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Date: May 3, 1994
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2225 TA 51

Barbara Driscoll
EPA Region 6
RCRA Permits Branch
6H-PN, EPA
1445 Ross Ave, Suite 1200
Dallas, TX 75202-2733

Dear Barbara,

Enclosed is a draft report on the passive soil gas data collected with Emflux cartridges in Operable Unit (OU) 1148 at Los Alamos National Laboratory. You requested the data in our conference call between DOE, EPA, NMED/AIP, and LANL, on April 8, wherein we discussed modifications to the OU 1148 Work Plan. In the conference call, and in our November 1993 response to the EPA Notice of Deficiency, we discussed how this data is being used only for screening, rather than for quantitative risk assessment. Based on the soil gas data, we will be suggesting to EPA some fine-tuning to future borehole locations within the MDAs. I apologize that the draft report contains the tabulated data, but no data in map form. The data is currently being worked into the FIMAD system and should be available in display format soon.

As we discussed, OU 1148 has plans to deploy 120 additional Emflux samplers for further screening of areas within the four MDAs which make up the OU. I hope your analysis of the data provides you with the confidence necessary to endorse our use of this technique.

As agreed on April 8, this draft is simultaneously going to Cort Fesmire, DOE/LAAO, and to Bruce Swanton, New Mexico Environment Department.

Sincerely,

Don Krier
OU 1148 Project Leader

Cy: Cort Fesmire, DOE/LAAO (w/ att.)
Bruce Swanton, NMED/AIP (w/ att.)
Tracy Glatzmaier, EM/ER, MS M992 (w/o att.)
EES-1, MS D462 (w/o att.)
OU 1148 files

4335

ENVIRONMENTAL RESTORATION PROGRAM

PASSIVE SURFACE EMISSION RESULTS USING THE EMFLUX® GAS SAMPLING SYSTEM AT OU 1148

ROUGH DRAFT

LOS ALAMOS NATIONAL LABORATORY
LOS ALAMOS, NEW MEXICO

ROUGH DRAFT

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Passive Surface Soil-Gas Sampling At TA-54 Report

1.0 Introduction / Background

A passive surface-soil-gas survey at Los Alamos National Laboratory (LANL), Technical Area (TA) 54 was conducted by QUADREL Services, Inc. on August 26-31, 1993. The purpose of the survey was to determine the presence, identities, and the relative strengths of contaminants migrating, in vapor phase, toward the surface. The results from this survey will be used as a field-screening tool to guide placement of boreholes used for subsurface sampling, and to identify the extent of the plume along canyon walls where monitoring with wells is difficult.

1.1 Survey Location

The survey took place at TA-54 which is located on the Mesita del Buey, a mesa comprised largely of volcanic tuff and covered with light, grassy vegetation and deep rooted trees. Historical information determined that volatile organic compounds were placed in subsurface disposal sites at Material Disposal Areas (MDA'S) MDA L, and MDA G.

2.0 Technology

In this section the technology supporting the surface sampling method along with more detailed information about sample deployment/retrieval and analysis is discussed.

2.1 Quadrel Service, Inc. Sampling System

The survey was conducted by Quadrel Service, Inc. on a subcontract basis. The Quadrel sampling system for soil-gas detection is based on two procedures; first, selecting the time for sample collection from analysis of gravitational earth tides, and second, the use of EMFLUX® samplers. Each of these procedures is discussed below in more detail.

2.1.1 Optimal Sampling Period

Subsurface matrix pore gas migration is controlled by several conditions such as changes in concentration gradient, barometric pressure, temperature gradients between surface and subsurface materials, wind shear, and compression/relaxation of the earth's crust resulting from periodic changes in gravitational forces. The Quadrel system utilizes a computer code to predict the most favorable period for gas emission to the surface based on gravitational forces exerted on the earth's crust which are known as earth tides. In general, a favorable sampling duration from earth tide calculations is about 72 hours. We are not certain of the importance of earth tides on the upward vertical movement of soil gas through Mesita del Buey. However, our subsurface pressure measurements in soil gas monitoring wells has established that there is an upward pressure gradient to depths of greater than 100 feet during periods of low atmospheric pressure. The August 1993 passive soil gas survey was conducted during a period of both low atmospheric pressure (upward movement of soil gas) and preferred flow based on earth tide calculations. We will attempt to perform additional passive soil gas surveys at Mesita del Buey when both conditions occur. However, we will give priority to performing the surveys during periods of low atmospheric pressure when our subsurface pressure measurements indicate upward movement of soil gas. Fig. 1 shows the upward pressure gradient for soil gas within the mesa during the passive soil gas survey performed from August 26-31, 1993. We believe that the conditions shown in Figure 1 are optimal for collection of soil gas and the collection period should be long such as the 72 hour period used in this survey.

2.1.2 EMFLUX® Sampler

Matrix trace-gas is collected with an EMFLUX® sample cartridge. The cartridge consists of an activated carbon sorbent cylinder. The sorbent material is site specific depending on the number of target compounds. At TA-54, the survey was designed to detect VOC's on the U.S. Environmental Protection Agency's standard Target Compound List for EPA's Contract Laboratory Program, and 15 additional VOC's. Table 1 contains a list of the VOC's.

2.2 Subsurface Gas Migration Studies At LANL

2.2.0 Background

Subsurface gas migration is an important factor when working with contaminated soils and a contaminated subsurface matrix. Characterization of the plume via gas samples is difficult because concentration levels may be changing both temporally and spacially due to the "breathing" of the mesa. A number of factors control gas migration in the subsurface including concentration, barometric pressure fluctuations, thermal gradients, wind shear,earth tides, and matrix material properties. Because of the large number of variables we are conducting a field investigation to monitor both pressure gradients in the subsurface matrix and barometric pressure fluctuations. The pressure gradient trends are also compared to predicted favorable and unfavorable surface emission periods based on earth-tide theory.

2.3 Criteria For Selection Of Survey Method

The EMFLUX® system was chosen as a field screening method at TA-54 for the following reasons:

- Capable of screening for a large suite of analytes;
- Easy to deploy/retrieve in the field in areas with rough terrain such as on canyon walls. It is difficult to use active extraction systems in these settings because of access and also because of high possibility of short circuiting;
- Simultaneous data collection. This allows all the samples to collect data while subject to the same environmental conditions and also compensates for the frequent changes in surface emission due to matrix pore-gas migration. This is an important factor when comparing relative contaminant levels between samples, and is important when determining plume migration and source location;
- Avoids the possibility of "short circuiting" which may occur with active subsurface sampling methods. Because the subsurface matrix is composed of fractured tuff the potential for short circuiting is high;
- It is a passive system and does not require special equipment. In addition, it minimizes the likelihood of human and/or equipment error;

- Non-intrusive gas sampling method;
- Substantially lower cost than active-intrusive methods;
- High sensitivity; the sorbent material is sensitive to low emission levels in the ppb range.
- Sampling near biota. Gas samples can be taken near biota such as in the vicinity of trees where the root system may act as a pathway for gas migration or samples may be taken near rodent tunnels. These samples can be taken with minimal physical disturbance.
- Long sampling time. The cartridges are deployed from 72 hours which provides a period of time to span upward soil gas movement due to periods of low atmospheric pressure. Active extraction sampling surveys rarely extract gas for periods greater than several minutes to tens of minutes. We believe long measurement periods are necessary to avoid short term fluctuations in pressure gradients.

2.3 Sample Deployment and Retrieval

The EMFLUX® collection devices were deployed at sample location id's 5000-5085 and 5091-5100 on MDA's J, L, and part of G on Thursday, August 26, 1993; the remaining devices were deployed the following day. Sample location id's are for the three MDA's are shown in Fig. 2 through Fig. 6. The devices deployed on Thursday were retrieved on Monday, August 30 and the devices deployed on Friday were retrieved on Tuesday, August 31. There were 257 field sample points, 12 duplicate field samples, 26 ambient-air control samples, and four trip blanks. This resulted in a combined total of 299 sample cartridges submitted for analysis.

2.4 Sample Analysis

The cartridge analysis was performed by a contract laboratory, Maryland Spectral Services. The process included analyte thermal desorption from the cartridge and analyte characterization by GC/MS incorporating EPA Method 8240(modified to accommodate thermal desorption). Analysis of all cartridges took approximately two weeks and the laboratory report was available on Thursday, September 23.

3.0 Results And Discussion

Analytical results for samples placed in and around each of the three MDA boundaries at TA-54 are presented below.

3.1 The Region Of The Plume Emanating From MDA L

Samples were placed in and around the MDA L facility boundary and in the adjacent expansion zone of MDA G. A total of 70 sample locations (5000-5068 and 5131) were deployed. The results from the analysis, summarized on Table 2, show that the primary contaminants are chlorinated solvents including trichloroethene (TCE), tetrachloroethene (PCE), 1,1,1-trichloroethane (TCA), and 1,1,2-trichlorotrifluoroethane (Freon 113). Smaller amounts of BTEX compounds were also detected. The types of analytes detected from the surface samples agree with the analytes which have been detected during Quarterly subsurface sampling of the vapor monitoring wells in the area.

Maximum concentration values are located near the pits and the two shaft clusters which are located at opposite ends of the MDA L facility, one at the far west side and the other at the far east side of the area. The change in magnitude of the contaminant levels suggest movement from the source areas toward the canyon wall on the north side of the Mesa. High contaminant levels were observed along the fence line on the northern edge of the facility. This may be a result from the effect of the asphalt pad above the source areas restricting vertical gas emission. The passive soil gas survey is our first source of information on contaminants north of the MDA.

Results from the passive soil gas survey agree closely with results from monitor wells located within and east of MDA L. Comparison of spacial contaminant concentration between results from the surface-sample survey and the subsurface quarterly sampling from vapor monitoring wells is shown in graphical form in Fig. 7 for 1,1,1-trichloroethane. The data was taken from locations near the eastern shaft cluster. Because the two methods present the results in different units, the measured values for both methods were normalized. Normalization for the monitoring wells was performed by taking the maximum detected value of 1,1,1-trichloroethane for each well, then dividing these values by the largest value in the

population. Results from the surface samples were normalized similarly. Therefore, both methods have a normalized contaminant range from 0 to 1. The data was plotted as a function of distance from the maximum concentration value. The sample points for the two techniques are not co-located, but the comparison demonstrates general agreement between the two techniques. The contaminant concentration levels are expected to decay exponentially as a function of distance. If the matrix were homogeneous then the contaminant concentration decay would be smooth with respect to distance. At TA-54 the subsurface matrix is not a homogeneous medium, instead it consists of fractured tuff and the decay is jagged. The spikes and valleys on the decay curve may be indications of zones of higher concentrations along high permeability fractures and lower values in regions away from fractures.

We propose to take additional passive soil gas measurements at MDA L on the north and south walls of the mesa extending into the canyon bottoms. We presently have no information on VOC emissions from the south wall of the mesa above Pajarito Canyon.

3.2 Results From MDA J

At MDA J 13 locations (5060-5081) were sampled. The results for these locations are shown on Table 3. The contaminant levels are low compared to those of MDA L.

MDA J is a disposal site for administrative waste, and large quantities of wastes with volatile organic compounds should not be present. The passive gas survey only detected a limited number of VOC's and all of the measured values were low (see Table 3). The VOC's were detected along the west end of Pit 1 and the east end of Pit 3. We propose to do 10 additional measurements at MDA J to guide the locations for boreholes.

3.3 Results From MDA G

Locations for passive soil gas samples at MDA G are shown on Figures 5 and 6. At MDA G, 174 (5082-5256, excluding 5131) locations were sampled. Table 4 presents the analytical results for the passive survey at MDA G. The dominant VOC which was detected at the majority of measurement locations was 1,1,1-trichloroethane with values ranging from 2.0 $ng/m^2/min$ to 2235 $ng/m^2/min$. The highest values occur in the eastern side of MDA G above the oldest

disposal pits (pits 1 through 5). The measured values for 1,1,1-trichloroethane at MDA G exceed the highest values measured at MDA L. Other VOC's that occur at elevated values at MDA G measurement locations are tetrachloroethene, trichloroethene, 1,1-dichloroethane, 1,1-dichloroethene, and Freon-113.

We propose to perform additional passive soil gas measurements above disposal pits at MDA G. For the eastern part of the MDA we propose measurements along the canyon walls to the north, east, and south of the MDA. The information will be used to enhance our understanding of the nature and extent of VOC plumes at and around MDA G and to refine the locations for boreholes.

ROUGH DRAFT

Figure 1: Pressure measurements (at well #22) during the passive soil survey at TA-54.

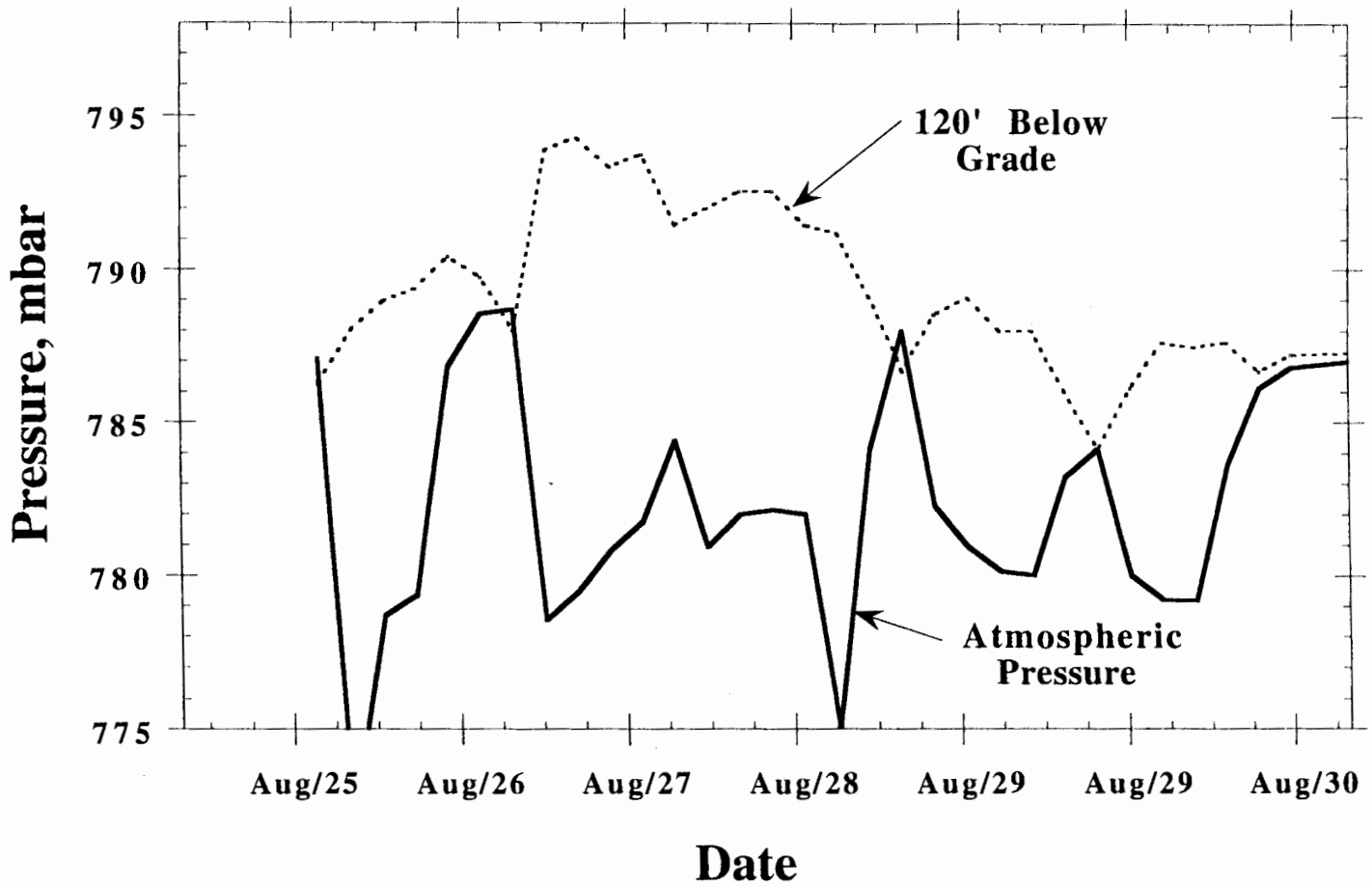

Fig. 2: Surface sample locations at MDA J

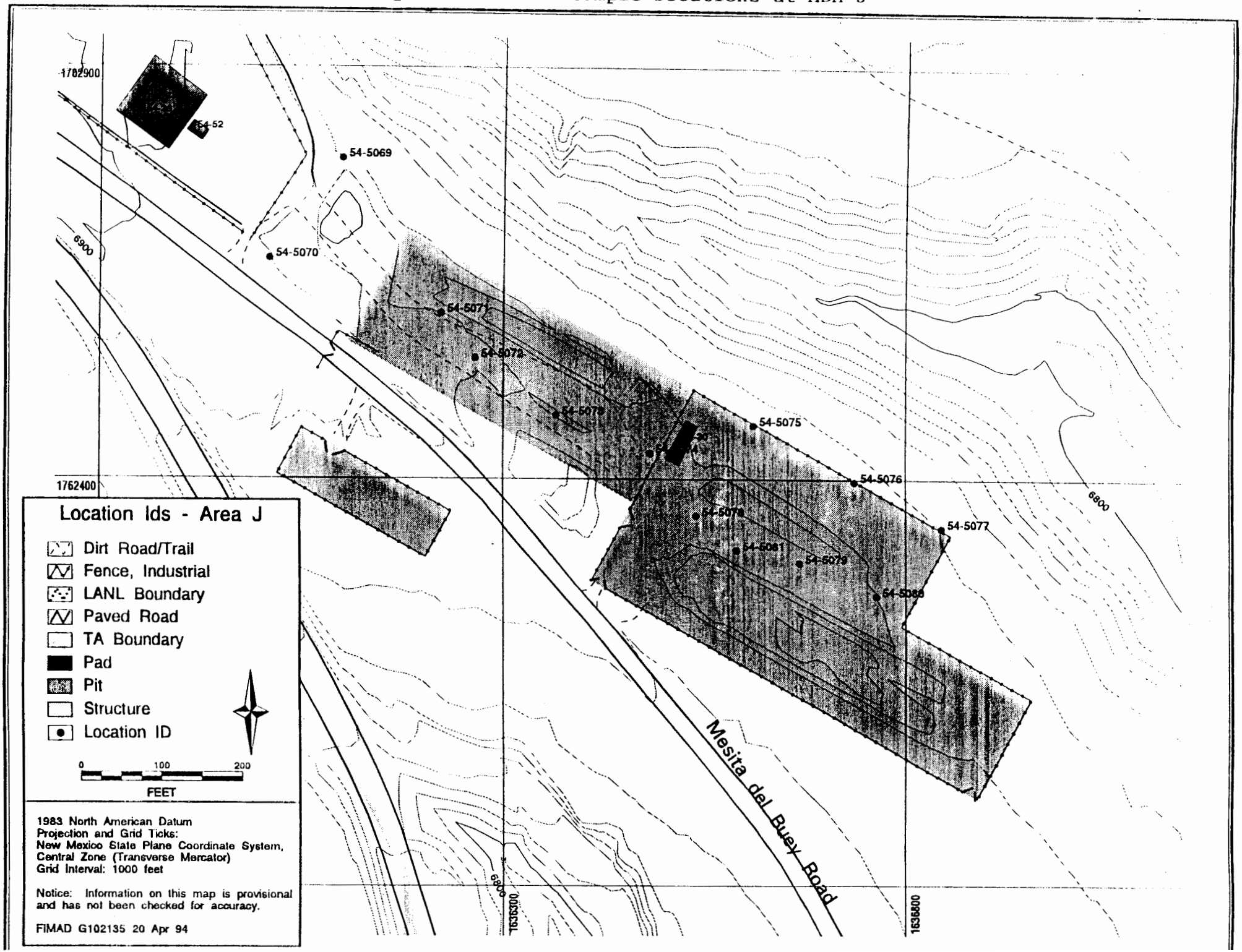

Fig. 3: Surface sample locations at MDA L

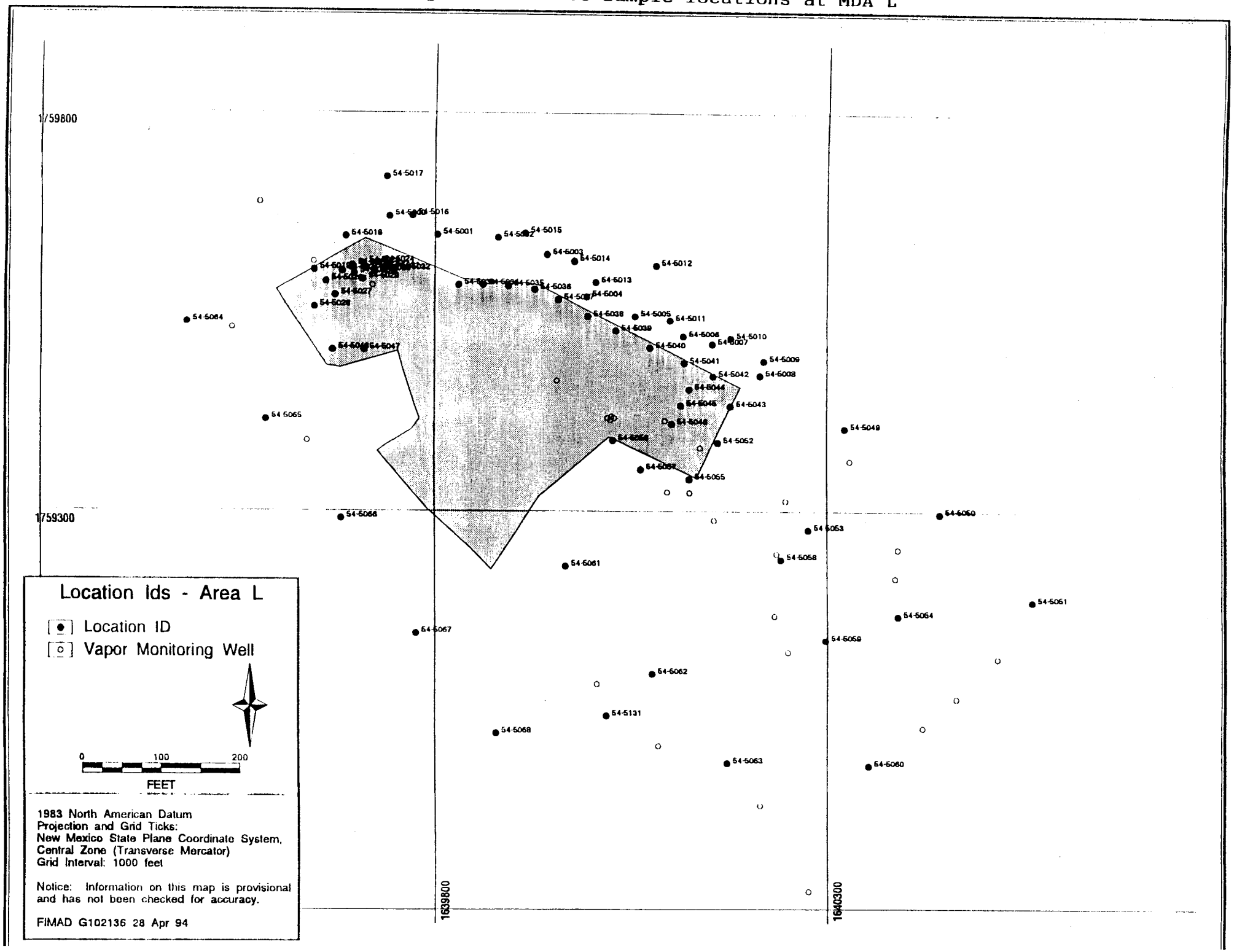

Fig. 4: Surface sample locations near western shaft cluster at MDA L

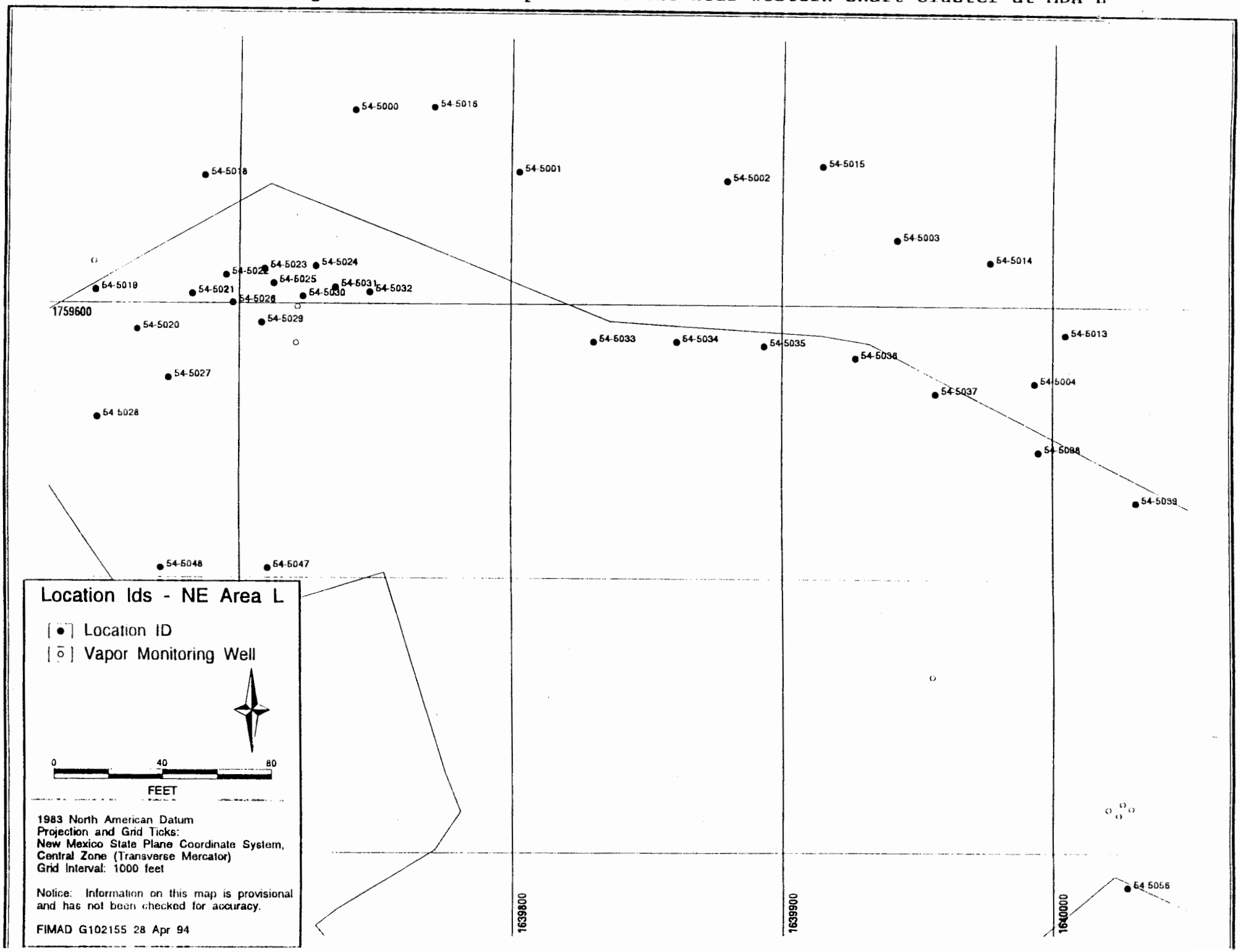

Fig. 5: Surface sample locations at MDA G

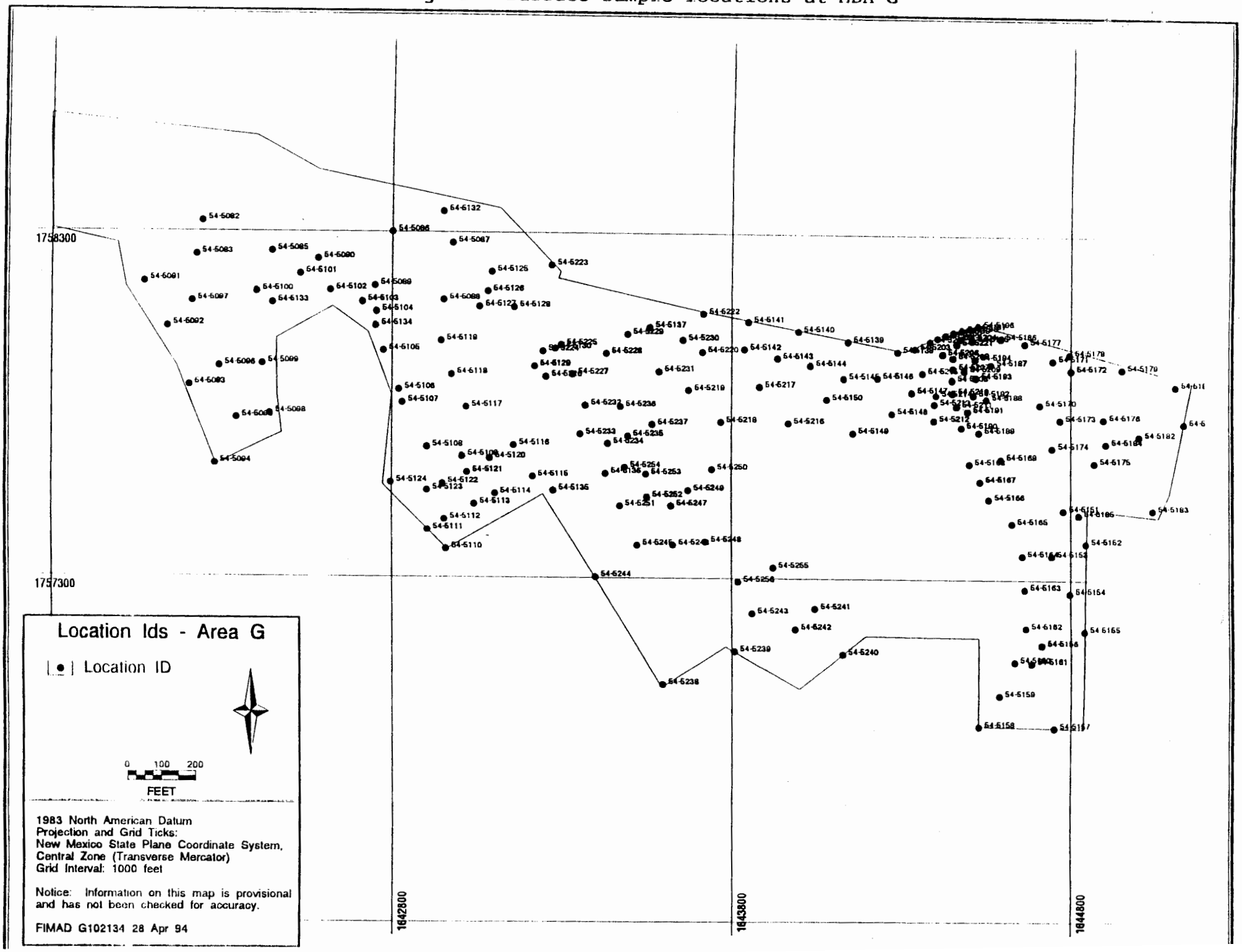

Fig. 6: Surface sample locations for the north-east section of MDA G

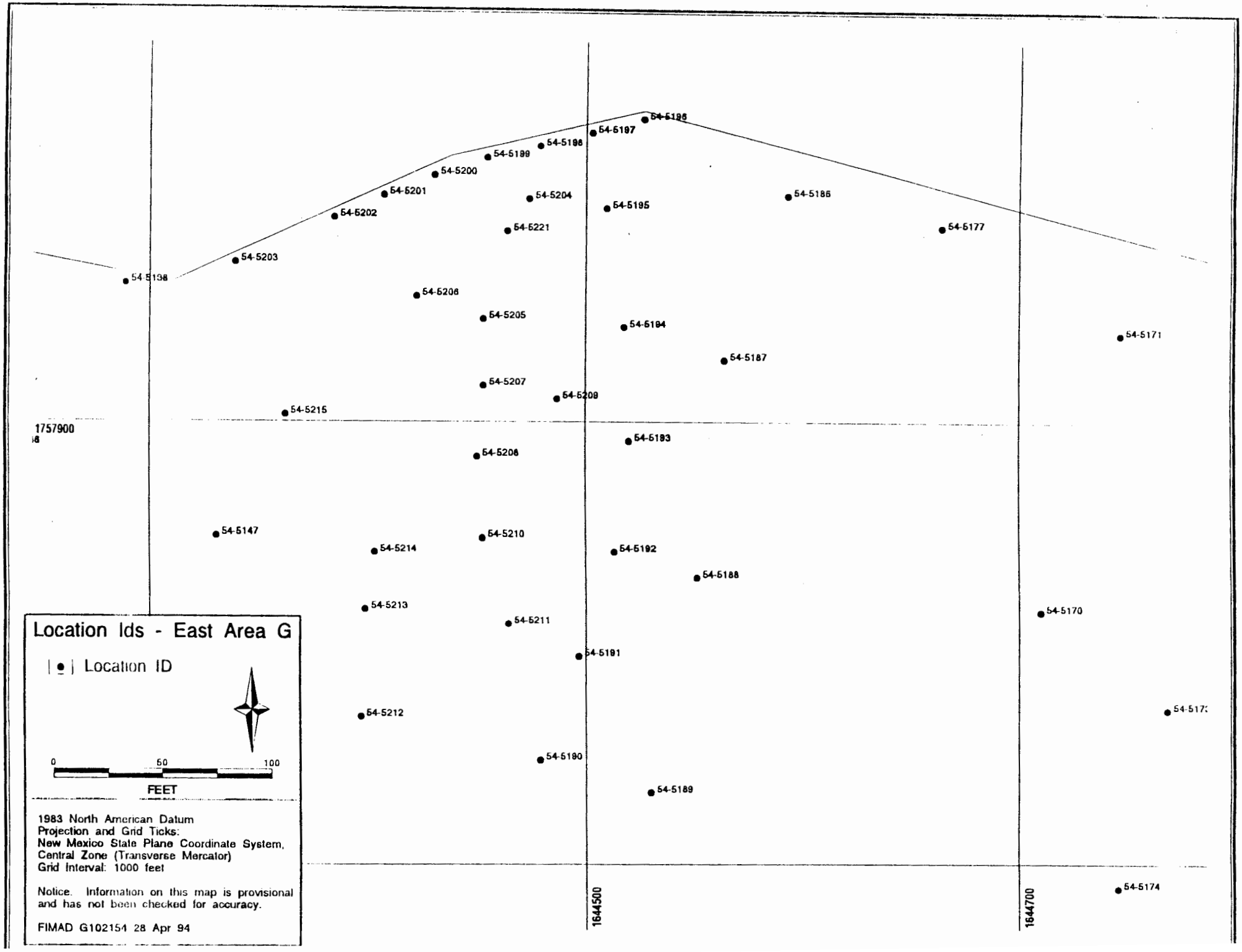

Figure 7: 1,1,1-TCA concentration gradient at MDA L (near eastern shaft cluster).

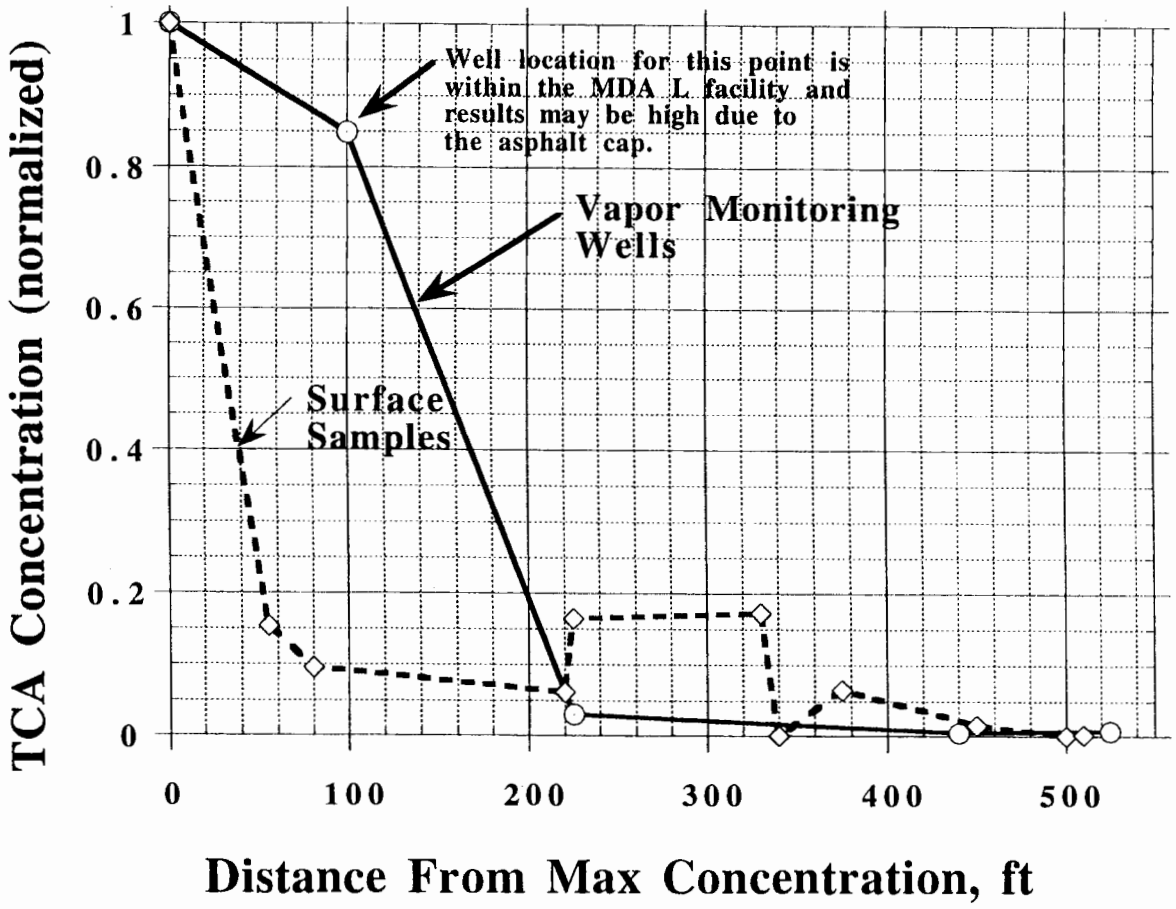

Table 1
Analytes in the Passive Soil Gas Survey at TA-54[1]

Compound	MDA[2]	Compound	MDA[2]
Acetone	G J L	1,3-Dichloropropane	ND
Benzene	G J L	2,2-Dichloropropane	ND
Bromobenzene	L	1,2-Dichloropropane	L
Bromoform	ND[3]	trans-1,3-Dichloropropene	ND
Bromomethane	ND	cis-1,3-Dichloropropene	ND
2-Butanone	L	1,1-Dichloropropene	ND
Carbon Disulfide	G	Ethylbenzene	L
Carbon Tetrachloride	G L	4-Methyl-2-Pentanone	ND
Chlrorobenzene	L	Methylene Chlroide	G
Chloroethane	L	n Propylbenzene	L
Chloroform	G L	Tetrachloroethene	G J L
Chloromethane	G J L	Toluene	G L
Dibromomethane	ND	1,1,1-Trichloroethane	G J L
1,2-Dichlorobenzene	ND	1,1,2-Trichloroethane	ND
1,3-Dichlorobenzene	ND	Trichloroethene	G J
1,4-Dichlorobenzene	ND	Trichlorofluoromethane	G
Dichlorodifluoromethane	ND	1,1,2-Trichlorotrifluoroethane	G J L
1,2-Dichloroethane	L	1,2,4-Trimethylbenzene	ND
1,1-Dichloroethane	G L	1,3,5-Trimethylbenzene	ND
1,1-Dichloroethene	G L	Vinyl Chloride	ND
1,2-Dichloroethene (total)	ND	Xylene (total)	G L

[1] Includes target compound list (TCL) for EPA Contract Laboratory Program (CLP).

[2] Volatile organic compound was detected at the designated MDA.

[3] ND Volatile organic compound was not detected at any measurement location.

Table 2

Emission Flux Rates (ng/m2/min)
Material Disposal Area L
Technical Area 54
LANL, New Mexico

SAMPLE LOCATION	5000	5001	5002	5003	5004	5005	5006	5007	5008	5010
CONTAMINANTS										
Acetone	15.9	---	---	---	7.1	31.5	9.5	21.2	85.9	69.5
Benzene	---	---	6.1	1.4	---	1.7	---	---	1.5	---
Bromobenzene	---	---	---	---	---	---	---	---	---	---
2-Butanone	---	---	---	---	---	---	---	---	---	---
Carbon Tetrachloride	---	---	---	---	---	---	---	2.5	---	---
Chlorobenzene	---	---	---	---	---	6.5	---	---	---	---
Chloroform	---	---	---	---	---	---	---	---	---	---
Chloromethane	---	---	---	---	---	8.8	---	---	---	---
1,2-Dichloroethane	---	---	---	---	---	---	---	---	---	---
1,1-Dichloroethane	---	---	---	---	---	---	---	---	---	---
1,1-Dichloroethene	9.2	---	---	---	---	---	10.7	---	---	---
1,2-Dichloropropane	---	---	---	---	---	3.2	11.3	8.9	9.0	2.1
Ethylbenzene	---	---	---	---	---	---	---	---	---	---
n-Propylbenzene	---	---	---	---	---	---	---	---	---	---
Tetrachloroethene	39.3	30.2	1.1	204.4	233.4	473.4	218.7	194.3	148.7	99.0
Toluene	1.2	0.8	---	---	1.0	4.0	1.7	1.7	13.2	4.3
1,1,1-Trichloroethane	510.8	1.0	---	6.3	4.3	130.3	290.6	477.0	390.4	140.8
Trichloroethene	302.7	80.8	---	3.7	14.3	213.5	233.5	212.5	59.4	39.8
112-Trichlorotrifluoroethane	28.8	---	---	---	---	14.6	42.9	171.9	57.9	60.7
Xylene	---	---	---	---	---	1.1	---	---	---	1.8

NOTES:
1) "---" denotes value below the reported quantitation level.
2) Data for sample 5009 was lost because of a laboratory equipment malfunction.

Table 2
(continued)
Emission Flux Rates (ng/m2/min)
Material Disposal Area L
Technical Area 54
LANL, New Mexico

SAMPLE LOCATION	5011	5012	5013	5014	5015	5016	5017	5018	5019	5020
CONTAMINANTS										
Acetone	7.9	---	15.7	7.3	---	10.1	308.2	8.1	15.7	---
Benzene	---	---	---	---	---	---	---	1.5	---	---
Bromobenzene	---	---	---	---	---	---	---	---	---	---
2-Butanone	---	---	---	---	---	---	---	---	---	---
Carbon Tetrachloride	---	---	---	---	---	---	---	---	---	---
Chlorobenzene	---	---	---	---	---	---	---	---	---	---
Chloroform	---	---	---	---	---	---	---	---	---	---
Chloromethane	---	---	2.0	---	---	---	---	---	---	---
1,2-Dichloroethane	---	---	---	---	---	---	---	11.2	---	---
1,1-Dichloroethane	---	---	---	---	---	---	---	---	---	---
1,1-Dichloroethene	---	---	---	---	---	---	---	11.9	17.9	---
1,2-Dichloropropane	---	---	---	---	---	---	---	---	---	---
Ethylbenzene	---	---	---	---	---	---	---	---	---	---
n-Propylbenzene	---	---	---	---	---	---	---	---	---	---
Tetrachloroethene	177.8	210.5	519.6	424.5	303.0	52.1	8.8	163.5	6.8	3.3
Toluene	3.7	0.9	4.8	2.3	1.1	---	4.1	1.6	---	---
1,1,1-Trichloroethane	211.8	189.0	31.8	125.4	220.5	360.5	17.1	710.1	888.7	10.4
Trichloroethene	85.7	126.9	110.9	114.6	68.2	289.2	30.9	354.7	46.8	13.5
112-Trichlorotrifluoroethane	28.2	20.8	---	12.4	28.3	19.1	---	17.2	54.8	---
Xylene	2.5	---	0.9	---	---	---	---	---	---	---

NOTE: "---" denotes value below the reported quantitation level.

Table 2
(continued)
Emission Flux Rates (ng/m2/min)
Material Disposal Area L
Technical Area 54
LANL, New Mexico

SAMPLE LOCATION	5020D	5021	5022	5023	5024	5025	5026	5027	5028	5029
CONTAMINANTS										
Acetone	---	---	---	5.7	49.8	---	---	6.7	19.6	12.2
Benzene	---	---	---	---	---	---	---	---	---	---
Bromobenzene	---	---	---	---	---	---	---	---	---	---
2-Butanone	---	---	---	---	---	---	---	---	---	---
Carbon Tetrachloride	---	---	---	---	9.0	---	---	---	4.6	---
Chlorobenzene	---	---	---	---	---	---	---	---	---	---
Chloroform	---	---	---	---	---	---	---	---	---	---
Chloromethane	---	2.1	---	4.5	---	---	3.6	---	---	9.0
1,2-Dichloroethane	---	---	---	---	---	---	---	---	5.8	---
1,1-Dichloroethane	---	---	---	---	---	---	---	---	3.4	---
1,1-Dichloroethene	---	---	---	---	---	---	---	9.9	26.0	---
1,2-Dichloropropane	---	---	---	---	---	---	---	---	---	---
Ethylbenzene	---	---	---	---	---	---	---	---	---	---
n-Propylbenzene	---	---	---	---	---	---	---	---	---	---
Tetrachloroethene	19.4	17.1	138.6	61.5	114.1	38.2	17.1	49.5	169.0	22.2
Toluene	---	1.3	1.0	---	---	---	0.9	---	0.7	---
1,1,1-Trichloroethane	147.0	457.3	2.8	222.5	715.2	90.0	27.0	316.2	863.3	255.0
Trichloroethene	70.1	100.7	57.4	274.4	557.4	249.4	18.0	254.7	407.2	150.2
112-Trichlorotrifluoroethane	---	15.2	---	7.6	184.7	3.7	---	6.3	58.2	27.6
Xylene	---	---	---	---	---	---	---	---	---	---

NOTE: "---" denotes value below the reported quantitation level.

Table 2
(continued)
Emission Flux Rates (ng/m2/min)
Material Disposal Area L
Technical Area 54
LANL, New Mexico

SAMPLE LOCATION	5030	5030D	5031	5032	5033	5034	5035	5036	5037	5038
CONTAMINANTS										
Acetone	10.6	10.9	36.6	5.2	16.0	---	---	---	---	19.0
Benzene	---	2.1	7.1	---	---	---	---	---	3.5	---
Bromobenzene	---	---	1.1	---	---	---	---	---	---	---
2-Butanone	---	---	---	---	---	---	---	---	---	---
Carbon Tetrachloride	---	---	15.4	---	---	---	---	---	---	---
Chlorobenzene	---	3.9	51.4	---	---	---	---	---	---	---
Chloroform	---	---	2.8	---	---	---	---	---	---	---
Chloromethane	---	---	---	---	---	8.0	---	---	---	4.0
1,2-Dichloroethane	---	---	47.1	---	---	---	---	---	---	---
1,1-Dichloroethane	---	---	5.2	---	---	---	---	---	---	---
1,1-Dichloroethene	---	---	140.7	12.8	---	---	---	---	---	---
1,2-Dichloropropane	---	---	---	---	---	---	---	---	---	---
Ethylbenzene	---	---	1.1	---	---	---	---	---	---	---
n-Propylbenzene	---	---	---	---	---	---	---	---	---	---
Tetrachloroethene	150.9	398.1	673.3	70.8	336.9	531.9	769.6	1364.4	1275.2	2000.0
Toluene	1.5	1.7	18.8	---	---	---	---	---	---	---
1,1,1-Trichloroethane	354.4	250.3	1057.0	58.5	347.6	38.5	263.1	34.2	99.2	207.4
Trichloroethene	479.8	630.2	4517.9	309.9	277.2	50.9	130.8	25.9	60.7	202.3
112-Trichlorotrifluoroethane	---	9.1	478.6	7.2	62.7	5.2	41.6	4.3	12.1	25.0
Xylene	---	---	0.8	---	---	---	---	---	---	---

NOTE: "---" denotes value below the reported quantitation level.

Table 2
(continued)
Emission Flux Rates (ng/m2/min)
Material Disposal Area L
Technical Area 54
LANL, New Mexico

SAMPLE LOCATION	5039	5040	5040D	5041	5042	5043	5044	5045	5046	5047
CONTAMINANTS										
Acetone	22.5	---	15.1	---	10.9	10.1	13.4	48.4	9.1	104.7
Benzene	---	---	---	---	9.8	3.4	10.5	12.0	---	2.8
Bromobenzene	---	---	---	---	---	---	---	---	---	---
2-Butanone	---	---	---	---	---	---	---	---	---	14.6
Carbon Tetrachloride	4.4	---	5.6	---	---	---	---	7.0	---	4.8
Chlorobenzene	---	---	---	---	---	---	---	---	---	---
Chloroform	---	---	---	---	---	---	---	---	---	---
Chloromethane	5.5	---	---	---	---	---	2.1	---	---	30.5
1,2-Dichloroethane	---	---	---	---	---	---	---	---	---	---
1,1-Dichloroethane	---	---	---	---	---	---	---	---	---	---
1,1-Dichloroethene	---	---	---	---	---	---	---	---	---	---
1,2-Dichloropropane	3.4	2.0	4.0	2.5	---	---	---	---	---	---
Ethylbenzene	---	---	---	---	---	---	---	---	---	---
n-Propylbenzene	---	---	---	---	---	---	---	---	---	2.0
Tetrachloroethene	1503.0	255.8	328.7	92.4	93.7	148.2	70.5	33.9	0.9	41.7
Toluene	---	---	---	1.1	1.2	---	---	---	---	0.8
1,1,1-Trichloroethane	516.0	165.9	607.7	103.7	17.3	156.7	199.2	1027.3	58.6	1190.1
Trichloroethene	538.8	196.8	373.7	76.7	24.6	28.3	94.9	115.3	7.0	200.5
112-Trichlorotrifluoroethane	51.8	27.5	175.7	22.7	7.4	78.2	33.9	668.4	---	60.9
Xylene	---	---	---	---	---	---	---	---	---	1.1

NOTE: "---" denotes value below the reported quantitation level.

Table 2
(continued)
Emission Flux Rates (ng/m2/min)
Material Disposal Area L
Technical Area 54
LANL, New Mexico

SAMPLE LOCATION	5048	5049	5050	5051	5052	5053	5054	5055	5056	5057
CONTAMINANTS										
Acetone	65.7	9.9	6.7	---	---	26.6	23.9	14.3	---	10.5
Benzene	10.1	4.1	4.7	---	4.1	8.6	6.0	---	---	---
Bromobenzene	---	---	---	---	---	---	---	---	---	---
2-Butanone	---	---	---	---	---	---	---	---	5.4	5.4
Carbon Tetrachloride	11.2	---	---	---	---	---	---	---	---	---
Chlorobenzene	---	---	---	---	---	---	---	---	---	---
Chloroform	---	---	---	---	---	---	---	---	---	---
Chloromethane	24.7	---	---	---	---	5.6	---	---	---	---
1,2-Dichloroethane	---	---	---	---	---	---	---	---	---	---
1,1-Dichloroethane	---	---	---	---	---	---	---	---	---	---
1,1-Dichloroethene	120.9	---	---	---	---	---	---	---	---	---
1,2-Dichloropropane	---	---	---	---	5.1	---	---	---	---	---
Ethylbenzene	---	---	---	---	---	---	---	---	---	---
n-Propylbenzene	---	---	---	---	---	---	---	---	---	---
Tetrachloroethene	147.9	25.4	3.5	---	319.5	21.7	1.3	39.4	2.0	14.6
Toluene	---	1.4	---	---	---	1.7	---	---	---	---
1,1,1-Trichloroethane	1829.3	288.7	188.4	---	58.6	63.3	66.6	98.0	9.6	15.0
Trichloroethene	624.4	27.4	3.5	18.0	17.4	24.0	7.1	37.4	3.6	18.9
112-Trichlorotrifluoroethane	119.8	72.5	83.5	---	4.6	---	13.6	128.8	---	4.3
Xylene	---	---	---	---	---	---	---	---	---	---

NOTE: "---" denotes value below the reported quantitation level.

Table 2
(continued)
Emission Flux Rates (ng/m2/min)
Material Disposal Area L
Technical Area 54
LANL, New Mexico

SAMPLE LOCATION	5058	5059	5060	5060D	5061	5062	5063	5064	5065	5066
CONTAMINANTS										
Acetone	13.1	---	11.2	15.4	15.5	9.1	56.9	---	23.2	12.7
Benzene	5.4	---	---	11.2	4.8	---	12.1	---	12.6	---
Bromobenzene	---	---	---	---	---	---	---	---	---	---
2-Butanone	---	---	---	---	---	---	37.7	---	---	---
Carbon Tetrachloride	---	---	---	---	---	---	---	---	---	---
Chlorobenzene	---	---	---	---	---	---	---	---	---	---
Chloroform	---	---	---	---	---	---	---	---	---	---
Chloromethane	2.3	---	---	5.8	---	---	15.9	---	6.7	---
1,2-Dichloroethane	---	---	---	---	---	---	---	---	---	---
1,1-Dichloroethane	---	---	---	---	---	---	---	---	---	---
1,1-Dichloroethene	---	---	---	---	---	---	---	---	---	---
1,2-Dichloropropane	---	---	---	---	---	---	---	---	---	---
Ethylbenzene	---	---	---	---	---	---	---	---	---	---
n-Propylbenzene	---	---	---	---	---	---	---	---	---	---
Tetrachloroethene	8.1	5.1	---	---	12.6	9.5	2.4	---	---	3.0
Toluene	---	---	---	---	---	---	1.0	---	---	---
1,1,1-Trichloroethane	168.7	---	2.2	4.1	---	177.6	16.2	---	132.9	118.3
Trichloroethene	27.4	7.3	1.1	---	5.5	19.8	5.8	7.2	1.7	---
112-Trichlorotrifluoroethane	85.9	---	---	---	---	41.6	---	---	39.5	49.4
Xylene	---	---	---	---	---	---	---	---	---	---

NOTE: "---" denotes value below the reported quantitation level.

Table 2
(continued)
Emission Flux Rates (ng/m2/min)
Material Disposal Area L
Technical Area 54
LANL, New Mexico

SAMPLE LOCATION	5067	5068	5131
CONTAMINANTS			
Acetone	13.2	13.0	30.7
Benzene	8.9	---	---
Bromobenzene	---	---	---
2-Butanone	---	---	---
Carbon Tetrachloride	---	---	---
Chlorobenzene	---	---	---
Chloroform	---	---	---
Chloromethane	---	---	---
1,2-Dichloroethane	---	---	---
1,1-Dichloroethane	---	---	---
1,1-Dichloroethene	---	---	---
1,2-Dichloropropane	---	---	---
Ethylbenzene	---	---	---
n-Propylbenzene	---	---	---
Tetrachloroethene	0.9	---	---
Toluene	---	3.4	5.6
1,1,1-Trichloroethane	49.1	---	---
Trichloroethene	1.5	---	---
112-Trichlorotrifluoroethane	11.5	---	---
Xylene	---	---	---

NOTE: "---" denotes value below the reported quantitation level.

Table 3

Emission Flux Rates (ng/m2/min)
Material Disposal Area J
Technical Area 54
LANL, New Mexico

SAMPLE LOCATION	5069	5070	5071	5072	5073	5074	5075
CONTAMINANTS							
Acetone	11.8	---	17.2	6.0	11.7	27.5	5.4
Benzene	---	---	8.0	3.9	7.8	10.8	5.1
Chloromethane	---	---	---	2.3	---	---	2.1
Tetrachloroethene	---	---	---	---	---	---	2.0
1,1,1-Trichloroethane	---	1.1	6.0	12.1	3.1	---	---
Trichloroethene	---	---	6.7	1.6	---	---	0.7
112-Trichlorotrifluoroethane	---	---	---	---	---	---	---

SAMPLE LOCATION	5076	5077	5078	5080	5080D	5081
CONTAMINANTS						
Acetone	5.2	14.7	---	6.3	---	---
Benzene	---	5.7	---	---	5.4	---
Chloromethane	4.3	4.5	---	---	---	---
Tetrachloroethene	---	---	---	---	---	---
1,1,1-Trichloroethane	14.6	14.2	---	---	---	---
Trichloroethene	2.6	---	---	---	---	2.5
112-Trichlorotrifluoroethane	5.7	8.2	---	---	---	---

NOTES:

1) "---" denotes value below the reported quantitation level.
2) Data for sample 5079 was lost because of a laboratory equipment malfunction.

Table 4

Emission Flux Rates (ng/m2/min)
Material Disposal Area G
Technical Area 54
LANL, New Mexico

SAMPLE LOCATION	5082	5083	5084	5085	5086	5087	5088	5089	5090	5091
CONTAMINANTS										
Acetone	---	---	---	---	---	---	---	7.4	---	---
Benzene	---	---	---	---	---	---	---	---	1.3	---
Carbon Disulfide	---	---	---	---	---	---	---	---	---	---
Carbon Tetrachloride	---	---	---	---	---	---	---	---	---	---
Chloroform	---	---	---	---	---	---	---	---	---	---
Chloromethane	---	3.8	---	---	---	---	---	---	---	---
1,1-Dichloroethane	---	---	---	---	---	---	---	---	---	---
1,1-Dichloroethene	---	---	---	---	---	---	---	---	---	---
Methylene Chloride	---	---	---	---	---	---	---	---	---	---
Tetrachloroethene	10.1	58.4	6.4	1.5	---	---	---	0.9	---	---
Toluene	---	---	---	---	---	---	---	---	---	---
1,1,1-Trichloroethane	9.1	129.2	20.6	12.1	13.4	3.3	29.5	542.4	66.7	2.9
Trichloroethene	1.2	1.3	1.0	1.7	---	---	1.8	2.6	4.2	---
Trichlorofluoromethane	---	11.5	---	---	---	---	---	---	---	---
112-Trichlorotrifluoroethane	---	45.8	---	7.2	10.8	---	15.7	109.5	40.0	---
Xylene	---	---	---	---	---	---	---	---	---	---

SAMPLE LOCATION	5092	5093	5094	5095	5096	5097	5098	5099	5100	5101
CONTAMINANTS										
Acetone	---	5.8	---	---	---	10.1	---	11.6	8.6	---
Benzene	---	---	1.6	---	---	---	---	---	---	---
Carbon Disulfide	---	---	---	---	---	---	---	---	---	---
Carbon Tetrachloride	---	---	---	---	---	---	---	3.2	---	---
Chloroform	---	---	---	---	---	---	---	---	---	---
Chloromethane	---	---	---	---	---	---	---	---	---	---
1,1-Dichloroethane	---	---	---	---	---	---	---	---	---	---
1,1-Dichloroethene	---	---	---	---	---	---	---	---	---	---
Methylene Chloride	---	---	---	---	---	---	---	---	---	---
Tetrachloroethene	---	8.1	---	---	1.8	2.2	5.6	23.4	1.0	---
Toluene	---	1.2	---	---	---	---	---	1.0	---	---
1,1,1-Trichloroethane	34.0	85.5	2.1	8.7	20.2	34.4	7.9	374.8	53.2	12.4
Trichloroethene	---	0.8	---	---	---	3.0	2.5	1.3	---	---
Trichlorofluoromethane	---	---	---	---	---	---	---	---	---	---
112-Trichlorotrifluoroethane	30.4	25.4	---	---	23.7	134.5	---	137.4	25.7	17.0
Xylene	---	---	---	---	---	---	---	---	---	---

NOTE: "---" denotes value below the reported quantitation level.

Table 4
(continued)
Emission Flux Rates (ng/m2/min)
Material Disposal Area G
Technical Area 54
LANL, New Mexico

SAMPLE LOCATION	5102	5103	5104	5105	5106	5107	5108	5109	5110	5111
CONTAMINANTS										
Acetone	---	---	---	---	---	---	---	---	---	---
Benzene	---	---	---	---	---	---	---	---	---	---
Carbon Disulfide	---	---	---	---	---	---	---	---	---	---
Carbon Tetrachloride	---	---	---	---	---	---	---	---	---	---
Chloroform	---	---	---	---	---	---	---	---	---	---
Chloromethane	---	---	---	---	---	---	---	---	---	---
1,1-Dichloroethane	---	---	---	---	---	---	---	---	---	---
1,1-Dichloroethene	---	---	---	---	9.0	---	100.6	---	---	---
Methylene Chloride	---	---	---	---	---	---	---	---	---	---
Tetrachloroethene	---	3.2	3.9	34.3	10.7	4.5	4.1	0.8	0.8	1.7
Toluene	---	---	---	---	---	---	---	---	---	---
1,1,1-Trichloroethane	60.4	163.9	130.0	249.8	143.8	405.2	372.8	43.5	65.4	104.6
Trichloroethene	2.5	5.6	2.8	0.8	---	2.6	1.3	---	2.8	---
Trichlorofluoromethane	---	---	---	---	---	---	---	---	---	---
112-Trichlorotrifluoroethane	16.9	47.8	24.3	78.5	4.4	21.2	83.8	28.0	6.7	38.3
Xylene	---	---	---	---	---	---	---	---	---	---

SAMPLE LOCATION	5112	5113	5114	5115	5116	5117	5118	5119	5120	5121
CONTAMINANTS										
Acetone	4.7	---	---	---	5.8	---	7.5	---	---	---
Benzene	---	---	---	---	---	---	---	---	---	---
Carbon Disulfide	---	---	---	---	---	---	---	---	---	---
Carbon Tetrachloride	---	---	---	---	---	---	---	---	---	---
Chloroform	---	---	---	---	---	---	---	---	---	---
Chloromethane	---	---	---	19.8	---	---	---	---	---	11.1
1,1-Dichloroethane	---	---	---	---	---	---	---	---	---	---
1,1-Dichloroethene	---	---	---	---	50.9	10.7	---	---	---	---
Methylene Chloride	---	---	---	---	---	---	---	---	---	---
Tetrachloroethene	17.4	48.7	21.7	26.7	2.6	11.6	81.8	6.9	2.0	0.9
Toluene	---	---	---	0.9	---	---	---	---	---	---
1,1,1-Trichloroethane	215.1	129.2	541.6	200.8	306.1	35.6	151.9	175.7	166.3	12.9
Trichloroethene	---	---	0.8	---	2.3	1.9	---	---	---	---
Trichlorofluoromethane	---	---	---	---	---	---	15.4	---	---	---
112-Trichlorotrifluoroethane	37.2	15.8	30.9	7.5	63.1	15.7	77.9	21.3	22.0	---
Xylene	---	---	---	---	---	---	---	---	---	---

NOTE: "---" denotes value below the reported quantitation level.

Table 4
(continued)
Emission Flux Rates (ng/m2/min)
Material Disposal Area G
Technical Area 54
LANL, New Mexico

SAMPLE LOCATION	5122	5123	5124	5125	5126	5127	5128	5129	5130	5132
CONTAMINANTS										
Acetone	---	---	17.2	5.2	5.0	5.6	---	---	---	10.8
Benzene	---	---	---	---	---	---	---	---	---	---
Carbon Disulfide	---	---	---	---	---	---	---	---	---	---
Carbon Tetrachloride	---	---	---	---	---	---	---	---	---	---
Chloroform	---	---	---	---	---	---	---	---	---	---
Chloromethane	8.4	10.7	---	---	---	---	---	---	---	---
1,1-Dichloroethane	---	---	---	---	---	---	---	---	---	---
1,1-Dichloroethene	---	---	17.0	---	---	---	---	---	---	---
Methylene Chloride	---	---	---	---	---	---	---	---	---	---
Tetrachloroethene	0.9	1.0	3.0	---	4.5	---	---	3.0	4.5	---
Toluene	1.6	---	---	2.2	1.2	---	---	---	---	---
1,1,1-Trichloroethane	0.7	6.5	450.9	---	13.8	3.0	2.7	1.0	2.9	2.0
Trichloroethene	0.8	---	2.3	---	---	---	---	---	2.3	---
Trichlorofluoromethane	---	---	---	---	---	---	---	---	---	---
112-Trichlorotrifluoroethane	---	---	193.7	---	10.2	---	7.4	---	---	---
Xylene	0.7	---	---	---	---	---	---	---	---	---

SAMPLE LOCATION	5133	5134	5135	5136	5137	5138	5139	5140	5140D	5141
CONTAMINANTS										
Acetone	4.9	8.9	---	17.7	---	6.1	6.2	19.5	29.4	---
Benzene	---	---	---	1.8	---	---	---	---	1.5	---
Carbon Disulfide	---	---	---	---	---	---	---	---	---	---
Carbon Tetrachloride	---	---	---	---	---	---	---	---	---	---
Chloroform	---	---	---	---	---	---	---	---	---	---
Chloromethane	---	---	---	---	---	---	3.6	---	---	---
1,1-Dichloroethane	---	---	---	---	---	---	---	---	---	---
1,1-Dichloroethene	---	---	---	---	---	---	---	---	---	---
Methylene Chloride	---	---	---	---	---	---	---	---	---	---
Tetrachloroethene	1.7	30.0	8.4	---	21.9	---	1.8	3.2	8.3	94.9
Toluene	---	---	---	0.8	1.2	---	---	3.2	3.9	---
1,1,1-Trichloroethane	26.0	202.6	20.5	---	54.2	3.7	---	33.4	74.9	17.5
Trichloroethene	---	13.8	0.7	---	2.2	---	0.9	15.8	37.1	202.6
Trichlorofluoromethane	---	---	---	---	---	---	---	---	---	---
112-Trichlorotrifluoroethane	22.3	71.3	4.5	---	3.4	---	---	---	---	---
Xylene	---	---	---	---	---	---	---	---	---	---

NOTE: "---" denotes value below the reported quantitation level.

Table 4
(continued)
Emission Flux Rates (ng/m2/min)
Material Disposal Area G
Technical Area 54
LANL, New Mexico

SAMPLE LOCATION	5142	5143	5144	5145	5146	5147	5148	5149	5150	5151
CONTAMINANTS										
Acetone	---	6.9	---	---	---	---	---	---	---	5.4
Benzene	---	---	---	---	---	---	---	---	---	---
Carbon Disulfide	---	---	---	---	---	---	---	---	---	---
Carbon Tetrachloride	---	---	---	---	---	---	---	---	---	---
Chloroform	---	---	---	---	---	---	---	---	---	---
Chloromethane	---	---	---	---	---	---	---	---	10.7	---
1,1-Dichloroethane	---	---	---	---	---	---	---	---	---	3.3
1,1-Dichloroethene	---	17.7	---	---	---	---	41.4	11.4	---	305.1
Methylene Chloride	---	---	---	---	---	---	---	---	---	---
Tetrachloroethene	101.6	5.0	3.7	1.0	40.5	30.9	9.0	---	3.7	13.4
Toluene	---	---	---	---	---	---	1.3	---	---	---
1,1,1-Trichloroethane	19.6	297.1	176.4	8.7	32.9	151.2	107.2	12.2	60.0	870.8
Trichloroethene	67.2	78.9	16.0	---	---	---	2.0	1.3	10.6	5.8
Trichlorofluoromethane	---	---	---	---	---	---	---	---	---	---
112-Trichlorotrifluoroethane	---	---	9.9	---	---	---	14.9	---	4.5	6.1
Xylene	---	---	---	---	---	---	---	---	---	---

SAMPLE LOCATION	5152	5153	5154	5155	5156	5157	5158	5159	5160	5160D
CONTAMINANTS										
Acetone	---	---	---	---	---	17.8	6.5	---	---	---
Benzene	---	---	---	---	---	---	---	---	---	---
Carbon Disulfide	---	---	---	---	---	---	---	---	---	---
Carbon Tetrachloride	---	---	---	---	---	---	---	---	---	---
Chloroform	---	---	---	---	---	---	---	---	---	---
Chloromethane	---	---	---	---	---	---	---	8.6	---	---
1,1-Dichloroethane	---	---	7.4	---	---	---	---	---	3.1	3.6
1,1-Dichloroethene	13.0	---	149.8	189.3	21.2	---	---	22.2	---	39.7
Methylene Chloride	---	---	---	---	---	---	---	---	---	---
Tetrachloroethene	19.7	117.4	64.2	27.2	152.6	---	3.4	25.0	98.7	146.5
Toluene	---	---	---	---	---	1.9	---	---	---	---
1,1,1-Trichloroethane	806.0	555.9	1414.5	943.5	429.7	---	137.0	418.4	594.4	961.9
Trichloroethene	3.0	6.7	7.0	1.4	5.8	---	2.9	2.5	4.4	13.7
Trichlorofluoromethane	---	---	---	---	---	---	---	---	---	---
112-Trichlorotrifluoroethane	---	---	---	---	---	---	---	---	---	---
Xylene	---	---	---	---	---	---	---	---	---	---

NOTE: "---" denotes value below the reported quantitation level.

Table 4
(continued)
Emission Flux Rates (ng/m2/min)
Material Disposal Area G
Technical Area 54
LANL, New Mexico

SAMPLE LOCATION	5161	5162	5163	5164	5165	5166	5167	5168	5169	5170
CONTAMINANTS										
Acetone	---	---	---	---	---	---	---	---	---	---
Benzene	---	---	---	---	---	---	---	---	---	---
Carbon Disulfide	---	---	---	---	---	---	---	---	---	---
Carbon Tetrachloride	---	---	---	---	---	---	---	---	---	---
Chloroform	---	---	---	---	---	---	---	---	---	---
Chloromethane	---	---	---	---	---	---	---	---	---	---
1,1-Dichloroethane	12.2	12.8	4.3	6.1	---	---	---	---	---	12.2
1,1-Dichloroethene	47.6	45.1	48.9	82.2	11.7	---	---	8.9	---	18.3
Methylene Chloride	---	---	---	---	8.9	8.0	---	---	---	---
Tetrachloroethene	23.2	38.5	216.4	371.1	43.3	7.9	5.9	39.2	123.8	174.2
Toluene	---	---	---	---	---	---	---	---	---	---
1,1,1-Trichloroethane	1860.1	1689.1	752.6	716.5	533.6	92.4	45.8	215.6	468.5	1990.4
Trichloroethene	7.3	4.7	8.3	3.0	9.9	3.4	2.0	6.9	56.7	11.0
Trichlorofluoromethane	---	---	---	---	---	---	---	---	---	---
112-Trichlorotrifluoroethane	---	---	---	---	---	---	---	---	3.5	8.6
Xylene	---	---	---	---	---	---	---	---	---	---

SAMPLE LOCATION	5170D	5171	5172	5173	5174	5175	5176	5177	5178	5179
CONTAMINANTS										
Acetone	---	---	---	---	4.9	---	---	---	---	---
Benzene	---	---	---	---	---	---	---	---	---	---
Carbon Disulfide	---	---	---	---	---	---	---	---	---	---
Carbon Tetrachloride	---	---	---	---	---	---	---	---	---	---
Chloroform	---	---	---	---	---	---	---	---	---	---
Chloromethane	---	---	---	---	---	---	---	---	---	---
1,1-Dichloroethane	17.7	---	---	---	---	---	---	---	---	---
1,1-Dichloroethene	24.6	---	---	---	---	---	---	---	---	---
Methylene Chloride	---	---	---	---	---	---	---	---	---	---
Tetrachloroethene	192.9	156.9	61.0	20.5	9.8	54.8	183.4	60.2	84.8	128.9
Toluene	---	---	---	---	---	---	---	---	---	---
1,1,1-Trichloroethane	2235.0	328.7	333.7	620.3	1009.7	470.4	375.2	629.7	330.2	248.1
Trichloroethene	11.4	2.5	0.7	2.4	5.8	34.8	6.4	2.9	1.4	1.0
Trichlorofluoromethane	---	---	---	---	---	---	---	---	---	---
112-Trichlorotrifluoroethane	10.5	5.6	6.5	20.5	13.8	7.9	10.1	11.3	---	---
Xylene	---	---	---	---	---	---	---	---	---	---

NOTE: "---" denotes value below the reported quantitation level.

Table 4
(continued)
Emission Flux Rates (ng/m2/min)
Material Disposal Area G
Technical Area 54
LANL, New Mexico

SAMPLE LOCATION	5180	5180D	5181	5182	5183	5184	5185	5186	5187	5188
CONTAMINANTS										
Acetone	---	---	---	---	---	---	---	---	---	---
Benzene	---	---	---	---	---	---	---	---	---	---
Carbon Disulfide	---	---	---	---	---	---	---	---	---	---
Carbon Tetrachloride	---	---	---	---	---	---	---	---	---	---
Chloroform	---	---	---	---	---	---	---	---	---	---
Chloromethane	---	6.0	---	---	---	---	---	---	---	---
1,1-Dichloroethane	---	---	---	---	---	---	---	3.1	---	---
1,1-Dichloroethene	---	---	---	---	---	---	27.7	---	12.8	---
Methylene Chloride	---	---	---	---	---	---	---	---	---	---
Tetrachloroethane	35.8	34.1	5.6	83.0	4.6	54.9	---	55.3	42.5	11.9
Toluene	---	0.8	---	---	---	---	---	---	---	---
1,1,1-Trichloroethene	66.5	29.2	83.1	181.0	146.3	316.3	1210.4	935.5	708.4	67.2
Trichloroethene	---	---	1.8	---	---	63.4	---	11.3	7.0	1.7
Trichlorofluoromethane	---	---	---	---	---	---	---	---	---	---
112-Trichlorotrifluoroethane	---	---	9.2	3.5	---	---	5.8	13.8	11.3	---
Xylene	---	---	---	---	---	---	---	---	---	---

SAMPLE LOCATION	5189	5190	5191	5192	5193	5194	5195	5196	5197	5198
CONTAMINANTS										
Acetone	---	---	---	---	---	---	---	---	---	---
Benzene	---	---	---	---	---	---	---	---	---	---
Carbon Disulfide	---	---	---	---	---	---	---	---	---	---
Carbon Tetrachloride	---	---	---	---	---	---	---	---	---	---
Chloroform	---	---	---	---	---	---	---	---	---	---
Chloromethane	---	---	---	---	---	---	---	---	---	---
1,1-Dichloroethane	---	---	---	---	---	---	---	---	---	---
1,1-Dichloroethene	---	17.6	26.4	23.5	27.5	55.9	171.9	7.4	12.2	---
Methylene Chloride	---	---	---	---	---	---	---	---	---	---
Tetrachloroethane	40.4	41.3	122.7	148.6	7.6	37.9	15.3	1.8	9.3	1.2
Toluene	---	---	---	---	---	---	---	---	---	---
1,1,1-Trichloroethene	443.3	479.8	563.5	650.7	588.8	748.8	62.7	140.2	347.2	124.9
Trichloroethene	10.9	13.7	13.3	30.6	5.5	17.4	10.9	3.1	14.4	---
Trichlorofluoromethane	---	---	---	---	---	---	---	---	---	---
112-Trichlorotrifluoroethane	4.2	7.2	9.3	10.3	8.2	22.8	5.1	4.0	7.3	---
Xylene	---	---	---	---	---	---	---	---	---	---

NOTE: "---" denotes value below the reported quantitation level.

Table 4
(continued)
Emission Flux Rates (ng/m2/min)
Material Disposal Area G
Technical Area 54
LANL, New Mexico

SAMPLE LOCATION	5199	5200	5200D	5201	5202	5203	5204	5205	5206	5207
CONTAMINANTS										
Acetone	---	---	---	---	---	---	---	---	---	---
Benzene	---	---	---	---	---	---	---	---	---	---
Carbon Disulfide	---	---	---	---	---	---	---	---	---	---
Carbon Tetrachloride	---	---	---	---	---	---	---	---	---	---
Chloroform	---	---	---	---	---	---	---	---	---	---
Chloromethane	---	---	---	---	---	---	---	---	---	---
1,1-Dichloroethane	---	---	---	---	---	---	---	---	---	---
1,1-Dichloroethene	---	---	76.7	7.9	---	---	---	21.9	15.6	7.9
Methylene Chloride	---	---	---	---	---	---	---	---	---	---
Tetrachloroethane	3.5	9.3	2.0	1.7	8.8	6.6	3.5	2.2	12.6	354.7
Toluene	---	---	---	---	---	---	---	---	---	2.8
1,1,1-Trichloroethene	17.5	326.8	475.6	222.2	65.3	88.5	19.2	241.7	155.7	567.6
Trichloroethene	1.8	9.1	4.8	3.7	2.1	0.7	1.6	5.3	35.5	51.9
Trichlorofluoromethane	---	---	---	---	---	---	---	---	---	---
112-Trichlorotrifluoroethane	---	8.8	18.0	9.1	5.2	3.9	---	---	8.5	---
Xylene	---	---	---	---	---	---	---	---	---	---

SAMPLE LOCATION	5208	5209	5210	5211	5212	5213	5214	5215	5216	5217
CONTAMINANTS										
Acetone	---	---	---	---	---	---	---	---	---	---
Benzene	---	---	---	---	---	---	---	---	---	---
Carbon Disulfide	---	---	---	---	---	---	---	---	---	---
Carbon Tetrachloride	---	---	---	---	---	---	---	---	---	---
Chloroform	---	---	---	---	---	---	---	---	---	---
Chloromethane	---	---	---	---	---	---	---	---	---	---
1,1-Dichloroethane	---	---	---	---	---	---	---	---	---	---
1,1-Dichloroethene	13.6	9.6	---	---	---	---	---	---	---	---
Methylene Chloride	---	---	---	---	---	---	---	---	---	---
Tetrachloroethane	1.2	7.5	26.8	370.2	64.9	52.2	36.8	9.2	55.1	10.0
Toluene	---	---	---	---	---	---	---	---	---	---
1,1,1-Trichloroethene	329.9	118.6	199.5	138.3	172.8	91.2	9.1	127.0	15.4	135.3
Trichloroethene	1.6	1.7	4.3	9.1	6.3	4.8	1.8	2.8	74.1	23.9
Trichlorofluoromethane	---	---	---	---	---	---	---	---	---	---
112-Trichlorotrifluoroethane	10.2	---	6.7	6.3	5.1	4.2	---	6.0	4.1	5.9
Xylene	---	---	---	---	---	---	---	---	---	---

NOTE: "---" denotes value below the reported quantitation level.

Table 4
(continued)
Emission Flux Rates (ng/m2/min)
Material Disposal Area G
Technical Area 54
LANL, New Mexico

SAMPLE LOCATION	5218	5219	5220	5220D	5221	5222	5223	5224	5225	5226
CONTAMINANTS										
Acetone	---	---	---	---	---	---	---	---	---	---
Benzene	---	---	---	1.3	---	---	---	---	---	---
Carbon Disulfide	---	---	---	---	---	---	---	---	---	---
Carbon Tetrachloride	---	---	---	---	---	---	---	---	---	---
Chloroform	---	2.4	---	---	---	---	---	---	---	---
Chloromethane	21.8	---	---	---	---	---	---	---	---	---
1,1-Dichloroethane	---	---	---	---	---	---	---	---	---	---
1,1-Dichloroethene	---	---	---	---	72.4	---	---	---	---	---
Methylene Chloride	---	---	---	---	---	---	---	---	---	---
Tetrachloroethane	1.4	10.5	0.7	1.8	22.3	1.1	---	6.9	7.4	26.3
Toluene	---	---	---	---	0.7	---	---	0.9	---	---
1,1,1-Trichloroethene	24.6	63.4	63.4	56.0	488.0	29.6	2.1	7.6	12.5	2.1
Trichloroethene	---	7.1	2.7	3.0	45.7	---	---	---	---	1.3
Trichlorofluoromethane	---	---	---	---	---	---	---	---	---	---
112-Trichlorotrifluoroethane	5.1	10.1	12.6	7.9	13.2	10.5	---	4.2	---	---
Xylene	---	---	---	---	---	---	---	---	---	---

SAMPLE LOCATION	5227	5228	5229	5230	5231	5232	5233	5234	5235	5236
CONTAMINANTS										
Acetone	---	---	---	---	---	6.0	---	---	---	---
Benzene	---	---	---	---	---	---	---	---	---	---
Carbon Disulfide	---	---	---	---	---	---	---	---	---	---
Carbon Tetrachloride	---	---	---	---	---	---	---	---	---	---
Chloroform	---	---	---	---	---	---	---	---	---	---
Chloromethane	---	---	---	---	---	---	---	5.5	---	---
1,1-Dichloroethane	---	---	---	---	---	---	---	---	---	---
1,1-Dichloroethene	---	---	---	---	---	---	---	---	---	---
Methylene Chloride	---	---	---	---	---	---	---	---	---	---
Tetrachloroethane	17.7	71.0	5.9	25.2	6.5	204.4	75.2	25.7	6.7	96.3
Toluene	---	---	---	---	---	0.7	---	1.9	---	---
1,1,1-Trichloroethene	11.7	612.1	38.3	270.2	269.4	35.7	26.5	11.0	2.1	32.1
Trichloroethene	---	---	---	12.9	---	---	1.5	11.8	2.4	---
Trichlorofluoromethane	---	---	---	---	---	---	---	---	---	---
112-Trichlorotrifluoroethane	---	42.5	---	32.1	27.4	12.0	---	9.1	---	33.6
Xylene	---	---	---	---	---	---	---	---	---	---

NOTE: "---" denotes value below the reported quantitation level.

Table 4
(continued)
Emission Flux Rates (ng/m2/min)
Material Disposal Area G
Technical Area 54
LANL, New Mexico

SAMPLE LOCATION	5237	5238	5239	5240	5240D	5241	5242	5243	5244	5245	5
CONTAMINANTS											
Acetone	---	5.6	---	---	---	---	---	---	---	---	
Benzene	---	---	---	---	---	---	---	---	---	---	
Carbon Disulfide	---	---	---	---	18.6	---	---	---	---	---	
Carbon Tetrachloride	---	---	---	---	---	---	---	---	---	---	
Chloroform	---	---	---	---	---	---	---	---	---	---	
Chloromethane	---	---	---	---	---	---	---	---	---	---	
1,1-Dichloroethane	---	---	---	---	---	---	---	---	---	---	
1,1-Dichloroethene	---	---	---	---	---	---	---	---	6.9	---	
Methylene Chloride	---	---	---	---	---	---	---	---	---	---	
Tetrachloroethane	4.7	1.5	4.4	4.0	2.0	3.3	1.9	2.9	1.8	195.5	3
Toluene	---	0.6	---	---	---	---	---	---	---	---	
1,1,1-Trichloroethene	5.6	4.3	41.4	9.2	6.4	2.1	11.5	55.8	11.7	39.3	8
Trichloroethene	0.9	---	---	---	---	---	---	---	---	---	
Trichlorofluoromethane	---	---	---	---	---	---	---	---	---	---	
112-Trichlorotrifluoroethane	---	4.5	9.1	---	---	---	4.2	18.4	---	5.0	1
Xylene	---	---	---	---	---	---	---	---	---	---	

SAMPLE LOCATION	5247	5248	5249	5250	5251	5252	5253	5254	5255	5256
CONTAMINANTS										
Acetone	---	---	---	---	---	---	---	---	---	5.1
Benzene	---	---	---	---	---	---	---	---	---	---
Carbon Disulfide	---	---	---	---	---	---	---	---	---	---
Carbon Tetrachloride	---	---	---	---	---	---	---	---	---	---
Chloroform	---	---	---	---	---	---	---	---	---	---
Chloromethane	---	---	---	---	---	---	---	---	---	5.9
1,1-Dichloroethane	---	---	---	---	---	---	---	---	---	---
1,1-Dichloroethene	---	---	---	---	---	---	---	---	---	---
Methylene Chloride	---	---	---	---	---	---	---	---	---	---
Tetrachloroethane	7.3	174.8	7.2	---	3.2	20.1	19.8	2.8	12.6	16.4
Toluene	---	---	---	---	---	---	---	---	---	---
1,1,1-Trichloroethene	---	61.5	73.3	45.0	98.3	2.7	---	3.3	150.8	87.2
Trichloroethene	15.5	14.0	29.3	0.7	---	2.0	---	1.3	---	---
Trichlorofluoromethane	---	---	---	---	---	---	---	---	---	---
112-Trichlorotrifluoroethane	---	8.7	8.0	6.4	13.5	---	---	---	61.1	34.1
Xylene	---	---	---	---	---	---	---	---	---	---

NOTE: "---" denotes value below the reported quantitation level.