



## U.S. Department of Energy

Oakland Operations Office, Oakland, California

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### ADDENDUM TO WORK PLAN for DATA GAPS INVESTIGATION

at the

Laboratory for Energy-Related Health Research (LEHR)  
University of California at Davis, California

*Submitted to:*

**United States Department of Energy**  
Oakland Operations Office  
1301 Clay Street  
Oakland, California 95612-5208

*Prepared by:*

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5500 Shellmound Street  
Emeryville, California 94608

September 16, 1997

DOE Oakland Operations Contract DE-AC03-96SF20686

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PROJECT: 17823  
CAT: 13924

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Approvals Page

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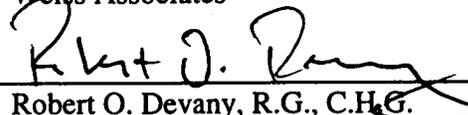
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September 16, 1997

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## ADDENDUM

This addendum to the "Final Work Plan for Data Gaps Investigation at the Laboratory for Energy-Related Health Research (LEHR), University of California at Davis, California" (IT Corporation, 1997) addresses drilling additional borings and collecting additional soil samples near four domestic septic systems (Septic Tanks No. 1, 3, 4, and 6) (Figure 1). The proposed borings will twin boreholes drilled on June 11 and June 12, 1997 located adjacent to four domestic septic systems and the Radium-226 seepage.

The primary objective of the June 1997 Data Gaps Investigation (DGI) was to collect the necessary information to determine if any of the domestic septic systems and/or Radium-226 seepage trench pose unacceptable risk to human health and the environment. This data will be used in preparing the Engineering Evaluation/Cost Analysis (EE/CA). To this end, soil samples were collected during the DGI and were submitted to the contract laboratory, LAS Laboratories Inc., of Las Vegas, Nevada, for radiological, volatile organic, semi-volatile organic, metals, and pesticides analyses.

Although the radiological, semi-volatile organic, and metals data recently reported to us by LAS meets standard quality measures, the LAS GC/MS volatile organics data and pesticides data do not, and these data may prove unreliable and unacceptable for use in the EE/CA. Therefore, because of the uncertainty surrounding these volatiles and pesticides data, and our immediate need for incorporating these volatiles and pesticides data into the EE/CA, we propose drilling additional borings and analyzing additional soil samples from the same general depths and vicinities as the June 1997 borings. The locations of the recently drilled June 1997 DGI borings and the proposed twin borings are presented on Figures 2, 3 and 4.

Data gaps field activities for the septic tanks will consist of:

- Underground Utility Clearance;
- Exploration hand augering and drilling at Tanks 1, 3, 4, and 6; and,
- Lithologic logging and sample collection (Table 1).

Each of these tasks is described in greater detail below. Sampling activities and analysis procedures will be in accordance with the analyses and procedures presented in the "Final Work Plan for Data Gaps Investigation (IT, 1997).

### *Underground Utility Clearance*

Underground utility clearance will be performed prior to the proposed drilling activities. A white box will be spray painted on the ground surface at each sampling location(s) to designate the specific area(s) requiring utility clearance. Underground Services Alert (USA) will be contacted at least 48 hours prior to the start of fieldwork and UC Davis Facilities Services will also be alerted to

the proposed fieldwork. The UC Davis Facilities Services Department will visit the proposed sampling locations and clear each location of UC Davis utilities.

If for any reason the UC Davis Facilities Services Department is uncertain as to the exact location of a utility, an independent line locator may be subcontracted to verify the UC Davis Facilities Service Department's utility clearance prior to the start of fieldwork. Once USA and UC Davis have cleared the proposed locations, fieldwork can begin. During the fieldwork, the first 5 ft of ground at each proposed soil boring location will be hand-augered as an additional safeguard against unknowingly damaging unmarked utilities.

#### *Exploration Hand-Augering and Drilling*

The proposed borings will be drilled using direct push drilling. Direct push drilling has been successfully used at LEHR in 1996 and 1997. This coring method produces minimal waste, provides high quality core for logging purposes, is rapid, and specific direct push rigs can be used in areas of limited access like those associated with Septic Tanks 3 and 4. During logging of the core, a photoionization detector (PID), Geiger Mueller Detector (GM), and scintillation detector (SCIN) will be used to screen for organic vapors and radionuclide activity. At the conclusion of deep soil sampling, coreholes will be backfilled to grade with grout. Grout will be mixed above ground and placed into the corehole with a tremie pipe. Unused core will be placed in a shallow trench located immediately near its point of origin and covered with native soil.

#### *Lithologic Logging and Sample Collection*

Lithologic logging of core will be performed using the USCS method. Soil sample collection during drilling will be according to Section 4.0 of the Data Gaps Workplan (IT, 1997) and in accordance with Table 1, attached. Direct push drilling methods will follow the Continuous Core Sampling System Methods in SOP 5.0 (IT, 1997, Appendix A). Sample handling, packaging, and shipping are described in SOP 2.0 (IT, 1997, Appendix A).

#### *Conclusion*

In conclusion, fieldwork will be conducted according to the Standard Operating Procedures (SOPs) presented in Appendix A of the "Final Work Plan for Data Gaps Investigation at the Laboratory for Energy-Related Health Research (LEHR), University of California at Davis, California" (IT Corporation, 1997). The field activities anticipated for this phase of the DGI will include:

- Sample Handling, Packaging, and Shipping (SOP 2.0);
- Chain-of-Custody (SOP 6.0);
- Logging of Soil – Visual USCS (SOP 3.0); and,
- Borehole Sampling (SOP 5.0).

Soil samples collected from the proposed borings will be analyzed by a contract laboratory for volatile organic compounds and for Pesticides/PCBs, by CLP SOW OLM 01.8 (or more recent).

Table 1. September 17, 1997 Sampling and Analysis Summary

Sampling Point	Sample ID	Number of Containers	Sample/ Container Type <sup>1</sup>	Preservative <sup>2</sup>	Turnaround <sup>3</sup>	Lab <sup>4</sup>	Analyze for:	Analytical Method	Special Instructions
Septic Tank 3	LEHR-S-T304	1	S/6-in Tubes	None	Normal	Quanterra	Volatile Organics - CLP	OLM01.8	
Septic Tank 3	LEHR-S-T304	1	S/6-in Tubes	None	Normal	Quanterra	Pesticides - CLP		HOLD
Septic Tank 3	LEHR-S-T304	1	S/6-in Tubes	None	Hold	Quanterra			
Septic Tank 3	LEHR-S-T305	1	S/6-in Tubes	None	Normal	Quanterra	Volatile Organics - CLP	OLM01.8	
Septic Tank 3	LEHR-S-T305	1	S/6-in Tubes	None	Normal	Quanterra	Pesticides - CLP		HOLD
Septic Tank 3	LEHR-S-T305	1	S/6-in Tubes	None	Hold	Quanterra			
Septic Tank 3	LEHR-S-T306	1	S/6-in Tubes	None	Normal	Quanterra	Volatile Organics - CLP	OLM01.8	
Septic Tank 3	LEHR-S-T306	1	S/6-in Tubes	None	Normal	Quanterra	Pesticides - CLP		HOLD
Septic Tank 3	LEHR-S-T306	1	S/6-in Tubes	None	Hold	Quanterra			
Septic Tank 4	LEHR-S-T404	1	S/6-in Tubes	None	Normal	Quanterra	Volatile Organics - CLP	OLM01.8	
Septic Tank 4	LEHR-S-T404	1	S/6-in Tubes	None	Normal	Quanterra	Pesticides - CLP		HOLD
Septic Tank 4	LEHR-S-T404	1	S/6-in Tubes	None	Hold	Quanterra			
Septic Tank 4	LEHR-S-T405	1	S/6-in Tubes	None	Normal	Quanterra	Volatile Organics - CLP	OLM01.8	
Septic Tank 4	LEHR-S-T405	1	S/6-in Tubes	None	Normal	Quanterra	Pesticides - CLP		HOLD
Septic Tank 4	LEHR-S-T405	1	S/6-in Tubes	None	Hold	Quanterra			
Septic Tank 4	LEHR-S-T406	1	S/6-in Tubes	None	Normal	Quanterra	Volatile Organics - CLP	OLM01.8	
Septic Tank 4	LEHR-S-T406	1	S/6-in Tubes	None	Normal	Quanterra	Pesticides - CLP		HOLD
Septic Tank 4	LEHR-S-T406	1	S/6-in Tubes	None	Hold	Quanterra			
Septic Tank 6	LEHR-S-T604	1	S/6-in Tubes	None	Normal	Quanterra	Volatile Organics - CLP	OLM01.8	
Septic Tank 6	LEHR-S-T604	1	S/6-in Tubes	None	Normal	Quanterra	Pesticides - CLP		HOLD
Septic Tank 6	LEHR-S-T604	1	S/6-in Tubes	None	Hold	Quanterra			

Sampling Point	Sample ID	Number of Containers	Sample/ Container Type <sup>1</sup>	Preservative <sup>2</sup>	Turnaround <sup>3</sup>	Lab <sup>4</sup>	Analyze for:	Analytical Method	Special Instructions
Septic Tank 6	LEHR-S-T605	1	S/6-in Tubes	None	Normal	Quanterra	Volatile Organics - CLP	OLM01.8	
Septic Tank 6	LEHR-S-T605	1	S/6-in Tubes	None	Normal	Quanterra	Pesticides - CLP		
Septic Tank 6	LEHR-S-T605	1	S/6-in Tubes	None	Hold	Quanterra			HOLD
Septic Tank 6	LEHR-S-T606	1	S/6-in Tubes	None	Normal	Quanterra	Volatile Organics - CLP	OLM01.8	
Septic Tank 6	LEHR-S-T606	1	S/6-in Tubes	None	Normal	Quanterra	Pesticides - CLP		
Septic Tank 6	LEHR-S-T606	1	S/6-in Tubes	None	Hold	Quanterra			HOLD
Trench T1A0	LEHR-S-T1A05	1	S/6-in Tubes	None	Normal	Quanterra	Volatile Organics - CLP	OLM01.8	
Trench T1A0	LEHR-S-T1A05	1	S/6-in Tubes	None	Normal	Quanterra	Pesticides - CLP		
Trench T1A0	LEHR-S-T1A05	1	S/6-in Tubes	None	Hold	Quanterra			HOLD
Trench T1A0	LEHR-S-T1A06	1	S/6-in Tubes	None	Normal	Quanterra	Volatile Organics - CLP	OLM01.8	
Trench T1A0	LEHR-S-T1A06	1	S/6-in Tubes	None	Normal	Quanterra	Pesticides - CLP		
Trench T1A0	LEHR-S-T1A06	1	S/6-in Tubes	None	Hold	Quanterra			HOLD
Trench T1A0	LEHR-S-T1A07	1	S/6-in Tubes	None	Normal	Quanterra	Volatile Organics - CLP	OLM01.8	
Trench T1A0	LEHR-S-T1A07	1	S/6-in Tubes	None	Normal	Quanterra	Pesticides - CLP		
Trench T1A0	LEHR-S-T1A07	1	S/6-in Tubes	None	Hold	Quanterra			HOLD
Equipment Rinsate Sample	LEHR-W-T607	3	W/V	HCl	Normal	Quanterra	Volatile Organics - CLP	OLM01.8	
Equipment Rinsate Sample	LEHR-W-T607	2	W/1-L Amber	None	Normal	Quanterra	Pesticides - CLP		

Notes:

- 1 = Water; S = Soil; V = Clear VOA; VB = Brown VOA; O+G = Oil and Grease Bottle; T = Brass Tube; Other (Specify in Special Instructions)
- 2 = None; specify any preservative desired
- 3 = Normal; Rush (include desired turnaround); Hold (spell out)
- 4 = Quanterra Incorporated, 13715 Rider Trail North, Earth City, MO 63045

## REFERENCES

IT Corporation, 1997, Final Work Plan for Data Gaps Investigation, Laboratory for Energy-Related Health Research (LEHR), University of California at Davis, California, June 1997, 30 pp., 3 tables, 5 figures, 1 appendix.

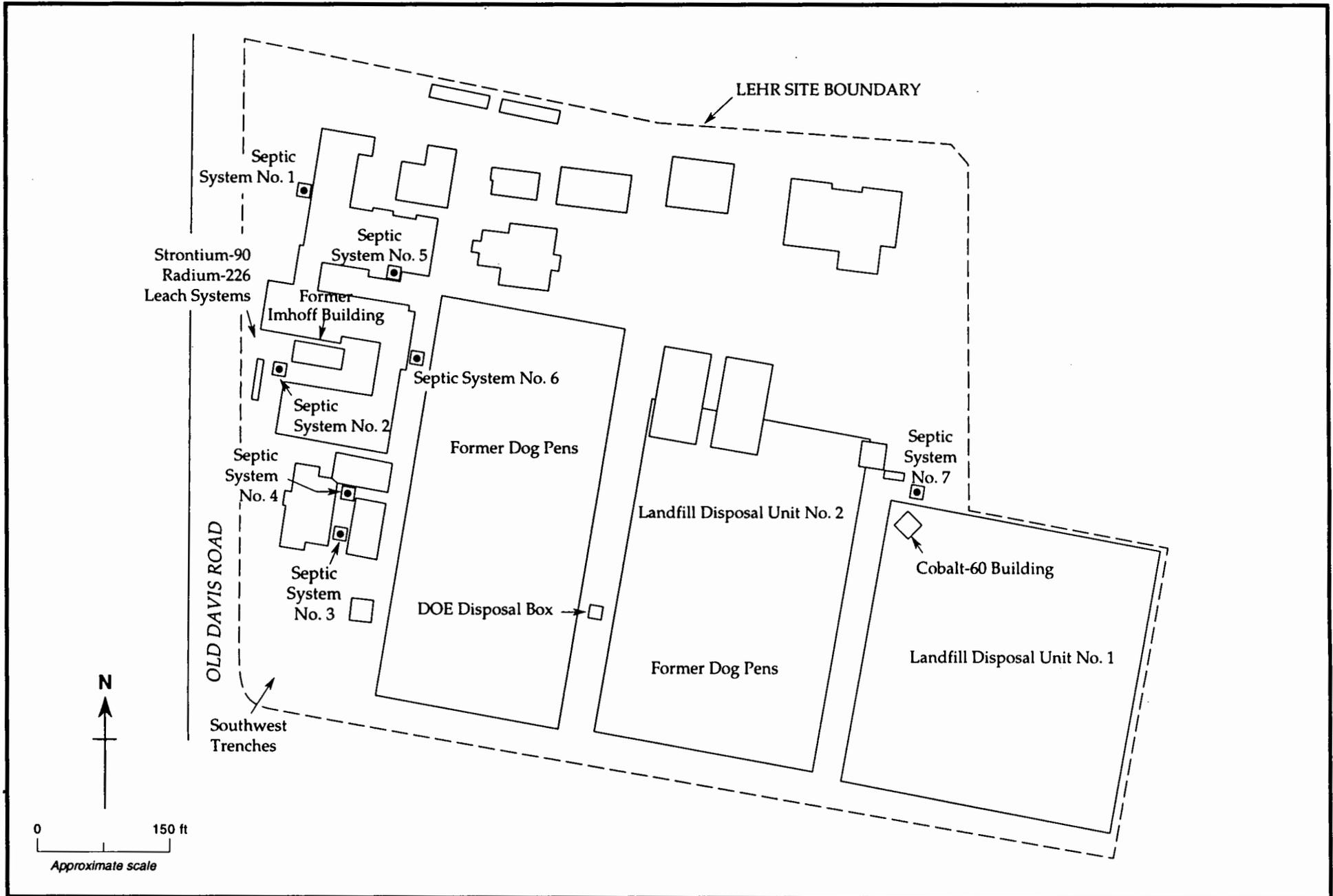


Figure 1. LEHR Septic Tank Locations (OU-4) - LEHR Site, Davis, California

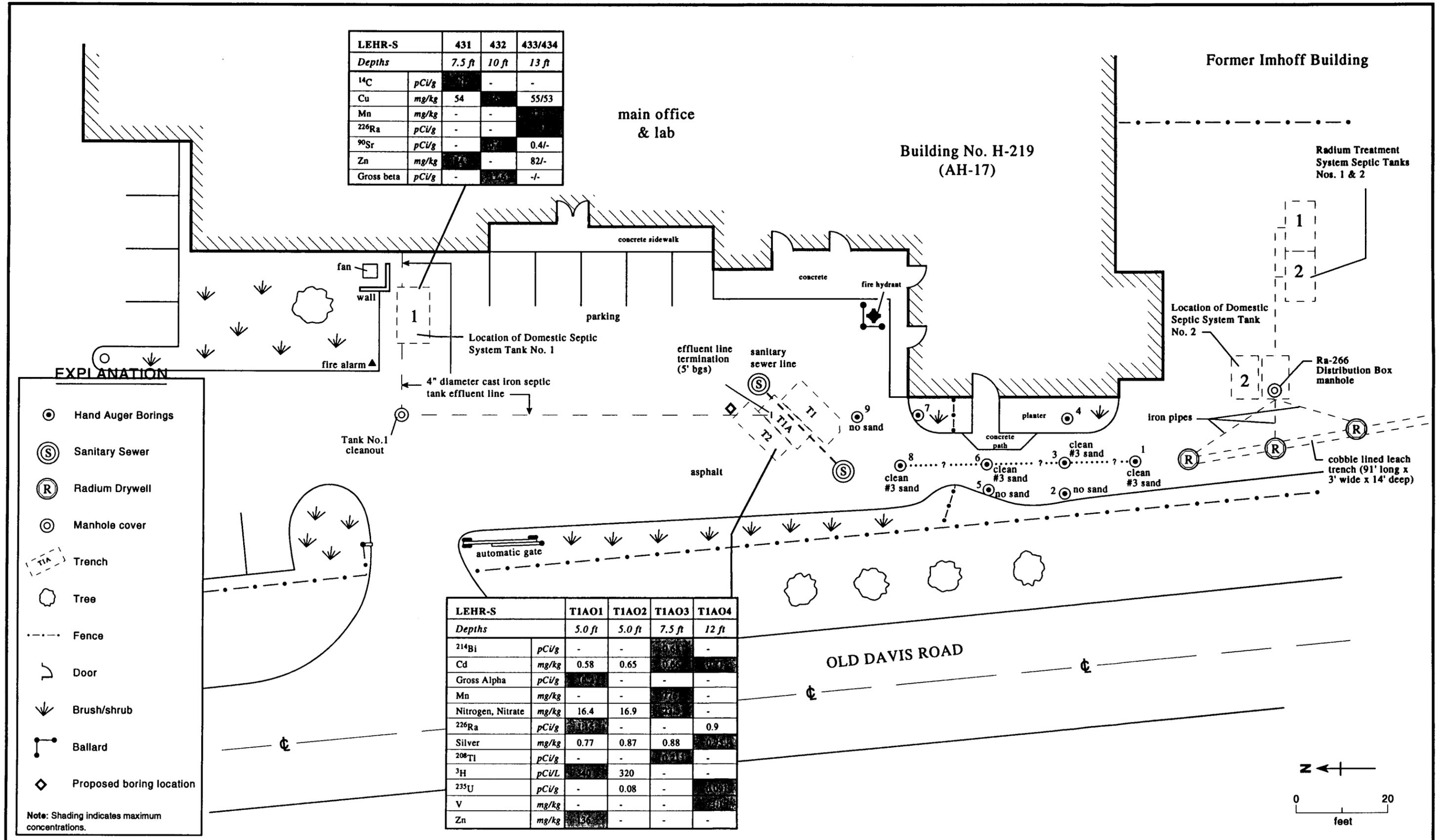


Figure 2. Analytic Results Above Background for Soil Samples and Proposed 9/17/97 Boring Locations, Domestic Septic System No.1

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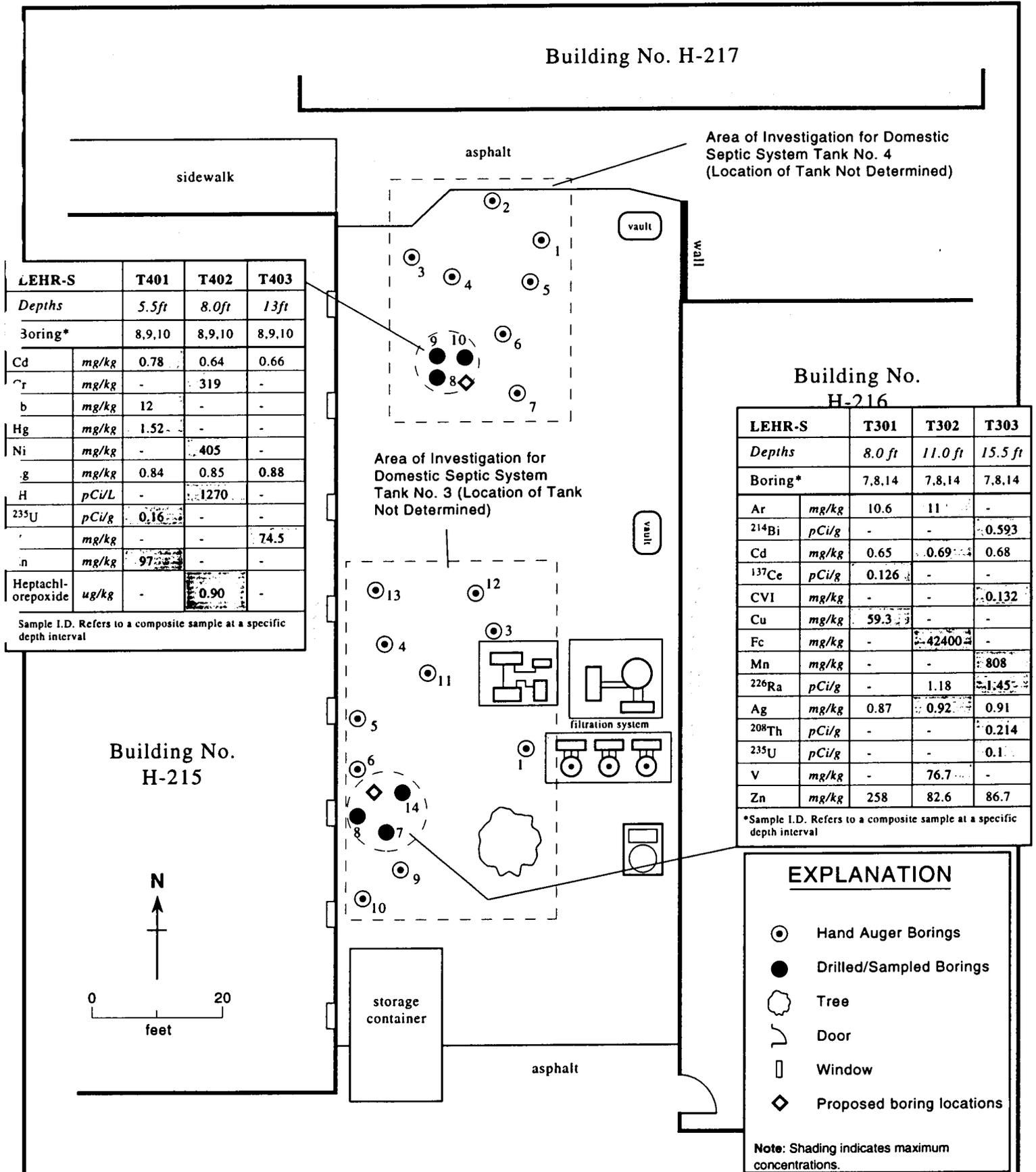


Figure 3. Analytic Results Above Background for Soil Samples and Proposed 9/17/97 Boring Locations, Domestic Septic System No. 3&4

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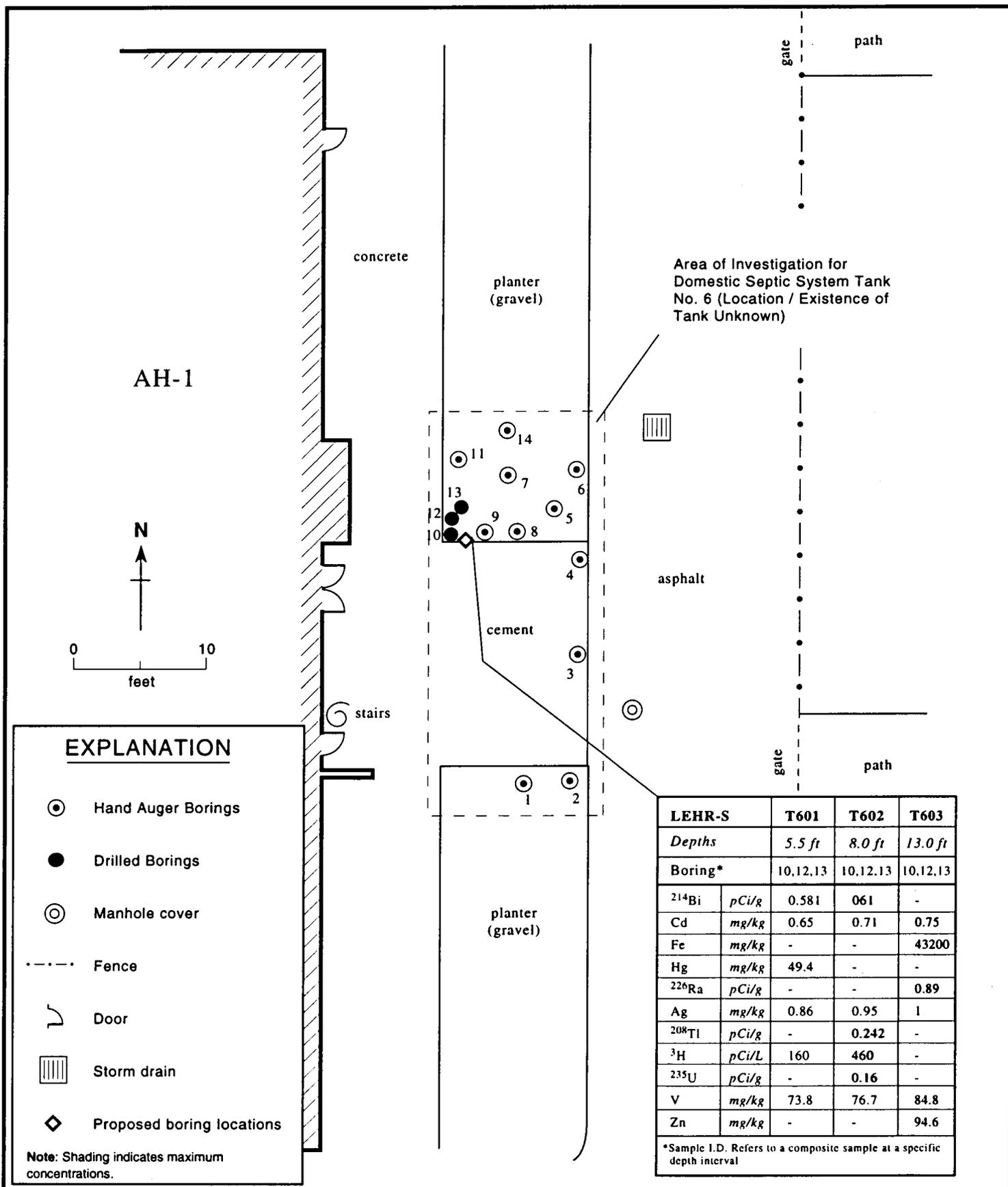


Figure 4. Analytic Results Above Background for Soil Samples and Proposed 9/17/97 Boring Locations, domestic Septic System No. 6