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 2017 Q-1

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Final Report

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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 during the first quarter of Federal Fiscal Year (FFY) 2017.

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Disclaimer:

Introduction

The New Mexico Environment Department (NMED) DOE Oversight Bureau (DOE-OB or Bureau) has compiled and assessed soil vapor data collected on October 13, 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 ALS Environmental located in Salt Lake City, Utah. ALS-SLC is an independent analytical laboratory under contract with the NMED.

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 before sampling at MWL-SV04 and a duplicate sample was collected from monitoring well MWL-SV04 300ft bgs.

Split samples were collected in sequence, rather than using the manifold sampling system, designed to collect samples simultaneously. All samples collected from October 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. 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 ppbv. PCE concentrations ranged from 9.6 ppbv at MWL-SV04 300ft to 350 ppbv at MWL-SV03 400ft. TCE concentrations ranged from 34 ppbv at monitoring well MWL-SV04 300ft to 230 ppbv at MWL-SV03 400ft. Total

VOCs ranged from 153.58 ppbv at MWL-SV04-300ft to 681.73 ppbv at MWL-SV03 400ft.

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

Soil Vapor Monitoring Well	Tetrachlorethene (PCE) (ppbv)	Trichloroethene (TCE) (ppbv)	Total VOCs (ppbv)
MWL-SV03-300ft	260	180	649.67
MWL-SV03-400ft	350	230	681.73
MWL-SV04-300ft	9.6	34	153.58
MWL-SV04-300ft Dup	130	68	320.64
MWL-SV04-400ft	110	56	285.08
MWL-SV05-300ft	150	150	534.19
MWL-SV05-400ft	94	75	310.66
Trigger Level[a]	20,000	20,000	25,000

Note: [a]= The trigger levels only apply to samples collected from 400ft ports (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-SV04 300ft bgs. The soil vapor samples collected by DOE-OB during October 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 five (5) 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 monitor 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	Trichloroethene (TCE) (ppbv)				
	Sep 2014	Apr 2015	Oct 2015	Apr 2016	Oct 2016
MWL-SV03-300ft	120	150	140	160	180
MWL-SV03-400ft	200	210	210	200	230
MWL-SV04-300ft	33	58	59	82	34
MWL-SV04-400ft	40	58	67	68	56
MWL-SV05-300ft	70	72	66	81	150
MWL-SV05-400ft	56	62	60	71	75
Trigger Level[a]	20,000				

Note: [a]= The trigger levels only apply to samples collected from 400ft ports (SNL/NM March 2012).

MWL Soil Vapor Monitoring Well	Tetrachlorethene (PCE) (ppbv)				
	Sep 2014	Apr 2015	Oct 2015	Apr 2016	Oct 2016
MWL-SV03-300ft	200	270	190	240	260
MWL-SV03-400ft	350	330	310	340	350
MWL-SV04-300ft	61	86	85	98	9.6
MWL-SV04-400ft	67	93	88	90	110
MWL-SV05-300ft	73	76	46	91	150
MWL-SV05-400ft	71	74	71	94	94
Trigger Level[a]	20,000				

Note: [a]= The trigger levels only apply to samples collected from 400ft ports (SNL/NM March 2012).

MWL Soil Vapor Monitoring Well	Total VOCs (ppbv)				
	Sep 2014	Apr 2015	Oct 2015	Apr 2016	Oct 2016
MWL-SV03-300ft	460.6	554.9	493.6	576.8	649.67
MWL-SV03-400ft	825.4	685.3	661.5	678.6	681.73
MWL-SV04-300ft	158.7	237.9	252.4	269.7	153.58
MWL-SV04-400ft	147.5	228.9	220.5	234.6	285.08
MWL-SV05-300ft	282.8	289.9	272.2	335.3	534.19
MWL-SV05-400ft	802	235.8	241.2	249.7	310.66
Trigger Level[a]	25,000				

Note: [a]= The trigger levels only apply to samples collected from 400ft ports (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

Soil Vapor Monitoring at SNL/NM MWL Conducted by NMED DOE OB for FFY 2016 Q-3

Table-1 NMED DOE OB FFY 2017 Q-1 Mixed Waste Landfill Soil Vapor Quality Results: Volatile Organic Compounds by Method TO-15. October 13, 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	0.66	0.5	0.15	
	1,1,2,2-Tetrachloroethane	0.15	0.5	0.15	U
	1,1,2-Trichloroethane	0.15	0.5	0.15	U
	1,1-Dichloroethane	1.5	0.5	0.15	
	1,1-Dichloroethene	15	0.5	0.15	
	1,2,4-Trichlorobenzene	0.3	1	0.3	U
	1,2,4-Trimethylbenzene	0.15	0.5	0.15	U
	1,2-Dibromoethane	0.15	0.5	0.15	U
	1,2-Dichlorobenzene	0.3	1	0.3	U
	1,2-Dichloroethane	0.15	0.5	0.15	U
	1,2-Dichloropropane	0.15	0.5	0.15	U
	1,3,5-Trimethylbenzene	0.15	0.5	0.15	U
	1,3-Butadiene	0.15	0.5	0.15	U
	1,3-Dichlorobenzene	0.15	0.5	0.15	U
	1,4-Dichlorobenzene	0.15	0.5	0.15	U
	2-Hexanone	0.3	1	0.3	U
	4-Ethyl toluene	0.15	1	0.15	U
	Acetone	2.3	1	0.3	
	Benzene	0.34	0.5	0.15	J
	Benzyl chloride	0.3	1	0.3	U
	Bromodichloromethane	0.15	0.5	0.15	U
	Bromoform	0.15	0.5	0.15	U
	Bromomethane	0.15	0.5	0.15	U
	Carbon disulfide	0.25	0.5	0.15	J
	Carbon tetrachloride	0.32	0.5	0.15	J
	Chlorobenzene	0.15	0.5	0.15	U
	Chloroform	0.73	0.5	0.15	
	cis-1,2-Dichloroethene	1.4	0.5	0.15	
	cis-1,3-Dichloropropene	0.15	0.5	0.15	U
	Cyclohexane	0.15	0.5	0.15	U
	Dibromochloromethane	0.15	0.5	0.15	U
	Dichlorodifluoromethane	31	0.5	0.15	E
	Ethyl acetate	0.15	1	0.15	U
	Ethyl benzene	0.15	0.5	0.15	U
	Ethyl chloride	0.15	0.5	0.15	U

E = Qualifier indicates that the analyte result exceeds calibration range.

J = Qualifier indicates that the analyte value is between the MDL and the RL.

U = Qualifier indicates that the analyte was not detected above the MDL.

Table-1 NMED DOE OB FFY 2017 Q-1 Mixed Waste Landfill Soil Vapor Quality Results: Volatile Organic Compounds by Method TO-15. October 13, 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.	Freon 11	12	0.5	0.15	
	Freon 113	130	0.5	0.15	E
	Freon 114	0.15	0.5	0.15	U
	Heptane	0.15	0.5	0.15	U
	Hexachloro-1,3-butadiene	0.3	1	0.3	U
	m,p-Xylene	0.15	0.5	0.15	U
	Methyl chloride	0.15	0.5	0.15	U
	Methyl ethyl ketone	0.22	0.5	0.15	J
	Methyl isobutyl ketone	0.15	0.5	0.15	U
	Methyl t-butyl ether	0.15	0.5	0.15	U
	Methylene chloride	13	0.5	0.15	
	n-Hexane	0.17	0.5	0.15	J
	o-Xylene	0.15	0.5	0.15	U
	Styrene	0.15	0.5	0.15	U
	Tetrachloroethene	260	0.5	0.15	E
	Tetrahydrofuran	0.15	0.5	0.15	U
	Toluene	0.78	0.5	0.15	
	trans-1,2-Dichloroethene	0.15	0.5	0.15	U
	trans-1,3-Dichloropropene	0.15	0.5	0.15	U
	Trichloroethene	180	0.5	0.15	E
	Vinyl acetate	0.15	0.5	0.15	U
	Vinyl chloride	0.15	0.5	0.15	U

E = Qualifier indicates that the analyte result exceeds calibration range.

J = Qualifier indicates that the analyte value is between the MDL and the RL.

U = Qualifier indicates that the analyte was not detected above the MDL.

Table-2 NMED DOE OB FFY 2017 Q-1 Mixed Waste Landfill Soil Vapor Quality Results: Volatile Organic Compounds by Method TO-15, October 13, 2016

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

Trigger levels are 20 ppmv for PCE and TCE and 25 ppmv 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	1.4	0.5	0.15	
	1,1,2,2-Tetrachloroethane	0.15	0.5	0.15	U
	1,1,2-Trichloroethane	0.15	0.5	0.15	U
	1,1-Dichloroethane	2.8	0.5	0.15	
	1,1-Dichloroethene	14	0.5	0.15	
	1,2,4-Trichlorobenzene	0.3	1	0.3	U
	1,2,4-Trimethylbenzene	0.15	0.5	0.15	U
	1,2-Dibromoethane	0.15	0.5	0.15	U
	1,2-Dichlorobenzene	0.3	1	0.3	U
	1,2-Dichloroethane	0.15	0.5	0.15	U
	1,2-Dichloropropane	0.15	0.5	0.15	U
	1,3,5-Trimethylbenzene	0.15	0.5	0.15	U
	1,3-Butadiene	0.15	0.5	0.15	U
	1,3-Dichlorobenzene	0.15	0.5	0.15	U
	1,4-Dichlorobenzene	0.15	0.5	0.15	U
	2-Hexanone	0.3	1	0.3	U
	4-Ethyl toluene	0.15	1	0.15	U
	Acetone	0.93	1	0.3	J
	Benzene	0.4	0.5	0.15	J
	Benzyl chloride	0.3	1	0.3	U
	Bromodichloromethane	0.15	0.5	0.15	U
	Bromoform	0.15	0.5	0.15	U
	Bromomethane	0.15	0.5	0.15	U
	Carbon disulfide	0.25	0.5	0.15	J
	Carbon tetrachloride	0.34	0.5	0.15	J
	Chlorobenzene	0.15	0.5	0.15	U
	Chloroform	0.94	0.5	0.15	
	cis-1,2-Dichloroethene	1.5	0.5	0.15	
	cis-1,3-Dichloropropene	0.15	0.5	0.15	U
	Cyclohexane	0.15	0.5	0.15	U
	Dibromochloromethane	0.15	0.5	0.15	U
	Dichlorodifluoromethane	14	0.5	0.15	
	Ethyl acetate	0.15	1	0.15	U
	Ethyl benzene	0.15	0.5	0.15	U
	Ethyl chloride	0.15	0.5	0.15	U

E = Qualifier indicates that the analyte result exceeds calibration range.

J = Qualifier indicates that the analyte value is between the MDL and the RL.

U = Qualifier indicates that the analyte was not detected above the MDL.

Table-2 NMED DOE OB FFY 2017 Q-1 Mixed Waste Landfill Soil Vapor Quality Results: Volatile Organic Compounds by Method TO-15, October 13, 2016

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

Trigger levels are 20 ppmv for PCE and TCE and 25 ppmv 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.	Freon 11	8.3	0.5	0.15	
	Freon 113	54	0.5	0.15	E
	Freon 114	0.15	0.5	0.15	U
	Heptane	0.15	0.5	0.15	U
	Hexachloro-1,3-butadiene	0.3	1	0.3	U
	m,p-Xylene	0.15	0.5	0.15	U
	Methyl chloride	0.15	0.5	0.15	U
	Methyl ethyl ketone	0.27	0.5	0.15	J
	Methyl isobutyl ketone	0.15	0.5	0.15	U
	Methyl t-butyl ether	0.15	0.5	0.15	U
	Methylene chloride	1.3	0.5	0.15	
	n-Hexane	0.15	0.5	0.15	U
	o-Xylene	0.15	0.5	0.15	U
	Styrene	0.15	0.5	0.15	U
	Tetrachloroethene	350	0.5	0.15	E
	Tetrahydrofuran	0.15	0.5	0.15	U
	Toluene	1.3	0.5	0.15	
	trans-1,2-Dichloroethene	0.15	0.5	0.15	U
	trans-1,3-Dichloropropene	0.15	0.5	0.15	U
	Trichloroethene	230	0.5	0.15	E
	Vinyl acetate	0.15	0.5	0.15	U
	Vinyl chloride	0.15	0.5	0.15	U

E = Qualifier indicates that the analyte result exceeds calibration range.

J = Qualifier indicates that the analyte value is between the MDL and the RL.

U = Qualifier indicates that the analyte was not detected above the MDL.

Table-3 NMED DOE OB FFY 2017 Q-1 Mixed Waste Landfill Soil Vapor Quality Results: Volatile Organic Compounds by Method TO-15. October 13, 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	0.24	0.5	0.15	J
	1,1,2,2-Tetrachloroethane	0.15	0.5	0.15	U
	1,1,2-Trichloroethane	0.15	0.5	0.15	U
	1,1-Dichloroethane	0.36	0.5	0.15	J
	1,1-Dichloroethene	8.6	0.5	0.15	
	1,2,4-Trichlorobenzene	0.3	1	0.3	U
	1,2,4-Trimethylbenzene	0.15	0.5	0.15	U
	1,2-Dibromoethane	0.15	0.5	0.15	U
	1,2-Dichlorobenzene	0.3	1	0.3	U
	1,2-Dichloroethane	0.15	0.5	0.15	U
	1,2-Dichloropropane	0.15	0.5	0.15	U
	1,3,5-Trimethylbenzene	0.15	0.5	0.15	U
	1,3-Butadiene	0.15	0.5	0.15	U
	1,3-Dichlorobenzene	0.15	0.5	0.15	U
	1,4-Dichlorobenzene	0.15	0.5	0.15	U
	2-Hexanone	0.3	1	0.3	U
	4-Ethyl toluene	0.15	1	0.15	U
	Acetone	1.8	1	0.3	
	Benzene	0.15	0.5	0.15	U
	Benzyl chloride	0.3	1	0.3	U
	Bromodichloromethane	0.15	0.5	0.15	U
	Bromoform	0.15	0.5	0.15	U
	Bromomethane	0.15	0.5	0.15	U
	Carbon disulfide	0.24	0.5	0.15	J
	Carbon tetrachloride	0.22	0.5	0.15	J
	Chlorobenzene	0.15	0.5	0.15	U
	Chloroform	0.21	0.5	0.15	J
	cis-1,2-Dichloroethene	0.27	0.5	0.15	J
	cis-1,3-Dichloropropene	0.15	0.5	0.15	U
	Cyclohexane	0.15	0.5	0.15	U
	Dibromochloromethane	0.15	0.5	0.15	U
	Dichlorodifluoromethane	20	0.5	0.15	
	Ethyl acetate	0.15	1	0.15	U
	Ethyl benzene	0.15	0.5	0.15	U
	Ethyl chloride	0.15	0.5	0.15	U

E = Qualifier indicates that the analyte result exceeds calibration range.

J = Qualifier indicates that the analyte value is between the MDL and the RL.

U = Qualifier indicates that the analyte was not detected above the MDL.

Table-3 NMED DOE OB FFY 2017 Q-1 Mixed Waste Landfill Soil Vapor Quality Results: Volatile Organic Compounds by Method TO-15. October 13, 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.	Freon 11	9	0.5	0.15	
	Freon 113	68	0.5	0.15	E
	Freon 114	0.15	0.5	0.15	U
	Heptane	0.15	0.5	0.15	U
	Hexachloro-1,3-butadiene	0.3	1	0.3	U
	m,p-Xylene	0.15	0.5	0.15	U
	Methyl chloride	0.15	0.5	0.15	U
	Methyl ethyl ketone	0.15	0.5	0.15	U
	Methyl isobutyl ketone	0.15	0.5	0.15	U
	Methyl t-butyl ether	0.15	0.5	0.15	U
	Methylene chloride	0.81	0.5	0.15	
	n-Hexane	0.15	0.5	0.15	U
	o-Xylene	0.15	0.5	0.15	U
	Styrene	0.15	0.5	0.15	U
	Tetrachloroethene	9.6	0.5	0.15	
	Tetrahydrofuran	0.15	0.5	0.15	U
	Toluene	0.23	0.5	0.15	J
	trans-1,2-Dichloroethene	0.15	0.5	0.15	U
	trans-1,3-Dichloropropene	0.15	0.5	0.15	U
	Trichloroethene	34	0.5	0.15	E
	Vinyl acetate	0.15	0.5	0.15	U
	Vinyl chloride	0.15	0.5	0.15	U

E = Qualifier indicates that the analyte result exceeds calibration range.

J = Qualifier indicates that the analyte value is between the MDL and the RL.

U = Qualifier indicates that the analyte was not detected above the MDL.

Table-3 NMED DOE OB FFY 2017 Q-1 Mixed Waste Landfill Soil Vapor Quality Results: Volatile Organic Compounds by Method TO-15. October 13, 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. DUP	1,1,1-Trichloroethane	0.27	0.5	0.15	J
	1,1,2,2-Tetrachloroethane	0.15	0.5	0.15	U
	1,1,2-Trichloroethane	0.15	0.5	0.15	U
	1,1-Dichloroethane	0.35	0.5	0.15	J
	1,1-Dichloroethene	9.4	0.5	0.15	
	1,2,4-Trichlorobenzene	0.3	1	0.3	U
	1,2,4-Trimethylbenzene	0.15	0.5	0.15	U
	1,2-Dibromoethane	0.15	0.5	0.15	U
	1,2-Dichlorobenzene	0.3	1	0.3	U
	1,2-Dichloroethane	0.15	0.5	0.15	U
	1,2-Dichloropropane	0.15	0.5	0.15	U
	1,3,5-Trimethylbenzene	0.15	0.5	0.15	U
	1,3-Butadiene	0.15	0.5	0.15	U
	1,3-Dichlorobenzene	0.15	0.5	0.15	U
	1,4-Dichlorobenzene	0.15	0.5	0.15	U
	2-Hexanone	0.3	1	0.3	U
	4-Ethyl toluene	0.15	1	0.15	U
	Acetone	0.96	1	0.3	J
	Benzene	0.52	0.5	0.15	
	Benzyl chloride	0.3	1	0.3	U
	Bromodichloromethane	0.15	0.5	0.15	U
	Bromoform	0.15	0.5	0.15	U
	Bromomethane	0.15	0.5	0.15	U
	Carbon disulfide	0.15	0.5	0.15	U
	Carbon tetrachloride	0.26	0.5	0.15	J
	Chlorobenzene	0.15	0.5	0.15	U
	Chloroform	0.2	0.5	0.15	J
	cis-1,2-Dichloroethene	0.24	0.5	0.15	J
	cis-1,3-Dichloropropene	0.15	0.5	0.15	U
	Cyclohexane	0.15	0.5	0.15	U
	Dibromochloromethane	0.15	0.5	0.15	U
	Dichlorodifluoromethane	22	0.5	0.15	E
	Ethyl acetate	0.15	1	0.15	U
	Ethyl benzene	0.15	0.5	0.15	U
	Ethyl chloride	0.15	0.5	0.15	U

E = Qualifier indicates that the analyte result exceeds calibration range.

J = Qualifier indicates that the analyte value is between the MDL and the RL.

U = Qualifier indicates that the analyte was not detected above the MDL.

Table-3 NMED DOE OB FFY 2017 Q-1 Mixed Waste Landfill Soil Vapor Quality Results: Volatile Organic Compounds by Method TO-15. October 13, 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. DUP	Freon 11	9.7	0.5	0.15	
	Freon 113	78	0.5	0.15	E
	Freon 114	0.15	0.5	0.15	U
	Heptane	0.15	0.5	0.15	U
	Hexachloro-1,3-butadiene	0.3	1	0.3	U
	m,p-Xylene	0.2	0.5	0.15	J
	Methyl chloride	0.15	0.5	0.15	U
	Methyl ethyl ketone	0.15	0.5	0.15	U
	Methyl isobutyl ketone	0.15	0.5	0.15	U
	Methyl t-butyl ether	0.15	0.5	0.15	U
	Methylene chloride	0.15	0.5	0.15	U
	n-Hexane	0.16	0.5	0.15	J
	o-Xylene	0.15	0.5	0.15	U
	Styrene	0.15	0.5	0.15	U
	Tetrachloroethene	130	0.5	0.15	E
	Tetrahydrofuran	0.15	0.5	0.15	U
	Toluene	0.38	0.5	0.15	J
	trans-1,2-Dichloroethene	0.15	0.5	0.15	U
	trans-1,3-Dichloropropene	0.15	0.5	0.15	U
	Trichloroethene	68	0.5	0.15	E
	Vinyl acetate	0.15	0.5	0.15	U
	Vinyl chloride	0.15	0.5	0.15	U

E = Qualifier indicates that the analyte result exceeds calibration range.

J = Qualifier indicates that the analyte value is between the MDL and the RL.

U = Qualifier indicates that the analyte was not detected above the MDL.

Table-4 NMED DOE OB FFY 2017 Q-1 Mixed Waste Landfill Soil Vapor Quality Results: Volatile Organic Compounds by Method TO-15. October 13, 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	0.27	0.5	0.15	J
	1,1,2,2-Tetrachloroethane	0.15	0.5	0.15	U
	1,1,2-Trichloroethane	0.15	0.5	0.15	U
	1,1-Dichloroethane	0.2	0.5	0.15	J
	1,1-Dichloroethene	3	0.5	0.15	
	1,2,4-Trichlorobenzene	0.3	1	0.3	U
	1,2,4-Trimethylbenzene	0.15	0.5	0.15	U
	1,2-Dibromoethane	0.15	0.5	0.15	U
	1,2-Dichlorobenzene	0.3	1	0.3	U
	1,2-Dichloroethane	0.15	0.5	0.15	U
	1,2-Dichloropropane	0.15	0.5	0.15	U
	1,3,5-Trimethylbenzene	0.15	0.5	0.15	U
	1,3-Butadiene	0.15	0.5	0.15	U
	1,3-Dichlorobenzene	0.15	0.5	0.15	U
	1,4-Dichlorobenzene	0.15	0.5	0.15	U
	2-Hexanone	0.3	1	0.3	U
	4-Ethyl toluene	0.15	1	0.15	U
	Acetone	9.7	1	0.3	
	Benzene	0.65	0.5	0.15	
	Benzyl chloride	0.3	1	0.3	U
	Bromodichloromethane	0.15	0.5	0.15	U
	Bromoform	0.15	0.5	0.15	U
	Bromomethane	0.15	0.5	0.15	U
	Carbon disulfide	0.64	0.5	0.15	
	Carbon tetrachloride	0.17	0.5	0.15	J
	Chlorobenzene	0.15	0.5	0.15	U
	Chloroform	0.19	0.5	0.15	J
	cis-1,2-Dichloroethene	0.23	0.5	0.15	J
	cis-1,3-Dichloropropene	0.15	0.5	0.15	U
	Cyclohexane	0.15	0.5	0.15	U
	Dibromochloromethane	0.15	0.5	0.15	U
	Dichlorodifluoromethane	11	0.5	0.15	
	Ethyl acetate	0.6	1	0.15	J
	Ethyl benzene	0.15	0.5	0.15	U
	Ethyl chloride	0.15	0.5	0.15	U

E = Qualifier indicates that the analyte result exceeds calibration range.

J = Qualifier indicates that the analyte value is between the MDL and the RL.

U = Qualifier indicates that the analyte was not detected above the MDL.

Table-4 NMED DOE OB FFY 2017 Q-1 Mixed Waste Landfill Soil Vapor Quality Results: Volatile Organic Compounds by Method TO-15. October 13, 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.	Freon 11	5.3	0.5	0.15	
	Freon 113	42	0.5	0.15	E
	Freon 114	0.15	0.5	0.15	U
	Heptane	0.15	0.5	0.15	U
	Hexachloro-1,3-butadiene	0.3	1	0.3	U
	m,p-Xylene	0.26	0.5	0.15	J
	Methyl chloride	0.15	0.5	0.15	U
	Methyl ethyl ketone	0.54	0.5	0.15	
	Methyl isobutyl ketone	0.15	0.5	0.15	U
	Methyl t-butyl ether	0.15	0.5	0.15	U
	Methylene chloride	43	0.5	0.15	E
	n-Hexane	0.15	0.5	0.15	U
	o-Xylene	0.15	0.5	0.15	U
	Styrene	0.15	0.5	0.15	U
	Tetrachloroethene	110	0.5	0.15	E
	Tetrahydrofuran	0.33	0.5	0.15	J
	Toluene	1	0.5	0.15	
	trans-1,2-Dichloroethene	0.15	0.5	0.15	U
	trans-1,3-Dichloropropene	0.15	0.5	0.15	U
	Trichloroethene	56	0.5	0.15	E
	Vinyl acetate	0.15	0.5	0.15	U
	Vinyl chloride	0.15	0.5	0.15	U

E = Qualifier indicates that the analyte result exceeds calibration range.

J = Qualifier indicates that the analyte value is between the MDL and the RL.

U = Qualifier indicates that the analyte was not detected above the MDL.

Table-5 NMED DOE OB FFY 2017 Q-1 Mixed Waste Landfill Soil Vapor Quality Results: Volatile Organic Compounds by Method TO-15. October 13, 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	0.97	0.5	0.15	
	1,1,2,2-Tetrachloroethane	0.15	0.5	0.15	U
	1,1,2-Trichloroethane	0.15	0.5	0.15	U
	1,1-Dichloroethane	1.4	0.5	0.15	
	1,1-Dichloroethene	24	0.5	0.15	E
	1,2,4-Trichlorobenzene	0.3	1	0.3	U
	1,2,4-Trimethylbenzene	0.15	0.5	0.15	U
	1,2-Dibromoethane	0.15	0.5	0.15	U
	1,2-Dichlorobenzene	0.3	1	0.3	U
	1,2-Dichloroethane	0.15	0.5	0.15	U
	1,2-Dichloropropane	0.15	0.5	0.15	U
	1,3,5-Trimethylbenzene	0.15	0.5	0.15	U
	1,3-Butadiene	0.15	0.5	0.15	U
	1,3-Dichlorobenzene	0.15	0.5	0.15	U
	1,4-Dichlorobenzene	0.15	0.5	0.15	U
	2-Hexanone	0.3	1	0.3	U
	4-Ethyl toluene	0.15	1	0.15	U
	Acetone	1	1	0.3	
	Benzene	0.21	0.5	0.15	J
	Benzyl chloride	0.3	1	0.3	U
	Bromodichloromethane	0.15	0.5	0.15	U
	Bromoform	0.15	0.5	0.15	U
	Bromomethane	0.15	0.5	0.15	U
	Carbon disulfide	0.15	0.5	0.15	U
	Carbon tetrachloride	1	0.5	0.15	
	Chlorobenzene	0.15	0.5	0.15	U
	Chloroform	0.69	0.5	0.15	
	cis-1,2-Dichloroethene	0.83	0.5	0.15	
	cis-1,3-Dichloropropene	0.15	0.5	0.15	U
	Cyclohexane	0.15	0.5	0.15	U
	Dibromochloromethane	0.15	0.5	0.15	U
	Dichlorodifluoromethane	36	0.5	0.15	E
	Ethyl acetate	0.15	1	0.15	U
	Ethyl benzene	0.15	0.5	0.15	U
	Ethyl chloride	0.15	0.5	0.15	U

E = Qualifier indicates that the analyte result exceeds calibration range.

J = Qualifier indicates that the analyte value is between the MDL and the RL.

U = Qualifier indicates that the analyte was not detected above the MDL.

Table-5 NMED DOE OB FFY 2017 Q-1 Mixed Waste Landfill Soil Vapor Quality Results: Volatile Organic Compounds by Method TO-15. October 13, 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.	Freon 11	27	0.5	0.15	E
	Freon 113	140	0.5	0.15	E
	Freon 114	0.15	0.5	0.15	U
	Heptane	0.15	0.5	0.15	U
	Hexachloro-1,3-butadiene	0.3	1	0.3	U
	m,p-Xylene	0.15	0.5	0.15	U
	Methyl chloride	0.15	0.5	0.15	U
	Methyl ethyl ketone	0.15	0.5	0.15	U
	Methyl isobutyl ketone	0.15	0.5	0.15	U
	Methyl t-butyl ether	0.15	0.5	0.15	U
	Methylene chloride	0.77	0.5	0.15	
	n-Hexane	0.15	0.5	0.15	U
	o-Xylene	0.15	0.5	0.15	U
	Styrene	0.15	0.5	0.15	U
	Tetrachloroethene	150	0.5	0.15	E
	Tetrahydrofuran	0.15	0.5	0.15	U
	Toluene	0.32	0.5	0.15	J
	trans-1,2-Dichloroethene	0.15	0.5	0.15	U
	trans-1,3-Dichloropropene	0.15	0.5	0.15	U
	Trichloroethene	150	0.5	0.15	E
	Vinyl acetate	0.15	0.5	0.15	U
	Vinyl chloride	0.15	0.5	0.15	U

E = Qualifier indicates that the analyte result exceeds calibration range.

J = Qualifier indicates that the analyte value is between the MDL and the RL.

U = Qualifier indicates that the analyte was not detected above the MDL.

Table-6 NMED DOE OB FFY 2017 Q-1 Mixed Waste Landfill Soil Vapor Quality Results: Volatile Organic Compounds by Method TO-15. October 13, 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	1.3	0.5	0.15	
	1,1,2,2-Tetrachloroethane	0.15	0.5	0.15	U
	1,1,2-Trichloroethane	0.15	0.5	0.15	U
	1,1-Dichloroethane	1.1	0.5	0.15	
	1,1-Dichloroethene	13	0.5	0.15	
	1,2,4-Trichlorobenzene	0.3	1	0.3	U
	1,2,4-Trimethylbenzene	0.15	0.5	0.15	U
	1,2-Dibromoethane	0.15	0.5	0.15	U
	1,2-Dichlorobenzene	0.3	1	0.3	U
	1,2-Dichloroethane	0.15	0.5	0.15	U
	1,2-Dichloropropane	0.15	0.5	0.15	U
	1,3,5-Trimethylbenzene	0.15	0.5	0.15	U
	1,3-Butadiene	0.15	0.5	0.15	U
	1,3-Dichlorobenzene	0.15	0.5	0.15	U
	1,4-Dichlorobenzene	0.15	0.5	0.15	U
	2-Hexanone	0.3	1	0.3	U
	4-Ethyl toluene	0.15	1	0.15	U
	Acetone	1.9	1	0.3	
	Benzene	0.45	0.5	0.15	J
	Benzyl chloride	0.3	1	0.3	U
	Bromodichloromethane	0.15	0.5	0.15	U
	Bromoform	0.15	0.5	0.15	U
	Bromomethane	0.15	0.5	0.15	U
	Carbon disulfide	0.44	0.5	0.15	J
	Carbon tetrachloride	0.58	0.5	0.15	
	Chlorobenzene	0.15	0.5	0.15	U
	Chloroform	0.31	0.5	0.15	J
	cis-1,2-Dichloroethene	0.32	0.5	0.15	J
	cis-1,3-Dichloropropene	0.15	0.5	0.15	U
	Cyclohexane	0.15	0.5	0.15	U
	Dibromochloromethane	0.15	0.5	0.15	U
	Dichlorodifluoromethane	28	0.5	0.15	E
	Ethyl acetate	0.15	1	0.15	U
	Ethyl benzene	0.15	0.5	0.15	U
	Ethyl chloride	0.15	0.5	0.15	U

E = Qualifier indicates that the analyte result exceeds calibration range.

J = Qualifier indicates that the analyte value is between the MDL and the RL.

U = Qualifier indicates that the analyte was not detected above the MDL.

Table-6 NMED DOE OB FFY 2017 Q-1 Mixed Waste Landfill Soil Vapor Quality Results: Volatile Organic Compounds by Method TO-15. October 13, 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.	Freon 11	30	0.5	0.15	E
	Freon 113	60	0.5	0.15	E
	Freon 114	0.15	0.5	0.15	U
	Heptane	0.15	0.5	0.15	U
	Hexachloro-1,3-butadiene	0.3	1	0.3	U
	m,p-Xylene	0.15	0.5	0.15	U
	Methyl chloride	0.15	0.5	0.15	U
	Methyl ethyl ketone	0.3	0.5	0.15	J
	Methyl isobutyl ketone	0.15	0.5	0.15	U
	Methyl t-butyl ether	0.15	0.5	0.15	U
	Methylene chloride	1.8	0.5	0.15	
	n-Hexane	0.15	0.5	0.15	U
	o-Xylene	0.15	0.5	0.15	U
	Styrene	0.15	0.5	0.15	U
	Tetrachloroethene	94	0.5	0.15	E
	Tetrahydrofuran	0.16	0.5	0.15	J
	Toluene	2	0.5	0.15	
	trans-1,2-Dichloroethene	0.15	0.5	0.15	U
	trans-1,3-Dichloropropene	0.15	0.5	0.15	U
	Trichloroethene	75	0.5	0.15	E
	Vinyl acetate	0.15	0.5	0.15	U
	Vinyl chloride	0.15	0.5	0.15	U

E = Qualifier indicates that the analyte result exceeds calibration range.

J = Qualifier indicates that the analyte value is between the MDL and the RL.

U = Qualifier indicates that the analyte was not detected above the MDL.