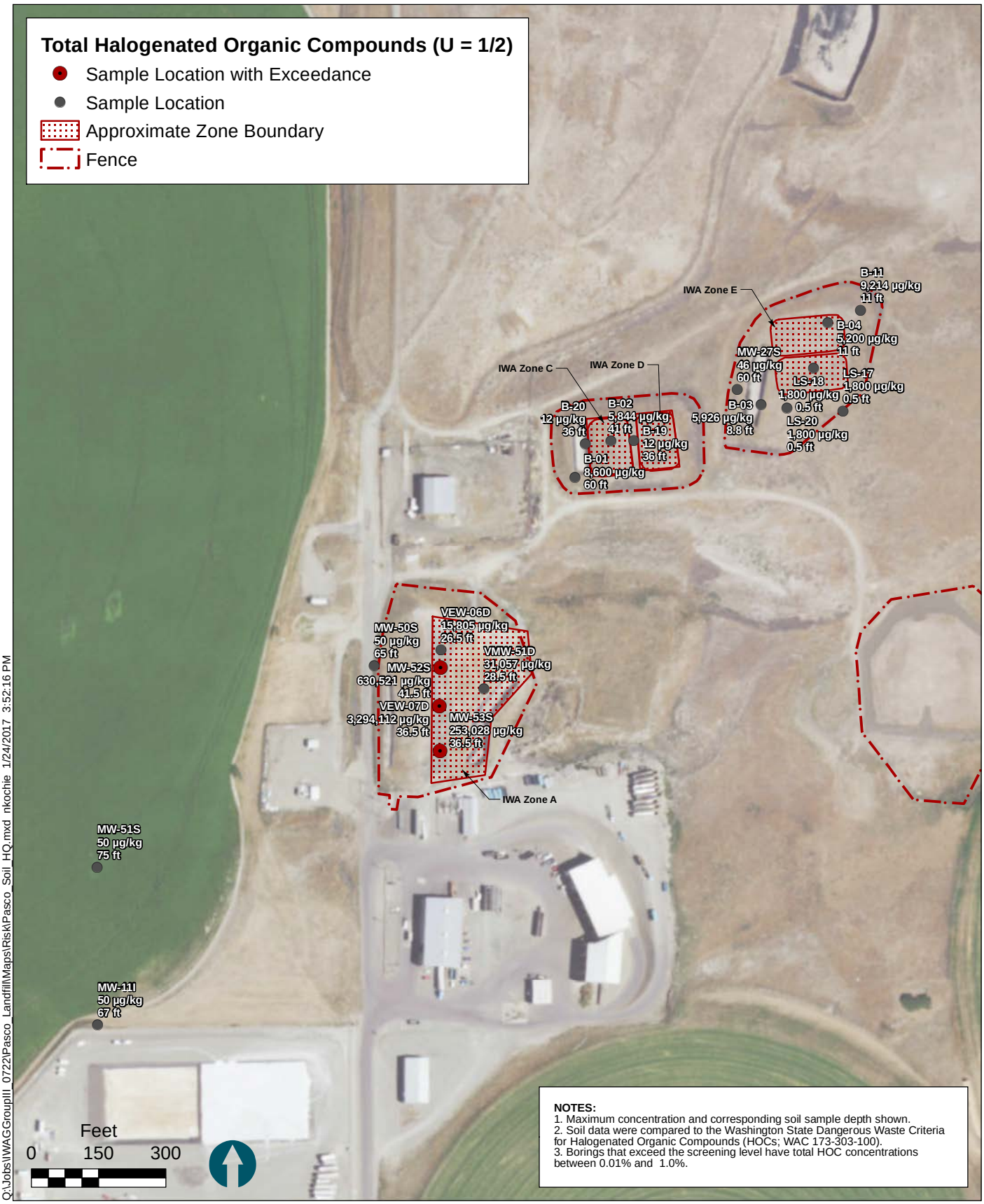

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Figure 9
Waste Screening Results for
Total Halogenated Organic Compounds (U = 1/2) in Soil
Preliminary Waste Characterization for Soil
Pasco Landfill Site

ANCHOR QEA

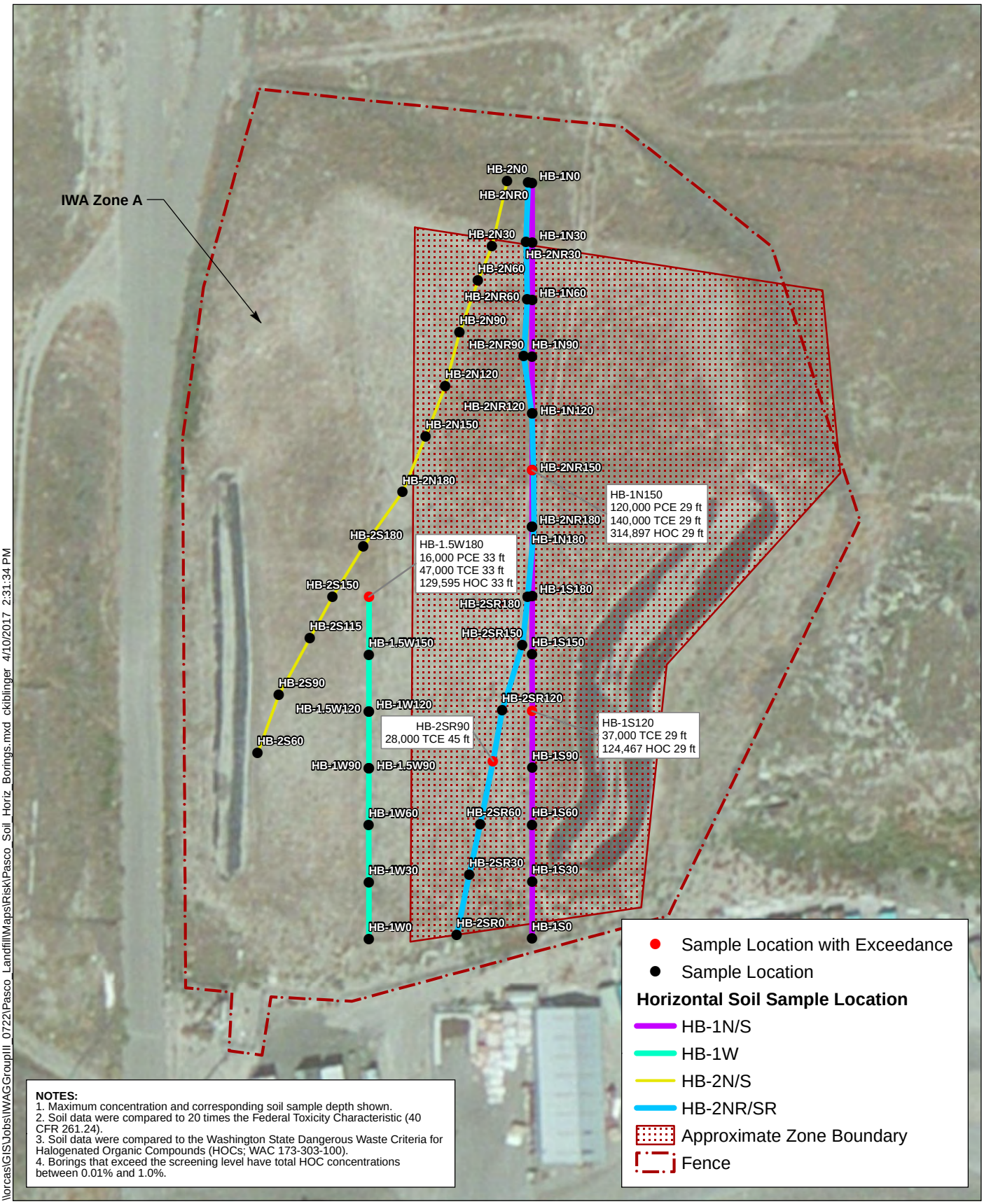

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Figure 10
Waste Screening Results for TCE, PCE, and HOC from Horizontal Borings in Zone A Soil
Preliminary Waste Characterization for Soil
Pasco Landfill Site

APPENDIX H
ZONE E ALTERNATIVE E-2
PASCO LANDFILL NPL SITE

Prepared by
GSI Water Solutions, Inc.

August 2017

Technical Memorandum

To: Carol Wiseman/Weyerhaeuser

From: Randy Pratt

Date: **May 26, 2017**

Re: **Pasco Landfill Zone E Ex Situ Treatment Alternative**

A Draft Focused Feasibility Study (FFS) for the Pasco Landfill Site was prepared in 2014 (Anchor QEA, 2014) that describes alternatives evaluated for Zone E. These included (1) continued monitoring, (2) in situ stabilization by injecting portland cement slurry, and (3) excavation and disposal at a Subtitle C landfill. This memorandum presents a replacement for the stabilization Alternative E-2. Rather than in situ stabilization as described in the Draft FFS, Alternative E-2 has been replaced with ex situ stabilization and placement back in the Zone E storage area. An estimated cost for this alternative (Table 1) is also presented, including the assumptions that serve as a basis for the estimated alternative cost.
The ex situ stabilization alternative consists of the following components:

- Remove the current Zone E cover system (2-foot thick topsoil layer, , 1-foot drainage layer, and geomembrane) and stockpile near Zone E. Costing was based on pushing the cover system and soil fill into stockpiles using a bulldozer.

- A power rake will be pulled through the drainage layer stockpile to remove the geomembrane debris. The debris will be disposed at a solid waste landfill.

- Remove clean grading soil. Costing was based on pushing a 2-foot thick layer of clean soil into a stockpile using a bulldozer.

- Remove waste material and stockpile near Zone E. Costing was based on pushing the waste material into a stockpile using a bulldozer.

- Place waste material in the excavation area in 1-foot lifts. Cement will be mixed into the 1-foot lifts with a power tiller/shedder. For costing, an application rate of 10% cement was assumed.

- If debris found in the waste material limits the effectiveness of the mixing, the waste material will be passed through a screen to remove debris before placement into the excavation. Costs for screening are not included in the estimated cost.

- After completing placement of the lifts of waste material mixed with cement, the stockpile of clean soil will be placed over the waste material and graded to drain.

- A geomembrane liner and topsoil will be placed over the graded clean soil layer.

- Hydroseed finished ground surface.

Basis for Assumptions Used in Cost Estimate

Waste Quantity

The quantity of waste is based on weight tickets for truck loads taken to the landfill from 1973 to 1975, provided by Weyerhaeuser. A summary of weight tickets and dates is provided in Table 2.

Zone E Area

The area of Zone E is based on cell boundaries shown in Figure 5.7.1-1 in the FFS. The cap area was assumed to 1. 3 acres, which is consistent with the value listed in Table 2a, Appendix D of the FFS.

Thickness of Soil Cover

The cover layers and thicknesses were taken from Table 2a, Appendix D, of the FFS.

Cement Mix

The amount and type of cement to be used for mixing with the waste material will be determined from laboratory testing. The testing will evaluate structural stability, hydraulic conductivity and leaching of the treated waste material. The assumed 10% cement was based on past experience, findings from the design mix testing for the Balefill Area Extinguishment project (IWAG Group III, 2016), and testing on brine sludge used for producing non-structural concrete paving stones (Garg and Pundir, 2014). The cement used for treatment of the waste material could be a mixture of portland cement, slag cement[1], and bentonite. The Balefill design mix called for 12% slag cement and 4% bentonite. The testing for non-structural paving components showed that portland cement mixed at a rate of 50% with brine sludge provided a structural strength of 3,000 pounds per square foot (psf). This strength is much greater than needed for stabilization but demonstrates that brine sludge does not inhibit the performance of portland cement.

Table 1 summarizes estimated construction costs to complete the project. Construction costs were primarily based on estimates made by Stratus Corporation, a remediation general contractor based in Oregon.

References

Anchor QEA, 2014. Draft Focused Feasibility Study Pasco Landfill National Priority List Site, Anchor QEA, LLC. September 2014.

IWAG Group III, 2016. Revised Construction Summary Report for the Balefill Area Extinguishment and Supplemental Protection Barrier Project at the Pasco Landfill NPL Site, IWAG Group III. October 31, 2016.

[1] Slag cement is derived from ground granulated blast-furnace (GGBF) slag.

Garg and Pundir, 2014. Utilization of Brine Sludge in Nonstructural Building Components: A Sustainable Approach, Mridul Garg and Aakanksha Pundir, Journal of Waste Management, Volume 2014, Article ID 389316. August 21, 2014.

TABLES

Table 1. Alternative E-2 - Ex Situ Treatment

Work Item	Unit Cost	Units	Estimated Quantity	Estimated Cost	Comments
Construction Costs					
Mob/Supplies	$29,440	lump sum	1	$29,440	based on quote from Stratus Corp.
Soil Cover Removal and Stockpile					**unit prices based on quote from Stratus Corp.**
Topsoil stockpile (2 ft thick)	$15.57	c.yd.	4,195	$65,311	2 ft thick topsoil; 1.3 acre area
Drainage soil stockpile (1 ft thick)	$3.98	c.yd.	2,097	$8,347	1 ft thick soil layer w/ geomembrane; 1.3 acre area
Clean soil stockpile (2 ft thick)	$3.98	c.yd.	4,195	$16,695	2 ft thick soil layer for graded for drainage; 1.3 acre area
Remove geomembrane cover	$0.10	s.f.	56,628	$5,663	from Alternative E-3 cost spreadsheet
Waste Stabilization					**unit prices based on quote from Stratus Corp.**
Ex situ mix w/ cement	$17.62	per ton	15,000	$264,300	
Mix design testing	$80,000	LS	1	$80,000	includes sample collection and mix testing
Cement costs	$188.04	per ton	1,500	$282,060	assume 10% cement
Confirmation sampling	$50,000	LS	1	$50,000	run strength tests on cylinders as indicator of proper mix
Dust suppression	$0.96	per ton	15,000	$14,400	assumes onsite water available
Soil Cover Construction					**unit prices based on quote from Stratus Corp.**
Clean soil	$6.47	c.yd.	4,195	$27,139	2 ft thick for grading; use stockpiled soil
40 mil HDPE	$0.60	sq.ft.	56,628	$33,977	
Topsoil cover	$12.95	c.yd.	4,195	$54,321	2 ft thick; use stockpiled topsoil
Hydroseeding	$5,623	acre	1.3	$7,310	
Total Estimated Construction Costs:				**$938,963**	

Volume Estimates

Waste tonnage based on estimated 15,000 tons =	15,000	tons
HDPE Liner based on waste area + 65 ft perimeter = 1.3 acres	56,628	sq.ft.
Topsoil volume estimate based on: 1.3 acre by 2 ft deep =	4,195	c.yds
Drainage soil volume estimate based on: 1.3 acre by 1 ft deep =	2,097	c.yds
Clean soil volume estimate based on: 1.3 acre by 2 ft deep =	4,195	c.yds

Assumptions:

On-site water will be available for the dust suppresion, Equipment cleaning and construction activities

The machine Stratus would use for "Tilling" the soil is able to grind up the titanium anodes, Stratus will need a sample of one to determine this confirm item.

All equipment may be Washed/Decontaminated on-site with no wash water collection or treatment

Cement delivery is a 30-ton per load minimum

Table 2. Summary of Waste Weight Tickets

Disposal Date	Total Weight of Waste (lbs)	Disposal Date	Total Weight of Waste (lbs)	Disposal Date	Total Weight of Waste (lbs)
7/11/73	126,700	11/6/73	134,640	4/5/74	277,960
7/12/73	79,860	11/6/73	134,640	4/9/74	329,700
7/20/73	42,980	11/6/73	134,640	4/11/74	187,800
7/23/73	48,000	11/9/73	135,500	4/15/74	137,800
7/26/73	43,220	11/13/73	268,340	4/16/74	47,540
7/30/73	342,520	11/14/73	95,980	4/22/74	93,680
7/30/73	44,920	11/15/73	226,500	4/23/74	275,200
7/31/73	87,040	11/19/73	135,120	4/24/74	186,440
7/31/73	42,120	11/20/73	130,840	4/29/74	238,260
8/1/73	42,960	11/21/73	136,460	4/30/74	420,220
8/1/73	42,960	11/24/73	167,520	5/4/74	47,040
8/3/73	91,060	11/27/73	219,740	5/4/74	74,520
8/6/73	45,040	11/28/73	86,800	5/4/74	46,160
8/14/73	270,760	11/29/73	90,080	5/6/74	47,500
8/14/73	110,980	11/30/73	91,500	5/6/74	44,780
8/17/73	152,900	12/1/73	274,520	5/6/74	47,920
8/21/73	81,400	12/3/73	274,520	5/6/74	47,500
8/22/73	126,060	12/5/73	230,780	5/6/74	44,780
8/24/73	87,360	12/6/73	139,900	5/6/74	47,920
8/28/73	169,000	12/8/73	228,980	5/8/74	557,540
8/29/73	44,420	12/11/73	137,860	5/9/74	139,060
8/30/73	31,440	12/12/73	137,040	5/13/74	326,960
8/31/73	306,920	12/14/73	309,640	5/16/74	323,380
8/31/73	26,660	12/15/73	91,540	5/20/74	281,240
9/4/73	83,560	12/17/73	127,100	5/28/74	414,940
9/7/73	217,380	12/19/73	179,020	5/28/74	240,520
9/7/73	40,340	12/21/73	90,640	5/29/74	183,700
9/12/73	268,480	12/29/73	259,840	6/11/74	419,000
9/14/73	315,320	12/31/73	176,320	6/25/74	46,820
9/19/73	225,420	1/3/74	178,600	10/15/74	131,660
9/21/73	172,320	1/15/74	219,820	10/21/74	138,760
9/24/73	171,740	1/16/74	892,240	10/29/74	234,480
9/26/73	93,620	1/16/74	43,140	11/7/74	186,660
9/29/73	264,500	1/17/74	131,180	11/12/74	93,220
10/3/73	276,520	1/19/74	221,500	11/19/74	232,680
10/6/73	236,900	1/21/74	136,240	11/25/74	47,540
10/8/73	139,760	1/24/74	421,260	11/29/74	47,540
10/11/73	226,840	1/26/74	227,360	11/29/74	46,180
10/15/73	259,880	1/28/74	136,540	3/12/75	70,620
10/16/73	132,260	1/29/74	88,380	3/18/75	46,900
10/16/73	132,260	1/31/74	88,140		
10/17/73	132,260	2/1/74	87,540		
10/17/73	132,260	2/6/74	94,980		
10/18/73	210,920	2/7/74	188,740		
10/18/73	210,920	2/8/74	98,220		
10/19/73	210,920	2/11/74	186,340		
10/19/73	39,680	2/14/74	182,380		
10/19/73	39,680	2/14/74	45,140		
10/22/73	210,920	2/15/74	188,020		
10/22/73	210,920	2/18/74	92,420		
10/22/73	210,920	2/20/74	179,900		
10/23/73	186,620	2/21/74	92,420		
10/23/73	186,620	2/25/74	90,320		
10/24/73	49,160	2/27/74	46,440		
10/24/73	49,160	2/28/74	46,120		
10/25/73	186,620	2/28/74	184,320		
10/25/73	186,620	3/4/74	88,620		
10/25/73	186,620	3/5/74	90,640		
10/26/73	183,380	3/6/74	94,280		
10/26/73	183,380	3/11/74	135,600		
10/29/73	183,380	3/14/74	284,660		
10/29/73	183,380	3/15/74	186,380		
10/29/73	183,380	3/18/74	232,920		
10/30/73	132,760	3/18/74	43,560		
10/30/73	132,760	3/19/74	47,300		
10/31/73	132,760	3/19/74	46,900		
10/31/73	132,760	3/20/74	279,420		
11/1/73	81,840	3/23/74	48,660		
11/1/73	81,840	3/23/74	45,300		
11/1/73	81,840	3/26/74	321,960		
11/2/73	45,720	3/27/74	322,880		
11/2/73	45,720	3/29/74	185,440		
11/5/73	134,640	3/30/74	133,300		

29,178,380	**Total (lbs)**
14,589	**Total (tons)**

APPENDIX I
LANDFILL GAS GENERATION RATES
PASCO LANDFILL NPL SITE

Prepared by
Aspect Consulting LLC

August 2017

Methane generation and collection projections for the MSW Landfill have been updated periodically to assess the timeframe for sustained flare operations (Ecology, 2009 and 2011). Methane generation is due to decomposition of MSW under anaerobic conditions. Methane generation forecasting is affected by multiple factors, including waste volume, density, age, moisture content, and potential methane generating capacity, among other parameters. Methane collection efficiency is also affected by multiple factors including the landfill gas collection system design and operation. We compare the collectable methane projections with the observed flare methane requirements to assess the timeframe for sustained flare operations.

The U.S. Environmental Protection Agency (EPA) model LandGEM (EPA, 2005) was used to calculate landfill gas generation rates, and the LandGEM report is provided as Attachment I-1. The mass of potential methane-generating waste was calculated from the estimated volume of waste (2.3 million cubic yards) and the estimated density of waste (1,000 pounds per cubic yard). The waste placement history was assumed to be uniform during the years of operation. The methane generation potential was estimated to be 100 cubic meters per megagram of waste, the lower of two default values (compared to 170 cubic meters per megagram). The decay in methane generation rate was estimated to be 0.05 per year, the greater of two default values (compared to 0.02 per year). The combination of the lower methane generation potential and greater decay for methane generation rates yields the least amount of contemporary landfill gas generation. The collectable methane was estimated based on the assumption that the landfill gas collection system is 75 percent efficient, (SCS Engineers, 2008) Figure I-1 shows the projected methane generation rates (blue dash-dot line) and the projected collectable methane (error bars). Figure I-3 also shows LandGEM results with other combinations of assumptions resulting in greater methane generation rates (gray lines). The projected collectable methane was used to assess the timeframe for sustained flare operations.

The average methane collection rate during 2013 was approximately 28 scfm, and we do not anticipate substantial changes in this fuel requirement in the future. Projected collectable methane, represented by the error bars in Figure I-3, will be greater than 28 scfm through the year 2020. With a target methane concentration of 35 percent by volume, the total landfill gas collection rate is expected to be approximately 80 scfm, which is within the range

of historical values and the operating range for the flare system. Landfill gas generation and collection projections will be revisited in future annual reports.

LandGEM was used to calculate landfill gas generation rates for the Balefill Area and Burn Trenches, and the LandGEM reports are provided as Attachment I-2 and I-3, respectively. The mass of potential methane-generating waste was calculated from the estimated volumes of waste (2.3 million cubic yards) and the estimated density of waste (1,000 pounds per cubic yard). The waste placement history was assumed to be uniform during the years of operation. The methane generation potential was estimated to be 100 cubic meters per megagram of waste, the lower of two default values (compared to 170 cubic meters per megagram). The decay in methane generation rate was estimated to be 0.05 per year, the greater of two default values (compared to 0.02 per year). The combination of the lower methane generation potential and greater decay for methane generation rates yields the least amount of contemporary landfill gas generation. The collectable methane was estimated based on the assumption that the landfill gas collection system is 75 percent efficient, (SCS Engineers, 2008) Figure I-1 shows the projected methane generation rates (blue dash-dot line) and the projected collectable methane (error bars). Figure I-3 also shows LandGEM results with other combinations of assumptions resulting in greater methane generation rates (gray lines). The projected collectable methane was used to assess the timeframe for sustained flare operations.

The average methane collection rate during 2013 was approximately 28 scfm, and we do not anticipate substantial changes in this fuel requirement in the future. Projected collectable methane, represented by the error bars in Figure I-3, will be greater than 28 scfm through the year 2020. With a target methane concentration of 35 percent by volume, the total landfill gas collection rate is expected to be approximately 80 scfm, which is within the range of historical values and the operating range for the flare system. Landfill gas generation and collection projections will be revisited in future annual reports.

Summary Report

Landfill Name or Identifier: Pasco Sanitary Landfill - MSW Landfill

Date: Wednesday, August 27, 2014

Description/Comments:

About LandGEM:

First-Order Decomposition Rate Equation:

$$Q_{CH_4} = \sum_{i=1}^{n} \sum_{j=0.1}^{1} kL_o \left(\frac{M_i}{10} \right) e^{-kt_{ij}}$$

Where,

Q_{CH4} = annual methane generation in the year of the calculation ($m^3/year$)

i = 1-year time increment

n = (year of the calculation) - (initial year of waste acceptance)

j = 0.1-year time increment

k = methane generation rate ($year^{-1}$)

L_o = potential methane generation capacity (m^3/Mg)

M_i = mass of waste accepted in the i^{th} year (Mg)

t_{ij} = age of the j^{th} section of waste mass M_i accepted in the i^{th} year (*decimal years*, e.g., 3.2 years)

LandGEM is based on a first-order decomposition rate equation for quantifying emissions from the decomposition of landfilled waste in municipal solid waste (MSW) landfills. The software provides a relatively simple approach to estimating landfill gas emissions. Model defaults are based on empirical data from U.S. landfills. Field test data can also be used in place of model defaults when available. Further guidance on EPA test methods, Clean Air Act (CAA) regulations, and other guidance regarding landfill gas emissions and control technology requirements can be found at http://www.epa.gov/ttnatw01/landfill/landflpg.html.

LandGEM is considered a screening tool — the better the input data, the better the estimates. Often, there are limitations with the available data regarding waste quantity and composition, variation in design and operating practices over time, and changes occurring over time that impact the emissions potential. Changes to landfill operation, such as operating under wet conditions through leachate recirculation or other liquid additions, will result in generating more gas at a faster rate. Defaults for estimating emissions for this type of operation are being developed to include in LandGEM along with defaults for convential landfills (no leachate or liquid additions) for developing emission inventories and determining CAA applicability. Refer to the Web site identified above for future updates.

Input Review

LANDFILL CHARACTERISTICS

Landfill Open Year	**1958**	
Landfill Closure Year (with 80-year limit)	**1993**	
Actual Closure Year (without limit)	***1993***	
Have Model Calculate Closure Year?	**No**	
Waste Design Capacity	**1,030,000**	*megagrams*

MODEL PARAMETERS

Methane Generation Rate, k	**0.050**	*year^{-1}*
Potential Methane Generation Capacity, L_o	**100**	*m^3/Mg*
NMOC Concentration	**4,000**	*ppmv as hexane*
Methane Content	**50**	*% by volume*

GASES / POLLUTANTS SELECTED

Gas / Pollutant #1:	**Total landfill gas**
Gas / Pollutant #2:	**Methane**
Gas / Pollutant #3:	**Carbon dioxide**
Gas / Pollutant #4:	**NMOC**

WASTE ACCEPTANCE RATES

Year	Waste Accepted		Waste-In-Place	
	(Mg/year)	*(short tons/year)*	*(Mg)*	*(short tons)*
1958	29,429	32,371	0	0
1959	29,429	32,371	29,429	32,371
1960	29,429	32,371	58,857	64,743
1961	29,429	32,371	88,286	97,114
1962	29,429	32,371	117,714	129,486
1963	29,429	32,371	147,143	161,857
1964	29,429	32,371	176,571	194,229
1965	29,429	32,371	206,000	226,600
1966	29,429	32,371	235,429	258,971
1967	29,429	32,371	264,857	291,343
1968	29,429	32,371	294,286	323,714
1969	29,429	32,371	323,714	356,086
1970	29,429	32,371	353,143	388,457
1971	29,429	32,371	382,571	420,829
1972	29,429	32,371	412,000	453,200
1973	29,429	32,371	441,429	485,571
1974	29,429	32,371	470,857	517,943
1975	29,429	32,371	500,286	550,314
1976	29,429	32,371	529,714	582,686
1977	29,429	32,371	559,143	615,057
1978	29,429	32,371	588,571	647,429
1979	29,429	32,371	618,000	679,800
1980	29,429	32,371	647,429	712,171
1981	29,429	32,371	676,857	744,543
1982	29,429	32,371	706,286	776,914
1983	29,429	32,371	735,714	809,286
1984	29,429	32,371	765,143	841,657
1985	29,429	32,371	794,571	874,029
1986	29,429	32,371	824,000	906,400
1987	29,429	32,371	853,429	938,771
1988	29,429	32,371	882,857	971,143
1989	29,429	32,371	912,286	1,003,514
1990	29,429	32,371	941,714	1,035,886
1991	29,429	32,371	971,143	1,068,257
1992	29,429	32,371	1,000,571	1,100,629
1993	0	0	1,030,000	1,133,000
1994	0	0	1,030,000	1,133,000
1995	0	0	1,030,000	1,133,000
1996	0	0	1,030,000	1,133,000
1997	0	0	1,030,000	1,133,000

WASTE ACCEPTANCE RATES (Continued)

Year	Waste Accepted		Waste-In-Place	
	(Mg/year)	*(short tons/year)*	*(Mg)*	*(short tons)*
1998	0	0	1,030,000	1,133,000
1999	0	0	1,030,000	1,133,000
2000	0	0	1,030,000	1,133,000
2001	0	0	1,030,000	1,133,000
2002	0	0	1,030,000	1,133,000
2003	0	0	1,030,000	1,133,000
2004	0	0	1,030,000	1,133,000
2005	0	0	1,030,000	1,133,000
2006	0	0	1,030,000	1,133,000
2007	0	0	1,030,000	1,133,000
2008	0	0	1,030,000	1,133,000
2009	0	0	1,030,000	1,133,000
2010	0	0	1,030,000	1,133,000
2011	0	0	1,030,000	1,133,000
2012	0	0	1,030,000	1,133,000
2013	0	0	1,030,000	1,133,000
2014	0	0	1,030,000	1,133,000
2015	0	0	1,030,000	1,133,000
2016	0	0	1,030,000	1,133,000
2017	0	0	1,030,000	1,133,000
2018	0	0	1,030,000	1,133,000
2019	0	0	1,030,000	1,133,000
2020	0	0	1,030,000	1,133,000
2021	0	0	1,030,000	1,133,000
2022	0	0	1,030,000	1,133,000
2023	0	0	1,030,000	1,133,000
2024	0	0	1,030,000	1,133,000
2025	0	0	1,030,000	1,133,000
2026	0	0	1,030,000	1,133,000
2027	0	0	1,030,000	1,133,000
2028	0	0	1,030,000	1,133,000
2029	0	0	1,030,000	1,133,000
2030	0	0	1,030,000	1,133,000
2031	0	0	1,030,000	1,133,000
2032	0	0	1,030,000	1,133,000
2033	0	0	1,030,000	1,133,000
2034	0	0	1,030,000	1,133,000
2035	0	0	1,030,000	1,133,000
2036	0	0	1,030,000	1,133,000
2037	0	0	1,030,000	1,133,000

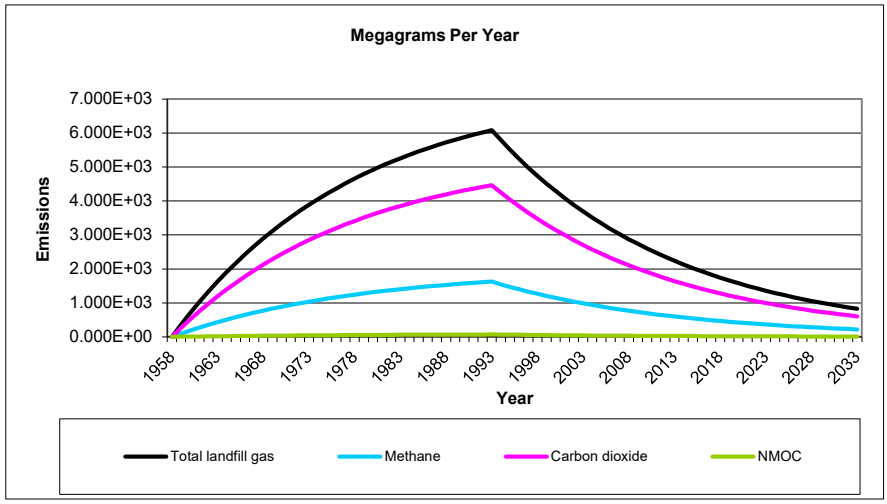
Pollutant Parameters

		Gas / Pollutant Default Parameters:		*User-specified Pollutant Parameters:*	
	Compound	Concentration (*ppmv*)	Molecular Weight	Concentration (*ppmv*)	Molecular Weight
Gases	Total landfill gas		0.00		
	Methane		16.04		
	Carbon dioxide		44.01		
	NMOC	4,000	86.18		
Pollutants	1,1,1-Trichloroethane (methyl chloroform) - HAP	0.48	133.41		
	1,1,2,2-Tetrachloroethane - HAP/VOC	1.1	167.85		
	1,1-Dichloroethane (ethylidene dichloride) - HAP/VOC	2.4	98.97		
	1,1-Dichloroethene (vinylidene chloride) - HAP/VOC	0.20	96.94		
	1,2-Dichloroethane (ethylene dichloride) - HAP/VOC	0.41	98.96		
	1,2-Dichloropropane (propylene dichloride) - HAP/VOC	0.18	112.99		
	2-Propanol (isopropyl alcohol) - VOC	50	60.11		
	Acetone	7.0	58.08		
	Acrylonitrile - HAP/VOC	6.3	53.06		
	Benzene - No or Unknown Co-disposal - HAP/VOC	1.9	78.11		
	Benzene - Co-disposal - HAP/VOC	11	78.11		
	Bromodichloromethane - VOC	3.1	163.83		
	Butane - VOC	5.0	58.12		
	Carbon disulfide - HAP/VOC	0.58	76.13		
	Carbon monoxide	140	28.01		
	Carbon tetrachloride - HAP/VOC	4.0E-03	153.84		
	Carbonyl sulfide - HAP/VOC	0.49	60.07		
	Chlorobenzene - HAP/VOC	0.25	112.56		
	Chlorodifluoromethane	1.3	86.47		
	Chloroethane (ethyl chloride) - HAP/VOC	1.3	64.52		
	Chloroform - HAP/VOC	0.03	119.39		
	Chloromethane - VOC	1.2	50.49		
	Dichlorobenzene - (HAP for para isomer/VOC)	0.21	147		
	Dichlorodifluoromethane	16	120.91		
	Dichlorofluoromethane - VOC	2.6	102.92		
	Dichloromethane (methylene chloride) - HAP	14	84.94		
	Dimethyl sulfide (methyl sulfide) - VOC	7.8	62.13		
	Ethane	890	30.07		
	Ethanol - VOC	27	46.08		

Pollutant Parameters (Continued)

		Gas / Pollutant Default Parameters:		*User-specified Pollutant Parameters:*	
	Compound	Concentration (*ppmv*)	Molecular Weight	Concentration (*ppmv*)	Molecular Weight
Pollutants	Ethyl mercaptan (ethanethiol) - VOC	2.3	62.13		
	Ethylbenzene - HAP/VOC	4.6	106.16		
	Ethylene dibromide - HAP/VOC	1.0E-03	187.88		
	Fluorotrichloromethane - VOC	0.76	137.38		
	Hexane - HAP/VOC	6.6	86.18		
	Hydrogen sulfide	36	34.08		
	Mercury (total) - HAP	2.9E-04	200.61		
	Methyl ethyl ketone - HAP/VOC	7.1	72.11		
	Methyl isobutyl ketone - HAP/VOC	1.9	100.16		
	Methyl mercaptan - VOC	2.5	48.11		
	Pentane - VOC	3.3	72.15		
	Perchloroethylene (tetrachloroethylene) - HAP	3.7	165.83		
	Propane - VOC	11	44.09		
	t-1,2-Dichloroethene - VOC	2.8	96.94		
	Toluene - No or Unknown Co-disposal - HAP/VOC	39	92.13		
	Toluene - Co-disposal - HAP/VOC	170	92.13		
	Trichloroethylene (trichloroethene) - HAP/VOC	2.8	131.40		
	Vinyl chloride - HAP/VOC	7.3	62.50		
	Xylenes - HAP/VOC	12	106.16		

Graphs


Megagrams Per Year
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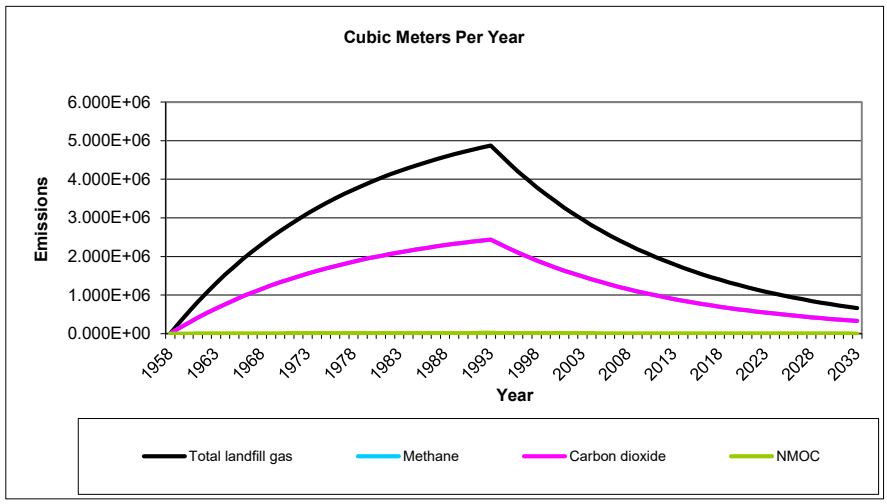
6.000E+03
5.000E+03
4.000E+03
3.000E+03
2.000E+03
1.000E+03
0.000E+00
1958 1963 1968 1973 1978 1983 1988 1993 1998 2003 2008 2013 2018 2023 2028 2033
Year
Total landfill gas
Methane
Carbon dioxide
NMOC


Cubic Meters Per Year
Emissions
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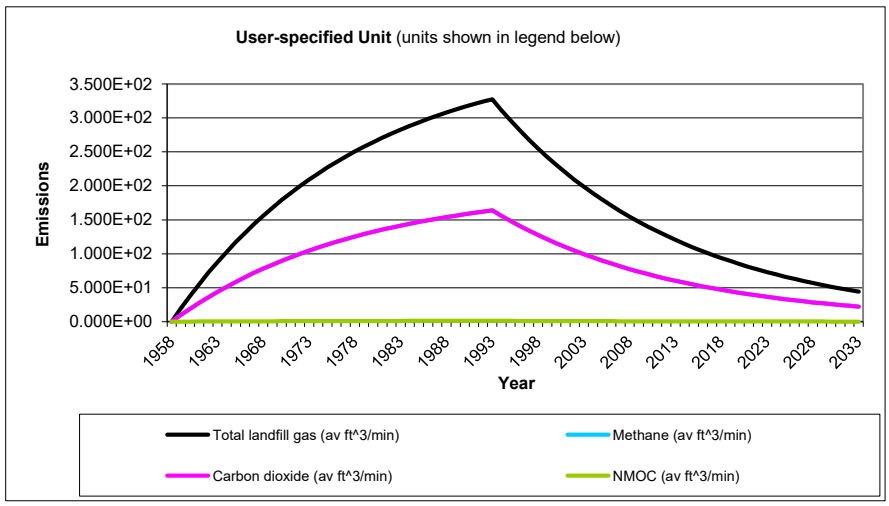
5.000E+06
4.000E+06
3.000E+06
2.000E+06
1.000E+06
0.000E+00
1958 1963 1968 1973 1978 1983 1988 1993 1998 2003 2008 2013 2018 2023 2028 2033
Year
Total landfill gas
Methane
Carbon dioxide
NMOC


User-specified Unit (units shown in legend below)
Emissions
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3.000E+02
2.500E+02
2.000E+02
1.500E+02
1.000E+02
5.000E+01
0.000E+00
1958 1963 1968 1973 1978 1983 1988 1993 1998 2003 2008 2013 2018 2023 2028 2033
Year
Total landfill gas (av ft^3/min)
Methane (av ft^3/min)
Carbon dioxide (av ft^3/min)
NMOC (av ft^3/min)

Results

Year	Total landfill gas			Methane		
	(Mg/year)	*(m^3/year)*	*(av ft^3/min)*	*(Mg/year)*	*(m^3/year)*	*(av ft^3/min)*
1958	0	0	0	0	0	0
1959	3.594E+02	2.878E+05	1.934E+01	9.599E+01	1.439E+05	9.668E+00
1960	7.012E+02	5.615E+05	3.773E+01	1.873E+02	2.808E+05	1.886E+01
1961	1.026E+03	8.219E+05	5.522E+01	2.742E+02	4.109E+05	2.761E+01
1962	1.336E+03	1.070E+06	7.186E+01	3.568E+02	5.348E+05	3.593E+01
1963	1.630E+03	1.305E+06	8.769E+01	4.354E+02	6.526E+05	4.385E+01
1964	1.910E+03	1.529E+06	1.028E+02	5.101E+02	7.646E+05	5.138E+01
1965	2.176E+03	1.742E+06	1.171E+02	5.812E+02	8.712E+05	5.854E+01
1966	2.429E+03	1.945E+06	1.307E+02	6.489E+02	9.726E+05	6.535E+01
1967	2.670E+03	2.138E+06	1.437E+02	7.132E+02	1.069E+06	7.183E+01
1968	2.899E+03	2.322E+06	1.560E+02	7.744E+02	1.161E+06	7.800E+01
1969	3.117E+03	2.496E+06	1.677E+02	8.327E+02	1.248E+06	8.386E+01
1970	3.325E+03	2.662E+06	1.789E+02	8.880E+02	1.331E+06	8.944E+01
1971	3.522E+03	2.820E+06	1.895E+02	9.407E+02	1.410E+06	9.474E+01
1972	3.709E+03	2.970E+06	1.996E+02	9.908E+02	1.485E+06	9.979E+01
1973	3.888E+03	3.113E+06	2.092E+02	1.039E+03	1.557E+06	1.046E+02
1974	4.058E+03	3.249E+06	2.183E+02	1.084E+03	1.625E+06	1.092E+02
1975	4.219E+03	3.379E+06	2.270E+02	1.127E+03	1.689E+06	1.135E+02
1976	4.373E+03	3.502E+06	2.353E+02	1.168E+03	1.751E+06	1.176E+02
1977	4.519E+03	3.618E+06	2.431E+02	1.207E+03	1.809E+06	1.216E+02
1978	4.658E+03	3.730E+06	2.506E+02	1.244E+03	1.865E+06	1.253E+02
1979	4.790E+03	3.836E+06	2.577E+02	1.279E+03	1.918E+06	1.289E+02
1980	4.916E+03	3.936E+06	2.645E+02	1.313E+03	1.968E+06	1.322E+02
1981	5.035E+03	4.032E+06	2.709E+02	1.345E+03	2.016E+06	1.355E+02
1982	5.149E+03	4.123E+06	2.770E+02	1.375E+03	2.062E+06	1.385E+02
1983	5.257E+03	4.210E+06	2.829E+02	1.404E+03	2.105E+06	1.414E+02
1984	5.360E+03	4.292E+06	2.884E+02	1.432E+03	2.146E+06	1.442E+02
1985	5.458E+03	4.371E+06	2.937E+02	1.458E+03	2.185E+06	1.468E+02
1986	5.552E+03	4.445E+06	2.987E+02	1.483E+03	2.223E+06	1.493E+02
1987	5.640E+03	4.516E+06	3.035E+02	1.507E+03	2.258E+06	1.517E+02
1988	5.724E+03	4.584E+06	3.080E+02	1.529E+03	2.292E+06	1.540E+02
1989	5.805E+03	4.648E+06	3.123E+02	1.550E+03	2.324E+06	1.562E+02
1990	5.881E+03	4.709E+06	3.164E+02	1.571E+03	2.355E+06	1.582E+02
1991	5.953E+03	4.767E+06	3.203E+02	1.590E+03	2.384E+06	1.602E+02
1992	6.022E+03	4.823E+06	3.240E+02	1.609E+03	2.411E+06	1.620E+02
1993	6.088E+03	4.875E+06	3.276E+02	1.626E+03	2.438E+06	1.638E+02
1994	5.791E+03	4.637E+06	3.116E+02	1.547E+03	2.319E+06	1.558E+02
1995	5.509E+03	4.411E+06	2.964E+02	1.471E+03	2.206E+06	1.482E+02
1996	5.240E+03	4.196E+06	2.819E+02	1.400E+03	2.098E+06	1.410E+02
1997	4.985E+03	3.991E+06	2.682E+02	1.331E+03	1.996E+06	1.341E+02
1998	4.741E+03	3.797E+06	2.551E+02	1.266E+03	1.898E+06	1.276E+02
1999	4.510E+03	3.612E+06	2.427E+02	1.205E+03	1.806E+06	1.213E+02
2000	4.290E+03	3.435E+06	2.308E+02	1.146E+03	1.718E+06	1.154E+02
2001	4.081E+03	3.268E+06	2.196E+02	1.090E+03	1.634E+06	1.098E+02
2002	3.882E+03	3.108E+06	2.089E+02	1.037E+03	1.554E+06	1.044E+02
2003	3.693E+03	2.957E+06	1.987E+02	9.863E+02	1.478E+06	9.934E+01
2004	3.513E+03	2.813E+06	1.890E+02	9.382E+02	1.406E+06	9.449E+01
2005	3.341E+03	2.676E+06	1.798E+02	8.925E+02	1.338E+06	8.988E+01
2006	3.178E+03	2.545E+06	1.710E+02	8.490E+02	1.273E+06	8.550E+01
2007	3.023E+03	2.421E+06	1.627E+02	8.076E+02	1.210E+06	8.133E+01

Results (Continued)

Year	Total landfill gas			Methane		
	(Mg/year)	*(m^3/year)*	*(av ft^3/min)*	*(Mg/year)*	*(m^3/year)*	*(av ft^3/min)*
2008	2.876E+03	2.303E+06	1.547E+02	7.682E+02	1.151E+06	7.736E+01
2009	2.736E+03	2.191E+06	1.472E+02	7.307E+02	1.095E+06	7.359E+01
2010	2.602E+03	2.084E+06	1.400E+02	6.951E+02	1.042E+06	7.000E+01
2011	2.475E+03	1.982E+06	1.332E+02	6.612E+02	9.910E+05	6.659E+01
2012	2.355E+03	1.885E+06	1.267E+02	6.289E+02	9.427E+05	6.334E+01
2013	2.240E+03	1.793E+06	1.205E+02	5.982E+02	8.967E+05	6.025E+01
2014	2.130E+03	1.706E+06	1.146E+02	5.691E+02	8.530E+05	5.731E+01
2015	2.027E+03	1.623E+06	1.090E+02	5.413E+02	8.114E+05	5.452E+01
2016	1.928E+03	1.544E+06	1.037E+02	5.149E+02	7.718E+05	5.186E+01
2017	1.834E+03	1.468E+06	9.866E+01	4.898E+02	7.342E+05	4.933E+01
2018	1.744E+03	1.397E+06	9.385E+01	4.659E+02	6.984E+05	4.692E+01
2019	1.659E+03	1.329E+06	8.927E+01	4.432E+02	6.643E+05	4.463E+01
2020	1.578E+03	1.264E+06	8.492E+01	4.216E+02	6.319E+05	4.246E+01
2021	1.501E+03	1.202E+06	8.077E+01	4.010E+02	6.011E+05	4.039E+01
2022	1.428E+03	1.144E+06	7.684E+01	3.815E+02	5.718E+05	3.842E+01
2023	1.358E+03	1.088E+06	7.309E+01	3.629E+02	5.439E+05	3.654E+01
2024	1.292E+03	1.035E+06	6.952E+01	3.452E+02	5.174E+05	3.476E+01
2025	1.229E+03	9.843E+05	6.613E+01	3.283E+02	4.921E+05	3.307E+01
2026	1.169E+03	9.363E+05	6.291E+01	3.123E+02	4.681E+05	3.145E+01
2027	1.112E+03	8.906E+05	5.984E+01	2.971E+02	4.453E+05	2.992E+01
2028	1.058E+03	8.472E+05	5.692E+01	2.826E+02	4.236E+05	2.846E+01
2029	1.006E+03	8.058E+05	5.414E+01	2.688E+02	4.029E+05	2.707E+01
2030	9.573E+02	7.665E+05	5.150E+01	2.557E+02	3.833E+05	2.575E+01
2031	9.106E+02	7.292E+05	4.899E+01	2.432E+02	3.646E+05	2.450E+01
2032	8.662E+02	6.936E+05	4.660E+01	2.314E+02	3.468E+05	2.330E+01
2033	8.239E+02	6.598E+05	4.433E+01	2.201E+02	3.299E+05	2.217E+01
2034	7.838E+02	6.276E+05	4.217E+01	2.093E+02	3.138E+05	2.108E+01
2035	7.455E+02	5.970E+05	4.011E+01	1.991E+02	2.985E+05	2.006E+01
2036	7.092E+02	5.679E+05	3.816E+01	1.894E+02	2.839E+05	1.908E+01
2037	6.746E+02	5.402E+05	3.629E+01	1.802E+02	2.701E+05	1.815E+01
2038	6.417E+02	5.138E+05	3.452E+01	1.714E+02	2.569E+05	1.726E+01
2039	6.104E+02	4.888E+05	3.284E+01	1.630E+02	2.444E+05	1.642E+01
2040	5.806E+02	4.649E+05	3.124E+01	1.551E+02	2.325E+05	1.562E+01
2041	5.523E+02	4.423E+05	2.972E+01	1.475E+02	2.211E+05	1.486E+01
2042	5.254E+02	4.207E+05	2.827E+01	1.403E+02	2.103E+05	1.413E+01
2043	4.997E+02	4.002E+05	2.689E+01	1.335E+02	2.001E+05	1.344E+01
2044	4.754E+02	3.807E+05	2.558E+01	1.270E+02	1.903E+05	1.279E+01
2045	4.522E+02	3.621E+05	2.433E+01	1.208E+02	1.810E+05	1.216E+01
2046	4.301E+02	3.444E+05	2.314E+01	1.149E+02	1.722E+05	1.157E+01
2047	4.092E+02	3.276E+05	2.201E+01	1.093E+02	1.638E+05	1.101E+01
2048	3.892E+02	3.117E+05	2.094E+01	1.040E+02	1.558E+05	1.047E+01
2049	3.702E+02	2.965E+05	1.992E+01	9.889E+01	1.482E+05	9.959E+00
2050	3.522E+02	2.820E+05	1.895E+01	9.407E+01	1.410E+05	9.474E+00
2051	3.350E+02	2.682E+05	1.802E+01	8.948E+01	1.341E+05	9.012E+00
2052	3.187E+02	2.552E+05	1.714E+01	8.512E+01	1.276E+05	8.572E+00
2053	3.031E+02	2.427E+05	1.631E+01	8.096E+01	1.214E+05	8.154E+00
2054	2.883E+02	2.309E+05	1.551E+01	7.702E+01	1.154E+05	7.756E+00
2055	2.743E+02	2.196E+05	1.476E+01	7.326E+01	1.098E+05	7.378E+00
2056	2.609E+02	2.089E+05	1.404E+01	6.969E+01	1.045E+05	7.018E+00
2057	2.482E+02	1.987E+05	1.335E+01	6.629E+01	9.936E+04	6.676E+00
2058	2.361E+02	1.890E+05	1.270E+01	6.305E+01	9.451E+04	6.350E+00

Results (Continued)

Year	Total landfill gas			Methane		
	(Mg/year)	*(m^3/year)*	*(av ft^3/min)*	*(Mg/year)*	*(m^3/year)*	*(av ft^3/min)*
2059	2.245E+02	1.798E+05	1.208E+01	5.998E+01	8.990E+04	6.041E+00
2060	2.136E+02	1.710E+05	1.149E+01	5.705E+01	8.552E+04	5.746E+00
2061	2.032E+02	1.627E+05	1.093E+01	5.427E+01	8.135E+04	5.466E+00
2062	1.933E+02	1.548E+05	1.040E+01	5.162E+01	7.738E+04	5.199E+00
2063	1.838E+02	1.472E+05	9.891E+00	4.911E+01	7.361E+04	4.946E+00
2064	1.749E+02	1.400E+05	9.409E+00	4.671E+01	7.002E+04	4.704E+00
2065	1.664E+02	1.332E+05	8.950E+00	4.443E+01	6.660E+04	4.475E+00
2066	1.582E+02	1.267E+05	8.514E+00	4.227E+01	6.335E+04	4.257E+00
2067	1.505E+02	1.205E+05	8.098E+00	4.021E+01	6.026E+04	4.049E+00
2068	1.432E+02	1.147E+05	7.703E+00	3.824E+01	5.733E+04	3.852E+00
2069	1.362E+02	1.091E+05	7.328E+00	3.638E+01	5.453E+04	3.664E+00
2070	1.296E+02	1.037E+05	6.970E+00	3.461E+01	5.187E+04	3.485E+00
2071	1.232E+02	9.868E+04	6.630E+00	3.292E+01	4.934E+04	3.315E+00
2072	1.172E+02	9.387E+04	6.307E+00	3.131E+01	4.693E+04	3.154E+00
2073	1.115E+02	8.929E+04	5.999E+00	2.979E+01	4.465E+04	3.000E+00
2074	1.061E+02	8.494E+04	5.707E+00	2.833E+01	4.247E+04	2.853E+00
2075	1.009E+02	8.079E+04	5.428E+00	2.695E+01	4.040E+04	2.714E+00
2076	9.598E+01	7.685E+04	5.164E+00	2.564E+01	3.843E+04	2.582E+00
2077	9.130E+01	7.310E+04	4.912E+00	2.439E+01	3.655E+04	2.456E+00
2078	8.684E+01	6.954E+04	4.672E+00	2.320E+01	3.477E+04	2.336E+00
2079	8.261E+01	6.615E+04	4.444E+00	2.207E+01	3.307E+04	2.222E+00
2080	7.858E+01	6.292E+04	4.228E+00	2.099E+01	3.146E+04	2.114E+00
2081	7.475E+01	5.985E+04	4.022E+00	1.997E+01	2.993E+04	2.011E+00
2082	7.110E+01	5.693E+04	3.825E+00	1.899E+01	2.847E+04	1.913E+00
2083	6.763E+01	5.416E+04	3.639E+00	1.807E+01	2.708E+04	1.819E+00
2084	6.433E+01	5.152E+04	3.461E+00	1.718E+01	2.576E+04	1.731E+00
2085	6.120E+01	4.900E+04	3.293E+00	1.635E+01	2.450E+04	1.646E+00
2086	5.821E+01	4.661E+04	3.132E+00	1.555E+01	2.331E+04	1.566E+00
2087	5.537E+01	4.434E+04	2.979E+00	1.479E+01	2.217E+04	1.490E+00
2088	5.267E+01	4.218E+04	2.834E+00	1.407E+01	2.109E+04	1.417E+00
2089	5.010E+01	4.012E+04	2.696E+00	1.338E+01	2.006E+04	1.348E+00
2090	4.766E+01	3.816E+04	2.564E+00	1.273E+01	1.908E+04	1.282E+00
2091	4.534E+01	3.630E+04	2.439E+00	1.211E+01	1.815E+04	1.220E+00
2092	4.312E+01	3.453E+04	2.320E+00	1.152E+01	1.727E+04	1.160E+00
2093	4.102E+01	3.285E+04	2.207E+00	1.096E+01	1.642E+04	1.104E+00
2094	3.902E+01	3.125E+04	2.099E+00	1.042E+01	1.562E+04	1.050E+00
2095	3.712E+01	2.972E+04	1.997E+00	9.915E+00	1.486E+04	9.985E-01
2096	3.531E+01	2.827E+04	1.900E+00	9.431E+00	1.414E+04	9.498E-01
2097	3.359E+01	2.689E+04	1.807E+00	8.971E+00	1.345E+04	9.035E-01
2098	3.195E+01	2.558E+04	1.719E+00	8.534E+00	1.279E+04	8.594E-01

Results (Continued)

Year	Carbon dioxide			NMOC		
	(Mg/year)	*(m^3/year)*	*(av ft^3/min)*	*(Mg/year)*	*(m^3/year)*	*(av ft^3/min)*
1958	0	0	0	0	0	0
1959	2.634E+02	1.439E+05	9.668E+00	4.126E+00	1.151E+03	7.734E-02
1960	5.139E+02	2.808E+05	1.886E+01	8.051E+00	2.246E+03	1.509E-01
1961	7.522E+02	4.109E+05	2.761E+01	1.178E+01	3.288E+03	2.209E-01
1962	9.789E+02	5.348E+05	3.593E+01	1.534E+01	4.278E+03	2.875E-01
1963	1.195E+03	6.526E+05	4.385E+01	1.871E+01	5.221E+03	3.508E-01
1964	1.400E+03	7.646E+05	5.138E+01	2.193E+01	6.117E+03	4.110E-01
1965	1.595E+03	8.712E+05	5.854E+01	2.498E+01	6.970E+03	4.683E-01
1966	1.780E+03	9.726E+05	6.535E+01	2.789E+01	7.781E+03	5.228E-01
1967	1.957E+03	1.069E+06	7.183E+01	3.066E+01	8.553E+03	5.746E-01
1968	2.125E+03	1.161E+06	7.800E+01	3.329E+01	9.287E+03	6.240E-01
1969	2.285E+03	1.248E+06	8.386E+01	3.579E+01	9.985E+03	6.709E-01
1970	2.437E+03	1.331E+06	8.944E+01	3.817E+01	1.065E+04	7.155E-01
1971	2.581E+03	1.410E+06	9.474E+01	4.043E+01	1.128E+04	7.579E-01
1972	2.719E+03	1.485E+06	9.979E+01	4.259E+01	1.188E+04	7.983E-01
1973	2.849E+03	1.557E+06	1.046E+02	4.464E+01	1.245E+04	8.367E-01
1974	2.974E+03	1.625E+06	1.092E+02	4.659E+01	1.300E+04	8.733E-01
1975	3.092E+03	1.689E+06	1.135E+02	4.844E+01	1.351E+04	9.080E-01
1976	3.205E+03	1.751E+06	1.176E+02	5.020E+01	1.401E+04	9.411E-01
1977	3.312E+03	1.809E+06	1.216E+02	5.188E+01	1.447E+04	9.725E-01
1978	3.414E+03	1.865E+06	1.253E+02	5.348E+01	1.492E+04	1.002E+00
1979	3.511E+03	1.918E+06	1.289E+02	5.500E+01	1.534E+04	1.031E+00
1980	3.603E+03	1.968E+06	1.322E+02	5.644E+01	1.575E+04	1.058E+00
1981	3.690E+03	2.016E+06	1.355E+02	5.781E+01	1.613E+04	1.084E+00
1982	3.774E+03	2.062E+06	1.385E+02	5.912E+01	1.649E+04	1.108E+00
1983	3.853E+03	2.105E+06	1.414E+02	6.036E+01	1.684E+04	1.131E+00
1984	3.929E+03	2.146E+06	1.442E+02	6.154E+01	1.717E+04	1.154E+00
1985	4.000E+03	2.185E+06	1.468E+02	6.267E+01	1.748E+04	1.175E+00
1986	4.069E+03	2.223E+06	1.493E+02	6.374E+01	1.778E+04	1.195E+00
1987	4.134E+03	2.258E+06	1.517E+02	6.476E+01	1.807E+04	1.214E+00
1988	4.195E+03	2.292E+06	1.540E+02	6.572E+01	1.834E+04	1.232E+00
1989	4.254E+03	2.324E+06	1.562E+02	6.664E+01	1.859E+04	1.249E+00
1990	4.310E+03	2.355E+06	1.582E+02	6.752E+01	1.884E+04	1.266E+00
1991	4.363E+03	2.384E+06	1.602E+02	6.835E+01	1.907E+04	1.281E+00
1992	4.414E+03	2.411E+06	1.620E+02	6.914E+01	1.929E+04	1.296E+00
1993	4.462E+03	2.438E+06	1.638E+02	6.990E+01	1.950E+04	1.310E+00
1994	4.244E+03	2.319E+06	1.558E+02	6.649E+01	1.855E+04	1.246E+00
1995	4.037E+03	2.206E+06	1.482E+02	6.325E+01	1.764E+04	1.186E+00
1996	3.840E+03	2.098E+06	1.410E+02	6.016E+01	1.678E+04	1.128E+00
1997	3.653E+03	1.996E+06	1.341E+02	5.723E+01	1.597E+04	1.073E+00
1998	3.475E+03	1.898E+06	1.276E+02	5.444E+01	1.519E+04	1.020E+00
1999	3.305E+03	1.806E+06	1.213E+02	5.178E+01	1.445E+04	9.706E-01
2000	3.144E+03	1.718E+06	1.154E+02	4.926E+01	1.374E+04	9.233E-01
2001	2.991E+03	1.634E+06	1.098E+02	4.685E+01	1.307E+04	8.783E-01
2002	2.845E+03	1.554E+06	1.044E+02	4.457E+01	1.243E+04	8.354E-01
2003	2.706E+03	1.478E+06	9.934E+01	4.240E+01	1.183E+04	7.947E-01
2004	2.574E+03	1.406E+06	9.449E+01	4.033E+01	1.125E+04	7.559E-01
2005	2.449E+03	1.338E+06	8.988E+01	3.836E+01	1.070E+04	7.191E-01
2006	2.329E+03	1.273E+06	8.550E+01	3.649E+01	1.018E+04	6.840E-01
2007	2.216E+03	1.210E+06	8.133E+01	3.471E+01	9.684E+03	6.506E-01

Results (Continued)

Year	Carbon dioxide			NMOC		
	(Mg/year)	*(m^3/year)*	*(av ft^3/min)*	*(Mg/year)*	*(m^3/year)*	*(av ft^3/min)*
2008	2.108E+03	1.151E+06	7.736E+01	3.302E+01	9.211E+03	6.189E-01
2009	2.005E+03	1.095E+06	7.359E+01	3.141E+01	8.762E+03	5.887E-01
2010	1.907E+03	1.042E+06	7.000E+01	2.988E+01	8.335E+03	5.600E-01
2011	1.814E+03	9.910E+05	6.659E+01	2.842E+01	7.928E+03	5.327E-01
2012	1.726E+03	9.427E+05	6.334E+01	2.703E+01	7.542E+03	5.067E-01
2013	1.641E+03	8.967E+05	6.025E+01	2.571E+01	7.174E+03	4.820E-01
2014	1.561E+03	8.530E+05	5.731E+01	2.446E+01	6.824E+03	4.585E-01
2015	1.485E+03	8.114E+05	5.452E+01	2.327E+01	6.491E+03	4.361E-01
2016	1.413E+03	7.718E+05	5.186E+01	2.213E+01	6.175E+03	4.149E-01
2017	1.344E+03	7.342E+05	4.933E+01	2.105E+01	5.873E+03	3.946E-01
2018	1.278E+03	6.984E+05	4.692E+01	2.003E+01	5.587E+03	3.754E-01
2019	1.216E+03	6.643E+05	4.463E+01	1.905E+01	5.314E+03	3.571E-01
2020	1.157E+03	6.319E+05	4.246E+01	1.812E+01	5.055E+03	3.397E-01
2021	1.100E+03	6.011E+05	4.039E+01	1.724E+01	4.809E+03	3.231E-01
2022	1.047E+03	5.718E+05	3.842E+01	1.640E+01	4.574E+03	3.073E-01
2023	9.956E+02	5.439E+05	3.654E+01	1.560E+01	4.351E+03	2.924E-01
2024	9.470E+02	5.174E+05	3.476E+01	1.484E+01	4.139E+03	2.781E-01
2025	9.008E+02	4.921E+05	3.307E+01	1.411E+01	3.937E+03	2.645E-01
2026	8.569E+02	4.681E+05	3.145E+01	1.342E+01	3.745E+03	2.516E-01
2027	8.151E+02	4.453E+05	2.992E+01	1.277E+01	3.562E+03	2.394E-01
2028	7.754E+02	4.236E+05	2.846E+01	1.215E+01	3.389E+03	2.277E-01
2029	7.376E+02	4.029E+05	2.707E+01	1.155E+01	3.223E+03	2.166E-01
2030	7.016E+02	3.833E+05	2.575E+01	1.099E+01	3.066E+03	2.060E-01
2031	6.674E+02	3.646E+05	2.450E+01	1.045E+01	2.917E+03	1.960E-01
2032	6.348E+02	3.468E+05	2.330E+01	9.945E+00	2.774E+03	1.864E-01
2033	6.039E+02	3.299E+05	2.217E+01	9.460E+00	2.639E+03	1.773E-01
2034	5.744E+02	3.138E+05	2.108E+01	8.998E+00	2.510E+03	1.687E-01
2035	5.464E+02	2.985E+05	2.006E+01	8.560E+00	2.388E+03	1.604E-01
2036	5.197E+02	2.839E+05	1.908E+01	8.142E+00	2.271E+03	1.526E-01
2037	4.944E+02	2.701E+05	1.815E+01	7.745E+00	2.161E+03	1.452E-01
2038	4.703E+02	2.569E+05	1.726E+01	7.367E+00	2.055E+03	1.381E-01
2039	4.473E+02	2.444E+05	1.642E+01	7.008E+00	1.955E+03	1.314E-01
2040	4.255E+02	2.325E+05	1.562E+01	6.666E+00	1.860E+03	1.250E-01
2041	4.048E+02	2.211E+05	1.486E+01	6.341E+00	1.769E+03	1.189E-01
2042	3.850E+02	2.103E+05	1.413E+01	6.032E+00	1.683E+03	1.131E-01
2043	3.663E+02	2.001E+05	1.344E+01	5.738E+00	1.601E+03	1.076E-01
2044	3.484E+02	1.903E+05	1.279E+01	5.458E+00	1.523E+03	1.023E-01
2045	3.314E+02	1.810E+05	1.216E+01	5.192E+00	1.448E+03	9.732E-02
2046	3.152E+02	1.722E+05	1.157E+01	4.938E+00	1.378E+03	9.257E-02
2047	2.999E+02	1.638E+05	1.101E+01	4.698E+00	1.311E+03	8.805E-02
2048	2.852E+02	1.558E+05	1.047E+01	4.468E+00	1.247E+03	8.376E-02
2049	2.713E+02	1.482E+05	9.959E+00	4.251E+00	1.186E+03	7.968E-02
2050	2.581E+02	1.410E+05	9.474E+00	4.043E+00	1.128E+03	7.579E-02
2051	2.455E+02	1.341E+05	9.012E+00	3.846E+00	1.073E+03	7.209E-02
2052	2.335E+02	1.276E+05	8.572E+00	3.658E+00	1.021E+03	6.858E-02
2053	2.221E+02	1.214E+05	8.154E+00	3.480E+00	9.709E+02	6.523E-02
2054	2.113E+02	1.154E+05	7.756E+00	3.310E+00	9.235E+02	6.205E-02
2055	2.010E+02	1.098E+05	7.378E+00	3.149E+00	8.785E+02	5.902E-02
2056	1.912E+02	1.045E+05	7.018E+00	2.995E+00	8.356E+02	5.615E-02
2057	1.819E+02	9.936E+04	6.676E+00	2.849E+00	7.949E+02	5.341E-02
2058	1.730E+02	9.451E+04	6.350E+00	2.710E+00	7.561E+02	5.080E-02

Results (Continued)

Year	Carbon dioxide			NMOC		
	(Mg/year)	*(m^3/year)*	*(av ft^3/min)*	*(Mg/year)*	*(m^3/year)*	*(av ft^3/min)*
2059	1.646E+02	8.990E+04	6.041E+00	2.578E+00	7.192E+02	4.833E-02
2060	1.565E+02	8.552E+04	5.746E+00	2.452E+00	6.842E+02	4.597E-02
2061	1.489E+02	8.135E+04	5.466E+00	2.333E+00	6.508E+02	4.373E-02
2062	1.416E+02	7.738E+04	5.199E+00	2.219E+00	6.191E+02	4.159E-02
2063	1.347E+02	7.361E+04	4.946E+00	2.111E+00	5.889E+02	3.957E-02
2064	1.282E+02	7.002E+04	4.704E+00	2.008E+00	5.601E+02	3.764E-02
2065	1.219E+02	6.660E+04	4.475E+00	1.910E+00	5.328E+02	3.580E-02
2066	1.160E+02	6.335E+04	4.257E+00	1.817E+00	5.068E+02	3.405E-02
2067	1.103E+02	6.026E+04	4.049E+00	1.728E+00	4.821E+02	3.239E-02
2068	1.049E+02	5.733E+04	3.852E+00	1.644E+00	4.586E+02	3.081E-02
2069	9.982E+01	5.453E+04	3.664E+00	1.564E+00	4.362E+02	2.931E-02
2070	9.495E+01	5.187E+04	3.485E+00	1.487E+00	4.150E+02	2.788E-02
2071	9.032E+01	4.934E+04	3.315E+00	1.415E+00	3.947E+02	2.652E-02
2072	8.591E+01	4.693E+04	3.154E+00	1.346E+00	3.755E+02	2.523E-02
2073	8.172E+01	4.465E+04	3.000E+00	1.280E+00	3.572E+02	2.400E-02
2074	7.774E+01	4.247E+04	2.853E+00	1.218E+00	3.397E+02	2.283E-02
2075	7.395E+01	4.040E+04	2.714E+00	1.158E+00	3.232E+02	2.171E-02
2076	7.034E+01	3.843E+04	2.582E+00	1.102E+00	3.074E+02	2.065E-02
2077	6.691E+01	3.655E+04	2.456E+00	1.048E+00	2.924E+02	1.965E-02
2078	6.365E+01	3.477E+04	2.336E+00	9.970E-01	2.782E+02	1.869E-02
2079	6.054E+01	3.307E+04	2.222E+00	9.484E-01	2.646E+02	1.778E-02
2080	5.759E+01	3.146E+04	2.114E+00	9.022E-01	2.517E+02	1.691E-02
2081	5.478E+01	2.993E+04	2.011E+00	8.582E-01	2.394E+02	1.609E-02
2082	5.211E+01	2.847E+04	1.913E+00	8.163E-01	2.277E+02	1.530E-02
2083	4.957E+01	2.708E+04	1.819E+00	7.765E-01	2.166E+02	1.456E-02
2084	4.715E+01	2.576E+04	1.731E+00	7.386E-01	2.061E+02	1.385E-02
2085	4.485E+01	2.450E+04	1.646E+00	7.026E-01	1.960E+02	1.317E-02
2086	4.266E+01	2.331E+04	1.566E+00	6.683E-01	1.865E+02	1.253E-02
2087	4.058E+01	2.217E+04	1.490E+00	6.357E-01	1.774E+02	1.192E-02
2088	3.860E+01	2.109E+04	1.417E+00	6.047E-01	1.687E+02	1.134E-02
2089	3.672E+01	2.006E+04	1.348E+00	5.752E-01	1.605E+02	1.078E-02
2090	3.493E+01	1.908E+04	1.282E+00	5.472E-01	1.527E+02	1.026E-02
2091	3.323E+01	1.815E+04	1.220E+00	5.205E-01	1.452E+02	9.757E-03
2092	3.161E+01	1.727E+04	1.160E+00	4.951E-01	1.381E+02	9.281E-03
2093	3.006E+01	1.642E+04	1.104E+00	4.710E-01	1.314E+02	8.828E-03
2094	2.860E+01	1.562E+04	1.050E+00	4.480E-01	1.250E+02	8.398E-03
2095	2.720E+01	1.486E+04	9.985E-01	4.262E-01	1.189E+02	7.988E-03
2096	2.588E+01	1.414E+04	9.498E-01	4.054E-01	1.131E+02	7.599E-03
2097	2.461E+01	1.345E+04	9.035E-01	3.856E-01	1.076E+02	7.228E-03
2098	2.341E+01	1.279E+04	8.594E-01	3.668E-01	1.023E+02	6.875E-03

Summary Report

Landfill Name or Identifier: Pasco Sanitary Landfill - Balefill Area

Date: Wednesday, August 27, 2014

Description/Comments:

About LandGEM:

First-Order Decomposition Rate Equation:

$$Q_{CH_4} = \sum_{i=1}^{n} \sum_{j=0.1}^{1} kL_o \left(\frac{M_i}{10} \right) e^{-kt_{ij}}$$

Where,

Q_{CH4} = annual methane generation in the year of the calculation ($m^3/year$)

i = 1-year time increment

n = (year of the calculation) - (initial year of waste acceptance)

j = 0.1-year time increment

k = methane generation rate ($year^{-1}$)

L_o = potential methane generation capacity (m^3/Mg)

M_i = mass of waste accepted in the i^{th} year (Mg)

t_{ij} = age of the j^{th} section of waste mass M_i accepted in the i^{th} year (*decimal years*, e.g., 3.2 years)

LandGEM is based on a first-order decomposition rate equation for quantifying emissions from the decomposition of landfilled waste in municipal solid waste (MSW) landfills. The software provides a relatively simple approach to estimating landfill gas emissions. Model defaults are based on empirical data from U.S. landfills. Field test data can also be used in place of model defaults when available. Further guidance on EPA test methods, Clean Air Act (CAA) regulations, and other guidance regarding landfill gas emissions and control technology requirements can be found at http://www.epa.gov/ttnatw01/landfill/landflpg.html.

LandGEM is considered a screening tool — the better the input data, the better the estimates. Often, there are limitations with the available data regarding waste quantity and composition, variation in design and operating practices over time, and changes occurring over time that impact the emissions potential. Changes to landfill operation, such as operating under wet conditions through leachate recirculation or other liquid additions, will result in generating more gas at a faster rate. Defaults for estimating emissions for this type of operation are being developed to include in LandGEM along with defaults for convential landfills (no leachate or liquid additions) for developing emission inventories and determining CAA applicability. Refer to the Web site identified above for future updates.

Input Review

LANDFILL CHARACTERISTICS

Landfill Open Year	**1977**	
Landfill Closure Year (with 80-year limit)	**1989**	
Actual Closure Year (without limit)	***1989***	
Have Model Calculate Closure Year?	**No**	
Waste Design Capacity	**70,354**	*megagrams*

MODEL PARAMETERS

Methane Generation Rate, k	**0.050**	$year^{-1}$
Potential Methane Generation Capacity, L_o	**100**	m^3/Mg
NMOC Concentration	**4,000**	*ppmv as hexane*
Methane Content	**50**	*% by volume*

GASES / POLLUTANTS SELECTED

Gas / Pollutant #1:	**Total landfill gas**
Gas / Pollutant #2:	**Methane**
Gas / Pollutant #3:	**Carbon dioxide**
Gas / Pollutant #4:	**NMOC**

WASTE ACCEPTANCE RATES

Year	Waste Accepted		Waste-In-Place	
	(Mg/year)	*(short tons/year)*	*(Mg)*	*(short tons)*
1977	3,528	3,881	0	0
1978	3,528	3,881	3,528	3,881
1979	3,528	3,881	7,056	7,761
1980	1,323	1,455	10,584	11,642
1981	1,323	1,455	11,907	13,097
1982	9,261	10,187	13,230	14,553
1983	9,261	10,187	22,491	24,740
1984	9,261	10,187	31,751	34,927
1985	9,261	10,187	41,012	45,114
1986	4,725	5,197	50,273	55,300
1987	4,725	5,197	54,998	60,498
1988	5,316	5,847	59,723	65,695
1989	5,316	5,847	65,039	71,542
1990	0	0	70,354	77,389
1991	0	0	70,354	77,389
1992	0	0	70,354	77,389
1993	0	0	70,354	77,389
1994	0	0	70,354	77,389
1995	0	0	70,354	77,389
1996	0	0	70,354	77,389
1997	0	0	70,354	77,389
1998	0	0	70,354	77,389
1999	0	0	70,354	77,389
2000	0	0	70,354	77,389
2001	0	0	70,354	77,389
2002	0	0	70,354	77,389
2003	0	0	70,354	77,389
2004	0	0	70,354	77,389
2005	0	0	70,354	77,389
2006	0	0	70,354	77,389
2007	0	0	70,354	77,389
2008	0	0	70,354	77,389
2009	0	0	70,354	77,389
2010	0	0	70,354	77,389
2011	0	0	70,354	77,389
2012	0	0	70,354	77,389
2013	0	0	70,354	77,389
2014	0	0	70,354	77,389
2015	0	0	70,354	77,389
2016	0	0	70,354	77,389

WASTE ACCEPTANCE RATES (Continued)

Year	Waste Accepted		Waste-In-Place	
	(Mg/year)	*(short tons/year)*	*(Mg)*	*(short tons)*
2017	0	0	70,354	77,389
2018	0	0	70,354	77,389
2019	0	0	70,354	77,389
2020	0	0	70,354	77,389
2021	0	0	70,354	77,389
2022	0	0	70,354	77,389
2023	0	0	70,354	77,389
2024	0	0	70,354	77,389
2025	0	0	70,354	77,389
2026	0	0	70,354	77,389
2027	0	0	70,354	77,389
2028	0	0	70,354	77,389
2029	0	0	70,354	77,389
2030	0	0	70,354	77,389
2031	0	0	70,354	77,389
2032	0	0	70,354	77,389
2033	0	0	70,354	77,389
2034	0	0	70,354	77,389
2035	0	0	70,354	77,389
2036	0	0	70,354	77,389
2037	0	0	70,354	77,389
2038	0	0	70,354	77,389
2039	0	0	70,354	77,389
2040	0	0	70,354	77,389
2041	0	0	70,354	77,389
2042	0	0	70,354	77,389
2043	0	0	70,354	77,389
2044	0	0	70,354	77,389
2045	0	0	70,354	77,389
2046	0	0	70,354	77,389
2047	0	0	70,354	77,389
2048	0	0	70,354	77,389
2049	0	0	70,354	77,389
2050	0	0	70,354	77,389
2051	0	0	70,354	77,389
2052	0	0	70,354	77,389
2053	0	0	70,354	77,389
2054	0	0	70,354	77,389
2055	0	0	70,354	77,389
2056	0	0	70,354	77,389

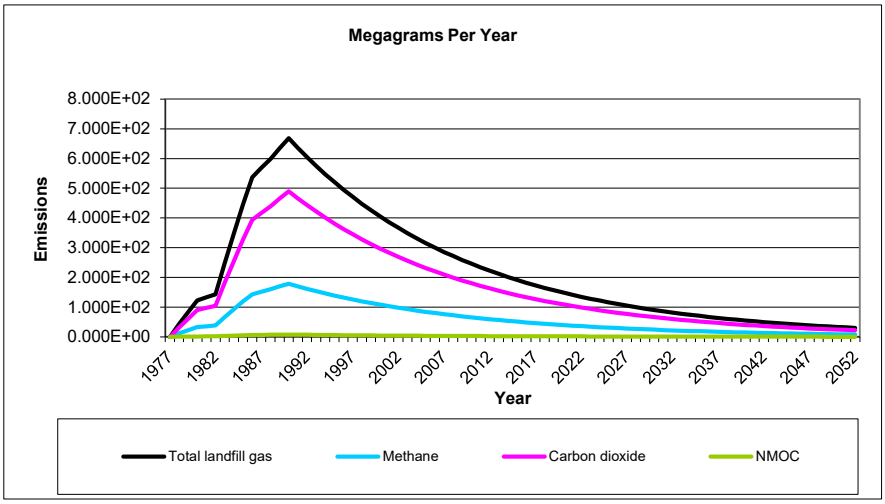
Pollutant Parameters

		Gas / Pollutant Default Parameters:		*User-specified Pollutant Parameters:*	
	Compound	Concentration (*ppmv*)	Molecular Weight	Concentration (*ppmv*)	Molecular Weight
Gases	Total landfill gas		0.00		
	Methane		16.04		
	Carbon dioxide		44.01		
	NMOC	4,000	86.18		
Pollutants	1,1,1-Trichloroethane (methyl chloroform) - HAP	0.48	133.41		
	1,1,2,2-Tetrachloroethane - HAP/VOC	1.1	167.85		
	1,1-Dichloroethane (ethylidene dichloride) - HAP/VOC	2.4	98.97		
	1,1-Dichloroethene (vinylidene chloride) - HAP/VOC	0.20	96.94		
	1,2-Dichloroethane (ethylene dichloride) - HAP/VOC	0.41	98.96		
	1,2-Dichloropropane (propylene dichloride) - HAP/VOC	0.18	112.99		
	2-Propanol (isopropyl alcohol) - VOC	50	60.11		
	Acetone	7.0	58.08		
	Acrylonitrile - HAP/VOC	6.3	53.06		
	Benzene - No or Unknown Co-disposal - HAP/VOC	1.9	78.11		
	Benzene - Co-disposal - HAP/VOC	11	78.11		
	Bromodichloromethane - VOC	3.1	163.83		
	Butane - VOC	5.0	58.12		
	Carbon disulfide - HAP/VOC	0.58	76.13		
	Carbon monoxide	140	28.01		
	Carbon tetrachloride - HAP/VOC	4.0E-03	153.84		
	Carbonyl sulfide - HAP/VOC	0.49	60.07		
	Chlorobenzene - HAP/VOC	0.25	112.56		
	Chlorodifluoromethane	1.3	86.47		
	Chloroethane (ethyl chloride) - HAP/VOC	1.3	64.52		
	Chloroform - HAP/VOC	0.03	119.39		
	Chloromethane - VOC	1.2	50.49		
	Dichlorobenzene - (HAP for para isomer/VOC)	0.21	147		
	Dichlorodifluoromethane	16	120.91		
	Dichlorofluoromethane - VOC	2.6	102.92		
	Dichloromethane (methylene chloride) - HAP	14	84.94		
	Dimethyl sulfide (methyl sulfide) - VOC	7.8	62.13		
	Ethane	890	30.07		
	Ethanol - VOC	27	46.08		

Pollutant Parameters (Continued)

		Gas / Pollutant Default Parameters:		*User-specified Pollutant Parameters:*	
	Compound	Concentration (*ppmv*)	Molecular Weight	Concentration (*ppmv*)	Molecular Weight
Pollutants	Ethyl mercaptan (ethanethiol) - VOC	2.3	62.13		
	Ethylbenzene - HAP/VOC	4.6	106.16		
	Ethylene dibromide - HAP/VOC	1.0E-03	187.88		
	Fluorotrichloromethane - VOC	0.76	137.38		
	Hexane - HAP/VOC	6.6	86.18		
	Hydrogen sulfide	36	34.08		
	Mercury (total) - HAP	2.9E-04	200.61		
	Methyl ethyl ketone - HAP/VOC	7.1	72.11		
	Methyl isobutyl ketone - HAP/VOC	1.9	100.16		
	Methyl mercaptan - VOC	2.5	48.11		
	Pentane - VOC	3.3	72.15		
	Perchloroethylene (tetrachloroethylene) - HAP	3.7	165.83		
	Propane - VOC	11	44.09		
	t-1,2-Dichloroethene - VOC	2.8	96.94		
	Toluene - No or Unknown Co-disposal - HAP/VOC	39	92.13		
	Toluene - Co-disposal - HAP/VOC	170	92.13		
	Trichloroethylene (trichloroethene) - HAP/VOC	2.8	131.40		
	Vinyl chloride - HAP/VOC	7.3	62.50		
	Xylenes - HAP/VOC	12	106.16		

Graphs


Megagrams Per Year
Emissions
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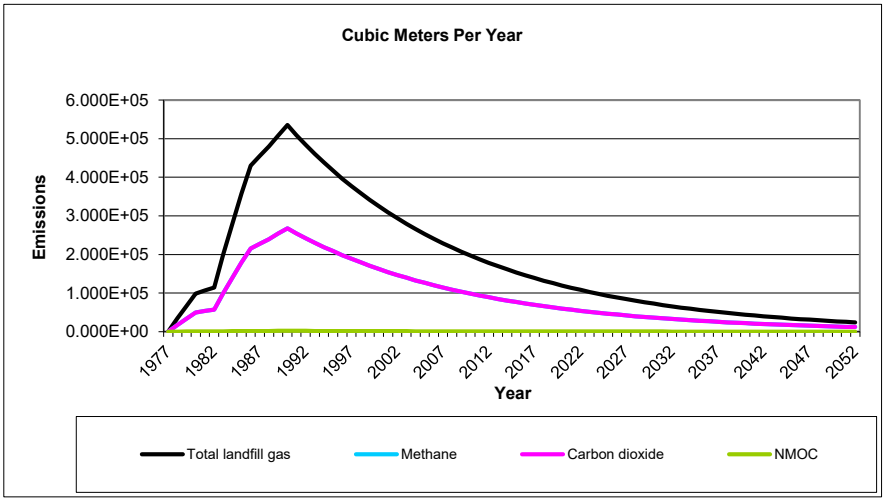
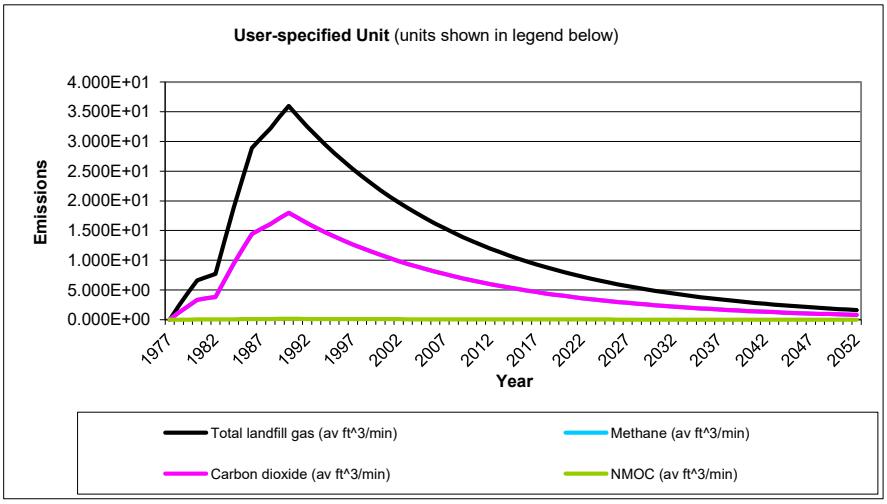
7.000E+02
6.000E+02
5.000E+02
4.000E+02
3.000E+02
2.000E+02
1.000E+02
0.000E+00
1977
1982
1987
1992
1997
2002
2007
2012
2017
2022
2027
2032
2037
2042
2047
2052
Year
Total landfill gas
Methane
Carbon dioxide
NMOC


Cubic Meters Per Year
Emissions
6.000E+05
5.000E+05
4.000E+05
3.000E+05
2.000E+05
1.000E+05
0.000E+00
1977
1982
1987
1992
1997
2002
2007
2012
2017
2022
2027
2032
2037
2042
2047
2052
Year
Total landfill gas
Methane
Carbon dioxide
NMOC


User-specified Unit (units shown in legend below)
Emissions
4.000E+01
3.500E+01
3.000E+01
2.500E+01
2.000E+01
1.500E+01
1.000E+01
5.000E+00
0.000E+00
1977
1982
1987
1992
1997
2002
2007
2012
2017
2022
2027
2032
2037
2042
2047
2052
Year
Total landfill gas (av ft^3/min)
Methane (av ft^3/min)
Carbon dioxide (av ft^3/min)
NMOC (av ft^3/min)

Results

Year	Total landfill gas			Methane		
	(Mg/year)	*(m^3/year)*	*(av ft^3/min)*	*(Mg/year)*	*(m^3/year)*	*(av ft^3/min)*
1977	0	0	0	0	0	0
1978	4.308E+01	3.450E+04	2.318E+00	1.151E+01	1.725E+04	1.159E+00
1979	8.406E+01	6.731E+04	4.523E+00	2.245E+01	3.366E+04	2.261E+00
1980	1.230E+02	9.853E+04	6.620E+00	3.287E+01	4.926E+04	3.310E+00
1981	1.332E+02	1.067E+05	7.166E+00	3.558E+01	5.333E+04	3.583E+00
1982	1.429E+02	1.144E+05	7.686E+00	3.816E+01	5.720E+04	3.843E+00
1983	2.490E+02	1.994E+05	1.340E+01	6.651E+01	9.969E+04	6.698E+00
1984	3.499E+02	2.802E+05	1.883E+01	9.347E+01	1.401E+05	9.414E+00
1985	4.460E+02	3.571E+05	2.399E+01	1.191E+02	1.785E+05	1.200E+01
1986	5.373E+02	4.302E+05	2.891E+01	1.435E+02	2.151E+05	1.445E+01
1987	5.688E+02	4.555E+05	3.060E+01	1.519E+02	2.277E+05	1.530E+01
1988	5.987E+02	4.794E+05	3.221E+01	1.599E+02	2.397E+05	1.611E+01
1989	6.345E+02	5.080E+05	3.414E+01	1.695E+02	2.540E+05	1.707E+01
1990	6.684E+02	5.352E+05	3.596E+01	1.785E+02	2.676E+05	1.798E+01
1991	6.358E+02	5.091E+05	3.421E+01	1.698E+02	2.546E+05	1.710E+01
1992	6.048E+02	4.843E+05	3.254E+01	1.616E+02	2.422E+05	1.627E+01
1993	5.753E+02	4.607E+05	3.095E+01	1.537E+02	2.303E+05	1.548E+01
1994	5.473E+02	4.382E+05	2.944E+01	1.462E+02	2.191E+05	1.472E+01
1995	5.206E+02	4.168E+05	2.801E+01	1.391E+02	2.084E+05	1.400E+01
1996	4.952E+02	3.965E+05	2.664E+01	1.323E+02	1.983E+05	1.332E+01
1997	4.710E+02	3.772E+05	2.534E+01	1.258E+02	1.886E+05	1.267E+01
1998	4.481E+02	3.588E+05	2.411E+01	1.197E+02	1.794E+05	1.205E+01
1999	4.262E+02	3.413E+05	2.293E+01	1.138E+02	1.706E+05	1.147E+01
2000	4.054E+02	3.246E+05	2.181E+01	1.083E+02	1.623E+05	1.091E+01
2001	3.856E+02	3.088E+05	2.075E+01	1.030E+02	1.544E+05	1.037E+01
2002	3.668E+02	2.937E+05	1.974E+01	9.799E+01	1.469E+05	9.868E+00
2003	3.489E+02	2.794E+05	1.877E+01	9.321E+01	1.397E+05	9.387E+00
2004	3.319E+02	2.658E+05	1.786E+01	8.866E+01	1.329E+05	8.929E+00
2005	3.157E+02	2.528E+05	1.699E+01	8.434E+01	1.264E+05	8.494E+00
2006	3.003E+02	2.405E+05	1.616E+01	8.022E+01	1.203E+05	8.080E+00
2007	2.857E+02	2.288E+05	1.537E+01	7.631E+01	1.144E+05	7.686E+00
2008	2.718E+02	2.176E+05	1.462E+01	7.259E+01	1.088E+05	7.311E+00
2009	2.585E+02	2.070E+05	1.391E+01	6.905E+01	1.035E+05	6.954E+00
2010	2.459E+02	1.969E+05	1.323E+01	6.568E+01	9.845E+04	6.615E+00
2011	2.339E+02	1.873E+05	1.258E+01	6.248E+01	9.365E+04	6.292E+00
2012	2.225E+02	1.782E+05	1.197E+01	5.943E+01	8.908E+04	5.986E+00
2013	2.116E+02	1.695E+05	1.139E+01	5.653E+01	8.474E+04	5.694E+00
2014	2.013E+02	1.612E+05	1.083E+01	5.378E+01	8.061E+04	5.416E+00
2015	1.915E+02	1.534E+05	1.030E+01	5.115E+01	7.668E+04	5.152E+00
2016	1.822E+02	1.459E+05	9.801E+00	4.866E+01	7.294E+04	4.901E+00
2017	1.733E+02	1.388E+05	9.323E+00	4.629E+01	6.938E+04	4.662E+00
2018	1.648E+02	1.320E+05	8.868E+00	4.403E+01	6.599E+04	4.434E+00
2019	1.568E+02	1.256E+05	8.436E+00	4.188E+01	6.278E+04	4.218E+00
2020	1.491E+02	1.194E+05	8.024E+00	3.984E+01	5.971E+04	4.012E+00
2021	1.419E+02	1.136E+05	7.633E+00	3.790E+01	5.680E+04	3.817E+00
2022	1.350E+02	1.081E+05	7.261E+00	3.605E+01	5.403E+04	3.630E+00
2023	1.284E+02	1.028E+05	6.907E+00	3.429E+01	5.140E+04	3.453E+00
2024	1.221E+02	9.778E+04	6.570E+00	3.262E+01	4.889E+04	3.285E+00
2025	1.162E+02	9.301E+04	6.249E+00	3.103E+01	4.651E+04	3.125E+00
2026	1.105E+02	8.848E+04	5.945E+00	2.951E+01	4.424E+04	2.972E+00

Results (Continued)

Year	Total landfill gas			Methane		
	(Mg/year)	*(m^3/year)*	*(av ft^3/min)*	*(Mg/year)*	*(m^3/year)*	*(av ft^3/min)*
2027	1.051E+02	8.416E+04	5.655E+00	2.807E+01	4.208E+04	2.827E+00
2028	9.998E+01	8.006E+04	5.379E+00	2.670E+01	4.003E+04	2.689E+00
2029	9.510E+01	7.615E+04	5.117E+00	2.540E+01	3.808E+04	2.558E+00
2030	9.046E+01	7.244E+04	4.867E+00	2.416E+01	3.622E+04	2.434E+00
2031	8.605E+01	6.890E+04	4.630E+00	2.298E+01	3.445E+04	2.315E+00
2032	8.185E+01	6.554E+04	4.404E+00	2.186E+01	3.277E+04	2.202E+00
2033	7.786E+01	6.235E+04	4.189E+00	2.080E+01	3.117E+04	2.095E+00
2034	7.406E+01	5.931E+04	3.985E+00	1.978E+01	2.965E+04	1.992E+00
2035	7.045E+01	5.641E+04	3.790E+00	1.882E+01	2.821E+04	1.895E+00
2036	6.702E+01	5.366E+04	3.606E+00	1.790E+01	2.683E+04	1.803E+00
2037	6.375E+01	5.105E+04	3.430E+00	1.703E+01	2.552E+04	1.715E+00
2038	6.064E+01	4.856E+04	3.262E+00	1.620E+01	2.428E+04	1.631E+00
2039	5.768E+01	4.619E+04	3.103E+00	1.541E+01	2.309E+04	1.552E+00
2040	5.487E+01	4.394E+04	2.952E+00	1.466E+01	2.197E+04	1.476E+00
2041	5.219E+01	4.179E+04	2.808E+00	1.394E+01	2.090E+04	1.404E+00
2042	4.965E+01	3.975E+04	2.671E+00	1.326E+01	1.988E+04	1.336E+00
2043	4.723E+01	3.782E+04	2.541E+00	1.261E+01	1.891E+04	1.270E+00
2044	4.492E+01	3.597E+04	2.417E+00	1.200E+01	1.799E+04	1.208E+00
2045	4.273E+01	3.422E+04	2.299E+00	1.141E+01	1.711E+04	1.150E+00
2046	4.065E+01	3.255E+04	2.187E+00	1.086E+01	1.627E+04	1.093E+00
2047	3.866E+01	3.096E+04	2.080E+00	1.033E+01	1.548E+04	1.040E+00
2048	3.678E+01	2.945E+04	1.979E+00	9.824E+00	1.473E+04	9.894E-01
2049	3.499E+01	2.801E+04	1.882E+00	9.345E+00	1.401E+04	9.411E-01
2050	3.328E+01	2.665E+04	1.790E+00	8.889E+00	1.332E+04	8.952E-01
2051	3.166E+01	2.535E+04	1.703E+00	8.456E+00	1.267E+04	8.516E-01
2052	3.011E+01	2.411E+04	1.620E+00	8.043E+00	1.206E+04	8.101E-01
2053	2.864E+01	2.294E+04	1.541E+00	7.651E+00	1.147E+04	7.705E-01
2054	2.725E+01	2.182E+04	1.466E+00	7.278E+00	1.091E+04	7.330E-01
2055	2.592E+01	2.075E+04	1.394E+00	6.923E+00	1.038E+04	6.972E-01
2056	2.465E+01	1.974E+04	1.326E+00	6.585E+00	9.871E+03	6.632E-01
2057	2.345E+01	1.878E+04	1.262E+00	6.264E+00	9.389E+03	6.309E-01
2058	2.231E+01	1.786E+04	1.200E+00	5.959E+00	8.931E+03	6.001E-01
2059	2.122E+01	1.699E+04	1.142E+00	5.668E+00	8.496E+03	5.708E-01
2060	2.018E+01	1.616E+04	1.086E+00	5.392E+00	8.081E+03	5.430E-01
2061	1.920E+01	1.537E+04	1.033E+00	5.129E+00	7.687E+03	5.165E-01
2062	1.826E+01	1.462E+04	9.826E-01	4.878E+00	7.312E+03	4.913E-01
2063	1.737E+01	1.391E+04	9.347E-01	4.641E+00	6.956E+03	4.674E-01
2064	1.653E+01	1.323E+04	8.891E-01	4.414E+00	6.617E+03	4.446E-01
2065	1.572E+01	1.259E+04	8.458E-01	4.199E+00	6.294E+03	4.229E-01
2066	1.495E+01	1.197E+04	8.045E-01	3.994E+00	5.987E+03	4.023E-01
2067	1.422E+01	1.139E+04	7.653E-01	3.799E+00	5.695E+03	3.826E-01
2068	1.353E+01	1.083E+04	7.280E-01	3.614E+00	5.417E+03	3.640E-01
2069	1.287E+01	1.031E+04	6.925E-01	3.438E+00	5.153E+03	3.462E-01
2070	1.224E+01	9.803E+03	6.587E-01	3.270E+00	4.902E+03	3.293E-01
2071	1.165E+01	9.325E+03	6.266E-01	3.111E+00	4.663E+03	3.133E-01
2072	1.108E+01	8.870E+03	5.960E-01	2.959E+00	4.435E+03	2.980E-01
2073	1.054E+01	8.438E+03	5.669E-01	2.815E+00	4.219E+03	2.835E-01
2074	1.002E+01	8.026E+03	5.393E-01	2.677E+00	4.013E+03	2.696E-01
2075	9.535E+00	7.635E+03	5.130E-01	2.547E+00	3.817E+03	2.565E-01
2076	9.070E+00	7.263E+03	4.880E-01	2.423E+00	3.631E+03	2.440E-01
2077	8.627E+00	6.908E+03	4.642E-01	2.304E+00	3.454E+03	2.321E-01

Results (Continued)

Year	Total landfill gas			Methane		
	(Mg/year)	*(m^3/year)*	*(av ft^3/min)*	*(Mg/year)*	*(m^3/year)*	*(av ft^3/min)*
2078	8.206E+00	6.571E+03	4.415E-01	2.192E+00	3.286E+03	2.208E-01
2079	7.806E+00	6.251E+03	4.200E-01	2.085E+00	3.125E+03	2.100E-01
2080	7.426E+00	5.946E+03	3.995E-01	1.983E+00	2.973E+03	1.998E-01
2081	7.063E+00	5.656E+03	3.800E-01	1.887E+00	2.828E+03	1.900E-01
2082	6.719E+00	5.380E+03	3.615E-01	1.795E+00	2.690E+03	1.807E-01
2083	6.391E+00	5.118E+03	3.439E-01	1.707E+00	2.559E+03	1.719E-01
2084	6.080E+00	4.868E+03	3.271E-01	1.624E+00	2.434E+03	1.635E-01
2085	5.783E+00	4.631E+03	3.111E-01	1.545E+00	2.315E+03	1.556E-01
2086	5.501E+00	4.405E+03	2.960E-01	1.469E+00	2.202E+03	1.480E-01
2087	5.233E+00	4.190E+03	2.815E-01	1.398E+00	2.095E+03	1.408E-01
2088	4.977E+00	3.986E+03	2.678E-01	1.330E+00	1.993E+03	1.339E-01
2089	4.735E+00	3.791E+03	2.547E-01	1.265E+00	1.896E+03	1.274E-01
2090	4.504E+00	3.606E+03	2.423E-01	1.203E+00	1.803E+03	1.212E-01
2091	4.284E+00	3.431E+03	2.305E-01	1.144E+00	1.715E+03	1.152E-01
2092	4.075E+00	3.263E+03	2.193E-01	1.089E+00	1.632E+03	1.096E-01
2093	3.876E+00	3.104E+03	2.086E-01	1.035E+00	1.552E+03	1.043E-01
2094	3.687E+00	2.953E+03	1.984E-01	9.849E-01	1.476E+03	9.920E-02
2095	3.508E+00	2.809E+03	1.887E-01	9.369E-01	1.404E+03	9.436E-02
2096	3.337E+00	2.672E+03	1.795E-01	8.912E-01	1.336E+03	8.976E-02
2097	3.174E+00	2.541E+03	1.708E-01	8.478E-01	1.271E+03	8.538E-02
2098	3.019E+00	2.417E+03	1.624E-01	8.064E-01	1.209E+03	8.121E-02
2099	2.872E+00	2.300E+03	1.545E-01	7.671E-01	1.150E+03	7.725E-02
2100	2.732E+00	2.187E+03	1.470E-01	7.297E-01	1.094E+03	7.349E-02
2101	2.598E+00	2.081E+03	1.398E-01	6.941E-01	1.040E+03	6.990E-02
2102	2.472E+00	1.979E+03	1.330E-01	6.602E-01	9.896E+02	6.649E-02
2103	2.351E+00	1.883E+03	1.265E-01	6.280E-01	9.414E+02	6.325E-02
2104	2.237E+00	1.791E+03	1.203E-01	5.974E-01	8.955E+02	6.017E-02
2105	2.127E+00	1.704E+03	1.145E-01	5.683E-01	8.518E+02	5.723E-02
2106	2.024E+00	1.620E+03	1.089E-01	5.406E-01	8.102E+02	5.444E-02
2107	1.925E+00	1.541E+03	1.036E-01	5.142E-01	7.707E+02	5.178E-02
2108	1.831E+00	1.466E+03	9.852E-02	4.891E-01	7.331E+02	4.926E-02
2109	1.742E+00	1.395E+03	9.371E-02	4.653E-01	6.974E+02	4.686E-02
2110	1.657E+00	1.327E+03	8.914E-02	4.426E-01	6.634E+02	4.457E-02
2111	1.576E+00	1.262E+03	8.480E-02	4.210E-01	6.310E+02	4.240E-02
2112	1.499E+00	1.200E+03	8.066E-02	4.005E-01	6.002E+02	4.033E-02
2113	1.426E+00	1.142E+03	7.673E-02	3.809E-01	5.710E+02	3.836E-02
2114	1.357E+00	1.086E+03	7.298E-02	3.623E-01	5.431E+02	3.649E-02
2115	1.290E+00	1.033E+03	6.943E-02	3.447E-01	5.166E+02	3.471E-02
2116	1.227E+00	9.829E+02	6.604E-02	3.279E-01	4.914E+02	3.302E-02
2117	1.168E+00	9.349E+02	6.282E-02	3.119E-01	4.675E+02	3.141E-02

Results (Continued)

Year	Carbon dioxide			NMOC		
	(Mg/year)	*(m^3/year)*	*(av ft^3/min)*	*(Mg/year)*	*(m^3/year)*	*(av ft^3/min)*
1977	0	0	0	0	0	0
1978	3.157E+01	1.725E+04	1.159E+00	4.946E-01	1.380E+02	9.272E-03
1979	6.161E+01	3.366E+04	2.261E+00	9.651E-01	2.693E+02	1.809E-02
1980	9.018E+01	4.926E+04	3.310E+00	1.413E+00	3.941E+02	2.648E-02
1981	9.762E+01	5.333E+04	3.583E+00	1.529E+00	4.266E+02	2.867E-02
1982	1.047E+02	5.720E+04	3.843E+00	1.640E+00	4.576E+02	3.074E-02
1983	1.825E+02	9.969E+04	6.698E+00	2.859E+00	7.975E+02	5.358E-02
1984	2.565E+02	1.401E+05	9.414E+00	4.018E+00	1.121E+03	7.531E-02
1985	3.268E+02	1.785E+05	1.200E+01	5.120E+00	1.428E+03	9.597E-02
1986	3.938E+02	2.151E+05	1.445E+01	6.169E+00	1.721E+03	1.156E-01
1987	4.169E+02	2.277E+05	1.530E+01	6.530E+00	1.822E+03	1.224E-01
1988	4.388E+02	2.397E+05	1.611E+01	6.874E+00	1.918E+03	1.289E-01
1989	4.650E+02	2.540E+05	1.707E+01	7.284E+00	2.032E+03	1.365E-01
1990	4.899E+02	2.676E+05	1.798E+01	7.674E+00	2.141E+03	1.439E-01
1991	4.660E+02	2.546E+05	1.710E+01	7.300E+00	2.037E+03	1.368E-01
1992	4.433E+02	2.422E+05	1.627E+01	6.944E+00	1.937E+03	1.302E-01
1993	4.216E+02	2.303E+05	1.548E+01	6.605E+00	1.843E+03	1.238E-01
1994	4.011E+02	2.191E+05	1.472E+01	6.283E+00	1.753E+03	1.178E-01
1995	3.815E+02	2.084E+05	1.400E+01	5.977E+00	1.667E+03	1.120E-01
1996	3.629E+02	1.983E+05	1.332E+01	5.685E+00	1.586E+03	1.066E-01
1997	3.452E+02	1.886E+05	1.267E+01	5.408E+00	1.509E+03	1.014E-01
1998	3.284E+02	1.794E+05	1.205E+01	5.144E+00	1.435E+03	9.643E-02
1999	3.124E+02	1.706E+05	1.147E+01	4.893E+00	1.365E+03	9.172E-02
2000	2.971E+02	1.623E+05	1.091E+01	4.655E+00	1.299E+03	8.725E-02
2001	2.826E+02	1.544E+05	1.037E+01	4.428E+00	1.235E+03	8.300E-02
2002	2.689E+02	1.469E+05	9.868E+00	4.212E+00	1.175E+03	7.895E-02
2003	2.557E+02	1.397E+05	9.387E+00	4.006E+00	1.118E+03	7.510E-02
2004	2.433E+02	1.329E+05	8.929E+00	3.811E+00	1.063E+03	7.143E-02
2005	2.314E+02	1.264E+05	8.494E+00	3.625E+00	1.011E+03	6.795E-02
2006	2.201E+02	1.203E+05	8.080E+00	3.448E+00	9.620E+02	6.464E-02
2007	2.094E+02	1.144E+05	7.686E+00	3.280E+00	9.151E+02	6.148E-02
2008	1.992E+02	1.088E+05	7.311E+00	3.120E+00	8.705E+02	5.849E-02
2009	1.895E+02	1.035E+05	6.954E+00	2.968E+00	8.280E+02	5.563E-02
2010	1.802E+02	9.845E+04	6.615E+00	2.823E+00	7.876E+02	5.292E-02
2011	1.714E+02	9.365E+04	6.292E+00	2.686E+00	7.492E+02	5.034E-02
2012	1.631E+02	8.908E+04	5.986E+00	2.555E+00	7.127E+02	4.788E-02
2013	1.551E+02	8.474E+04	5.694E+00	2.430E+00	6.779E+02	4.555E-02
2014	1.475E+02	8.061E+04	5.416E+00	2.311E+00	6.449E+02	4.333E-02
2015	1.404E+02	7.668E+04	5.152E+00	2.199E+00	6.134E+02	4.121E-02
2016	1.335E+02	7.294E+04	4.901E+00	2.091E+00	5.835E+02	3.920E-02
2017	1.270E+02	6.938E+04	4.662E+00	1.989E+00	5.550E+02	3.729E-02
2018	1.208E+02	6.599E+04	4.434E+00	1.892E+00	5.280E+02	3.547E-02
2019	1.149E+02	6.278E+04	4.218E+00	1.800E+00	5.022E+02	3.374E-02
2020	1.093E+02	5.971E+04	4.012E+00	1.712E+00	4.777E+02	3.210E-02
2021	1.040E+02	5.680E+04	3.817E+00	1.629E+00	4.544E+02	3.053E-02
2022	9.891E+01	5.403E+04	3.630E+00	1.549E+00	4.323E+02	2.904E-02
2023	9.408E+01	5.140E+04	3.453E+00	1.474E+00	4.112E+02	2.763E-02
2024	8.949E+01	4.889E+04	3.285E+00	1.402E+00	3.911E+02	2.628E-02
2025	8.513E+01	4.651E+04	3.125E+00	1.334E+00	3.720E+02	2.500E-02
2026	8.098E+01	4.424E+04	2.972E+00	1.269E+00	3.539E+02	2.378E-02

Results (Continued)

Year	Carbon dioxide			NMOC		
	(Mg/year)	*(m^3/year)*	*(av ft^3/min)*	*(Mg/year)*	*(m^3/year)*	*(av ft^3/min)*
2027	7.703E+01	4.208E+04	2.827E+00	1.207E+00	3.366E+02	2.262E-02
2028	7.327E+01	4.003E+04	2.689E+00	1.148E+00	3.202E+02	2.152E-02
2029	6.970E+01	3.808E+04	2.558E+00	1.092E+00	3.046E+02	2.047E-02
2030	6.630E+01	3.622E+04	2.434E+00	1.039E+00	2.898E+02	1.947E-02
2031	6.306E+01	3.445E+04	2.315E+00	9.879E-01	2.756E+02	1.852E-02
2032	5.999E+01	3.277E+04	2.202E+00	9.398E-01	2.622E+02	1.762E-02
2033	5.706E+01	3.117E+04	2.095E+00	8.939E-01	2.494E+02	1.676E-02
2034	5.428E+01	2.965E+04	1.992E+00	8.503E-01	2.372E+02	1.594E-02
2035	5.163E+01	2.821E+04	1.895E+00	8.089E-01	2.257E+02	1.516E-02
2036	4.912E+01	2.683E+04	1.803E+00	7.694E-01	2.147E+02	1.442E-02
2037	4.672E+01	2.552E+04	1.715E+00	7.319E-01	2.042E+02	1.372E-02
2038	4.444E+01	2.428E+04	1.631E+00	6.962E-01	1.942E+02	1.305E-02
2039	4.227E+01	2.309E+04	1.552E+00	6.622E-01	1.848E+02	1.241E-02
2040	4.021E+01	2.197E+04	1.476E+00	6.299E-01	1.757E+02	1.181E-02
2041	3.825E+01	2.090E+04	1.404E+00	5.992E-01	1.672E+02	1.123E-02
2042	3.639E+01	1.988E+04	1.336E+00	5.700E-01	1.590E+02	1.068E-02
2043	3.461E+01	1.891E+04	1.270E+00	5.422E-01	1.513E+02	1.016E-02
2044	3.292E+01	1.799E+04	1.208E+00	5.158E-01	1.439E+02	9.668E-03
2045	3.132E+01	1.711E+04	1.150E+00	4.906E-01	1.369E+02	9.196E-03
2046	2.979E+01	1.627E+04	1.093E+00	4.667E-01	1.302E+02	8.748E-03
2047	2.834E+01	1.548E+04	1.040E+00	4.439E-01	1.238E+02	8.321E-03
2048	2.695E+01	1.473E+04	9.894E-01	4.223E-01	1.178E+02	7.915E-03
2049	2.564E+01	1.401E+04	9.411E-01	4.017E-01	1.121E+02	7.529E-03
2050	2.439E+01	1.332E+04	8.952E-01	3.821E-01	1.066E+02	7.162E-03
2051	2.320E+01	1.267E+04	8.516E-01	3.634E-01	1.014E+02	6.813E-03
2052	2.207E+01	1.206E+04	8.101E-01	3.457E-01	9.645E+01	6.480E-03
2053	2.099E+01	1.147E+04	7.705E-01	3.289E-01	9.175E+01	6.164E-03
2054	1.997E+01	1.091E+04	7.330E-01	3.128E-01	8.727E+01	5.864E-03
2055	1.899E+01	1.038E+04	6.972E-01	2.976E-01	8.301E+01	5.578E-03
2056	1.807E+01	9.871E+03	6.632E-01	2.831E-01	7.897E+01	5.306E-03
2057	1.719E+01	9.389E+03	6.309E-01	2.692E-01	7.511E+01	5.047E-03
2058	1.635E+01	8.931E+03	6.001E-01	2.561E-01	7.145E+01	4.801E-03
2059	1.555E+01	8.496E+03	5.708E-01	2.436E-01	6.797E+01	4.567E-03
2060	1.479E+01	8.081E+03	5.430E-01	2.317E-01	6.465E+01	4.344E-03
2061	1.407E+01	7.687E+03	5.165E-01	2.204E-01	6.150E+01	4.132E-03
2062	1.339E+01	7.312E+03	4.913E-01	2.097E-01	5.850E+01	3.931E-03
2063	1.273E+01	6.956E+03	4.674E-01	1.995E-01	5.565E+01	3.739E-03
2064	1.211E+01	6.617E+03	4.446E-01	1.897E-01	5.293E+01	3.557E-03
2065	1.152E+01	6.294E+03	4.229E-01	1.805E-01	5.035E+01	3.383E-03
2066	1.096E+01	5.987E+03	4.023E-01	1.717E-01	4.790E+01	3.218E-03
2067	1.042E+01	5.695E+03	3.826E-01	1.633E-01	4.556E+01	3.061E-03
2068	9.916E+00	5.417E+03	3.640E-01	1.553E-01	4.334E+01	2.912E-03
2069	9.433E+00	5.153E+03	3.462E-01	1.478E-01	4.122E+01	2.770E-03
2070	8.973E+00	4.902E+03	3.293E-01	1.406E-01	3.921E+01	2.635E-03
2071	8.535E+00	4.663E+03	3.133E-01	1.337E-01	3.730E+01	2.506E-03
2072	8.119E+00	4.435E+03	2.980E-01	1.272E-01	3.548E+01	2.384E-03
2073	7.723E+00	4.219E+03	2.835E-01	1.210E-01	3.375E+01	2.268E-03
2074	7.346E+00	4.013E+03	2.696E-01	1.151E-01	3.211E+01	2.157E-03
2075	6.988E+00	3.817E+03	2.565E-01	1.095E-01	3.054E+01	2.052E-03
2076	6.647E+00	3.631E+03	2.440E-01	1.041E-01	2.905E+01	1.952E-03
2077	6.323E+00	3.454E+03	2.321E-01	9.905E-02	2.763E+01	1.857E-03

Results (Continued)

Year	Carbon dioxide			NMOC		
	(Mg/year)	*(m^3/year)*	*(av ft^3/min)*	*(Mg/year)*	*(m^3/year)*	*(av ft^3/min)*
2078	6.014E+00	3.286E+03	2.208E-01	9.422E-02	2.629E+01	1.766E-03
2079	5.721E+00	3.125E+03	2.100E-01	8.962E-02	2.500E+01	1.680E-03
2080	5.442E+00	2.973E+03	1.998E-01	8.525E-02	2.378E+01	1.598E-03
2081	5.177E+00	2.828E+03	1.900E-01	8.110E-02	2.262E+01	1.520E-03
2082	4.924E+00	2.690E+03	1.807E-01	7.714E-02	2.152E+01	1.446E-03
2083	4.684E+00	2.559E+03	1.719E-01	7.338E-02	2.047E+01	1.375E-03
2084	4.456E+00	2.434E+03	1.635E-01	6.980E-02	1.947E+01	1.308E-03
2085	4.238E+00	2.315E+03	1.556E-01	6.640E-02	1.852E+01	1.245E-03
2086	4.032E+00	2.202E+03	1.480E-01	6.316E-02	1.762E+01	1.184E-03
2087	3.835E+00	2.095E+03	1.408E-01	6.008E-02	1.676E+01	1.126E-03
2088	3.648E+00	1.993E+03	1.339E-01	5.715E-02	1.594E+01	1.071E-03
2089	3.470E+00	1.896E+03	1.274E-01	5.436E-02	1.517E+01	1.019E-03
2090	3.301E+00	1.803E+03	1.212E-01	5.171E-02	1.443E+01	9.693E-04
2091	3.140E+00	1.715E+03	1.152E-01	4.919E-02	1.372E+01	9.220E-04
2092	2.987E+00	1.632E+03	1.096E-01	4.679E-02	1.305E+01	8.770E-04
2093	2.841E+00	1.552E+03	1.043E-01	4.451E-02	1.242E+01	8.343E-04
2094	2.702E+00	1.476E+03	9.920E-02	4.234E-02	1.181E+01	7.936E-04
2095	2.571E+00	1.404E+03	9.436E-02	4.027E-02	1.123E+01	7.549E-04
2096	2.445E+00	1.336E+03	8.976E-02	3.831E-02	1.069E+01	7.181E-04
2097	2.326E+00	1.271E+03	8.538E-02	3.644E-02	1.017E+01	6.830E-04
2098	2.213E+00	1.209E+03	8.121E-02	3.466E-02	9.670E+00	6.497E-04
2099	2.105E+00	1.150E+03	7.725E-02	3.297E-02	9.198E+00	6.180E-04
2100	2.002E+00	1.094E+03	7.349E-02	3.136E-02	8.750E+00	5.879E-04
2101	1.904E+00	1.040E+03	6.990E-02	2.983E-02	8.323E+00	5.592E-04
2102	1.812E+00	9.896E+02	6.649E-02	2.838E-02	7.917E+00	5.319E-04
2103	1.723E+00	9.414E+02	6.325E-02	2.699E-02	7.531E+00	5.060E-04
2104	1.639E+00	8.955E+02	6.017E-02	2.568E-02	7.164E+00	4.813E-04
2105	1.559E+00	8.518E+02	5.723E-02	2.443E-02	6.814E+00	4.578E-04
2106	1.483E+00	8.102E+02	5.444E-02	2.323E-02	6.482E+00	4.355E-04
2107	1.411E+00	7.707E+02	5.178E-02	2.210E-02	6.166E+00	4.143E-04
2108	1.342E+00	7.331E+02	4.926E-02	2.102E-02	5.865E+00	3.941E-04
2109	1.277E+00	6.974E+02	4.686E-02	2.000E-02	5.579E+00	3.749E-04
2110	1.214E+00	6.634E+02	4.457E-02	1.902E-02	5.307E+00	3.566E-04
2111	1.155E+00	6.310E+02	4.240E-02	1.809E-02	5.048E+00	3.392E-04
2112	1.099E+00	6.002E+02	4.033E-02	1.721E-02	4.802E+00	3.226E-04
2113	1.045E+00	5.710E+02	3.836E-02	1.637E-02	4.568E+00	3.069E-04
2114	9.942E-01	5.431E+02	3.649E-02	1.557E-02	4.345E+00	2.919E-04
2115	9.457E-01	5.166E+02	3.471E-02	1.481E-02	4.133E+00	2.777E-04
2116	8.996E-01	4.914E+02	3.302E-02	1.409E-02	3.931E+00	2.642E-04
2117	8.557E-01	4.675E+02	3.141E-02	1.341E-02	3.740E+00	2.513E-04

Summary Report

Landfill Name or Identifier: Pasco Sanitary Landfill - Burn Trenches

Date: Wednesday, August 27, 2014

Description/Comments:

About LandGEM:

First-Order Decomposition Rate Equation:

$$Q_{CH_4} = \sum_{i=1}^{n} \sum_{j=0.1}^{1} kL_o \left(\frac{M_i}{10} \right) e^{-kt_{ij}}$$

Where,

Q_{CH4} = annual methane generation in the year of the calculation ($m^3/year$)

i = 1-year time increment

n = (year of the calculation) - (initial year of waste acceptance)

j = 0.1-year time increment

k = methane generation rate ($year^{-1}$)

L_o = potential methane generation capacity (m^3/Mg)

M_i = mass of waste accepted in the i^{th} year (Mg)

t_{ij} = age of the j^{th} section of waste mass M_i accepted in the i^{th} year (*decimal years*, e.g., 3.2 years)

LandGEM is based on a first-order decomposition rate equation for quantifying emissions from the decomposition of landfilled waste in municipal solid waste (MSW) landfills. The software provides a relatively simple approach to estimating landfill gas emissions. Model defaults are based on empirical data from U.S. landfills. Field test data can also be used in place of model defaults when available. Further guidance on EPA test methods, Clean Air Act (CAA) regulations, and other guidance regarding landfill gas emissions and control technology requirements can be found at http://www.epa.gov/ttnatw01/landfill/landflpg.html.

LandGEM is considered a screening tool — the better the input data, the better the estimates. Often, there are limitations with the available data regarding waste quantity and composition, variation in design and operating practices over time, and changes occurring over time that impact the emissions potential. Changes to landfill operation, such as operating under wet conditions through leachate recirculation or other liquid additions, will result in generating more gas at a faster rate. Defaults for estimating emissions for this type of operation are being developed to include in LandGEM along with defaults for convential landfills (no leachate or liquid additions) for developing emission inventories and determining CAA applicability. Refer to the Web site identified above for future updates.

Input Review

LANDFILL CHARACTERISTICS

Landfill Open Year	**1958**	
Landfill Closure Year (with 80-year limit)	**1965**	
Actual Closure Year (without limit)	***1965***	
Have Model Calculate Closure Year?	**No**	
Waste Design Capacity	**24,570**	*megagrams*

MODEL PARAMETERS

Methane Generation Rate, k	**0.050**	$year^{-1}$
Potential Methane Generation Capacity, L_o	**100**	m^3/Mg
NMOC Concentration	**4,000**	*ppmv as hexane*
Methane Content	**50**	*% by volume*

GASES / POLLUTANTS SELECTED

Gas / Pollutant #1:	**Total landfill gas**
Gas / Pollutant #2:	**Methane**
Gas / Pollutant #3:	**Carbon dioxide**
Gas / Pollutant #4:	**NMOC**

WASTE ACCEPTANCE RATES

Year	Waste Accepted		Waste-In-Place	
	(Mg/year)	*(short tons/year)*	*(Mg)*	*(short tons)*
1958	3,071	3,378	0	0
1959	3,071	3,378	3,071	3,378
1960	3,071	3,378	6,143	6,757
1961	3,071	3,378	9,214	10,135
1962	3,071	3,378	12,285	13,514
1963	3,071	3,378	15,356	16,892
1964	3,071	3,378	18,428	20,270
1965	3,071	3,378	21,499	23,649
1966	0	0	24,570	27,027
1967	0	0	24,570	27,027
1968	0	0	24,570	27,027
1969	0	0	24,570	27,027
1970	0	0	24,570	27,027
1971	0	0	24,570	27,027
1972	0	0	24,570	27,027
1973	0	0	24,570	27,027
1974	0	0	24,570	27,027
1975	0	0	24,570	27,027
1976	0	0	24,570	27,027
1977	0	0	24,570	27,027
1978	0	0	24,570	27,027
1979	0	0	24,570	27,027
1980	0	0	24,570	27,027
1981	0	0	24,570	27,027
1982	0	0	24,570	27,027
1983	0	0	24,570	27,027
1984	0	0	24,570	27,027
1985	0	0	24,570	27,027
1986	0	0	24,570	27,027
1987	0	0	24,570	27,027
1988	0	0	24,570	27,027
1989	0	0	24,570	27,027
1990	0	0	24,570	27,027
1991	0	0	24,570	27,027
1992	0	0	24,570	27,027
1993	0	0	24,570	27,027
1994	0	0	24,570	27,027
1995	0	0	24,570	27,027
1996	0	0	24,570	27,027
1997	0	0	24,570	27,027

WASTE ACCEPTANCE RATES (Continued)

Year	Waste Accepted		Waste-In-Place	
	(Mg/year)	*(short tons/year)*	*(Mg)*	*(short tons)*
1998	0	0	24,570	27,027
1999	0	0	24,570	27,027
2000	0	0	24,570	27,027
2001	0	0	24,570	27,027
2002	0	0	24,570	27,027
2003	0	0	24,570	27,027
2004	0	0	24,570	27,027
2005	0	0	24,570	27,027
2006	0	0	24,570	27,027
2007	0	0	24,570	27,027
2008	0	0	24,570	27,027
2009	0	0	24,570	27,027
2010	0	0	24,570	27,027
2011	0	0	24,570	27,027
2012	0	0	24,570	27,027
2013	0	0	24,570	27,027
2014	0	0	24,570	27,027
2015	0	0	24,570	27,027
2016	0	0	24,570	27,027
2017	0	0	24,570	27,027
2018	0	0	24,570	27,027
2019	0	0	24,570	27,027
2020	0	0	24,570	27,027
2021	0	0	24,570	27,027
2022	0	0	24,570	27,027
2023	0	0	24,570	27,027
2024	0	0	24,570	27,027
2025	0	0	24,570	27,027
2026	0	0	24,570	27,027
2027	0	0	24,570	27,027
2028	0	0	24,570	27,027
2029	0	0	24,570	27,027
2030	0	0	24,570	27,027
2031	0	0	24,570	27,027
2032	0	0	24,570	27,027
2033	0	0	24,570	27,027
2034	0	0	24,570	27,027
2035	0	0	24,570	27,027
2036	0	0	24,570	27,027
2037	0	0	24,570	27,027

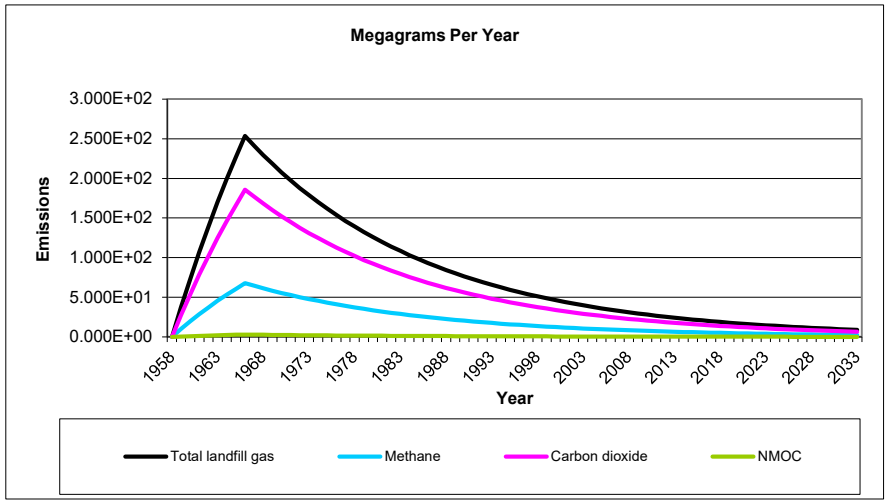
Pollutant Parameters

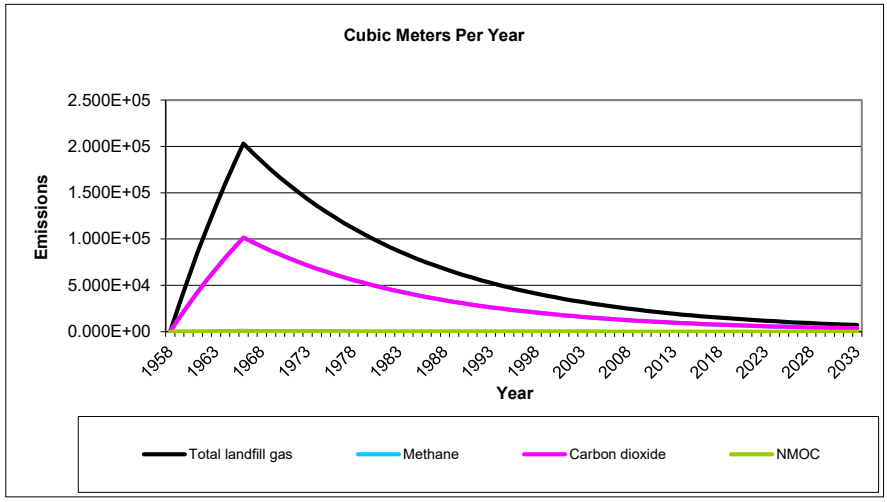
		Gas / Pollutant Default Parameters:		*User-specified Pollutant Parameters:*	
	Compound	Concentration (*ppmv*)	Molecular Weight	Concentration (*ppmv*)	Molecular Weight
Gases	Total landfill gas		0.00		
	Methane		16.04		
	Carbon dioxide		44.01		
	NMOC	4,000	86.18		
Pollutants	1,1,1-Trichloroethane (methyl chloroform) - HAP	0.48	133.41		
	1,1,2,2-Tetrachloroethane - HAP/VOC	1.1	167.85		
	1,1-Dichloroethane (ethylidene dichloride) - HAP/VOC	2.4	98.97		
	1,1-Dichloroethene (vinylidene chloride) - HAP/VOC	0.20	96.94		
	1,2-Dichloroethane (ethylene dichloride) - HAP/VOC	0.41	98.96		
	1,2-Dichloropropane (propylene dichloride) - HAP/VOC	0.18	112.99		
	2-Propanol (isopropyl alcohol) - VOC	50	60.11		
	Acetone	7.0	58.08		
	Acrylonitrile - HAP/VOC	6.3	53.06		
	Benzene - No or Unknown Co-disposal - HAP/VOC	1.9	78.11		
	Benzene - Co-disposal - HAP/VOC	11	78.11		
	Bromodichloromethane - VOC	3.1	163.83		
	Butane - VOC	5.0	58.12		
	Carbon disulfide - HAP/VOC	0.58	76.13		
	Carbon monoxide	140	28.01		
	Carbon tetrachloride - HAP/VOC	4.0E-03	153.84		
	Carbonyl sulfide - HAP/VOC	0.49	60.07		
	Chlorobenzene - HAP/VOC	0.25	112.56		
	Chlorodifluoromethane	1.3	86.47		
	Chloroethane (ethyl chloride) - HAP/VOC	1.3	64.52		
	Chloroform - HAP/VOC	0.03	119.39		
	Chloromethane - VOC	1.2	50.49		
	Dichlorobenzene - (HAP for para isomer/VOC)	0.21	147		
	Dichlorodifluoromethane	16	120.91		
	Dichlorofluoromethane - VOC	2.6	102.92		
	Dichloromethane (methylene chloride) - HAP	14	84.94		
	Dimethyl sulfide (methyl sulfide) - VOC	7.8	62.13		
	Ethane	890	30.07		
	Ethanol - VOC	27	46.08		

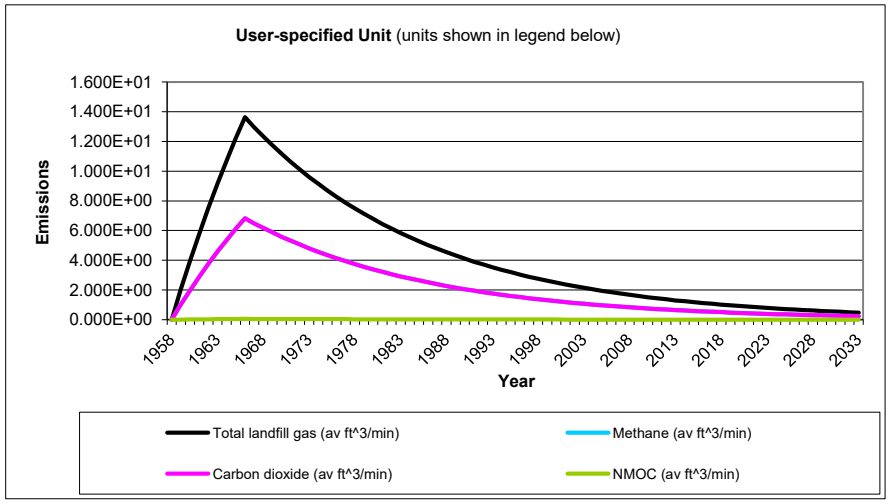
Pollutant Parameters (Continued)

		Gas / Pollutant Default Parameters:		*User-specified Pollutant Parameters:*	
	Compound	Concentration (*ppmv*)	Molecular Weight	Concentration (*ppmv*)	Molecular Weight
Pollutants	Ethyl mercaptan (ethanethiol) - VOC	2.3	62.13		
	Ethylbenzene - HAP/VOC	4.6	106.16		
	Ethylene dibromide - HAP/VOC	1.0E-03	187.88		
	Fluorotrichloromethane - VOC	0.76	137.38		
	Hexane - HAP/VOC	6.6	86.18		
	Hydrogen sulfide	36	34.08		
	Mercury (total) - HAP	2.9E-04	200.61		
	Methyl ethyl ketone - HAP/VOC	7.1	72.11		
	Methyl isobutyl ketone - HAP/VOC	1.9	100.16		
	Methyl mercaptan - VOC	2.5	48.11		
	Pentane - VOC	3.3	72.15		
	Perchloroethylene (tetrachloroethylene) - HAP	3.7	165.83		
	Propane - VOC	11	44.09		
	t-1,2-Dichloroethene - VOC	2.8	96.94		
	Toluene - No or Unknown Co-disposal - HAP/VOC	39	92.13		
	Toluene - Co-disposal - HAP/VOC	170	92.13		
	Trichloroethylene (trichloroethene) - HAP/VOC	2.8	131.40		
	Vinyl chloride - HAP/VOC	7.3	62.50		
	Xylenes - HAP/VOC	12	106.16		

Graphs


Megagrams Per Year
Emissions
3.000E+02
2.500E+02
2.000E+02
1.500E+02
1.000E+02
5.000E+01
0.000E+00
1958
1963
1968
1973
1978
1983
1988
1993
1998
2003
2008
2013
2018
2023
2028
2033
Year
Total landfill gas
Methane
Carbon dioxide
NMOC


Cubic Meters Per Year
Emissions
2.500E+05
2.000E+05
1.500E+05
1.000E+05
5.000E+04
0.000E+00
1958
1963
1968
1973
1978
1983
1988
1993
1998
2003
2008
2013
2018
2023
2028
2033
Year
Total landfill gas
Methane
Carbon dioxide
NMOC


User-specified Unit (units shown in legend below)
Emissions
1.600E+01
1.400E+01
1.200E+01
1.000E+01
8.000E+00
6.000E+00
4.000E+00
2.000E+00
0.000E+00
1958
1963
1968
1973
1978
1983
1988
1993
1998
2003
2008
2013
2018
2023
2028
2033
Year
Total landfill gas (av ft^3/min)
Methane (av ft^3/min)
Carbon dioxide (av ft^3/min)
NMOC (av ft^3/min)

Results

Year	Total landfill gas			Methane		
	(Mg/year)	*(m^3/year)*	*(av ft^3/min)*	*(Mg/year)*	*(m^3/year)*	*(av ft^3/min)*
1958	0	0	0	0	0	0
1959	3.751E+01	3.003E+04	2.018E+00	1.002E+01	1.502E+04	1.009E+00
1960	7.318E+01	5.860E+04	3.937E+00	1.955E+01	2.930E+04	1.969E+00
1961	1.071E+02	8.577E+04	5.763E+00	2.861E+01	4.289E+04	2.882E+00
1962	1.394E+02	1.116E+05	7.500E+00	3.723E+01	5.581E+04	3.750E+00
1963	1.701E+02	1.362E+05	9.152E+00	4.544E+01	6.811E+04	4.576E+00
1964	1.993E+02	1.596E+05	1.072E+01	5.324E+01	7.980E+04	5.362E+00
1965	2.271E+02	1.818E+05	1.222E+01	6.066E+01	9.092E+04	6.109E+00
1966	2.535E+02	2.030E+05	1.364E+01	6.772E+01	1.015E+05	6.820E+00
1967	2.412E+02	1.931E+05	1.298E+01	6.442E+01	9.656E+04	6.488E+00
1968	2.294E+02	1.837E+05	1.234E+01	6.128E+01	9.185E+04	6.171E+00
1969	2.182E+02	1.747E+05	1.174E+01	5.829E+01	8.737E+04	5.870E+00
1970	2.076E+02	1.662E+05	1.117E+01	5.544E+01	8.311E+04	5.584E+00
1971	1.974E+02	1.581E+05	1.062E+01	5.274E+01	7.905E+04	5.312E+00
1972	1.878E+02	1.504E+05	1.011E+01	5.017E+01	7.520E+04	5.053E+00
1973	1.787E+02	1.431E+05	9.612E+00	4.772E+01	7.153E+04	4.806E+00
1974	1.699E+02	1.361E+05	9.143E+00	4.539E+01	6.804E+04	4.572E+00
1975	1.617E+02	1.294E+05	8.697E+00	4.318E+01	6.472E+04	4.349E+00
1976	1.538E+02	1.231E+05	8.273E+00	4.107E+01	6.157E+04	4.137E+00
1977	1.463E+02	1.171E+05	7.870E+00	3.907E+01	5.856E+04	3.935E+00
1978	1.391E+02	1.114E+05	7.486E+00	3.717E+01	5.571E+04	3.743E+00
1979	1.324E+02	1.060E+05	7.121E+00	3.535E+01	5.299E+04	3.560E+00
1980	1.259E+02	1.008E+05	6.774E+00	3.363E+01	5.041E+04	3.387E+00
1981	1.198E+02	9.590E+04	6.443E+00	3.199E+01	4.795E+04	3.222E+00
1982	1.139E+02	9.122E+04	6.129E+00	3.043E+01	4.561E+04	3.065E+00
1983	1.084E+02	8.677E+04	5.830E+00	2.894E+01	4.339E+04	2.915E+00
1984	1.031E+02	8.254E+04	5.546E+00	2.753E+01	4.127E+04	2.773E+00
1985	9.805E+01	7.851E+04	5.275E+00	2.619E+01	3.926E+04	2.638E+00
1986	9.327E+01	7.468E+04	5.018E+00	2.491E+01	3.734E+04	2.509E+00
1987	8.872E+01	7.104E+04	4.773E+00	2.370E+01	3.552E+04	2.387E+00
1988	8.439E+01	6.758E+04	4.540E+00	2.254E+01	3.379E+04	2.270E+00
1989	8.028E+01	6.428E+04	4.319E+00	2.144E+01	3.214E+04	2.160E+00
1990	7.636E+01	6.115E+04	4.108E+00	2.040E+01	3.057E+04	2.054E+00
1991	7.264E+01	5.816E+04	3.908E+00	1.940E+01	2.908E+04	1.954E+00
1992	6.909E+01	5.533E+04	3.717E+00	1.846E+01	2.766E+04	1.859E+00
1993	6.572E+01	5.263E+04	3.536E+00	1.756E+01	2.631E+04	1.768E+00
1994	6.252E+01	5.006E+04	3.364E+00	1.670E+01	2.503E+04	1.682E+00
1995	5.947E+01	4.762E+04	3.200E+00	1.589E+01	2.381E+04	1.600E+00
1996	5.657E+01	4.530E+04	3.044E+00	1.511E+01	2.265E+04	1.522E+00
1997	5.381E+01	4.309E+04	2.895E+00	1.437E+01	2.154E+04	1.448E+00
1998	5.119E+01	4.099E+04	2.754E+00	1.367E+01	2.049E+04	1.377E+00
1999	4.869E+01	3.899E+04	2.620E+00	1.301E+01	1.949E+04	1.310E+00
2000	4.632E+01	3.709E+04	2.492E+00	1.237E+01	1.854E+04	1.246E+00
2001	4.406E+01	3.528E+04	2.370E+00	1.177E+01	1.764E+04	1.185E+00
2002	4.191E+01	3.356E+04	2.255E+00	1.119E+01	1.678E+04	1.127E+00
2003	3.986E+01	3.192E+04	2.145E+00	1.065E+01	1.596E+04	1.072E+00
2004	3.792E+01	3.036E+04	2.040E+00	1.013E+01	1.518E+04	1.020E+00
2005	3.607E+01	2.888E+04	1.941E+00	9.635E+00	1.444E+04	9.703E-01
2006	3.431E+01	2.747E+04	1.846E+00	9.165E+00	1.374E+04	9.230E-01
2007	3.264E+01	2.613E+04	1.756E+00	8.718E+00	1.307E+04	8.780E-01

Results (Continued)

Year	Total landfill gas			Methane		
	(Mg/year)	*(m^3/year)*	*(av ft^3/min)*	*(Mg/year)*	*(m^3/year)*	*(av ft^3/min)*
2008	3.105E+01	2.486E+04	1.670E+00	8.293E+00	1.243E+04	8.352E-01
2009	2.953E+01	2.365E+04	1.589E+00	7.888E+00	1.182E+04	7.944E-01
2010	2.809E+01	2.249E+04	1.511E+00	7.504E+00	1.125E+04	7.557E-01
2011	2.672E+01	2.140E+04	1.438E+00	7.138E+00	1.070E+04	7.188E-01
2012	2.542E+01	2.035E+04	1.368E+00	6.790E+00	1.018E+04	6.838E-01
2013	2.418E+01	1.936E+04	1.301E+00	6.458E+00	9.681E+03	6.504E-01
2014	2.300E+01	1.842E+04	1.237E+00	6.143E+00	9.208E+03	6.187E-01
2015	2.188E+01	1.752E+04	1.177E+00	5.844E+00	8.759E+03	5.885E-01
2016	2.081E+01	1.666E+04	1.120E+00	5.559E+00	8.332E+03	5.598E-01
2017	1.980E+01	1.585E+04	1.065E+00	5.288E+00	7.926E+03	5.325E-01
2018	1.883E+01	1.508E+04	1.013E+00	5.030E+00	7.539E+03	5.066E-01
2019	1.791E+01	1.434E+04	9.637E-01	4.784E+00	7.172E+03	4.819E-01
2020	1.704E+01	1.364E+04	9.167E-01	4.551E+00	6.822E+03	4.584E-01
2021	1.621E+01	1.298E+04	8.720E-01	4.329E+00	6.489E+03	4.360E-01
2022	1.542E+01	1.235E+04	8.295E-01	4.118E+00	6.173E+03	4.147E-01
2023	1.467E+01	1.174E+04	7.890E-01	3.917E+00	5.872E+03	3.945E-01
2024	1.395E+01	1.117E+04	7.505E-01	3.726E+00	5.585E+03	3.753E-01
2025	1.327E+01	1.063E+04	7.139E-01	3.544E+00	5.313E+03	3.570E-01
2026	1.262E+01	1.011E+04	6.791E-01	3.372E+00	5.054E+03	3.396E-01
2027	1.201E+01	9.614E+03	6.460E-01	3.207E+00	4.807E+03	3.230E-01
2028	1.142E+01	9.146E+03	6.145E-01	3.051E+00	4.573E+03	3.072E-01
2029	1.086E+01	8.700E+03	5.845E-01	2.902E+00	4.350E+03	2.923E-01
2030	1.033E+01	8.275E+03	5.560E-01	2.760E+00	4.138E+03	2.780E-01
2031	9.830E+00	7.872E+03	5.289E-01	2.626E+00	3.936E+03	2.644E-01
2032	9.351E+00	7.488E+03	5.031E-01	2.498E+00	3.744E+03	2.516E-01
2033	8.895E+00	7.123E+03	4.786E-01	2.376E+00	3.561E+03	2.393E-01
2034	8.461E+00	6.775E+03	4.552E-01	2.260E+00	3.388E+03	2.276E-01
2035	8.048E+00	6.445E+03	4.330E-01	2.150E+00	3.222E+03	2.165E-01
2036	7.656E+00	6.130E+03	4.119E-01	2.045E+00	3.065E+03	2.060E-01
2037	7.282E+00	5.831E+03	3.918E-01	1.945E+00	2.916E+03	1.959E-01
2038	6.927E+00	5.547E+03	3.727E-01	1.850E+00	2.774E+03	1.864E-01
2039	6.589E+00	5.277E+03	3.545E-01	1.760E+00	2.638E+03	1.773E-01
2040	6.268E+00	5.019E+03	3.372E-01	1.674E+00	2.510E+03	1.686E-01
2041	5.962E+00	4.774E+03	3.208E-01	1.593E+00	2.387E+03	1.604E-01
2042	5.672E+00	4.542E+03	3.051E-01	1.515E+00	2.271E+03	1.526E-01
2043	5.395E+00	4.320E+03	2.903E-01	1.441E+00	2.160E+03	1.451E-01
2044	5.132E+00	4.109E+03	2.761E-01	1.371E+00	2.055E+03	1.381E-01
2045	4.882E+00	3.909E+03	2.626E-01	1.304E+00	1.954E+03	1.313E-01
2046	4.644E+00	3.718E+03	2.498E-01	1.240E+00	1.859E+03	1.249E-01
2047	4.417E+00	3.537E+03	2.376E-01	1.180E+00	1.768E+03	1.188E-01
2048	4.202E+00	3.364E+03	2.261E-01	1.122E+00	1.682E+03	1.130E-01
2049	3.997E+00	3.200E+03	2.150E-01	1.068E+00	1.600E+03	1.075E-01
2050	3.802E+00	3.044E+03	2.045E-01	1.015E+00	1.522E+03	1.023E-01
2051	3.616E+00	2.896E+03	1.946E-01	9.660E-01	1.448E+03	9.728E-02
2052	3.440E+00	2.755E+03	1.851E-01	9.189E-01	1.377E+03	9.254E-02
2053	3.272E+00	2.620E+03	1.761E-01	8.740E-01	1.310E+03	8.803E-02
2054	3.113E+00	2.492E+03	1.675E-01	8.314E-01	1.246E+03	8.373E-02
2055	2.961E+00	2.371E+03	1.593E-01	7.909E-01	1.185E+03	7.965E-02
2056	2.816E+00	2.255E+03	1.515E-01	7.523E-01	1.128E+03	7.577E-02
2057	2.679E+00	2.145E+03	1.441E-01	7.156E-01	1.073E+03	7.207E-02
2058	2.548E+00	2.041E+03	1.371E-01	6.807E-01	1.020E+03	6.856E-02

Results (Continued)

Year	Total landfill gas			Methane		
	(Mg/year)	*(m^3/year)*	*(av ft^3/min)*	*(Mg/year)*	*(m^3/year)*	*(av ft^3/min)*
2059	2.424E+00	1.941E+03	1.304E-01	6.475E-01	9.706E+02	6.521E-02
2060	2.306E+00	1.846E+03	1.241E-01	6.159E-01	9.232E+02	6.203E-02
2061	2.193E+00	1.756E+03	1.180E-01	5.859E-01	8.782E+02	5.901E-02
2062	2.086E+00	1.671E+03	1.123E-01	5.573E-01	8.354E+02	5.613E-02
2063	1.985E+00	1.589E+03	1.068E-01	5.301E-01	7.946E+02	5.339E-02
2064	1.888E+00	1.512E+03	1.016E-01	5.043E-01	7.559E+02	5.079E-02
2065	1.796E+00	1.438E+03	9.662E-02	4.797E-01	7.190E+02	4.831E-02
2066	1.708E+00	1.368E+03	9.191E-02	4.563E-01	6.839E+02	4.595E-02
2067	1.625E+00	1.301E+03	8.743E-02	4.340E-01	6.506E+02	4.371E-02
2068	1.546E+00	1.238E+03	8.316E-02	4.129E-01	6.189E+02	4.158E-02
2069	1.470E+00	1.177E+03	7.911E-02	3.927E-01	5.887E+02	3.955E-02
2070	1.399E+00	1.120E+03	7.525E-02	3.736E-01	5.600E+02	3.762E-02
2071	1.330E+00	1.065E+03	7.158E-02	3.554E-01	5.327E+02	3.579E-02
2072	1.266E+00	1.013E+03	6.809E-02	3.380E-01	5.067E+02	3.404E-02
2073	1.204E+00	9.639E+02	6.477E-02	3.215E-01	4.820E+02	3.238E-02
2074	1.145E+00	9.169E+02	6.161E-02	3.059E-01	4.585E+02	3.080E-02
2075	1.089E+00	8.722E+02	5.860E-02	2.909E-01	4.361E+02	2.930E-02
2076	1.036E+00	8.297E+02	5.575E-02	2.768E-01	4.148E+02	2.787E-02
2077	9.856E-01	7.892E+02	5.303E-02	2.633E-01	3.946E+02	2.651E-02
2078	9.375E-01	7.507E+02	5.044E-02	2.504E-01	3.754E+02	2.522E-02
2079	8.918E-01	7.141E+02	4.798E-02	2.382E-01	3.571E+02	2.399E-02
2080	8.483E-01	6.793E+02	4.564E-02	2.266E-01	3.396E+02	2.282E-02
2081	8.069E-01	6.461E+02	4.341E-02	2.155E-01	3.231E+02	2.171E-02
2082	7.676E-01	6.146E+02	4.130E-02	2.050E-01	3.073E+02	2.065E-02
2083	7.301E-01	5.847E+02	3.928E-02	1.950E-01	2.923E+02	1.964E-02
2084	6.945E-01	5.561E+02	3.737E-02	1.855E-01	2.781E+02	1.868E-02
2085	6.607E-01	5.290E+02	3.554E-02	1.765E-01	2.645E+02	1.777E-02
2086	6.284E-01	5.032E+02	3.381E-02	1.679E-01	2.516E+02	1.691E-02
2087	5.978E-01	4.787E+02	3.216E-02	1.597E-01	2.393E+02	1.608E-02
2088	5.686E-01	4.553E+02	3.059E-02	1.519E-01	2.277E+02	1.530E-02
2089	5.409E-01	4.331E+02	2.910E-02	1.445E-01	2.166E+02	1.455E-02
2090	5.145E-01	4.120E+02	2.768E-02	1.374E-01	2.060E+02	1.384E-02
2091	4.894E-01	3.919E+02	2.633E-02	1.307E-01	1.960E+02	1.317E-02
2092	4.656E-01	3.728E+02	2.505E-02	1.244E-01	1.864E+02	1.252E-02
2093	4.428E-01	3.546E+02	2.383E-02	1.183E-01	1.773E+02	1.191E-02
2094	4.212E-01	3.373E+02	2.266E-02	1.125E-01	1.687E+02	1.133E-02
2095	4.007E-01	3.209E+02	2.156E-02	1.070E-01	1.604E+02	1.078E-02
2096	3.812E-01	3.052E+02	2.051E-02	1.018E-01	1.526E+02	1.025E-02
2097	3.626E-01	2.903E+02	1.951E-02	9.685E-02	1.452E+02	9.754E-03
2098	3.449E-01	2.762E+02	1.856E-02	9.212E-02	1.381E+02	9.278E-03

Results (Continued)

Year	Carbon dioxide			NMOC		
	(Mg/year)	*(m^3/year)*	*(av ft^3/min)*	*(Mg/year)*	*(m^3/year)*	*(av ft^3/min)*
1958	0	0	0	0	0	0
1959	2.749E+01	1.502E+04	1.009E+00	4.306E-01	1.201E+02	8.071E-03
1960	5.363E+01	2.930E+04	1.969E+00	8.402E-01	2.344E+02	1.575E-02
1961	7.850E+01	4.289E+04	2.882E+00	1.230E+00	3.431E+02	2.305E-02
1962	1.022E+02	5.581E+04	3.750E+00	1.600E+00	4.465E+02	3.000E-02
1963	1.247E+02	6.811E+04	4.576E+00	1.953E+00	5.448E+02	3.661E-02
1964	1.461E+02	7.980E+04	5.362E+00	2.288E+00	6.384E+02	4.289E-02
1965	1.664E+02	9.092E+04	6.109E+00	2.607E+00	7.274E+02	4.887E-02
1966	1.858E+02	1.015E+05	6.820E+00	2.911E+00	8.121E+02	5.456E-02
1967	1.767E+02	9.656E+04	6.488E+00	2.769E+00	7.724E+02	5.190E-02
1968	1.681E+02	9.185E+04	6.171E+00	2.634E+00	7.348E+02	4.937E-02
1969	1.599E+02	8.737E+04	5.870E+00	2.505E+00	6.989E+02	4.696E-02
1970	1.521E+02	8.311E+04	5.584E+00	2.383E+00	6.649E+02	4.467E-02
1971	1.447E+02	7.905E+04	5.312E+00	2.267E+00	6.324E+02	4.249E-02
1972	1.376E+02	7.520E+04	5.053E+00	2.156E+00	6.016E+02	4.042E-02
1973	1.309E+02	7.153E+04	4.806E+00	2.051E+00	5.722E+02	3.845E-02
1974	1.246E+02	6.804E+04	4.572E+00	1.951E+00	5.443E+02	3.657E-02
1975	1.185E+02	6.472E+04	4.349E+00	1.856E+00	5.178E+02	3.479E-02
1976	1.127E+02	6.157E+04	4.137E+00	1.765E+00	4.925E+02	3.309E-02
1977	1.072E+02	5.856E+04	3.935E+00	1.679E+00	4.685E+02	3.148E-02
1978	1.020E+02	5.571E+04	3.743E+00	1.597E+00	4.457E+02	2.994E-02
1979	9.700E+01	5.299E+04	3.560E+00	1.520E+00	4.239E+02	2.848E-02
1980	9.227E+01	5.041E+04	3.387E+00	1.445E+00	4.033E+02	2.709E-02
1981	8.777E+01	4.795E+04	3.222E+00	1.375E+00	3.836E+02	2.577E-02
1982	8.349E+01	4.561E+04	3.065E+00	1.308E+00	3.649E+02	2.452E-02
1983	7.942E+01	4.339E+04	2.915E+00	1.244E+00	3.471E+02	2.332E-02
1984	7.554E+01	4.127E+04	2.773E+00	1.183E+00	3.302E+02	2.218E-02
1985	7.186E+01	3.926E+04	2.638E+00	1.126E+00	3.141E+02	2.110E-02
1986	6.835E+01	3.734E+04	2.509E+00	1.071E+00	2.987E+02	2.007E-02
1987	6.502E+01	3.552E+04	2.387E+00	1.019E+00	2.842E+02	1.909E-02
1988	6.185E+01	3.379E+04	2.270E+00	9.689E-01	2.703E+02	1.816E-02
1989	5.883E+01	3.214E+04	2.160E+00	9.217E-01	2.571E+02	1.728E-02
1990	5.596E+01	3.057E+04	2.054E+00	8.767E-01	2.446E+02	1.643E-02
1991	5.323E+01	2.908E+04	1.954E+00	8.339E-01	2.327E+02	1.563E-02
1992	5.064E+01	2.766E+04	1.859E+00	7.933E-01	2.213E+02	1.487E-02
1993	4.817E+01	2.631E+04	1.768E+00	7.546E-01	2.105E+02	1.414E-02
1994	4.582E+01	2.503E+04	1.682E+00	7.178E-01	2.002E+02	1.345E-02
1995	4.358E+01	2.381E+04	1.600E+00	6.828E-01	1.905E+02	1.280E-02
1996	4.146E+01	2.265E+04	1.522E+00	6.495E-01	1.812E+02	1.217E-02
1997	3.944E+01	2.154E+04	1.448E+00	6.178E-01	1.724E+02	1.158E-02
1998	3.751E+01	2.049E+04	1.377E+00	5.877E-01	1.640E+02	1.102E-02
1999	3.568E+01	1.949E+04	1.310E+00	5.590E-01	1.560E+02	1.048E-02
2000	3.394E+01	1.854E+04	1.246E+00	5.317E-01	1.483E+02	9.967E-03
2001	3.229E+01	1.764E+04	1.185E+00	5.058E-01	1.411E+02	9.481E-03
2002	3.071E+01	1.678E+04	1.127E+00	4.811E-01	1.342E+02	9.019E-03
2003	2.922E+01	1.596E+04	1.072E+00	4.577E-01	1.277E+02	8.579E-03
2004	2.779E+01	1.518E+04	1.020E+00	4.354E-01	1.215E+02	8.161E-03
2005	2.644E+01	1.444E+04	9.703E-01	4.141E-01	1.155E+02	7.763E-03
2006	2.515E+01	1.374E+04	9.230E-01	3.939E-01	1.099E+02	7.384E-03
2007	2.392E+01	1.307E+04	8.780E-01	3.747E-01	1.045E+02	7.024E-03

Results (Continued)

Year	Carbon dioxide			NMOC		
	(Mg/year)	*(m^3/year)*	*(av ft^3/min)*	*(Mg/year)*	*(m^3/year)*	*(av ft^3/min)*
2008	2.275E+01	1.243E+04	8.352E-01	3.564E-01	9.944E+01	6.681E-03
2009	2.164E+01	1.182E+04	7.944E-01	3.391E-01	9.459E+01	6.356E-03
2010	2.059E+01	1.125E+04	7.557E-01	3.225E-01	8.998E+01	6.046E-03
2011	1.958E+01	1.070E+04	7.188E-01	3.068E-01	8.559E+01	5.751E-03
2012	1.863E+01	1.018E+04	6.838E-01	2.918E-01	8.142E+01	5.470E-03
2013	1.772E+01	9.681E+03	6.504E-01	2.776E-01	7.744E+01	5.203E-03
2014	1.686E+01	9.208E+03	6.187E-01	2.641E-01	7.367E+01	4.950E-03
2015	1.603E+01	8.759E+03	5.885E-01	2.512E-01	7.007E+01	4.708E-03
2016	1.525E+01	8.332E+03	5.598E-01	2.389E-01	6.666E+01	4.479E-03
2017	1.451E+01	7.926E+03	5.325E-01	2.273E-01	6.341E+01	4.260E-03
2018	1.380E+01	7.539E+03	5.066E-01	2.162E-01	6.031E+01	4.052E-03
2019	1.313E+01	7.172E+03	4.819E-01	2.056E-01	5.737E+01	3.855E-03
2020	1.249E+01	6.822E+03	4.584E-01	1.956E-01	5.457E+01	3.667E-03
2021	1.188E+01	6.489E+03	4.360E-01	1.861E-01	5.191E+01	3.488E-03
2022	1.130E+01	6.173E+03	4.147E-01	1.770E-01	4.938E+01	3.318E-03
2023	1.075E+01	5.872E+03	3.945E-01	1.684E-01	4.697E+01	3.156E-03
2024	1.022E+01	5.585E+03	3.753E-01	1.602E-01	4.468E+01	3.002E-03
2025	9.725E+00	5.313E+03	3.570E-01	1.523E-01	4.250E+01	2.856E-03
2026	9.251E+00	5.054E+03	3.396E-01	1.449E-01	4.043E+01	2.716E-03
2027	8.800E+00	4.807E+03	3.230E-01	1.379E-01	3.846E+01	2.584E-03
2028	8.370E+00	4.573E+03	3.072E-01	1.311E-01	3.658E+01	2.458E-03
2029	7.962E+00	4.350E+03	2.923E-01	1.247E-01	3.480E+01	2.338E-03
2030	7.574E+00	4.138E+03	2.780E-01	1.186E-01	3.310E+01	2.224E-03
2031	7.205E+00	3.936E+03	2.644E-01	1.129E-01	3.149E+01	2.116E-03
2032	6.853E+00	3.744E+03	2.516E-01	1.074E-01	2.995E+01	2.012E-03
2033	6.519E+00	3.561E+03	2.393E-01	1.021E-01	2.849E+01	1.914E-03
2034	6.201E+00	3.388E+03	2.276E-01	9.714E-02	2.710E+01	1.821E-03
2035	5.899E+00	3.222E+03	2.165E-01	9.240E-02	2.578E+01	1.732E-03
2036	5.611E+00	3.065E+03	2.060E-01	8.790E-02	2.452E+01	1.648E-03
2037	5.337E+00	2.916E+03	1.959E-01	8.361E-02	2.333E+01	1.567E-03
2038	5.077E+00	2.774E+03	1.864E-01	7.953E-02	2.219E+01	1.491E-03
2039	4.829E+00	2.638E+03	1.773E-01	7.565E-02	2.111E+01	1.418E-03
2040	4.594E+00	2.510E+03	1.686E-01	7.196E-02	2.008E+01	1.349E-03
2041	4.370E+00	2.387E+03	1.604E-01	6.845E-02	1.910E+01	1.283E-03
2042	4.157E+00	2.271E+03	1.526E-01	6.512E-02	1.817E+01	1.221E-03
2043	3.954E+00	2.160E+03	1.451E-01	6.194E-02	1.728E+01	1.161E-03
2044	3.761E+00	2.055E+03	1.381E-01	5.892E-02	1.644E+01	1.104E-03
2045	3.578E+00	1.954E+03	1.313E-01	5.605E-02	1.564E+01	1.051E-03
2046	3.403E+00	1.859E+03	1.249E-01	5.331E-02	1.487E+01	9.993E-04
2047	3.237E+00	1.768E+03	1.188E-01	5.071E-02	1.415E+01	9.506E-04
2048	3.079E+00	1.682E+03	1.130E-01	4.824E-02	1.346E+01	9.042E-04
2049	2.929E+00	1.600E+03	1.075E-01	4.589E-02	1.280E+01	8.601E-04
2050	2.786E+00	1.522E+03	1.023E-01	4.365E-02	1.218E+01	8.182E-04
2051	2.650E+00	1.448E+03	9.728E-02	4.152E-02	1.158E+01	7.783E-04
2052	2.521E+00	1.377E+03	9.254E-02	3.949E-02	1.102E+01	7.403E-04
2053	2.398E+00	1.310E+03	8.803E-02	3.757E-02	1.048E+01	7.042E-04
2054	2.281E+00	1.246E+03	8.373E-02	3.574E-02	9.970E+00	6.699E-04
2055	2.170E+00	1.185E+03	7.965E-02	3.399E-02	9.484E+00	6.372E-04
2056	2.064E+00	1.128E+03	7.577E-02	3.234E-02	9.021E+00	6.061E-04
2057	1.963E+00	1.073E+03	7.207E-02	3.076E-02	8.581E+00	5.766E-04
2058	1.868E+00	1.020E+03	6.856E-02	2.926E-02	8.163E+00	5.484E-04

Results (Continued)

Year	Carbon dioxide			NMOC		
	(Mg/year)	*(m^3/year)*	*(av ft^3/min)*	*(Mg/year)*	*(m^3/year)*	*(av ft^3/min)*
2059	1.777E+00	9.706E+02	6.521E-02	2.783E-02	7.765E+00	5.217E-04
2060	1.690E+00	9.232E+02	6.203E-02	2.647E-02	7.386E+00	4.963E-04
2061	1.608E+00	8.782E+02	5.901E-02	2.518E-02	7.026E+00	4.721E-04
2062	1.529E+00	8.354E+02	5.613E-02	2.395E-02	6.683E+00	4.490E-04
2063	1.455E+00	7.946E+02	5.339E-02	2.279E-02	6.357E+00	4.271E-04
2064	1.384E+00	7.559E+02	5.079E-02	2.168E-02	6.047E+00	4.063E-04
2065	1.316E+00	7.190E+02	4.831E-02	2.062E-02	5.752E+00	3.865E-04
2066	1.252E+00	6.839E+02	4.595E-02	1.961E-02	5.472E+00	3.676E-04
2067	1.191E+00	6.506E+02	4.371E-02	1.866E-02	5.205E+00	3.497E-04
2068	1.133E+00	6.189E+02	4.158E-02	1.775E-02	4.951E+00	3.326E-04
2069	1.078E+00	5.887E+02	3.955E-02	1.688E-02	4.709E+00	3.164E-04
2070	1.025E+00	5.600E+02	3.762E-02	1.606E-02	4.480E+00	3.010E-04
2071	9.750E-01	5.327E+02	3.579E-02	1.527E-02	4.261E+00	2.863E-04
2072	9.275E-01	5.067E+02	3.404E-02	1.453E-02	4.053E+00	2.723E-04
2073	8.822E-01	4.820E+02	3.238E-02	1.382E-02	3.856E+00	2.591E-04
2074	8.392E-01	4.585E+02	3.080E-02	1.315E-02	3.668E+00	2.464E-04
2075	7.983E-01	4.361E+02	2.930E-02	1.251E-02	3.489E+00	2.344E-04
2076	7.594E-01	4.148E+02	2.787E-02	1.190E-02	3.319E+00	2.230E-04
2077	7.223E-01	3.946E+02	2.651E-02	1.132E-02	3.157E+00	2.121E-04
2078	6.871E-01	3.754E+02	2.522E-02	1.076E-02	3.003E+00	2.018E-04
2079	6.536E-01	3.571E+02	2.399E-02	1.024E-02	2.856E+00	1.919E-04
2080	6.217E-01	3.396E+02	2.282E-02	9.739E-03	2.717E+00	1.826E-04
2081	5.914E-01	3.231E+02	2.171E-02	9.264E-03	2.585E+00	1.737E-04
2082	5.625E-01	3.073E+02	2.065E-02	8.813E-03	2.459E+00	1.652E-04
2083	5.351E-01	2.923E+02	1.964E-02	8.383E-03	2.339E+00	1.571E-04
2084	5.090E-01	2.781E+02	1.868E-02	7.974E-03	2.225E+00	1.495E-04
2085	4.842E-01	2.645E+02	1.777E-02	7.585E-03	2.116E+00	1.422E-04
2086	4.606E-01	2.516E+02	1.691E-02	7.215E-03	2.013E+00	1.352E-04
2087	4.381E-01	2.393E+02	1.608E-02	6.863E-03	1.915E+00	1.286E-04
2088	4.167E-01	2.277E+02	1.530E-02	6.528E-03	1.821E+00	1.224E-04
2089	3.964E-01	2.166E+02	1.455E-02	6.210E-03	1.732E+00	1.164E-04
2090	3.771E-01	2.060E+02	1.384E-02	5.907E-03	1.648E+00	1.107E-04
2091	3.587E-01	1.960E+02	1.317E-02	5.619E-03	1.568E+00	1.053E-04
2092	3.412E-01	1.864E+02	1.252E-02	5.345E-03	1.491E+00	1.002E-04
2093	3.246E-01	1.773E+02	1.191E-02	5.084E-03	1.418E+00	9.531E-05
2094	3.087E-01	1.687E+02	1.133E-02	4.836E-03	1.349E+00	9.066E-05
2095	2.937E-01	1.604E+02	1.078E-02	4.601E-03	1.283E+00	8.624E-05
2096	2.793E-01	1.526E+02	1.025E-02	4.376E-03	1.221E+00	8.203E-05
2097	2.657E-01	1.452E+02	9.754E-03	4.163E-03	1.161E+00	7.803E-05
2098	2.528E-01	1.381E+02	9.278E-03	3.960E-03	1.105E+00	7.422E-05