

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-1**

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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 first 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 October 8, 2015. The Bureau collected soil vapor samples from Solid Waste Management Unit (SWMU) 76 at the Mixed Waste Landfill (MWL) soil vapor 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. Samples were collected in 6-liter SUMMA canisters at various depths and were shipped to an independent analytical laboratory for volatile organic compounds (VOCs) analysis. Split samples were collected in sequence, rather than using the manifold sampling system, designed to collect samples simultaneously. All samples from October 2015 were below established trigger levels for VOCs in soil vapor, as outlined in the SNL/NM Long-Term Monitoring and Maintenance Plan (LTMMMP) for the Mixed Waste Landfill.

Soil vapor monitoring wells MWL-SV03, MWL-SV04 and MWL-SV05 are constructed of Flexible Liner Underground Technologies (FLUTE™). Each soil vapor well was 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-SV03 and a duplicate sample was taken 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

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 46 ppbv at MWL-SV05 300ft to 310 ppbv at MWL-SV03 400ft. Trichloroethene (TCE) ranged from 52 ppbv at monitoring well MWL-SV05 400ft (duplicate sample) to 210 ppbv at MWL-SV03 400ft. Total VOCs ranged from 214.6 ppbv at MWL-SV05-400ft (duplicate sample) to 661.5 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	190	140	493.6
MWL-SV03-400ft	310	210	661.5
MWL-SV04-300ft	85	59	252.4
MWL-SV04-400ft	88	67	220.5
MWL-SV05-300ft	46	66	272.2
MWL-SV05-400ft	71	60	241.2
MWL-SV05-400ft (Dup)	58	52	214.6
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 400 ft bgs at each well. A duplicate sample was collected at MWL-SV05 400ft bgs. The soil vapor samples collected by DOE-OB during October 2015 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 last three (3) soil vapor 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 2014-2015

MWL Soil Vapor Monitoring Well	Tetrachlorethene (PCE) (ppbv)			Trichloroethene (TCE) (ppbv)			Total VOCs (ppbv)		
	Sep 2014	Apr 2015	Oct 2015	Sep 2014	Apr 2015	Oct 2015	Sep 2014	Apr 2015	Oct 2015
MWL-SV03-300ft	200	270	190	120	150	140	460.6	554.9	493.6
MWL-SV03-400ft	350	330	310	200	210	210	825.4	685.3	661.5
MWL-SV04-300ft	61	86	85	33	58	59	158.7	237.9	252.4
MWL-SV04-400ft	67	93	88	40	58	67	147.5	228.9	220.5
MWL-SV05-300ft	73	76	46	70	72	66	282.8	289.88	272.2
MWL-SV05-400ft	71	74	71	56	62	60	802	235.84	241.2
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

Table-1 NMED DOE OB FFY 2016 Q-1 Mixed Waste Landfill Soil Vapor Quality Results: Volatile Organic Compounds by Method TO-15, October 8, 2015

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 at 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	0.25	1.2	0.25	U
	1,1,2,2-TETRACHLOROETHANE	0.41	1.2	0.41	U
	1,1,2-TRICHLOROETHANE	0.31	1.2	0.31	U
	1,1-DICHLOROETHANE	2.1	1.2	0.17	
	1,1-DICHLOROETHENE	16	1.2	0.73	
	1,2,4-TRICHLOROBENZENE	0.49	4.8	0.49	U
	1,2,4-TRIMETHYLBENZENE	0.22	1.2	0.22	U
	1,2-DIBROMOETHANE (EDB)	0.23	1.2	0.23	U
	1,2-DICHLOROBENZENE	0.2	1.2	0.2	U
	1,2-DICHLOROETHANE	0.4	1.2	0.4	U
	1,2-DICHLOROPROPANE	0.28	1.2	0.28	U
	1,3,5-TRIMETHYLBENZENE	0.16	1.2	0.16	U
	1,3-BUTADIENE	0.56	1.2	0.56	U
	1,3-DICHLOROBENZENE	0.22	1.2	0.22	U
	1,4-DICHLOROBENZENE	0.15	1.2	0.15	U
	1,4-DIOXANE	1	4.8	1	U
	2,2,4-TRIMETHYLPENTANE	0.088	1.2	0.088	U
	2-BUTANONE (METHYL ETHYL KETONE)	0.67	4.8	0.67	U
	2-HEXANONE	0.27	4.8	0.27	U
	2-PROPANOL	0.79	4.8	0.79	U
	3-CHLOROPROPENE	0.7	4.8	0.7	U
	4-ETHYLTOLUENE	0.29	1.2	0.29	U
	4-METHYL-2-PENTANONE	0.58	1.2	0.58	U
	ACETONE	0.67	12	0.67	U
	ALPHA-CHLOROTOLUENE	0.086	1.2	0.086	U
	BENZENE	0.35	1.2	0.35	U
	BROMODICHLOROMETHANE	0.62	1.2	0.62	U
	BROMOFORM	0.21	1.2	0.21	U
	BROMOMETHANE	0.46	12	0.46	U
	CARBON DISULFIDE	0.33	4.8	0.33	U
	CARBON TETRACHLORIDE	0.3	1.2	0.3	U
	CHLOROBENZENE	0.19	1.2	0.19	U
	CHLOROETHANE	0.74	4.8	0.74	U
	CHLOROFORM	0.27	1.2	0.27	U

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

Table-1 NMED DOE OB FFY 2016 Q-1 Mixed Waste Landfill Soil Vapor Quality Results: Volatile Organic Compounds by Method TO-15, October 8, 2015

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 at samples collected from 400ft ports.

Monitoring Well/ Sample Depth	Analyte	Result (ppbv)	Reporting Limit (ppbv)	MDL (ppbv)	Laboratory Qualifier
MWL-SV03 300 ft	CHLOROMETHANE	0.93	12	0.93	U
	CIS-1,2-DICHLOROETHENE	1.2	1.2	0.34	
	CIS-1,3-DICHLOROPROPENE	0.34	1.2	0.34	U
	CUMENE	0.14	1.2	0.14	U
	CYCLOHEXANE	0.18	1.2	0.18	U
	DIBROMOCHLOROMETHANE	0.32	1.2	0.32	U
	ETHANOL	2.3	4.8	2.3	U
	ETHYL BENZENE	0.29	1.2	0.29	U
	FREON 11	11	1.2	0.38	
	FREON 113	96	1.2	0.26	
	FREON 114	0.36	1.2	0.36	U
	FREON 12	36	1.2	0.23	
	HEPTANE	0.25	1.2	0.25	U
	HEXACHLOROBUTADIENE	0.44	4.8	0.44	U
	HEXANE	0.3	1.2	0.3	U
	M,P-XYLENE	0.2	1.2	0.2	U
	METHYL TERT-BUTYL ETHER	0.38	1.2	0.38	U
	METHYLENE CHLORIDE	0.74	12	0.74	U
	O-XYLENE	0.28	1.2	0.28	U
	PROPYLBENZENE	0.13	1.2	0.13	U
	STYRENE	0.21	1.2	0.21	U
	TETRACHLOROETHENE	190	1.2	0.17	
	TETRAHYDROFURAN	0.71	1.2	0.71	U
	TOLUENE	1.3	1.2	0.22	
	TRANS-1,2-DICHLOROETHENE	0.62	1.2	0.62	U
	TRANS-1,3-DICHLOROPROPENE	0.42	1.2	0.42	U
	TRICHLOROETHENE	140	1.2	0.44	
	VINYL CHLORIDE	0.38	1.2	0.38	U

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

Table-2 NMED DOE OB FFY 2016 Q-1 Mixed Waste Landfill Soil Vapor Quality Results: Volatile Organic Compounds by Method TO-15, October 8, 2015

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 at 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	0.25	1.2	0.25	U
	1,1,2,2-TETRACHLOROETHANE	0.42	1.2	0.42	U
	1,1,2-TRICHLOROETHANE	0.31	1.2	0.31	U
	1,1-DICHLOROETHANE	2	1.2	0.17	
	1,1-DICHLOROETHENE	19	1.2	0.74	
	1,2,4-TRICHLOROBENZENE	0.5	4.8	0.5	U
	1,2,4-TRIMETHYLBENZENE	0.22	1.2	0.22	U
	1,2-DIBROMOETHANE (EDB)	0.23	1.2	0.23	U
	1,2-DICHLOROBENZENE	0.2	1.2	0.2	U
	1,2-DICHLOROETHANE	0.4	1.2	0.4	U
	1,2-DICHLOROPROPANE	0.28	1.2	0.28	U
	1,3,5-TRIMETHYLBENZENE	0.16	1.2	0.16	U
	1,3-BUTADIENE	0.56	1.2	0.56	U
	1,3-DICHLOROBENZENE	0.22	1.2	0.22	U
	1,4-DICHLOROBENZENE	0.15	1.2	0.15	U
	1,4-DIOXANE	1	4.8	1	U
	2,2,4-TRIMETHYLPENTANE	0.088	1.2	0.088	U
	2-BUTANONE (METHYL ETHYL KETONE)	0.67	4.8	0.67	U
	2-HEXANONE	0.27	4.8	0.27	U
	2-PROPANOL	0.79	4.8	0.79	U
	3-CHLOROPROPENE	0.7	4.8	0.7	U
	4-ETHYLTOLUENE	0.29	1.2	0.29	U
	4-METHYL-2-PENTANONE	0.58	1.2	0.58	U
	ACETONE	0.67	12	0.67	U
	ALPHA-CHLOROTOLUENE	0.086	1.2	0.086	U
	BENZENE	0.36	1.2	0.36	U
	BROMODICHLOROMETHANE	0.63	1.2	0.63	U
	BROMOFORM	0.21	1.2	0.21	U
	BROMOMETHANE	0.47	12	0.47	U
	CARBON DISULFIDE	0.33	4.8	0.33	U
	CARBON TETRACHLORIDE	0.3	1.2	0.3	U
	CHLOROBENZENE	0.19	1.2	0.19	U
	CHLOROETHANE	0.74	4.8	0.74	U
	CHLOROFORM	0.27	1.2	0.27	U

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

Table-2 NMED DOE OB FFY 2016 Q-1 Mixed Waste Landfill Soil Vapor Quality Results: Volatile Organic Compounds by Method TO-15, October 8, 2015

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 at samples collected from 400ft ports.

Monitoring Well/ Sample Depth	Analyte	Result (ppbv)	Reporting Limit (ppbv)	MDL (ppbv)	Laboratory Qualifier
MWL-SV03 400 ft	CHLOROMETHANE	0.94	12	0.94	U
	CIS-1,2-DICHLOROETHENE	0.34	1.2	0.34	U
	CIS-1,3-DICHLOROPROPENE	0.34	1.2	0.34	U
	CUMENE	0.15	1.2	0.15	U
	CYCLOHEXANE	0.18	1.2	0.18	U
	DIBROMOCHLOROMETHANE	0.32	1.2	0.32	U
	ETHANOL	2.3	4.8	2.3	U
	ETHYL BENZENE	0.3	1.2	0.3	U
	FREON 11	15	1.2	0.38	
	FREON 113	85	1.2	0.27	
	FREON 114	0.36	1.2	0.36	U
	FREON 12	18	1.2	0.23	
	HEPTANE	0.25	1.2	0.25	U
	HEXACHLOROBUTADIENE	0.44	4.8	0.44	U
	HEXANE	0.3	1.2	0.3	U
	M,P-XYLENE	0.2	1.2	0.2	U
	METHYL TERT-BUTYL ETHER	0.38	1.2	0.38	U
	METHYLENE CHLORIDE	0.74	12	0.74	U
	O-XYLENE	0.28	1.2	0.28	U
	PROPYLBENZENE	0.13	1.2	0.13	U
	STYRENE	0.21	1.2	0.21	U
	TETRACHLOROETHENE	310	1.2	0.17	
	TETRAHYDROFURAN	0.71	1.2	0.71	U
	TOLUENE	2.5	1.2	0.22	
	TRANS-1,2-DICHLOROETHENE	0.63	1.2	0.63	U
	TRANS-1,3-DICHLOROPROPENE	0.42	1.2	0.42	U
	TRICHLOROETHENE	210	1.2	0.45	
	VINYL CHLORIDE	0.38	1.2	0.38	U

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

Table-3 NMED DOE OB FFY 2016 Q-1 Mixed Waste Landfill Soil Vapor Quality Results: Volatile Organic Compounds by Method TO-15, October 8, 2015

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 at 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	0.24	1.2	0.24	U
	1,1,2,2-TETRACHLOROETHANE	0.4	1.2	0.4	U
	1,1,2-TRICHLOROETHANE	0.3	1.2	0.3	U
	1,1-DICHLOROETHANE	0.16	1.2	0.16	U
	1,1-DICHLOROETHENE	7	1.2	0.71	
	1,2,4-TRICHLOROBENZENE	0.48	4.6	0.48	U
	1,2,4-TRIMETHYLBENZENE	0.22	1.2	0.22	U
	1,2-DIBROMOETHANE (EDB)	0.22	1.2	0.22	U
	1,2-DICHLOROBENZENE	0.19	1.2	0.19	U
	1,2-DICHLOROETHANE	0.39	1.2	0.39	U
	1,2-DICHLOROPROPANE	0.27	1.2	0.27	U
	1,3,5-TRIMETHYLBENZENE	0.16	1.2	0.16	U
	1,3-BUTADIENE	0.54	1.2	0.54	U
	1,3-DICHLOROBENZENE	0.22	1.2	0.22	U
	1,4-DICHLOROBENZENE	0.15	1.2	0.15	U
	1,4-DIOXANE	0.99	4.6	0.99	U
	2,2,4-TRIMETHYLPENTANE	0.085	1.2	0.085	U
	2-BUTANONE (METHYL ETHYL KETONE)	0.65	4.6	0.65	U
	2-HEXANONE	0.26	4.6	0.26	U
	2-PROPANOL	0.76	4.6	0.76	U
	3-CHLOROPROPENE	0.68	4.6	0.68	U
	4-ETHYLTOLUENE	0.28	1.2	0.28	U
	4-METHYL-2-PENTANONE	0.56	1.2	0.56	U
	ACETONE	0.65	12	0.65	U
	ALPHA-CHLOROTOLUENE	0.083	1.2	0.083	U
	BENZENE	0.34	1.2	0.34	U
	BROMODICHLOROMETHANE	0.61	1.2	0.61	U
	BROMOFORM	0.2	1.2	0.2	U
	BROMOMETHANE	0.45	12	0.45	U
	CARBON DISULFIDE	0.32	4.6	0.32	U
	CARBON TETRACHLORIDE	0.29	1.2	0.29	U
	CHLOROBENZENE	0.18	1.2	0.18	U
	CHLOROETHANE	0.72	4.6	0.72	U
	CHLOROFORM	0.26	1.2	0.26	U

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

Table-3 NMED DOE OB FFY 2016 Q-1 Mixed Waste Landfill Soil Vapor Quality Results: Volatile Organic Compounds by Method TO-15, October 8, 2015

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 at samples collected from 400ft ports.

Monitoring Well/ Sample Depth	Analyte	Result (ppbv)	Reporting Limit (ppbv)	MDL (ppbv)	Laboratory Qualifier
MWL-SV04 300 ft	CHLOROMETHANE	0.91	12	0.91	U
	CIS-1,2-DICHLOROETHENE	0.33	1.2	0.33	U
	CIS-1,3-DICHLOROPROPENE	0.33	1.2	0.33	U
	CUMENE	0.14	1.2	0.14	U
	CYCLOHEXANE	0.18	1.2	0.18	U
	DIBROMOCHLOROMETHANE	0.31	1.2	0.31	U
	ETHANOL	17	4.6	2.2	
	ETHYL BENZENE	0.28	1.2	0.28	U
	FREON 11	8.2	1.2	0.37	
	FREON 113	53	1.2	0.26	
	FREON 114	0.34	1.2	0.34	U
	FREON 12	22	1.2	0.22	
	HEPTANE	0.25	1.2	0.25	U
	HEXACHLOROBUTADIENE	0.43	4.6	0.43	U
	HEXANE	0.3	1.2	0.3	U
	M,P-XYLENE	0.2	1.2	0.2	U
	METHYL TERT-BUTYL ETHER	0.37	1.2	0.37	U
	METHYLENE CHLORIDE	0.71	12	0.71	U
	O-XYLENE	0.27	1.2	0.27	U
	PROPYLBENZENE	0.13	1.2	0.13	U
	STYRENE	0.21	1.2	0.21	U
	TETRACHLOROETHENE	85	1.2	0.16	
	TETRAHYDROFURAN	0.69	1.2	0.69	U
	TOLUENE	1.2	1.2	0.21	
	TRANS-1,2-DICHLOROETHENE	0.6	1.2	0.6	U
	TRANS-1,3-DICHLOROPROPENE	0.4	1.2	0.4	U
	TRICHLOROETHENE	59	1.2	0.43	
	VINYL CHLORIDE	0.37	1.2	0.37	U

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

Table-4 NMED DOE OB FFY 2016 Q-1 Mixed Waste Landfill Soil Vapor Quality Results: Volatile Organic Compounds by Method TO-15, October 8, 2015

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 at 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	0.23	1.1	0.23	U
	1,1,2,2-TETRACHLOROETHANE	0.39	1.1	0.39	U
	1,1,2-TRICHLOROETHANE	0.29	1.1	0.29	U
	1,1-DICHLOROETHANE	0.16	1.1	0.16	U
	1,1-DICHLOROETHENE	4.3	1.1	0.69	
	1,2,4-TRICHLOROBENZENE	0.47	4.5	0.47	U
	1,2,4-TRIMETHYLBENZENE	0.21	1.1	0.21	U
	1,2-DIBROMOETHANE (EDB)	0.22	1.1	0.22	U
	1,2-DICHLOROBENZENE	0.19	1.1	0.19	U
	1,2-DICHLOROETHANE	0.38	1.1	0.38	U
	1,2-DICHLOROPROPANE	0.26	1.1	0.26	U
	1,3,5-TRIMETHYLBENZENE	0.16	1.1	0.16	U
	1,3-BUTADIENE	0.53	1.1	0.53	U
	1,3-DICHLOROBENZENE	0.21	1.1	0.21	U
	1,4-DICHLOROBENZENE	0.14	1.1	0.14	U
	1,4-DIOXANE	0.97	4.5	0.97	U
	2,2,4-TRIMETHYLPENTANE	0.083	1.1	0.083	U
	2-BUTANONE (METHYL ETHYL KETONE)	0.63	4.5	0.63	U
	2-HEXANONE	0.25	4.5	0.25	U
	2-PROPANOL	0.74	4.5	0.74	U
	3-CHLOROPROPENE	0.66	4.5	0.66	U
	4-ETHYLTOLUENE	0.27	1.1	0.27	U
	4-METHYL-2-PENTANONE	0.54	1.1	0.54	U
	ACETONE	0.63	11	0.63	U
	ALPHA-CHLOROTOLUENE	0.081	1.1	0.081	U
	BENZENE	1.2	1.1	0.34	
	BROMODICHLOROMETHANE	0.59	1.1	0.59	U
	BROMOFORM	0.2	1.1	0.2	U
	BROMOMETHANE	0.44	11	0.44	U
	CARBON DISULFIDE	0.31	4.5	0.31	U
	CARBON TETRACHLORIDE	0.28	1.1	0.28	U
	CHLOROBENZENE	0.18	1.1	0.18	U
	CHLOROETHANE	0.7	4.5	0.7	U
	CHLOROFORM	0.26	1.1	0.26	U

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

Table-4 NMED DOE OB FFY 2016 Q-1 Mixed Waste Landfill Soil Vapor Quality Results: Volatile Organic Compounds by Method TO-15, October 8, 2015

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 at samples collected from 400ft ports.

Monitoring Well/ Sample Depth	Analyte	Result (ppbv)	Reporting Limit (ppbv)	MDL (ppbv)	Laboratory Qualifier
MWL-SV04 400 ft	CHLOROMETHANE	0.88	11	0.88	U
	CIS-1,2-DICHLOROETHENE	0.32	1.1	0.32	U
	CIS-1,3-DICHLOROPROPENE	0.32	1.1	0.32	U
	CUMENE	0.14	1.1	0.14	U
	CYCLOHEXANE	0.17	1.1	0.17	U
	DIBROMOCHLOROMETHANE	0.3	1.1	0.3	U
	ETHANOL	2.2	4.5	2.2	U
	ETHYL BENZENE	0.28	1.1	0.28	U
	FREON 11	6	1.1	0.36	
	FREON 113	39	1.1	0.25	
	FREON 114	0.34	1.1	0.34	U
	FREON 12	15	1.1	0.22	
	HEPTANE	0.24	1.1	0.24	U
	HEXACHLOROBUTADIENE	0.42	4.5	0.42	U
	HEXANE	0.29	1.1	0.29	U
	M,P-XYLENE	0.19	1.1	0.19	U
	METHYL TERT-BUTYL ETHER	0.36	1.1	0.36	U
	METHYLENE CHLORIDE	0.7	11	0.7	U
	O-XYLENE	0.26	1.1	0.26	U
	PROPYLBENZENE	0.12	1.1	0.12	U
	STYRENE	0.2	1.1	0.2	U
	TETRACHLOROETHENE	88	1.1	0.16	
	TETRAHYDROFURAN	0.67	1.1	0.67	U
	TOLUENE	0.21	1.1	0.21	U
	TRANS-1,2-DICHLOROETHENE	0.59	1.1	0.59	U
	TRANS-1,3-DICHLOROPROPENE	0.39	1.1	0.39	U
	TRICHLOROETHENE	67	1.1	0.42	
	VINYL CHLORIDE	0.36	1.1	0.36	U

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

Table-5 NMED DOE OB FFY 2016 Q-1 Mixed Waste Landfill Soil Vapor Quality Results: Volatile Organic Compounds by Method TO-15, October 8, 2015

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 at 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	0.21	1	0.21	U
	1,1,2,2-TETRACHLOROETHANE	0.36	1	0.36	U
	1,1,2-TRICHLOROETHANE	0.27	1	0.27	U
	1,1-DICHLOROETHANE	1.2	1	0.15	
	1,1-DICHLOROETHENE	18	1	0.63	
	1,2,4-TRICHLOROBENZENE	0.43	4.1	0.43	U
	1,2,4-TRIMETHYLBENZENE	0.19	1	0.19	U
	1,2-DIBROMOETHANE (EDB)	0.2	1	0.2	U
	1,2-DICHLOROBENZENE	0.17	1	0.17	U
	1,2-DICHLOROETHANE	0.34	1	0.34	U
	1,2-DICHLOROPROPANE	0.24	1	0.24	U
	1,3,5-TRIMETHYLBENZENE	0.14	1	0.14	U
	1,3-BUTADIENE	0.48	1	0.48	U
	1,3-DICHLOROBENZENE	0.19	1	0.19	U
	1,4-DICHLOROBENZENE	0.13	1	0.13	U
	1,4-DIOXANE	0.88	4.1	0.88	U
	2,2,4-TRIMETHYLPENTANE	0.076	1	0.076	U
	2-BUTANONE (METHYL ETHYL KETONE)	0.58	4.1	0.58	U
	2-HEXANONE	0.23	4.1	0.23	U
	2-PROPANOL	0.68	4.1	0.68	U
	3-CHLOROPROPENE	0.6	4.1	0.6	U
	4-ETHYLTOLUENE	0.25	1	0.25	U
	4-METHYL-2-PENTANONE	1.2	1	0.5	
	ACETONE	0.58	10	0.58	U
	ALPHA-CHLOROTOLUENE	0.074	1	0.074	U
	BENZENE	0.31	1	0.31	U
	BROMODICHLOROMETHANE	0.54	1	0.54	U
	BROMOFORM	0.18	1	0.18	U
	BROMOMETHANE	0.4	10	0.4	U
	CARBON DISULFIDE	0.28	4.1	0.28	U
	CARBON TETRACHLORIDE	0.26	1	0.26	U
	CHLOROBENZENE	0.16	1	0.16	U
	CHLOROETHANE	0.64	4.1	0.64	U
	CHLOROFORM	0.24	1	0.24	U

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

Table-5 NMED DOE OB FFY 2016 Q-1 Mixed Waste Landfill Soil Vapor Quality Results: Volatile Organic Compounds by Method TO-15, October 8, 2015

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 at samples collected from 400ft ports.

Monitoring Well/ Sample Depth	Analyte	Result (ppbv)	Reporting Limit (ppbv)	MDL (ppbv)	Laboratory Qualifier
MWL-SV05 300 ft	CHLOROMETHANE	0.81	10	0.81	U
	CIS-1,2-DICHLOROETHENE	0.29	1	0.29	U
	CIS-1,3-DICHLOROPROPENE	0.29	1	0.29	U
	CUMENE	0.13	1	0.13	U
	CYCLOHEXANE	0.16	1	0.16	U
	DIBROMOCHLOROMETHANE	0.28	1	0.28	U
	ETHANOL	13	4.1	2	
	ETHYL BENZENE	0.25	1	0.25	U
	FREON 11	18	1	0.33	
	FREON 113	76	1	0.23	
	FREON 114	0.31	1	0.31	U
	FREON 12	26	1	0.2	
	HEPTANE	0.22	1	0.22	U
	HEXACHLOROBUTADIENE	0.38	4.1	0.38	U
	HEXANE	1	1	0.26	U
	M,P-XYLENE	0.18	1	0.18	U
	METHYL TERT-BUTYL ETHER	0.33	1	0.33	U
	METHYLENE CHLORIDE	0.64	10	0.64	U
	O-XYLENE	0.24	1	0.24	U
	PROPYLBENZENE	0.11	1	0.11	U
	STYRENE	0.18	1	0.18	U
	TETRACHLOROETHENE	46	1	0.15	
	TETRAHYDROFURAN	2.3	1	0.61	
	TOLUENE	4.5	1	0.19	
	TRANS-1,2-DICHLOROETHENE	0.54	1	0.54	U
	TRANS-1,3-DICHLOROPROPENE	0.36	1	0.36	U
	TRICHLOROETHENE	66	1	0.39	
	VINYL CHLORIDE	0.33	1	0.33	U

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

Table-6 NMED DOE OB FFY 2016 Q-1 Mixed Waste Landfill Soil Vapor Quality Results: Volatile Organic Compounds by Method TO-15, October 8, 2015

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 at 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	0.24	1.2	0.24	U
	1,1,2,2-TETRACHLOROETHANE	0.41	1.2	0.41	U
	1,1,2-TRICHLOROETHANE	0.3	1.2	0.3	U
	1,1-DICHLOROETHANE	0.17	1.2	0.17	U
	1,1-DICHLOROETHENE	12	1.2	0.72	
	1,2,4-TRICHLOROBENZENE	0.49	4.7	0.49	U
	1,2,4-TRIMETHYLBENZENE	0.22	1.2	0.22	U
	1,2-DIBROMOETHANE (EDB)	0.22	1.2	0.22	U
	1,2-DICHLOROBENZENE	0.2	1.2	0.2	U
	1,2-DICHLOROETHANE	0.39	1.2	0.39	U
	1,2-DICHLOROPROPANE	0.27	1.2	0.27	U
	1,3,5-TRIMETHYLBENZENE	0.16	1.2	0.16	U
	1,3-BUTADIENE	0.55	1.2	0.55	U
	1,3-DICHLOROBENZENE	0.22	1.2	0.22	U
	1,4-DICHLOROBENZENE	0.15	1.2	0.15	U
	1,4-DIOXANE	1	4.7	1	U
	2,2,4-TRIMETHYLPENTANE	0.086	1.2	0.086	U
	2-BUTANONE (METHYL ETHYL KETONE)	0.66	4.7	0.66	U
	2-HEXANONE	0.26	4.7	0.26	U
	2-PROPANOL	0.77	4.7	0.77	U
	3-CHLOROPROPENE	0.68	4.7	0.68	U
	4-ETHYLTOLUENE	0.28	1.2	0.28	U
	4-METHYL-2-PENTANONE	0.57	1.2	0.57	U
	ACETONE	0.66	12	0.66	U
	ALPHA-CHLOROTOLUENE	0.084	1.2	0.084	U
	BENZENE	0.35	1.2	0.35	U
	BROMODICHLOROMETHANE	0.61	1.2	0.61	U
	BROMOFORM	0.21	1.2	0.21	U
	BROMOMETHANE	0.46	12	0.46	U
	CARBON DISULFIDE	0.32	4.7	0.32	U
	CARBON TETRACHLORIDE	0.29	1.2	0.29	U
	CHLOROBENZENE	0.19	1.2	0.19	U
	CHLOROETHANE	0.72	4.7	0.72	U
	CHLOROFORM	0.27	1.2	0.27	U

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

Table-6 NMED DOE OB FFY 2016 Q-1 Mixed Waste Landfill Soil Vapor Quality Results: Volatile Organic Compounds by Method TO-15, October 8, 2015

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 at samples collected from 400ft ports.

Monitoring Well/ Sample Depth	Analyte	Result (ppbv)	Reporting Limit (ppbv)	MDL (ppbv)	Laboratory Qualifier
MWL-SV05 400 ft	CHLOROMETHANE	0.92	12	0.92	U
	CIS-1,2-DICHLOROETHENE	0.33	1.2	0.33	U
	CIS-1,3-DICHLOROPROPENE	0.33	1.2	0.33	U
	CUMENE	0.14	1.2	0.14	U
	CYCLOHEXANE	0.18	1.2	0.18	U
	DIBROMOCHLOROMETHANE	0.32	1.2	0.32	U
	ETHANOL	2.3	4.7	2.3	U
	ETHYL BENZENE	0.29	1.2	0.29	U
	FREON 11	23	1.2	0.37	
	FREON 113	52	1.2	0.26	
	FREON 114	0.35	1.2	0.35	U
	FREON 12	14	1.2	0.22	
	HEPTANE	0.25	1.2	0.25	U
	HEXACHLOROBUTADIENE	0.43	4.7	0.43	U
	HEXANE	0.3	1.2	0.3	U
	M,P-XYLENE	0.2	1.2	0.2	U
	METHYL TERT-BUTYL ETHER	0.37	1.2	0.37	U
	METHYLENE CHLORIDE	0.72	12	0.72	U
	O-XYLENE	0.28	1.2	0.28	U
	PROPYLBENZENE	0.13	1.2	0.13	U
	STYRENE	0.21	1.2	0.21	U
	TETRACHLOROETHENE	71	1.2	0.17	
	TETRAHYDROFURAN	0.7	1.2	0.7	U
	TOLUENE	9.2	1.2	0.22	
	TRANS-1,2-DICHLOROETHENE	0.61	1.2	0.61	U
	TRANS-1,3-DICHLOROPROPENE	0.41	1.2	0.41	U
	TRICHLOROETHENE	60	1.2	0.44	
	VINYL CHLORIDE	0.37	1.2	0.37	U

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

Table-6 NMED DOE OB FFY 2016 Q-1 Mixed Waste Landfill Soil Vapor Quality Results: Volatile Organic Compounds by Method TO-15, October 8, 2015

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 at samples collected from 400ft ports.

Monitoring Well/ Sample Depth	Analyte	Result (ppbv)	Reporting Limit (ppbv)	MDL (ppbv)	Laboratory Qualifier
MWL-SV05 400 ft DUP	1,1,1-TRICHLOROETHANE	0.24	1.1	0.24	U
	1,1,2,2-TETRACHLOROETHANE	0.4	1.1	0.4	U
	1,1,2-TRICHLOROETHANE	0.29	1.1	0.29	U
	1,1-DICHLOROETHANE	0.16	1.1	0.16	U
	1,1-DICHLOROETHENE	11	1.1	0.7	
	1,2,4-TRICHLOROBENZENE	0.47	4.6	0.47	U
	1,2,4-TRIMETHYLBENZENE	0.21	1.1	0.21	U
	1,2-DIBROMOETHANE (EDB)	0.22	1.1	0.22	U
	1,2-DICHLOROBENZENE	0.19	1.1	0.19	U
	1,2-DICHLOROETHANE	0.38	1.1	0.38	U
	1,2-DICHLOROPROPANE	0.26	1.1	0.26	U
	1,3,5-TRIMETHYLBENZENE	0.16	1.1	0.16	U
	1,3-BUTADIENE	0.53	1.1	0.53	U
	1,3-DICHLOROBENZENE	0.21	1.1	0.21	U
	1,4-DICHLOROBENZENE	0.14	1.1	0.14	U
	1,4-DIOXANE	0.97	4.6	0.97	U
	2,2,4-TRIMETHYLPENTANE	0.084	1.1	0.084	U
	2-BUTANONE (METHYL ETHYL KETONE)	0.64	4.6	0.64	U
	2-HEXANONE	0.25	4.6	0.25	U
	2-PROPANOL	0.75	4.6	0.75	U
	3-CHLOROPROPENE	0.66	4.6	0.66	U
	4-ETHYLTOLUENE	0.28	1.1	0.28	U
	4-METHYL-2-PENTANONE	0.55	1.1	0.55	U
	ACETONE	0.64	11	0.64	U
	ALPHA-CHLOROTOLUENE	0.082	1.1	0.082	U
	BENZENE	0.34	1.1	0.34	U
	BROMODICHLOROMETHANE	0.6	1.1	0.6	U
	BROMOFORM	0.2	1.1	0.2	U
	BROMOMETHANE	0.44	11	0.44	U
	CARBON DISULFIDE	0.31	4.6	0.31	U
	CARBON TETRACHLORIDE	0.28	1.1	0.28	U
	CHLOROBENZENE	0.18	1.1	0.18	U
	CHLOROETHANE	0.7	4.6	0.7	U
	CHLOROFORM	0.26	1.1	0.26	U

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

Table-6 NMED DOE OB FFY 2016 Q-1 Mixed Waste Landfill Soil Vapor Quality Results: Volatile Organic Compounds by Method TO-15, October 8, 2015

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 at samples collected from 400ft ports.

Monitoring Well/ Sample Depth	Analyte	Result (ppbv)	Reporting Limit (ppbv)	MDL (ppbv)	Laboratory Qualifier
MWL-SV05 400 ft DUP	CHLOROMETHANE	0.89	11	0.89	U
	CIS-1,2-DICHLOROETHENE	0.32	1.1	0.32	U
	CIS-1,3-DICHLOROPROPENE	0.32	1.1	0.32	U
	CUMENE	0.14	1.1	0.14	U
	CYCLOHEXANE	0.17	1.1	0.17	U
	DIBROMOCHLOROMETHANE	0.3	1.1	0.3	U
	ETHANOL	2.2	4.6	2.2	U
	ETHYL BENZENE	0.28	1.1	0.28	U
	FREON 11	22	1.1	0.36	
	FREON 113	49	1.1	0.25	
	FREON 114	0.34	1.1	0.34	U
	FREON 12	13	1.1	0.22	
	HEPTANE	0.24	1.1	0.24	U
	HEXACHLOROBUTADIENE	0.42	4.6	0.42	U
	HEXANE	0.29	1.1	0.29	U
	M,P-XYLENE	0.19	1.1	0.19	U
	METHYL TERT-BUTYL ETHER	0.36	1.1	0.36	U
	METHYLENE CHLORIDE	0.7	11	0.7	U
	O-XYLENE	0.27	1.1	0.27	U
	PROPYLBENZENE	0.12	1.1	0.12	U
	STYRENE	0.2	1.1	0.2	U
	TETRACHLOROETHENE	58	1.1	0.16	
	TETRAHYDROFURAN	0.68	1.1	0.68	U
	TOLUENE	9.6	1.1	0.21	
	TRANS-1,2-DICHLOROETHENE	0.6	1.1	0.6	U
	TRANS-1,3-DICHLOROPROPENE	0.4	1.1	0.4	U
	TRICHLOROETHENE	52	1.1	0.42	
	VINYL CHLORIDE	0.36	1.1	0.36	U

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