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16. KEY

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7. Abstract

A soil-gas survey is being conducted at the Nonradioactive Dangerous Waste Landfill (NRDWL) to assess the extent of detectable gases and volatile organic compounds (VOC) in the vadose zone resulting from hazardous wastes disposed in the early 1980's. One-hundred and seventy soil-gas probes installed over a 34 acre area were monitored using portable field screening instruments. Areas of elevated carbon dioxide and deficient oxygen levels were detected. In addition, VOCs were detected in one portion of the NRDWL site. Additional analyses are planned to further define the levels of potential contaminants.

Jacques, I. D., 1993, *Nonradioactive Dangerous Waste Landfill Soil-Gas Survey: Initial Field Screening Report*, WHC-SD-EN-TI-158, Rev. 0, Westinghouse Hanford Company, Richland, Washington.

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1.0 SUMMARY

A soil-gas survey is being conducted for the Nonradioactive Dangerous Waste Landfill (NRDWL), which is part of the 200-IU-3 Operable Unit of the Hanford Site. The soil-gas survey is being performed in accordance with Section 7.1.1 of the *Nonradioactive Dangerous Waste Landfill Closure/ Postclosure Plan* (DOE-RL 1990).

The objective of the survey is to assess the extent of detectable gaseous or volatile organic compounds (VOC) within the vadose zone of the NRDWL resulting from hazardous wastes disposed in the early 1980's. Soil-gas probes were installed in the vadose zone within the fenced boundary of the NRDWL and the area immediately outside the NRDWL fence.

Using portable field-screening instruments, each soil-gas probe was monitored for combustible gas, methane, carbon dioxide, oxygen, and VOCs. The screening data indicated elevated carbon dioxide and deficient oxygen levels in the southern and western portion of the NRDWL. These anomalies may represent increased subsurface microbial activity, which may result from biodegradation of landfill contents. In addition, an organic vapor anomaly was detected using the photoionization detector (PID) in the northeast portion of the NRDWL (the hazardous waste portion of the landfill). Concentration levels of the other screening parameters were at or below the detection limit of the screening instruments.

This report documents the methods implemented and activities performed during installation of the soil-gas probe network. In addition, it discusses results from the field-screening activities performed on the newly installed probes.

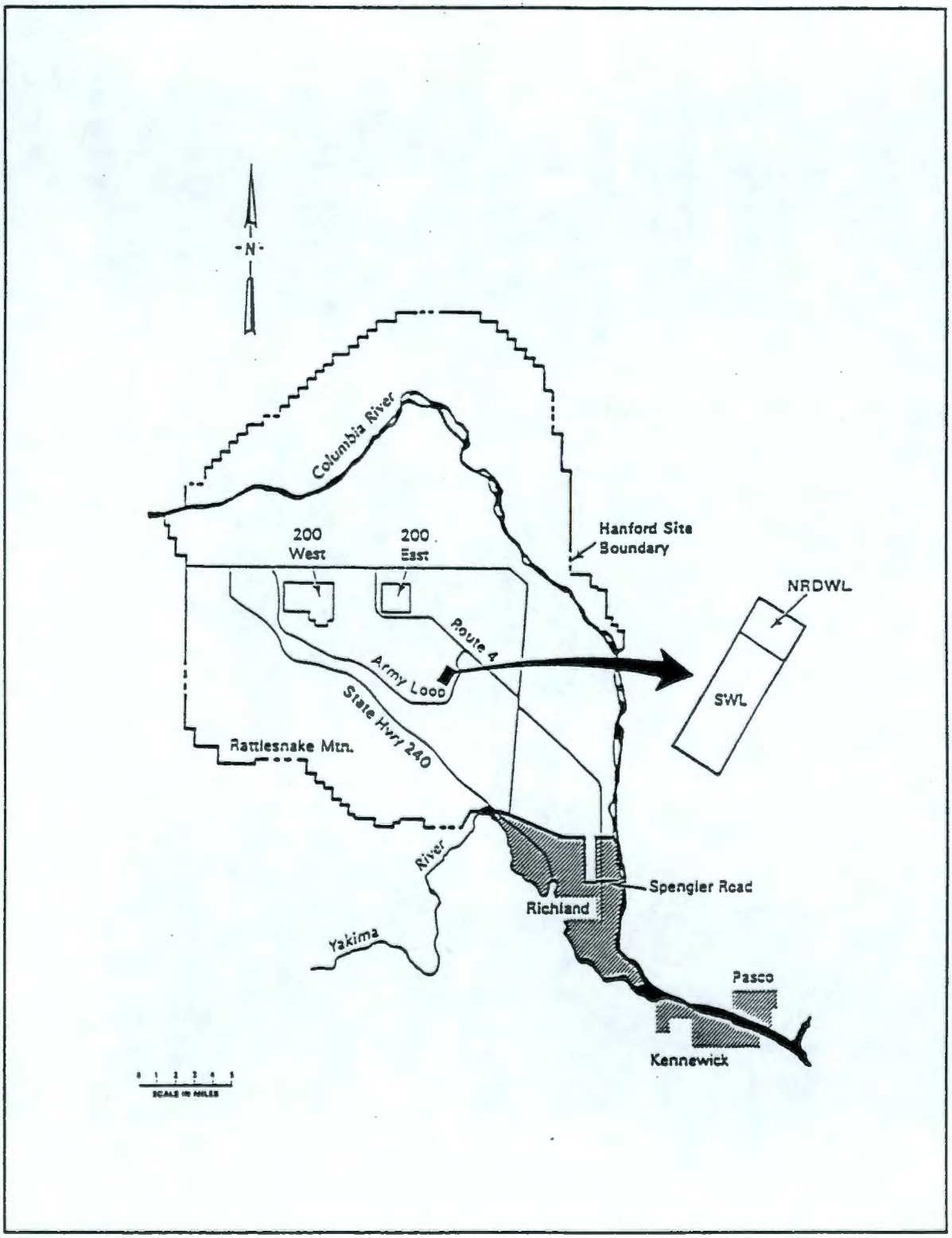
Future soil-gas analyses using a portable gas chromatograph will be conducted by Westinghouse Hanford Company (WHC) personnel. These analyses should provide a quantitative estimate of specific soil-gas constituents.

2.0 BACKGROUND

The NRDWL is an inactive disposal facility regulated by the *Resource Conservation and Recovery Act of 1976* (RCRA) as a Treatment, Storage, or Disposal (TSD) facility. It is located adjacent to and northeast of the Solid Waste Landfill (SWL) in the 600 Area of the Hanford Site (Figure 1). The NRDWL was operated from 1975 through 1985. During operation, the NRDWL received nonradioactive dangerous waste from process operations, research and development laboratories, and maintenance functions from the Hanford Site.

Waste was disposed in one of three types of trenches at the NRDWL depending on the waste characteristics. The trenches were designated to receive either chemical, asbestos, or sanitary solid waste. The NRDWL was originally designed as a series of 19 trenches segregated as asbestos and chemical disposal areas (Figure 2). However, not all of the planned trenches were used.

Figure 1. Location of the Solid Waste Landfill and the Nonradioactive Dangerous Waste Landfill on the Hanford Site.



Asbestos was disposed in plastic-lined cardboard boxes into the trenches. Chemicals were normally overpacked in 55-gallon drums prior to disposal in the trenches. Waste acceptance criteria at the time of disposal required liquids to be packed in at least twice their volume of absorbent. No containers holding free liquids were known to have been disposed at the site. The wastes were placed in the unlined trenches and covered with 6 to 10 feet of native soil.

The facility is currently managed by WHC and will be closed in conformance with standards required under WAC 173-303-610 as described in DOE-RL (1990).

One of the requirements specified in DOE-RL (1990) is completion of a soil-gas survey to assess the detectable gaseous vapors in the vadose zone. This survey will complement data generated from other NRDWL characterization activities (e.g., groundwater monitoring, soil sampling). The NRDWL manager requested WHC's Environmental Restoration Engineering (ERE) Section, which has performed similar programs for other Hanford RCRA/CERCLA sites, to conduct the soil-gas survey. Field engineers from Bovay Northwest, Incorporated (Bovay) helped ERE install and monitor the soil-gas network. In addition, Bovay prepared much of this report with the assistance of ERE.

3.0 SITE DESCRIPTION

The NRDWL is located near the center of the Hanford Site in the 600 Area. Access to the site is from Route 4 South and the Army Loop Road. The SWL is an active solid waste landfill located adjacent to and south of the NRDWL.

The undisturbed topography of the NRDWL site consists of stabilized dunes; therefore, surface soils are predominately fine- to medium-grained eolian sands. Some gravel exists at the surface around the NRDWL which is primarily the result of backfilling and road construction activities.

Depth to the groundwater at the NRDWL site ranges from approximately 125 feet to 135 feet below ground surface. The vadose zone consists of a thin veneer of eolian sands overlying silt, sand, and gravel of the Hanford formation. An approximately 6-inch-thick silt layer is evident in the open trenches within the NRDWL. The layer appears to be about 4 feet below ground surface in the NRDWL area. Both surface geophysical surveys and soil-gas probe installation encountered the layer over the undisturbed areas of the site.

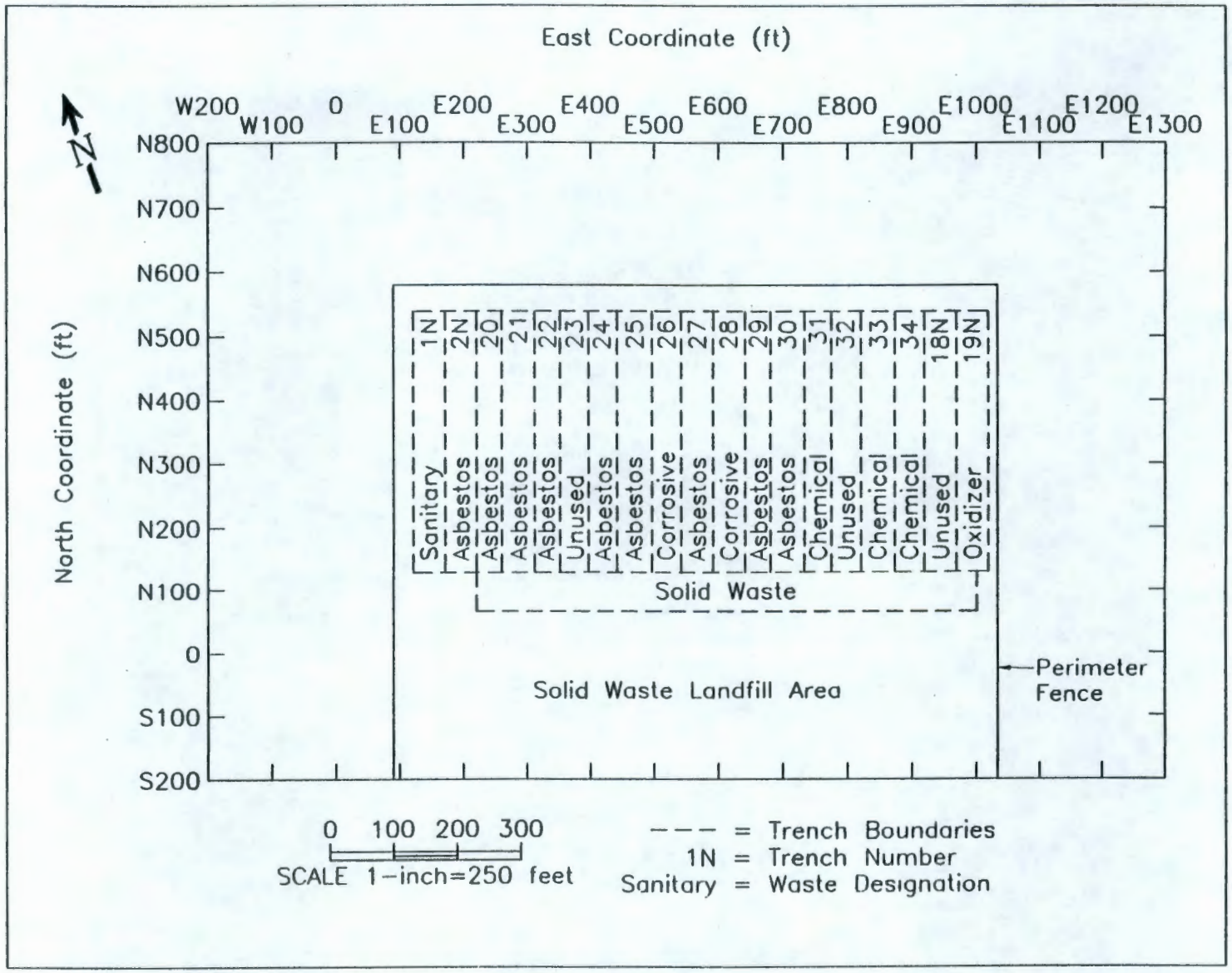


Figure 2. Trench Locations and Waste Designations for the Nonradioactive Dangerous Waste Landfill.

4.0 METHODS

This soil-gas survey was performed in accordance with a site-specific sampling and analysis plan (Jacques 1993). The soil-gas probes were installed over a 34-acre area extending 200 feet beyond the north, east, and west NRDWL perimeter fence and 200 feet into the north end of the SWL (Figure 3). Soil-gas probe locations within the perimeter fence were positioned along trench centerlines relative to subsurface anomalies located by using ground-penetrating radar (GPR) and electromagnetic induction (EMI) geophysical surveys (Mitchell 1993). Specifically, probe locations were positioned in areas thought most likely to encounter vapors, while minimizing the potential to penetrate buried waste with the soil-gas probes. Probes were installed along each trench centerline in the chemical disposal area and along alternating trench centerlines in the asbestos disposal area. The trench centerlines are oriented to magnetic north. Probe locations outside the NRDWL fence followed a 100-foot grid, which is also oriented to magnetic north. Open trenches and berms prevented installation of probes in some areas.

Each soil-gas probe was installed in accordance with Environmental Investigations Instruction (EII) 5.9, "Soil-Gas Sampling" (WHC 1988). The soil-gas probes consisted of a dedicated, perforated stainless-steel point connected to an 8-foot section of 1/4-inch OD Teflon (a trademark of E. I. du Pont de Nemours & Company) tubing. The soil-gas probes were driven to a depth of approximately 4 to 6 feet below ground surface using a PD-36 (a trademark of Rhino Tool Company) pneumatic post driver. This depth was chosen to ensure the probe inlet was placed beneath the confining silt layer where it was present.

Once the soil-gas probe was driven to depth, the steel probe-insertion assembly was removed using a hydraulic hand jack, leaving the stainless-steel point and the Teflon tube in the ground. The end of the tubing protruding from the ground was capped with a plastic cap. Finally, the soil around the tubing was firmly packed to ensure minimal annular space between the tubing and the emplacement hole. Once the soil-gas probe was installed, the probe depth and location were recorded in the logbook and a marker flag with the probe coordinates was placed next to the probe.

During probe installation, periodic sampling of the breathing zone was performed as specified by the site-specific Hazardous Waste Operations Permit using a Model 580B Organic Vapor Monitor (OVM) (a trademark of Thermo Environmental Instruments, Inc.). No organic vapors were detected during probe installation activities. Results were recorded in the field logbook. Additional information such as weather conditions, wind velocity and direction, temperature, barometric pressure, soil conditions, texture, and other significant observations were also recorded in the field logbook during probe installation.

One week after the soil-gas probes were installed, each soil-gas probe was sampled using a series of portable vapor monitoring instruments. These measurements were obtained from March 31 through April 5, 1993. These included a Model 1314 (a trademark of GasTech, Inc.) Combustible Gas Analyzer (CGA), a MicroTip HL-2000 (a trademark of Photovac International Inc.)

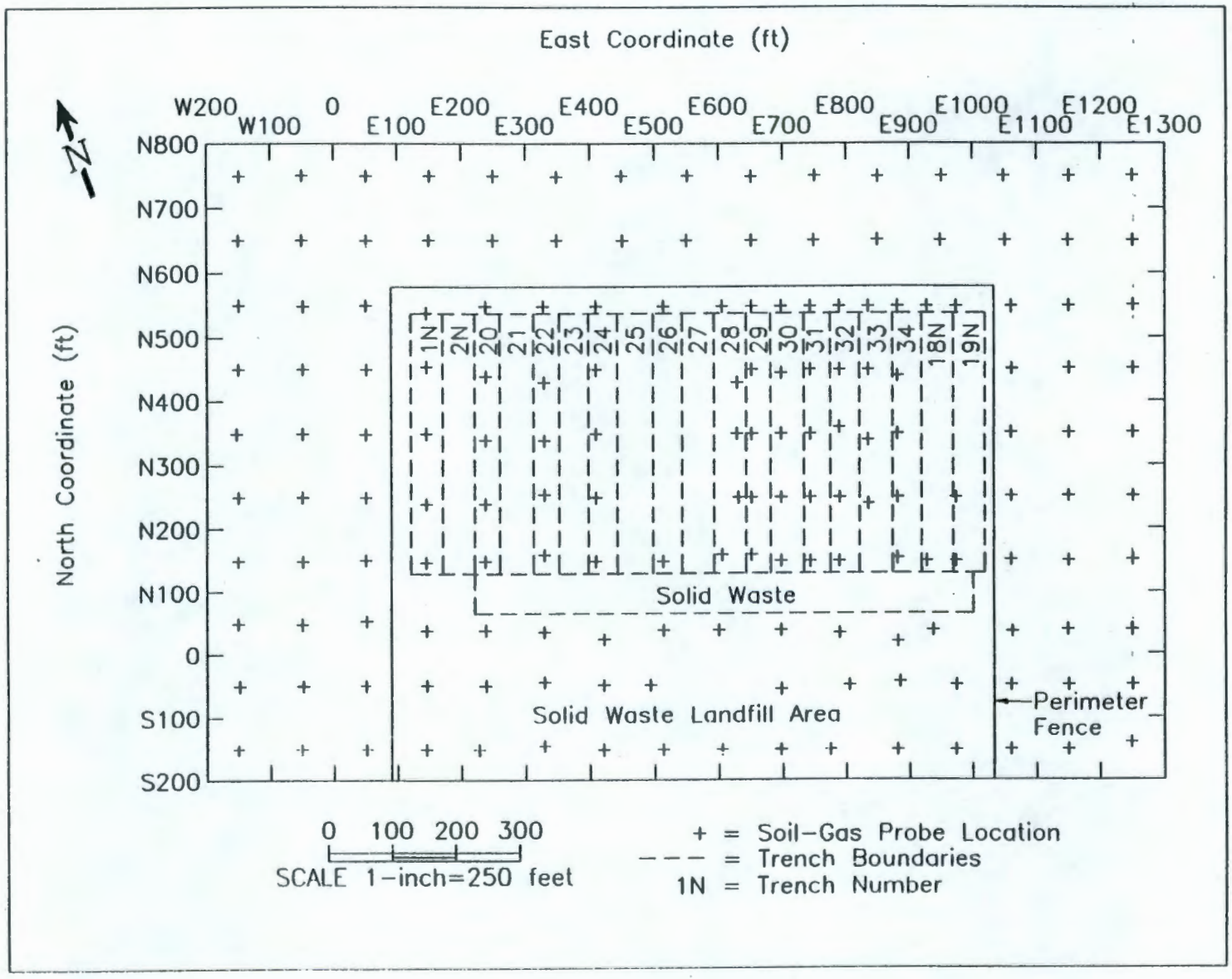


Figure 3. Map Showing Soil-Gas Probe Locations.

Photoionization Detector (PID) equipped with a 10.6-eV lamp, and a GA90 Infrared Gas Analyzer (IRA) (a trademark of Geotechnical Instruments). The instruments were calibrated twice daily (morning and noon) as follows.

- The CGA factory calibration was checked using 4,180 ppm hexane in air. In the field, combustible gas and oxygen levels were set to ambient air levels.

- The PID was zeroed using ambient air filtered through a charcoal filter. The instrument span was set using 101 ppm isobutylene in air. Finally the calibration was verified using 9.51 ppm isobutylene in air.

- The IRA, which detects oxygen, methane, and carbon dioxide, used the pre-set factory calibrations. In addition, methane and oxygen were zeroed and spanned, respectively, to match ambient air concentrations.

5.0 FIELD SCREENING

The field-screening activities took place over a two- and a half-day period under relatively stable weather conditions. The barometric pressure varied from a low of 29.13 inch Hg to a high of 29.34 inch Hg (based on Hanford Meteorological Station information). Weather conditions during the field measurement activities ranged from overcast to clear. Temperatures ranged from 45 °F to 60 °F. There was no precipitation during the field-screening activities.

The field-screening instruments were connected directly to each soil-gas probe using a 1-inch section of Tygon (a trademark of the Norton Company) tubing. A consistent methodology was used for collecting the field-screening measurements as follows.

(1) The CGA was connected and allowed to purge the soil-gas probe for approximately 0.5 to 1 minute. The LEL measurement was then recorded.

(2) The PID was connected to the probe and the response was recorded after about 15 seconds. It was found that a stable PID response was almost instantaneous.

(3) The IRA was attached to the probe and the carbon dioxide, methane, and oxygen concentrations were recorded. Approximately 40 seconds was required for the IRA readings to stabilize.

Field-screening measurements were recorded in the field using a GRiD 2260 Convertible (a trademark of GRiD Systems Corporation) pen-based notebook computer. The computer application stored the data in a table format, which was then directly imported into a spreadsheet format where the data were sorted according to probe location. All field-screening data are listed in Appendix A.

6.0 RESULTS AND OBSERVATIONS

Table A-1 shows the field-screening results for each probe in the NRDWL soil-gas network. The data indicate methane and combustible gas concentrations in the landfill and outside the fenced boundary were at or below the detection level of the field-screening instruments used.

The concentrations of VOCs detected were generally below the detection limit of the PID. However, soil vapors tested in the northeast portion of the NRDWL contained total VOCs ranging from 0.4 to 11.9 ppm. The greatest total-VOC concentrations detected, 4.6 and 11.9 ppm, correspond to trenches 33 and 34, respectively. Figure 2 shows these trenches were designated for chemical waste disposal. The high total-VOC concentrations in this region of the NRDWL may indicate organic vapors diffusing from the buried chemical wastes.

Contour maps of the oxygen and carbon dioxide field-screening data were produced using SURFER (version 4) (a registered trademark of Golden Software, Inc.) and are shown in Figures 4 and 5. The grid interpolation method applied to the data to derive the concentration contours was the inverse squared method.

Soil-gas probes in the southern and western portion of the NRDWL (and northern portion of the SWL) show elevated levels of carbon dioxide and depleted levels of oxygen. This anomaly is apparently due to increased metabolic activity of aerobic microorganisms that are degrading the waste contained in that portion of the landfill. The southern portion of the NRDWL represented by this anomaly corresponds to a designated construction/solid waste dump area. The west portion corresponds to a sanitary waste trench. Both waste types typically support high microbial activity. The center of this anomaly (greatest carbon dioxide and least oxygen) is positioned over the SWL, which contains solid waste.

7.0 CONCLUSIONS

Installation of a soil-gas sampling network at the NRDWL was successful and should meet performance standards for closure of the NRDWL facility. Field screening information from the probe network indicates chemical anomalies that correspond to known trench locations and trench waste characteristics. The nature and extent of these anomalies will be further delineated using more sensitive equipment such as a portable gas chromatograph. Gas chromatography will also allow detection of potential contaminants, such as carbon tetrachloride, that may not have been detected by the field-screening methods used in this study. WHC will collect and analyze soil-gas samples using a field gas chromatograph during the next phase of this investigation (Jacques 1993).

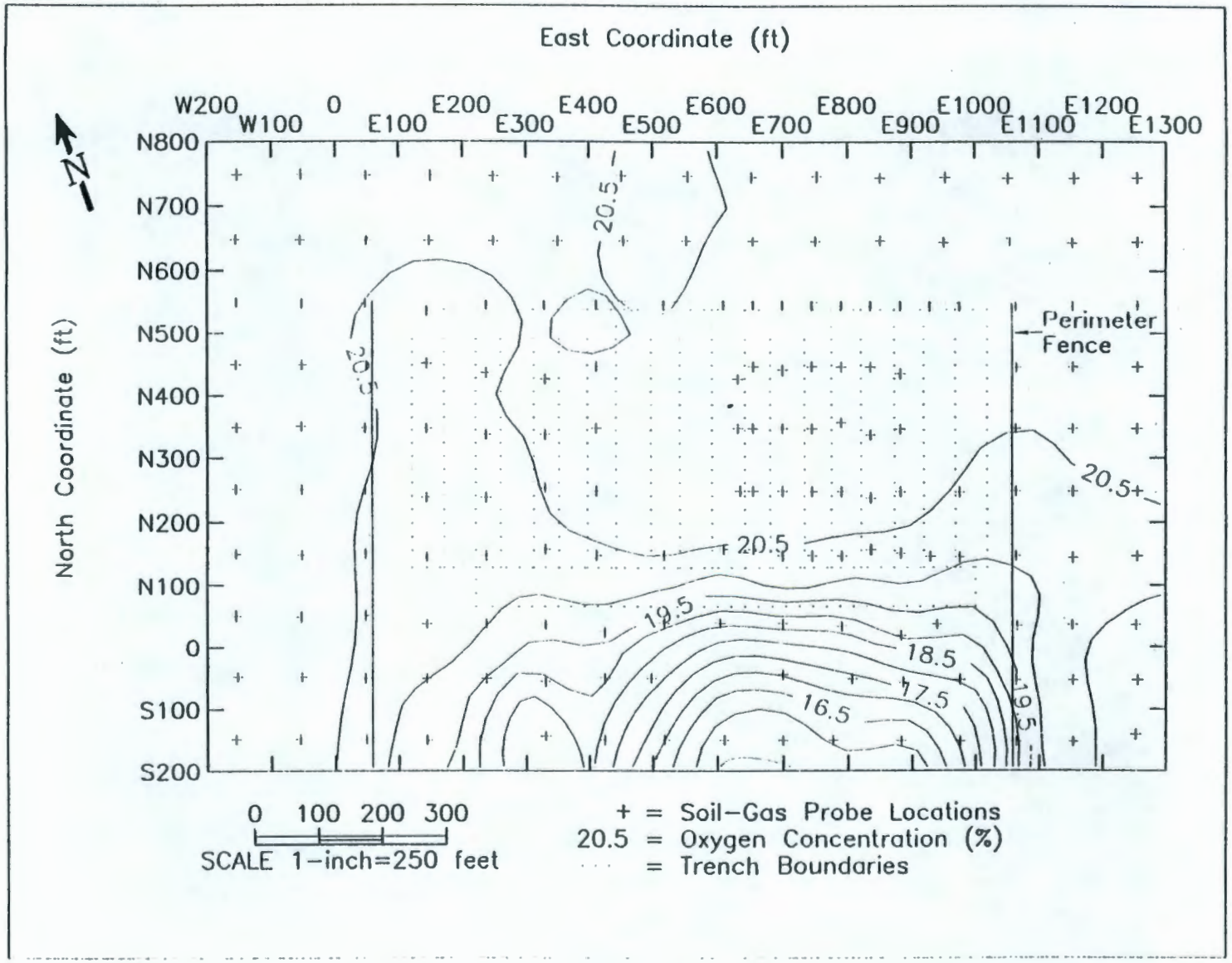


Figure 4. Contour Map Showing Soil-Gas Oxygen Levels at the Nonradioactive Dangerous Waste Landfill as Determined Using an Infrared Gas Analyzer.

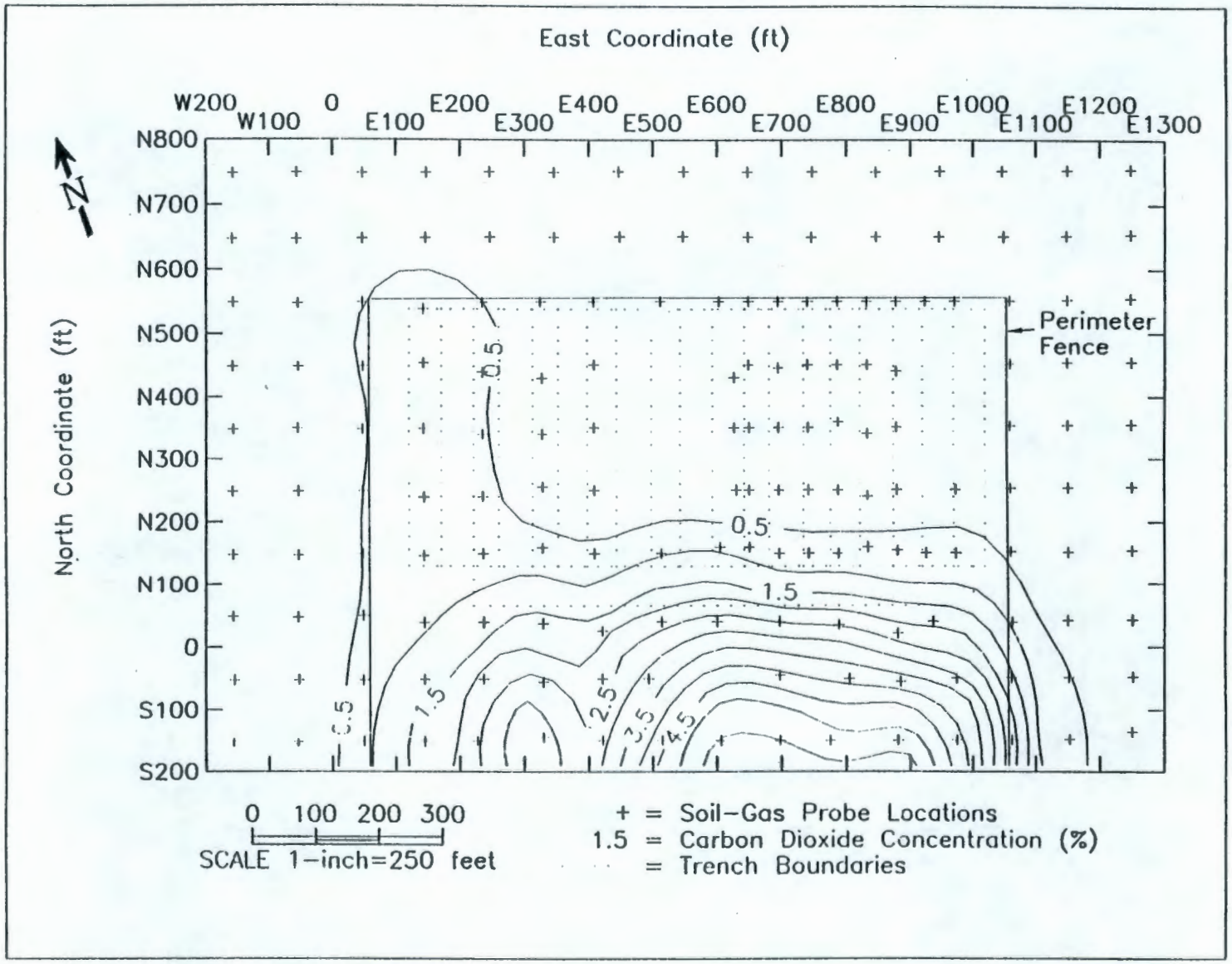


Figure 5. Contour Map Showing Soil-Gas Carbon Dioxide Levels at the Nonradioactive Dangerous Waste Landfill as Determined Using an Infrared Gas Analyzer.

8.0 REFERENCES

DOE-RL, 1990, *Nonradioactive Dangerous Waste Landfill Closure/Postclosure Plan*, DOE/RL-90-17, Rev. 0, U.S. Department of Energy, Richland Field Office, Richland, Washington.

Jacques, I. D., 1993, *Nonradioactive Dangerous Waste Landfill Soil-Gas Survey Sampling and Analysis Plan*, WHC-SD-EN-AP-124, Rev. 0, Westinghouse Hanford Company, Richland, Washington.

Mitchell, T. H., K. A. Bergstrom, and D. J. Hoff, 1993, *Geophysical Investigation of the Nonradioactive Dangerous Waste Landfill (NRDWL)*, WHC-SD-EN-TI-116, Rev. 0, Westinghouse Hanford Company, Richland, Washington.

WHC, 1988, *Environmental Investigations and Site Characterization Manual*, WHC-CM-7-7, Westinghouse Hanford Company, Richland, Washington.

WAC 173-303, *Washington Administrative Codes - Dangerous Waste Regulations*, Washington State Department of Ecology, Olympia, Washington.

APPENDIX A

FIELD-SCREENING DATA FOR THE NONRADIOACTIVE DANGEROUS WASTE LANDFILL SOIL-GAS MONITORING NETWORK

Table A-1. Field-Screening Data for the Nonradioactive Dangerous Waste Landfill Soil-Gas Network. (sheet 1 of 4)

Probe Location				Depth (ft)	Date Screened	VOC (ppm)	LEL (%)	CH4 (%)	CO2 (%)	O2 (%)
S	150	W	151	5.2	04/05/93	0	0	0	0.1	20.7
S	150	W	51	5.2	04/05/93	0	0	0	0.1	20.7
S	150	E	51	5.3	04/05/93	0	0	0	0.1	20.7
S	151	E	145	5.6	03/31/93	0	0	0	2.4	19.2
S	151	E	227	5.5	03/31/93	0	0	0	1.9	19.6
S	145	E	329	5.7	03/31/93	0	0	0.1	5.3	15.9
S	151	E	421	5.3	03/31/93	0	0.1	0	1.3	19.9
S	151	E	513	5.5	03/31/93	0.2	1	0.1	5.5	15.8
S	151	E	605	5.6	03/31/93	0.2	0	0	6.8	14.6
S	151	E	697	5.6	03/31/93	0.2	0	0	6.2	15.2
S	151	E	775	5.7	03/31/93	0.4	0	0	5.7	15.7
S	151	E	881	5.7	03/31/93	0.2	0	0.1	7.4	14.0
S	151	E	973	5.8	03/31/93	0.4	0	0.2	6.2	15.0
S	151	E	1060	5.3	04/02/93	0	0	0	0.3	20.9
S	151	E	1150	5.2	04/02/93	0	0	0	0.2	20.6
S	140	E	1248	5.5	04/02/93	0	0	0	0	21.0
S	50	W	149	5.3	04/05/93	0	0	0	0.1	20.6
S	50	W	49	5.0	04/05/93	0	0	0	0.1	20.7
S	51	E	50	5.5	04/05/93	0	0	0.1	0.2	20.8
S	51	E	145	5.7	03/31/93	0	0	0.1	2.3	19.5
S	51	E	237	5.6	03/31/93	0	0	0	1.9	19.8
S	56	E	329	5.6	03/31/93	0	0	0.1	3.6	18.0
S	51	E	421	5.6	03/31/93	0	0	0.1	0.9	20.0
S	51	E	493	5.6	03/31/93	0	1	0	3.2	18.3
S	45	E	697	5.6	03/31/93	0.3	0	0	4.6	15.7
S	51	E	805	5.6	03/31/93	0	0	0	3.8	17.5
S	56	E	885	4.7	03/31/93	0	0	0	3.6	17.9
S	51	E	973	5.4	03/31/93	0	0	0	5.1	16.0
S	51	E	1060	5.2	04/02/93	0	0	0	0.8	20.4
S	51	E	1150	5.2	04/02/93	0	0	0	0.1	20.5
S	51	E	1250	5.4	04/02/93	0	0	0	0	21.0
N	50	W	151	5.6	04/05/93	0	0	0	0	20.6
N	49	W	50	5.4	04/05/93	0	0	0	0.1	20.7
N	51	E	50	5.4	04/05/93	0	0	0.1	0.2	20.6
N	39	E	145	5.2	03/31/93	0	0	0.1	0.6	20.7
N	39	E	237	4.9	03/31/93	0	0	0	0.4	20.7
N	37	E	329	5.2	03/31/93	0	0	0.2	2	19.6
N	24	E	421	5.2	03/31/93	0	0	0.1	1.8	19.7
N	39	E	513	5.1	03/31/93	0	0	0.1	3	18.5
N	39	E	600	5.4	03/31/93	0	0	0.1	4.1	17.1
N	39	E	697	5.3	03/31/93	0	0	0.1	2.8	18.9
N	34	E	789	5.0	03/31/93	0	0.5	0.1	3.1	18.1
N	20	E	881	5.3	03/31/93	0	1	0.2	2.6	19.1
N	39	E	937	4.9	03/31/93	0	0	0	0.6	20.2
N	37	E	1062	4.9	04/02/93	0	0	0	0.2	20.6
N	39	E	1149	5.3	04/02/93	0	0	0	0.1	20.7

Table A-1. Field-Screening Data for the Nonradioactive Dangerous Waste Landfill Soil-Gas Network. (sheet 2 of 4)

Probe Location			Depth (ft)	Date Screened	VOC (ppm)	LEL (%)	CH4 (%)	CO2 (%)	O2 (%)
N	39 E	1249	5.1	04/02/93	0	0	0	0.1	21.0
N	150 W	151	5.5	04/05/93	0	0	0	0.1	20.8
N	149 W	49	5.5	04/05/93	0	0	0.1	0.1	20.6
N	151 E	50	5.2	04/05/93	0	0	0.1	0	20.7
N	147 E	145	5.0	03/31/93	0	0	0.1	2.2	19.4
N	149 E	237	5.1	03/31/93	0	0	0	0.2	20.7
N	159 E	329	5.3	03/31/93	0	0	0.1	0.7	20.3
N	149 E	409	5.2	03/31/93	0	0	0	0	21.0
N	149 E	513	5.3	03/31/93	0	0	0	0.2	21.8
N	159 E	605	5.7	03/31/93	0	1	0	0.7	21.1
N	159 E	651	5.3	03/31/93	0	0	0.1	0.2	21.0
N	149 E	697	5.0	03/31/93	0	0	0	0.3	21.2
N	149 E	743	5.4	03/31/93	0	0	0.1	0.4	20.5
N	149 E	789	5.3	03/31/93	0	0	0.1	0.4	20.5
N	159 E	835	5.4	03/31/93	0.1	0	0.1	0.3	20.6
N	154 E	881	5.3	03/31/93	0	0	0	0.5	20.6
N	149 E	927	5.2	03/31/93	0	0	0.1	0.3	20.4
N	149 E	973	4.8	03/31/93	0	0	0.2	1.3	19.7
N	151 E	1060	5.4	04/02/93	0	0	0	0.1	19.2
N	149 E	1150	5.4	04/02/93	0	0	0	0.1	19.6
N	151 E	1250	5.0	04/02/93	0	0	0	0.1	20.0
N	250 W	151	5.2	04/05/93	0	0	0	0	20.8
N	250 W	49	5.4	04/05/93	0	0	0.1	0.2	20.8
N	250 E	50	5.3	04/05/93	0	0	0.1	0.1	20.7
N	239 E	145	5.2	04/02/93	0	0	0	1.5	19.8
N	239 E	237	5.2	04/02/93	0	0	0	0.1	20.4
N	254 E	329	5.1	04/02/93	0	0	0	0.3	20.4
N	249 E	409	5.0	04/02/93	0	0	0	0	20.4
N	249 E	631	5.4	03/31/93	0	0	0.1	0.2	20.9
N	249 E	651	5.3	03/31/93	0	0	0	0.1	21.0
N	249 E	697	5.2	03/31/93	0	0	0	0.1	20.7
N	249 E	743	5.3	03/31/93	0	0	0	0.1	20.9
N	249 E	789	5.2	03/31/93	0	0	0	0.2	20.8
N	239 E	835	5.0	03/31/93	11.9	0	0	0.3	20.6
N	249 E	881	5.2	03/31/93	0.4	0	0	0.3	20.8
N	249 E	973	5.3	03/31/93	0	0	0.1	0	20.6
N	251 E	1060	5.4	04/02/93	0	0	0	0.2	20.2
N	251 E	1150	5.2	04/02/93	0	0	0	0.7	20.6
N	251 E	1250	5.2	04/02/93	0	0	0	0.1	20.9
N	349 W	150	5.3	04/05/93	0	0	0	0.2	20.5
N	351 W	50	5.2	04/05/93	0	0	0	0.1	20.8
N	349 E	50	5.5	04/05/93	0	0	0	0.2	20.9
N	349 E	145	5.2	04/02/93	0	0	0	1.3	20.1
N	339 E	237	5.1	04/02/93	0	0	0	0.3	20.5
N	339 E	329	5.2	04/02/93	0	0	0	0.4	20.6
N	349 E	409	4.8	04/02/93	0	0	0	0.1	21.0

Table A-1. Field-Screening Data for the Nonradioactive Dangerous Waste Landfill Soil-Gas Network. (sheet 3 of 4)

Probe Location			Depth (ft)	Date Screened	VOC (ppm)	LEL (%)	CH4 (%)	CO2 (%)	O2 (%)
N	349 E	628	5.8	03/31/93	0	0	0	0.1	20.9
N	349 E	651	5.3	03/31/93	0	0	0.1	0.2	20.8
N	349 E	697	5.4	03/31/93	0	0	0.1	0.3	20.7
N	349 E	743	5.3	03/31/93	0	0	0.1	0.1	21.0
N	359 E	789	5.1	03/31/93	0	0	0.1	0.1	21.0
N	339 E	835	5.2	03/31/93	0.6	0	0.1	0.1	20.9
N	349 E	881	5.1	03/31/93	1	0	0.1	0.1	20.9
N	351 E	1060	5.1	04/02/93	0	0	0	0.1	20.5
N	351 E	1150	5.3	04/02/93	0	0	0	0.1	20.7
N	351 E	1250	5.1	04/02/93	0	0	0	0.1	20.9
N	450 W	151	5.3	04/05/93	0	0	0	0.1	20.5
N	450 W	49	5.4	04/05/93	0	0	0.1	0	20.7
N	450 E	51	5.1	04/05/93	0	0	0.1	0.1	20.9
N	454 E	145	5.1	04/02/93	0	0	0.1	1.6	19.7
N	439 E	237	5.3	04/02/93	0	0	0.2	0.2	21.0
N	429 E	329	5.4	04/02/93	0	0	0	0.2	20.6
N	449 E	409	5.2	04/02/93	0	0	0	0.3	20.2
N	429 E	628	5.6	03/31/93	0	0	0.1	0.6	20.6
N	449 E	651	5.5	03/31/93	0	0	0.1	0.2	21.0
N	444 E	697	5.4	03/31/93	0	0	0.1	0.3	20.9
N	449 E	743	5.1	03/31/93	0	0	0.1	0.2	21.0
N	449 E	789	5.6	03/31/93	1.6	0	0.1	0.4	20.7
N	449 E	835	5.5	03/31/93	1.4	0	0.1	0.1	20.9
N	439 E	881	4.8	03/31/93	4.7	0	0.1	0.2	20.6
N	450 E	1061	5.2	04/02/93	0	0	0	0.3	20.4
N	451 E	1150	5.3	04/02/93	0	0	0	0.1	20.7
N	451 E	1250	4.8	04/02/93	0	0	0	0.1	20.1
N	551 W	150	5.3	04/05/93	0	0	0	0	20.7
N	550 W	49	5.3	04/05/93	0	0	0.1	0.2	20.4
N	551 E	50	5.4	04/05/93	0	0	0.1	0.1	20.9
N	539 E	145	5.2	04/02/93	0	0	0	2.5	18.8
N	549 E	237	5.0	04/02/93	0	0	0	0.2	20.5
N	549 E	327	4.8	04/02/93	0	0	0.1	0.1	20.6
N	549 E	409	5.3	04/02/93	0	0	0	0.1	20.5
N	549 E	513	5.4	04/02/93	0	0	0	0.3	20.4
N	549 E	605	5.6	04/02/93	0	0	0	0	20.6
N	549 E	651	5.5	04/02/93	0	0	0	0	20.6
N	549 E	697	5.4	04/02/93	0	0	0	0.2	20.7
N	549 E	743	5.3	04/02/93	0	0	0	0.2	20.6
N	549 E	789	5.3	04/02/93	0	0	0	0.1	20.7
N	549 E	835	5.4	04/02/93	0	0	0	0.2	20.6
N	549 E	881	5.4	04/02/93	0	0	0	0.3	20.6
N	549 E	927	5.5	03/31/93	0	0	0.3	0.2	20.7
N	549 E	973	5.6	03/31/93	0	0	0.2	0.2	21.1
N	549 E	1060	5.4	04/02/93	0	0	0	0	20.9
N	550 E	1150	5.3	04/02/93	0	0	0	0.1	20.7

Table A-1. Field-Screening Data for the Nonradioactive Dangerous Waste Landfill Soil-Gas Network. (sheet 4 of 4)

Probe Location			Depth (ft)	Date Screened	VOC (ppm)	LEL (%)	CH4 (%)	CO2 (%)	O2 (%)
N	551 E	1250	5.3	04/02/93	0	0	0	0.1	20.8
N	650 W	151	5.6	04/05/93	0	0	0	0	20.9
N	650 W	51	5.5	04/05/93	0	0	0	0.1	20.8
N	650 E	51	5.4	04/05/93	0	0	0	0.1	20.8
N	650 E	149	4.8	04/05/93	0	0	0	0	20.9
N	650 E	249	5.5	04/05/93	0	0	0	0.1	20.8
N	650 E	349	5.2	04/05/93	0	0	0	0.1	20.6
N	650 E	451	5.5	04/02/93	0	0	0	0.1	20.4
N	650 E	549	5.2	04/02/93	0	0	0	0.1	20.2
N	650 E	651	5.4	04/02/93	0	0	0	0.1	20.6
N	650 E	749	5.6	04/02/93	0	0	0	0.1	20.3
N	651 E	850	5.4	04/02/93	0	0	0	0	20.5
N	650 E	949	5.3	04/02/93	0	0	0	0	20.5
N	650 E	1051	5.5	04/02/93	0	0	0	0	20.4
N	650 E	1149	5.1	04/02/93	0	0	0	0	20.6
N	651 E	1250	5.2	04/02/93	0	0	0.1	0.1	20.6
N	750 W	149	5.2	04/05/93	0	0	0	0.1	20.7
N	751 W	50	5.6	04/05/93	0	0	0	0.1	20.8
N	750 E	51	5.3	04/05/93	0	0	0	0.1	20.7
N	750 E	151	5.3	04/05/93	0	0	0	0	20.8
N	750 E	249	5.3	04/05/93	0	0	0	0.1	20.7
N	749 E	349	5.1	04/05/93	0	0	0	0.1	20.8
N	750 E	449	5.4	04/02/93	0	0	0	0	20.3
N	750 E	551	5.3	04/02/93	0	0	0	0	20.5
N	749 E	650	5.1	04/02/93	0	0	0	0	20.6
N	750 E	751	5.3	04/02/93	0	0	0	0	20.8
N	749 E	850	5.2	04/02/93	0	0	0	0.1	20.7
N	750 E	951	5.4	04/02/93	0	0	0	0.1	20.6
N	750 E	1049	4.0	04/02/93	0	0	0	0.1	20.7
N	750 E	1151	5.3	04/02/93	0	0	0	0	20.7
N	751 E	1250	4.3	04/02/93	0	0	0.1	0.1	20.6