REFERENCE 8
SITE NAME McKinley Thompson LF
SITE ID IN0980050433

McKinley Thompson Farms, Inc.:
Surface and Groundwater, Ambient Air,
and Odor Testing Study

Indianapolis, Indiana EN-7504

1978060

INTRODUCTION

This study was to determine the ambient air, odor, and water quality characteristics of the McKinley Thompson Farms, Inc. demolition waste disposal site. To accomplish this in an expeditous manner, the study was divided into two segments. Segment 1 was a study of surface and groundwater quality; Segment 2 was a study of the ambient air and odor quality. Mr. Kenneth Kemp, ATEC Associates of Indianapolis, conducted the water quality testing program, while Mr. David B. Taub, Particle Data Laboratories, Elmhurst, Illinois, conducted the air and odor testing program. The testing site was located at 3434 South Harding Street, Indianapolis, Indiana. The report will address each study segment as a separate entity.

PURPOSE AND SCOPE

The purpose of the study was to:

1. Sample and analyze sources of ground and surface water on and near the McKinley Thompson Farm waste disposal site for inorganic chemical constituents. The standard for comparison was the "Interim Primary Drinking Water Standards" of the U.S. Environmental Protection Agency which appear in the March 14, 1975 Federal Register, marked Part II, Volume 40, Number 51.

2. Determine the direction of groundwater flow in the vicinity of the disposal site.

3. Test and characterize upwind and downwind ambient air particulate concentrations within the boundaries of the disposal site in accordance with standards set forth in Indiana Air Pollution Control Board Regulation APC 20, Sections 2(a), 2(b), and 2(c).

4. Sample and test for odors at upwind and downwind locations within the disposal site.

WATER QUALITY TESTING

Background

The initial discussion concerning water quality-ambient air testing at the McKinley Thompson site was held between Mr. Norman E. Brennan and Mr. Kenneth Kemp on October 6, 1975. A meeting between the same was held on October 8th at which time the general details of the project were discussed. A second meeting was held between the same on October 10th at which time the specific approach to the testing project was delineated. Ten water quality testing sites were agreed to.

Procedure

Intital site visit was made on October 10th. Locations of four observation wells were selected as were six other surface and groundwater sampling sites. The general location of each of the selected sampling sites is shown in Figure 1, and a description of each site is contained in Table 1. Appendix A shows a detailed map and description of each of these sites. Sites along the West Fork of White River were selected so as to be able to sample and test water quality conditions upstream and downstream from the Thompson disposal site. Observa-

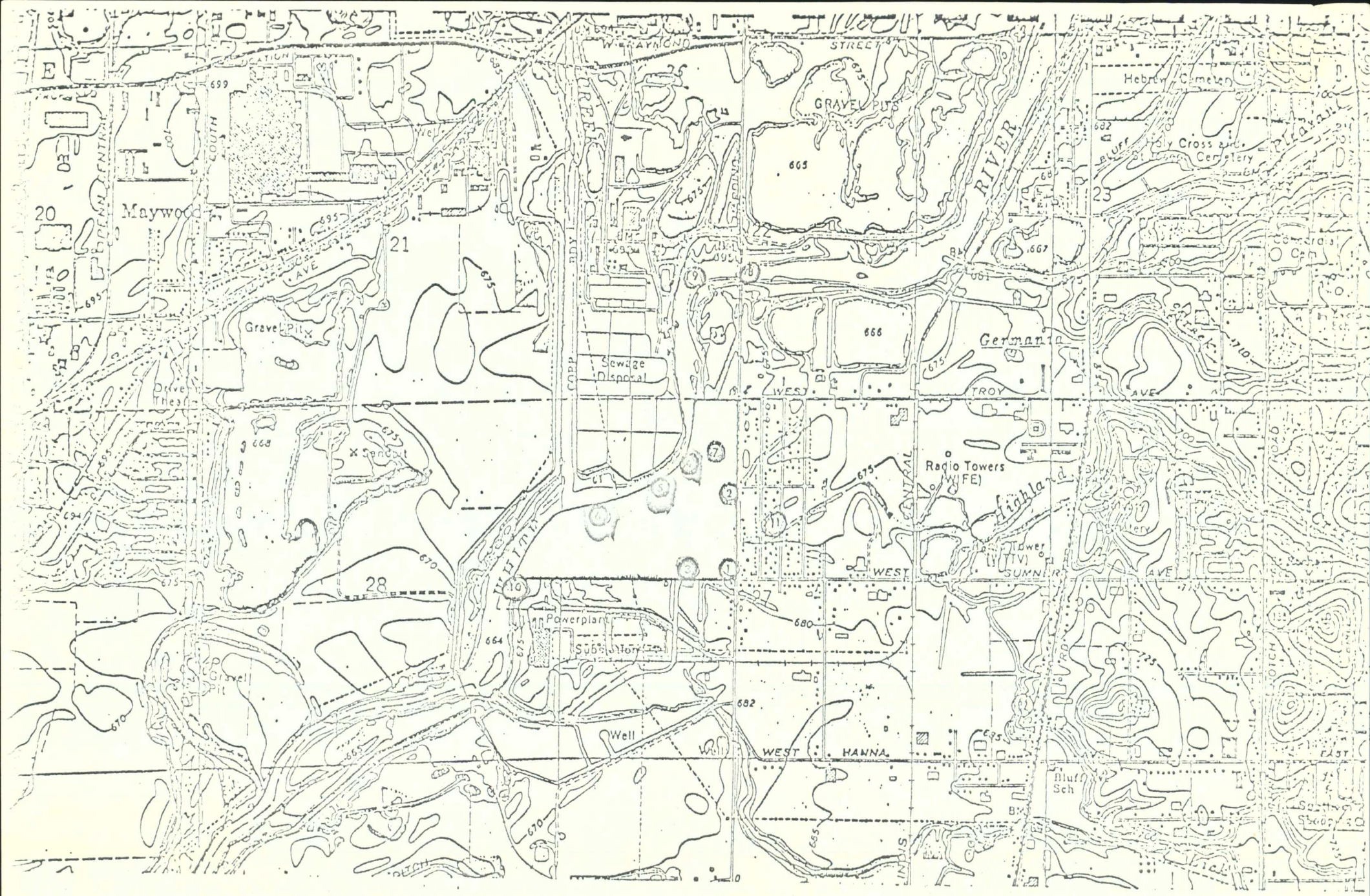

Figure 1. Location of Water Sampling Sites On and Near McKinley Thompson Farms, Inc. Indianapolis, Indiana

Table 1. Water Sampling Sites, McKinley Thompson Farms, Inc., Indianapolis, Indiana

Site Number	Site Description
1	[redacted] non-responsive (Ex. 6)
2	F. W. Richards Trucking Co., Inc. 3300 S. Harding Street
3	Observation well, south property line
4	Observation well, northwest side of entrance road near gravel pit
5	Observation well - along north side of entrance road across from haul road junction
6	Observation well - near west edge of property
7	Gravel pit
8	Mid-stream, approximately 25 yards upstream of Harding Street bridge
9	Inside 60 inch outfall pipe from Belmont sewage disposal plant
10	Ten feet from east edge of west Fork White River southwest edge of property
11	[redacted] non-responsive (Ex. 6)

Date sampled: October 13-15, 1975

tion wells and other groundwater sampling sites were selected to enable the testing of groundwater quality entering and exiting the disposal site.

The direction of groundwater flow was determined from a groundwater elevation map obtained from the Indiana Department of Natural Resources. This map is shown in Figure 2.

Four observation wells were installed at Sites #3, #4, #5, and #6, and the locations of these wells are shown in Figure 1. Casing for each of these wells consisted of two inch PVC pipe. Well depths ranged from 13 to 18 feet, and complete drilling logs for these wells are included in Appendix B. Soils were visually classified by the driller at time of boring.

Water in observation wells was sampled using a PVC pipe sampler. Samples collected from stream sources were collected 6 inches below the surface and toward the current. Samples collected from pumping wells and taps were collected after flushing pipes for a period of 1 minute. All samples were collected in EPA approved 1 quart glass jars with teflon cap liners. EPA prescribed preservatives were also used in the sampling process. The water sampling process extended from October 13-16, 1975.

The standard used by ATEC as a basis for comparison in determining the quality of the water sampled was the "Interim Primary Drinking Water Standards" of the U.S. Environmental Protection Agency. These standards appeared in the March 14, 1975 issue of the Federal Register. A copy of these standards is shown as Appendix C. These standards were regarded as the most stringent that could be applied.

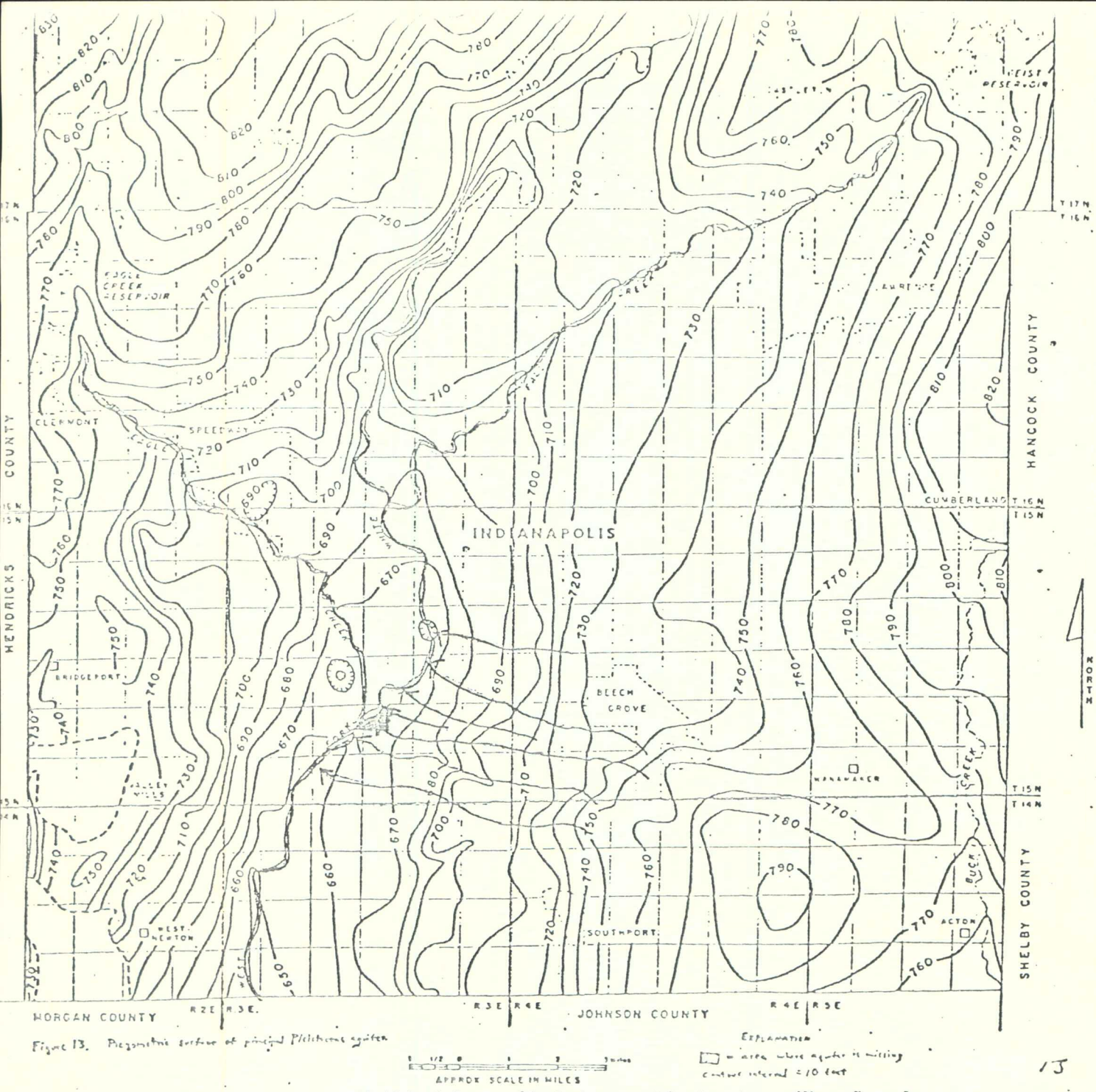

Figure 13. Piezometric surface of principal Pleistocene aquifer

15

- Property of McKinley Thompson Farms, Inc.

- Direction of Groundwater Flow

gure 2. Piezometric Surface of Principal Pleistocene Aquifer in Marion County, Indiana Showing Direction of Groundwater Flow

p Source: State of Indiana
Department of Natural Resources
Division of Water, Groundwater Unit

Collected samples were taken to the laboratory and analyzed for the following parameters: arsenic, barium, cadmium, chromium (hexavalent), cyanide, lead, mercury, nitrate, selenium, silver, iron, zinc, and pH. Concentrations of all parameters except arsenic, cyanide, nitrate, and pH were determined with a Pye Unicam atomic absorption spectrophotometer. Arsenic, cyanide, and nitrate were determined calorimetrically with a Bausch-Lomb spectrophotometer, and pH was determined with a Photovolt pH meter.

Results and Discussion

Table 2 shows the concentration of inorganic elements contained in each of the collected samples. Except for lead and nitrate, concentrations of inorganic elements are equal to or less than the maximum contaminant levels shown in the Primary Drinking Water Standards of the enclosed Federal Register. Cadmium concentrations were equal in some samples to maximum levels. Note should be made there are no standards for iron, zinc, and pH in the Primary Drinking Water Standards.

Lead concentrations equalled or exceeded the maximum contaminant standard in all samples collected. The 0.10 mg/l concentration of lead at Site #10 could be the result of the concentration and volume of lead coming out of the City of Indianapolis' Belmont waste treatment facility, Site #9.

It also appears that lead concentrations in groundwater entering the disposal site (Sites #1 and #2) are slightly higher than the standard (0.05 mg/l). However, the concentrations of 0.14 and 0.15 mg/l found in observation wells

Table 2. Concentration of Inorganic Elements in Water Samples Collected at Selected Sites On and Near McKinley Thompson Farms, Marion County, Indiana, October 13-16, 1975. (Continued)

Sampling Site No.	Arsenic	Barium	Cadmium	Chromium (hexavalent)	Cyanide	Lead
	mg/l	mg/l	mg/l	mg/l	mg/l	mg/l
1	0.00	0.05	0.002	0.01	0.00	0.06
2	0.00	0.01	0.001	0.02	0.00	0.06
3	0.00	0.02	0.010	0.01	0.00	0.10
4	0.00	0.05	0.010	0.01	0.00	0.07
5	0.00	0.05	0.002	0.02	0.00	0.14
6	0.00	0.06	0.002	0.01	0.00	0.15
7	0.00	0.07	0.010	0.01	0.00	0.05
8	0.00	0.06	0.003	0.01	0.00	0.05
9	0.00	0.01	0.010	0.01	0.00	0.10
10	0.00	0.01	0.010	0.01	0.00	0.10
11	NT	NT	NT	NT	NT	0.03

* NT - Not tested

Table 2. Concentration of Inorganic Elements in Water Samples Collected at Selected Sites On and Near McKinley Thompson Farms, Marion County, Indiana, October 13-16, 1975

Sampling Site No.	Mercury	Nitrate	Selenium	Silver	Iron	Zinc	pH
	mg/l	mg/l	mg/l	mg/l	mg/l	mg/l	
1	0.0002	0.0	0.00	0.01	37.3	6.00	6.90
2	0.0004	0.0	0.00	0.00	34.0	5.68	7.25
3	0.0005	12.5	0.00	0.02	2.4	0.86	7.20
4	0.0007	0.0	0.00	0.01	53.5	2.70	6.80
5	0.0011	14.0	0.00	0.00	43.8	8.97	7.20
6	0.0005	15.0	0.00	0.00	98.9	3.83	7.25
7	0.0002	0.0	0.00	0.00	45.0	0.07	7.80
8	0.0004	0.0	0.00	0.00	40.3	7.51	7.80
9	0.0004	NT	.00	0.00	19.3	8.52	NT
10	0.0003	NT	0.00	0.00	53.4	6.49	NT
11	NT	40.0	NT	NT	NT	NT	7.10

* NT - Not tested

#5 and #6, respectively, suggest that lead may be being leached from the disposal site. Yet, even though these concentration levels equal or exceed the primary drinking water standard, other research has established that these concentrations are not high enough to result in lead intoxications. Information contained in Appendix D indicates that "a long-time intake of 0.6 mg lead per day is a level at which development of lead intoxication is unlikely and the normal intake of lead from food is approximately 0.3 mg/day. Assuming a 2 liter daily consumption of water with 0.05 mg/l lead, the additional daily intake would be 0.1 mg/l or 25 percent of the total intake." Hence, even allowing 0.3 mg of lead per day to be consumed in food and allowing 2 liters of water per day to be consumed from Site #6, the total daily intake of lead would equal 0.6 mg, a level in which lead intoxication is not likely.

Concentrations of nitrate in observation wells #3, #5, and #6 also exceed the primary drinking water standard of 10.0 mg/l. Without additional tests, it cannot be said that these higher concentrations are coming from the disposal site. Recognizing the direction of groundwater movement shown in Figure 2 and the very high concentration of nitrate found off-site at Site #11, there is good reason to believe that the high nitrate concentrations may not be associated in any way with the activities taking place at the disposal site. Instead the nitrate may be coming from some other off-site location and entering the disposal site as a result of the hydraulic gradient of the groundwater.

The pH of the water samples was tested at all sites and found to be nearly neutral, a desirable condition.

The samples were also tested for iron. Iron concentrations were found to be extremely high. Though these concentrations are not regarded as being toxic, these levels will result in an objectionable taste to many people and will cause certain staining and iron deposit problems. Appendix E has been added to provide additional insight to concentrations of iron in water.

Zinc concentrations are well within concentration levels considered not to be harmful to man. Appendix F has been added to provide additional information on zinc concentrations in water.

AMBIENT AIR-ODOR TESTING

Background

Initial contact with Dr. Eric Aynsley, Particle Data Laboratories, regarding the initiation of an ambient air-odor monitoring program at the Thompson disposal site was made by Mr. Kenneth Kemp on October 8, 1975. It was pointed out by Dr. Aynsley that the results from such a monitoring program would not be totally meaningful since ambient air dust loadings can be expected to vary both with day and time throughout the year. Consequently, a minimum of one year of testing data is preferred; however, the existing time schedule would not permit this amount of testing.

It was decided that a field sampling program should be initiated which would at least provide data for the basis of discussion. It was recognized that such a testing program would be biased for the weather conditions that would occur during the three days of testing. Additionally, such a testing program could not provide an overall picture of the many types of conditions that could occur

RECORD OF SOIL EXPLORATION

AMERICAN TESTING AND ENGINEERING CORPORATION

5129 EAST 65TH STREET Phone: 253-2782 INDIANAPOLIS, INDIANA 46220

ATEC

octed With McKinley Thompson Farms Boring # Site #3

ct Name Proposed Observation Well Job #

ion 3400 S. Harding, Indianapolis Station & Offset

ce Elevation Boring Method BSA Sampling Method

Start 10/13/75 Finish 10/13/75 Weather & Temperature

nan M. Haskett Water Depth at Completion 6 ft 3 1/2 in.

neer K. Kemp Water Depth After Hours

ATUM DEPTH From	To	SOIL CLASSIFICATION	SAMPLE NO.	SAMPLE DEPTH From	To	STANDARD PENETRATION TEST BLOWS/6 INCHES
.0	4.0	Black moist silty sandy clay				
.0	13.0	Brown moist fine to coarse sand				

AT 104

eral Remarks:

RECORD OF SOIL EXPLORATION

AMERICAN TESTING AND ENGINEERING CORPORATION

129 EAST 65TH STREET Phone: 253-2782 INDIANAPOLIS, INDIANA 46220

cted With McKinley Thompson Farms Boring # Site #4

Name Proposed Observation Well Job # EN 7504

on 3400 S. Harding, Indianapolis Station & Offset

e Elevation Boring Method HSA Sampling Method

Start 10/13/75 Finish 10/13/75 Weather & Temperature

on M. Haskett Water Depth at Completion 11 ft. 9 in.

er K. Kemp Water Depth After Hours

STRATUM DEPTH From	STRATUM DEPTH To	SOIL CLASSIFICATION	SAMPLE NO.	SAMPLE DEPTH From	SAMPLE DEPTH To	STANDARD PENETRATION TEST BLOWS/6 INCHES
0	6.0	Brown moist fine to coarse sand				
0	12.0	Brown moist sandy clay				
0	18.0	Brown moist fine to coarse sand				

AT 104

eral Remarks:

RECORD OF SOIL EXPLORATION

AMERICAN TESTING AND ENGINEERING CORPORATION

5129 EAST 65TH STREET Phone: 253-2782 INDIANAPOLIS, INDIANA 46220

ontracted With McKinley Thompson Farms Boring # Site #5

oject Name Proposed Observation Well Job # EN 7504

cation 3400 S. Harding, Indianapolis Station & Offset

rface Elevation Boring Method HSA Sampling Method

te: Start 10/14/75 Finish 10/14/75 Weather & Temperature

remon M. Haskett Water Depth at Completion 15 ft

gineer K. Kemp Water Depth After Hours

ELEVATION DEPTH From	To	SOIL CLASSIFICATION	SAMPLE NO.	SAMPLE DEPTH From	To	STANDARD PENETRATION TEST BLOWS/6 INCHES
0.0	18.0	Brown moist medium dense fine sand & gravel				

otal Remarks:

AT 164

RECORD OF SOIL EXPLORATION

AMERICAN TESTING AND ENGINEERING CORPORATION

129 EAST 65TH STREET Phone: 253-2762 INDIANAPOLIS, INDIANA 46220

cted With McKinley Thompson Farms Boring # Site 6

Name Proposed Observation Well Job # EN 7504

on 3400 S. Harding, Indianapolis Station & Offset

e Elevation Boring Method HSA Sampling Method

Start 10/13/75 Finish 10/14/75 Weather & Temperature

on M. Haskett Water Depth at Completion 12 ft 10 in.

er K. Kemp Water Depth After Hours

STRATUM DEPTH From	To	SOIL CLASSIFICATION	SAMPLE NO.	SAMPLE DEPTH From	To	STANDARD PENETRATION TEST BLOWS/6 INCHES
0	18.0	Brown moist fine to coarse sand				

AT 104

ol Remarks: