DEPARTMENT OF THE AIR FORCE

HEADQUARTERS 27th FIGHTER WING (ACC)
CANNON AIR FORCE BASE, NEW MEXICO

13 MAY 1997

Lt Colonel C. A. Hale
Deputy Commander, 27th Support Group
110 E Sextant Avenue Suite 1098
Cannon AFB NM 88103-5323

Mr. Benito J. Garcia, Chief
Hazardous and Radioactive Materials Bureau
New Mexico Environment Department
2044 Galisteo Street
P O Box 26110
Santa Fe NM 87502

ENTERED

Dear Mr. Garcia

In response to your request for additional information on Landfills 3 & 4 (Solid Waste Management Units 105 & 104) of 26 Mar 97, the following is submitted. Attached are the comments from Mr. Sanford Hutsell, Remedial Project Manager, Ms. Judy Strawhecker, Industrial Hygienist, with the Army Corps of Engineers and from Mr. Dave Davis, Wildlife Biologist with the Natural Resources Branch of Cannon's Environmental Flight.

If you have any questions, please contact Mr. Sanford Hutsell at (505) 784-6378.

Sincerely

CHARLES A. HALE, Lt Col, USAF
Deputy Commander, 27th Support Group

Attachments:
1. Comments from Mr. Hutsell
2. Comments from Ms. Strawhecker
3. Comments from Mr. Davis

cc:
NMED (C. Will)
NMED (S. Pullen)
NMED GW Bureau (J. Jacobs)
EPA Region VI (D. Neleigh)
HQ ACC CES/ESVW (M. Patterson)

DEPARTMENT OF THE AIR FORCE

27th CIVIL ENGINEER SQUADRON (ACC)
CANNON AIR FORCE BASE NEW MEXICO

U.S. AIR FORCE
1947 - 1997

MEMORANDUM FOR: Sanford Hutsell

FROM: David Z. Davis, Natural Resource Planner, CEVN

SUBJECT: Answer to NMED comments on Landfills 3 and 4

1. It is the opinion of this office that the contaminants from Landfills 3 and 4 listed in the Phase II RCRA Facility Investigation Report are not being transported by evapotranspiration or soil-dwelling animals. After surveying the areas in question and reviewing the report, all the contaminants mentioned were too deep to come in contact with any of the flora or fauna known to occur in these areas.
2. Contaminant concentrations transporting to the Playa Lake by surface water run-off from Landfill 3 could occur but is unlikely. The landfill is up gradient from the Playa, but because of the heavy vegetation and the lack of precipitation, contamination of the Playa would not occur except in extreme conditions. Run-off from Landfill 4 going to the Playa should not be a concern because of the contour of the land. In case of a flood, run-off from Landfill 4 would wind up in a low area northeast of the Playa.
3. Both Landfills were surveyed for Wildlife. Small mammal dens were identified in the area but all were shallow and way above the 15 foot deep concentration of even the most shallow contaminants. Waterfowl have been observed in the area of the Playa, but no known nesting occurs in the landfill areas. If flooding or ponding of water were to occur on these landfills, which is extremely remote, Waterfowl might become a mechanism by which transportation of contaminants to the Playa could occur. This however is highly unlikely, what little rainfall does occur comes during the spring and summer months after the waterfowl have migrated north to their historic nesting areas.

DEPARTMENT OF THE AIR FORCE
27TH CIVIL ENGINEER SQUADRON (ACC)
CANNON AIR FORCE BASE NEW MEXICO

Memo for: NMED, Hazardous and Radioactive Materials Bureau

Subject: Answer to NMED comments on Landfills 3 and 4

From: Sanford Hutsell, Remedial Project Manager, CEVR

1. I disagree that Landfills 3 and 4 have been inadequately characterized. I refer to RCRA Facility Investigation, SWMU No. 105, Landfill No.3, IRP Site LF-3, Final Report Feb 1994 and RCRA Facility Investigation, SWMU No. 104, Landfill No. 4, IRP Site LF-4, Final Report Mar 1994. Both these reports present a brief discussion of ecological risk is Section 6.6 and conclude that the ecological risk is insignificant. Attached are Figures 5-2 for Landfill 3 and 5-1 and 5-2 for Landfill 4. Also attached is Table 5-4 for Landfill 3. The sample depth is given by the last number in the Sample ID. Tables 5-5 and 5-6 for Landfill 4 are attached which give the depth of the sample in a separate column.

2. The most significant concentration was a single hit of DDT of 670 ppb at 15 feet deep. Most of the sample depths with significant hits were below this depth as seen in the attached tables. This is below the root zone of most common plants so the mechanism of evapotranspiration considered by NMED which might transport contaminants to the surface appears highly unlikely.

3. Common soil dwelling animals do not burrow 15 feet deep and the amount of dirt excavated by animal burrows is so insignificant that this would appear to to be an unlikely mechanism of transport for bioaccumulating chemicals.

4. Surface water runoff does not appear to be a very viable transport mechanism to the playa lake. Both landfill 3 and landfill 4 are relatively flat, heavily vegetated, and do not slope appreciably towards the playa lake. Given the meager amount of rainfall in this area, it would probably take at least the 25 year storm event to dump enough water on these areas to cause appreciable runoff. This is not frequently enough realized to provide an efficient transport mechanism. The most significant runoff entering the playa lake that we have observed in the field is coming from agricultural lands off base to the east.

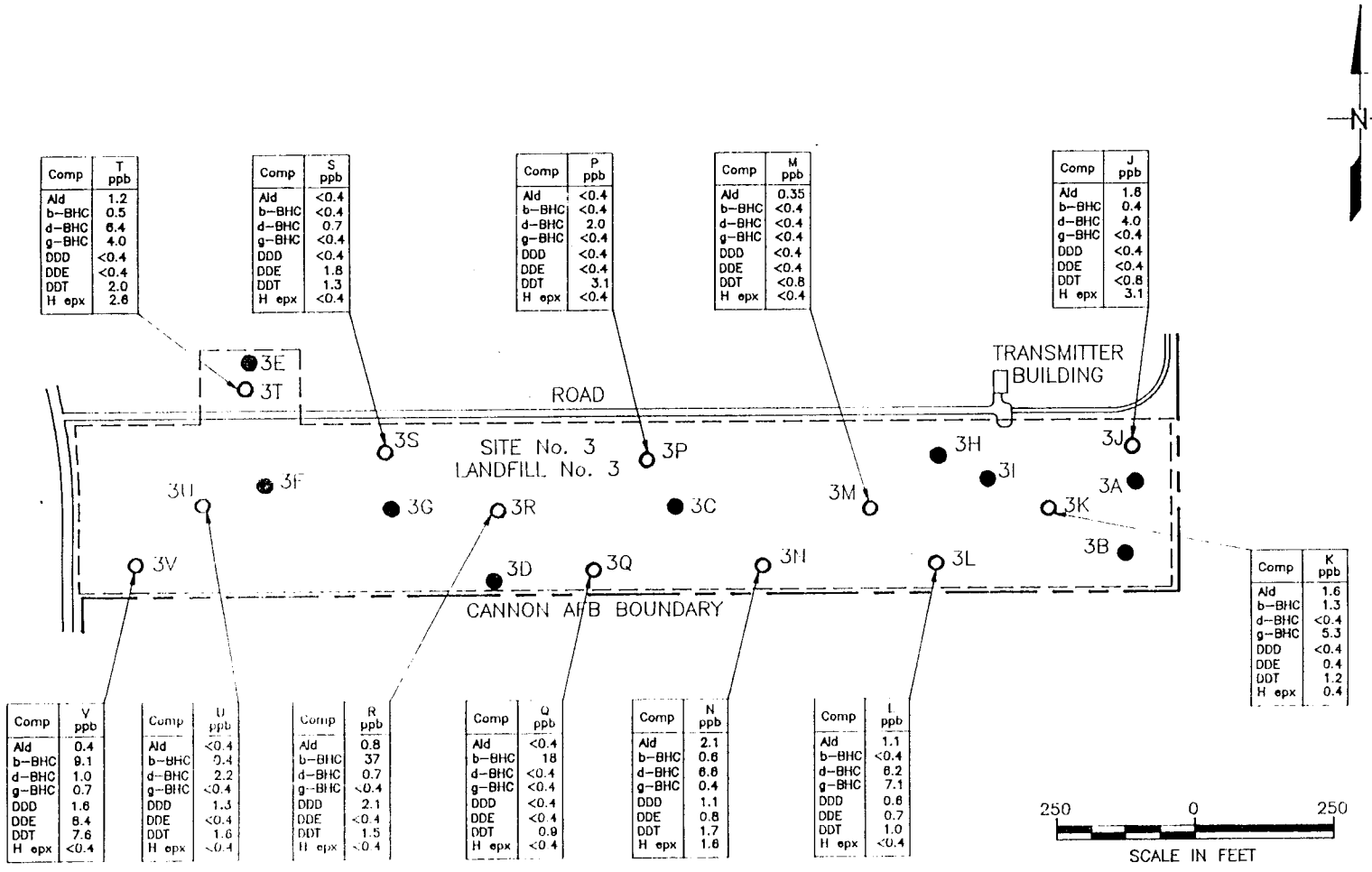
5. Shallow groundwater flow does not exist in this vicinity as speculated by NMED. This would have to be a perched water table and we have had no indications of a perched water table in this vicinity during the drilling of monitoring wells or numerous boreholes. The upper geologic column is all fine sands, silts, or caliche. The caliche is very discontinuous and is not a good confining layer. There are no continuous clay layers in the area to act as a confining layer to support a perched water table.

6. The amount of pesticides, herbicides, and PCBs released from the landfill is likely minimal as it is believed that only empty containers of these chemicals were disposed of. The only receptors of significance in the playa lake are the ducks and geese which stop over there during the winter. The lake contains no fish and the water quality is such that very minor amounts of bioaccumulator chemicals which might make their way there by whatever mechanism would be of minor consequence.

7. In the comments from Judy Strawhacker with the Corps of Engineer which follow, she quotes from Radian Reports which have been published long ago. I inserted my comments where I disagreed with the contractor's conclusions. My comments are based on field knowledge and experience while the report quoted was written by a contractor who had likely been to the base a time or two and was writing the report from far away.

Attachments:

1. Figure 5-2 for Landfill 3
2. Figure 5-1 for Landfill 4
3. Figure 5-2 for Landfill 4
4. Table 5-4 for Landfill 3
5. Table 5-5 for Landfill 4
6. Table 5-6 for Landfill 4



Comp	T ppb
Ald	1.2
b-BHC	0.5
d-BHC	6.4
g-BHC	4.0
DDD	<0.4
DDE	<0.4
DDT	2.0
H epx	2.6

Comp	S ppb
Ald	<0.4
b-BHC	<0.4
d-BHC	0.7
g-BHC	<0.4
DDD	<0.4
DDE	1.8
DDT	1.3
H epx	<0.4

Comp	P ppb
Ald	<0.4
b-BHC	<0.4
d-BHC	2.0
g-BHC	<0.4
DDD	<0.4
DDE	<0.4
DDT	3.1
H epx	<0.4

Comp	M ppb
Ald	0.35
b-BHC	<0.4
d-BHC	<0.4
g-BHC	<0.4
DDD	<0.4
DDE	<0.4
DDT	<0.8
H epx	<0.4

Comp	J ppb
Ald	1.8
b-BHC	0.4
d-BHC	4.0
g-BHC	<0.4
DDD	<0.4
DDE	<0.4
DDT	<0.8
H epx	3.1

Comp	K ppb
Ald	1.6
b-BHC	1.3
d-BHC	<0.4
g-BHC	5.3
DDD	<0.4
DDE	0.4
DDT	1.2
H epx	0.4

Comp	V ppb
Ald	0.4
b-BHC	9.1
d-BHC	1.0
g-BHC	0.7
DDD	1.6
DDE	8.4
DDT	7.6
H epx	<0.4

Comp	U ppb
Ald	<0.4
b-BHC	0.4
d-BHC	2.2
g-BHC	<0.4
DDD	1.3
DDE	<0.4
DDT	1.6
H epx	<0.4

Comp	R ppb
Ald	0.8
b-BHC	37
d-BHC	0.7
g-BHC	<0.4
DDD	2.1
DDE	<0.4
DDT	1.5
H epx	<0.4

Comp	Q ppb
Ald	<0.4
b-BHC	18
d-BHC	<0.4
g-BHC	<0.4
DDD	<0.4
DDE	<0.4
DDT	0.9
H epx	<0.4

Comp	N ppb
Ald	2.1
b-BHC	0.6
d-BHC	6.6
g-BHC	0.4
DDD	1.1
DDE	0.8
DDT	1.7
H epx	1.6

Comp	L ppb
Ald	1.1
b-BHC	<0.4
d-BHC	6.2
g-BHC	7.1
DDD	0.6
DDE	0.7
DDT	1.0
H epx	<0.4

LEGEND:

- ● SOIL BORINGS, FEBRUARY 1985
- ○ SOIL BORINGS, JULY 1992
- ▭ WASTE DISPOSAL SITE

KEY

Units (ug/kg)

Ald	Aldrin
b-BHC	beta-BHC
d-BHC	delta-BHC
g-BHC	gamma-BHC
DDD	4,4'-DDD
DDE	4,4'-DDE
DDT	4,4'-DDT
H epx	Heptachlor epoxide

FIGURE 5-2
MAXIMUM CONCENTRATIONS OF SELECTED PESTICIDES AND PCBs IN SAMPLES FROM LANDFILL No.3
JULY 1992
CANNON AIR FORCE BASE
CLOVIS, NEW MEXICO

266-069/H1492

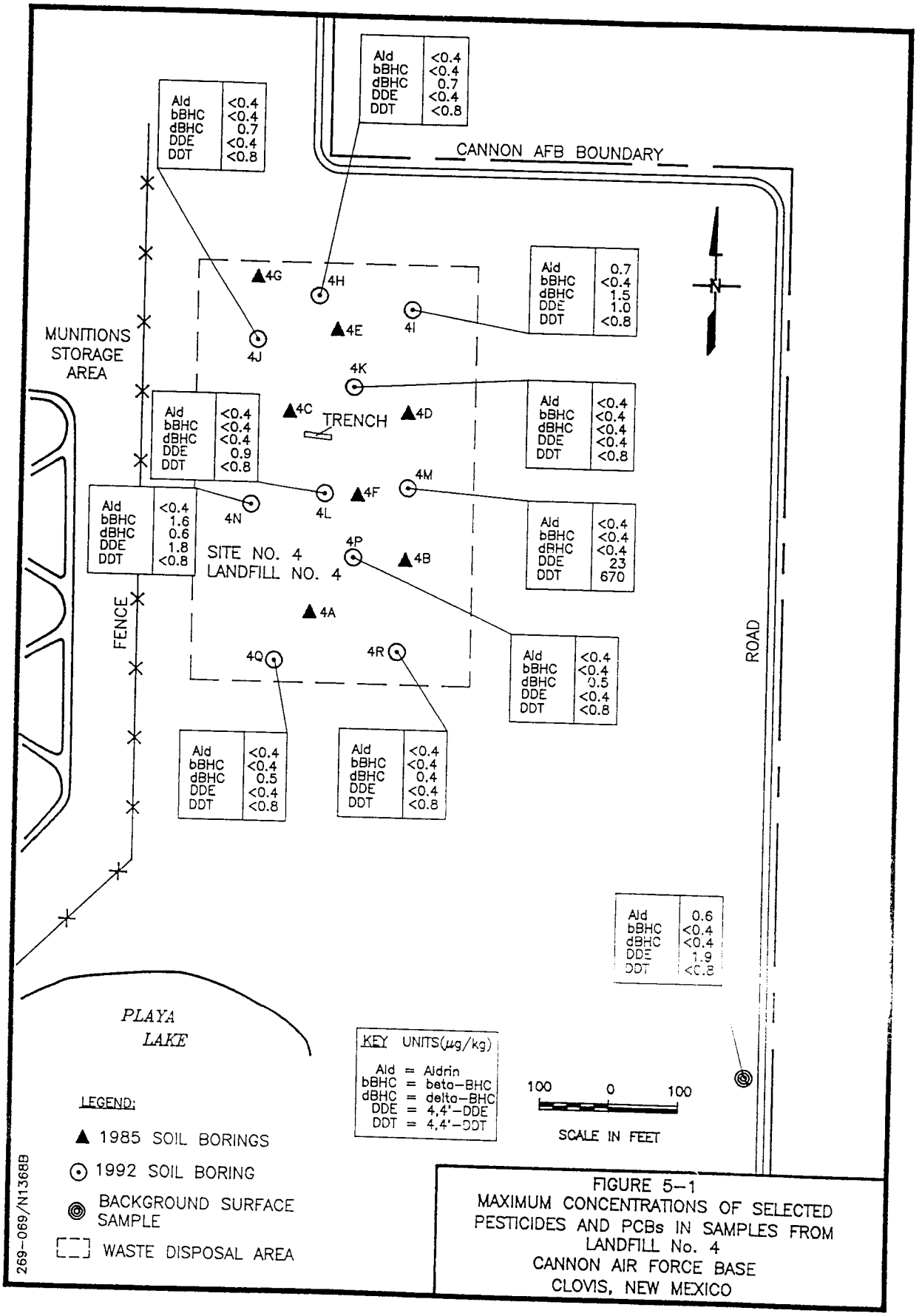


FIGURE 5-1
MAXIMUM CONCENTRATIONS OF SELECTED PESTICIDES AND PCBs IN SAMPLES FROM LANDFILL No. 4
CANNON AIR FORCE BASE
CLOVIS, NEW MEXICO

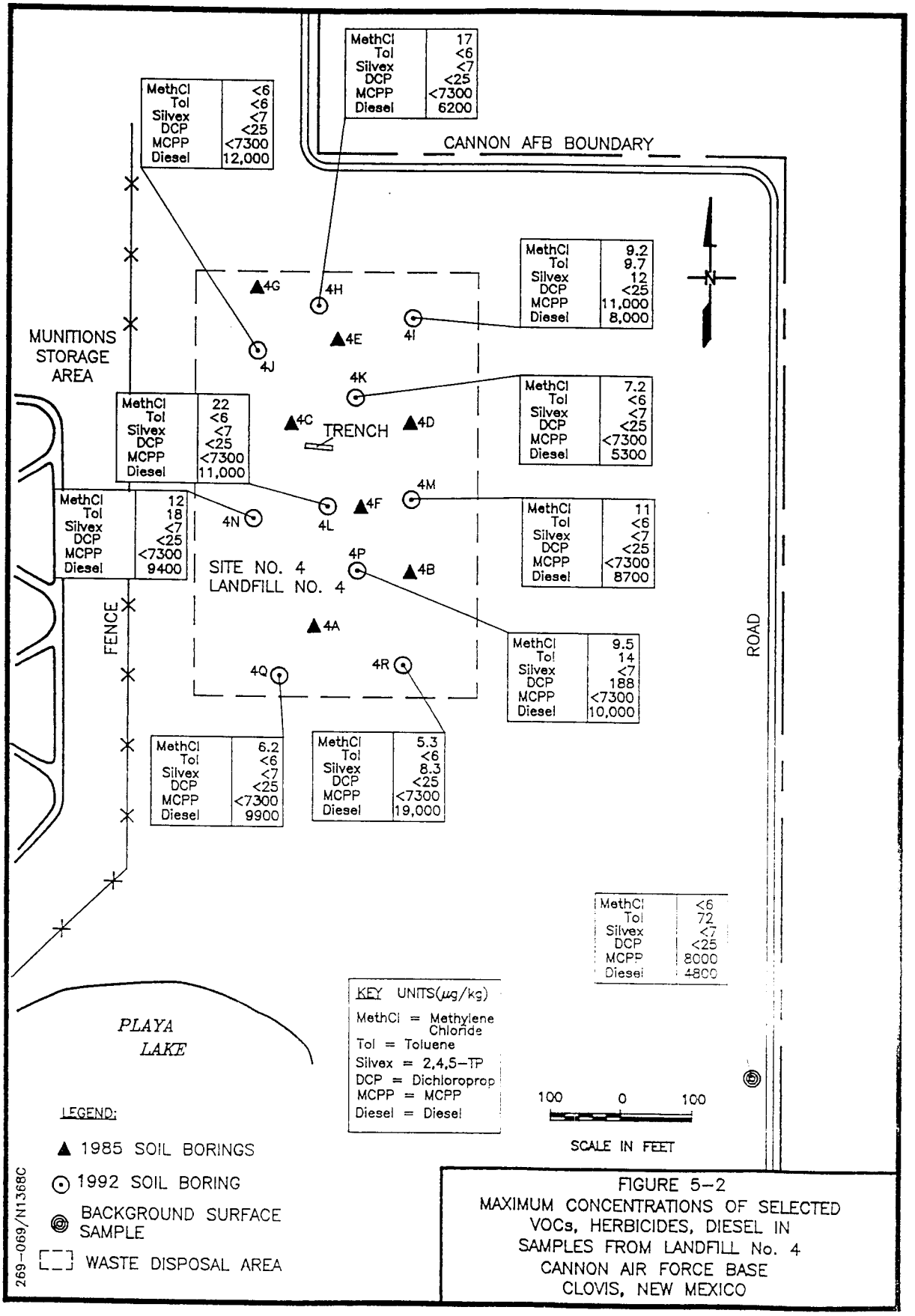


FIGURE 5-2
MAXIMUM CONCENTRATIONS OF SELECTED VOCs, HERBICIDES, DIESEL IN SAMPLES FROM LANDFILL No. 4
CANNON AIR FORCE BASE
CLOVIS, NEW MEXICO

Table 5-4

Organochlorine Pesticides and PCBs Found in Soil Samples From Landfill No. 3, Cannon AFB, New Mexico, 1992

Sample ID	Organochlorine Pesticides and PCBs (8080), µg/kg[a]													
	4,4'-DDD	4,4'-DDE	4,4'-DDT	Aldrin	Dieldrin	Endrin	Endrin Aldehyde	Heptachlor Epoxide	Methoxychlor	PCB-1254	PCB-1260	beta-BHC	delta-BHC	gamma-BHC
CAN-105-3J-21	<0.36	<0.36	<0.72	0.72 G@	<0.36	<0.36	<0.72	3.1 G	<1.8	<7.2	<7.2	<0.36	4 G	<0.36
CAN-105-3J-30	<0.36	<0.36	<0.73	0.51 G@	<0.36	<0.36	<0.73	<0.36	<1.8	<7.3	<7.3	<0.36	3.8 G	<0.36
CAN-105-3J-35	<0.35	<0.35	<0.70	0.75 G@	<0.35	<0.35	<0.70	<0.35	<1.7	<7.0	<7.0	<0.35	<0.35	<0.35
CAN-105-3J-52.5	<0.35	<0.35	<0.69	1.6 G@	<0.35	<0.35	<0.69	<0.35	<1.7	<6.9	<6.9	<0.35	<0.35	<0.35
CAN-105-3J-61	<0.34	<0.34	<0.68	0.6 G@	<0.34	<0.34	<0.68	<0.34	<1.7	<6.8	<6.8	<0.34	3.8 G	<0.34
CAN-105-3K-20	<0.36	<0.36	<0.71	<0.36	<0.36	<0.36	<0.71	<0.36	<1.8	<7.1	<7.1	1.3 G@	<0.36	2.8 G
CAN-105-3K-25	<0.38	<0.38	1.2 G@	<0.38	<0.3	<0.38	<0.75	<0.38	<1.9	<7.5	<7.5	<0.38	<0.38	<0.38
CAN-105-3K-30	<0.36	<0.36	<0.72	<0.36	<0.36	<0.36	<0.72	<0.36	<1.8	<7.2	<7.2	<0.36	<0.36	5.3 G
CAN-105-3K-36	<0.35	<0.35	1 G@	1.2 G@	<0.35	<0.35	<0.70	<0.35	<1.8	<7.0	<7.0	<0.35	<0.35	<0.35
CAN-105-3K-DUP10 (3K-40)	<0.35	<0.35	<0.70	<0.35	<0.35	<0.35	<0.70	<0.35	<1.8	<7.0	<7.0	<0.35	<0.35	0.65 @
CAN-105-3K-45	<0.35	<0.35	<0.71	<0.35	<0.35	<0.35	<0.71	<0.35	<1.8	<7.1	<7.1	<0.35	<0.35	0.75 @
CAN-105-3K-51	<0.36	<0.36	<0.72	0.65 G@	<0.36	<0.36	<0.72	0.42 G@	<1.8	<7.2	<7.2	<0.36	<0.36	<0.36
CAN-105-3K-59	<0.34	<0.34	<0.69	0.54 G@	<0.34	<0.34	<0.69	<0.34	<1.7	<6.9	<6.9	<0.34	<0.34	<0.34
CAN-105-3L-23.5	0.6 G@	0.71 @	5.1	<0.37	<0.37	<0.37	<0.74	<0.37	<1.9	<7.4	<7.4	<0.37	<0.37	<0.37

Table 5-4

(Continued)

Sample ID	Organochlorine Pesticides and PCBs (8080), µg/kg*													
	4,4'-DDD	4,4'-DDE	4,4'-DDT	Aldrin	Dieldrin	Endrin	Endrin Aldehyde	Heptachlor Epoxide	Methoxychlor	PCB-1254	PCB-1260	beta-BHC	delta-BHC	gamma-BHC
CAN-105-3L-25	<0.39	<0.39	<0.77	0.42 G@	<0.39	<0.39	<0.77	<0.39	<1.9	<7.7	<7.7	<0.39	3.2 G	<0.39
CAN-105-3L-56	<0.35	<0.35	<0.69	<0.35	<0.35	<0.35	<0.69	<0.35	<1.7	<6.9	<6.9	<0.35	5.9 G	7.1 G
CAN-105-3L-61	<0.35	<0.35	0.97 @	1.1 G@	<0.35	<0.35	<0.70	<0.35	<1.7	<7.0	<7.0	<0.35	6.2 G	1.5 @
CAN-105-3M-40	<0.35	<0.35	<0.69	0.35 G@	<0.35	<0.35	<0.69	<0.35	<1.7	<6.9	<6.9	<0.35	<0.35	<0.35
CAN-105-3MM-21	<0.36	<0.36	<0.72	<0.36	<0.36	<0.36	<0.72	<0.36	<1.8	110	<7.2	<0.36	<0.36	<0.36
CAN-105-3N-27	1.1 G@	0.61 G@	1.7 @	2.1 G	<0.36	<0.36	0.81 @	<0.36	<1.8	<7.1	<7.1	<0.36	<0.36	<0.36
CAN-105-3N-30	<0.36	<0.36	<0.72	<0.36	<0.36	<0.36	0.86 @	<0.36	<1.8	<7.2	<7.2	<0.36	<0.36	<0.36
CAN-105-3NN-20	<0.36	<0.36	<0.72	<0.36	<0.36	<0.36	<0.72	<0.36	<1.8	<7.2	<7.2	0.64 G@	<0.36	0.36 @
CAN-105-3NN-45	<0.37	<0.37	<0.73	<0.37	<0.37	<0.37	<0.73	<0.37	<1.8	<7.3	<7.3	<0.37	1.3 @	<0.37
CAN-105-3NN-61	<0.35	<0.35	0.83 @	<0.35	<0.35	<0.35	<0.70	1.6 G@	<1.7	<7.0	<7.0	<0.35	6.6 G	<0.35
CAN-105-3P-40	<0.36	<0.36	3.1 G@	<0.36	0.89 G@	<0.36	<0.71	<0.36	<1.8	<7.1	<7.1	<0.36	<0.36	<0.36
CAN-105-3P-45	<0.35	<0.35	0.88 G@	<0.35	<0.35	<0.35	<0.71	<0.35	<1.8	<7.1	<7.1	<0.35	<0.35	<0.35
CAN-105-3P-51	<0.35	<0.35	<0.69	<0.35	<0.35	<0.35	<0.69	<0.35	<1.7	<6.9	<6.9	<0.35	2 G	<0.35
CAN-105-3P-DUP7 (3P-56)	<0.34	<0.34	1.2 G@	<0.34	<0.34	<0.34	<0.69	<0.34	<1.7	<6.9	<6.9	<0.34	<0.34	<0.34
CAN-105-3Q-26	<0.39	<0.39	0.88 G@	<0.39	<0.39	<0.39	<0.77	<0.39	<1.9	<7.7	<7.7	<0.39	<0.39	<0.39
CAN-105-3Q-36	<0.35	<0.35	0.76 G@	<0.35	<0.35	<0.35	<0.70	<0.35	<1.7	<7.0	<7.0	<0.35	<0.35	<0.35
CAN-105-3Q-41	<0.35	<0.35	0.78 G@	<0.35	<0.35	<0.35	<0.70	<0.35	<1.7	<7.0	<7.0	15 G	<0.35	<0.35
CAN-105-3Q-46	<0.36	<0.36	0.8 @	<0.36	<0.36	<0.36	<0.72	<0.36	<1.8	<7.2	<7.2	18 G	<0.36	<0.36

Table 5-4

(Continued)

Sample ID	Organochlorine Pesticides and PCBs (8080), µg/kg*													
	4,4'-DDD	4,4'-DDE	4,4'-DDT	Aldrin	Dieldrin	Endrin	Endrin Aldehyde	Heptachlor Epoxide	Methoxychlor	PCB-1254	PCB-1260	beta-BHC	delta-BHC	gamma-BHC
CAN-105-3Q-53.5	<0.35	<0.35	0.8 G@	<0.35	<0.35	<0.35	<0.69	<0.35	<1.7	<6.9	<6.9	<0.35	<0.35	<0.35
CAN-105-3R-25	0.75 G@	<0.36	<0.72	0.75 G@	<0.36	<0.36	<0.72	<0.36	2.2 @	<7.2	<7.2	37 G	0.72 @	<0.36
CAN-105-3R-31	<0.36	<0.36	<0.71	<0.36	<0.36	<0.36	<0.71	<0.36	<1.8	<7.1	<7.1	<0.36	0.6 G@	<0.36
CAN-105-3R-32.5	2.1 G	<0.39	1.5 @	<0.39	<0.39	<0.39	<0.78	<0.39	<1.9	<7.8	<7.8	<0.39	0.71 G@	<0.39
CAN-105-3R-35	<0.38	<0.38	1 G@	<0.38	<0.38	<0.38	<0.76	<0.38	<1.9	<7.6	<7.6	<0.38	<0.38	<0.38
CAN-105-3R-41	<0.38	<0.38	1 G@	<0.38	<0.38	<0.38	<0.76	<0.38	<1.9	<7.6	<7.6	<0.38	<0.38	<0.38
CAN-105-3R-DUP5 (3R-52.5)	<0.35	<0.35	1 @	<0.35	<0.35	<0.35	<0.69	<0.35	<1.7	<6.9	<6.9	<0.35	0.57 G@	<0.35
CAN-105-3R-61	<0.35	<0.35	0.93 G@	<0.35	<0.35	<0.35	<0.70	<0.35	<1.7	<7.0	<7.0	<0.35	0.58 G@	<0.35
CAN-105-3S-21	<0.37	1.8 @	<0.74	<0.37	2.6 G	<0.37	<0.74	<0.37	<1.8	<7.4	160	<0.37	0.6 @	<0.37
CAN-105-3S-25	<0.38	<0.38	1 G@	<0.38	<0.38	<0.38	<0.76	<0.38	<1.9	<7.6	<7.6	<0.38	<0.38	<0.38
CAN-105-3S-36	<0.36	<0.36	0.94 G@	<0.36	<0.36	<0.36	<0.71	<0.36	<1.8	<7.1	<7.1	<0.36	0.59 G@	<0.36
CAN-105-3S-43	<0.38	<0.38	1.3 @	<0.38	<0.38	<0.38	<0.77	<0.38	<1.9	<7.7	<7.7	<0.38	0.69 G@	<0.38
CAN-105-3S-51	<0.35	<0.35	0.9 G@	<0.35	<0.35	<0.35	<0.69	<0.35	<1.7	<6.9	<6.9	<0.35	0.56 G@	<0.35
CAN-105-3T-20	<0.36	<0.36	0.94 @	<0.36	<0.36	<0.36	<0.72	2.6 G	<1.8	<7.2	<7.2	<0.36	6.4 G	<0.36
CAN-105-3T-28.5	<0.35	<0.35	<0.70	0.9 G@	<0.35	<0.35	<0.70	<0.35	<1.8	<7.0	<7.0	<0.35	5.5 G	<0.35
CAN-105-3T-31	<0.36	<0.36	<0.71	<0.36	<0.36	<0.36	<0.71	<0.36	<1.8	<7.1	<7.1	<0.36	<0.36	0.81 @
CAN-105-3T-35	<0.36	<0.36	<0.72	<0.36	<0.36	<0.36	<0.72	<0.36	<1.8	<7.2	<7.2	<0.36	<0.36	0.69 @
CAN-105-3T-40	<0.36	<0.36	0.75 @	<0.36	<0.36	<0.36	<0.72	<0.36	<1.8	<7.2	<7.2	0.37 G@	<0.36	1.3 G@
CAN-105-3T-46	<0.35	<0.35	0.75 @	1.2 G@	<0.35	<0.35	<0.70	<0.35	<1.8	<7.0	<7.0	<0.35	<0.35	1.5 G@

Table 5-4

(Continued)

Sample ID	Organochlorine Pesticides and PCBs (8080), µg/kg[a]													
	4,4'-DDD	4,4'-DDE	4,4'-DDT	Aldrin	Dieldrin	Endrin	Endrin Aldehyde	Heptachlor Epoxide	Methoxychlor	PCB-1254	PCB-1260	beta-BHC	delta-BHC	gamma-BHC
CAN-105-3T-48	<0.35	<0.35	<0.69	<0.35	<0.35	<0.35	<0.69	<0.35	<1.7	<6.9	<6.9	<0.35	<0.35	3.8 G
CAN-105-3T-52	<0.39	<0.39	1.5 G@	<0.39	<0.39	<0.39	<0.77	<0.39	<1.9	<7.7	<7.7	0.41 G@	<0.39	2.7 G
CAN-105-3T-56	<0.36	<0.36	2 G@	<0.36	<0.36	<0.36	<0.73	<0.36	<1.8	<7.3	<7.3	0.52 G@	5.5 G	4 G
CAN-105-3T-DUP13 (3T-60)	<0.35	<0.35	0.81 @	1.2 G@	<0.35	<0.35	<0.70	<0.35	<1.7	<7.0	<7.0	0.49 G@	6.2 G	2 G
CAN-105-3T-60	<0.35	<0.35	<0.70	<0.35	<0.35	<0.35	<0.70	<0.35	<1.7	<7.0	<7.0	<0.35	<0.35	3.4 G
CAN-105-3U-20	1.3 G@	<0.37	1.2 @	<0.37	<0.37	<0.37	<0.73	<0.37	<1.8	<7.3	<7.3	<0.37	0.61 G@	<0.37
CAN-105-3U-25	<0.36	<0.36	1.6 @	<0.36	<0.36	<0.36	<0.72	<0.36	<1.8	<7.2	<7.2	<0.36	0.74 G@	<0.36
CAN-105-3U-DUP2 (3U-30)	<0.36	<0.36	1.6 @	<0.36	<0.36	<0.36	<0.72	<0.36	<1.8	<7.2	<7.2	<0.36	0.7 G@	<0.36
CAN-105-3U-30	<0.38	<0.38	1.1 G@	<0.38	<0.38	<0.38	<0.75	<0.38	<1.9	<7.5	<7.5	<0.38	0.62 G@	<0.38
CAN-105-3U-32.5	<0.36	<0.36	1 G@	<0.36	<0.36	<0.36	<0.72	<0.36	<1.8	<7.2	<7.2	<0.36	0.59 G@	<0.36
CAN-105-3U-35	<0.37	<0.37	<0.73	<0.37	<0.37	<0.37	<0.73	<0.37	<1.8	<7.3	<7.3	<0.37	2.2 G	<0.37
CAN-105-3U-43.5	<0.39	<0.39	<0.77	<0.39	<0.39	<0.39	<0.77	<0.39	<1.9	<7.7	<7.7	0.42 G@	<0.39	<0.39
CAN-105-3U-55	<0.35	<0.35	<0.70	<0.35	<0.35	<0.35	<0.70	<0.35	<1.7	<7.0	<7.0	0.41 G@	<0.35	<0.35
CAN-105-3V-25.5	<0.37	<0.37	1 @	<0.37	<0.37	<0.37	<0.73	<0.37	<1.8	<7.3	<7.3	<0.37	0.62 @	<0.37
CAN-105-3V-45	<0.36	<0.36	1.2 @	<0.36	<0.36	<0.36	<0.71	<0.36	<1.8	<7.1	<7.1	<0.36	0.59 G@	<0.36
CAN-105-3V-52	<0.35	<0.35	1.1 G@	<0.35	<0.35	<0.35	<0.70	<0.35	<1.8	<7.0	<7.0	<0.35	0.65 @	<0.35

Table 5-4

(Continued)

Sample ID	Organochlorine Pesticides and PCBs (8080), µg/kg*													
	4,4'-DDD	4,4'-DDE	4,4'-DDT	Aldrin	Dieldrin	Endrin	Endrin Aldehyde	Heptachlor Epoxide	Methoxychlor	PCB-1254	PCB-1260	beta-BHC	delta-BHC	gamma-BHC
CAN-105-3V-50	<0.35	<0.35	1.4 G@	<0.35	<0.35	<0.35	<0.71	<0.35	<1.8	<7.1	<7.1	<0.35	0.74 G@	<0.35
CAN-105-3V-55	<0.35	<0.35	1.6 @	<0.35	<0.35	<0.35	<0.69	<0.35	<1.8	<6.9	<6.9	<0.35	<0.35	<0.35
CAN-105-3V-61	1.6 G@	<0.34	1.2 @	<0.34	<0.34	<0.34	<0.69	<0.34	<1.7	<6.9	<6.9	<0.34	0.62 G@	<0.34
CAN-105-3VV-30	<0.35	8.4	7.6	0.41 G@	<0.35	6.1 G	<0.70	<0.35	4.2 G@	<7.0	<7.0	9.1 G	1 @	0.68 @
CAN-105-3VV-35	1.5 G@	0.54 G@	1.4 @	<0.35	<0.35	<0.35	<0.71	<0.35	<1.8	<7.1	<7.1	<0.35	0.61 @	<0.35
CAN-105-3VV-41	<0.35	<0.35	<0.70	<0.35	<0.35	<0.35	<0.35	<0.35	<1.8	<7.0	<7.0	<0.35	0.7 G@	<0.35

* - Heptachlor and alpha-BHC were not detected above the reporting level in the field samples, and are therefore not included in this table. These compounds were included in the risk assessment based on J-flagged data. J-flagged data are given in Appendix D.

@ - Reported value is within a factor of five of the detection limit.

G - Second column confirmation denotes the presence of this compound but the result is estimated due to matrix interferences.

Table 5-5

Organochlorine Pesticides and PCBs Found in Soil Samples from Cannon Landfill No. 4, 1992

Sample ID	Depth, ft	Organochlorine Pesticides and PCBs (8080), µg/kg										
		4,4'-DDD	4,4'-DDE	4,4'-DDT	Aldrin	Endosulfan II	Endrin	Heptachlor Epoxide	PCB-1260	beta-BHC	delta-BHC	gamma-BHC
CAN-104-4H-01	15-16.7	<0.38	<0.38	<0.75	<0.38	<1.1	<0.38	<0.38	<7.5	<.38	0.57 @	<0.38
CAN-104-4H-13[a]	15.16.7	<0.38	<0.38	<0.75	<0.38	<1.1	<0.38	<0.38	<7.5	<0.38	0.7 @	<0.38
CAN-104-4H-02	20-20.7	<0.36	<0.36	<0.73	<0.36	<1.1	<0.36	33G	7.3 @	<0.36	<0.36	0.62G @
CAN-104-4H-09	52.5-54	<0.35	<0.35	<0.70	<0.35	<1.1	<0.35	16G	<7.0	<0.35	0.38 @	<0.35
CAN-104-4I-07	47.5-48.8	<0.35	<0.35	<0.70	<0.35	<1.1	<0.35	<0.35	<7.0	<0.35	<0.35	1
CAN-104-4I-13[b]	47.5-48.8	<0.35	<0.35	<0.70	<0.35	<1.1	<0.35	<0.35	<7.0	<0.35	<0.35	<0.35
CAN-104-4I-10	55-57	<0.34	<0.34	<0.69	<0.34	<1.0	<0.34	<0.34	<6.9	<0.34	1.5G @	0.95G @
CAN-104-4II-01	Surface	<0.36	0.97 @	<0.73	0.67G @	<1.1	<0.36	<0.36	<7.3	<0.36	<0.36	<0.36
CAN-104-4J-04	27.5-28	<0.35	<0.35	<0.71	<0.35	<1.1	<0.35	<0.35	<7.1	<0.35	0.71 @	<0.35
CAN-104-4K-03	25-27	<0.36	<0.36	<0.73	<0.36	<1.1	<0.36	<0.36	<7.3	<0.36	<0.36	0.38 @
CAN-104-4K-04	30-32	<0.36	<0.36	<0.72	<0.36	<1.1	<0.36	<0.36	<7.2	<0.36	<0.36	0.38 @
CAN-104-4LL-01	Surface	<0.37	0.88 @	<0.74	<0.37	<1.1	<0.37	<0.37	<7.4	<0.37,	<0.37	<0.37
CAN-104-4M-01	15-16.3	64G	23	670	<0.35	<1.1	1.3 @	<0.35	<7.0	<0.35	<0.35	0.57 @
CAN-104-4M-02	20-22	5.4G	1.4 @	42	<0.36	<1.1	<0.36	<0.36	<7.3	<0.36	<0.36	<0.36
CAN-104-4M-03	22.5-23.2	0.59G @	<0.37	10	<0.37	<1.1	<0.37	<0.37	<7.4	<0.37	<0.37	<0.37
CAN-104-4M-05	30-31	5.3G	1.8 @	54	<0.37	<1.1	<0.37	<0.37	<7.3	<0.37	<0.37	<0.37
CAN-104-4N-01	15-17	<0.36	1.8	<0.73	<0.36	<1.1	<0.36	<0.36	<7.3	<0.36	<0.36	<0.36
CAN-104-4NN-01	40-42	<0.37	<0.37	<0.73	<0.37	<1.1	<0.37	<0.37	<7.3	1.6G @	0.55 @	0.57 @
CAN-104-4NN-03	50-52	<0.35	<0.35	<0.70	<0.35	<1.1	<0.35	<0.35	<7.0	<0.35	0.38 @	<0.35

Table 5-5

(Continued)

Sample ID	Depth, ft	Organochlorine Pesticides and PCBs (8080), µg/kg										
		4,4'-DDD	4,4'-DDE	4,4'-DDT	Aldrin	Endosulfan II	Endrin	Heptachlor Epoxide	PCB-1260	beta-BHC	delta-BHC	gamma-BHC
CAN-104-4NN-04	55-57	<0.35	<0.35	<0.69	<0.35	<1.0	<0.35	<0.35	<6.9	<0.35	0.37G @	<0.35
CAN-104-4NN-05	60-62	<0.34	<0.34	<0.68	<0.34	<1.0	<0.34	<0.34	<6.8	<0.34	<0.34	0.68G @
CAN-104-4P-10	50-52	<0.35	<0.35	<0.69	<0.35	<1.0	<0.35	<0.35	<6.9	<0.35	0.48G @	<0.35
CAN-104-4Q-08	55-57	<0.34	<0.34	<0.68	<0.34	<1.0	<0.34	<0.34	<6.8	<0.34	0.49 @	<0.34
CAN-104-4Q-14 [c]	55-57	<0.34	<0.34	<0.68	<0.34	<1.0	<0.34	<0.34	<6.8	<0.34	<0.34	<0.34
CAN-104-4RR-03	60-62	<0.34	<0.34	<0.69	<0.34	<1.0	<0.34	<0.34	<6.9	<0.34	0.4G @	<0.34
CAN-104-BG-01	Surface	<0.35	1.9	<0.69	0.58G @	1.2G @	<0.35	<0.35	<6.9	<0.35	<0.35	<0.35

[a] - CAN-104-4H-13 is a field duplicate of CAN-104-4H-01.
[b] - CAN-104-4I-13 is a field duplicate of CAN-104-4I-07.
[c] - CAN-104-4Q-14 is a field duplicate of CAN-104-4Q-08.
@ - Result listed is leess than five times the method detection limit.
G - Result is estimated due to matrix interferences.

Table 5-6

VOCs, Herbicides, Diesel, and TRPH Concentrations Found in Soil Samples from Cannon Landfill No. 4, 1992

Sample ID	Depth, ft	TRPH (9071/418.1) mg/kg	Diesel (8015ME) µg/kg	Chlorinated Herbicides (8150), µg/kg			Volatile Organic Compounds (8240), µg/kg[a,b]			
				2,4,5-TP	Dichloroprop	MCPP	Acetone	Methylene Chloride	Toluene	Xylenes
CAN-104-4H-01	15-16.7	<28					<110	11@	<5.6	<5.6
CAN-104-4H-13[c]	15-16.7	<28					<110	17@	<5.7	<5.7
CAN-104-4H-02	20-20.7	<27					<110	13@	<5.5	<5.5
CAN-104-4H-03	25-27	<27	6200 G@[B]	<6.2	<24	<7000	<110	15@	<5.5	<5.5
CAN-104-4H-04	30-31	<27					<110	16@	<5.5	<5.5
CAN-104-4H-05	35-37	<27	5000 G@[B]	<6.1	<23	<6900	<110	11@	<5.4	<5.4
CAN-104-4H-14[d]	35-37	<27	4800 G@[B]	<6.1	<23	<6900	<110	14@	<5.4	<5.4
CAN-104-4H-06	40-41	<28					<110	11@	<5.6	<5.6
CAN-104-4H-07	45-46	<27					<110	16@	<5.4	<5.4
CAN-104-4H-08	50-51.3	<26					<100	11@	<5.2	<5.2
CAN-104-4H-09	52.5-54	<26					<110	12@	<5.3	<5.3
CAN-104-4H-10	55-56	28@	4200 G@[B]	<5.8	<22	<6600	<100	12@	<5.2	<5.2
CAN-104-4H-11	60-62	<26					<100	11@	<5.2	<5.2
CAN-104-4I-01	15-17	<26	4400 G@[B]	<5.9	<23	<6700	<110	6.8@[C]	<5.3	<5.3
CAN-104-4I-03	32.5-33	34@					<110	6.5@[C]	<5.6	<5.6
CAN-104-4I-04	35-36.5	<27	4800 G@[B]	<6.2	<24	<7000	<110	6.7@[C]	<5.5	<5.5
CAN-104-4I-05	40-41	<28					<110	7.6@[C]	9.7@	<5.7
CAN-104-4I-06	45-46.8	<27					<110	6.9@[C]	<5.3	<5.3
CAN-104-4I-13[e]	47.5-48.8	<26					<110	9.2@[C]	<5.3	<5.3

Table 5-6

(Continued)

Sample ID	Depth, ft	TRPH (9071/418.1) mg/kg	Diesel (8015ME) µg/kg	Chlorinated Herbicides (8150), µg/kg			Volatile Organic Compounds (8240), µg/kg[a,b]			
				2,4,5-TP	Dichloroprop	MCPP	Acetone	Methylene Chloride	Toluene	Xylenes
CAN-104-4I-08	50-51.8	<27	4000 G@[B]	<6.0	<23	<6800	<110	<5.3[C]	<5.3	<5.3
CAN-104-4I-09	52.5-54.5	29@	4300 G@[B]	<6.0	<23	<6800	<100	<5.2[C]	<5.2	<5.2
CAN-104-4I-14[f]	52.5-54.5	<26	4200 G@[B]	<5.8	<22	<6600	<100	5.5@[C]	<5.2	<5.2
CAN-104-4I-10	55-57	32@					<100	5.4@[C]	<5.2	<5.2
CAN-104-4I-11	60-62	<26					<100	9@[C]	<5.2	<5.2
CAN-104-4II-01	Surface	28@	8000 G@[B]	12@	<24	11000@	<110	8.7@	<5.5	<5.5
CAN-104-4J-01	15-17	<27	4100 G@[B]	<6.0	<23	<6800	<110	<5.4	<5.4	<5.4
CAN-104-4J-13[g]	15-17	<26	4500 G@[B]	<6.0	<23	<6800	<110	6.9@	<5.3	<5.3
CAN-104-4J-05	30-32	29@	4600 G@[B]	<6.0	<23	<6800	<110	<5.3	<5.3	<5.3
CAN-104-4J-08	50-50.8	44@					<110	<5.4	<5.4	<5.4
CAN-104-4J-09	55-57	33@	3300 G@[B]	<5.8	<22	<6500	<100	<5.1	<5.1	<5.1
CAN-104-4J-10	60-62	47@					<100	<5.1	<5.1	<5.1
CAN-104-4JJ-01	Surface	36@	12000 G@[B]	<6.2	<24	<6900	<110	<5.5	<5.5	<5.5
CAN-104-4K-01	15-17	<26	5300 G@[B]	<6.0	<23	<6800	<110	<5.3[C]	<5.3	<5.3
CAN-104-4K-13[h]	15-17	<26	4700 G@[B]	<6.0	<23	<6800	<110	<5.3[C]	<5.3	<5.3
CAN-104-4K-02	20-22	<27					170@	<5.4[C]	<5.4	<5.4
CAN-104-4K-03	25-27	42@					<110	<5.4[C]	<5.4	<5.4
CAN-104-4K-04	30-32	28@					<110	<5.4[C]	<5.4	<5.4
CAN-104-4K-05	35-37	35@					<110	7.2@	<5.4	<5.4

Table 5-6

(Continued)

Sample ID	Depth, ft	TRPH (9071/418.1) mg/kg	Diesel (8015ME) µg/kg	Chlorinated Herbicides (8150), µg/kg			Volatile Organic Compounds (8240), µg/kg[a,b]			
				2,4,5-TP	Dichloroprop	MCPP	Acetone	Methylene Chloride	Toluene	Xylenes
CAN-104-4K-06	40-41	<27					<110	5.4@	<5.4	<5.4
CAN-104-4K-07	45-47	49@					<110	<5.3	<5.3	<5.3
CAN-104-4K-08	50-51.7	29@					<110	<5.3	<5.3	<5.3
CAN-104-4K-09	57.5-59.5	50@					<100	<5.1	<5.1	<5.1
CAN-104-4K-10	60-62	34@					<100	<5.2	<5.2	<5.2
CAN-104-4L-01	15-17	<27	11000 G@[B]	<6.1	<23	<6900	<110	<5.4	<5.4	<5.4
CAN-104-4L-13[i]	15-17	58@[B]	9300 G@[B]	<6.1	<23	<6900	<110	<5.4	<5.4	<5.4
CAN-104-4L-02	20-22	<27					<110	8@	<5.5	<5.5
CAN-104-4L-03	25-27	41@	7800 G@[B]	<6.1	<23	<6900	<110	<5.4	<5.4	<5.4
CAN-104-4L-04	30-30.5	49@					<110	<5.3	<5.3	<5.3
CAN-104-4L-05	35-37	<27					<110	7.9@	<5.4	<5.4
CAN-104-4L-07	40-42	<27					<110	7.4@	<5.4	<5.4
CAN-104-4L-08	45-47	49@					<110	<5.3	<5.3	<5.3
CAN-104-4L-10	55-57	<26	6700 G@[B]				<100	<5.2	<5.2	<5.2
CAN-104-4L-14[j]	55-57	42@	7400 G@[B]				<100	<5.2	<5.2	<5.2
CAN-104-4L-11	60-62	28@[B]					<100	22@	<5.2	<5.2
CAN-104-4LL-01	Surface	58@	11000 G@[B]	<6.3	<24	<7100	<110	<5.5	<5.5	<5.5
CAN-104-4M-01	15-16.3	41@[B]					<110	11@	<5.3	<5.3
CAN-104-4M-02	20-22	28@[B]	8000 G@[B]	<6.2	<24	<7000	<110	<5.5	<5.5	<5.5

Table 5-6

(Continued)

Sample ID	Depth, ft	TRPH (9071/418.1) mg/kg	Diesel (8015ME) µg/kg	Chlorinated Herbicides (8150), µg/kg			Volatile Organic Compounds (8240), µg/kg[a,b]			
				2,4,5-TP	Dichloroprop	MCPP	Acetone	Methylene Chloride	Toluene	Xylenes
CAN-104-4M-03	22.5-23.2	41@[B]					<110	7.6@	<5.6	<5.6
CAN-104-4M-04	25-27	41@[B]					<110	<5.6	<5.6	<5.6
CAN-104-4M-05	30-31	<27	7300 G@[B]	<6.2	<24	<7000	<110	<5.5	<5.5	<5.5
CAN-104-4M-06	35-37	<27					<110	7.3@	<5.4	<5.4
CAN-104-4M-07	40-42	27@[B]					<110	<5.3	<5.3	<5.3
CAN-104-4M-08	45-47	37@[B]					<110	<5.5	<5.5	<5.5
CAN-104-4M-09	50-51.5	<26	8700 G@[B]	<6.0	<23	<6800	<110	<5.3	<5.3	<5.3
CAN-104-4M-13[k]	50-51.5	30@[B]	7300 G@[B]	<6.0	<23	<6800	<110	<5.3	<5.3	<5.3
CAN-104-4M-11	60-62	32@[B]					<100	<5.2	<5.2	<5.2
CAN-104-4N-01	15-17	<27	9400 G@[B]	<6.2	<24	<7000	<110	<5.5	<5.5	<5.5
CAN-104-4N-02	17.5-19.5	77@					130@	<6.3	18@	<6.3
CAN-104-4N-03	20-21.7	37@	8800 G@[B]	<6.2	<24	<7000	<110	<5.5	13@	<5.5
CAN-104-4N-13[l]	20-21.7	<27	8300 G@[B]	<6.2	<24	<7000	<110	12@	<5.5	<5.5
CAN-104-4N-04	25-26	38@					<110	11@	5.7	<5.7
CAN-104-4N-05	30-31.5	<27					<110	8.2@	<5.4	<5.4
CAN-104-4N-07	40-40.5	29@					<120	10@	5.8	<5.8
CAN-104-4N-08	45-47	<26	8600 G@[B]	<5.9	<22	<6600	<110	5.7@	<5.3	<5.3
CAN-104-4N-09	50-52	<26					<100	7.5@	<5.2	<5.2
CAN-104-4N-10	55-57	<26	7900 G@[B]	<5.8	<22	<6600	<100	<5.2	<5.2	<5.2

Table 5-6

(Continued)

Sample ID	Depth, ft	TRPH (9071/418.1) mg/kg	Diesel (8015ME) µg/kg	Chlorinated Herbicides (8150), µg/kg			Volatile Organic Compounds (8240), µg/kg[a,b]			
				2,4,5-TP	Dichloroprop	MCPP	Acetone	Methylene Chloride	Toluene	Xylenes
CAN-104-4N-14[m]	55-57	49@	8100 G@[B]	<5.8	<22	<6600	<100	<5.2	<5.2	<5.2
CAN-104-4N-11	60-62	87@					<100	<5.1	<5.1	<5.1
CAN-104-4P-01	15-17	<27	10000 G@[B]	<6.1	<23	<6900	<110	<5.4	<5.4	<5.4
CAN-104-4P-13[n]	15-17	<27	7500 G@[B]	<6.1	<23	<6900	<110	<5.4	<5.4	<5.4
CAN-104-4P-02	17.5-18.1	38@[B]					<110	<5.5	<5.5	<5.5
CAN-104-4P-03	20-22	38@[B]	7700 G@[B]	<6.2	<24	<7000	<110	6.7@	7.4@	<5.5
CAN-104-4P-14[o]	20-22	38@[B]	10000 G@[B]	<6.2	188 G	<7000	<110	5.6@	14@	<5.5
CAN-104-4P-04	25-27	<27					<110	5.5@	<5.4	<5.4
CAN-104-4P-05	30-32	<27					<110	6.3@	<5.5	<5.5
CAN-104-4P-06	32.5-34.5	<28					<110	5.9@	<5.5	<5.5
CAN-104-4P-07	35-36	31@[B]					<110	<5.7	<5.7	<5.7
CAN-104-4P-09	45-47	39@[B]					<120	9.5@	<6.0	<6.0
CAN-104-4P-11	55-57	30@[B]					<100	<5.1	<5.1	<5.1
CAN-104-4P-12	60-62	27@[B]					<100	<5.1	<5.1	<5.1
CAN-104-4Q-02	20-22	45@					<110	<5.4	<5.4	<5.4
CAN-104-4Q-03	25-25.7	<27					<110	5.9@	<5.4	<5.4
CAN-104-4Q-04	30-32	<26	8800 G@[B]	<6.1	<23	<6900	<100	<5.2	<5.2	<5.2
CAN-104-4Q-13[p]	30-32	<26	9400 G@[B]	<5.8	<22	<6600	<100	<5.2	<5.2	<5.2
CAN-104-4Q-05	40-40.5	60@					<110	<5.4	<5.4	<5.4

Table 5-6

(Continued)

Sample ID	Depth, ft	TRPH (9071/418.1) mg/kg	Diesel (8015ME) µg/kg	Chlorinated Herbicides (8150), µg/kg			Volatile Organic Compounds (8240), µg/kg[a,b]			
				2,4,5-TP	Dichloroprop	MCPP	Acetone	Methylene Chloride	Toluene	Xylenes
CAN-104-4Q-06	50-50.5	<27					<110	6.1@	<5.3	<5.3
CAN-104-4Q-07	52.5-54.5	29@	8900 G@[B]	<5.7	<22	<6500	<100	<5.1	<5.1	<5.1
CAN-104-4Q-10	60-62	26@	5200 G@[B]	<5.7	<22	<6500	<100	<5.1	<5.1	<5.1
CAN-104-4QQ-01	Surface	30@	9900 G@[B]	<6.1	<23	<6900	<110	<5.4	<5.4	<5.4
CAN-104-4R-01	15-17	<27	9300 G@[B]	<6.1	<23	<6800	<110	<5.4	<5.4	<5.4
CAN-104-4R-13[q]	15-17	<27	16000 G@[B]	<6.0	<23	<6800	<110	<5.4	<5.4	<5.4
CAN-104-4R-02	17.5-19	<27	19000 G@[B]	<6.5	<25	<7300	<110	5.3@	<5.3	<5.3
CAN-104-4R-05	27.5-29.5	27@					<110	<5.3	<5.3	<5.3
CAN-104-4R-10	55-57	26@	9000 G@[B]	<5.7	<22	<6500	<100	<5.1	<5.1	<5.1
CAN-104-4RR-01	Surface	<27	8300 G@[B]	8.3@	<24	<7000	<110	<5.5	<5.5	<5.5
CAN-104-4RR-02[r]	Surface	<27	14000 G@[B]	<6.2	<24	<7000	<110	<5.5	<5.5	<5.5
CAN-104-BG-01	Surface	<26	4800 G@[B]	<5.9	<22	8000@	<100	<5.2	72	7.7@

[a] - 8240 TICs include 2-ethyl-1-hexanol, 2-propanol, decanal, ethyl acetate, methyl acetate, nonanal, and bromocyclohexane. Ethyl acetate was present in most samples at concentrations ranging from 0 to 210 ug/kg.
[b] - 8270 TICs include 1,2-cyclohexanediol, cyclohexenone, trichloropropene, alpha-pinene, DDD, and hydroxymethyl pentanone. Cyclohexenone was present in roughly half the samples at concentrations ranging from 140 to 380 ug/kg.
[c] - CAN-104-4H-13 is a field duplicate of CAN-104-4H-01.
[d] - CAN-104-4H-14 is a field duplicate of CAN-104-4H-05.
[e] - CAN-104-4I-13 is a field duplicate of CAN-104-4I-07. No target analytes were detected in CAN-104-4I-07.
[f] - CAN-104-4I-14 is a field duplicate of CAN-104-4I-09.
[g] - CAN-104-4J-13 is a field duplicate of CAN-104-4J-01.
[h] - CAN-104-4K-13 is a field duplicate of CAN-104-4K-01.
[i] - CAN-104-4L-13 is a field duplicate of CAN-104-4L-01.
[j] - CAN-104-4L-14 is a field duplicate of CAN-104-4L-10.
[k] - CAN-104-4M-13 is a field duplicate of CAN-104-4M-09.
[l] - CAN-104-4N-13 is a field duplicate of CAN-104-4N-03.
[m] - CAN-104-4N-14 is a field duplicate of CAN-104-4N-10.
[n] - CAN-104-4P-13 is a field duplicate of CAN-104-4P-01.
[o] - CAN-104-4P-14 is a field duplicate of CAN-104-4P-03.
[p] - CAN-104-4Q-13 is a field duplicate of CAN-104-4Q-03.