

DOE Oversight Bureau, New Mexico Environment Department

**Soil Vapor Monitoring at
Sandia National Laboratories/New Mexico
Mixed Waste Landfill**

**Conducted by the
New Mexico Environment Department DOE Oversight Bureau
for FFY 2016 Q-3**

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The purpose of this communication is to transmit soil vapor data collected by the New Mexico Environment Department DOE Oversight Bureau from Sandia National Laboratories/New Mexico Mixed Waste Landfill soil vapor monitoring wells MWL-SV03, MWL-SV04 and MWL-SV05 during third quarter FFY 2016.

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Introduction

The New Mexico Environment Department (NMED) DOE Oversight Bureau (DOE-OB or Bureau) has compiled and assessed soil vapor data collected on April 27, 2016. The Bureau collected soil vapor samples from Solid Waste Management Unit (SWMU) 76, Mixed Waste Landfill (MWL) monitoring wells MWL-SV03, MWL-SV04 and MWL-SV05. Samples were collected using standard Sandia National Laboratories/New Mexico (SNL/NM or Sandia) sampling procedures and equipment in accordance with the MWL Long-Term Monitoring and Maintenance Plan (LTMMP), Appendix D (Soil-Vapor Sampling and Analysis Plan). Soil vapor samples were collected in 6-liter SUMMA canisters and analyzed for volatile organic compounds (VOCs) using method TO-15, by Eurofins Air Toxics, Inc. located in Folsom, CA. Eurofins Air Toxics, Inc. is an independent analytical laboratory under contract with NMED. The Bureau uses an independent laboratory to verify data results reported by Sandia's analytical laboratory.

Soil vapor monitoring wells MWL-SV03, MWL-SV04 and MWL-SV05 are Flexible Liner Underground Technologies (FLUTE™) wells, constructed with multi-ports at sampling depths of approximately 50ft, 100ft, 200ft, 300ft, and 400ft below ground surface (bgs). Bureau staff collected split samples at depths of 300ft bgs and 400ft bgs from each well. Bureau staff also collected a field blank during sampling at MWL-SV04 and a duplicate sample was collected from monitoring well MWL-SV05 400ft bgs.

The Oversight Bureau collected samples from the following soil vapor monitoring wells and depths measured as feet below ground surface:

Soil Vapor Monitoring Well	First Sampling Depth (ft bgs)	Second Sampling Depth (ft bgs)
MWL-SV03	300	400
MWL-SV04	300	400
MWL-SV05	300	400
MWL-SV05 Dup	-	400

Split samples were collected in sequence, rather than using the manifold sampling system, designed to collect samples simultaneously. All samples collected from April 2016 were well below established trigger levels for VOCs in soil vapor, as specified in the SNL/NM LTMMP for the MWL.

Data Assessment

Data results are compared to VOC trigger levels listed in the SNL/NM LTMMP for the MWL. Trigger levels for tetrachloroethylene (PCE), trichloroethylene (TCE), and total VOCs in soil vapor at the MWL are 20 parts per million by volume (ppmv) for PCE and TCE, and 25 ppmv for total VOCs. These trigger levels are equivalent to 20,000 parts per billion by volume (ppbv) and 25,000 ppbv, respectively. All trigger levels apply only to samples collected from the deepest sampling port (i.e., 400 feet bgs) in each of the three FLUTe™ soil vapor monitoring wells.

Results

Analytical results for VOCs are presented in Tables 1 through 6. All samples were analyzed for VOCs using analytical method TO-15. Sample results are presented in units of part per billion per volume (ppbv). Tetrachlorethene (PCE) ranged from 69 ppbv at MWL-SV05 400ft (duplicate) to 340 ppbv at MWL-SV03 400ft. Trichloroethene (TCE) ranged from 68 ppbv at monitoring well MWL-SV04 400ft to 200 ppbv at MWL-SV03 400ft. Total VOCs ranged from 220.91 ppbv at MWL-SV05-400ft (duplicate sample) to 678.6 ppbv at MWL-SV03 400ft.

Below are the sample results for TCE and PCE as well as total VOCs in units of part per billion per volume directly measured by the analytical laboratory.

Soil Vapor Monitoring Well	Tetrachlorethene (PCE) (ppbv)	Trichloroethene (TCE) (ppbv)	Total VOCs (ppbv)
MWL-SV03-300ft	240	160	576.8
MWL-SV03-400ft	340	200	678.6
MWL-SV04-300ft	98	82	269.7
MWL-SV04-400ft	90	68	234.56
MWL-SV05-300ft	91	81	335.31
MWL-SV05-400ft	94	71	249.73
MWL-SV05-400ft (Dup)	69	71	220.91
Trigger Level ^a	20,000	20,000	25,000

Note: ^a= The trigger levels only apply to samples collected at the 400ft depth (SNL/NM March 2012).

Conclusions

The DOE-OB collected soil vapor samples from monitoring wells MWL-SV03, MWL-SV04 and MWL-SV05. Samples were collected at depths of 300ft and 400ft bgs at each well. A duplicate sample was also collected at MWL-SV05 400ft bgs. The soil vapor samples collected by DOE-OB during April 2016 were measured at levels well below the trigger levels listed in the SNL/NM LTMMP for the MWL.

Data results for PCE, TCE and total VOCs from the four (4) previous sampling events at the MWL are provided in the table below. The soil vapor concentrations measured by the analytical laboratories were well below the LTMMP trigger levels during each sampling event.

The DOE-OB will continue to independently monitoring soil vapor at the MWL during future SNL/NM semi-annual sampling events and report data results to DOE.

NMED DOE OB Soil Vapor Data Results from the MWL 2014-2016

MWL Soil Vapor Monitoring Well	Tetrachlorethene (PCE) (ppbv)				Trichloroethene (TCE) (ppbv)				Total VOCs (ppbv)			
	Sep 2014	Apr 2015	Oct 2015	Apr 2016	Sep 2014	Apr 2015	Oct 2015	Apr 2016	Sep 2014	Apr 2015	Oct 2015	Apr 2016
MWL-SV03-300ft	200	270	190	240	120	150	140	160	460.6	554.9	493.6	576.8
MWL-SV03-400ft	350	330	310	340	200	210	210	200	825.4	685.3	661.5	678.6
MWL-SV04-300ft	61	86	85	98	33	58	59	82	158.7	237.9	252.4	269.7
MWL-SV04-400ft	67	93	88	90	40	58	67	68	147.5	228.9	220.5	234.6
MWL-SV05-300ft	73	76	46	91	70	72	66	81	282.8	289.9	272.2	335.3
MWL-SV05-400ft	71	74	71	94	56	62	60	71	802	235.8	241.2	249.7
Trigger Level ^a	20,000				20,000				25,000			

Note: ^a= The trigger levels only apply to samples collected at the 400ft depth (SNL/NM March 2012).

References

Sandia National Laboratories, New Mexico Environmental Restoration Operations. Long-Term Monitoring and Maintenance Plan for the Mixed Waste Landfill, March 2012.

Sandia National Laboratories, New Mexico Environmental Restoration Operations. Installation of Three FLUTe™ Soil-Vapor Monitoring Wells (MWL-SV03, MWL-SV04, and MWL-SV05) at the Mixed Waste Landfill, September 2014.

Soil Vapor Monitoring at SNL/NM MWL Conducted by NMED DOE OB for FFY 2014 Q-4

Soil Vapor Monitoring at SNL/NM MWL Conducted by NMED DOE OB for FFY 2015 Q-3

Soil Vapor Monitoring at SNL/NM MWL Conducted by NMED DOE OB for FFY 2016 Q-1

Table-1 NMED DOE OB FFY 2016 Q-3 Mixed Waste Landfill Soil Vapor Quality Results: Volatile Organic Compounds by Method TO-15. April 27, 2016

MWL-SV03 sampled at a depth of 300 feet below ground surface

Trigger levels are 20,000 ppbv for PCE and TCE and 25,000 ppbv for total VOCs in samples collected from 400ft ports.

Monitoring Well/ Sample Depth	Analyte	Result (ppbv)	Reporting Limit (ppbv)	MDL (ppbv)	Laboratory Qualifier
MWL-SV03 300 ft.	1,1,1-TRICHLOROETHANE	0.18	0.77	0.18	U
	1,1,2,2-TETRACHLOROETHANE	0.079	0.77	0.079	U
	1,1,2-TRICHLOROETHANE	0.39	0.77	0.39	U
	1,1-DICHLOROETHANE	1.6	0.77	0.098	
	1,1-DICHLOROETHENE	17	0.77	0.15	
	1,2,4-TRICHLOROBENZENE	0.16	3.9	0.16	U
	1,2,4-TRIMETHYLBENZENE	0.15	0.77	0.15	U
	1,2-DIBROMOETHANE (EDB)	0.13	0.77	0.13	U
	1,2-DICHLOROBENZENE	0.24	0.77	0.24	U
	1,2-DICHLOROETHANE	0.26	0.77	0.26	U
	1,2-DICHLOROPROPANE	0.17	0.77	0.17	U
	1,3,5-TRIMETHYLBENZENE	0.13	0.77	0.13	U
	1,3-BUTADIENE	0.11	0.77	0.11	U
	1,3-DICHLOROBENZENE	0.1	0.77	0.1	U
	1,4-DICHLOROBENZENE	0.11	0.77	0.11	U
	1,4-DIOXANE	0.23	0.77	0.23	U
	2,2,4-TRIMETHYLPENTANE	0.49	3.9	0.49	U
	2-BUTANONE (METHYL ETHYL KETONE)	0.28	3.9	0.28	U
	2-HEXANONE	0.41	3.9	0.41	U
	2-PROPANOL	0.29	3.9	0.29	U
	3-CHLOROPROPENE	0.27	3.9	0.27	U
	4-ETHYLTOLUENE	0.16	0.77	0.16	U
	4-METHYL-2-PENTANONE	0.14	0.77	0.14	U
	ACETONE	0.53	3.9	0.53	U
	ALPHA-CHLOROTOLUENE	0.16	0.77	0.16	U
	BENZENE	0.25	0.77	0.25	U
	BROMODICHLOROMETHANE	0.12	0.77	0.12	U
	BROMOFORM	0.14	0.77	0.14	U
	BROMOMETHANE	1.2	3.9	1.2	U
	CARBON DISULFIDE	0.31	3.9	0.31	U
	CARBON TETRACHLORIDE	0.072	0.77	0.072	U
	CHLOROBENZENE	0.19	0.77	0.19	U
	CHLOROETHANE	0.61	3.9	0.61	U
	CHLOROFORM	0.16	0.77	0.16	U

U = Compound analyzed for but not detected above the Method Detection Limit.

Table-1 NMED DOE OB FFY 2016 Q-3 Mixed Waste Landfill Soil Vapor Quality Results: Volatile Organic Compounds by Method TO-15. April 27, 2016

MWL-SV03 sampled at a depth of 300 feet below ground surface

Trigger levels are 20,000 ppbv for PCE and TCE and 25,000 ppbv for total VOCs in samples collected from 400ft ports.

Monitoring Well/ Sample Depth	Analyte	Result (ppbv)	Reporting Limit (ppbv)	MDL (ppbv)	Laboratory Qualifier
MWL-SV03 300 ft.	CHLOROMETHANE	0.94	3.9	0.94	U
	CIS-1,2-DICHLOROETHENE	1.2	0.77	0.22	
	CIS-1,3-DICHLOROPROPENE	0.16	0.77	0.16	U
	CUMENE	0.12	0.77	0.12	U
	CYCLOHEXANE	0.13	0.77	0.13	U
	DIBROMOCHLOROMETHANE	0.13	0.77	0.13	U
	ETHANOL	0.83	3.9	0.83	U
	ETHYL BENZENE	0.22	0.77	0.22	U
	FREON 11	13	0.77	0.099	
	FREON 113	110	0.77	0.22	
	FREON 114	0.14	0.77	0.14	U
	FREON 12	34	0.77	0.12	
	HEPTANE	0.18	0.77	0.18	U
	HEXACHLOROBUTADIENE	0.19	3.9	0.19	U
	HEXANE	0.16	0.77	0.16	U
	M,P-XYLENE	0.13	0.77	0.13	U
	METHYL TERT-BUTYL ETHER	0.1	0.77	0.1	U
	METHYLENE CHLORIDE	0.12	1.5	0.12	U
	O-XYLENE	0.19	0.77	0.19	U
	PROPYLBENZENE	0.14	0.77	0.14	U
	STYRENE	0.079	0.77	0.079	U
	TETRACHLOROETHENE	240	0.77	0.21	
	TETRAHYDROFURAN	0.66	3.9	0.66	U
	TOLUENE	0.094	0.77	0.094	U
	TRANS-1,2-DICHLOROETHENE	0.23	0.77	0.23	U
	TRANS-1,3-DICHLOROPROPENE	0.16	0.77	0.16	U
	TRICHLOROETHENE	160	0.77	0.23	
	VINYL CHLORIDE	0.17	0.77	0.17	U

U = Compound analyzed for but not detected above the Method Detection Limit.

Table-2 NMED DOE OB FFY 2016 Q-3 Mixed Waste Landfill Soil Vapor Quality Results: Volatile Organic Compounds by Method TO-15. April 27, 2016

MWL-SV03 sampled at a depth of 400 feet below ground surface

Trigger levels are 20,000 ppbv for PCE and TCE and 25,000 ppbv for total VOCs in samples collected from 400ft ports.

Monitoring Well/ Sample Depth	Analyte	Result (ppbv)	Reporting Limit (ppbv)	MDL (ppbv)	Laboratory Qualifier
MWL-SV03 400 ft	1,1,1-TRICHLOROETHANE	0.21	0.89	0.21	U
	1,1,2,2-TETRACHLOROETHANE	0.09	0.89	0.09	U
	1,1,2-TRICHLOROETHANE	0.44	0.89	0.44	U
	1,1-DICHLOROETHANE	2.1	0.89	0.11	
	1,1-DICHLOROETHENE	15	0.89	0.18	
	1,2,4-TRICHLOROBENZENE	0.18	4.4	0.18	U
	1,2,4-TRIMETHYLBENZENE	0.17	0.89	0.17	U
	1,2-DIBROMOETHANE (EDB)	0.15	0.89	0.15	U
	1,2-DICHLOROBENZENE	0.28	0.89	0.28	U
	1,2-DICHLOROETHANE	0.3	0.89	0.3	U
	1,2-DICHLOROPROPANE	0.19	0.89	0.19	U
	1,3,5-TRIMETHYLBENZENE	0.16	0.89	0.16	U
	1,3-BUTADIENE	0.13	0.89	0.13	U
	1,3-DICHLOROBENZENE	0.12	0.89	0.12	U
	1,4-DICHLOROBENZENE	0.12	0.89	0.12	U
	1,4-DIOXANE	0.27	0.89	0.27	U
	2,2,4-TRIMETHYLPENTANE	0.57	4.4	0.57	U
	2-BUTANONE (METHYL ETHYL KETONE)	0.32	4.4	0.32	U
	2-HEXANONE	0.47	4.4	0.47	U
	2-PROPANOL	0.34	4.4	0.34	U
	3-CHLOROPROPENE	0.31	4.4	0.31	U
	4-ETHYLTOLUENE	0.19	0.89	0.19	U
	4-METHYL-2-PENTANONE	0.16	0.89	0.16	U
	ACETONE	0.61	4.4	0.61	U
	ALPHA-CHLOROTOLUENE	0.19	0.89	0.19	U
	BENZENE	0.28	0.89	0.28	U
	BROMODICHLOROMETHANE	0.14	0.89	0.14	U
	BROMOFORM	0.16	0.89	0.16	U
	BROMOMETHANE	1.4	4.4	1.4	U
	CARBON DISULFIDE	0.36	4.4	0.36	U
	CARBON TETRACHLORIDE	0.083	0.89	0.083	U
	CHLOROBENZENE	0.22	0.89	0.22	U
	CHLOROETHANE	0.7	4.4	0.7	U
	CHLOROFORM	0.18	0.89	0.18	U

U = Compound analyzed for but not detected above the Method Detection Limit.

Table-2 NMED DOE OB FFY 2016 Q-3 Mixed Waste Landfill Soil Vapor Quality Results: Volatile Organic Compounds by Method TO-15. April 27, 2016

MWL-SV03 sampled at a depth of 400 feet below ground surface

Trigger levels are 20,000 ppbv for PCE and TCE and 25,000 ppbv for total VOCs in samples collected from 400ft ports.

Monitoring Well/ Sample Depth	Analyte	Result (ppbv)	Reporting Limit (ppbv)	MDL (ppbv)	Laboratory Qualifier
MWL-SV03 400 ft	CHLOROMETHANE	1.1	4.4	1.1	U
	CIS-1,2-DICHLOROETHENE	1.3	0.89	0.26	
	CIS-1,3-DICHLOROPROPENE	0.19	0.89	0.19	U
	CUMENE	0.14	0.89	0.14	U
	CYCLOHEXANE	0.15	0.89	0.15	U
	DIBROMOCHLOROMETHANE	0.15	0.89	0.15	U
	ETHANOL	0.96	4.4	0.96	U
	ETHYL BENZENE	0.25	0.89	0.25	U
	FREON 11	11	0.89	0.11	
	FREON 113	82	0.89	0.25	
	FREON 114	0.16	0.89	0.16	U
	FREON 12	25	0.89	0.13	
	HEPTANE	0.2	0.89	0.2	U
	HEXACHLOROBUTADIENE	0.22	4.4	0.22	U
	HEXANE	0.18	0.89	0.18	U
	M,P-XYLENE	0.15	0.89	0.15	U
	METHYL TERT-BUTYL ETHER	0.12	0.89	0.12	U
	METHYLENE CHLORIDE	0.13	1.8	0.13	U
	O-XYLENE	0.22	0.89	0.22	U
	PROPYLBENZENE	0.16	0.89	0.16	U
	STYRENE	0.09	0.89	0.09	U
	TETRACHLOROETHENE	340	0.89	0.24	
	TETRAHYDROFURAN	0.76	4.4	0.76	U
	TOLUENE	2.2	0.89	0.11	
	TRANS-1,2-DICHLOROETHENE	0.26	0.89	0.26	U
	TRANS-1,3-DICHLOROPROPENE	0.19	0.89	0.19	U
	TRICHLOROETHENE	200	0.89	0.26	
	VINYL CHLORIDE	0.2	0.89	0.2	U

U = Compound analyzed for but not detected above the Method Detection Limit.

Table-3 NMED DOE OB FFY 2016 Q-3 Mixed Waste Landfill Soil Vapor Quality Results: Volatile Organic Compounds by Method TO-15. April 27, 2016

MWL-SV04 sampled at a depth of 300 feet below ground surface

Trigger levels are 20,000 ppbv for PCE and TCE and 25,000 ppbv for total VOCs in samples collected from 400ft ports.

Monitoring Well/ Sample Depth	Analyte	Result (ppbv)	Reporting Limit (ppbv)	MDL (ppbv)	Laboratory Qualifier
MWL-SV04 300 ft.	1,1,1-TRICHLOROETHANE	0.5	0.48	0.11	
	1,1,2,2-TETRACHLOROETHANE	0.049	0.48	0.049	U
	1,1,2-TRICHLOROETHANE	0.24	0.48	0.24	U
	1,1-DICHLOROETHANE	0.061	0.48	0.061	U
	1,1-DICHLOROETHENE	6.1	0.48	0.096	
	1,2,4-TRICHLOROBENZENE	0.097	2.4	0.097	U
	1,2,4-TRIMETHYLBENZENE	0.094	0.48	0.094	U
	1,2-DIBROMOETHANE (EDB)	0.082	0.48	0.082	U
	1,2-DICHLOROBENZENE	0.15	0.48	0.15	U
	1,2-DICHLOROETHANE	0.16	0.48	0.16	U
	1,2-DICHLOROPROPANE	0.1	0.48	0.1	U
	1,3,5-TRIMETHYLBENZENE	0.084	0.48	0.084	U
	1,3-BUTADIENE	0.07	0.48	0.07	U
	1,3-DICHLOROBENZENE	0.062	0.48	0.062	U
	1,4-DICHLOROBENZENE	0.067	0.48	0.067	U
	1,4-DIOXANE	0.14	0.48	0.14	U
	2,2,4-TRIMETHYLPENTANE	0.3	2.4	0.3	U
	2-BUTANONE (METHYL ETHYL KETONE)	0.17	2.4	0.17	U
	2-HEXANONE	0.25	2.4	0.25	U
	2-PROPANOL	0.18	2.4	0.18	U
	3-CHLOROPROPENE	0.17	2.4	0.17	U
	4-ETHYLTOLUENE	0.1	0.48	0.1	U
	4-METHYL-2-PENTANONE	0.088	0.48	0.088	U
	ACETONE	4.8	2.4	0.33	
	ALPHA-CHLOROTOLUENE	0.1	0.48	0.1	U
	BENZENE	0.15	0.48	0.15	U
	BROMODICHLOROMETHANE	0.074	0.48	0.074	U
	BROMOFORM	0.089	0.48	0.089	U
	BROMOMETHANE	0.74	2.4	0.74	U
	CARBON DISULFIDE	0.19	2.4	0.19	U
	CARBON TETRACHLORIDE	0.044	0.48	0.044	U
	CHLOROBENZENE	0.12	0.48	0.12	U
	CHLOROETHANE	0.38	2.4	0.38	U
	CHLOROFORM	0.096	0.48	0.096	U

U = Compound analyzed for but not detected above the Method Detection Limit.

Table-3 NMED DOE OB FFY 2016 Q-3 Mixed Waste Landfill Soil Vapor Quality Results: Volatile Organic Compounds by Method TO-15. April 27, 2016

MWL-SV04 sampled at a depth of 300 feet below ground surface

Trigger levels are 20,000 ppbv for PCE and TCE and 25,000 ppbv for total VOCs in samples collected from 400ft ports.

Monitoring Well/ Sample Depth	Analyte	Result (ppbv)	Reporting Limit (ppbv)	MDL (ppbv)	Laboratory Qualifier
MWL-SV04 300 ft.	CHLOROMETHANE	0.59	2.4	0.59	U
	CIS-1,2-DICHLOROETHENE	0.14	0.48	0.14	U
	CIS-1,3-DICHLOROPROPENE	0.1	0.48	0.1	U
	CUMENE	0.076	0.48	0.076	U
	CYCLOHEXANE	0.081	0.48	0.081	U
	DIBROMOCHLOROMETHANE	0.079	0.48	0.079	U
	ETHANOL	0.52	2.4	0.52	U
	ETHYL BENZENE	0.14	0.48	0.14	U
	FREON 11	8.3	0.48	0.061	
	FREON 113	51	0.48	0.13	
	FREON 114	0.089	0.48	0.089	U
	FREON 12	19	0.48	0.073	
	HEPTANE	0.11	0.48	0.11	U
	HEXACHLOROBUTADIENE	0.12	2.4	0.12	U
	HEXANE	0.098	0.48	0.098	U
	M,P-XYLENE	0.084	0.48	0.084	U
	METHYL TERT-BUTYL ETHER	0.064	0.48	0.064	U
	METHYLENE CHLORIDE	0.072	0.96	0.072	U
	O-XYLENE	0.12	0.48	0.12	U
	PROPYLBENZENE	0.087	0.48	0.087	U
	STYRENE	0.049	0.48	0.049	U
	TETRACHLOROETHENE	98	0.48	0.13	
	TETRAHYDROFURAN	0.41	2.4	0.41	U
	TOLUENE	0.058	0.48	0.058	U
	TRANS-1,2-DICHLOROETHENE	0.14	0.48	0.14	U
	TRANS-1,3-DICHLOROPROPENE	0.1	0.48	0.1	U
	TRICHLOROETHENE	82	0.48	0.14	
	VINYL CHLORIDE	0.11	0.48	0.11	U

U = Compound analyzed for but not detected above the Method Detection Limit.

Table-4 NMED DOE OB FFY 2016 Q-3 Mixed Waste Landfill Soil Vapor Quality Results: Volatile Organic Compounds by Method TO-15. April 27, 2016

MWL-SV04 sampled at a depth of 400 feet below ground surface

Trigger levels are 20,000 ppbv for PCE and TCE and 25,000 ppbv for total VOCs in samples collected from 400ft ports.

Monitoring Well/ Sample Depth	Analyte	Result (ppbv)	Reporting Limit (ppbv)	MDL (ppbv)	Laboratory Qualifier
MWL-SV04 400 ft.	1,1,1-TRICHLOROETHANE	0.11	0.11	0.47	U
	1,1,2,2-TETRACHLOROETHANE	0.048	0.048	0.47	U
	1,1,2-TRICHLOROETHANE	0.23	0.23	0.47	U
	1,1-DICHLOROETHANE	0.06	0.06	0.47	U
	1,1-DICHLOROETHENE	4.6	0.094	0.47	
	1,2,4-TRICHLOROBENZENE	0.094	0.094	2.3	U
	1,2,4-TRIMETHYLBENZENE	0.092	0.092	0.47	U
	1,2-DIBROMOETHANE (EDB)	0.08	0.08	0.47	U
	1,2-DICHLOROBENZENE	0.14	0.14	0.47	U
	1,2-DICHLOROETHANE	0.16	0.16	0.47	U
	1,2-DICHLOROPROPANE	0.1	0.1	0.47	U
	1,3,5-TRIMETHYLBENZENE	0.082	0.082	0.47	U
	1,3-BUTADIENE	0.068	0.068	0.47	U
	1,3-DICHLOROBENZENE	0.061	0.061	0.47	U
	1,4-DICHLOROBENZENE	0.065	0.065	0.47	U
	1,4-DIOXANE	0.14	0.14	0.47	U
	2,2,4-TRIMETHYLPENTANE	0.3	0.3	2.3	U
	2-BUTANONE (METHYL ETHYL KETONE)	0.17	0.17	2.3	U
	2-HEXANONE	0.25	0.25	2.3	U
	2-PROPANOL	0.18	0.18	2.3	U
	3-CHLOROPROPENE	0.16	0.16	2.3	U
	4-ETHYLTOLUENE	0.099	0.099	0.47	U
	4-METHYL-2-PENTANONE	0.085	0.085	0.47	U
	ACETONE	2.4	0.32	2.3	
	ALPHA-CHLOROTOLUENE	0.098	0.098	0.47	U
	BENZENE	0.66	0.15	0.47	
	BROMODICHLOROMETHANE	0.072	0.072	0.47	U
	BROMOFORM	0.087	0.087	0.47	U
	BROMOMETHANE	0.72	0.72	2.3	U
	CARBON DISULFIDE	0.19	0.19	2.3	U
	CARBON TETRACHLORIDE	0.043	0.043	0.47	U
	CHLOROBENZENE	0.12	0.12	0.47	U
	CHLOROETHANE	0.37	0.37	2.3	U
	CHLOROFORM	0.094	0.094	0.47	U

U = Compound analyzed for but not detected above the Method Detection Limit.

Table-4 NMED DOE OB FFY 2016 Q-3 Mixed Waste Landfill Soil Vapor Quality Results: Volatile Organic Compounds by Method TO-15. April 27, 2016

MWL-SV04 sampled at a depth of 400 feet below ground surface

Trigger levels are 20,000 ppbv for PCE and TCE and 25,000 ppbv for total VOCs in samples collected from 400ft ports.

Monitoring Well/ Sample Depth	Analyte	Result (ppbv)	Reporting Limit (ppbv)	MDL (ppbv)	Laboratory Qualifier
MWL-SV04 400 ft.	CHLOROMETHANE	0.57	0.57	2.3	U
	CIS-1,2-DICHLOROETHENE	0.13	0.13	0.47	U
	CIS-1,3-DICHLOROPROPENE	0.099	0.099	0.47	U
	CUMENE	0.074	0.074	0.47	U
	CYCLOHEXANE	0.079	0.079	0.47	U
	DIBROMOCHLOROMETHANE	0.077	0.077	0.47	U
	ETHANOL	0.5	0.5	2.3	U
	ETHYL BENZENE	0.13	0.13	0.47	U
	FREON 11	6.9	0.06	0.47	
	FREON 113	46	0.13	0.47	
	FREON 114	0.086	0.086	0.47	U
	FREON 12	16	0.071	0.47	
	HEPTANE	0.11	0.11	0.47	U
	HEXACHLOROBUTADIENE	0.12	0.12	2.3	U
	HEXANE	0.096	0.096	0.47	U
	M,P-XYLENE	0.081	0.081	0.47	U
	METHYL TERT-BUTYL ETHER	0.062	0.062	0.47	U
	METHYLENE CHLORIDE	0.071	0.071	0.94	U
	O-XYLENE	0.11	0.11	0.47	U
	PROPYLBENZENE	0.085	0.085	0.47	U
	STYRENE	0.048	0.048	0.47	U
	TETRACHLOROETHENE	90	0.13	0.47	
	TETRAHYDROFURAN	0.4	0.4	2.3	U
	TOLUENE	0.057	0.057	0.47	U
	TRANS-1,2-DICHLOROETHENE	0.14	0.14	0.47	U
	TRANS-1,3-DICHLOROPROPENE	0.1	0.1	0.47	U
	TRICHLOROETHENE	68	0.14	0.47	
	VINYL CHLORIDE	0.1	0.1	0.47	U

U = Compound analyzed for but not detected above the Method Detection Limit.

Table-5 NMED DOE OB FFY 2016 Q-3 Mixed Waste Landfill Soil Vapor Quality Results: Volatile Organic Compounds by Method TO-15. April 27, 2016

MWL-SV05 sampled at a depth of 300 feet below ground surface

Trigger levels are 20,000 ppbv for PCE and TCE and 25,000 ppbv for total VOCs in samples collected from 400ft ports.

Monitoring Well/ Sample Depth	Analyte	Result (ppbv)	Reporting Limit (ppbv)	MDL (ppbv)	Laboratory Qualifier
MWL-SV05 300 ft.	1,1,1-TRICHLOROETHANE	0.52	0.29	0.069	
	1,1,2,2-TETRACHLOROETHANE	0.029	0.29	0.029	U
	1,1,2-TRICHLOROETHANE	0.14	0.29	0.14	U
	1,1-DICHLOROETHANE	0.88	0.29	0.037	
	1,1-DICHLOROETHENE	19	0.29	0.058	
	1,2,4-TRICHLOROBENZENE	0.058	1.4	0.058	U
	1,2,4-TRIMETHYLBENZENE	0.057	0.29	0.057	U
	1,2-DIBROMOETHANE (EDB)	0.05	0.29	0.05	U
	1,2-DICHLOROBENZENE	0.09	0.29	0.09	U
	1,2-DICHLOROETHANE	0.096	0.29	0.096	U
	1,2-DICHLOROPROPANE	0.063	0.29	0.063	U
	1,3,5-TRIMETHYLBENZENE	0.051	0.29	0.051	U
	1,3-BUTADIENE	0.042	0.29	0.042	U
	1,3-DICHLOROBENZENE	0.038	0.29	0.038	U
	1,4-DICHLOROBENZENE	0.04	0.29	0.04	U
	1,4-DIOXANE	0.087	0.29	0.087	U
	2,2,4-TRIMETHYLPENTANE	0.18	1.4	0.18	U
	2-BUTANONE (METHYL ETHYL KETONE)	0.1	1.4	0.1	U
	2-HEXANONE	0.15	1.4	0.15	U
	2-PROPANOL	0.11	1.4	0.11	U
	3-CHLOROPROPENE	0.1	1.4	0.1	U
	4-ETHYLTOLUENE	0.061	0.29	0.061	U
	4-METHYL-2-PENTANONE	0.053	0.29	0.053	U
	ACETONE	2	1.4	0.2	
	ALPHA-CHLOROTOLUENE	0.061	0.29	0.061	U
	BENZENE	0.093	0.29	0.093	U
	BROMODICHLOROMETHANE	0.044	0.29	0.044	U
	BROMOFORM	0.054	0.29	0.054	U
	BROMOMETHANE	0.45	1.4	0.45	U
	CARBON DISULFIDE	0.12	1.4	0.12	U
	CARBON TETRACHLORIDE	0.74	0.29	0.027	
	CHLOROBENZENE	0.073	0.29	0.073	U
	CHLOROETHANE	0.23	1.4	0.23	U
	CHLOROFORM	0.44	0.29	0.058	

U = Compound analyzed for but not detected above the Method Detection Limit.

Table-5 NMED DOE OB FFY 2016 Q-3 Mixed Waste Landfill Soil Vapor Quality Results: Volatile Organic Compounds by Method TO-15. April 27, 2016

MWL-SV05 sampled at a depth of 300 feet below ground surface

Trigger levels are 20,000 ppbv for PCE and TCE and 25,000 ppbv for total VOCs in samples collected from 400ft ports.

Monitoring Well/ Sample Depth	Analyte	Result (ppbv)	Reporting Limit (ppbv)	MDL (ppbv)	Laboratory Qualifier
MWL-SV05 300 ft.	CHLOROMETHANE	0.35	1.4	0.35	U
	CIS-1,2-DICHLOROETHENE	0.38	0.29	0.083	
	CIS-1,3-DICHLOROPROPENE	0.061	0.29	0.061	U
	CUMENE	0.046	0.29	0.046	U
	CYCLOHEXANE	0.049	0.29	0.049	U
	DIBROMOCHLOROMETHANE	0.048	0.29	0.048	U
	ETHANOL	0.31	1.4	0.31	U
	ETHYL BENZENE	0.082	0.29	0.082	U
	FREON 11	20	0.29	0.037	
	FREON 113	90	0.29	0.081	
	FREON 114	0.054	0.29	0.054	U
	FREON 12	29	0.29	0.044	
	HEPTANE	0.066	0.29	0.066	U
	HEXACHLOROBUTADIENE	0.073	1.4	0.073	U
	HEXANE	0.059	0.29	0.059	U
	M,P-XYLENE	0.05	0.29	0.05	U
	METHYL TERT-BUTYL ETHER	0.038	0.29	0.038	U
	METHYLENE CHLORIDE	0.58	0.58	0.044	U
	O-XYLENE	0.071	0.29	0.071	U
	PROPYLBENZENE	0.053	0.29	0.053	U
	STYRENE	0.029	0.29	0.029	U
	TETRACHLOROETHENE	91	0.29	0.079	
	TETRAHYDROFURAN	0.25	1.4	0.25	U
	TOLUENE	0.35	0.29	0.035	
	TRANS-1,2-DICHLOROETHENE	0.086	0.29	0.086	U
	TRANS-1,3-DICHLOROPROPENE	0.062	0.29	0.062	U
	TRICHLOROETHENE	81	0.29	0.086	
	VINYL CHLORIDE	0.064	0.29	0.064	U

U = Compound analyzed for but not detected above the Method Detection Limit.

Table-6 NMED DOE OB FFY 2016 Q-3 Mixed Waste Landfill Soil Vapor Quality Results: Volatile Organic Compounds by Method TO-15. April 27, 2016

MWL-SV05 sampled at a depth of 400 feet below ground surface

Trigger levels are 20,000 ppbv for PCE and TCE and 25,000 ppbv for total VOCs in samples collected from 400ft ports.

Monitoring Well/ Sample Depth	Analyte	Result (ppbv)	Reporting Limit (ppbv)	MDL (ppbv)	Laboratory Qualifier
MWL-SV05 400 ft.	1,1,1-TRICHLOROETHANE	0.71	0.34	0.08	
	1,1,2,2-TETRACHLOROETHANE	0.034	0.34	0.034	U
	1,1,2-TRICHLOROETHANE	0.17	0.34	0.17	U
	1,1-DICHLOROETHANE	0.72	0.34	0.043	
	1,1-DICHLOROETHENE	7.8	0.34	0.067	
	1,2,4-TRICHLOROBENZENE	0.068	1.7	0.068	U
	1,2,4-TRIMETHYLBENZENE	0.066	0.34	0.066	U
	1,2-DIBROMOETHANE (EDB)	0.058	0.34	0.058	U
	1,2-DICHLOROBENZENE	0.1	0.34	0.1	U
	1,2-DICHLOROETHANE	0.11	0.34	0.11	U
	1,2-DICHLOROPROPANE	0.074	0.34	0.074	U
	1,3,5-TRIMETHYLBENZENE	0.059	0.34	0.059	U
	1,3-BUTADIENE	0.049	0.34	0.049	U
	1,3-DICHLOROBENZENE	0.044	0.34	0.044	U
	1,4-DICHLOROBENZENE	0.047	0.34	0.047	U
	1,4-DIOXANE	0.1	0.34	0.1	U
	2,2,4-TRIMETHYLPENTANE	0.21	1.7	0.21	U
	2-BUTANONE (METHYL ETHYL KETONE)	0.12	1.7	0.12	U
	2-HEXANONE	0.18	1.7	0.18	U
	2-PROPANOL	0.13	1.7	0.13	U
	3-CHLOROPROPENE	0.12	1.7	0.12	U
	4-ETHYLTOLUENE	0.071	0.34	0.071	U
	4-METHYL-2-PENTANONE	0.062	0.34	0.062	U
	ACETONE	3.1	1.7	0.23	
	ALPHA-CHLOROTOLUENE	0.071	0.34	0.071	U
	BENZENE	0.4	0.34	0.11	
	BROMODICHLOROMETHANE	0.052	0.34	0.052	U
	BROMOFORM	0.062	0.34	0.062	U
	BROMOMETHANE	0.52	1.7	0.52	U
	CARBON DISULFIDE	0.14	1.7	0.14	U
	CARBON TETRACHLORIDE	0.031	0.34	0.031	U
	CHLOROBENZENE	0.084	0.34	0.084	U
	CHLOROETHANE	0.27	1.7	0.27	U
	CHLOROFORM	0.068	0.34	0.068	U

J = Estimated value

U = Compound analyzed for but not detected above the Method Detection Limit.

Table-6 NMED DOE OB FFY 2016 Q-3 Mixed Waste Landfill Soil Vapor Quality Results: Volatile Organic Compounds by Method TO-15. April 27, 2016

MWL-SV05 sampled at a depth of 400 feet below ground surface

Trigger levels are 20,000 ppbv for PCE and TCE and 25,000 ppbv for total VOCs in samples collected from 400ft ports.

Monitoring Well/ Sample Depth	Analyte	Result (ppbv)	Reporting Limit (ppbv)	MDL (ppbv)	Laboratory Qualifier
MWL-SV05 400 ft.	CHLOROMETHANE	0.41	1.7	0.41	U
	CIS-1,2-DICHLOROETHENE	0.097	0.34	0.097	U
	CIS-1,3-DICHLOROPROPENE	0.071	0.34	0.071	U
	CUMENE	0.054	0.34	0.054	U
	CYCLOHEXANE	0.057	0.34	0.057	U
	DIBROMOCHLOROMETHANE	0.056	0.34	0.056	U
	ETHANOL	0.36	1.7	0.36	U
	ETHYL BENZENE	0.095	0.34	0.095	U
	FREON 11	12	0.34	0.043	
	FREON 113	31	0.34	0.095	
	FREON 114	0.062	0.34	0.062	U
	FREON 12	13	0.34	0.051	
	HEPTANE	0.076	0.34	0.076	U
	HEXACHLOROBUTADIENE	0.085	1.7	0.085	U
	HEXANE	0.069	0.34	0.069	U
	M,P-XYLENE	0.059	0.34	0.059	U
	METHYL TERT-BUTYL ETHER	0.045	0.34	0.045	U
	METHYLENE CHLORIDE	0.051	0.67	0.051	U
	O-XYLENE	0.082	0.34	0.082	U
	PROPYLBENZENE	0.061	0.34	0.061	U
	STYRENE	0.034	0.34	0.034	U
	TETRACHLOROETHENE	94	0.34	0.092	
	TETRAHYDROFURAN	0.29	1.7	0.29	U
	TOLUENE	16	0.34	0.041	
	TRANS-1,2-DICHLOROETHENE	0.1	0.34	0.1	U
	TRANS-1,3-DICHLOROPROPENE	0.072	0.34	0.072	U
	TRICHLOROETHENE	71	0.34	0.1	
	VINYL CHLORIDE	0.075	0.34	0.075	U

J = Estimated value

U = Compound analyzed for but not detected above the Method Detection Limit.

Table-6 NMED DOE OB FFY 2016 Q-3 Mixed Waste Landfill Soil Vapor Quality Results: Volatile Organic Compounds by Method TO-15. April 27, 2016

MWL-SV05 sampled at a depth of 400 feet below ground surface

Trigger levels are 20,000 ppbv for PCE and TCE and 25,000 ppbv for total VOCs in samples collected from 400ft ports.

Monitoring Well/ Sample Depth	Analyte	Result (ppbv)	Reporting Limit (ppbv)	MDL (ppbv)	Laboratory Qualifier
MWL-SV05 400 ft. (Duplicate)	1,1,1-TRICHLOROETHANE	0.73	0.33	0.078	
	1,1,2,2-TETRACHLOROETHANE	0.034	0.33	0.034	U
	1,1,2-TRICHLOROETHANE	0.16	0.33	0.16	U
	1,1-DICHLOROETHANE	0.72	0.33	0.042	
	1,1-DICHLOROETHENE	7.6	0.33	0.066	
	1,2,4-TRICHLOROBENZENE	0.067	1.6	0.067	U
	1,2,4-TRIMETHYLBENZENE	0.065	0.33	0.065	U
	1,2-DIBROMOETHANE (EDB)	0.057	0.33	0.057	U
	1,2-DICHLOROBENZENE	0.1	0.33	0.1	U
	1,2-DICHLOROETHANE	0.11	0.33	0.11	U
	1,2-DICHLOROPROPANE	0.072	0.33	0.072	U
	1,3,5-TRIMETHYLBENZENE	0.058	0.33	0.058	U
	1,3-BUTADIENE	0.048	0.33	0.048	U
	1,3-DICHLOROBENZENE	0.043	0.33	0.043	U
	1,4-DICHLOROBENZENE	0.046	0.33	0.046	U
	1,4-DIOXANE	0.099	0.33	0.099	U
	2,2,4-TRIMETHYLPENTANE	0.21	1.6	0.21	U
	2-BUTANONE (METHYL ETHYL KETONE)	0.12	1.6	0.12	U
	2-HEXANONE	0.17	1.6	0.17	U
	2-PROPANOL	0.13	1.6	0.13	U
	3-CHLOROPROPENE	0.12	1.6	0.12	U
	4-ETHYLTOLUENE	0.07	0.33	0.07	U
	4-METHYL-2-PENTANONE	0.06	0.33	0.06	U
	ACETONE	3.2	1.6	0.22	
	ALPHA-CHLOROTOLUENE	0.07	0.33	0.07	U
	BENZENE	0.32	0.33	0.1	J
	BROMODICHLOROMETHANE	0.051	0.33	0.051	U
	BROMOFORM	0.061	0.33	0.061	U
	BROMOMETHANE	0.51	1.6	0.51	U
	CARBON DISULFIDE	0.13	1.6	0.13	U
	CARBON TETRACHLORIDE	0.031	0.33	0.031	U
	CHLOROBENZENE	0.083	0.33	0.083	U
	CHLOROETHANE	0.26	1.6	0.26	U
	CHLOROFORM	0.34	0.33	0.066	

J = Estimated value

U = Compound analyzed for but not detected above the Method Detection Limit.

Table-6 NMED DOE OB FFY 2016 Q-3 Mixed Waste Landfill Soil Vapor Quality Results: Volatile Organic Compounds by Method TO-15. April 27, 2016

MWL-SV05 sampled at a depth of 400 feet below ground surface

Trigger levels are 20,000 ppbv for PCE and TCE and 25,000 ppbv for total VOCs in samples collected from 400ft ports.

Monitoring Well/ Sample Depth	Analyte	Result (ppbv)	Reporting Limit (ppbv)	MDL (ppbv)	Laboratory Qualifier
MWL-SV05 400 ft. (Duplicate)	CHLOROMETHANE	0.4	1.6	0.4	U
	CIS-1,2-DICHLOROETHENE	0.095	0.33	0.095	U
	CIS-1,3-DICHLOROPROPENE	0.07	0.33	0.07	U
	CUMENE	0.053	0.33	0.053	U
	CYCLOHEXANE	0.056	0.33	0.056	U
	DIBROMOCHLOROMETHANE	0.054	0.33	0.054	U
	ETHANOL	4	1.6	0.36	
	ETHYL BENZENE	0.094	0.33	0.094	U
	FREON 11	12	0.33	0.042	
	FREON 113	30	0.33	0.093	
	FREON 114	0.061	0.33	0.061	U
	FREON 12	12	0.33	0.05	
	HEPTANE	0.075	0.33	0.075	U
	HEXACHLOROBUTADIENE	0.083	1.6	0.083	U
	HEXANE	0.068	0.33	0.068	U
	M,P-XYLENE	0.058	0.33	0.058	U
	METHYL TERT-BUTYL ETHER	0.044	0.33	0.044	U
	METHYLENE CHLORIDE	0.05	0.66	0.05	U
	O-XYLENE	0.081	0.33	0.081	U
	PROPYLBENZENE	0.06	0.33	0.06	U
	STYRENE	0.034	0.33	0.034	U
	TETRACHLOROETHENE	69	0.33	0.09	
	TETRAHYDROFURAN	0.28	1.6	0.28	U
	TOLUENE	10	0.33	0.04	
	TRANS-1,2-DICHLOROETHENE	0.098	0.33	0.098	U
	TRANS-1,3-DICHLOROPROPENE	0.071	0.33	0.071	U
	TRICHLOROETHENE	71	0.33	0.098	
	VINYL CHLORIDE	0.074	0.33	0.074	U

J = Estimated value

U = Compound analyzed for but not detected above the Method Detection Limit.