PA/SI 1.6

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DATA SUMMARY EVALUATION REPORT FOR SITE INVESTIGATIONS OF OPEN BURN/OPEN DETONATION AREA, CUSTER HILL WASTEWATER PONDS, AND BUILDING 1301 AREA AT FORT RILEY, KANSAS

17 December 1993

Prepared for United States Army Engineer District, Kansas City CEMRK-ED-TP 601 East 12th Street Kansas City, Missouri 64106-2896

> Prepared by Louis Berger & Associates, Inc. 1819 H Street, N.W., Suite 900 Washington, D.C. 20006



Table 3Data Summary Organic Matrix

Free Product Sampling, Custer Hill Waste Water Pond

Laboratory Continental Analytical Services, Inc. Report ID 19634/20003

Client Army Corps of Engineers, Kansas City District

Project Fort Riley, Kansas Sampling Date November 3, 1993

Fraction: Volatiles, Semivolatile Petroleum Hydrocarbons, Total Organic Halogen.

Results are reported for TCL-VOC as ug/l, mg/kg all others.

Analyte	Lab Blank
TPH-OA2	ND
TCL VOAs	ND
тох	ND

ND Not Detected

qasmtabl.pro

Table 4 Analytical Results Report ID <u>19634/20003</u> Free Product Analysis, Custer Hill Waste Water Pond-Samples collected 11/3/93 All results are mg/l, unless indicated

Analyte	EPMW-PRO
TPH-OA2	1,100,000 (mg/kg)
тох	840 (mg/kg)
Ethylbenzene	600 ^н
m,p-xylene	2200 ^H
o-xylene	910 ^H
Toluene	1100 ^H
2-Chloroethyl Vinyl Ether	ND ^{H,M}

(H) Recommended holding time exceeded. Result is an estimate.

(M) Reporting limit higher than normal due to matrix interferences.

DATSMPRO.634

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16 December 1993

Ms. Joan Pamperien U.S. Army Engineer District, Kansas City ATTN: CEMRK-ED-TP 601 East 12th Street Kansas City, MO 64106-2896

RE: Data Summary and Evaluation Report, High Priority Sites Contract No. DACA41-92-D-001

Dear Ms. Pamperien:

Enclosed are four copies of the DSER for the Highe Priority Sites, including the Open Burn/Open Detonation Area, the Custer Hill Ponds and Building 1301 Area. Copies are being forwarded to the parties to the IAG to arrive on 17 December.

Sincerely, LOUIS BERGER & ASSOCIATES 5 7 David E. Egan, CPG Principal Scientist

Enclosures

cc: Katie Watson, Fort Riley DEH (5 copies) Scott Marquess, EPA Region VII (2 copies) Randy Brown, KDHE (2 copies) Doug Taggert, MRD (1 copy) Joe King, AEC (2 copies)

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1.0 OVERVIEW

This Data Summary and Evaluation Report (DSER) presents a summary of the major findings from the field investigations conducted as part of the Site Investigations (SI) of the High Priority Sites at Fort Riley, Kansas. The SIs included the open burn/open detonation area, the former fire training pit at Marshall Army Airfield, the Custer Hill wastewater ponds and Building 1301 area. The SI data for the former fire training pit has been presented in a separate DSER, dated 17 December 1993, and is not presented here. This DSER contains data on the remaining three high priority sites.

To provide a context for the data reported in this DSER, a brief overview of each site and the SI activities are presented. More complete information on the sites and the SI activities is located in the following documents:

- □ Draft Final Installation Wide Site Assessment for Fort Riley, Kansas, as revised 16 February 1993.
- □ Draft Final Sampling and Analysis Plan for Site Investigations of High Priority Sites at Fort Riley, Kansas, 20 August 1993.
- □ Comprehensive Basic Documents for the Site Investigations at Fort Riley, Kansas (version dated 20 August 1993).

This DSER is organized by site as follows: Section 2.0 - Open Burn/Open Detonation Area, Section 3.0 - Custer Hill Wastewater Ponds, and Section 4.0 - Building 1301 Area. Within each section, a summary of analytical data from the SI is presented. The complete analytical data package for environmental samples analyzed at an off-site laboratory is contained in the following document:

Quality Control Summary Report for Site Investigations of High Priority Sites at Fort Riley, 17 December 1993.

In addition, this DSER includes two attachments. Attachment A presents the complete data package for the chemical analyses for soil gas and groundwater screening samples performed in the field. Attachment B provides soil boring logs and data sheets providing information on groundwater monitor well construction and development.

Within each of the sections, the analytical results for the SI are compared against regulatory standards and guidelines. For groundwater samples, the regulatory standards include Maximum Contaminant Levels (MCLs) established by the U.S. Environmental Protection Agency (EPA) and Kansas Action Levels (KAL) and Kansas Notification

Levels (KNL) established by the Kansas Department of Health and Environment (KDHE). These same standards are used for surface water; however, ambient water quality criteria are also used, which represent levels published by EPA where no harmful effects on the environment are expected. In contrast, few regulatory guidelines have been established by EPA or KDHE for contaminant levels in soils and sediments. Therefore, the soil and sediment tables also present risk-based concentrations for contaminants in soils that are published and distributed by EPA Region III. The risk-based concentrations are based on fixed levels of risk (e.g., a hazard quotient of 1 for non-carcinogenic substances and a lifetime cancer risk of 10⁻⁶ for carcinogenic substances) and are used by EPA as a quick screen for contaminants in soil for both commercial/industrial and residential soils. The soil and sediment concentrations at all three sites discussed in this DSER are compared against the commercial/industrial risk-based concentrations.

The data presented in this DSER are presented in the following units:

- \square micrograms per liter (ug/l) and milligrams per liter (mg/l) for aqueous samples.
- □ micrograms per kilogram (ug/kg) and milligrams per kilogram (mg/kg) for soil and sediment samples.

The units ug/l and ug/kg are approximately equivalent to parts per billion, and the units mg/l and mg/kg are approximately equivalent to parts per million.

2.0 OPEN BURN/OPEN DETONATION AREA

The explosive ordnance disposal (EOD) unit at Fort Riley recovers ordnance materials from Fort Riley and from a multi-state area for the Department of Defense and other state and federal agencies. Effective August 1991, the mission of the 74th EOD at Fort Riley, Kansas has been to provide routine and emergency EOD support to military installations, operations, and exercises, and to civilian and Federal authorities within its assigned geographical area of operation. This area of operation includes the State of Kansas, State of Nebraska, parts of Missouri, and parts of South of Dakota.

The 74th EOD performs ordnance disposal via open burning and open detonation (OB/OD) at Range 16 within the Impact Area of Fort Riley. Figure 2-1 provides the general location of the EOD range, which is synonymous with the OB/OD area. The currently used area at the OB/OD area is approximately 1,000 feet by 350 feet and has been used for this purpose since 1941 (although, as explained below, some former site features are outside the boundaries of the area currently used).

Open detonation of waste ordnance is generally conducted on a quarterly basis; however, detonation events are scheduled and conducted based on need. Detonation is conducted on the open ground which creates crater-like pits in the natural soil of the OB/OD area. These pits are the result of the detonations and increase in size with use. These pits generally reach a maximum size of 10 to 20 feet deep and 25 feet in diameter. Open detonation pits are filled in approximately once per year by back filling the excavated soil surrounding the pits.

Open burning is performed at a specific, dedicated location within the OB/OD Area. This area is characterized by a small pit dug into the soil on which a metal grating rests. The pit measures approximately 3 feet wide by 7 feet and is surrounded by a horse-shoe shaped embankment approximately 9 feet above the surrounding ground surface. The open burn pit is primarily used to dispose of black powder and phosphorous based munitions. Materials are disposed of by dousing them with petroleum hydrocarbons (typically diesel fuel) and igniting them.

In December of 1990, one 105 millimeter depleted uranium (DU) round was inadvertently included in ordnance disposal activities. The round contained an eight pound DU penetrator, described by the Army as a cylindrical object with a diameter of approximately one-inch and length of approximately one foot. The detonation of the DU round was accidental; the round had been mistakenly classified and labelled. Upon discovery of its detonation, the site was visually searched, and in June 1993 the surface of the detonation area was surveyed for radioactivity using a Radiac meter. No trace of the DU penetrator was uncovered as a result of either search effort.

At the time of the site inspection, five active and former detonation pits were present. Also, in addition to the active burn pit, a former burn pit was identified approximately 200 feet to the south. The areas outside and between the detonation pits and burn pits is covered with tall grasses and shrubs. A mesic (wet) area is located to the west of the site between the site and an intermittent stream.

As stated above, the OB/OD area is located within the Impact Area used by Fort Riley for numerous active ranges. An environmental investigation was conducted of the Impact Areas as a whole in 1992. The investigation consisted of the installation and sampling of ten groundwater monitor wells around the perimeter of the Impact Area and the collection of stream sediment and aqueous samples along intermittent tributaries draining the Impact Area. A summary of the environmental sampling data from the Impact Area investigation is used in this DSER as a comparison with the results of this SI.

Additional information on the site and surrounding area can be found in the following two documents:

- □ Final Subpart X Portion of RCRA Part B Application Open Burning/Open Detonation Area for Fort Riley, Kansas, 21 May 1993.
- Draft Final Impact Area Site Assessment for Fort Riley, Kansas, 11 March 1993.

2.1 Overview of SI Activities

Sampling at the site was conducted according to the Sampling and Analysis Plan (SAP) for Site Investigations of High Priority Sites (20 August 1993). The SI was designed such that samples would be collected from within active pits used for burning and detonation of ordnance. These sampling locations are those likely to produce the highest concentrations of explosive residues, if any are present. In addition, soil samples were collected from the surface and subsurface at locations throughout the OB/OD Area to assess whether residual contamination is present from formerly used pits. Lastly, potential contaminant migration pathways were sampled and included surface water and groundwater pathways. Surface water pathways were assessed by sampling Threemile Creek and by sampling it's tributary. Groundwater was assessed by installation and sampling of monitoring wells. The SI sampling locations are shown in Figure 2-2.

Due to the presence of unexploded ordnance (UXO), the SI included surface reconnaissance for UXO with geophysical equipment and downhole clearance of soil borings. A variety of small caliber shells were identified during the SI and isolated for Fort Riley EOD. Also, radiation surveys were performed over the area using a Multi-Channel Analyzer (MCA) at the site prior to field activities. In addition, specific sample collection locations, samples, access ways, drill cuttings, and boots, hands, and clothing of field personnel were screened using a Geiger Mueller instrument. No readings above background were registered during the radiation survey or screenings.

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As shown on Figure 2-2, the SI included collection of the following samples:

- eight surface soil samples (SS1 through SS8) were collected from within pits and across the OB/OD area:
- 23 subsurface soil samples were collected from eight deep soil borings (SB1 through SB8); one of the deep borings (SB1) was used to continue installation of groundwater monitoring well OB-93-04 and is not shown separately on Figure 2-2; three samples were collected from each boring except SB8 where only two samples were collected because of shallow auger refusal;
- three shallow soil borings were installed near the opening to the active open burn pit (SB10 a, b and c); two samples were retained for chemical analyses (one from SB10a and one from SB10b); these shallow soil borings were not included in the SAP but were added because the high amount of UXO debris near the open burn pit prevented the UXO clearance specialists from identifying an acceptable location to install a deep boring by the burn pit with the drilling rig, as originally planned;
- three sediment samples were collected along the intermittent tributary to Three-mile Creek (one upstream from the site, one due west of the site and one downstream from the site); the stream was flowing at the time of the SI and two aqueous samples were collected (at the sediment sampling locations due west and downstream of the site); and
- four groundwater monitor wells were installed and sampled -- one upgradient from the site to the northeast and three downgradient of the site to the southeast and south.

A summary of the chemical analyses performed on the environmental samples is collected presented below. All of the samples (with the exception of those added in the shallow from 2 borings) were analyzed for explosives and metals, including uranium. In addition, the surface soil sample from the open burn pit, shallow and deep soil boring samples from the locations nearest the open burn pit, and the groundwater well downgradient of the open burn pit were analyzed for volatile and semi-volatile organic compounds. In addition, the soil samples from within the open burn pit and at the mouth of the open burn pit were analyzed for total petroleum hydrocarbons. Groundwater was also analyzed for select anions (nitrate, nitrite, sulfate and phosphate).

As shown in Table 2-1 and as outlined in the SAP for the OB/OD area, four soil samples (two surface and two subsurface) were selected for metals analyses using the Toxicity Characteristic Leaching Procedure. The samples selected are as follows:

the surface soil samples from SS1 and SS6;

Shallow 600785

DSER - High Priority Sites

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the shallowest sample from soil boring SB3; and ••••

the deepest sample from soil boring SB7.

The results of the TCLP analyses are not available for this DSER but will be presented t at - it doesn't match up w/ the text

16 Table 2-1 - Overview of Chemical Analyses for SI Samples

	Surface Soil	Shallow Soil Borings	Deep Soil Borings	Ground- water	Surface Water	Sediment
Explosives-EPA Method 8330	X		x	X	X	X
Priority Pollutant Metals- EPA Method 7000 Series/6010	X		X	X	X	x
TCLP Metals-EPA Methods 1311 & 7000 Series/6010*	X		X			
Uranium-EPA Method 6020 (ICP)	X		x	X	X	X
Anions-EPA Methods 335.2, 345.1, 406C and 9036				X		
Volatiles-EPA Method 8240	X	[•] X	X	X		
Semi-Volatiles-EPA Method 8270	X	X	X	X		
Total Petroleum Hydrocarbons- EPA Method 8015 Modified		X	X			

* Analytical results pending.

8 total sample locations Surface soil List bused 26ppb I Sample ROX 2500 Berryllium Frample Shallow soil Isample din-nitrotoluene \$ 4900 KB 2000 all samples Berrylium GW MCL KNC MW-4 TCE 29 0.5 1.3 MW3TCE

2.2 Summary of SI Results

A summary of the positive analytical detections for the OB/OD area are presented in Tables 2-2 through 2-6, which are organized by sample media. The results are compared with regulatory standards, as discussed in Section 1.0. In addition, the results for the groundwater and stream sampling are compared with the findings for the Impact Area. [There are no comparable results for soils in the Impact Area investigation.]

Table 2-2 presents the positive detections for the eight surface soil samples. Explosive compounds (RDX and Di-nitrotoluene) were detected at two locations - SS1 and SS3. SS1 was collected from within the open burn pit and SS3 was collected from within a detonation pit. Di-n-butyl-phthalate was also detected in SS1. Metals, including uranium, were detected in all samples. The concentration of RDX at SS3 (2,500 ug/kg) exceeds the EPA risk-based concentration of 26 ug/kg for industrial/commercial soils. Beryllium concentrations at locations SS2 through SS8 (ranging from 0.8 to 1.1 mg/kg) also exceed the EPA risk-based concentration of 0.67 mg/kg for industrial/commercial soils. No other concentrations exceed regulatory standards.

Table 2-3 presents the positive detections for the 8 deep (23 samples) and the two shallow (two samples) soil borings. Of the deep soil borings, seven of the eight borings were drilled to depths of 18 to 20 feet. At SB8, auger refusal was encountered at less than 10 feet. In general, undisturbed soils were encountered at depths of two to four feet beneath the surface. For borings SB1 through SB7, the shallowest sample includes disturbed soils, the middle sample is from undisturbed soils immediately beneath the disturbed soils, and the deep sample is from undisturbed soils At boring SB8, only the disturbed soils and the immediately at greater depth. underlying soils were sampled. As shown in Table 2-3, the explosive di-nitrotoluene was detected in only one sample the shallow sample from SB8. The detected concentration of 4,900 ug/kg exceeds the risk-based concentration of 2,000 ug/kg for commercial/industrial soils. Metals, including uranium, were detected in all samples. Beryllium concentrations ranged from 0.6 to 1.3 mg/kg. The beryllium concentrations exceed the risk-based level of 0.67 for industrial/commercial soils in all samples except the deep sample from SB6. No other metals exceed risk-based levels. No other contaminants were detected.

Table 2-4 presents the results of the stream aqueous samples. Uranium was detected in both samples. The concentrations are below regulatory standards and are below the highest level reported in the Impact Area investigation. No other contaminants were detected.

Table 2-5 presents the results of the stream sediment sampling. A variety of metals, including uranium, were detected in all samples. The concentrations in SD-1, the upstream sediment sample, are the same (and sometimes higher) than the concentrations in the downstream sediment samples. With the exception of beryllium, the detected

concentrations were below the highest reported concentration for the Impact Area investigation.

Table 2-6 presents the results of the groundwater sampling. Following the discussion of the groundwater analytical data, an overview of the groundwater setting and well placement is provided. The positive detections in groundwater include uranium, sulfate, nitrate and trichloroethylene (TCE). The highest concentration was reported for OB-93-01 (.0043 to .0057 mg/l) whereas the upgradient well, OB-93-02 had a reported concentration of .0023 mg/l. The highest concentration for groundwater in the Impact Area investigation is .0048 mg/l. The detected uranium concentrations do not exceed regulatory standards. Similarly, the detections of nitrate and sulfate do not exceed regulatory standards. The detections of TCE range from 1.3 ug/l in OB-93-03 to 29 ug/l in OB-93-04. The concentration in OB-93-04 exceeds the MCL and KAL of 5.0 ug/l.

The total depths of the ground water monitoring wells range between 51 feet and 77 feet below the ground surface. Lithologic logs and well completion records for the wells are provided in Attachment 2. The depth of the well was determined based on the depth at which the first sustainable water-bearing zone was encountered. The depth to bedrock beneath the site ranged from approximately 10 to 20 feet. In some of the borings, small amounts of water (up to 1.5 feet) were present in the boreholes at the interface between overburden and bedrock. However, upon bailing of the boreholes, the groundwater did not noticeably recharge at any boring. Thus, all wells were advanced into bedrock and completed in the first water-bearing zone. Upon encountering the first water-bearing zone at each well, the groundwater levels rose in the borehole, indicating that confining conditions exist.

Figure 2-3 presents an east-west geologic cross-section for the site. Data from the Impact Area investigation was used to identify specific geologic formations at the OB/OD area. In constructing these cross-sections, the Shroyer Limestone and underlying Havensville Shale provide the principle correlative units. Presence of these units are also found in many of the groundwater monitoring wells installed during the 1992 Impact Zone investigations and therefore can be used to tie the OB/OD Area geology to the overall subsurface geology (Impact Area Draft Final Report, March 1993). The Havensville Shale in particular provides a distinct marker bed of very dark grey to black shale found in all four of the OB/OD Area wells as well as in two 1992 Impact Area wells located along Vinton School Road (i.e., MW-IZ92-010 and MW-IZ92-011).

As is shown in the geologic cross-section, the first water-bearing zone was encountered in the Schroyer limestone at OB-93-02. Although not shown, the first water-bearing zone at OB-93-02 is also the Schroyer limestone. However, the first water-bearing zone was encountered in an underlying formation in wells OB-93-03 and OB-93-04 -the Threemile limestone formation of the Wreford limestone. The two waterbearing limestones are separated stratigraphically by less than 10 feet of shale. Since no three monitoring wells intercept the same water bearing zone, no ground water gradient map can be developed. However, as indicated in the Impact Area report (Draft Final, March 1993) the flow of groundwater within the bedrock is moving downdip toward the west. Groundwater in wells OBOD-93-02 through 04 is under significant pressure as indicated by static water level above the saturated zone in these wells. In OBOD-93-01, the shallowest of the four wells, groundwater is only under slight pressure. This may indicate that the weathered shale and clay units above the water bearing zones provides an effective seal (i.e., aquitard). It may also indicate that the recharge area is updip of the OB/OD Area.

2.3 Discussion of SI Results

A detailed discussion of the results of the SI will be presented in an SI report to be completed at a later date. This section presents several observations regarding the data presented in Section 2.0.

- □ Explosive residues were not widespread across the site; rather, they were found in only three soil samples, all from the surface or shallow disturbed materials.
- □ The concentrations of beryllium are fairly uniform across all samples. The data has not yet been compared to local and regional data to assess whether they are significantly different from naturally-occurring, background concentrations.
- □ The Fort Riley area was subjected to massive regional flooding as a result of high amounts of rainfall in July 1993. Remnants of high water from the flood were evident throughout the area during the SI field work in the fall of 1993. If sustainable groundwater was not encountered in the overburden materials at the site during the SI, it is considered unlikely that sustainable groundwater will be present in the overburden in the future.

17 December 1993

				pr' Sa	mple Locatio	n			······································	
Analyte	and an			d'ix !	Sample ID #					Risked-Based Concentrations
(μg/kg organics) (mg/kg inorganics)	<u>SS-1</u> OBOD SS1001	SS-2 OBOD	<u>SS-3</u> OBOD SS3001	<u>SS-3</u> OBOD SS9001 ^A	<u>SS-4</u> OBOD SS4001	<u>SS-5</u> OBOD SS5001	<u>SS-6</u> OBOD SS6001	<u>SS-7</u> OBOD SS7001	<u>SS-8</u> OBOD SS8001	Commercial/ Industrial Soil
otal Solids %	73	78	80	79	80	76	69	78	83	
Explosives		<u>. · ·</u>		LA						
2,4-di Nitrotoluene	1.0	<u> </u>	.001		ND	ND	ND	ND	ND	
RDX ^B	ND ^H	ND ^H	ND ^H	2500 ^{H²}	ND	ND	ND	ND	ND	26
Metals	1 1									<u> </u>
Arsenic	3	4	4	2	4	3	3	3	6	310
Beryllium		0.8	0.9	.0.9	1.0	1.1	1.0	0.9	1:0	0.67
Cadmium	1.0	0.9	1.3	1.6	0.9	0.8	0.9	1.0	0.7	510
Chromium	15	15	24	18	23	22	26	23	25	5100 ^c
Copper	93	19	100	95	280	210	320	59	20	38000
Nickel	22	15	20	18	18	17	19	17	22	20000
Lead	140	30	50	50	50	110	180	45	60	500-1000 ^D
Zinc	320	60	190	250	180	140	230	100	61	310000
Uranium	1.8	1.9	0.97	1.1	1.2	1.2	1.2	1.1	1.5	3100 ^E
Volatiles	ND	NA	NA	NA	NA	NA	NA	NA	NA	

All results in dry weight. Note:

Not Analyzed NA:

Not Detected ND:

H:

Recommended holding time exceeded. Result is an estimate. Reporting limit higher than normal due to matrix interference. M:

A: Duplicate of OBODSB6001

B: RDX - Cyclotrimethylenetrinitramine or Hexa-1,3,5-trinitro-1,3,5-triazine

C: Value for Chromium VI

D: EPA Guideline for Lead

E: Soluble Salts

TABLE 2-3 - OB/OD AREA SOIL BORING RESULTS

(Page 1 of 3)

<u>Analyte</u> (µg/kg organics) (mg/kg inorganics)		Sample Location Sample ID # Sample Footage Interval										
	<u>SB-1</u> OBOD <u>SB 1001</u> 1-2	<u>SB-1</u> OBOD <u>SB 1002</u> 7-9	<u>SB-1</u> OBOD <u>SB 1003</u> 11.5-12.5	<u>SB-2</u> OBOD <u>SB 2001</u> 3-5	<u>SB-2</u> 0BOD <u>SB 2002</u> 7-8.5	<u>SB-2</u> 0BOD <u>SB 2003</u> 10-11	<u>SB-3</u> OBOD <u>SB 3001</u> 1-3.5	<u>SB-3</u> OBOD <u>SB 9001</u> ^A 1-3.5	<u>SB-3</u> 0B0D <u>SB 3002</u> 4.5-6	Commercial/ Industrial Soil		
Total Solids %	84	83	80	82	84	81	80	82	84			
Explosives	ND ^H	ND ^H	ND ^H	ND	ND	ND	ND	ND	ND	·		
Metals Arsenic	4	5	3	5	3	3	5	6	4	310		
Beryllium	0:8		1.0	1:0	0.8	0.9	411	10	- 1.0	0.67		
Cadmium	0.7	0.8	ND	0.7	ND	ND	0.6	0.7	0.6	510		
Chromium	17	23	23	21	19	16	23	21	17	5100 ^c		
Copper	11	14	14	15	10	9	19	28	11	38000		
Nickel	13	18	16	18	15	14	19	17	15	20000		
Lead	18	18	15	15	19	20	22	30	14	500-1000 ^D		
Zinc	44	61	54	52	40	38	63	62	44	310000		
Uranium	1.0	1.9	1.0	1.4	2.2	0.92	1.3	1.5	2.7	3100 ^E		
Volatiles	NA	NA	NA	NA	NA	NA	NA	NA	NA			
Semi-Volatiles	NA	NA	NA	NA	NA	NA	NA	NA	NA			
Total Petroleum Hydrocarbons	NA	NA	NA	NA	NA	NA	NA	NA	NA			

Note: All results in dry weight.

- NA: Not Analyzed
- ND: Not Detected
- H: Recommended holding time exceeded. Result is an estimate.

M: Reporting limit higher than normal due to matrix interference.

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- A: Duplicate of OBODSB6001
- C: Value for Chromium VI
- D: EPA Guideline for Lead
- E: Soluble Salts

 TABLE 2-3 - SOIL BORING RESULTS (continued)

<u>Analyte</u> (µg/kg organics)		<u>Sample Location</u> <u>Sample ID #</u> Sample Footage Interval											
(mg/kg inorganics)	<u>SB-3</u> OBOD <u>SB 3003</u> 12-13.5	<u>SB-4</u> OBOD <u>SB 4001</u> 2-3	<u>SB-4</u> OBOD <u>SB 4002</u> 5-6	<u>SB-4</u> OBOD <u>SB 4003</u> 11.5-13.5	<u>SB-5</u> OBOD <u>SB 5001</u> 0-4	<u>SB-5</u> OBOD <u>SB 5002</u> 5-6	<u>SB-5</u> OBOD <u>SB 5003</u> 9-10	<u>SB-6</u> OBOD <u>SB 6001</u> 4.5-8	<u>SB-6</u> OBOD <u>SB 10001</u> ^A 4.5-8	Industrial Soil			
Total Solids %	81	83	83	81	80	81	79	81	81				
Explosives	ND	ND	ND	ND	ND	ND	ND	ND ^H	ND ^H				
Metals Arsenics	3	5	3	3	5	4	4	3	3	310			
Beryllium	1.0	1.0	1.0	0.9	1.0	1.0	1:0 ¹	1.0		0.67			
Cadmium	ND	0.7	ND	ND	0.8	ND	ND	0.9	ND	510			
Chromium	14	18	22	17	19	19	14	20	20	5100 ^c			
Copper	10	12	10	10	13	12	11	12	12	38000			
Nickel	19	14	17	19	16	23	19	16	21	20000			
Lead	13	14	9	10	17	16	11	15	15	500-1000 ^D			
Zinc	42	43	49	69	50	73	59	48	53	310000			
Uranium	0.87	1.1	1.1	0.97	1.5	1.3	0.77	1.2	1.3	3100 ^E			
Volatiles	NA	NA	NA	NA	NA	NA	NA	NA	NA				
Semi-Volatiles	NA .	NA	NA	NA	NA	NA	NA	NA	NA				
Total Petroleum Hydrocarbons	NA	NA	NA	NA	NA	NA	NA	NA	NA				

All results in dry weight. Note:

B: C:

Not Applicable ND: Not Detected NA:

Recommended holding time exceeded. Result is an estimate. D: Duplicate of OBODSB6001 E: H:

A:

RDX - Cyclotrimethylenetrinitramine or Hexahydro-1,3,5-trinitro -1,3,5-triazine

Value for Chromium VI

EPA Guideline for Lead

Soluble Salts

(Page 2 of 3)

 TABLE 2-3 - SOIL BORING RESULTS (concluded)

(Page 3 of 3)

<u>Analyte</u> (µg/kg organics)		Sample Location Sample ID # Sample Footage Interval)									
(mg/kg inorganics)	<u>SB-6</u> OBOD <u>SB 6002</u> 11.5-12.5	<u>SB-7</u> OBOD <u>SB 7001</u> 1-3	<u>SB-7</u> OBOD <u>SB 7002</u> 4.5-5.5	<u>SB-7</u> OBOD <u>SB 7003</u> 7.5-8.5	<u>SB-8</u> OBOD <u>SB 8001</u> 1.8-2.8	<u>SB-8</u> OBOD <u>SB 8002</u> 3-4	<u>SB-10A</u> OBODSB <u>10A-001</u> 1.3-1.6	<u>SB-10B</u> OBODSB <u>10B-001</u> 2.3-2.8	Risked Based Concentrations; Commercial/ Industrial Soil		
Total Solids %	83	75	83	79	76	81	85	85			
Explosives	11			h							
2,4-di Nitrotoluene	ND ^H	ND	ND	ND	4900	ND	NA	ŇA	2000		
RDX ^B	ND ^H	ND	ND	ND	ND	ND	NA	NA			
Metals Arsenic	3	5	6	8	3	ŃD	NA	NA	310		
Beryllium	0.6	1.5	0.7	s 1 .0	1.3	0.9	NA	NA	0.67		
Cadmium	ND	1.2	0.7	1.0	0.9	ND	NA	NA	510		
Chromium	16	29	16	33	25	16	NA	NA	5100 ^c		
Copper	16	17	12	16	14	10	NA	NA	38000		
Nickel	20	29	17	28	26	15	NA	NA	20000		
Lead	12	20	16	24	17	9	NA	NA	500-1000 ^D		
Zinc	30	71	52	41	59	41	NA	NA	310000		
Uranium	0.91	0.76	1.1	2.7	0.98	1.3	NA	NA	3100 ^E		
Volatiles	NA	NA	NA	NA	ND	ND	ND	ND			
Semi-Volatiles	NA	NA	NA	NA	ND	ND	ND	ND			
Total Petroleum Hydrocarbons	NA	NA	NA	NA	ND	ND	ND	ND			

All results in dry weight. Note:

Not Applicable ND: Not Detected NA:

Recommended holding time exceeded. Result is an estimate. Duplicate of OBODSB6001 D: H: E:

A:

RDX - Cyclotrimethylenetrinitramine or Hexahydro-1,3,5-trinitro -1,3,5-triazine

Value for Chromium VI

EPA Guideline for Lead

Soluble Salts

B:

C:

TABLE 2-4 - OB/OD AREA SURFACE WATER ANALYTICAL RESULTS

Analyte	Sample Location Sample ID #									
(μg/l organics) (mg/l inorganics)	<u>SW-1</u> OBOD SW-1-001	<u>SW-2</u> OBOD SW-2-001	Regula	tory Com Values	parison	1992 Impact Area Surface Water Comparison Values				
			KAL	KNL	MCL	Low Value	High Value			
Explosives	ND	ND	*	*	*	*	*			
Metals	ND	ND	*	*	*	*	*			
Uranium	.0024	.0021	_ C	_ c	.02	ND	.0057			

ND: Not Detected

C: No value referenced

* Data values are not relevant to OB/OD area and are not provided.

KAL - Kansas Action Level

KNL - Kansas Notification Level

MCL - Maximum Contaminant Level

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Analyte			1992 Impact Area Sediment Concentrations				
(μg/kg organics) (mg/kg inorganics)	SD-1 OBOD SD1001	SD-1 OBOD SD9001 ^A	SD-2 OBOD SD2001	<u>SD-3</u> OBOD SD3001	Risked Based Concentrations Industrial/ Commercial Soils	Low Values	High Values
Total Solids %	75	74	77	65	*	*	*
Explosives	ND	ND	ND	ND	*	ND	ND
Metals Arsenic	4	4	4	. 3	310	ND	14
Beryllium	0.8	0.9	0.9	0.7	0.67	ND	ND
Cadmium	1.1	0.9	1.0	0.9	510	1.0	1.6
Chromium	. 17	19	21	14	5100 ^c	19	26
Copper	13	16	14	13	38,000	NA	NA
Nickel	16	19	18	18	20,000	NA	NA
Lead	15	15	15	20	500-1,000 ^D	12	36
Selenium	ND	ND	ND	ND ^M	5100	ND	ND
Zinc	67	73	57	46	310000	NA	NA
Uranium	0.49	0.66	0.49	0.84	3100 ^E	0.26	1.51

TABLE 2-5 - OB/OD AREA SEDIMENT SAMPLE RESULTS

All results in dry weight. Not Detected Note:

ND:

Reporting limit higher than normal due to matrix interference. Duplicate of OBODSD1001 M:

A:

Not Analyzed. NA:

- C: Value for Chromium VI
- EPA Guideline for Lead D:

Soluble Salts E: *

Data are not applicable and are not provided.

TABLE 2-6 - OB/OD AREA GROUNDWATER RESULTS

Analyte	Sample Location Sample ID #									
(μg/l organics) (mg/l inorganics)	<u>MW-1</u> OBOD <u>MW-1-001</u>	<u>MW-1</u> OBOD <u>MW-9</u> ^A	<u>MW-2</u> OBOD <u>MW-2-001</u>	<u>MW-3</u> OBOD <u>MW-3-001</u>	<u>MW-4</u> OBOD <u>MW-4-001</u>	Regulatory Comparison Values			1992 Impact Area Groundwater Comparison Values	
						KAL	KNL	MCL	Low Value	High Value
Explosives	ND	ND	ND	ND	ND				ND	ND
Metals	ND	ND	ND	ND	ND				*	*
Uranium	.0057	.0043	.0023	ND	.0029	_ ^C	_ C	.02	ND	.0048
Anions Sulfate ^B	52	33	26	97	87	250	_ c	_ c	14	2240
Nitrate	ND	ND	1.0	ND	ND	10	- C	10 ^D	ND	2.8
Volatiles										
Trichloroethylene	ND	ND	ND	1.3		5	0.5	5.0	ND	ND
Semi-Volatiles	ND	ND	ND	ND	ND	*	*	*	ND	ND

ND: Not Detected

KAL - Kansas Action Level

KNL - Kansas Notification Level

MCL - Maximum Contaminant Level

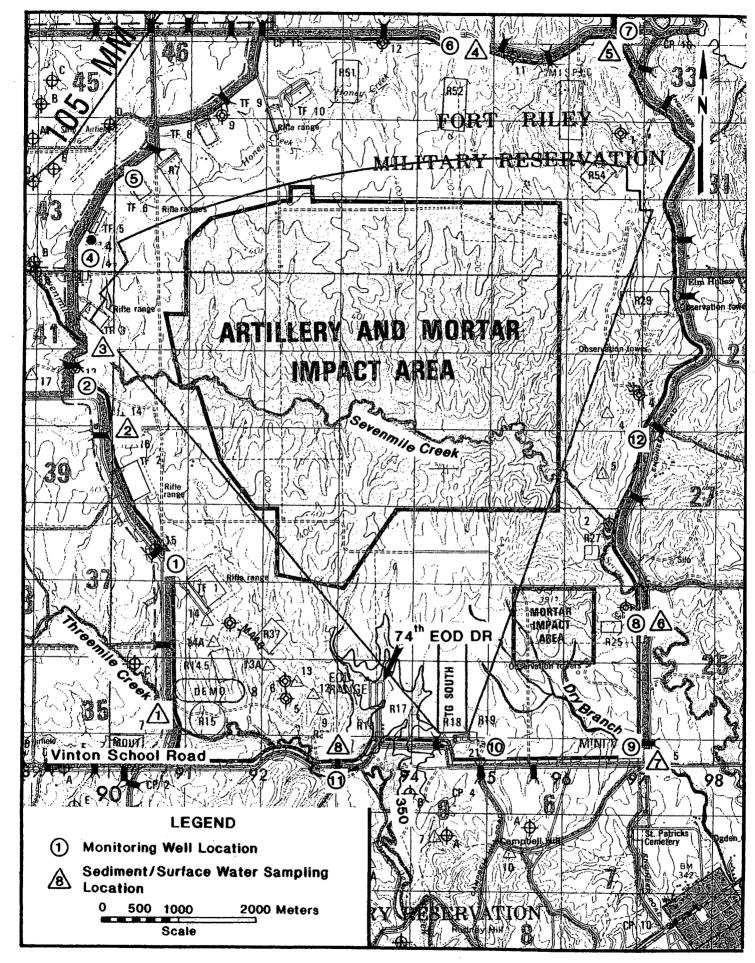
* Data are not relevant and are not provided.

A: Duplicate of OBOD-MW-1-001.

B: Field blank OBOD-FB-11 contained 19 mg/l sufate.

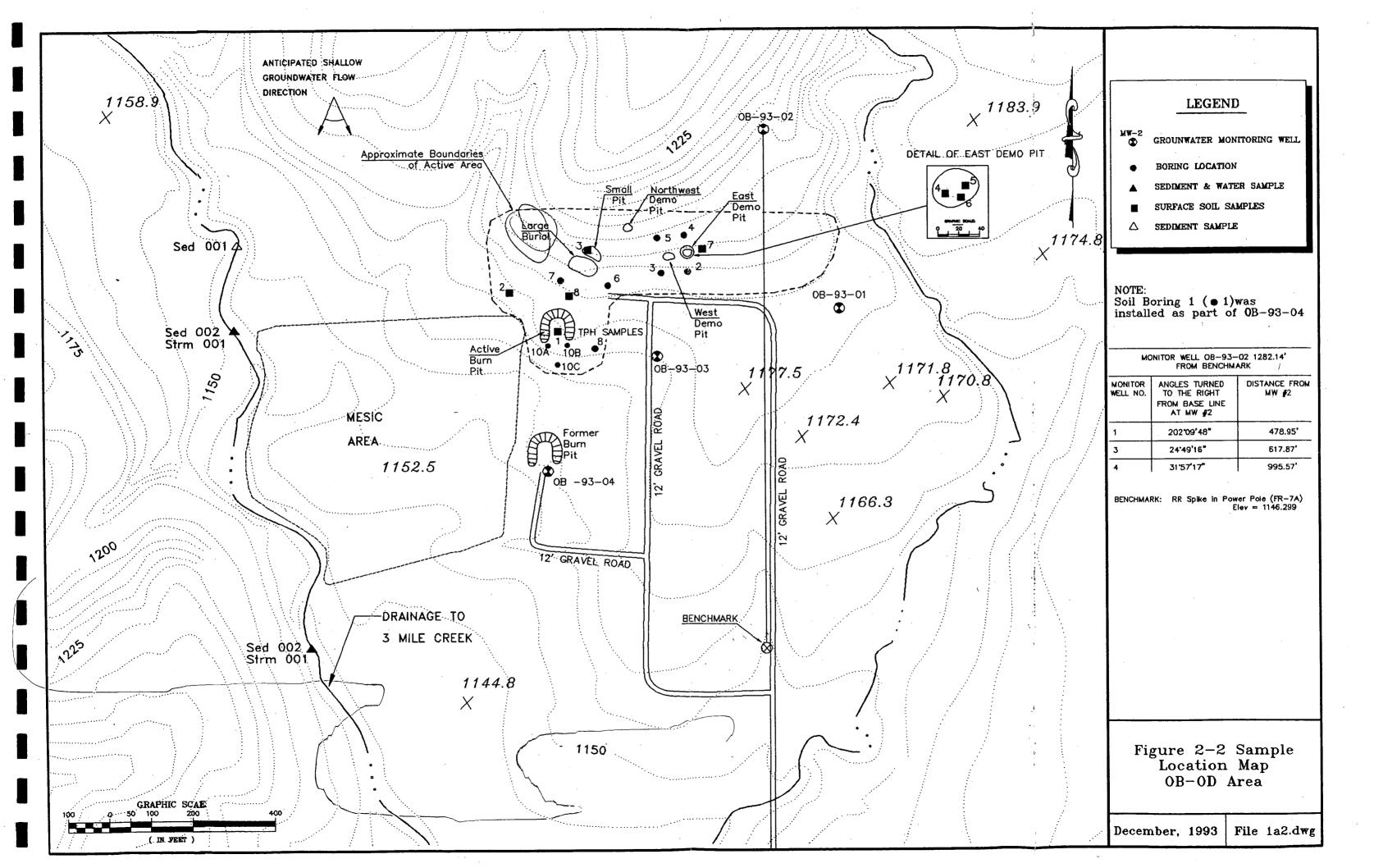
C: No value referenced.

D: Total Nitrate and Nitrite.



Contour Interval 10 Meters

Figure 2-1 -- General Site Location of OB/OD Area



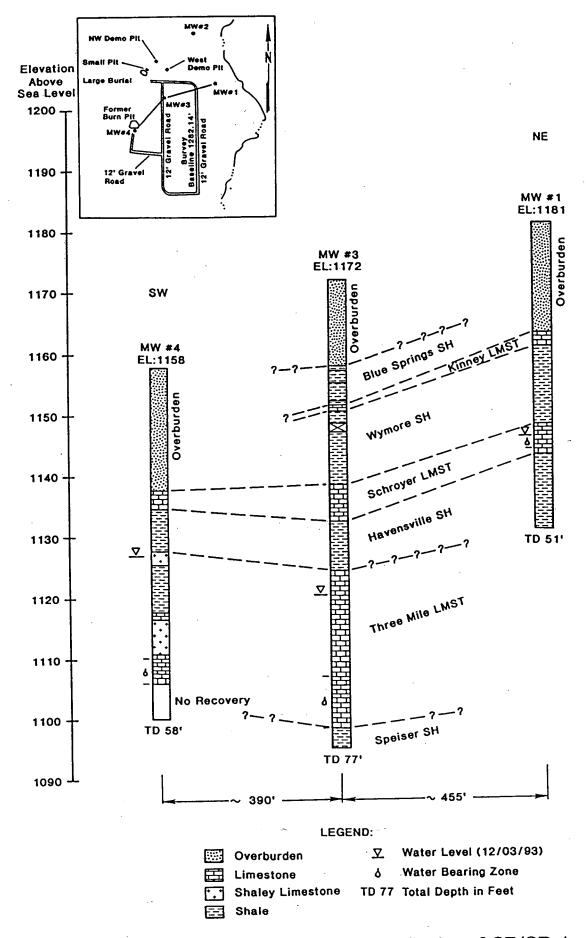


Figure 2-3 - East/West Geologic Cross Section of OB/OD Area

3.0 CUSTER HILL WASTEWATER PONDS

The Custer Hill industrial wastewater system consists of the old wash rack reservoir and two wastewater retention ponds. Together, these three ponds collect runoff and wastewater throughout Custer Hill Troop Complex. Water from east and west ponds is then pumped to the old wash rack reservoir; thus, the old wash rack reservoir eventually receives all the wastewater collected in the three ponds. The old wash rack reservoir is connected to a series of four cells that receives water from the central vehicle wash facility. Specifically, the old wash rack reservoir discharges to Cell 2. The locations of the ponds and cells included in the SI is provided in Figure 3-1.

The central vehicle wash facility serves to remove exterior dirt and grime from vehicles. None of the processes at the central vehicle wash facility use hazardous substances, and the wash process does not generate hazardous waste. Thus, as explained in the Installation Wide Site Assessment, the central vehicle wash facility is not included in this SI. However, the east pond, west pond and old wash rack reservoir were included in the SI for the following reasons:

- \Box All three ponds are known to receive petroleum hydrocarbons;
- \square None of the ponds are lined;
- □ The east pond receives water from Building 8100, which represents a consolidation of activities at Fort Riley that generate hazardous waste;
- Previous testing of the old wash rack reservoir by KDHE indicated that chlorinated solvent were present in sediments at low concentrations; and
- There is the potential for small quantities of hazardous substances to be inadvertently picked up by wastewaters and facility runoff from the tactical equipment shops on Custer Hill.

In addition, because the old wash rack reservoir is connected to Cell 2, which in turn is connected to the other cells, Cells 1 through 4 are also included in the SI.

The east pond, located on First Division Road, is across from the petroleum storage facility. The pond is rectangular in shape (approximately 200 feet by 100 feet). The west pond is located on the tracked vehicle road north of the sub-caliber range. It is circular with a diameter of about 100 feet. Each of these ponds receives storm drain and floor drain water from the automotive and industrial shops on Custer Hill. There is floating petroleum product on these ponds and booms were installed to prevent surface spreading. The central vehicle wash facility is located on the northwest fringe of the Custer Hill area; the old wash rack reservoir and cells 1 through 4 are located adjacent to a tributary of Three Mile Creek. The old wash rack reservoir has an irregular outline and surface area of several acres. cells 1 through 4 range in size from

3 to 5 acres. As noted above, water from the old wash rack reservoir is discharged into cell 2. In turn, cell 2 overflows into cell 3 which overflows to cell 4. Water from cell 4 is pumped to the central vehicle wash facility where it is used and eventually returned to cell 1, which empties into cell 3. Water from Cell 4 can be diverted into the headwaters of Threemile Creek; however, routinely the cell network is run as a closed-loop system with no releases to the nearby streams. If necessary, water can also be diverted from Cells 2 and 3 directly into intermittent tributaries to Threemile Creek.

The ponds were evaluated by collecting samples of water and sediments from within each pond and cell to assess whether hazardous substances are present. The pond sediment and aqueous samples were analyzed for priority pollutant metals using EPA Method 7000 Series/6010, volatile organic compounds using EPA Method 8240, semi-volatile organic compounds using EPA Method 8270, and Total Petroleum Hydrocarbons (TPH) using EPA Method 8015 modified. TPH analyses includes two fractions -- the volatile fraction (gasoline recoverable organics - GRO) and the semi-volatile fraction (diesel recoverable organics - DRO).

To evaluate whether the ponds had released contaminants to soils and/or groundwater, soil gas surveys were conducted around each pond. Soil gas samples were analyzed for both petroleum hydrocarbons and chlorinated organic compounds using modified EPA Methods 8010 and 8020. For each site, an initial grid of soil gas sampling locations was established. Then, additional soil gas samples were collected if warranted based on positive findings from Phase I (additional samples were collected when specific compounds were detected above 10 ug/l or when the total volatile organic concentrations exceeded 10 ug/l). Also, because the east pond was considered to have a high potential for receiving hazardous substances and KDHE sampling data indicated that the old wash rack reservoir had received some chlorinated solvents, the SI included the installation and sampling of groundwater monitoring wells around each pond. Lastly, intermittent tributaries to Threemile Creek are adjacent to the east pond as well as the old wash rack reservoir and cells 1 through 4. Thus, the SI included the collection of stream aqueous and sediment samples around both areas. The groundwater samples and stream aqueous and sediment samples were analyzed for priority metals, volatiles, semi-volatiles and TPH, as described above for the pond samples. The following subsections provide more detail on the SI sampling conducted at each pond or area.

3.1 East Pond

Sampling at the east pond included the following:

- \Box three aqueous samples from the pond,
- \Box two sediment samples from the pond,
- thirteen soil gas points in Phase I and 14 soil gas points in Phase 2,

 \Box installation and sampling of three groundwater monitor wells, and

 \Box stream samples (aqueous and sediment) at three locations.

The sampling locations are shown in Figure 3-2.

During the SI, petroleum hydrocarbons were visible on the surface of the pond. A surface boom lies across the pond approximately 25 feet south of the pond inlet. The boom is present as a passive barrier preventing the spread of petroleum on the surface. Within the perimeter of the boom is the greatest accumulation of petroleum. An oil water separator is in operation at this pond, and the oil/water separator is periodically maintained. Black staining is observed along the northwestern banks of the pond near the pond inlet. This may be due to either minor spills and drips as the waste petroleum is transferred to a tanker truck for final disposition or as a result of the flooding (and elevated pond levels) that occurred during the summer of 1993. A slight petroleum odor was occasionally observed near the inlet side of the pond. At the time of the SI, a layer of petroleum was present behind the boom. Qualitatively, the petroleum was thick and had characteristics (e.g., apparent viscosity) of heavy end oils.

3.1.1 Summary of SI Results

The field investigation continued at the East Pond. The impact to the pond from adjacent site activities is present as a thick layer of petroleum on the pond surface. However, similar to the West Pond, no levels above background (0-1 ppm) were detected by the on-site organic vapor meter.

The positive detections during the soil gas survey are presented in Table 3-1. During the Phase I survey, elevated levels of petroleum hydrocarbons were detected to the east of the pond, between the pond and First Division Road. Also, low levels of 1,2-dichloroethene (DCE) and 1,1-dichloroethane (DCA) were detected (samples EP-C4 and EP-H3). As a result, fourteen additional locations were sampled during the Phase 2 soil gas survey; the phase 2 samples can be identified as follows: EP-A__. During the Phase 2 survey, petroleum hydrocarbons were encountered at concentrations exceeding 5,000 ug/l, and detections of petroleum hydrocarbons were found on the opposite side of First Division Road, adjacent to the petroleum storage facility for Fort Riley. The soil gas data for total FID concentrations (representing the sum of all petroleum hydrocarbons detected on the gas chromatograph - flame ionization detector) was used to prepare an isoconcentration map of the hydrocarbon contamination. The results are shown on Figure 3-3 and show that the highest concentrations are separated from the area of the east pond by areas of no detections.

The analytical results for the pond aqueous samples are shown in Table 3-2. The results for the pond sediment sampling are shown in Table 3-3. The pond samples contained components of petroleum hydrocarbons, bis-2-ethylhexyl phthalate, lead and zinc. However, although petroleum is visible on the surface

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Page 3-3

of the East Pond, the analytical results for the pond aqueous samples show no analytes detected above regulatory standards or guidelines. Similarly, the pond sediment samples contained components of petroleum hydrocarbons, phenanthrene, and a variety of metals. As shown, only the concentrations of beryllium and lead exceed risk-based standards for soils. During the SI, the thickness of the pond sludge was measured at multiple locations; the results of this sludge thickness

Three monitor wells, EP-93-01, EP-93-02, and EP-93-03, were installed and sampled. The depth to bedrock varied from approximately 5 to 11 feet. The uppermost bedrock consisted of weathered shale and shale. All three wells were installed in the first water-bearing units, which consisted of thin (less than two feet at some locations) limestone layers. Because of the low permeable shales overlying the limestone formations, groundwater was under confining conditions in the limestone layers and rose 5 to 10 feet inside the boreholes and completed wells. Figure 3-5 presents a groundwater gradient map for the site; it shows that the groundwater levels in all three wells are below the level of the pond, and that groundwater levels drop to the east. As described below, the column of petroleum hydrocarbons in EP-93-03 may depress the measured groundwater elevation; thus, the groundwater gradient may differ from that shown in Figure 3-5. A geologic cross-section for the site showing the shale bedrock and limestone stringers is presented in Figure 3-6.

Monitor Well EP-93-01 exhibited chemical concentrations below levels of detection for all analytes except for two volatile organic compounds: 1,1,1 These chemical constituents were trichloroethane and 1,1 dichloroethane. detected at concentrations of .0051 mg/l and .001 mg/l, which fall below MCLs and KALs.. Monitor Well EP-93-02 exhibited chemical concentrations below levels of detection for all analytes measured. Monitor Well EP-93-03 was moved from its original location, as approved in the sampling and analysis plan (SAP), prior to installation. This well location was moved (approximately 100 feet to the south and east) to coincide with high readings obtained from the soil gas survey that was performed at the East Pond. During well installation at this location, the drill bit encountered significant contamination in the form of floating product. The well is screened across a limestone layer beginning at a depth of 29 feet. Periodic measurements of product thickness were made, and levels varied from 5 to 9 feet of product in the well. Approximately 15 gallons of free product was bailed from the well and containerized. The results of petroleum chemical analysis for Monitor Well EP-93-03 found the following chemical constituents and their concentrations in the groundwater: Total Purgeable Hydrocarbons (GRO fraction of TPH) (6.3 mg/l), Semi-Volatile Petroleum Hydrocarbons (2.0 mg/l), 2-methyl Naphthalene (.18 mg/l), Naphthalene (.15 mg/l), Phenanthrene (.011 mg/l), Benzene (.28 mg/l), Ethylbenzene (.17 mg/l), m-p-o-Xylene (.72 mg/l), Toluene (.36 mg/l), and Arsenic (.04mg/l). A sample of product from the well was sent to the laboratory for petroleum

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fingerprinting; the product was identified as <u>diesel_fuel</u>. These values as detected in the groundwater from Monitor Well EP-93-03 do not represent chemical migration from the East Pond. These values document the presence where of contamination as a result of the spill at the tank farm.

The analytical results for the <u>aqueous stream samples</u> collected at the East Pond are shown in Table 3-4. The results for the sediment stream samples collected at the East Pond are shown in Table 3-5. The <u>only positive detection in the</u> a<u>queous samples was</u> for the <u>DRO fraction of TPH</u> in the downstream sample at a concentration of 0.22 mg/l. The DRO fraction of TPH was also detected in the <u>upstream sediment sample</u>. Also, numerous metals were detected. Beryllium was above the risk-based standards for soils in all three sediment samples, and was at the highest concentration of 4.2 mg/kg in the downstream sample. Lead was also above the risk-based standards for soils in all three samples. No other detections exceeded risk-based guidelines.

3.1.2 Discussion of SI Results

The most significant finding during the SI was the presence of free petroleum product in EP-93-03. This well is located near a manhole to a sewer pipeline that runs by the petroleum storage facility. According to Fort Riley DEH personnel, several large spills (several thousands gallons each) have occurred at the storage facility. When spills occur, product has been known to run into the sewer drains and overflow at the manhole near EP-93-03.

3.2 West Pond - No Further Action

The sampling of the West Pond included eight soil gas sampling points around the perimeter of the pond to determine the extent of contamination that may exist in the unsaturated zone. Also, two aqueous samples and two sediment samples were collected from the pond. During the SI, a petroleum layer characteristic of heavy end oils (e.g., high relative viscosity) was present on the surface of the west pond. Petroleum odors were present; however, the on-site organic vapor monitor did not detect any odors above background (i.e., 0-1 ppm). Black staining was observed on the bank of the pond. The staining likely occurred as a result of fluctuations in the water level of the pond due to the high water levels associated with regional flooding that took place over the summer of 1993. An oil boom has been placed across the inlet side of the pond surface to inhibit the spreading of the petroleum layer. Inside the perimeter of the boom is observed the greatest accumulation of the surface petroleum layer.

3.2.1 Summary of SI Results

The locations of the samples collected at the west pond are shown in Figure 3-7. The Phase 1 soil gas survey for the site included eight sampling locations.

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There were <u>no detections in any of the soil gas samples (from depths of 4 and 12 feet at each location)</u>, and Phase 2 soil gas sampling was not conducted.

The analytical results for the pond aqueous samples are shown in Table 3-6. The results for the pond sediment sampling are shown in Table 3-7. Both tables tabulate only the positive detections. The aqueous samples from the pond contained a variety of components of petroleum hydrocarbons (e.g., benzene, ethylbenzene, toluene and xylene) and some chlorinated organic compounds (1,1,1-trichloroethane, DCE, methylene chloride and chloroform). Also, the DRO fraction of TPH and cadmium, lead and zinc were detected. None of the detections exceed MCLs or KALs. The detections for chloroform and lead exceed ambient water quality criteria.

The pond sediment results show that a variety of components of petroleum hydrocarbons were present, including both volatile and semi-volatile compounds. Other semi-volatile compounds detected were phenanthrene, bis-2-ethylhexyl phthalate, fluorene and dibenzofuran. A variety of metals were also detected. None of the organic compounds were detected at concentrations above risk-based standards. Of the metals, only lead was detected above the risk-based level for soils. Sludge thickness measurements were made at multiple locations during the SI; the results are shown in Figure 3-8.

3.2.2 Discussion of SI Results

The soil gas results indicate that the west pond has not released contaminants to the environment. The pond sampling indicates that some volatile, semivolatile and metal contaminants are present in the pond; however, the detected concentrations are low relative to regulatory standards and guidelines.

3.3 Old Wash Rack Reservoir and Cells 1 through 4

Sampling activities were conducted for the Old Wash Rack Reservoir and Cells 1 through 4 as a whole because of their nearness to one another. The general location of these ponds is shown in Figure 3-9. The field investigation included a soil gas survey around the perimeter of all the cells to evaluate whether releases had occurred to soils and/or groundwater. This soil gas survey included an initial test of 20 locations. However, along the east and north sides of the cells, the elevation drops sharply from the top of the berm surrounding the ponds towards natural elevations. Therefore, an additional eight soil gas sample locations were placed on the east and north so that samples could be collected from both the top of the pond berm and the base of the pond berm. Two aqueous and three sediment samples were collected from each pond for a total of 10 aqueous and 15 sediment samples. As shown on Figure 3-9, there are two primary intermittent streams -- they flow along the eastern and western sides of the cells and join into a common intermittent stream north of cell 4.

Potential migration from the site along these intermittent streams was evaluated by collecting three stream aqueous and six stream sediment samples. The locations of the SI samples are shown in Figure 3-10. During the SI, the thickness of the sludge in each of the ponds was measured at multiple locations. The results of these measurements are shown in Figures 3-11 through 3-13.

The following observations were made during the pond sampling events. The old wash rack reservoir did not have visual petroleum hydrocarbons like the east and west ponds. Plant life flourishes on the banks of the reservoir (i.e., cat-tails etc.) and algal blooms grow abundantly within the reservoir itself. A very thin sheen of petroleum is perceptible at the outlet location where a sediment sample was collected. This sheen could be a result of naturally occurring organic by-products from the plants and algae and not from man-made impacts like waste oils or diesel fuels. Overall, the reservoir appeared clean. No odors were detected by the sense of smell or from the on-site organic vapor meter. Similarly, cells 1 through 4 were free of petroleum odors and visible petroleum product. In cell 1, two beaver/muskrat dens, two muskrats hundreds of frogs, and a family of ducks were found.. In addition, the cell was covered with plant life that included cat tails over the entire surface of cell 1.

3.3.1 Summary of SI Results

Of the 28 soil gas sampling locations, there were positive detections in only three samples. Specifically, toluene was detected at 1.6 and 1.1 ug/l in the 12 foot soil gas samples at locations WR-F0 and WR-H2. These locations are at the northeast and southeast corners of cell 4, respectively. Also, there was a Total FID detection of 12 ug/l at location WR-C2, which is to the west of cell 4. All three of these detections are just above the detection limits of 1.0 ug/l for toluene and 10 ug/l for Total FID.

The results of the aqueous pond samples are shown in Table 3-8. The only substances detected were the DRO fraction of TPH (in 7 samples up to 0.720 mg/l), bis-2-ethylhexyl phthalate (at .023 mg/l in one sample), lead in one sample at .004 mg/l, and silver in two samples (.01 and .03 mg/l). None of the detections exceed MCLs or KALs although the one detection of lead exceeds the ambient water quality criteria.

The results of the pond sediment samples are shown in Table 3-9. Organic compounds detected include both the DRO and GRO fractions of TPH. The DRO fraction is detected with greater frequency and at higher concentrations and is present at 13 of the 15 locations. The maximum concentration is 32,000 mg/kg from the outlet of the old wash rack reservoir. Other organic compounds detected include methylene chloride (0.24 mg/kg in one sample), toluene (.220 mg/kg in one sample), and bid-2-ethylhexyl phthalate (from 25 to 51 mg/kg in three samples -- all from the old wash rack reservoir. None of these detections exceed risk-based concentrations for soils. A variety of metals

Concentra-

tion

were detected. Beryllium was detected in five samples (from four ponds) at concentrations ranging from 0.7 to 0.9 mg/kg; these concentrations exceed the risk-based guidelines of 0.67 mg/kg for soils. Lead was detected at concentrations above the risk-based guideline at all locations. The maximum lead concentration was 290 mg/kg which is well below EPA's cleanup guideline for lead of 500 to 1,000 mg/kg.

The results of the stream aqueous samples are shown in Table 3-10. The only substances detected are lead and zinc, both detected at only one location. The concentrations do not exceed MCLs, KALs or ambient water quality criteria. The results of the stream sediment samples are shown in Table 3-11. The DRO fraction of TPH was detected at two locations. The highest concentration (1,100 mg/kg) was off the northwest corner of cell 4. No other organic compounds were detected. A variety of metals was also detected. Beryllium ranged from 0.6 to 1.1 mg/kg with three samples exceeding the risk-based guideline for soils of 0.67 mg/kg. Lead was detected at concentrations ranging from 8 to 22 mg/kg. Although these levels exceed the risk-based guideline for soils, they are well below EPA's cleanup guideline of 500 to 1,000 mg/kg for soils. No other metals exceeded risk-based guidelines for soils.

Three monitor wells, WR-93-01, WR-93-02, and WR-93-03, were installed at the old wash rack reservoir. The wells were completed in unconsolidated clays and weathered shales. The groundwater gradient map for the site is presented in Figure 3-14 and shows that the groundwater levels in the wells are below the level of the pond, producing a radial gradient outward from the pond. A geologic cross-section for the site is shown in Figure 3-15. Monitor Well WR-93-01 exhibited chemical concentration values below levels of detection for all analytes measured except for the metal Arsenic. Arsenic appeared in the groundwater at this well location at a concentration of .02 mg/l, which falls below all regulatory standards. Monitor Wells WR-93-02 and WR-93-03 exhibited chemical concentrations values below levels of detection for all analytes measured.

3.3.2 Discussion of SI Results

The soil gas data and the groundwater monitoring data indicate that the old wash rack reservoir are not releasing contaminants to groundwater. The soil gas data also indicate that cells 1 through 4 are not releasing contaminants to the environment.

The aqueous samples from the ponds indicate that few contaminants are present. The most common contaminant in the pond sediments is the DRO fraction of TPH, with the highest concentrations in the old wash rack reservoir. The metals data for the pond sediments has not been compared to local and regional data to determine whether detected concentrations differ significantly from naturally-occurring, background concentrations.

TABLE 3-1 - EAST POND SOIL GAS DATA

ANALYTE CONCENTRATIONS VIA GC/FID (ug/l)

SAMPLE	DEPTH (FT.)	BENZENE	TOLUENE	ETHYL- BENZENE	XYLENES	TOTAL FID *	t12DCE	11DCA
REPORTING I	LIMITS	1.0	1.0	1.0	1.0	10	1.0	1.0
SOIL GAS SAM	<u>IPLES</u>							
EP-A3-10	10	<1.0	<1.0	<1.0	<1.0	. 20	<1.0	<1.0
EP-A5	4	<1.0	<1.0	<1.0	<1.0	11	<1.0	<1.0
EP-A10	4	1.4	5.8	1.2	2.7	993	<1.0	<1.0
EP-A10-8	8	1.1	8.2	1.9	4.5	1,476	<1.0	<1.0
EP-A11	4	9	30	7.9	21	5,373	<1.0	<1.0
EP-A12-4	4	<1.0	<1.0	<1.0	<1.0	19	<1.0	<1.0
EP-A13-4	4	<1.0	2.2	<1.0	1.4	136	<1.0	<1.0
EP-A14-4	4	<1.0	3.1	<1.0	1.4	357	<1.0	<1.0
EP-A14-8	8	<1.0	3.1	1	<1.0	261	<1.0	<1.0
EP-C2-8	8	<1.0	<1.0	<1.0	<1.0	11	<1.0	<1.0
EP-C4	4	<1.0	1.2	<1.0	<1.0	<10	1.4	<1.0
EP-H3	4	<1.0	<1.0	<1.0	<1.0	<10	<1.0	1.8

11DCA = 1,1-dichloroethane

Total FID = sum of hydrocarbons detected on flame ionization detector

t12DCE = trans-1, 2-dichloroethene

		AQUEO		REGULATORY STANDARDS (mg/L)					
	EP-CH- S1	EP-CH- S2	EP-CH- S4	EP-CH- B01	MCL	KAL	KNL	Ambient Water Quality - Chronic	
Volatiles	<u></u>	1		· · · · · · · · · · · · · · · · · · ·				T	
Toluene	.001	.0011	.0012	.0014	1	2	0.2		
Xylene (O/M/P)	.0009	.0017	.0016	.0026	10	.44	0.044		
Purgeable Hydrocarbon	ŅD	ND	ND	ND					
Semi-volatiles									
Semi-purgeable Hydrocarbon	68	2.6	2.6	2.6					
Bis (2-EH) Phthalate	.030	ND	ND	ND					
Metals		· · · · ·							
Lead	0.007	0.004	0.005	0.005	0.015	0.05		.0032	
Zinc	0.05	0.02	0.03	0.03		5.0		.110	

Table 3-2 - Pond Aqueous Samples for East Pond, Ft. Riley, Kansas

^a Lowest Observed Effect Criteria. Insufficient Data to develop criteria.

^p Proposed Criterion.

ND: Not Detected. MCL = Maximum Contaminant Level ---: Standard Not Available. KAL = Kansas Action Level KNL = Kansas Notification Level

		SED	DIMENT (mg	g/kg)	· · · · · · · · · · · · · · · · · · ·	REGULATORY STANDARDS (mg/kg)
	EP-CH	EP-CH	EP-CH	EP-CH-	EP-CH-	EPA Risk Based
	Sed Outlet	S001	Sed Inlet	205*	Sed Inlet 2**	Commercial/Industrial Soil
Toluene	ND	ND	ND	ND	1.8	200,000
Ethylbenzene	ND	ND	ND	ND	.440	100,000
Xylene (O/M/P)	ND	ND	ND	ND	1.64	2,000,000
Purgeable Hydrocarbon	ND	ND	ND	4 <u>2</u> H	240 H	
Semi-Volatiles						
Semi-purgeable Hydrocarbon	14,000	4,800	6,100	ND	ND	
Naphthalene	ND	ND	13	NA	NA	41,000
Methyl-naphthalene	12	14	34	NA	NA	
Phenanthrene	ND	ND	16	NA	NA	
Bis (2-EH) Phthalate	11	14	ND	NA	NA	
Metals					· ·	
Arsenic	6	6	4	NA	NA	310
Beryllium	0.8	0.8	ND	NA	NA	0.67
Cadmium	10	12	9.4	NA	NA	510
Chromium	28	28	15.	NA	NA	5,100
Copper	41	47	32	NA	NA	38,000
Lead	57	80	60	NA	NA	0.1
Nickel	17	19	10	NA	NA	100,000
Zinc	200	230	250		<u>NA</u>	310,000

Table 3-3 - Pond Sediment Samples for East Pond, Ft. Riley, Kansas

Re-sampled sediment outlet location. ** Re-sampled sediment inlet location. *

NA: Not Applicable. Analyses included VOA, SVOA GRO only. ND: Not Detected.

H: Result is an estimated value. Recommended holding time was exceeded. ---: Standard Not Available.

		AQUEO	US (mg/L)			STANDARDS (mg/L)							
	EP-CH- Stream AQ-1	EP-CH Stream AQ-2	EP-CH- Stream AQ-3	Field Blank	Federal Maximum Contaminant Level (MCL)	Kansas Action Level (KAL)	Kansas Notification Level (KNL)	Ambient Water Quality - Chronic	Risk based Concentration - Tap Water				
Purgeable Hydrocarbon	ND	ND	ND	ND									
Semi- purgeable Hydrocarbon	.130	ND	.220	ND									

Table 3-4: Aqueous Stream Sampling for East Pond, Ft. Riley, Kansas

ND: Not Detected.

---: Standard Not Available.

		STANDARDS (mg/kg)		
	EP-CH-Stream Sed 1	EP-CH-Stream Sed 2	EP-CH-Stream Sed 3	Commercial/Industrial Soll
Purgeable Hydrocarbon	ND	ND	ND	·
Semi- purgeable Hydrocarbon	54 H	ND	ND H	
Arsenic	3	4	7	310
Beryllium	0.7	0.7	4.2	0.67
Cadmium	1	0.8	5.1	510
Chromium	24	16	96	5,100
Copper	12	10	60	38,000
Lead	13	16	22	0.1
Nickel	18	13	72	100,000
Zinc	51	34	220	310,000

 $i \in \mathbb{R}^{n}$

Table 3-5: Sediment Stream Sampling for East Pond, Ft. Riley, Kansas

ND: Not detected.

---: Standard Not Available.

H: Result is an estimated value. Recommended holding time was exceeded.

	AQUEOU	JS (mg/L)	R	EGULATORY ST	ANDARDS (mg/L)	
	WP- CH-S	WP-CH- B	MCL	KAL	KNL	Ambient Water Quality - Chronic
Volatiles						· · · · · · · · · · · · · · · · · · ·
Benzene	.0006	.0007	0.005	0.005	0.0005	
Toluene	.0047	.0043	1	2	0.2	
Ethylbenzene	.0010	.0011	0.7	.68	0.068	
Xylene (O/M/P)	.0037	.0039	10	.44	0.044	
1,1,1 Trichloroethane	.0034	.0037	0.2	0.2	.020	
1,1 Dichloroethene	ND	.0019		0.005	0.0005	
Methylene Chloride	.0017	ND				·
Chloroform	.0009	ND	0.1			.00124ª
Purgeable Hydrocarbon	ND	ND				
Semi-Volatiles						
Semi-purgeable Hydrocarbon	10	6				
Metals			·			
Cadmium	ND	0.005	0.005	0.005		.0011
Lead	0.004	ND	0.015	0.05		.0032
Zinc	0.09	0.10		5.0		.110

Table 3-6: Pond Aqueous Samples for West Pond, Ft. Riley, Kansas

ND: Not detected. ^a Lowest Observed Effect Criteria. MCL = Maximum Contaminant Level KAL = Kansas Action Level KNL = Kansas Notification Level ---: Standard Not Available.

		SEDIME	NT (mg/kg)	<u></u>	REGULATORY STANDARDS (mg/kg)
	WP-CH-	WP-CH-Sed.	WP-CH-	WP-CH-Inlet	EPA Risk-Based
	Sed. Outlet	Inlet	Outlet 1*	1*	Commercial/Industrial Soil
Volatiles					
Toluene	ND	ND	1.2	1.2	200,000
Xylene (O/M/P)	ND	ND	ND	.90	2,000,000
Purgeable Hydrocarbon	ND	ND 🥀	220)	(110)	
Semi-Volatiles				· · · · · · · · · · · · · · · · · · ·	· · · · · · · · · · · · · · · · · · ·
Semi-purgeable TPH	24,000	18,000	ND	ND	
Naphthalene	ND	13	NA	NA	41,000
Methyl-naphthalene	20	34	NA	NA	
Phenanthrene	19	19	NA	NA	±
Bis (2-EH) Phthalate	18	16	NA	NA	
Fluorene	ND	6.3	NA	NA	
Dibenzofuran	ND	5.3	NA	NA	
Metals					
Arsenic	5	4	NA	NA	310
Cadmium	11	10	NA	NA	510
Chromium	17	11	NA	NA	5,100
Copper	20	16	NA	NA	38,000
Lead	40	20	NA	NA	0.1
Nickel	11	7	NA	NA	100,000
Zinc	140	98	NA	NA	310,000

Table 3-7 - Pond Sediment Samples Collected for West Pond, Ft. Riley, Kansas

* Re-sampled location. NA: Not Applicable. Analyses included VOA, SVOA GRO only. ND: Not Detected.

Shaded areas represent those concentrations exceeding risk-based levels for soils (human risk) or sediment (based on potential harm to fish)

		AQUEOUS (mg/L)													RDS (mg/	STANDARDS (mg/L)			
	Old Wash Rack Reservoir		Cel	11	Cell 2			Cell 3		Cell 4		MCL	KAL	KNL	Ambient				
	CVWF- CH-S1-R	CVWF- CH-B-R	CVWF- CH-001-R	CVWF- CH-C13	CVWF- CH-Cl4	CVWF- CH-C22	CVWF- CH-C23	CVWF- CH-C31	CVWF- CH-C32	CVWF-CH- 009-C3-	CVWF- CH-42-C4	CVWF- CH-43- C4				Water Quality - Chronic			
Semi-Volatiles		*						······································		······································	. L			L		L			
Semi-purgeable Hydrocarbon	.330	.670	.550	ND	.720	.280	ND	.250	ND	.440	ND	ND							
Bis (2-EH) Phthalate	ND	.023	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND							
Metals		2 *					· · ·		A	L		• e'		L		·			
Lead	ND	NĎ	ND	ND	ND	ND	ND	ND	ND	ND	ND	0.004	0.015	0.05		.0032			
Silver	ND	ND	ND	ND	ND	0.03	ND	0.01	ND	ND	ND	ND		0.05		.0032			

Table 3-8 - Analytical Results for the Pond Aqueous Samples Collected at the Wash Rack Reservoir, Ft. Riley, Kansas

---: Standard Not Available. Shaded areas represent concentratoins exceeding regulatory standards or guidelines. MCL = Maximum Contaminant Level KAL = Kansas Action Level ND: Not Detected. Notification Level

KNL = Kansas

				·				-	SEDIME	NT (mg/kg)			·						
	Old Wash Rack Reservoir		ad up licente	c Cell 1				Cell 2			Cell 3			Cel	14		EPA Risk-Based		
	CVWF- CH- SED-CR	CVWF- CH-Sed CR1*	CVWF- CH-005- R	CVWF- CH-Sed- Outlet-R	CVWF- CH-Sed- Inlet-R	CVWF- CH-Sed Outlet- C10	CVWF- CH-Sed C11	CVWF- CH-Sed Inlet-C12	CVWF- CH-Sed Outlet C20	CVWF- CH-Sed- Inlet C21	CVWF- CH-Sed C24	CVWF- CH-Sed Outlet C30	CVWF- CH-C34	CVWF- CH-C33	CVWF- CH-Sed Outlet- C40-	CVWF- CH-041- C4	CVWF- CH-44- C4	CVWF- CH-45- C4	Commercial/ Industrial Soi
Volatiles														<u>, , , , , , , , , , , , , , , , , , , </u>					
Methylene Chloride	ND	ND	ND	ND	ND	ND	0.24	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	380
Toluene	ND	ND	ND	ND	ND	ND	ND	.220	ND	ND	ND	ND	ND	ND	ND,	ND	ND	ND	200,000
Purgeable Hydrocarbon	ND	130	ND H	ND H	ND H	ND H	ND H	1.2 H	ND H	3.7 H	ND H	ND H	ND	ND	ND	ND	ND	ND	
Semi-Vola	atiles			-										·····	4	••••••	<u> </u>	4	
Semi-purgeable Hydrocarbon	4,400	ND	32,000	⁻ 8,800	18,000	210	180	570	322	3,100	ND	87	17 H	31 H	14 H	20 H	15 H	10 H	
Bis (2-EH) Phthalate	ND	ND	25	27	51	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	
Metals															······································		· · · · · · · · · · · · · · · · · · ·		L
Arsenic	6	NA	6	6	3	3	2	6	3	5	3	3	2	18	4	3	4	3	310
Beryllium	0.8	NA	0.9	ND	0.5	ND	08	ND	ND	ND	0.9	0.5	0.5	0.5	0.7	0.6	0.6	0.7	0.67
Cadmium	4.7	NA	8.4	7.5	4.7	0.8	1.0	4	0.8	4.3	1.0	1.1	0.8	1.5	0.8	0.7	0.7	0.7	510
Chromium	25	NA	33	26	21	14	20	5	12	32	23	19	15	19	21	18	17	16	5,100
Copper	23	NA	36	31	22	9	11	6	11	27	13	12	10	15	12	10	12	10	38,000
Lead	30	NA	40	40	30	100 100 100	10	64	5	20	15	10	12	75			14		0.1
Nickel	19	NA	21	18	14	12	15	4	12	25	21	16	13	17	18	15	16	13	100,000
Zinc	130	NA	290	260	110	35	45	35	50	200	56	51	36	54	49 ;	45	38	37	310,000

Table 3-9 - Analytical Results for the Pond Sediment Samples Collected at the Wash Rack Reservoir, Ft. Riley, Kansas

* Re-sampled location.NA: Not Applicable. Analyses included VOA, TPH GRO only.ND: Not Detected. H: Result is an estimated value. Recommended holding time was exceeded.

---: Standard Not Available.

	AQ	U EOUS (n	ng/L)	STANDARDS (mg/L)						
	CVWF- CH- Stream AQ-1	CVWF- CH- Stream AQ-5	CVWF- CH- Stream AQ 6	Federal Maximum Contaminant Level (MCL)	Kansas Action Level (KAL)	Kansas Notification Level (KNL)	Ambient Water Quality - Chronic			
Lead	ND	0.008	ND	0.015	0.05		.0032			
Zinc	ND	0.04	ND		5.0		.110			

Table 3-10: Aqueous Stream Sampling for Cells 1-4, Ft. Riley, Kansas

ND: Not Detected. ---: Standard Not Available.

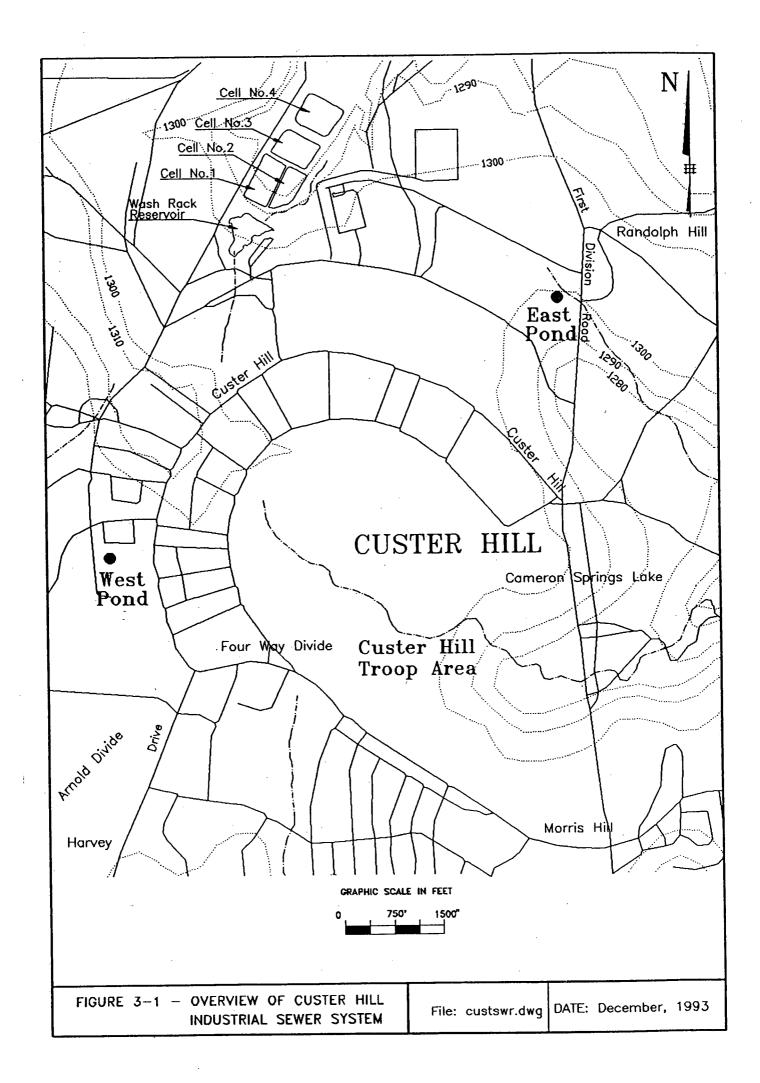
1			STANDARDS (mg/kg)				
	CVWF- CH- Stream Sed 1	CVWF- CH Stream Sed 2	CVWF- CH Stream Sed 3	CVWF- CH Stream Sed 4	CVWF- CH- Stream Sed 5	CVWF- CH- Stream Sed 6	Commercial/Industrial Soil
Semi- purgeable Hydrocarbon	1,100 H	ND H	ND	ND H	38 H	ND H	
Arsenic	9	4	10	8	4	3	310
Beryllium	1.1	0.7	ND	ND	0.6	0.7	0.67
Cadmium	1.3	0.8	1.1	1.0	0.8	0.7	510
Chromium	31	17	25	24	15	16	5,100
Copper	20	13	17	14	10	11	38,000
Lead	15	8	18	22	16	12	0.1
Nickel	27	16	22	21	13	18	100,000
Zinc	68	41	57	50	43	40	310,000

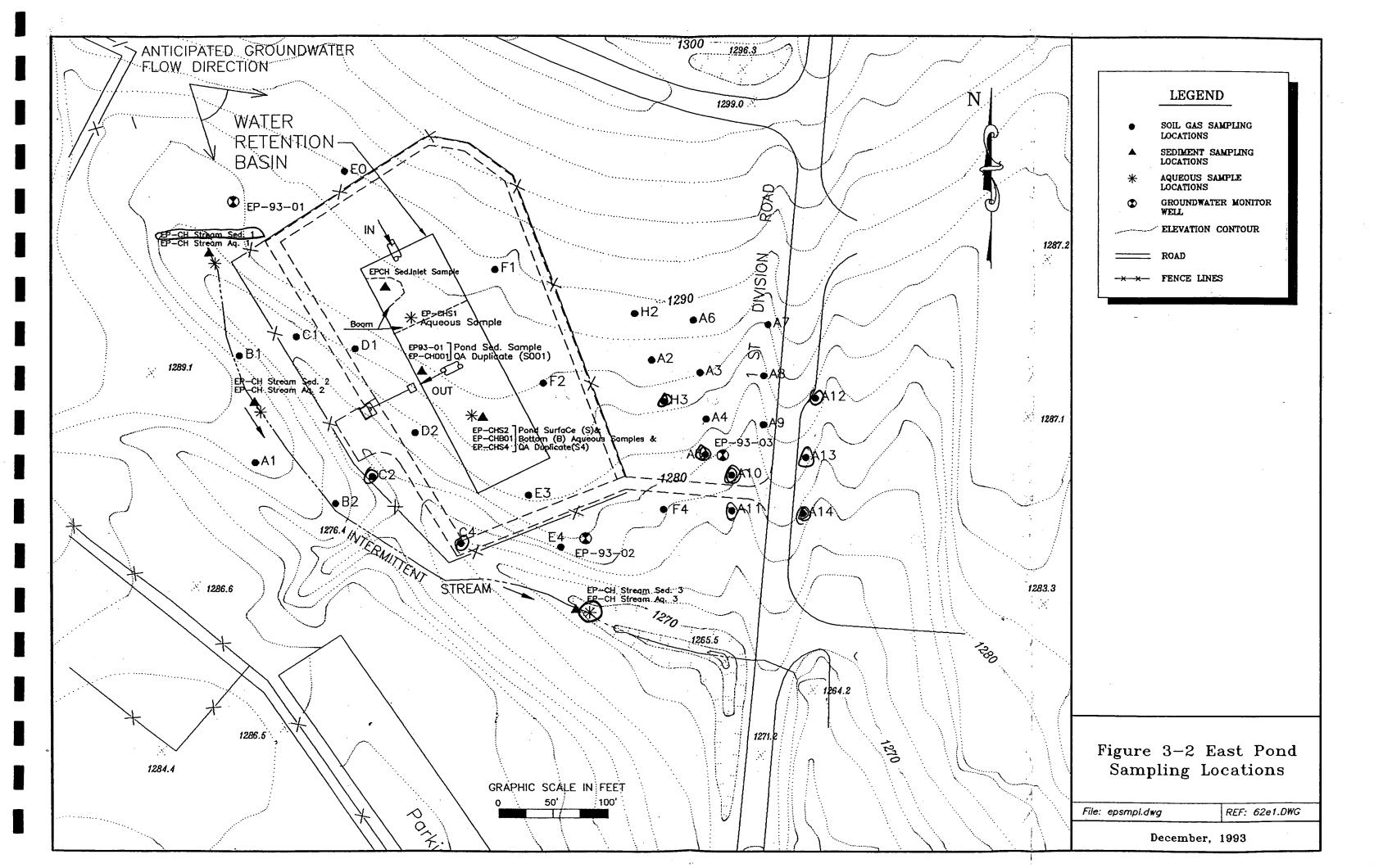
Table 3-11: Sediment Stream Sampling for Cells 1-4, Ft. Riley, Kansas

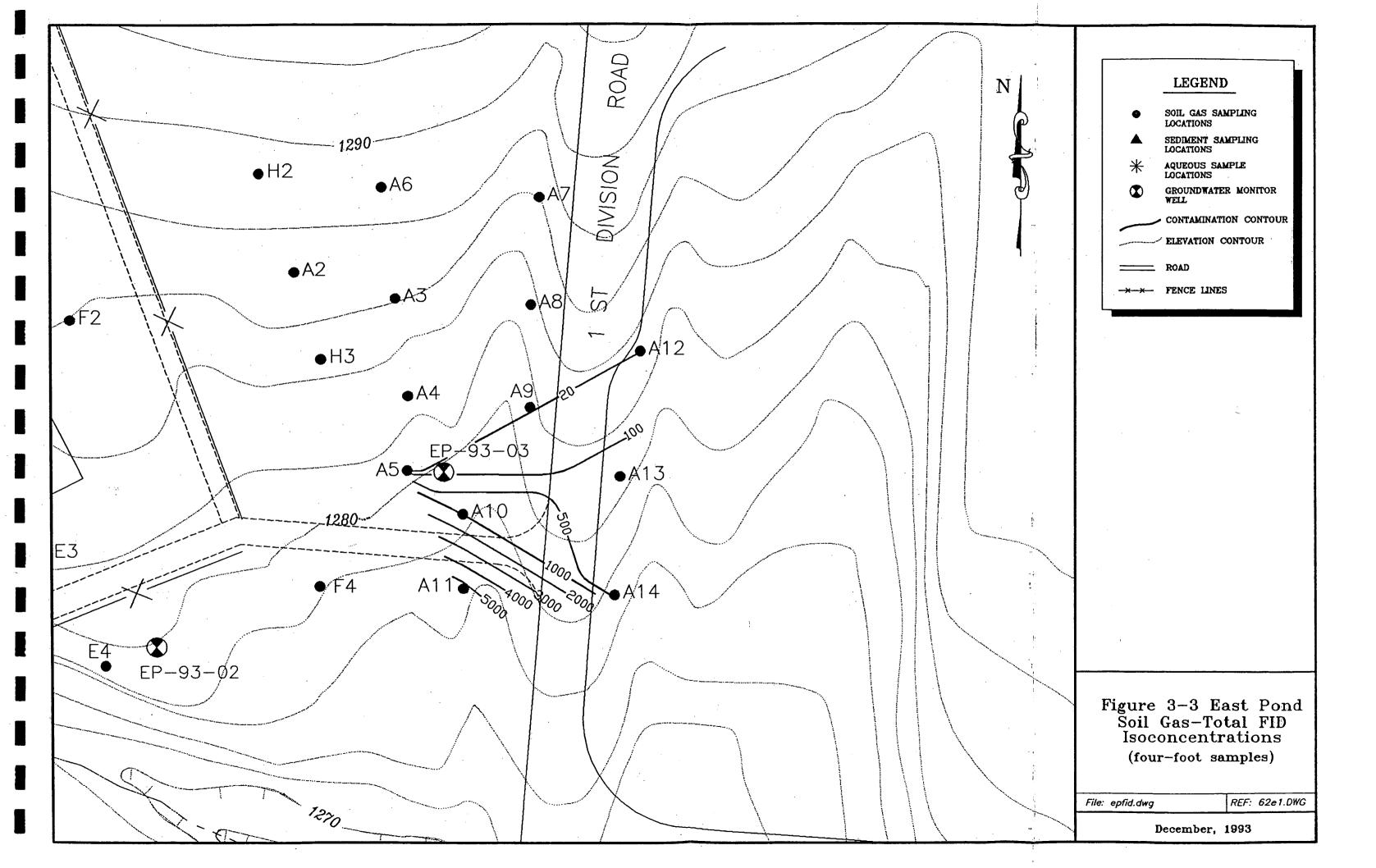
ND: Not Detected.

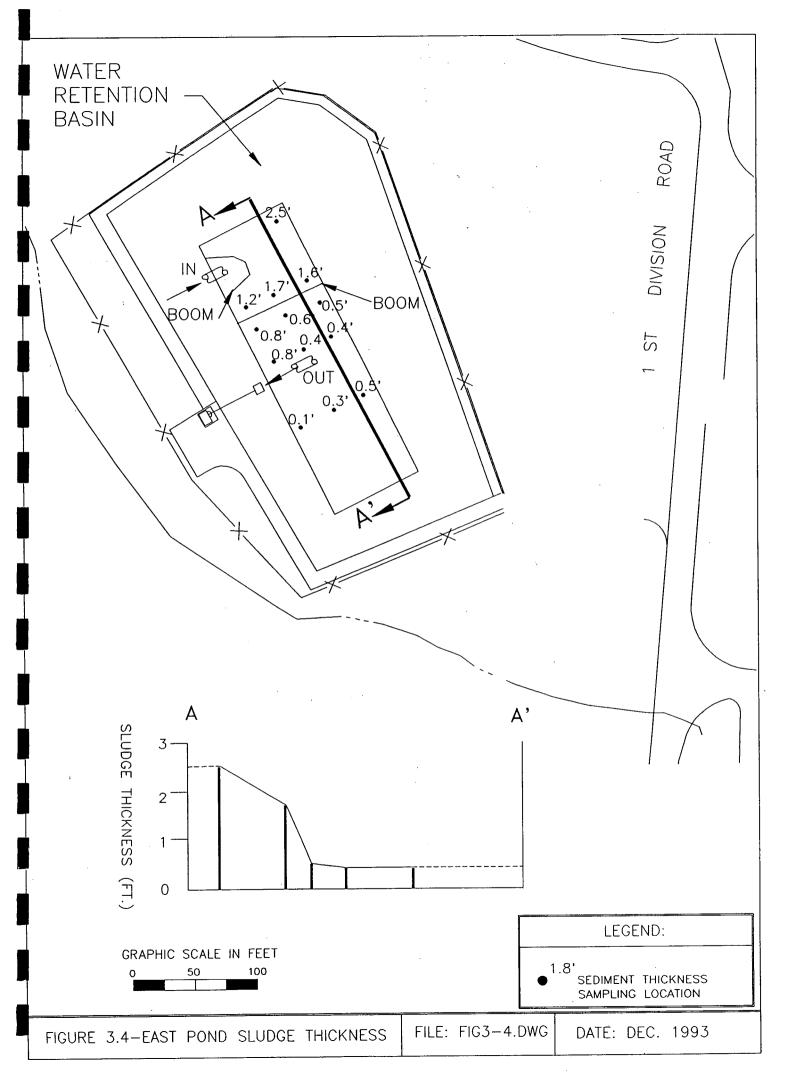
---: Standard Not Available.

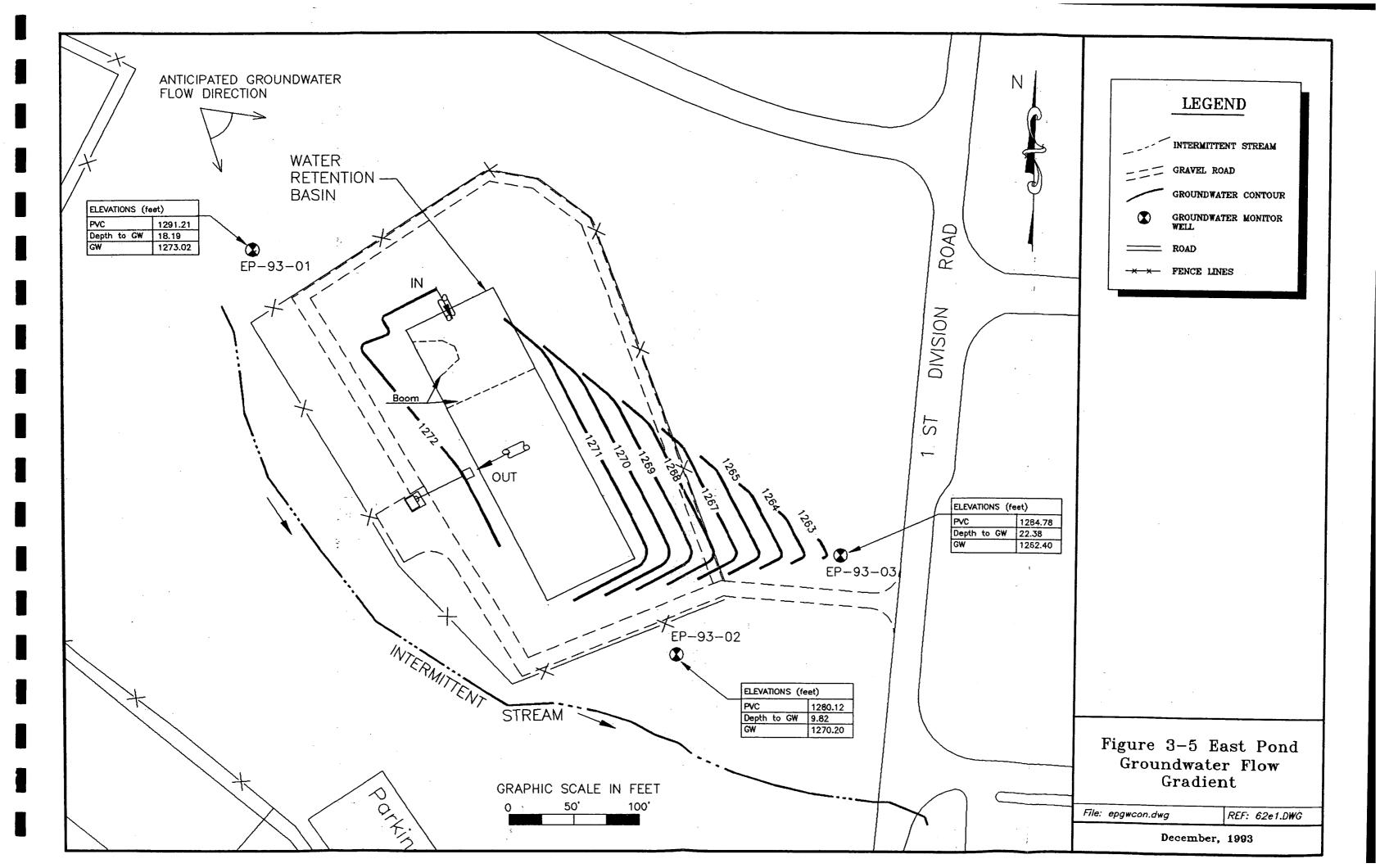
H: Result is an estimated value. Recommended holding time was exceeded.

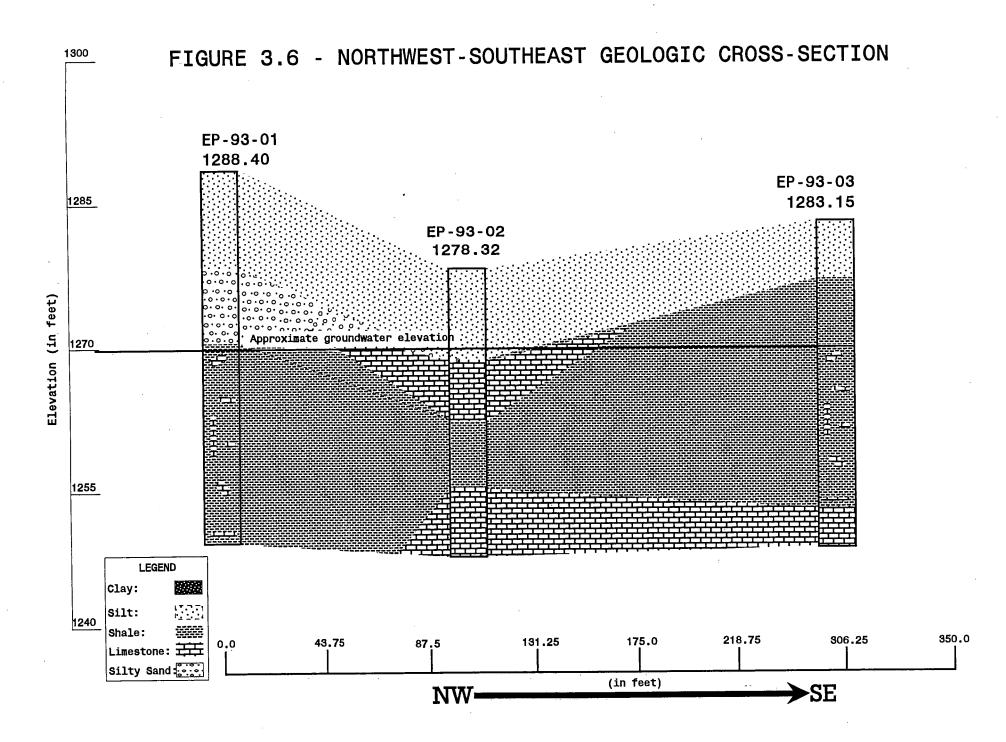


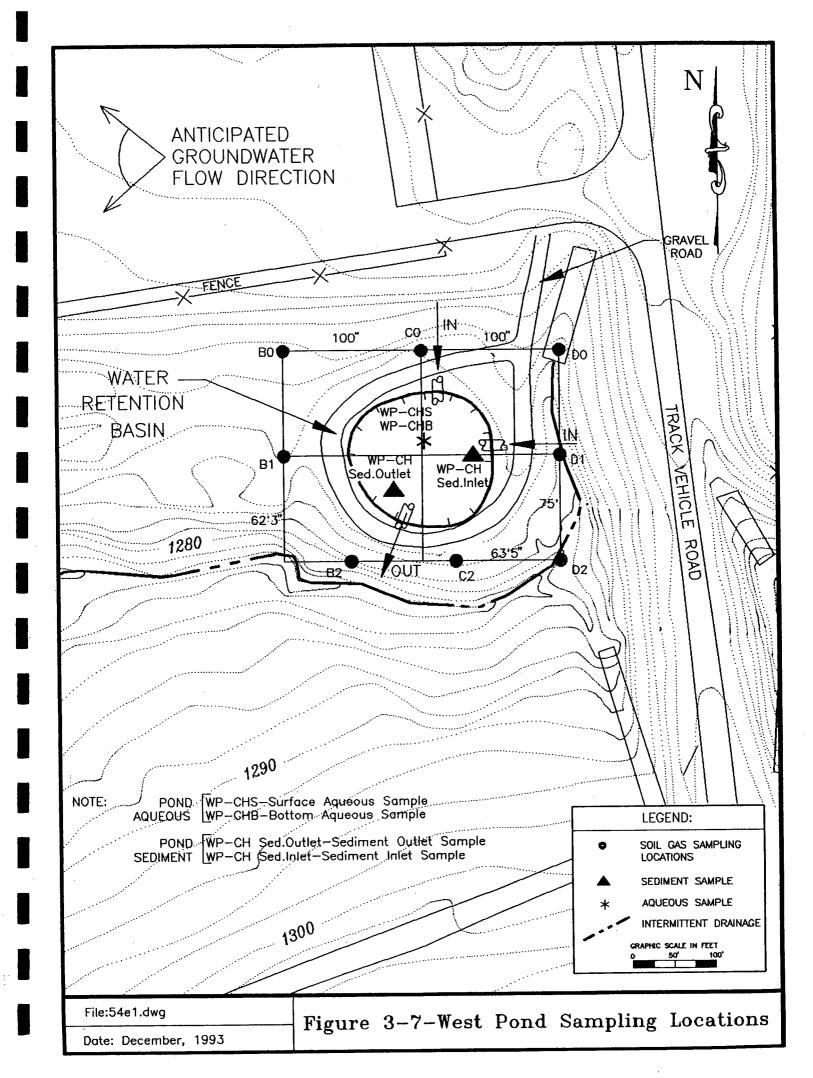


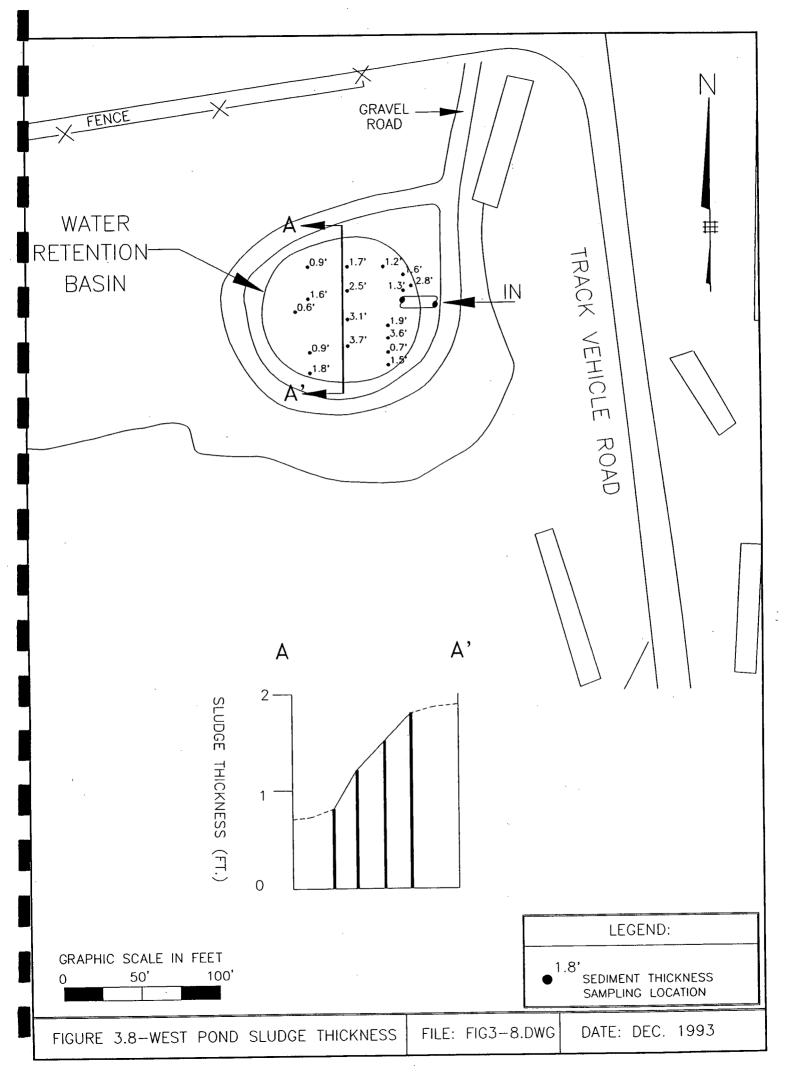


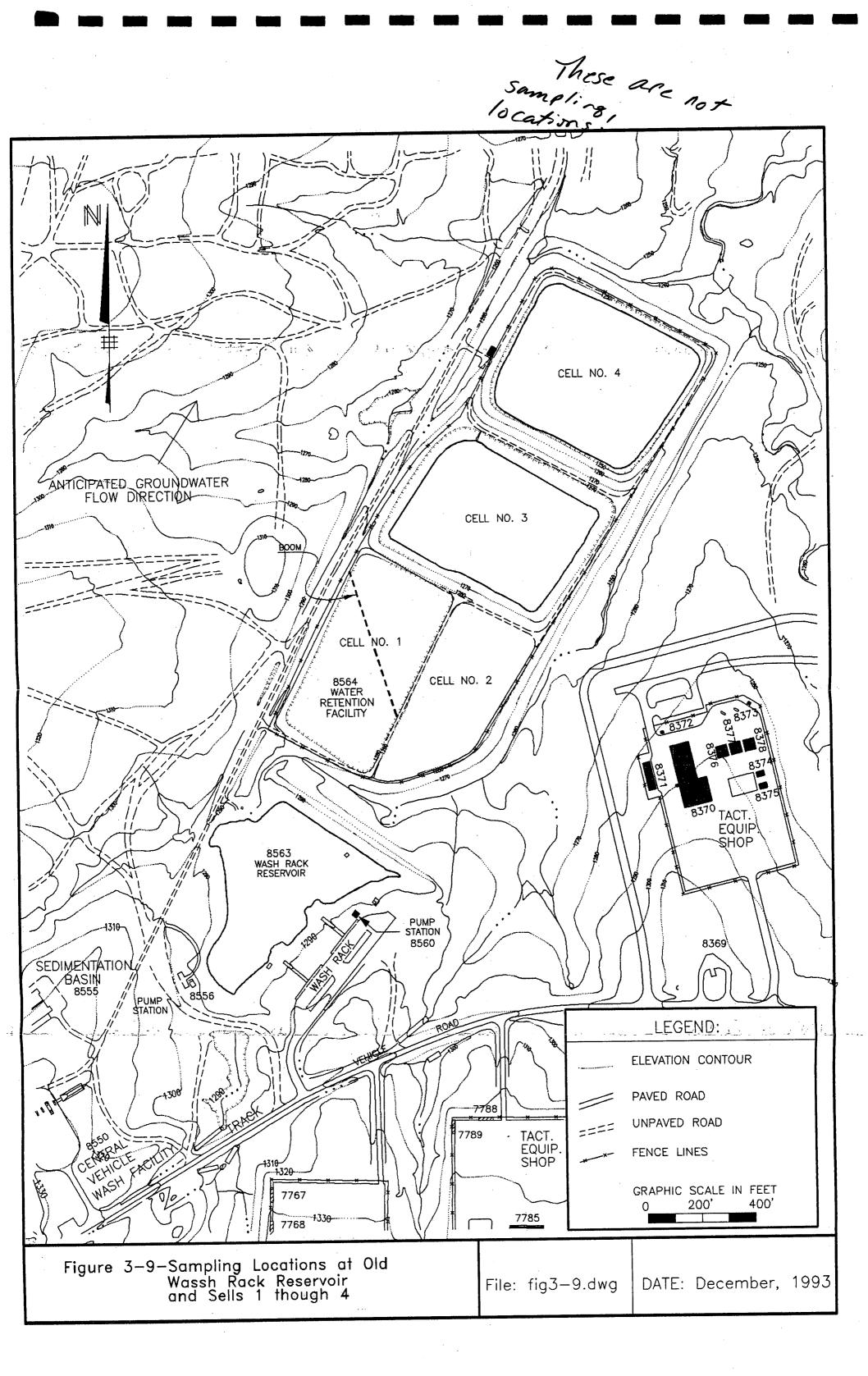


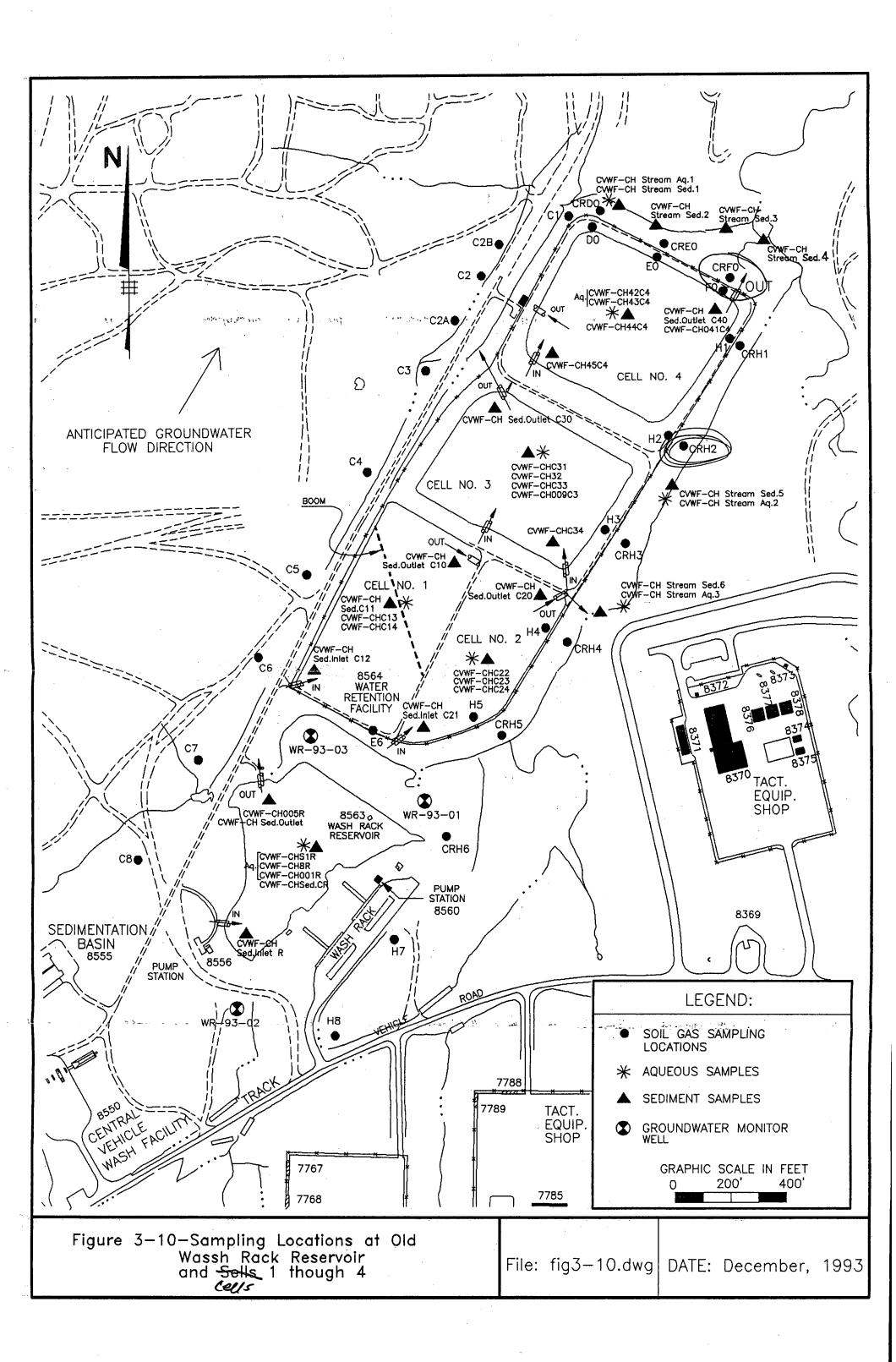


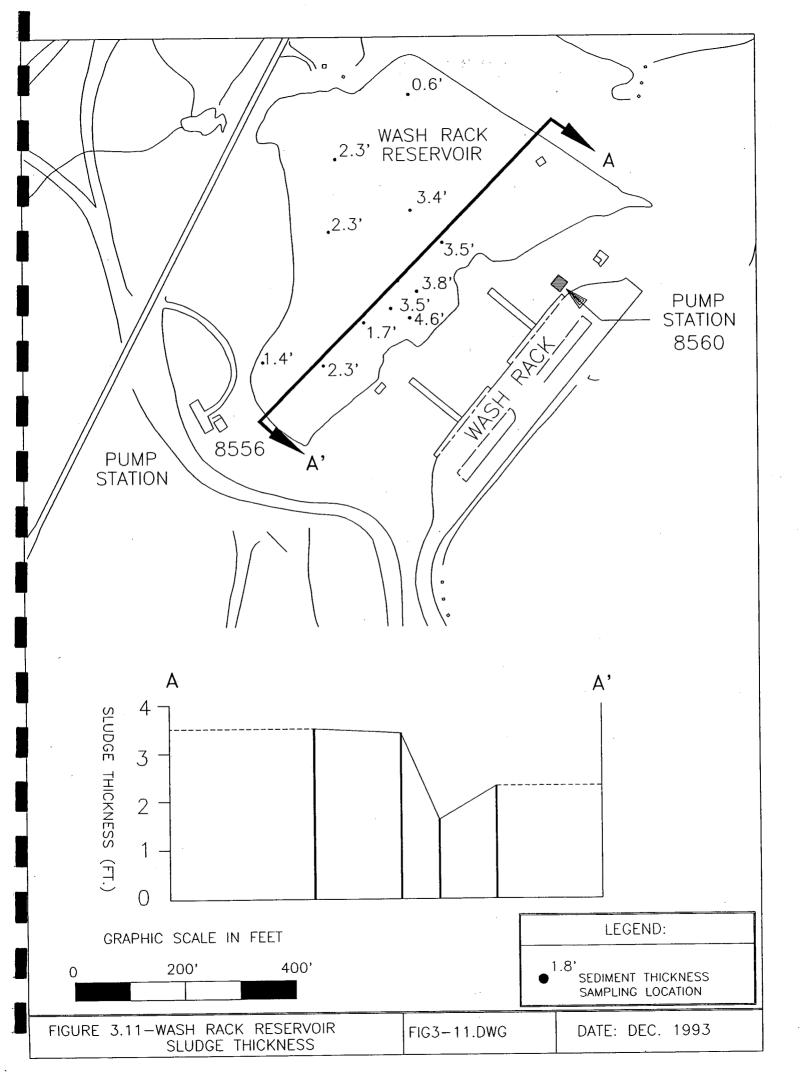


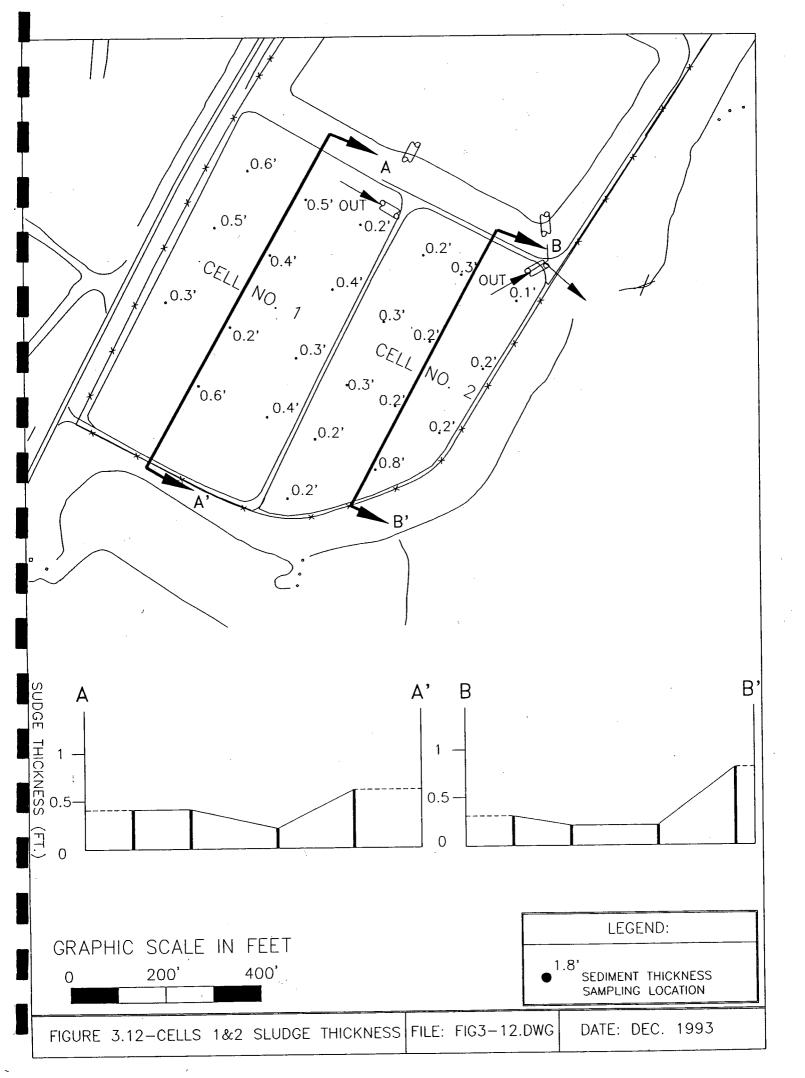


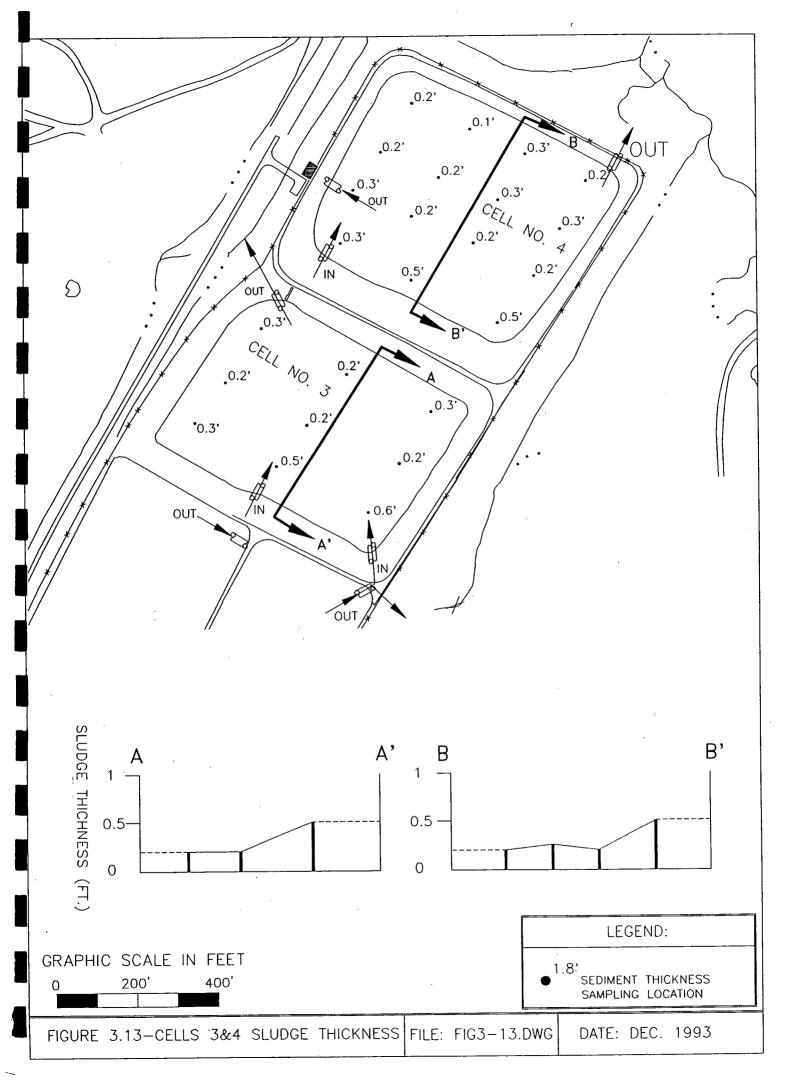


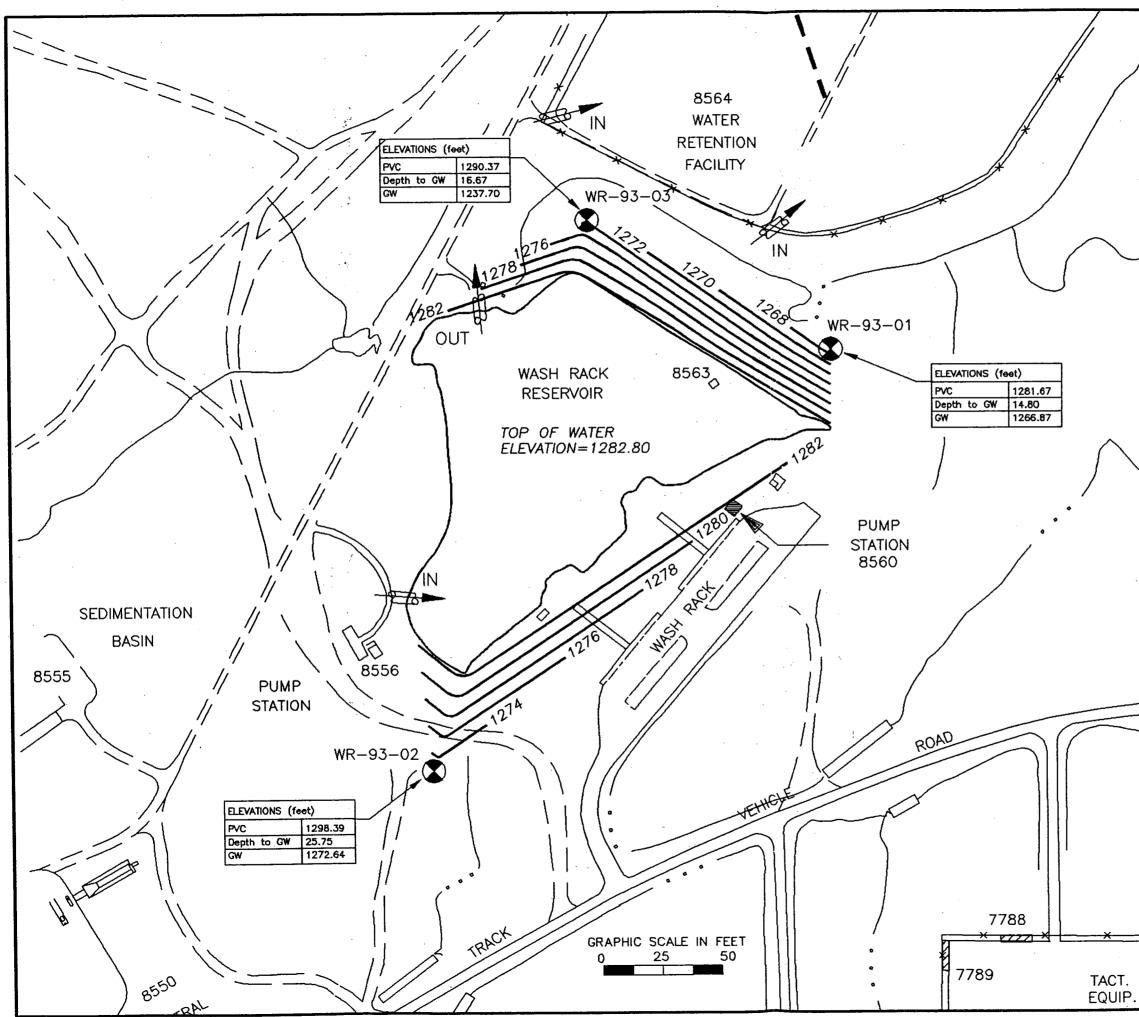




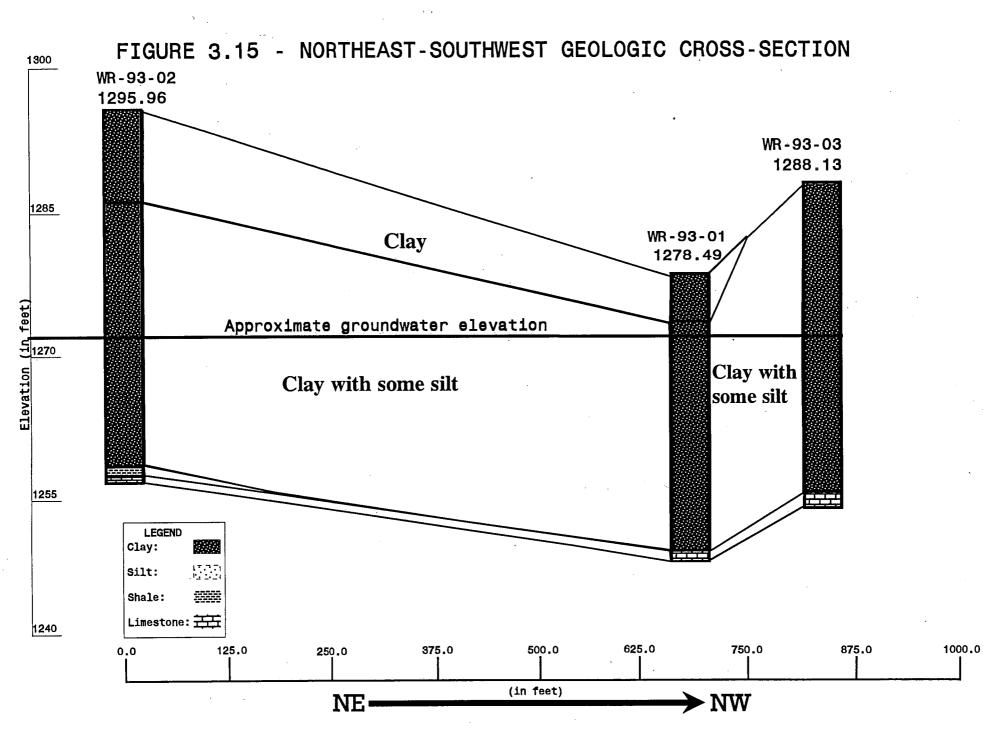








N	LEGEND INTERMITTENT STREAM GRAVEL ROAD GROUNDWATER CONTOUR GROUNDWATER MONITOR WELL ROAD T FENCE LINES
	DRAFT
	Figure 3-14 Groundwater Flow Gradient Wash Rack Reservoir File: wrgwcon.dwg REF: 62e1.DWG December, 1993



Fort Riley

4.0 BUILDING 1301 AREA

The Building 1301 Area is located between Fifth and Seventh Streets, between H and G Streets in Camp Funston. The general location is shown in Figure 4-1. The area was included in the high priority SI because building 1301 was scheduled for demolition. The purpose of the SI was to investigate environmental conditions around building 1301 and former building 1605.

Building 1301 was former used for furniture repair and paint stripping, between 1988 and 1992. One room in the northwest corner has five, one-inch diameter holes drilled in the floor for ventilation during the stripping operation. The SI consisted of a soil gas survey within and around the northwest corner of building 1301 to determine whether volatile organic compounds had been released to the environment.

Former building 1605 was used for similar furniture repair and stripping operations circa 1984 to 1988 when it burned down. The SI consisted of a soil gas survey over the area of former building 1605. The former building is now a vacant lot covered with soil and used as a vehicle parking area.

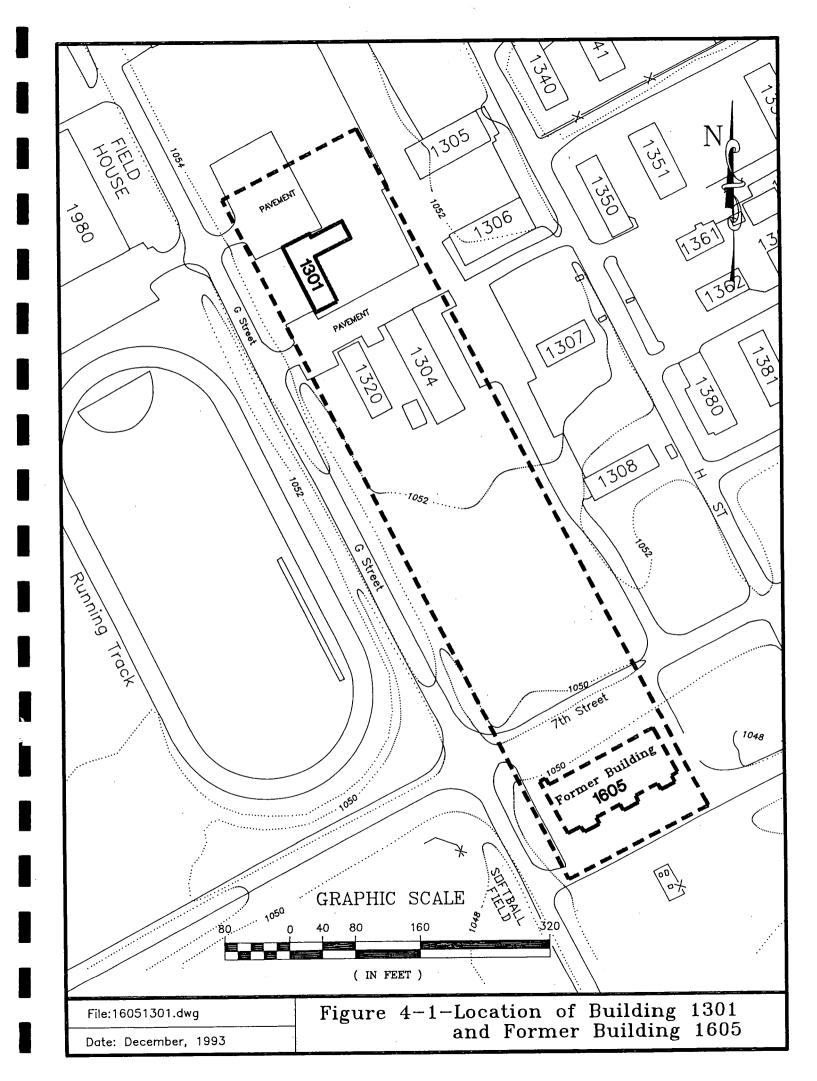
4.1 Summary of SI Results

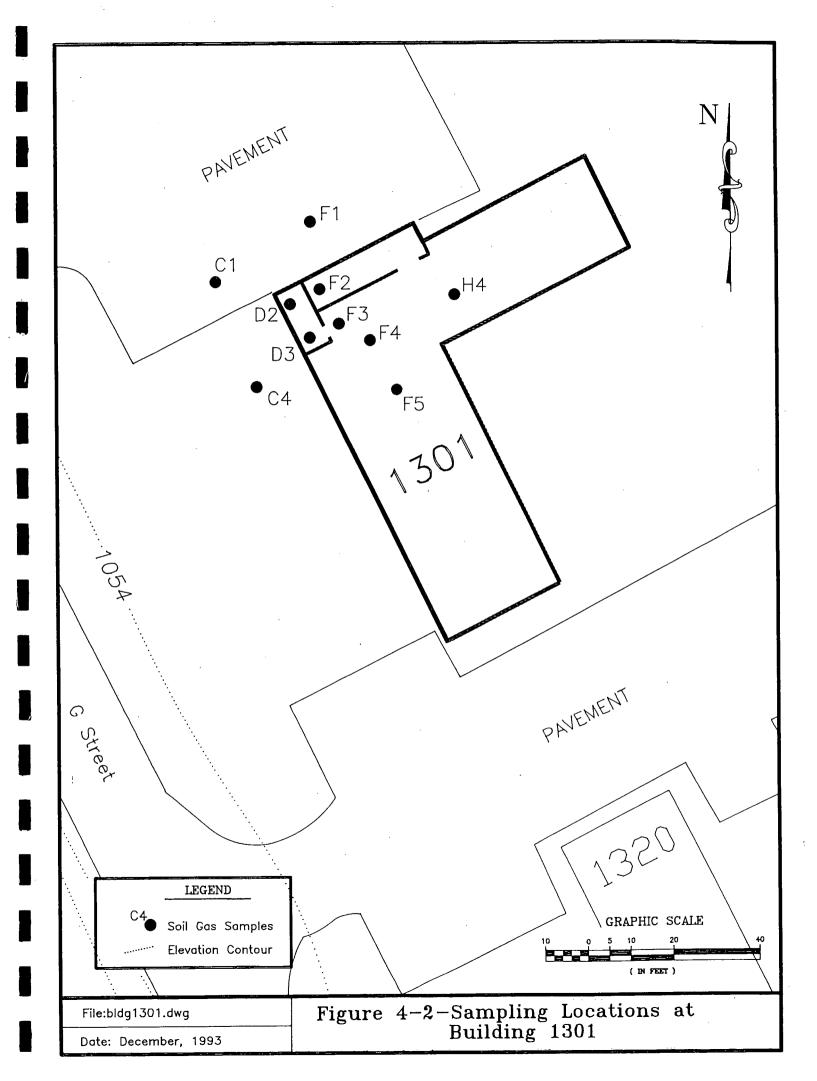
The phase 1 soil gas survey of building 1301 included collection of four-foot soil gas samples at 10 locations, as shown in Figure 4-2. The soil gas samples were analyzed for petroleum hydrocarbons and chlorinated organic compounds using modified EPA Method 8010 and 8020. There were <u>no detections at any of the ten sampling</u> locations. No further sampling was conducted.

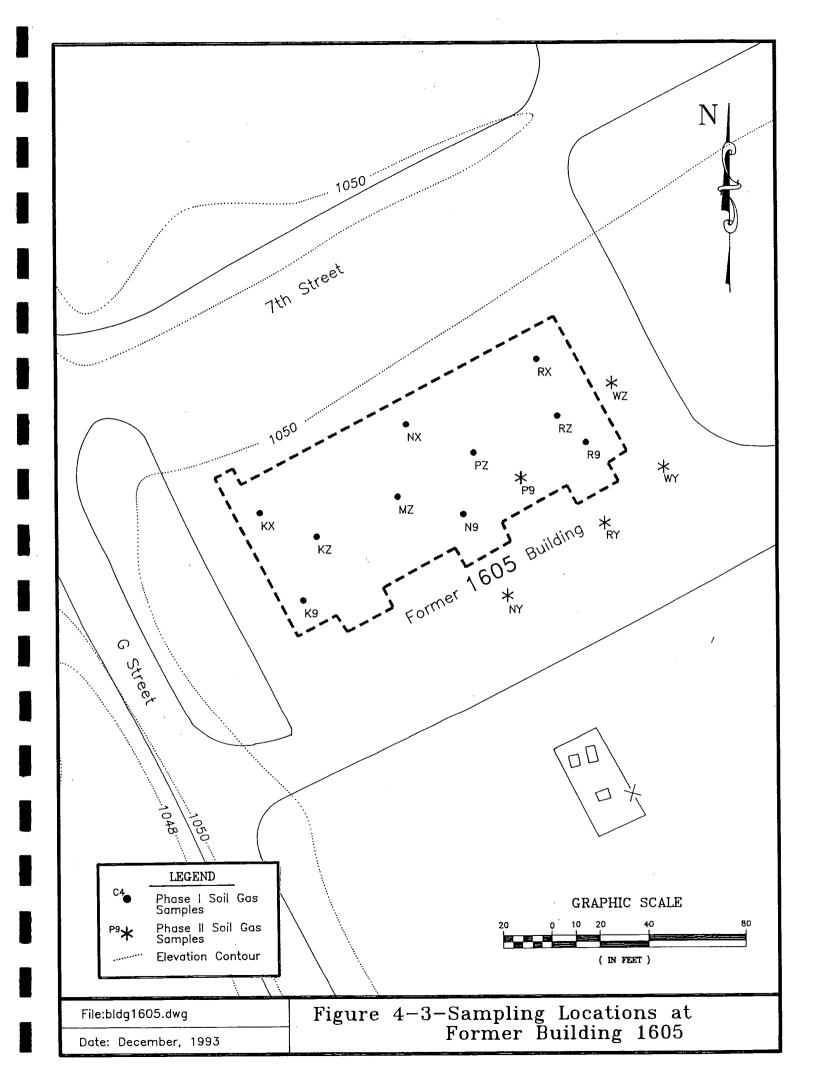
The phase 1 soil gas survey of former building 1605 included collection of soil gas samples at 10 locations; the samples were collected and analyzed as described above for building 1301. There were no detections at 9 of the sample locations. However, at one location - R9 -- Total FID concentrations were <u>660 ug/l</u>. Consequently, a phase 2 soil gas survey was conducted. The phase 2 survey included collection of a groundwater screening sample from a depth of 10 feet below sample location R9 as well as the collection of soil gas samples at five new locations around R9. There were no detections in any of the phase 2 soil gas or groundwater screening samples. In addition, two soil samples were collected at R9 at depths of 18 inches and 3 to 4 feet. The soil samples were analyzed in the laboratory for volatile organic compounds and TPH. There were no detections in either of the soil samples. No further investigations were conducted.

4.2 Discussion of SI Results

The SI results indicate that there are no releases to the environment from building 1301. Further, the SI results indicate that there are no significant releases from former building 1605. The detection of petroleum hydrocarbons at one location is more likely attributable to the use of the area for vehicle parking than to the activities at the former building. Since the time of the SI sampling, Fort Riley, in consultation with KDHE, has conducted a soil removal from the area of sample R9 at former building 1605. The details of this removal will be presented in the SI report for this site.







DSER - High Priority Sites

ATTACHMENT A

SOIL GAS AND FIELD GROUNDWATER SCREENING ANALYTICAL DATA PACKAGE

Fort Riley

SAMPLE COLLECTION AND ANALYSIS

From September 20 to October 1, 1993, TARGET Environmental Services, Inc. (TARGET) conducted a site screening survey at Fort Riley, Kansas near Junction City. A total of 199 soil gas samples and 77 ground water samples were collected at the various sites on base. All sampling depths and locations were chosen on site by Louis Berger Associates (LBA). The sampling locations are shown on the accompanying copies of the field maps.

Two sampling procedures were employed to collect soil gas samples. For both methods, the entire sampling system was first purged with ambient air drawn through an organic vapor filter cartridge. In general, deep (> 4 feet) samples were collected using a van-mounted hydraulic probe to advance connected 3-foot sections of 1-inch diameter threaded steel casing down to the sampling depth. A tefion line was inserted into the casing to the bottom of the hole, and the bottom-hole line perforations were isolated from the up-hole annulus by an inflatable packer. Shallow samples (4 feet or less) were collected manually using a drive rod to produce a 1/2-inch hole. A stainless steel probe was inserted to the full depth of the hole and sealed off from the atmosphere. Where pavement was present, a rotary hammer was employed for penetration prior to using the drive rod.

Following isolation of the sampling zone, a sample of in-situ soil gas was then withdrawn through the probe or line and used to purge atmospheric air from the sampling system. A second sample of soil gas was withdrawn through the probe and encapsulated in a pre-evacuated glass vial at two atmospheres of pressure (15 psig). The self-sealing vial was detached from the sampling system, packaged, labeled, and stored for laboratory analysis.

To collect the ground water samples, a van-mounted hydraulic probe was used to advance connected 3-foot sections of 1-inch diameter threaded steel casing down to the sampling depth.

The steel casing was removed and a 5-foot section of 1-inch diameter slotted PVC pipe connected to one or more 5-foot sections of PVC riser pipe was inserted to the full depth of the hole. The pipe was allowed to sit for a period of time to allow the water to fill the pipe. A 21" long by 7/16" O.D. stainless steel bailer was then used to collect 40 ml of ground water. Samples were placed in glass vials, acidified to pH < 2 using a 50% hydrochloric solution, sealed, labeled and stored on ice pending laboratory analysis.

Prior to the day's field activities all sampling equipment, slide hammer rods and probes were decontaminated by washing with soapy water and rinsing thoroughly. Internal surfaces were flushed dry using pre-purified nitrogen or filtered ambient air, and external surfaces were wiped clean using clean paper towels.

All of the samples collected during the field phase of the survey were subjected to dual analyses. One analysis was conducted according to EPA Method 8010 (modified) on a gas chromatograph equipped with an electron capture detector (ECD), and using direct injection. Specific analytes standardized for this analysis were:

> 1,1-dichloroethene (11DCE) methylene chloride (CH_2Cl_2) trans-1,2-dichloroethene (t12DCE) 1,1-dichloroethane (11DCA) cis-1,2-dichloroethene (c12DCE) chloroform (CHCl₃) 1,1,1-trichloroethane (111TCA) carbon tetrachloride (CCl₄) trichloroethene (TCE) 1,1,2-trichloroethane (112TCA) tetrachloroethene (PCE)

The chlorinated hydrocarbons in this suite were chosen because of their common usage in industrial solvents, and/or their degradational relationship to commonly used compounds.

The second analysis was conducted according to EPA Method 8020 (modified) on a gas chromatograph equipped with a flame ionization detector (FID), and using direct injection. The analytes selected for standardization in this analysis were:

> benzene toluene ethylbenzene meta- and para- xylene ortho- xylene

These compounds were chosen because of their utility in evaluating the presence of fuel products, or petroleum based solvents.

The tabulated results of the laboratory analyses of the soil gas samples are reported in micrograms per liter (μ g/l) in Tables 1 and 2. Although "micrograms per liter" is equivalent to "parts per billion (v/v)" in water analyses, they are not equivalent in gas analyses, due to the difference in the mass of equal volumes of water and gas matrices. The xylenes concentrations reported in Table 1 are the sum of the m- and p-xylene and the o-xylene concentrations for each sample.

The analytical equipment was calibrated using a 3-point instrument response curve and injection of known concentrations of the target analytes. Retention times of the standards were used to identify the peaks in the chromatograms of the field samples, and their response factors were used to calculate the analyte concentrations. The ground water samples were prepared for analysis by pouring 15 ml of sample into a 30 ml EPA clean vial and sealing with a teflon-faced butyl rubber septum. The vial was heated for 10 minutes in a 90°C heating block to volatilize hydrocarbons from the water. The headspace of the sample was then directly injected into a gas chromatograph.

Total FID Volatiles values were generated by summing the areas of all integrated chromatogram peaks and calculated using the instrument response factor for toluene. Injection peaks, which also contain the light hydrocarbon methane, were excluded to avoid the skewing of Total FID Volatiles values due to injection disturbances and biogenic methane. For samples with low hydrocarbon concentrations, the calculated Total FID Volatiles concentration is occasionally lower than the sum of the individual analytes. This is because the response factor used for the Total FID Volatiles calculation is a constant, whereas the individual analyte response factors are compound specific. It is important to understand that the Total FID Volatiles levels reported are relative, not absolute, values.

Quality Assurance/Quality Control (QA/QC) Evaluation

Field QA/QC Samples

Soil gas field control samples were collected at the beginning and end of each day's soil gas sampling activities, after every tenth sample and between individual sites. These QA/QC samples were obtained by filtering ambient air through a dust and organic vapor filter cartridge and encapsulating as described above. Equipment rinseate blanks were collected at the beginning and end of each day's ground water sampling activities, after every tenth sample and between individual sites. These QA/QC samples were obtained by rinsing distilled water through the decontaminated bailer and into a sample vial. Duplicate samples were also collected after every tenth field sample. The laboratory results of the analysis of these samples are reported in Tables T and 2.

Laboratory QA/QC Samples

To document analytical repeatability, a duplicate analysis was performed on every tenth field sample. Laboratory blanks of nitrogen gas were also analyzed after every tenth field sample. The results of these analyses are reported in Tables 1 and 2.

Discussion of Results

The disparity in the results for ground water samples collected at the same locations on different days may be due to several natural phenomena including; ground water flow, water table fluctuations, or the influx of meteoric waters and atmospheric changes.

The chromatograms of several samples were selected by LBA for discussion. Copies of these chromatograms are included in Appendix A. The ECD chromatogram of Sample CF1301-R9 reveals only a few small background peaks, however, none of the standardized chlorinated analytes were present above the reporting limit. The FID chromatogram of Sample CF1301-R9 depicts peaks representative of a petroleum hydrocarbon mixture of relatively low volatility. The ECD chromatogram of Sample MAAF-M8W exhibits a few prominent peaks representing c-1,2-DCE, TCE and PCE. The FID chromatogram of Sample MAAF-M8W reveals a few smaller peaks which represent the FID response to the chlorinated compounds present in the sample. The ECD chromatograms of Samples MAAF-H7 and MAAF-H7W show peaks representing c-1,2-DCE and non-reportable levels of PCE. The FID chromatogram signatures of Samples MAAF-H7 and MAAF-H7W show peaks representing c-1,2-DCE and non-reportable levels of PCE. The FID chromatogram signatures of Samples MAAF-H7 and MAAF-H7W show peaks representing c-1,2-DCE and non-reportable levels of PCE. The FID chromatogram signatures of Samples MAAF-H7W are suggestive of weathered gasoline. However, the abundance of late eluting peaks also suggests the possibility that these signatures may represent a mixture of gasoline and diesel fuel. The ECD and FID chromatograms of Samples MAAF-V8W and MAAF-E5W do not reveal the presence of any standardized analytes above the reporting limit.

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TABLE 1

ANALYTE CONCENTRATIONS VIA GC/FID (µg/I)

				ETHYL-		TOTAL FID
SAMPLE	DEPTH (FT.)	BENZENE	TOLUENE	BENZENE	XYLENES	VOLATILES*
REPORTING	······	1.0	1.0	1.0	1.0	10
LIMIT						
WASH RACK	RESERVOIR	AND CELLS	S AREA			
SOIL GAS SAMP	PLES					
CR-C2-A	4	<1.0	<1.0	<1.0	<1.0	<10
CR-C2B	4	<1.0	<1.0	<1.0	<1.0	<10
CR-C2A-12	12	<1.0	<1.0	<1.0	<1.0	<10
CR-C2B12	12	<1.0	<1.0	<1.0	<1.0	<10
CR-D0	4	<1.0	<1.0	<1.0	<1.0	<10
CR-D0-12	12	<1.0	<1.0	<1.0	<1.0	<10
CR-E0	4	<1.0	<1.0	<1.0	<1.0	<10
CR-E0-12	12	<1.0	<1.0	<1.0	<1.0	<10
CR-F0	4	<1.0	<1.0	<1.0	<1.0	<10
CR-H1	4	<1.0	<1.0	<1.0	<1.0	<10
CR-H2	4	<1.0	<1.0	<1.0	<1.0	<10
CR-H3	4	<1.0	<1.0	<1.0	<1.0	<10
CR-H4	4	<1.0	<1.0	<1.0	<1.0	<10
CR-H5	4	<1.0	<1.0	<1.0	<1.0	<10
WR-C1	4	<1.0	<1.0	<1.0	1.3	<10
WR-C2	4	<1.0	<1.0	<1.0	<1.0	<10
WR-C2-9	9	<1.0	<1.0	<1.0	<1.0	12
WR-C3	4	<1.0	<1.0	<1.0	<1.0	<10
WR-C3-12	12	<1.0	<1.0	<1.0	<1.0	<10
WR-C4	4	<1.0	<1.0	<1.0	<1.0	<10
WR-C4-12	12	<1.0	<1.0	<1.0	<1.0	<10
WR-C5	4	`<1.0	<1.0	<1.0	<1.0	<10
WR-C5-11	11	<1.0	<1.0	<1.0	<1.0	<10
WR-C6	4	<1.0	<1.0	<1.0	<1.0	<10
WR-C6-12	12	<1.0	<1.0	<1.0	<1.0	
WR-C7	4	<1.0	<1.0	<1.0	<1.0	
WR-C7-12	12	<1.0	<1.0	<1.0	<1.0	
WR-C8	4	<1.0	<1.0	<1.0	<1.0	
WR-C8-12	12	<1.0	<1.0	<1.0	<1.0	<10
WR-DQ	. 4	<1.0	<1.0	<1.0	<1.0	
WR-E6	4	<1.0	<1.0	<1.0	<1.0	<10

• CALCULATED USING THE SUM OF THE AREAS OF ALL INTEGRATED CHROMATOGRAM PEAKS AND THE INSTRUMENT RESPONSE FACTOR FOR TOLUENE

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				ETHYL-		TOTAL FID
SAMPLE	DEPTH (FT.)	BENZENE	TOLUENE	BENZENE	XYLENES	VOLATILES*
REPORTING		1.0	1.0	1.0	1.0	10
LIMIT						
SOIL GAS SAMPL	.ES (cont.)					
WR-E6-12	12	<1.0	<1.0	<1.0	<1.0	<10
WR-EQ	4	<1.0	<1.0	<1.0	<1.0	<10
WR-EQ-12	12	<1.0	<1.0	<1.0	<1.0	<10
WR-FQ	4	<1.0	<1.0	<1.0	<1.0	<10
WR-FQ-12	12	<1.0	1.6	<1.0	<1.0	<10
WR-H1	4	<1.0	<1.0	<1.0	<1.0	<10
WR-H1-12	12	<1.0	<1.0	<1.0	<1.0	<10
WR-H2	4	<1.0	<1.0	<1.0	<1.0	<10
WR-H2-12	12	<1.0	1.1	<1.0	<1.0	<10
WR-H3	4	<1.0	<1.0	<1.0	<1.0	<10
WR-H3-12	12	<1.0	<1.0	<1.0	<1.0	<10
WR-H4	4	<1.0	<1.0	<1.0	<1.0	<10
WR-H4-12	12	<1.0	<1.0	<1.0	<1.0	<10
WR-H5	4	<1.0	<1.0	<1.0	<1.0	<10
WR-H5-12	12	<1.0	<1.0	<1.0	<1.0	<10
WR-H6-4	4	<1.0	<1.0	<1.0	<1.0	<10
WR-H6-12	12	<1.0	<1.0	<1.0	<1.0	<10
WR-H7	4	<1.0	<1.0	<1.0	<1.0	<10
WR-H8	4	<1.0	<1.0	<1.0	<1.0	<10
WATER SAMPLE	<u>ES</u>					
WR-C1W	7	<1.0	<1.0	<1.0	<1.0	<10
WR-DQW	12	<1.0	<1.0	<1.0	<1.0	<10
FIELD CONTROL	SAMPLES					
CR-1B	N/A	<1.0	<1.0	<1.0	<1.0	<10
CR-2B	N/A	<1.0	<1.0	<1.0	<1.0	
CR-3B	N/A	<1.0	<1.0	<1.0	<1.0	
CR-4B	N/A	<1.0	<1.0	<1.0	<1.0	<10
WR-1	N/A	<1.0	<1.0	<1.0	<1.0	<10
WR-2	N/A	<1.0	<1.0	<1.0	<1.0	
WR-3	N/A	<1.0	<1.0	<1.0	<1.0	<10
WR-4	N/A	<1.0	<1.0	<1.0	<1.0) <10

ANALYTE CONCENTRATIONS VIA GC/FID (µg/I)

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TABLE 1 (CONT.)

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				ETHYL-		TOTAL FID
SAMPLE	DEPTH (FT.)	BENZENE	TOLUENE	BENZENE	XYLENES	VOLATILES*
REPORTING LIMIT		1.0	1.0	1.0	1.0	10
FIELD CONTROL	SAMPLES (cont.	1				
WR-5	N/A	<1.0	<1.0	<1.0	<1.0	<10
EQUIPMENT RIN	SEATE BLANKS					
WR-1W	N/A	<1.0	<1.0	<1.0	<1.0	<10
LABORATORY D	UPLICATE ANAL	YSIS				
CR-C2B12	12	<1.0	<1.0	<1.0	<1.0	<10
CR-C2B12R	12	<1.0	<1.0	<1.0	<1.0	<10
CR-H5	4	<1.0	<1.0	<1.0	<1.0	<10
CR-H5R	4	<1.0	<1.0	<1.0	<1.0	<10
WR-C2-9	9	<1.0	<1.0	<1.0	<1.0	12
WR-C2-9R	9	<1.0	<1.0	<1.0	<1.0	12
WR-C6	4	<1.0	<1.0	<1.0	<1.0	<10
WR-C6R	4	<1.0	<1.0	<1.0	<1.0	<10
WR-H3-12	12	<1.0	<1.0	<1.0	<1.0	<10
WR-H3-12R	12	<1.0	<1.0	<1.0	<1.0	<10
WR-H4-12	12	<1.0	<1.0	<1.0	<1.0	<10
WR-H4-12R	12	<1.0	<1.0	<1.0	<1.0	<10
FIELD DUPLICA	TE ANALYSIS					
WR-C4-12	12	<1.0	<1.0	<1.0	<1.0	<10
WR-C4-12D	12	<1.0	<1.0	<1.0	<1.0	<10
WR-FQ-12	12	<1.0	1.6	<1.0	<1.0	<10
WR-FQ-12D	12	<1.0	1.5	<1.0	<1.0	<10
WR-H8	4	<1.0	<1.0	<1.0	<1.0	<10
WR-H8D	4	<1.0	<1.0	<1.0	<1.0	<10

ANALYTE CONCENTRATIONS VIA GC/FID (µg/I)

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TABLE 1 (CONT.)

				ETHYL-		TOTAL FID
SAMPLE	DEPTH (FT.)	BENZENE	TOLUENE	BENZENE	XYLENES	VOLATILES*
REPORTING		1.0	1.0	1.0	1.0	10
LIMIT						
LABORATORY B	LANKS					
CR-C2B12B	N/A	<1.0	<1.0	<1.0	<1.0	<10
CR-H5B	N/A	<1.0	<1.0	<1.0	<1.0	<10
WR-3B	N/A	<1.0	<1.0	<1.0	<1.0	<10
WR-C2-9B	N/A	<1.0	<1.0	<1.0	<1.0	<10
WR-C6B	N/A	<1.0	<1.0	<1.0	<1.0	<10
WR-H3-12B	N/A	<1.0	<1.0	<1.0	<1.0	<10
WR-H4-12B	N/A	<1.0	<1.0	<1.0	<1.0	, <10

ANALYTE CONCENTRATIONS VIA GC/FID (µg/I)

* CALCULATED USING THE SUM OF THE AREAS OF ALL INTEGRATED CHROMATOGRAM PEAKS AND THE INSTRUMENT RESPONSE FACTOR FOR TOLUENE

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				ETHYL-		TOTAL FID
SAMPLE	DEPTH (FT.)	BENZENE	TOLUENE	BENZENE	XYLENES	VOLATILES*
REPORTING		1.0	1.0	1.0	1.0	10
LIMIT						
EAST POND	AREA					
SOIL GAS SAMP	LES					
					.4.0	-10
EP-A1	4	<1.0	<1.0	<1.0	<1.0	<10 <10
EP-A1-10	10	<1.0	<1.0	<1.0	<1.0	<10 <10
EP-A2	4	<1.0	<1.0	<1.0	<1.0	<10 <10
EP-A2-9	9	<1.0	<1.0	<1.0	<1.0	<10 <10
EP-A3	4	<1.0	<1.0	<1.0	<1.0	<10
EP-A3-10	10	<1.0	<1.0	<1.0	<1.0	20
EP-A4	4	<1.0	<1.0	<1.0	<1.0	<10
EP-A4-9	9	<1.0	<1.0	<1.0	<1.0	<10
EP-A5	4	<1.0	<1.0	<1.0	<1.0	11
EP-A6-4	4	<1.0	<1.0	<1.0	<1.0	<10
EP-A6-12	12	<1.0	<1.0	<1.0	<1.0	<10
EP-A7-4	4	<1.0	<1.0	<1.0	<1.0	<10
EP-A7-12	12	<1.0	<1.0	<1.0	<1.0	<10
EP-A8	4	<1.0	<1.0	<1.0	<1.0	<10
EP-A8-12	4	<1.0	<1.0	<1.0	<1.0	<10
		.4.0	-1.0	<1.0	<1.0	<10
EP-A9	4	<1.0	<1.0	<1.0 <1.0	<1.0	<10
EP-A9-9	9.5	<1.0	<1.0	1.2	2.7	993
EP-A10	4	1.4	5.8 8.2	1.2	4.5	1,476
EP-A10-8	8	1.1	0.2 30	7.9	4.5	5,373
EP-A11	4	9.0	30	1.5	21	0,070
EP-A12-4	4	<1.0	<1.0	<1.0	<1.0	19
EP-A12-11	11	<1.0	<1.0	<1.0	<1.0	<10
EP-A13-4	4	<1.0	2.2	<1.0	1.4	136
EP-A14-4	4	<1.0	3.1	<1.0	1.4	357
EP-A14-8	8	<1.0	3.1	1.0	<1.0	261
			-4.0	-1.0	<1.0	<10
EP-B1	4	<1.0	<1.0	<1.0	<1.0 <1.0	<10 <10
EP-B2	4	<1.0	<1.0	<1.0		
EP-C1	4	<1.0	<1.0	<1.0	<1.0 <1.0	
EP-C1-12	12	<1.0	<1.0	<1.0		<10 <10
EP-C2	4	<1.0	<1.0	<1.0	<1.0	<10

ANALYTE CONCENTRATIONS VIA GC/FID (µg/I)

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TABLE 1 (CONT.)

				ETHYL-		TOTAL FID
SAMPLE	DEPTH (FT.)	BENZENE	TOLUENE	BENZENE	XYLENES	VOLATILES*
REPORTING		1.0	1.0	1.0	1.0	10
LIMIT						
SOIL GAS SAMP	LES (cont.)					
	-		.4.0	-1.0	-10	11
EP-C2-8	8	<1.0	<1.0	<1.0 <1.0	<1.0 <1.0	<10
EP-C4	4	<1.0	1.2 <1.0	<1.0 <1.0	<1.0 <1.0	<10
EP-C4-9	9	<1.0	<1.0	<1.0	<1.0	<10
EP-D1	4	<1.0	<1.0 <1.0	<1.0	<1.0	<10
EP-D1-11	11	<1.0	<1.0	1.0	×1.0	
EP-D2	4	<1.0	<1.0	<1.0	<1.0	<10
EP-D2-12	12	<1.0	<1.0	<1.0	<1.0	<10
EP-E3	4	<1.0	<1.0	<1.0	<1.0	<10
EP-E3-8	8	<1.0	<1.0	<1.0	<1.0	<10
EP-E4	4	<1.0	<1.0	<1.0	<1.0	<10
	-	1.0				
EP-E4-8	8	<1.0	<1.0	<1.0	<1.0	<10
EP-EQ	4	<1.0	<1.0	<1.0	<1.0	<10
EP-EQ-12	12	<1.0	<1.0	<1.0	<1.0	<10
EP-F1	4	<1.0	<1.0	<1.0	<1.0	<10
EP-F2	4	<1.0	<1.0	<1.0	<1.0	<10
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EP-F4	4	<1.0	<1.0	<1.0	<1.0	<10
EP-H2	4	<1.0	<1.0	<1.0	<1.0	<10
EP-H2-12	12	<1.0	<1.0	<1.0	<1.0	<10
EP-H3	4	<1.0	<1.0	<1.0	<1.0	<10
EP-H3-8	8	<1.0	<1.0	<1.0	<1.0	<10
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FIELD CONTRO	L SAMPLES					
EP-1	N/A	<1.0	<1.0	· <1.0	<1.0	<10
EP-2	N/A	<1.0	<1.0	<1.0	<1.0	<10
EP-3	N/A	<1.0	<1.0	<1.0	<1.0	<10
EP-4	N/A	<1.0	<1.0	<1.0	<1.0	
EP-5	N/A	<1.0	<1.0	<1.0	<1.0	<10
EP-6	N/A	<1.0	<1.0	<1.0	<1.0	<10
EP-7	N/A	<1.0	<1.0	<1.0	<1.0	<10

ANALYTE CONCENTRATIONS VIA GC/FID (µg/l)

TABLE 1 (CONT.)

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				ETHYL-		TOTAL FID			
SAMPLE	DEPTH (FT.)	BENZENE	TOLUENE	BENZENE	XYLENES	VOLATILES *			
REPORTING		1.0	1.0	1.0	1.0	10			
LIMIT									
LABORATORY DUPLICATE ANALYSIS									
EP-A4-9	9	<1.0	<1.0	<1.0	<1.0	<10			
EP-A4-9 EP-A4-9R	9	<1.0 <1.0	<1.0	<1.0	<1.0	<10			
CF-A4-91		\$1.0	\$1.0	\$1.0	-1.0				
EP-A6-12	12	<1.0	<1.0	<1.0	<1.0	<10			
EP-A6-12R	12	<1.0	<1.0	<1.0	<1.0	<10			
EP-A13-4	4	<1.0	2.2	<1.0	1.4	136			
EP-A13-4R	4	<1.0	1.3	1.4	<1.0	152			
EP-A13-4K	**	~1.0	1.5	1.4	\$1.0	152			
EP-B2	4	<1.0	<1.0	<1.0	<1.0	<10			
EP-B2R	4	<1.0	<1.0	<1.0	<1.0	<10			
EP-C2	4	<1.0	<1.0	<1.0	<1.0	<10			
EP-C2R	4	<1.0	<1.0	<1.0	<1.0	<10			
EP-E3	4	<1.0	<1.0	<1.0	<1.0	<10			
EP-E3R	4	<1.0	<1.0	<1.0	<1.0	<10			
	т	-1.0	1.0	1.0					
EP-E4-8	8	<1.0	<1.0	<1.0	<1.0	<10			
EP-E4-8R	8	<1.0	<1.0	<1.0	<1.0	<10			
FIELD DUPLICAT	<u>FE ANALYSIS</u>								
EP-A9-9	9.5	<1.0	<1.0	<1.0	<1.0	<10			
EP-A9-9D	9.5	<1.0	<1.0	<1.0	<1.0	<10			
EP-C4	4	<1.0	1.2	<1.0	<1.0	<10			
EP-C4D	4	<1.0	<1.0	<1.0	<1.0	<10			
LABORATORY E	BLANKS								
	N/A	<1.0	<1.0	<1.0	<1.0	<10			
EP-A4-9B	N/A N/A	<1.0 <1.0	<1.0	<1.0 <1.0	<1.0	<10			
EP-A6-12B	N/A N/A	<1.0 <1.0	<1.0	<1.0 <1.0	<1.0	<10			
EP-A13-4B	N/A N/A	<1.0 <1.0	<1.0	<1.0	<1.0	<10			
EP-B2B			<1.0 <1.0	<1.0	<1.0	<10			
EP-C2B	N/A	<1.0	NI.U	\1.0	\1.0				
EP-E3B	N/A	<1.0	<1.0	<1.0	<1.0	<10			
EP-E4-8B	N/A	<1.0	<1.0	.<1.0	<1.0	<10			
	*				· ·				

ANALYTE CONCENTRATIONS VIA GC/FID (µg/I)

ANALYTE CONCENTRATIONS VIA GC/FID (µg/I)

				ETHYL-		TOTAL FID			
SAMPLE	DEPTH (FT.)	BENZENE	TOLUENE	BENZENE	XYLENES	VOLATILES*			
REPORTING		1.0	1.0	1.0	1.0	10			
LIMIT									
WEST POND AREA									
SOIL GAS SAMPL	<u>ES</u>								
WP-B1	4	<1.0	<1.0	<1.0	<1.0	<10			
WP-B1-12	12	<1.0	<1.0	<1.0	<1.0	<10			
WP-B2	4	<1.0	<1.0	<1.0	<1.0	<10			
WP-B2-12	12	<1.0	<1.0	<1.0	<1.0	<10			
WP-BQ	4	<1.0	<1.0	<1.0	<1.0	<10			
WP-BQ-12	12	<1.0	<1.0	<1.0	<1.0	<10			
WP-C2	4	<1.0	<1.0	<1.0	<1.0	<10			
WP-C2-12	12	<1.0	<1.0	<1.0	<1.0	<10			
WP-CQ	4	<1.0	<1.0	<1.0	<1.0	<10			
WP-CQ-10	10	<1.0	<1.0	<1.0	<1.0	<10			
WP-D1	4	<1.0	<1.0	<1.0	<1.0	<10			
WP-D1-12	12	<1.0	<1.0	<1.0	<1.0	<10			
WP-D2	4	<1.0	<1.0	<1.0	<1.0	<10			
WP-D2-12	12	<1.0	<1.0	<1.0	<1.0	<10			
WP-DQ	4	<1.0	<1.0	<1.0	<1.0	<10			
WP-DQ-12	12	<1.0	<1,0	<1.0	<1.0	<10			
FIELD CONTROL	SAMPLES								
WP-5	N/A	<1.0	<1.0	<1.0	<1.0	<10			
LABORATORY D	UPLICATE ANAL	<u>YSIS</u>							
WP-5	N/A	<1.0	<1.0	<1.0	<1.0	<10			
WP-5R	N/A	<1.0	<1.0	<1.0	<1.0	<10			
WP-C2	4	<1.0	<1.0	<1.0		<10			
WP-C2R	4	<1.0	<1.0	<1.0	<1.0	<10			
FIELD DUPLICAT	<u>E ANALYSIS</u>								
WP-CQ-10	10	<1.0	<1.0	<1.0	<1.0	<10			
WP-CQ-10D	10	<1.0	<1.0	<1.0	<1.0	<10			

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			ETHYL-		TOTAL FID				
DEPTH (FT.)	BENZENE	TOLUENE	BENZENE	XYLENES	VOLATILES*				
	1.0	1.0	1.0	1.0	10				
:									
FIELD DUPLICATE ANALYSIS (cont.)									
12	<1.0	<1.0	<1.0	<1.0	<10				
12	<1.0	<1.0	<1.0	<1.0	<10				
ANKS									
N/A	<1.0	<1.0	<1.0	<1.0	<10				
N/A	<1.0	<1.0	<1.0	<1.0	<10				
	ANALYSIS (cor 12 12 ANKS N/A	1.0 <u>ANALYSIS (cont.)</u> 12 <1.0 12 <1.0 <u>ANKS</u> N/A <1.0	1.0 1.0 1.0 1.0 12 <1.0	DEPTH (FT.) BENZENE TOLUENE BENZENE 1.0 1.0 1.0 1.0 ANALYSIS (cont.) 12 <1.0	DEPTH (FT.) BENZENE TOLUENE BENZENE XYLENES 1.0 1.0 1.0 1.0 1.0 ANALYSIS (cont.) 12 <1.0				

ANALYTE CONCENTRATIONS VIA GC/FID (µg/I)

				ETHYL-		TOTAL FID			
SAMPLE	DEPTH (FT.)	BENZENE	TOLUENE	BENZENE	XYLENES	VOLATILES*			
REPORTING		1.0	1.0	1.0	1.0	10			
LIMIT									
BUILDING 1301 AREA									
SOIL GAS SAMPL	<u>ES</u>								
CF1301-C1	4	<1.0	<1.0	<1.0	<1.0	<10			
CF1301-C4	4	<1.0	<1.0	<1.0	<1.0	<10			
CF1301-D2	4	<1.0	<1.0	<1.0	<1.0	<10			
CF1301-D3	4	<1.0	<1.0	<1.0	<1.0	<10			
CF1301-E2	4	<1.0	<1.0	<1.0	<1.0	<10			
					•				
CF1301-E3	4	<1.0	<1.0	<1.0	<1.0	<10			
CF1301-F1	4	<1.0	<1.0	<1.0	<1.0	<10			
CF1301-F4	4	<1.0	<1.0	<1.0	<1.0	<10			
CF1301-F5	4	<1.0	<1.0	<1.0	<1.0	<10			
CF1301-H4	4	<1.0	<1.0	<1.0	<1.0	<10			
FIELD CONTROL	SAMPLES								
CF1301-1	N/A	. <1.0	<1.0	<1.0	<1.0	<10			
CF1301-2	N/A	<1.0	<1.0	<1.0	<1.0	<10			
01 1001-2									
LABORATORY D	UPLICATE ANAL	<u>YSIS</u>							
CF1301-C1	4	<1.0	<1.0	<1.0	<1.0	<10			
CF1301-C1R	4	<1.0	<1.0	<1.0	<1.0	<10			
FIELD DUPLICAT	E ANALYSIS								
CF1301-C4	4	<1.0	<1.0	<1.0	<1.0	<10			
CF1301-C4D	4	<1.0	<1.0	<1.0	<1.0	<10			
	•								
LABORATORY B	L:ANKS								
CF1301-C1B	N/A	<1.0	<1.0	<1.0	<1.0	<10			

ANALYTE CONCENTRATIONS VIA GC/FID (µg/I)

				ETHYL-		TOTAL FID		
SAMPLE	DEPTH (FT.)	BENZENE	TOLUENE	BENZENE	XYLENES	VOLATILES*		
REPORTING		1.0	1.0	1.0	1.0	10		
LIMIT								
BUILDING 1605 AREA								
SOIL GAS SAMPL	<u>.ES</u>							
1605-NY	4	<1.0	<1.0	<1.0	<1.0	<10		
1605-P9	4	<1.0	<1.0	<1.0	<1.0	<10		
1605-RY	4	<1.0	<1.0	<1.0	<1.0	<10		
1605-WY	4	<1.0	<1.0	<1.0	<1.0	<10		
1605-WZ	4	<1.0	<1.0	<1.0	<1.0	<10		
CF1301-K9	4	<1.0	<1.0	<1.0	<1.0	<10		
CF1301-KX	4	<1.0	<1.0	<1.0	<1.0	<10		
CF1301-KZ	4	<1.0	<1.0	<1.0	<1.0	<10		
CF1301-MZ	4	<1.0	<1.0	<1.0	<1.0	<10		
CF1301-N9	4	<1.0	<1.0	<1.0	<1.0	<10		
					-1.0	-10		
CF1301-NX	4	<1.0	<1.0	<1.0	<1.0	<10		
CF1301-PZ	4	<1.0	<1.0	<1.0	<1.0	<10 660		
CF1301-R9	4	<1.0	<1.0	18	80	660		
CF1301-RX	4	<1.0	<1.0	<1.0	<1.0	<10		
CF1301-RZ	4	<1.0	<1.0	<1.0	<1.0	<10		
	-							
WATER SAMPLE	5							
1605-NYW	9	<1.0	<1.0	<1.0	<1.0	<10		
1605-P9W	12	<1.0	<1.0	<1.0	<1.0	<10		
1605-R9W	10	<1.0	<1.0	<1.0	<1.0	<10		
1605-RYW	10	<1.0	<1.0	<1.0	<1.0	<10		
1605-WYW	10	<1.0	<1.0	<1.0	<1.0	<10		
1605-WZW	9.5	<1.0	<1.0	<1.0	<1.0	<10		
	CAMDIES							
FIELD CONTROL	. JAINFLED							
1605-1	N/A	<1.0	<1.0	<1.0	<1.0	<10		
1605-2	N/A	<1.0	<1.0	<1.0	<1.0	<10		
CF1301-3	N/A	<1.0	<1.0	<1.0	<1.0	<10		

ANALYTE CONCENTRATIONS VIA GC/FID (µg/l)

* CALCULATED USING THE SUM OF THE AREAS OF ALL INTEGRATED CHROMATOGRAM PEAKS AND THE INSTRUMENT RESPONSE FACTOR FOR TOLUENE

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				ETHYL-		TOTAL FID				
SAMPLE	DEPTH (FT.)	BENZENE	TOLUENE	BENZENE	XYLENES	VOLATILES*				
REPORTING		1.0	1.0	1.0	1.0	10				
LIMIT										
EQUIPMENT RINS	EATE BLANKS					,				
1605-1W	'N/A	<1.0	<1.0	<1.0	<1.0	<10				
1605-2W	N/A	<1.0	<1.0	<1.0	<1.0	<10				
1605-3W	N/A	<1.0	<1.0	<1.0	<1.0	<10				
LABORATORY DL	LABORATORY DUPLICATE ANALYSIS									
		<1.0	<1.0	<1.0	<1.0	<10				
1605-RY	4	<1.0 <1.0	<1.0 <1.0	<1.0	<1.0	<10				
1605-RYR	4	<1.0	NI.0	~1.0	ST.0	10				
CF1301-PZ	4	<1.0	<1.0	<1.0	<1.0	<10				
CF1301-PZR	4	<1.0	<1.0	<1.0	<1.0	<10				
FIELD DUPLICAT	E ANALYSIS									
1605-P9	4	<1.0	<1.0	<1.0	<1.0	<10				
1605-P9D	4	<1.0	<1.0	<1.0	<1.0	<10				
CF1301-R9	4	<1.0	<1.0	18	80	660				
CF1301-R9 CF1301-R9D	4	1.1	1.9	22	77	816				
CF1301-R9D	4	1.1	1.5	<i>44</i>	••	•••				
LABORATORY B	LANKS	-								
1605-RYB	N/A	<1.0	<1.0	<1.0	<1.0	<10				
CF1301-PZB	N/A	<1.0	<1.0	<1.0	<1.0	<10				

ANALYTE CONCENTRATIONS VIA GC/FID (µg/I)

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TABLE 1 (CONT.)

				ETHYL-		TOTAL FID				
SAMPLE	DEPTH (FT.)	BENZENE	TOLUENE	BENZENE	XYLENES	VOLATILES*				
REPORTING		1.0	1.0	1.0	1.0	10				
LIMIT										
FORMER FIR	FORMER FIRE TRAINING PIT									
<u>SOIL GAS SAMPI</u>	<u>_ES</u> .									
		.1.0	.4.0	-10	~1.0	<10				
MAAF-B6	4	<1.0	<1.0	<1.0	<1.0 <1.0	<10				
MAAF-D6	4	1.0	<1.0	<1.0 <1.0	<1.0 <1.0	<10 <10				
MAAF-D8	4	<1.0	<1.0		<1.0 <1.0	<10				
MAAF-E5	4	<1.0	<1.0	<1.0 <1.0	<1.0 <1.0	<10				
MAAF-E7	4	<1.0	<1.0	NI.0	NI.0					
MAAF-E9	4	<1.0	<1.0	<1.0	<1.0	<10				
MAAF-F4	4	<1.0	<1.0	<1.0	<1.0	<10				
MAAF-F6	4	<1.0	<1.0	<1.0	<1.0	<10				
MAAF-F7	4	<1.0	<1.0	<1.0	<1.0	<10				
MAAF-F8	4	<1.0	<1.0	<1.0	<1.0	<10				
	-1									
MAAF-FZ	4	<1.0	<1.0	<1.0	<1.0	<10				
MAAF-H5	4	<1.0	<1.0	<1.0	<1.0	<10				
MAAF-H6	4	<1.0	<1.0	<1.0	<1.0	<10				
MAAF-H7	4	<1.0	422	44	278	660				
MAAF-H8	4	<1.0	<1.0	<1.0	<1.0	<10				
MAAF-H9	4	<1.0	<1.0	<1.0	<1.0	<10				
MAAF-H04	4	<1.0	<1.0	<1.0	<1.0	<10				
MAAF-J4	4	<1.0	<1.0	<1.0	<1.0	<10				
MAAF-J6	4	<1.0	<1.0	<1.0	<1.0	<10				
MAAF-J7	4	<1.0	<1.0	<1.0	<1.0	<10				
				.4.0	-10	<10				
MAAF-J8	4	<1.0	<1.0	<1.0	<1.0	<10				
MAAF-JZ	. 4	<1.0	<1.0	<1.0	<1.0	<10 <10				
MAAF-K5	4	<1.0	<1.0	<1.0	<1.0	<10				
MAAF-K7	4	<1.0	<1.0	<1.0	<1.0	<10 <10				
MAAF-K9	4	<1.0	<1.0	<1.0	<1.0	<10				
MAAF-M6	4	<1.0	<1.0	<1.0	<1.0	<10				
MAAF-MO MAAF-M8	4	<1.0	<1.0	<1.0	<1.0	<10				
MAAF-MO MAAF-M14	4	<1.0	<1.0 <1.0	<1.0	<1.0	<10				
MAAF-M14 MAAF-N2	4	<1.0	<1.0	<1.0	<1.0	<10				
MAAF-NZ MAAF-N7	4	<1.0	<1.0	<1.0	<1.0	<10				
IVI/-\-\E-IN7	4	NI.U	\$1.0	-1.0						

ANALYTE CONCENTRATIONS VIA GC/FID (µg/I)

TABLE 1 (CONT.)

		·		ETHYL-		TOTAL FID
		BENZENE	TOLUENE	BENZENE	XYLENES	VOLATILES*
SAMPLE	DEPTH (FT.)	1.0	1.0	1.0	1.0	10
REPORTING		1.0	1.0	1.0		
LIMIT						
SOIL GAS SAMP	ES (cont.)					
SOIL GAS SAMP	LLS (COM.)					
MAAF-NY	4	<1.0	<1.0	<1.0	<1.0	<10
MAAF-P9	4	<1.0	<1.0	<1.0	<1.0	<10
MAAF-PX	4	<1.0	<1.0	<1.0	<1.0	<10
MAAF-PZ	4	<1.0	<1.0	<1.0	<1.0	<10
MAAF-R3	4	<1.0	<1.0	<1.0	<1.0	<10
MAAF-R8	4	<1.0	<1.0	<1.0	<1.0	<10
MAAF-R9	4	<1.0	<1.0	<1.0	<1.0	<10
MAAF-V8	4	<1.0	<1.0	<1.0	<1.0	<10
MAAF-W4	4	<1.0	<1.0	<1.0	<1.0	. <10
MAAF-WZ	4	<1.0	3.1	<1.0	<1.0	<10
MF-1	4	<1.0	1.1	<1.0	<1.0	<10
MF-2	. 4	<1.0	<1.0	<1.0	<1.0	<10
MF-3	4	<1.0	<1.0	<1.0	<1.0	11
MF-4	4	<1.0	1.3	<1.0	<1.0	<10
MF-5	4	<1.0	<1.0	<1.0	<1.0	<10
MF-6	4	<1.0	3.1	<1.0	<1.0	<10
MF-7	4	<1.0	<1.0	<1.0	<1.0	<10
MF-8	4	<1.0	1.3	<1.0	<1.0	<10
MF-9	4	<1.0	1.8	<1.0	<1.0	<10
MF-10	4	<1.0	<1.0	<1.0	<1.0	<10
MF-11	4	<1.0	<1.0	<1.0	<1.0	<10
MF-12	4	<1.0	<1.0	<1.0	<1.0	12
MF-13	4	<1.0	<1.0	<1.0	<1.0	<10
MF-14	4	<1.0	<1.0	<1.0	<1.0	<10
MF-15	4	<1.0	<1.0	<1.0	<1.0	<10
MF-16	4	<1.0	<1.0	<1.0	<1.0	<10
MF-17	4	<1.0	<1.0	<1.0	<1.0	
MF-18	4	<1.0	<1.0	<1.0	<1.0	<10

ANALYTE CONCENTRATIONS VIA GC/FID (µg/I)

TABLE 1 (CONT.)

				ETHYL-		TOTAL FID
SAMPLE	DEPTH (FT.)	BENZENE	TOLUENE	BENZENE	XYLENES	VOLATILES*
REPORTING		1.0	1.0	1.0	1.0	10
LIMIT						
WATER SAMPLES	<u>6</u>					
	10	-10	1.5	<1.0	<1.0	11
FP-E5	10	<1.0 6.7	1,522	177	888	14,510
FP-H7	7	۰.7 <1.0	<1.0	<1.0	<1.0	<10
FP-J6	8	<1.0 <1.0	<1.0 <1.0	<1.0 <1.0	<1.0	16
FP-M1	9 9	<1.0 <1.0	1.1	<1.0 <1.0	1.5	23
FP-M8	9	<1.0		×1.0	1.5	20
FP-N2	9	<1.0	<1.0	<1.0	<1.0	<10
FP-N7	8	<1.0	<1.0	<1.0	<1.0	<10
FP-PZ	8	<1.0	<1.0	<1.0	<1.0	<10
FP-V8	8	<1.0	<1.0	<1.0	<1.0	<10
FP-W4	6	<1.0	<1.0	<1.0	<1.0	<10
	· ·					
MAAF-B6W	6	<1.0	<1.0	<1.0	<1.0	<10
MAAF-D6W	8	<1.0	<1.0	<1.0	<1.0	<10
MAAF-D8W	8	<1.0	<1.0	<1.0	<1.0	<10
MAAF-E5W	9	<1.0	<1.0	<1.0	<1.0	<10
MAAF-E7W	7	<1.0	<1.0	<1.0	<1.0	<10
MAAF-E9W	8	<1.0	<1.0	. <1.0	<1.0	<10
MAAF-F4W	9	<1.0	<1.0	<1.0	<1.0	<10
MAAF-F6W	9	<1.0	<1.0	<1.0	<1.0	<10
MAAF-F7W	7	<1.0	<1.0	<1.0	<1.0	<10
MAAF-F8W	8	<1.0	<1.0	<1.0	<1.0	<10
MAAF-FZW	8	<1.0	<1.0	<1.0	<1.0	<10
MAAF-H5W	8	<1.0	<1.0	<1.0	<1.0	<10
MAAF-H6W	8	<1.0	<1.0	<1.0	<1.0	<10 0 401
MAAF-H7W	7	13	3,841	356	1,586	6,421
MAAF-H8W	8	<1.0	<1.0	<1.0	<1.0	<10
MAAF-H9W	8	<1.0	<1.0	<1.0	<1.0	<10
MAAF-HOW	8	<1.0	<1.0	<1.0	<1.0	<10
MAAF-J4W		<1.0	<1.0	<1.0	<1.0	
MAAF-J6W	8	<1.0	<1.0	<1.0	<1.0	
MAAF-J7W	8	<1.0	<1.0	<1.0	<1.0	
	0	-1.0	-,,0			
MAAF-J8W	6	. <1.0	<1.0	<1.0	<1.0	<10
MAAF-JZW	8	<1.0	<1.0	<1.0	<1.0	
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ANALYTE CONCENTRATIONS VIA GC/FID (µg/I)

* CALCULATED USING THE SUM OF THE AREAS OF ALL INTEGRATED CHROMATOGRAM PEAKS AND THE INSTRUMENT RESPONSE FACTOR FOR TOLUENE

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TABLE 1 (CONT.)

				ETHYL-		TOTAL FID
SAMPLE	DEPTH (FT.)	BENZENE	TOLUENE	BENZENE	XYLENES	VOLATILES*
REPORTING	22	1.0	1.0	1.0	1.0	10
LIMIT						
Cutat						
WATER SAMPLES	S (cont.)					
	•			<1.0	<1.0	<10
MAAF-K5W	8	<1.0	<1.0 <1.0	<1.0 <1.0	<1.0	17
MAAF-K7W	9	<1.0	•••=	<1.0	<1.0 <1.0	<10
MAAF-K9W	9	<1.0	<1.0	<1.0 <1.0	<1.0 <1.0	<10 <10
MAAF-M6W	8	<1.0	<1.0		<1.0 <1.0	<10 49
MAAF-M8W	8	<1.0	<1.0	<1.0	<1.0	43
MAAF-MIW	8	<1.0	<1.0	<1.0	<1.0	15
MAAF-N2W	8	<1.0	<1.0	<1.0	<1.0	<10
MAAF-N7W	8	<1.0	<1.0	<1.0	<1.0	<10
MAAF-NYW	7	<1.0	<1.0	<1.0	<1.0	<10
MAAF-P9W	7	<1.0	<1.0	<1.0	<1.0	<10
MAAF-PXW	7	<1.0	<1.0	<1.0	<1.0	<10
MAAF-PXW	7	<1.0 <1.0	<1.0	<1.0	<1.0	<10
MAAF-R3W	8	<1.0	<1.0	<1.0	<1.0	<10
MAAF-RSW	8	<1.0	<1.0	<1.0	<1.0	<10
MAAF-ROW MAAF-R9W	7	<1.0	<1.0	<1.0	<1.0	<10
MAAF-V8W	8	<1.0	<1.0	<1.0	<1.0	<10
MAAF-W4W	6	<1.0	<1.0	<1.0	<1.0	<10
MAAF-WZW	9	<1.0	<1.0	<1.0	<1.0	<10
MF-1W	8	<1.0	<1.0	<1.0	<1.0	<10
MF-2W	8	<1.0	<1.0	<1.0	<1.0	<10
MF-3W	8	<1.0	<1.0	<1.0	<1.0	<10
MF-4W	8	<1.0	<1.0	<1.0	<1.0	<10
MF-5W	8	<1.0	<1.0	<1.0	<1.0	<10
	^	~1 ^	<1.0	<1.0	<1.0	<10
MF-6W	8	<1.0 <1.0	<1.0	<1.0	<1.0	<10
MF-7W	9	<1.0 <1.0	<1.0 <1.0	<1.0	<1.0	<10
MF-8W	8	<1.0	<1.0	<1.0	<1.0	<10
MF-9W	8		<1.0	<1.0	<1.0	<10
MF-10W	8	<1.0	<1.U	\1.0	×1.0	
MF-11W	8	<1.0	<1.0	<1.0	<1.0	<10
MF-12W	8	<1.0	<1.0	<1.0	<1.0	
MF-13W	8	<1.0	<1.0	<1.0	<1.0	
MF-14W	9	<1.0	<1.0	<1.0	<1.0	
MF-15W	9	<1.0	<1.0	<1.0	<1.0	<10

ANALYTE CONCENTRATIONS VIA GC/FID (µg/I)

• CALCULATED USING THE SUM OF THE AREAS OF ALL INTEGRATED CHROMATOGRAM PEAKS AND THE INSTRUMENT RESPONSE FACTOR FOR TOLUENE

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TABLE 1 (CONT.)

				ETHYL-		TOTAL FID
SAMPLE	DEPTH (FT.)	BENZENE	TOLUENE	BENZENE	XYLENES	VOLATILES*
REPORTING		1.0	1.0	1.0	1.0	10
LIMIT						
WATER SAMPLE	<u>ES (cont.)</u>					.e
MF-16W	9	<1.0	<1.0	<1.0	<1.0	<10
MF-17W	8	<1.0	<1.0	<1.0	<1.0	<10
MF-18W	8	<1.0	<1.0	<1.0	<1.0	<10
MF-J6W	8	<1.0	<1.0	<1.0	<1.0	<10
FIELD CONTROL	SAMPLES					
MAAF-1	N/A	<1.0	<1.0	<1.0	<1.0	<10
MAAF-2	N/A	<1.0	<1.0	<1.0	<1.0	<10
MAAF-3	N/A	<1.0	<1.0	<1.0	<1.0	<10
MAAF-4	N/A	<1.0	<1.0	<1.0	<1.0	<10
MAAF-5	N/A	<1.0	<1.0	<1.0	<1.0	<10
MAAF-6	N/A	<1.0	<1.0	<1.0	<1.0	<10
MAAF-7	N/A	<1.0	<1.0	<1.0	<1.0	<10
MAAF-8	N/A	<1.0	<1.0	<1.0	<1.0	<10
MAAF-9	N/A	<1.0	<1.0	<1.0	<1.0	<10
MF-1B	N/A	<1.0	<1.0	<1.0	<1.0	<10
MF-2B	N/A	<1.0	<1.0	<1.0	<1.0	<10
MF-3B	N/A	<1.0	<1.0	<1.0	<1.0	<10
EQUIPMENT RIN	ISEATE BLANKS					
FP-1	N/A	<1.0	<1.0	<1.0	<1.0	<10
FP-4	N/A	<1.0	<1.0	<1.0	<1.0	<10
MAAF-1W	N/A	<1.0	<1.0	<1.0	<1.0	<10
MAAF-2W	N/A	<1.0	<1.0	<1.0	<1.0	<10
MAAF-3W	N/A	<1.0	<1.0	<1.0	<1.0	<10
MAAF-4W	N/A	<1.0	<1.0	<1.0	<1.0	<10
MAAF-5W	N/A	<1.0	<1.0	<1.0	<1.0	<10
MAAF-6W	N/A	<1.0	<1.0	<1.0	<1.0	<10
MAAF-7W	N/A	<1.0	<1.0	<1.0	<1.0	
MF-1WB	N/A	<1.0	<1.0	<1.0	<1.0	<10
MF-2WB	N/A	<1.0	<1.0	<1.0	<1.0	<10
MF-3BW	N/A	<1.0	<1.0	<1.0	<1.0	<10

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ANALYTE CONCENTRATIONS VIA GC/FID (µg/I)

* CALCULATED USING THE SUM OF THE AREAS OF ALL INTEGRATED CHROMATOGRAM PEAKS AND THE INSTRUMENT RESPONSE FACTOR FOR TOLUENE

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				ETHYL-		TOTAL FID
SAMPLE	DEPTH (FT.)	BENZENE	TOLUENE	BENZENE	XYLENES	VOLATILES*
REPORTING		1.0	1.0	1.0	1.0	10
LIMIT						
	,					
LABORATORY D	UPLICATE ANAL	YSIS		•		
	N1/A	<1.0	<1.0	<1.0	<1.0	<10
FP-1	N/A N/A	<1.0 <1.0	<1.0 <1.0	<1.0	<1.0	<10
FP-1R	N/A	<1.0	\$1.0	1.0		
FP-4	N/A	<1.0	<1.0	<1.0	<1.0	<10
FP-4R	N/A	<1.0	<1.0	<1.0	<1.0	<10
					-1.0	<10
MAAF-2	N/A	<1.0	<1.0	<1.0	<1.0	<10 <10
MAAF-2R	N/A	<1.0	<1.0	<1.0	<1.0	<10
MAAF-7	N/A	<1.0	<1.0	<1.0	<1.0	<10
MAAF-7R	N/A	<1.0	<1.0	<1.0	<1.0	<10
MAAF-E5	4	<1.0	<1.0	<1.0	<1.0	<10
MAAF-E5R	4	<1.0	<1.0	<1.0	<1.0	<10
	_		.4.0	-1.0	<1.0	<10
MAAF-E7	4	<1.0	<1.0	<1.0	<1.0	<10 <10
MAAF-E7R	4	<1.0	<1.0	<1.0	NI.0	
MAAF-H9	4	<1.0	<1.0	<1.0	<1.0	<10
MAAF-H9R	4	<1.0	<1.0	<1.0	<1.0	<10
MAAF-M6	4	<1.0	<1.0	<1.0	<1.0	<10
MAAF-M6R	4	<1.0	<1.0	<1.0	<1.0	<10
	4	<1.0	<1.0	<1.0	<1.0	<10
MAAF-M8	4 4	<1.0	<1.0 <1.0	<1.0	<1.0	<10
MAAF-M8R	4	\$1.0				
MAAF-N7	4	<1.0	<1.0	<1.0	<1.0	<10
MAAF-N7R	4	<1.0	<1.0	<1.0	<1.0	<10
				.4.0	-10	<10
MAAF-PZ	4	<1.0	<1.0	<1.0 <1.0	<1.0 <1.0	<10 <10
MAAF-PZR	4	<1.0	<1.0	<1.0÷	<1.0	
MF-3B	N/A	<1.0	<1.0	<1.0	<1.0	<10
MF-3BR	N/A	<1.0	<1.0	<1.0	<1.0	<10
	1 1/7 1					
MF-7	4	<1.0	<1.0	<1.0	<1.0	
MF-7R	4	<1.0	<1.0	<1.0	<1.0	<10

ANALYTE CONCENTRATIONS VIA GC/FID (µg/l)

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TABLE 1 (CONT.)

				ETHYL-		TOTAL FID
SAMPLE	DEPTH (FT.)	BENZENE	TOLUENE	BENZENE	XYLENES	VOLATILES*
REPORTING		1.0	1.0	1.0	1.0	10
LIMIT						
LABORATORY DL	JPLICATE ANAL	YSIS (cont.)				
MF-8	4	<1.0	1.3	<1.0	<1.0	<10
MF-8R	4	<1.0	1.3	<1.0	<1.0	<10
		·				
MF-13	• 4	<1.0	<1.0	<1.0	<1.0	<10
MF-13R	4	<1.0	<1.0	<1.0	<1.0	<10
FIELD DUPLICAT	<u>E ANALYSIS</u>					,
FP-W4	6	<1.0	<1.0	<1.0	<1.0	<10
FP-W4D	6	<1.0	<1.0	<1.0	<1.0	<10
	-					
MAAF-H6W	8	<1.0	<1.0	<1.0	<1.0	<10
MAAF-H6WD	8	<1.0	<1.0	<1.0	<1.0	<10
MAAF-J6	4	<1.0	<1.0	<1.0	<1.0	<10
MAAF-J6D	4	<1.0	<1.0	<1.0	<1.0	<10
	4	<1.0	<1.0	<1.0	<1.0	<10
MAAF-J8 MAAF-J8D	4	<1.0 <1.0	<1.0	<1.0	<1.0	<10
	-	41.0	-1.0	1.0		
MAAF-J8W	6	<1.0	<1.0	<1.0	<1.0	<10
MAAF-J8WD	6	<1.0	<1.0	<1.0	<1.0	<10
MAAF-V8W	8	<1.0	<1.0	<1.0	<1.0	<10
MAAF-V8WD	8	<1.0	<1.0	<1.0	<1.0	<10
MAAF-WZ	4	<1.0	3.1	<1.0	<1.0	<10
MAAF-WZD	-4	<1.0	2.0	<1.0	<1.0	<10
	-	1.0				
MF-3	4	<1.0	<1.0	<1.0	<1.0	11
MF-3D	4	<1.0	<1.0	<1.0	<1.0	12
MF-3W	8	<1.0	<1.0	<1.0	<1.0	<10
MF-3WD	8	<1.0	<1.0	<1.0	<1.0	<10
NE 47	4	-4 0	<1.0	<1.0	<1.0	<10
MF-17 MF-17D	4 4	<1.0 <1.0	<1.0 <1.0	<1.0 <1.0	<1.0	<10
	4	\$1.0	51.0	~1.0	-1.0	

ANALYTE CONCENTRATIONS VIA GC/FID (µg/I)

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TABLE 1 (CONT.)

				ETHYL-		TOTAL FID
SAMPLE	DEPTH (FT.)	BENZENE	TOLUENE	BENZENE	XYLENES	VOLATILES*
REPORTING		1.0	1.0	1.0	1.0	10
LIMIT						
LABORATORY BL	ANKS					
FP-1B	N/A	<1.0	<1.0	<1.0	<1.0	<10
FP-4B	N/A	<1.0	<1.0	<1.0	<1.0	<10
			-1.0	<1.0	<1.0	<10
MAAF-2B	N/A	<1.0	<1.0		<1.0	<10 <10
MAAF-7B	N/A	<1.0	<1.0	<1.0		<10 <10
MAAF-E5B	N/A	<1.0	<1.0	<1.0	<1.0	
MAAF-E7B	N/A	<1.0	<1.0	<1.0	<1.0	<10
MAAF-H9B	N/A	<1.0	<1.0	<1.0	<1.0	<10
MAAF-K5B	N/A	<1.0	<1.0	<1.0	<1.0	<10
MAAF-M6B	N/A	<1.0	<1.0	<1.0	<1.0	<10
MAAF-M8B	N/A	<1.0	<1.0	<1.0	<1.0	<10
MAAF-N7B	N/A	<1.0	<1.0	<1.0	<1.0	<10
MAAF-N7WB	N/A	<1.0	<1.0	<1.0	<1.0	<10
		.4.0	-10	<1.0	<1.0	<10
MAAF-PZB	N/A	<1.0	<1.0			<10
MAAF-R3B	N/A	<1.0	<1.0	<1.0	<1.0	
MF-3BB	N/A	<1.0	<1.0	<1.0	<1.0	<10
MF-7B	N/A	<1.0	<1.0	<1 [.] .0	<1.0	<10
MF-8B	N/A	<1.0	<1.0	<1.0	<1.0	<10
MF-13B	N/A	<1.0	<1.0	<1.0	<1.0	<10

ANALYTE CONCENTRATIONS VIA GC/FID (µg/I)

• CALCULATED USING THE SUM OF THE AREAS OF ALL INTEGRATED CHROMATOGRAM PEAKS AND THE INSTRUMENT RESPONSE FACTOR FOR TOLUENE

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TABLE 2

ANALYTE CONCENTRATIONS VIA GC/ECD (µg/I)

SAMPLE	11DCE	CH2CI2	t12DCE	11DCA	c12DCE	CHCI3	111TCA	CCI4	TCE	112TCA	
REPORTING	1.0	1.0	1.0	1.0	1.0	1.0	1.0	1.0	1.0	1.0	
LIMIT											
WASH RACK RE	SERVOIF		LLS ARE	A							
SOIL GAS SAMPLES											
CR-C2-A	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	•
CR-C2B	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	•
CR-C2A-12	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	•
CR-C2B12	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	•
CR-D0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	•
CR-D0-12	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	
CR-E0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	
CR-E0-12	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	
CR-F0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	
CR-H1	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	
CR-H2	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	
CR-H3	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	
CR-H4	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	
CR-H5	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	
WR-C1	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	
WR-C2	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	
WR-C2-9	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	
WR-C3	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	
WR-C3-12	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	
WR-C4	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	
WR-C4-12	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	
WR-C5	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	
WR-C5-11	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	
WR-C6	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	
WR-C6-12	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	
WR-C7	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	
WR-C7-12	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	
WR-C8	<1.0	<1.0	<1.0	<1.0		<1.0	<1.0	<1.0	<1.0	<1.0	
WR-C8-12	<1.0	<1.0	<1.0	<1.0		<1.0	<1.0	<1.0	<1.0	<1.0	
·····				•						-	

11DCE = 1,1-dichloroetheneCH2Cl2 = methylene chloridet12DCE = trans-1,2-dichloroethene11DCA = 1,1-dichloroethanec12DCE = cis-1,2-dichloroetheneCHCl3 = chloroform111TCA = 1,1,1-trichloroethaneCCl4 = carbon tetrachlorideTCE = trichloroethene112TCA = 1,1,2-trichloroethanePCE = tetrachloroetheneTCE = trichloroethene

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TABLE 2 (CONT.)

ANALYTE CONCENTRATIONS VIA GC/ECD (µg/I)

	SAMPLE	11DCE	CH2CI2	t12DCE	11DCA	c12DCE	CHCI3	111TCA	CCI4	TCE	112TCA	PCE
	REPORTING	1.0	1.0	1.0	1.0	1.0	1.0	1.0	1.0	1.0	1.0	1.0
	LIMIT											
						• • •						
	WR-DQ	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0
	WR-E6	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0
	WR-E6-12	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0
	WR-EQ	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0
	WR-EQ-12	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0
					-4.0	-1.0	-10	<1.0	<1.0	<1.0	<1.0	<1.0
	WR-FQ	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0 <1.0	<1.0 <1.0	<1.0	<1.0 <1.0	<1.0 <1.0
ł	WR-FQ-12	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0 <1.0	<1.0 <1.0	<1.0 <1.0	<1.0	<1.0 <1.0	<1.0 <1.0
1	WR-H1	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0 <1.0	<1.0 <1.0	<1.0 <1.0	<1.0	<1.0 <1.0	<1.0 <1.0
	WR-H1-12	<1.0	<1.0	<1.0	<1.0	<1.0		<1.0 <1.0	<1.0 <1.0	<1.0	<1.0 <1.0	<1.0
	WR-H2	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	~1.0	~1.0	NI. 0	\$1.0
144		~1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0
	WR-H2-12	<1.0 <1.0	<1.0 <1.0	<1.0 <1.0	<1.0	<1.0 <1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0
	WR-H3	<1.0 <1.0	<1.0 <1.0	<1.0 <1.0	<1.0	<1.0 <1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0
	WR-H3-12 WR-H4	<1.0 <1.0	<1.0	<1.0 <1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0
ŀ	WR-H4-12	<1.0 <1.0	<1.0	<1.0 <1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0
÷	VVIX-114-12	~1.0	\$1.0	\$1.0	1.0	-1.0	-1.0					
	WR-H5	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0
i:	WR-H5-12	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0
ŀ	WR-H6	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0
	WR-H6-12	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0
È	WR-H7	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0
	WR-H8	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0
1	WATER SAMPLES											
	WR-C1W	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0
	WR-DQW	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0 .	<1.0
	FIELD CONTROL SA	MPLES										•
	00.40	0	-4.0	-1.0	~1.0	~1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0
l	CR-1B	<1.0	<1.0	<1.0 <1.0	<1.0 <1.0	<1.0 <1.0	<1.0	<1.0 <1.0	<1.0 <1.0	<1.0	<1.0	<1.0
:	CR-2B	<1.0	<1.0	<1.0 <1.0	<1.0	<1.0 <1.0	<1.0	<1.0 <1.0	<1.0	<1.0	<1.0	<1.0
	CR-3B	<1.0	<1.0 <1.0	<1.0 <1.0	<1.0	<1.0 <1.0	<1.0 <1.0	<1.0 <1.0	<1.0	<1.0	<1.0	<1.0
	CR-4B	<1.0	S1.0	NI.U	NI. 0	NI.U	×1.0	NI.	-1.0	-1.0		
1							· .					
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11DCE = 1,1-dichloroethene	CH2Cl2 = methylene chloride	t12DCE = trans-1,2-dichloroethene
11DCA = 1,1-dichloroethane	c12DCE = cis-1,2-dichloroethene	CHCI3 = chloroform
111TCA = 1,1,1-trichloroethane	CCI4 = carbon tetrachloride	TCE = trichloroethene
112TCA = 1;1,2-trichloroethane	PCE = tetrachloroethene	

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TABLE 2 (CONT.)

ANALYTE CONCENTRATIONS VIA GC/ECD (µg/I)

SAMPLE	11DCE	CH2CI2	t12DCE	11DCA	c12DCE	CHCI3	111TCA	CC14	TCE	112TCA	PCE
REPORTING	1.0	1.0	1.0	1.0	1.0	1.0	1.0	1.0	1.0	1.0	1.0
LIMIT											
FIELD CONTROL SA	MPLES (cor	<u>nt.)</u>									
WR-1	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0
WR-2	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0
WR-3	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0
WR-4	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0
WR-5	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0
EQUIPMENT RINSE	TE BLANK	<u>S</u>	·								
WR-1W	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0
LABORATORY DUP		LYSIS									
CR-C2B12	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.Ó	<1.0	<1.0	<1.0	<1.0
CR-C2B12R	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0
CR-H5	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0
CR-H5R	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0
WR-C2-9	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0
WR-C2-9R	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0
WR-C6	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0
WR-C6R	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0
WR-H3-12	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0
WR-H3-12 WR-H3-12R	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0
WR-H4-12	<1.0 ⁻	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.(
***	-1.0	-1.0		<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.(

11DCE=1,1-dichloroethene11DCA=1,1-dichloroethane111TCA=1,1,1-trichloroethane

112TCA = 1,1,2-trichloroethane

CH2Cl2 = methylene chloride c12DCE = cis-1,2-dichloroethene CCl4 = carbon tetrachloride

PCE = tetrachloroethene

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TABLE 2 (CONT.)

ANALYTE CONCENTRATIONS VIA GC/ECD (µg/I)

$\begin{array}{c ccccccccccccccccccccccccccccccccccc$	SAMPLE	11DCE	CH2CI2	t12DCE	11DCA	c12DCE	CHCI3	111TCA	CCI4	TCE	112TCA	PCE
FIELD DUPLICATE ANALYSISWR-C4-12 <1.0 <1.0 <1.0 <1.0 <1.0 <1.0 <1.0 <1.0 <1.0 <1.0 <1.0 <1.0 <1.0 <1.0 <1.0 <1.0 <1.0 <1.0 <1.0 <1.0 <1.0 <1.0 <1.0 <1.0 <1.0 <1.0 <1.0 <1.0 <1.0 <1.0 <1.0 <1.0 <1.0 <1.0 <1.0 <1.0 <1.0 <1.0 <1.0 <1.0 <1.0 <1.0 <1.0 <1.0 <1.0 <1.0 <1.0 <1.0 <1.0 <1.0 <1.0 <1.0 <1.0 <1.0 <1.0 <1.0 <1.0 <1.0 <1.0 <1.0 <1.0 <1.0 <1.0 <1.0 <1.0 <1.0 <1.0 <1.0 <1.0 <1.0 <1.0 <1.0 <1.0 <1.0 <1.0 <1.0 <1.0 <1.0 <1.0 <1.0 <1.0 <1.0 <1.0 <1.0 <1.0 <1.0 <1.0 <1.0 <1.0 <1.0 <1.0 <1.0 <1.0 <1.0 <1.0 <1.0 <1.0 <1.0 <1.0 <1.0 <1.0 <1.0 <1.0 <1.0 <1.0 <1.0 <1.0 <1.0 <1.0 <1.0 <1.0 <1.0 <1.0 <1.0 <1.0 <1.0 <1.0 <1.0 <1.0 <1.0 <1.0 <1.0 <1.0 <1.0 <1.0 <1.0 <1.0 <1.0 <1.0 <1.0 <1.0 </td <td>REPORTING</td> <td>1.0</td>	REPORTING	1.0	1.0	1.0	1.0	1.0	1.0	1.0	1.0	1.0	1.0	1.0
WR-C4-12 <1.0 <1.0 <1.0 <1.0 <1.0 <1.0 <1.0 <1.0 <1.0 <1.0 <1.0 <1.0 <1.0 <1.0 <1.0 <1.0 <1.0 <1.0 <1.0 <1.0 <1.0 <1.0 <1.0 <1.0 <1.0 <1.0 <1.0 <1.0 <1.0 <1.0 <1.0 <1.0 <1.0 <1.0 <1.0 <1.0 <1.0 <1.0 <1.0 <1.0 <1.0 <1.0 <1.0 <1.0 <1.0 <1.0 <1.0 <1.0 <1.0 <1.0 <1.0 <1.0 <1.0 <1.0 <1.0 <1.0 <1.0 <1.0 <1.0 <1.0 <1.0 <1.0 <1.0 <1.0 <1.0 <1.0 <1.0 <1.0 <1.0 <1.0 <1.0 <1.0 <1.0 <1.0 <1.0 <1.0 <1.0 <1.0 <1.0 <1.0 <1.0 <1.0 <1.0 <1.0 <1.0 <1.0 <1.0 <1.0 <1.0 <1.0 <1.0 <td>LIMIT</td> <td></td>	LIMIT											
$\begin{array}{c ccccccccccccccccccccccccccccccccccc$	FIELD DUPLICATE	ANALYSIS										
WR-FQ-12 WR-FQ-12D<1.0 <1.0<1.0 <1.0<1.0 <1.0<1.0 <1.0<1.0 <1.0<1.0 <1.0<1.0 <1.0<1.0 <1.0<1.0 <1.0<1.0 <1.0<1.0 <1.0<1.0 <1.0<1.0 <1.0<1.0 <1.0<1.0 <1.0<1.0 <1.0<1.0 <1.0<1.0 <1.0<1.0 <1.0<1.0 <1.0<1.0 <1.0<1.0 <1.0<1.0 <1.0<1.0 <1.0<1.0 <1.0<1.0 <1.0<1.0 <1.0<1.0 <1.0<1.0 <1.0<1.0 <1.0<1.0 <1.0<1.0 <1.0<1.0 <1.0<1.0 <1.0<1.0 <1.0<1.0 <1.0<1.0 <1.0<1.0 <1.0<1.0 <1.0<1.0 <1.0<1.0 <1.0<1.0 <1.0<1.0 <1.0<1.0 <1.0<1.0 <1.0<1.0 <1.0<1.0 <1.0<1.0 <1.0<1.0 <1.0<1.0 <1.0<1.0 <1.0<1.0 <1.0<1.0 <1.0<1.0 <1.0<1.0 <1.0<1.0 <1.0<1.0 <1.0<1.0 <1.0<1.0 <1.0<1.0 <1.0<1.0 <1.0<1.0 <1.0<1.0 <1.0<1.0 <1.0<1.0 <1.0<1.0 <1.0<1.0 <1.0<1.0 <1.0<1.0 <1.0<1.0 <1.0<1.0 <1.0<1.0 <1.0<1.0 <1.0<1.0 <1.0<1.0 <1.0<1.0 <1.0<1.0 <1.0<1.0 <1.0<1.0 <1.0<1.0 <1.0<1.0 <1.0<1.0 <1.0<1.0 <1.0<1.0 <1.0<1.0 <1.0<1.0 <1.0<1.0 <1.0<1.0 <1.0<1.0 <1.0<1.0 <1.0<1.0 <1.0	WR-C4-12	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0
$\begin{array}{c cccc} WR-FQ-12D & <1.0 & <1.0 & <1.0 & <1.0 & <1.0 & <1.0 & <1.0 & <1.0 & <1.0 & <1.0 & <1.0 & <1.0 & <1.0 & <1.0 & <1.0 & <1.0 & <1.0 & <1.0 & <1.0 & <1.0 & <1.0 & <1.0 & <1.0 & <1.0 & <1.0 & <1.0 & <1.0 & <1.0 & <1.0 & <1.0 & <1.0 & <1.0 & <1.0 & <1.0 & <1.0 & <1.0 & <1.0 & <1.0 & <1.0 & <1.0 & <1.0 & <1.0 & <1.0 & <1.0 & <1.0 & <1.0 & <1.0 & <1.0 & <1.0 & <1.0 & <1.0 & <1.0 & <1.0 & <1.0 & <1.0 & <1.0 & <1.0 & <1.0 & <1.0 & <1.0 & <1.0 & <1.0 & <1.0 & <1.0 & <1.0 & <1.0 & <1.0 & <1.0 & <1.0 & <1.0 & <1.0 & <1.0 & <1.0 & <1.0 & <1.0 & <1.0 & <1.0 & <1.0 & <1.0 & <1.0 & <1.0 & <1.0 & <1.0 & <1.0 & <1.0 & <1.0 & <1.0 & <1.0 & <1.0 & <1.0 & <1.0 & <1.0 & <1.0 & <1.0 & <1.0 & <1.0 & <1.0 & <1.0 & <1.0 & <1.0 & <1.0 & <1.0 & <1.0 & <1.0 & <1.0 & <1.0 & <1.0 & <1.0 & <1.0 & <1.0 & <1.0 & <1.0 & <1.0 & <1.0 & <1.0 & <1.0 & <1.0 & <1.0 & <1.0 & <1.0 & <1.0 & <1.0 & <1.0 & <1.0 & <1.0 & <1.0 & <1.0 & <1.0 & <1.0 & <1.0 & <1.0 & <1.0 & <1.0 & <1.0 & <1.0 & <1.0 & <1.0 & <1.0 & <1.0 & <1.0 & <1.0 & <1.0 & <1.0 & <1.0 & <1.0 & <1.0 & <1.0 & <1.0 & <1.0 & <1.0 & <1.0 & <1.0 & <1.0 & <1.0 & <1.0 & <1.0 & <1.0 & <1.0 & <1.0 & <1.0 & <1.0 & <1.0 & <1.0 & <1.0 & <1.0 & <1.0 & <1.0 & <1.0 & <1.0 & <1.0 & <1.0 & <1.0 & <1.0 & <1.0 & <1.0 & <1.0 & <1.0 & <1.0 & <1.0 & <1.0 & <1.0 & <1.0 & <1.0 & <1.0 & <1.0 & <1.0 & <1.0 & <1.0 & <1.0 & <1.0 & <1.0 & <1.0 & <1.0 & <1.0 & <1.0 & <1.0 & <1.0 & <1.0 & <1.0 & <1.0 & <1.0 & <1.0 & <1.0 & <1.0 & <1.0 & <1.0 & <1.0 & <1.0 & <1.0 & <1.0 & <1.0 & <1.0 & <1.0 & <1.0 & <1.0 & <1.0 & <1.0 & <1.0 & <1.0 & <1.0 & <1.0 & <1.0 & <1.0 & <1.0 & <1.0 & <1.0 & <1.0 & <1.0 & <1.0 & <1.0 & <1.0 & <1.0 & <1.0 & <1.0 & <1.0 & <1.0 & <1.0 & <1.0 & <1.0 & <1.0 & <1.0 & <1.0 & <1.0 & <1.0 & <1.0 & <1.0 & <1.0 & <1.0 & <1.0 & <1.0 & <1.0 & <1.0 & <1.0 & <1.0 & <1.0 & <1.0 & <1.0 & <1.0 & <1.0 & <1.0 & <1.0 & <1.0 & <1.0 & <1.0 & <1.0 & <1.0 & <1.0 & <1.0 & <1.0 & <1.0 & <1.0 & <1.0 & <1.0 & <1.0 & <1.0 & <1.0 & <1.0 & <1.0 & <1.0 & <1.0 & <1.0 & <1.0 & <1.0 & <1.0 & <1.0 & <1.0 & <1.0 & <1.0 & <1.0 &$	WR-C4-12D	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0
WR-H8 <1.0 <1.0 <1.0 <1.0 <1.0 <1.0 <1.0 <1.0 <1.0 <1.0 <1.0 <1.0 <1.0 <1.0 <1.0 <1.0 <1.0 <1.0 <1.0 <1.0 <1.0 <1.0 <1.0 <1.0 <1.0 <1.0 <1.0 <1.0 <1.0 <1.0 <1.0 <1.0 <1.0 <1.0 <1.0 <1.0 <1.0 <1.0 <1.0 <1.0 <1.0 <1.0 <1.0 <1.0 <1.0 <1.0 <1.0 <1.0 <1.0 <1.0 <1.0 <1.0 <1.0 <1.0 <1.0 <1.0 <1.0 <1.0 <1.0 <1.0 <1.0 <1.0 <1.0 <1.0 <1.0 <1.0 <1.0 <1.0 <1.0 <1.0 <1.0 <1.0 <1.0 <1.0 <1.0 <1.0 <1.0 <1.0 <1.0 <1.0 <1.0 <1.0 <1.0 <1.0 <1.0 <1.0 <1.0 <1.0 <1.0 <1.0 <1.0 <1.0 <1.0 <1.0 <1.0 <1.0 <1.0 <1.0 <1.0 <1.0	WR-FQ-12	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0
WR-H8D <1.0 <1.0 <1.0 <1.0 <1.0 <1.0 <1.0 <1.0 <1.0 <1.0 <1.0 <1.0 <1.0 <1.0 <1.0 <1.0 <1.0 <1.0 <1.0 <1.0 <1.0 <1.0 <1.0 <1.0 <1.0 <1.0 <1.0 <1.0 <1.0 <1.0 <1.0 <1.0 <1.0 <1.0 <1.0 <1.0 <1.0 <1.0 <1.0 <1.0 <1.0 <1.0 <1.0 <1.0 <1.0 <1.0 <1.0 <1.0 <1.0 <1.0 <1.0 <1.0 <1.0 <1.0 <1.0 <1.0 <1.0 <1.0 <1.0 <1.0 <1.0 <1.0 <1.0 <1.0 <1.0 <1.0 <1.0 <1.0 <1.0 <1.0 <1.0 <1.0 <1.0 <1.0 <1.0 <1.0 <1.0 <1.0 <1.0 <1.0 <1.0 <1.0 <1.0 <1.0 <1.0 <1.0 <1.0 <1.0 <1.0 <1.0 <1.0 <1.0 <1.0 <1.0 <1.0 <1.0 <1.0 <1.0 <1.0 <1.0	WR-FQ-12D	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0
WR-H8D <1.0 <1.0 <1.0 <1.0 <1.0 <1.0 <1.0 <1.0 <1.0 <1.0 <1.0 <1.0 <1.0 <1.0 <1.0 <1.0 <1.0 <1.0 <1.0 <1.0 <1.0 <1.0 <1.0 <1.0 <1.0 <1.0 <1.0 <1.0 <1.0 <1.0 <1.0 <1.0 <1.0 <1.0 <1.0 <1.0 <1.0 <1.0 <1.0 <1.0 <1.0 <1.0 <1.0 <1.0 <1.0 <1.0 <1.0 <1.0 <1.0 <1.0 <1.0 <1.0 <1.0 <1.0 <1.0 <1.0 <1.0 <1.0 <1.0 <1.0 <1.0 <1.0 <1.0 <1.0 <1.0 <1.0 <1.0 <1.0 <1.0 <1.0 <1.0 <1.0 <1.0 <1.0 <1.0 <1.0 <1.0 <1.0 <1.0 <1.0 <1.0 <1.0 <1.0 <1.0 <1.0 <1.0 <1.0 <1.0 <1.0 <1.0 <1.0 <1.0 <1.0 <1.0 <1.0 <1.0 <1.0 <1.0 <1.0 <1.0	WR-H8	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0
CR-C2B12B <1.0		<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0
CR-H5B <1.0	LABORATORY BLA	NKS			-							
WR-3B <1.0	CR-C2B12B	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0
WR-C2-9B <1.0	CR-H5B	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0
WR-C6B <1.0 <1.0 <1.0 <1.0 <1.0 <1.0 <1.0 <1.0 <1.0 <1.0 <1.0 <1.0 <1.0 <1.0 <1.0 <1.0 <1.0 <1.0 <1.0 <1.0 <1.0 <1.0 <1.0 <1.0 <1.0 <1.0 <1.0 <1.0 <1.0 <1.0 <1.0 <1.0 <1.0 <1.0 <1.0 <1.0 <1.0 <1.0 <1.0 <1.0 <1.0 <1.0 <1.0 <1.0 <1.0 <1.0 <1.0 <1.0 <1.0 <1.0 <1.0 <1.0 <1.0 <1.0 <1.0 <1.0 <1.0 <1.0 <1.0 <1.0 <1.0 <1.0 <1.0 <1.0 <1.0 <1.0 <1.0 <1.0 <1.0 <1.0 <1.0 <1.0 <1.0 <1.0 <1.0 <1.0 <1.0 <1.0 <1.0 <1.0 <1.0 <1.0 <1.0 <1.0 <1.0 <1.0 <1.0 <1.0 <1.0 <1.0 <1.0 <1.0 <1.0 <1.0 <1.0 <1.0 <1.0 <1.0 <1.0 <1.0	WR-3B	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0
WR-H3-12B <1.0 <1.0 <1.0 <1.0 <1.0 <1.0 <1.0 <1.0	WR-C2-9B	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0
	WR-C6B	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0
	WR-H3-12B	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0
	WR-H4-12B	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0

11DCE = 1,1-dichloroethene 11DCA = 1,1-dichloroethane 111TCA = 1,1,1-trichloroethane 112TCA = 1,1,2-trichloroethane CH2Cl2 = methylene chloride c12DCE = cis-1,2-dichloroethene CCl4 = carbon tetrachloride PCE = tetrachloroethene

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ANALYTE CONCENTRATIONS VIA GC/ECD (µg/I)

SAMPLE	11DCE	CH2CI2	t12DCE	11DCA	c12DCE	CHCI3	111TCA	CCI4	TCE	112TCA	PCE
REPORTING	1.0	1.0	1.0	1.0	1.0	1.0	1.0	1.0	1.0	1.0	1.0
LIMIT			-								
EAST POND A	<u>REA</u>										
SOIL GAS SAMPLE	ES										
EP-A1	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0
EP-A1-10	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0
EP-A2	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0
EP-A2-9	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0
EP-A3	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0
EP-A3-10	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0
EP-A4	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0
EP-A4-9	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0
EP-A5	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0
EP-A6-4	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	、<1.0
EP-A6-12	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0
EP-A7-4	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0
EP-A7-12	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0
EP-A8	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0
EP-A8-12	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0
EP-A9	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0
EP-A9-9	<1.0 <1.0	<1.0 <1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0
EP-A9-9 EP-A10	<1.0 <1.0	<1.0 <1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0
EP-A10-8	<1.0 <1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0
EP-A10-8	<1.0 <1.0	<1.0 <1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0
EP-A12-4	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0
EP-A12-11	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0
EP-A13-4	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0
EP-A13-4 EP-A14-4	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0
EP-A14-4 EP-A14-8	<1.0 <1.0	<1.0	<1.0 <1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0
EP-B1	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0
	<1.0	<1.0	<1.0 <1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0
EP-B2		<1.0 <1.0	<1.0 <1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0
EP-C1	<1.0		<1.0 <1.0	<1.0	<1.0 <1.0	<1.0	<1.0 <1.0	<1.0	<1.0	<1.0	<1.0
EP-C1-12	<1.0	<1.0	×1.0	×1.0	×1.0	\$1.0	~1.0	-1.0	-1.0		

11DCE = 1,1-dichloroethene	CH2Cl2 = methylene chloride	t12DCE = trans-1,2-dichloroethene
11DCA = 1,1-dichloroethane	c12DCE = cis-1,2-dichloroethene	CHCI3 = chloroform
111TCA = 1,1,1-trichloroethane	CCI4 = carbon tetrachloride	TCE = trichloroethene
112TCA = 1,1,2-trichloroethane	PCE = tetrachloroethene	

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ANALYTE CONCENTRATIONS VIA GC/ECD (µg/l)

SAMPLE	11DCE	CH2CI2	t12DCE	11DCA	c12DCE	CHCI3	111TCA	CCI4	TCE	112TCA	PCE
REPORTING	1.0	1.0	1.0	1.0	1.0	1.0	1.0	1.0	1.0	1.0	1.0
LIMIT											
EP-C2	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0
EP-C2-8	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0
EP-C4	<1.0	<1.0	1.4	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0
EP-C4-9	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0
EP-D1	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0
EP-D1-11	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0
EP-D2	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0
EP-D2-12	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0
EP-E3	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0
EP-E3-8	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0
EP-E4	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0
EP-E4-8	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0
EP-EQ	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0
EP-EQ-12	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0
EP-F1	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0
EP-F2	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0
EP-F4	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0
EP-H2	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0
EP-H2-12	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0
EP-H3	<1.0	<1.0	<1.0	1.8	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0
EP-H3-8	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0
FIELD CONTROL	SAMPLES										
EP-1	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0
EP-2	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0
EP-2 EP-3	<1.0	<1.0 ⁻	<1.0 <1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0
EP-3 EP-4	<1.0	<1.0	<1.0 <1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	· <1.0
EP-4 EP-5	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1,0	<1.0
EP-6	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0
EP-7	<1.0	<1.0	<1.0	<1.0		<1.0		<1.0	<1.0	<1.0	<1.0

11DCE = 1,1-dichloroethene 11DCA = 1,1-dichloroethane

111TCA = 1,1,1-trichloroethane

CH2Cl2 = methylene chloride c12DCE = cis-1,2-dichloroethene

CCI4 = carbon tetrachloride

PCE = tetrachloroethene

t12DCE = trans-1,2-dichloroethene CHCl3 = chloroform TCE = trichloroethene

112TCA = 1,1,2-trichloroethane

ANALYTE CONCENTRATIONS VIA GC/ECD (µg/l)

SAMPLE	11DCE	CH2CI2	t12DCE	11DCA	c12DCE	CHCI3	111TCA	CCI4	TCE	112TCA	PCE
REPORTING	1.0	1.0	1.0	1.0	1.0	1.0	1.0	1.0	1.0	1.0	1.0
LIMIT											
LABORATORY DU	PLICATE ANA	LYSIS									,
EP-A4-9	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0
EP-A4-9R	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0
EP-A6-12	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0
EP-A6-12R	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0
EP-A13-4	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0
EP-A13-4R	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0
EP-B2	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0
EP-B2R	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0
EP-C2	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0
EP-C2R	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0
EP-E3	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0
EP-E3R	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0
EP-E4-8	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0
EP-E4-8R	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0
FIELD DUPLICATE	E ANIAI VSIS					•					
FIELD DOFLICATE	_ ANAL 1515										
EP-A9-9	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0
EP-A9-9D	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0
EP-C4	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0
EP-C4D	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0

11DCE =	1,1-dichloroethene
11DCA =	1,1-dichloroethane
111TCA =	1,1,1-trichloroethane

112TCA = 1,1,2-trichloroethane

CH2Cl2 = methylene chloride c12DCE = cis-1,2-dichloroethene CCl4 = carbon tetrachloride PCE = tetrachloroethene t12DCE = trans-1,2-dichloroethene CHCl3 = chloroform TCE = trichloroethene

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ANALYTE CONCENTRATIONS VIA GC/ECD (µg/I)

11DCE	CH2CI2	t12DCE	11DCA	c12DCE	CHCI3	111TCA	CCI4	TCE	112TCA	PCE
1.0	1.0	1.0	1.0	1.0	1.0	1.0	1.0	1.0	1.0	1.0
<u>NKS</u>										
<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0
<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0
<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0
	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0
<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0
<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0
<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0
	1.0 <u>NKS</u> <1.0 <1.0 <1.0 <1.0 <1.0 <1.0	1.0 1.0 NKS <1.0	1.0 1.0 1.0 NKS <1.0	1.0 1.0 1.0 1.0 1.0 NKS	NKS <1.0 <1.0 <1.0 <1.0 <1.0 <1.0 <1.0 <1.0 <1.0 <1.0 <1.0 <1.0 <1.0 <1.0 <1.0 <1.0 <1.0 <1.0 <1.0 <1.0 <1.0 <1.0 <1.0 <1.0 <1.0 <1.0 <1.0 <1.0 <1.0 <1.0 <1.0 <1.0 <1.0 <1.0 <1.0 <1.0 <1.0 <1.0 <1.0 <1.0 <1.0 <1.0 <1.0 <1.0 <1.0 <1.0 <1.0 <1.0 <1.0 <1.0 <1.0 <1.0 <1.0 <1.0 <1.0 <1.0 <1.0 <1.0 <1.0 <1.0 <1.0 <1.0 <1.0 <1.0 <1.0 <1.0 <1.0 <1.0 <1.0 <1.0 <1.0 <1.0 <1.0 <1.0 <1.0 <1.0 <1.0 <1.0 <1.0 <1.0 <1.0 <1.0 <1.0 <1.0 <td>NKS <1.0 <1.0<td>NKS <1.0 <1.0<td>NKS <1.0 <1.0<td>$\begin{array}{c ccccccccccccccccccccccccccccccccccc$</td><td>$\begin{array}{c ccccccccccccccccccccccccccccccccccc$</td></td></td></td>	NKS <1.0 <1.0 <1.0 <1.0 <1.0 <1.0 <1.0 <1.0 <1.0 <1.0 <1.0 <1.0 <1.0 <1.0 <1.0 <1.0 <1.0 <1.0 <1.0 <1.0 <1.0 <1.0 <1.0 <1.0 <1.0 <1.0 <1.0 <1.0 <1.0 <1.0 <1.0 <1.0 <1.0 <1.0 <1.0 <1.0 <1.0 <1.0 <1.0 <1.0 <1.0 <1.0 <1.0 <1.0 <1.0 <1.0 <1.0 <1.0 <1.0 <1.0 <1.0 <1.0 <1.0 <1.0 <1.0 <1.0 <1.0 <1.0 <1.0 <1.0 <1.0 <1.0 <1.0 <1.0 <1.0 <1.0 <1.0 <1.0 <1.0 <1.0 <1.0 <1.0 <1.0 <1.0 <1.0 <1.0 <1.0 <1.0 <1.0 <1.0 <1.0 <1.0 <1.0 <1.0 <td>NKS <1.0 <1.0<td>NKS <1.0 <1.0<td>$\begin{array}{c ccccccccccccccccccccccccccccccccccc$</td><td>$\begin{array}{c ccccccccccccccccccccccccccccccccccc$</td></td></td>	NKS <1.0 <1.0 <1.0 <1.0 <1.0 <1.0 <1.0 <1.0 <1.0 <1.0 <1.0 <1.0 <1.0 <1.0 <1.0 <1.0 <1.0 <1.0 <1.0 <1.0 <1.0 <1.0 <1.0 <1.0 <1.0 <1.0 <1.0 <1.0 <1.0 <1.0 <1.0 <1.0 <1.0 <1.0 <1.0 <1.0 <1.0 <1.0 <1.0 <1.0 <1.0 <1.0 <1.0 <1.0 <1.0 <1.0 <1.0 <1.0 <1.0 <1.0 <1.0 <1.0 <1.0 <1.0 <1.0 <1.0 <1.0 <1.0 <1.0 <1.0 <1.0 <1.0 <1.0 <1.0 <1.0 <1.0 <1.0 <1.0 <1.0 <1.0 <1.0 <1.0 <1.0 <1.0 <1.0 <1.0 <1.0 <1.0 <1.0 <1.0 <1.0 <1.0 <1.0 <1.0 <td>NKS <1.0 <1.0<td>$\begin{array}{c ccccccccccccccccccccccccccccccccccc$</td><td>$\begin{array}{c ccccccccccccccccccccccccccccccccccc$</td></td>	NKS <1.0 <1.0 <1.0 <1.0 <1.0 <1.0 <1.0 <1.0 <1.0 <1.0 <1.0 <1.0 <1.0 <1.0 <1.0 <1.0 <1.0 <1.0 <1.0 <1.0 <1.0 <1.0 <1.0 <1.0 <1.0 <1.0 <1.0 <1.0 <1.0 <1.0 <1.0 <1.0 <1.0 <1.0 <1.0 <1.0 <1.0 <1.0 <1.0 <1.0 <1.0 <1.0 <1.0 <1.0 <1.0 <1.0 <1.0 <1.0 <1.0 <1.0 <1.0 <1.0 <1.0 <1.0 <1.0 <1.0 <1.0 <1.0 <1.0 <1.0 <1.0 <1.0 <1.0 <1.0 <1.0 <1.0 <1.0 <1.0 <1.0 <1.0 <1.0 <1.0 <1.0 <1.0 <1.0 <1.0 <1.0 <1.0 <1.0 <1.0 <1.0 <1.0 <1.0 <1.0 <td>$\begin{array}{c ccccccccccccccccccccccccccccccccccc$</td> <td>$\begin{array}{c ccccccccccccccccccccccccccccccccccc$</td>	$\begin{array}{c ccccccccccccccccccccccccccccccccccc$	$\begin{array}{c ccccccccccccccccccccccccccccccccccc$

11DCE = 1,1-dichloroethene 11DCA = 1,1-dichloroethane 111TCA = 1,1.1-trichloroethane 112TCA = 1,1.2-trichloroethane CH2Cl2 = methylene chloride c12DCE = cis-1,2-dichloroethene CCl4 = carbon tetrachloride PCE = tetrachloroethene

ANALYTE CONCENTRATIONS VIA GC/ECD (µg/I)

SAMPLE	11DCE	CH2CI2	t12DCE	11DCA	c12DCE	CHCI3	111TCA	CCI4	TCE	112TCA	PCE
REPORTING	1.0	1.0	1.0	1.0	1.0	1.0	1.0	1.0	1.0	1.0	1.0
LIMIT											
WEST POND A	REA										
											i
SOIL GAS SAMPLE	5										
WP-B1	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0
WP-B1-12	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0
WP-B2	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0
WP-B2-12	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0
WP-BQ	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0
WP-BQ-12	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0
WP-C2	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0
WP-C2-12	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0
WP-CQ	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0
WP-CQ-10	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0
					.4.0		-1.0	-10	~1.0	<1.0	<1.0
WP-D1	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0 <1.0	<1.0	<1.0 <1.0
WP-D1-12	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0 <1.0	<1.0	<1.0 <1.0	<1.0
WP-D2	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0 <1.0	<1.0	<1.0 <1.0	<1.0
WP-D2-12	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0 <1.0	<1.0	<1.0 <1.0	<1.0 <1.0
WP-DQ	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	~1.0	NI.0	\$1.0
	-1.0	-1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0
WP-DQ-12	<1.0	<1.0	<1.0	<1.0	NI.0	<1.0	\$1.0	1.0	-1.0	1.0	
FIELD CONTROL S			•								
FIELD CONTROL 3	DAIVIPLES										
WP-5	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0
	-1.0						•				
LABORATORY DU	PLICATE ANA	ALYSIS									
		. <u> </u>					,				
WP-5	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0
WP-5R	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0
						_					
WP-C2	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0
; WP-C2R	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0
1											

11DCE = 1,1-dichloroethene
11DCA = 1,1-dichloroethane
111TCA = 1,1,1-trichloroethane
112TCA = 1,1,2-trichloroethane

CH2Cl2 = methylene chloride

c12DCE = cis-1,2-dichloroethene

CCI4 = carbon tetrachloride

PCE = tetrachloroethene

ANALYTE CONCENTRATIONS VIA GC/ECD (µg/l)

SAMPLE	11DCE	CH2CI2	t12DCE	11DCA	c12DCE	CHCI3	111TCA	CCH	TCE	112TCA	PCE
REPORTING	1.0	1.0	1.0	1.0	1.0	1.0	1.0	1.0	1.0	1.0	1.0
LIMIT											
FIELD DUPLICATE	ANALYSIS					*			-		
WP-CQ-10	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0
WP-CQ-10D	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0
WP-D2-12	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0
WP-D2-12D	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0
LABORATORY BLA	<u>NKS</u>	:									
WP-5B	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0
WP-C2B	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0
			-								

11DCE= 1,1-dichloroethene11DCA= 1,1-dichloroethane111TCA= 1,1,1-trichloroethane112TCA= 1,1,2-trichloroethane

CH2Cl2 = methylene chloride c12DCE = cis-1,2-dichloroethene CCl4 = carbon tetrachloride PCE = tetrachloroethene

ANALYTE CONCENTRATIONS VIA GC/ECD (µg/l)

SAMPLE	11DCE	CH2CI2	t12DCE	11DCA	c12DCE	CHCI3	111TCA	CCI4	TCE	112TCA	PCE
REPORTING	1.0	1.0	1.0	1.0	1.0	1.0	1.0	1.0	1.0	1.0	1.0
LIMIT											
BUILDING 1301	AREA										
SOIL GAS SAMPLES	e				· .						:
SOIL GAS SAMPLES	<u>.</u>										
CF1301-C1	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0
CF1301-C4	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0
CF1301-D2	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0
CF1301-D3	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0
CF1301-E2	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0
CF1301-E3	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0
CF1301-F1	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0
CF1301-F4	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0
CF1301-F5	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0
CF1301-H4	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0
FIELD CONTROL S	AMPLES										
CF1301-1	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0
CF1301-2	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0
LABORATORY DUP	PLICATE AN	ALYSIS									
				.4.0	-1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0
CF1301-C1	<1.0	<1.0	<1.0	<1.0	<1.0				<1.0	<1.0 <1.0	<1.0
CF1301-C1R	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	NI.U	N 1.0	~1.0
FIELD DUPLICATE	ANALYSIS										
CF1301-C4	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0
CF1301-C4D	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0
LABORATORY BL;	ANKS										
CF1301-C1B	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0

11DCE = 1.1-dichloroethene	CH2Cl2 = methylene chloride	t12DCE = trans-1,2-dichloroethene
11DCA = 1,1-dichloroethane	c12DCE = cis-1,2-dichloroethene	CHCI3 = chloroform
111TCA = 1,1,1-trichloroethane	CCI4 = carbon tetrachloride	TCE = trichloroethene
112TCA = 1.1.2-trichloroethane	PCE = tetrachloroethene	

TARGET Project SLBR

TABLE 2 (CONT.)

ANALYTE CONCENTRATIONS VIA GC/ECD (µg/l)

SAMPLE	11DCE	CH2CI2	t12DCE	11DCA	c12DCE	CHCI3	111TCA	CCI4	TCE	112TCA	PC
EPORTING	1.0	1.0	1.0	1.0	1.0	1.0	1.0	1.0	1.0	1.0	1.
МГ											
UILDING 1605 A	REA										
SOIL GAS SAMPLES											·
1605-NY	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1
1605-P9	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1
1605-RY	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1
1605-WY	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1
1605-WZ	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1
CF1301-K9	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1
CF1301-KX	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1
CF1301-KZ	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1
CF1301-MZ	<1.0 <1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1
CF1301-M2 CF1301-N9	<1.0 <1.0	<1.0 <1.0	<1.0 <1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1
CF 1301-149	×1.0	\$1.0	\1.0	\$1.0	\$1.0	-1.0	- 1.0				
CF1301-NX	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1
CF1301-PZ	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1
CF1301-R9	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1
CF1301-RX	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<'
CF1301-RZ	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<'
···· -											
WATER SAMPLES											
1605-NYW	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<'
1605-P9W	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<'
1605-R9W	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<'
1605-RYW	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<
1605-WYW	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<'
1605-WZW	<1.0	<1.0	<1.0	<1.0		<1.0	<1.0	<1.0	<1.0	<1.0	<
FIELD CONTROL SA!	MPLES										
1005 A	~4 0	~1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<
1605-1	<1.0	<1.0		<1.0 <1.0		<1.0	<1.0	<1.0	<1.0		<
1605-2	<1.0	<1.0	<1.0			<1.0	<1.0 <1.0	<1.0 <1.0	<1.0	<1.0	<
CF1301-3	<1.0	<1.0	<1.0	<1.0	N1.0	<1.U	NI. 0	NI.0	\$1.0	-1.0	-

11DCE = 1,1-dichloroethene	CH2Cl2 = methylene chloride
11DCA = 1,1-dichloroethane	c12DCE = cis-1,2-dichloroethene
111TCA = 1,1,1-trichloroethane	CCI4 = carbon tetrachloride
112TCA = 1,1,2-trichloroethane	PCE = tetrachloroethene

ANALYTE CONCENTRATIONS VIA GC/ECD (µg/I)

SAMPLE	11DCE	CH2CI2	t12DCE	11DCA	c12DCE	CHCI3	111TCA	CCI4	TCE	112TCA	PCE
REPORTING LIMIT	1.0	1.0	1.0	1.0	1.0	1.0	1.0	1.0	1.0	1.0	1.0
EQUIPMENT RINSE	ATE BLANKS	5				•					
1605-1W	<1.0	<1.0	<1.0 ⁻	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.(
1605-2W	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.(
1605-3W	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0
LABORATORY DUP	LICATE ANA	LYSIS									
1605-RY	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0
1605-RYR	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0
CF1301-PZ	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.
CF1301-PZR	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.
FIELD DUPLICATE	ANALYSIS										
1605-P9	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.
1605-P9D	1.5	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.
CF1301-R9	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.
CF1301-R9D	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.
LABORATORY BLA	<u>NKS</u>										
1605-RYB	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.
CF1301-PZB	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.
			•								

11DCE=1,1-dichloroethene11DCA=1,1-dichloroethane111TCA=1,1,1-trichloroethane112TCA=1,1,2-trichloroethane

CH2Cl2 = methylene chloride c12DCE = cis-1,2-dichloroethene CCl4 = carbon tetrachloride PCE = tetrachloroethene

TARGET Project SLBR

TABLE 2 (CONT.)

ANALYTE CONCENTRATIONS VIA GC/ECD (µg/l)

SAMPLE	11DCE	CH2CI2	t12DCE	11DCA	c12DCE	CHCI3	111TCA	CCI4	TCE	112TCA	PCE
REPORTING LIMIT	1.0	1.0	1.0	1.0	1.0	1.0	1.0	1.0	1.0	1.0	1.0
	TRAINING										
FORMERFIRE	TRAINING	<u> </u>									
SOIL GAS SAMPLE	<u>s</u>						*				1
MAAF-B6	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0
MAAF-D6	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0
MAAF-D8	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0
MAAF-E5	<1.0	<1.0	<1.0	<1:0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0
MAAF-E7	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0
MAAF-E9	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0
MAAF-F4	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0
MAAF-F6	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0
MAAF-F7	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0
MAAF-F8	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0
MAAF-FZ	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0
MAAF-H5	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0
MAAF-H6	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0
MAAF-H7	<1.0	<1.0	<1.0	<1.0	21	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0
MAAF-H8	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	2.8
MAAF-H9	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	4.6
MAAF-HQ4	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0
MAAF-J4	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0
MAAF-J6	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0
MAAF-J7	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	1.7
MAAF-J8	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	29
MAAF-JZ	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	9.7
MAAF-K5	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0
MAAF-K7	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	9.3
MAAF-K9	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	50
MAAF-M6	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	1.2
MAAF-M8	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	9.3
MAAF-M14	<1.0		<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0		4.0
MAAF-N2	<1.0		<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	3.5
1											

11DCE = 1,1-dichloroethene
11DCA = 1,1-dichloroethane
111TCA = 1,1,1-trichloroethane
112TCA = 1,1,2-trichloroethane

CH2Cl2 = methylene chloride

c12DCE = cis-1,2-dichloroethene

CCI4 = carbon tetrachloride

PCE = tetrachloroethene

t12DCE = trans-1,2-dichloroethene

CHCI3 = chloroform

TCE = trichloroethene

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TARGET Project SLBR

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TABLE 2 (CONT.)

ANALYTE CONCENTRATIONS VIA GC/ECD (µg/I)

SAMPLE	11DCE	CH2CI2	t12DCE	11DCA	c12DCE	CHC13	111TCA	CCI4	TCE	112TCA	PCE
REPORTING	1.0	1.0	1.0	1.0	1.0	1.0	1.0	1.0	1.0	1.0	1.0
LIMIT											
MAAF-N7	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	16
MAAF-NY	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	1.5
MAAF-P9	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	1.0
MAAF-PX	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	3.
MAAF-PZ	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	1.
MAAF-R3	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.
MAAF-R8	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.
MAAF-R9	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.
MAAF-V8	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.
MAAF-W4	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1
MAAF-WZ	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1
MF-1	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	3
MF-2	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	4
MF-3	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	6.2	<1.0	4
MF-4	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1
MF-5	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	9
MF-6	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1
MF-7	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1
MF-8	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1
MF-9	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1
MF-10	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1
MF-11	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1
MF-12	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1
MF-13	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1
MF-14	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1
MF-15	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1
MF-16	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1
MF-17	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1,0	<1
MF-18	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1

11DCE = 1,1-dichloroethene 11DCA = 1,1-dichloroethane 111TCA = 1,1,1-trichloroethane CH2Cl2 = methylene chloride c12DCE = cis-1,2-dichloroethene CCl4 = carbon tetrachloride t12DCE = trans-1,2-dichloroethene CHCl3 = chloroform TCE = trichloroethene

112TCA = 1,1,2-trichloroethane

PCE = tetrachloroethene

ANALYTE CONCENTRATIONS VIA GC/ECD (µg/I)

SAMPLE	11DCE	CH2Cl2	t12DCE	11DCA	c12DCE	CHCI3	111TCA	CCI4	TCE	112TCA	PCE
REPORTING	1.0	1.0	1.0	1.0	1.0	1.0	1.0	1.0	1.0	1.0	1.0
LIMIT											
WATER SAMPLES											
WATER SAMPLES											
FP-E5	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0
FP-H7	<1.0	<1.0	<1.0	<1.0	375	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0
FP-J6	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0
FP-M1	<1.0	<1.0	<1.0	<1.0	39	<1.0	<1.0	<1.0	<1.0	<1.0	6.5
FP-M8	<1.0	<1.0	<1.0	<1.0	13	<1.0	<1.0	<1.0	1.6	<1.0	78
FP-N2	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	7.3
FP-N7	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0
FP-PZ	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	1.4
FP-V8	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0
FP-W4	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0
MAAF-B6W	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0
MAAF-D6W	<1.0 <1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0
MAAF-DOW MAAF-D8W	<1.0 <1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0
MAAF-E5W	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0
MAAF-E7W	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0
	-10	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0
MAAF-E9W	<1.0 <1.0	<1.0 <1.0	<1.0 <1.0	<1.0 <1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0
MAAF-F4W	<1.0	<1.0 <1.0	<1.0 <1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0
MAAF-F6W MAAF-F7W	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0
MAAF-F8W	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0
											-1.0
MAAF-FZW	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0 <1.0	<1.0 <1.0	<1.0 <1.0
MAAF-H5W	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0 <1.0	<1.0 <1.0
MAAF-H6W	<1.0	<1.0	<1.0	<1.0	4.8	<1.0	<1.0	<1.0	<1.0	<1.0 <1.0	<1.0 <1.0
MAAF-H7W	<1.0	<1.0	<1.0	<1.0	725	<1.0	<1.0	<1.0 <1.0	<1.0	<1.0 <1.0	1.6
MAAF-H8W	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	1.0
MAAF-H9W	<1.0	<1.0	<1.0	<1.0		<1.0	<1.0	<1.0	<1.0	<1.0	4.6
MAAF-HQW	<1.0	<1.0	<1.0	<1.0		<1.0	<1.0	<1.0	<1.0	<1.0	<1.0
MAAF-J4W	<1.0	<1.0	<1.0	<1.0		<1.0	<1.0	<1.0	<1.0	<1.0	<1.0
MAAF-J6W	<1.0	<1.0	<1.0	<1.0		<1.0	<1.0	<1.0	<1.0	<1.0	<1.0
MAAF-J7W	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	4.4

11DCE = 1,1-dichloroethene 11DCA = 1,1-dichloroethane 111TCA = 1,1,1-trichloroethane 112TCA = 1,1,2-trichloroethane CH2Cl2 = methylene chloride c12DCE = cis-1,2-dichloroethene CCl4 = carbon tetrachloride

PCE = tetrachloroethene

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ANALYTE CONCENTRATIONS VIA GC/ECD (µg/l)

SAMPLE	11DCE	CH2CI2	t12DCE	11DCA	c12DCE	CHCI3	111TCA	CCI4	TCE	112TCA	PCE
REPORTING	1.0	1.0	1.0	1.0	1.0	1.0	1.0	1.0	1.0	1.0	1.0
LIMIT											
MAAF-J8W	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	51
MAAF-JZW	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	6.7
MAAF-K5W	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0
MAAF-K7W	<1.0	<1.0	<1.0	<1.0	1.6	<1.0	<1.0	<1.0	<1.0	<1.0	56
MAAF-K9W	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	46
MAAF-M6W	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	8.6
MAAF-M8W	<1.0	<1.0	<1.0	<1.0	32	<1.0	<1.0	<1.0	2.5	<1.0	160
MAAF-MIW	<1.0	<1.0	<1.0	<1.0	129	<1.0	<1.0	<1.0	. 1.3	<1.0	17
MAAF-N2W	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	24
MAAF-N7W	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	10
MAAF-NYW	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	13
MAAF-P9W	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	2.8
MAAF-PXW	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	4.(
MAAF-PZW	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	3.0
MAAF-R3W	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0
MAAF-R8W	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.(
MAAF-R9W	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.(
MAAF-V8W	<1.0	<1.0		<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.(
MAAF-W4W	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.
MAAF-WZW	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0
MF-1W	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	4
MF-2W	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	4.:
MF-3W	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	6.
MF-4W	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.
MF-5W	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	7.
MF-6W	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.
MF-7W	. <1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	1.
MF-8W	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.
MF-9W	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.
MF-10W	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.

11DCE = 1,1-dichloroethene 11DCA = 1,1-dichloroethane 111TCA = 1,1,1-trichloroethane

112TCA = 1,1,2-trichloroethane

CH2Cl2 = methylene chloride c12DCE = cis-1,2-dichloroethene CCl4 = carbon tetrachloride

PCE = tetrachloroethene

t12DCE = trans-1,2-dichloroethene CHCl3 = chloroform TCE = trichloroethene

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TABLE 2 (CONT.)

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ANALYTE CONCENTRATIONS VIA GC/ECD (µg/i)

SAMPLE	11DCE	CH2CI2	t12DCE	11DCA	c12DCE	CHCI3	111TCA	CCI4	TCE	112TCA	PCE
REPORTING	1.0	1.0	1.0	1.0	1.0	1.0	1.0	1.0	1.0	1.0	1.0
LIMIT											
MF-11W	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0
MF-12W	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0
MF-13W	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0
MF-14W	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.(
MF-15W	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.
MF-16W	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0
MF-17W	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0
MF-18W	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.
MF-J6W	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.
FIELD CONTROL S	AMPLES					-					
	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.
MAAF-1	<1.0 <1.0	<1.0 <1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.
MAAF-2 MAAF-3	<1.0	<1.0 <1.0	<1.0 <1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.
MAAF-3 MAAF-4	<1.0 <1.0	<1.0 <1.0	<1.0 <1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1
MAAF-4 MAAF-5	<1.0	<1.0 <1.0	<1.0 <1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1
MAAF-6	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.
MAAF-7	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1
MAAF-8	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.
MAAF-9	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.
	-11.0	-10	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1
MF-1B	<1.0	<1.0 <1.0	<1.0 <1.0	<1.0 <1.0	<1.0 <1.0	<1.0 <1.0	<1.0	<1.0	<1.0	<1.0	<1
MF-2B MF-3B	<1.0 <1.0	<1.0 <1.0	<1.0 <1.0	<1.0 <1.0	<1.0 <1.0	<1.0 <1.0	<1.0	<1.0	<1.0	<1.0	<1
WIF-3D	<1.0	\$1.0	\$1.0	-1.0	-1.0		-110				-
EQUIPMENT RINS	<u>EATE BLANK</u>	S									
FP-1	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1
FP-4	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1
MAAF-1W	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1
MAAF-2W	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1
MAAF-3W	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1
MAAF-4W	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1
MAAF-5W	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1
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11DCE = 1,1-dichloroethene	CH2Cl2 = methylene chloride	t12DCE = trans-1,2-dichloroethene
11DCA = 1,1-dichloroethane	c12DCE = cis-1,2-dichloroethene	CHCl3 = chloroform
111TCA = 1,1,1-trichloroethane	CCI4 = carbon tetrachloride	TCE = trichloroethene
112TCA = 1,1,2-trichloroethane	PCE = tetrachloroethene	

TABLE 2 (CONT.)

ANALYTE CONCENTRATIONS VIA GC/ECD (µg/l)

SAMPLE	11DCE	CH2CI2	t12DCE	11DCA	c12DCE	CHC13	111TCA	CCI4	TCE	112TCA	PCE
REPORTING	1.0	1.0	1.0	1.0	1.0	1.0	1.0	1.0	1.0	1.0	1.0
LIMIT											
EQUIPMENT RINSEAT	EBLANKS	<u> (cont.)</u>									
MAAF-6W	<1.0	<1.0	2.7	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0
MAAF-7W	<1.0	<1.0	2.6	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0
MF-1WB	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0
MF-2WB	<1.0	·<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0
MF-3BW	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0
LABORATORY DUPLI	CATE ANA	LYSIS									
FP-1	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0
FP-1R	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0
FP-4	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0
FP-4R	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0
MAAF-2	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0
MAAF-2 MAAF-2R	<1.0 <1.0	<1.0 <1.0	<1.0 <1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0
				-10	-10	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0
MAAF-7	<1.0	<1.0	<1.0	<1.0	<1.0		<1.0 <1.0	<1.0 <1.0	<1.0	<1.0 <1.0	<1.0
MAAF-7R	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	NI.U	<1.0	~1.0
MAAF-E5	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0
MAAF-E5R	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0
MAAF-E7	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0
MAAF-E7R	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0
MAAF-H9	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	4.6
MAAF-H9R	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	4.3
	-1.0										,
MAAF-M6	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	1.2
MAAF-M6R	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	1.2
MAAF-M8	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	9.3
MAAF-M8R	[^] <1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	8. 9

11DCE = 1,1-dichloroethene 11DCA = 1,1-dichloroethane CH2Cl2 = methylene chloride

c12DCE = cis-1,2-dichloroethene

CCI4 = carbon tetrachloride

PCE = tetrachloroethene

t12DCE = trans-1,2-dichloroethene CHCl3 = chloroform TCE = trichloroethene

111TCA = 1,1,1-trichloroethane 112TCA = 1,1,2-trichloroethane

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TABLE 2 (CONT.)

ANALYTE CONCENTRATIONS VIA GC/ECD (µg/I)

SAMPLE	11DCE	CH2CI2	t12DCE	11DCA	c12DCE	CHC13	111TCA	CCI4	TCE	112TCA	PCE
REPORTING	1.0	1.0	1.0	1.0	1.0	1.0	1.0	1.0	1.0	1.0	1.0
LIMIT	,										
LABORATORY DUPI	LICATE ANA	LYSIS (con	<u>L)</u>								
MAAF-N7	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	¹ 16
MAAF-N7R	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	1
MAAF-PZ	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	1.9
MAAF-PZR	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	1.
MF-3B	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.
MF-3BR	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.
MF-7	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.
MF-7R	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.
MF-8	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.
MF-8R	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.
MF-13	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.
MF-13R	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.
FIELD DUPLICATE											
FP-W4	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.
FP-W4D	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1
MAAF-H6W	<1.0	<1.0	<1.0	<1.0	4.8	<1.0	<1.0	<1.0	<1.0	<1.0	<1
MAAF-H6WD	<1.0	<1.0	<1.0	<1.0	5.8	<1.0	<1.0	<1.0	<1.0	<1.0	<1
MAAF-J6	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1
MAAF-J6D	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1
MAAF-J8	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	
MAAF-J8D	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1,0	9
MAAF-J8W	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	
MAAF-J8WD	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	
							,				

11DCE = 1,1-dichloroethene 11DCA = 1,1-dichloroethane

111TCA = 1,1,1-trichloroethane

112TCA = 1,1,2-trichloroethane

CH2Cl2 = methylene chloride c12DCE = cis-1,2-dichloroethene CCl4 = carbon tetrachloride

= cardon tetrachionoe

PCE = tetrachloroethene

t12DCE = trans-1,2-dichloroethene CHCl3 = chloroform TCE = trichloroethene

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TABLE 2 (CONT.)

ANALYTE CONCENTRATIONS VIA GC/ECD (µg/I)

SAMPLE	11DCE	CH2CI2	t12DCE	11DCA	c12DCE	CHCI3	111TCA	CCI4	TCE	112TCA	PC
REPORTING	1.0	1.0	1.0	1.0	1.0	1.0	1.0	1.0	1.0	1.0	1
LIMIT											
FIELD DUPLICATE A	NALYSIS (c	<u>ont.)</u>									
MAAF-V8W	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1
MAAF-V8WD	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1
MAAF-WZ	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1
MAAF-WZD	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1
MF-3	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	6.2	<1.0	
MF-3D	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	6.2	<1.0	
MF-3W	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	I
MF-3WD	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	1.2	<1.0	
MF-17	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<
MF-17D	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<
LABORATORY BLA	NKS 1					•					
FP-1B	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<
FP-4B	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<
MAAF-2B	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<
MAAF-7B	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<
MAAF-E5B	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<
MAAF-E7B	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<
MAAF-H9B	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<
MAAF-K5B	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<
MAAF-M6B	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<
MAAF-M8B	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<
MAAF-N7B	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<
MAAF-N7WB	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1,0	<
MAAF-PZB	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<
MAAF-R3B	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<
MF-3BB	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<

11DCE= 1,1-dichloroethene11DCA= 1,1-dichloroethane111TCA= 1,1,1-trichloroethane112TCA= 1,1,2-trichloroethane

CH2Cl2 = methylene chloride c12DCE = cis-1,2-dichloroethene

CCI4 = carbon tetrachloride

PCE = tetrachloroethene

t12DCE = trans-1,2-dichloroethene CHCl3 = chloroform TCE = trichloroethene

TABLE 2 (CONT.)

ANALYTE CONCENTRATIONS VIA GC/ECD (µg/I)

SAMPLE	11DCE	CH2CI2	t12DCE	11DCA	c12DCE	CHCI3	111TCA	CCI4	TCE	112TCA	PCE
REPORTING	1.0	1.0	1.0	1.0	1.0	1.0	1.0	1.0	1.0	1.0	1.0
LIMIT											
LABORATORY B	LANKS (cont.)										
MF-7B	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	ⁱ <1.0
MF-8B	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0
MF-13B	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0

11DCE=1,1-dichloroethene11DCA=1,1-dichloroethane111TCA=1,1,1-trichloroethane112TCA=1,1,2-trichloroethane

CH2Cl2 = methylene chloride c12DCE = cis-1,2-dichloroethene CCl4 = carbon tetrachloride PCE = tetrachloroethene t12DCE = trans-1,2-dichloroethene CHCl3 = chloroform TCE = trichloroethene

APPENDIX A

SOIL GAS AND GROUNDWATER SCREENING CHROMATOGRAPHS

ATTN: 6	(ECD RANGE=0, 800 UL)	
0	· · · · · · · · · · · · · · · · · · ·	•••••,
1.2	0/0.997	0.787
	$>^{0/1.350}$ 0/1.525	· · · · · · · · · · · · · · · · · · ·
	0/2.135	
2.4		
3.6		
	6/3.754	
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	D) $SLBR2-A$ $CF/30/-R9$	
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		1 1 1 1
5		
	0/4.081 0/4.308 0/4.438	
	$\begin{array}{c} 0/4.308 \\ 0/4.438 \\ 0/4.710 \\ 0/4.855 \\ 0/4.855 \\ \end{array}$	
	0/4. 308 0/4. 438 0/4. 571 0/4. 710 0/4. 855 0/5. 317 0/5. 317 0/5. 446	 0/5. 156
5	$\begin{array}{c} 0/4.308 \\ 0/4.438 \\ 0/4.571 \\ 0/4.710 \\ 0/4.855 \\ 0/5.317 \\ 0/5.446 \\ 0/5.664 \\ 0/5.559 \end{array}$	0/5.156
	$\begin{array}{c} 0/4.308 \\ 0/4.438 \\ 0/4.571 \\ 0/4.710 \\ 0/4.855 \\ 0/5.317 \\ 0/5.446 \\ 0/5.559 \\ 0/5.842 \\ 0/5.988 0/6.065 \\ 0/6-176 \\ 0/6-176 \\ \end{array}$	0/5.156
5	$\begin{array}{c ccccccccccccccccccccccccccccccccccc$	0/5.156
5	$\begin{array}{c ccccccccccccccccccccccccccccccccccc$	0/5.156
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(ECD)	ile : 1:@FHLE2.	SI BDD-D	MAAF-	MBW				
(ECD)		SLDRZ-D	7.7.11	• • • •		. بە ·		
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	TOTAL 11538 2204 0	<u> Antica antica de la com</u>
	HROMATOPAC CH=2 REPORT No.=33 CHROMATOGRAM=1:LBR2CE.C37 93/09/22 13:33:29	
Analysi (ECD)	s File : 1:@FILE2. SLBR2-C $MAAF - H7$	
ECD)	SLBRZ-C /V//// -///	
ATTN: 6	(ECD RANGE=0, 800 UL)	
0		
		→0/0.783
1.2	0/0.985 0/1:175- 0/1.350 0/1.520	
¢	1/1.908 0/2.112	8 8
2.4	2	
	0/2.785 0/3.095	
3.6	5/3.439	
4 1 1 1		
4.8	{	
	> 9/5.125	
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	}	
7.2	5	1 1/7.512
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8.4	₹0/8.875	1
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9.6	D079: 693	
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10.9		0
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	A CHROMATOPAC CH=	1 REPORT No. =39	CHROMATOGRAM=2:LBR2CF.C37	93/09/22 13:33:27	
Anal	ysis File : FILE-1				
(F1D)	SLBR2-C	MAAF-H7		
ATTN	: 3	(RANGE=1	. 800uL)		
0					
- 1	0/1.236				0/0.
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2	0/1.756 0/1.916 0/2.095	0/2.002			• •
	0/2.475				1 4 1
- 3	0/2.473				
2	0/3.192	0/3.075			T 0/3.
-	0/3.804	0/3.622			4/5.
4			4. 266		
	0/4 391	0/2			•
	0/4.391	0/4_803		2/4.669 0//	4-586
- 3	0/4.92	0/4.803 0/5.113		2/4.669 0//	4-586 -
- ऱ	0/4.92 0/5.405 0/5.51	0/4.803 0/5.113 0/5.296 6 0/5.616		2/4.669 0//	4-586 -
- 5	0/4.92 0/5.405 0/5.51 0/5.783 0/5.958 -	0/4.803 0/5.113 0/5.296 6 0/5.616		2/4.669 0//	4586 - -
	0/4.92 0/5.405 0/5.51 0/5.783 0/5.958 0	$ \begin{array}{c} 0/4.803 \\ 0/5.113 \\ 0/5.296 \\ 0/5.616 \\ 0/6.117 \\ 0/6.244 \end{array} $		2/4.669 0//	
- 6	0/4.92 0/5.405 0/5.51 0/5.783 0/5.958 0/6.367	$\begin{array}{c} 0/4.803 \\ \hline 0/5.113 \\ 0/5.296 \\ \hline 0/5.616 \\ \hline 0/6.117 \\ 0/6.244 \\ \hline 0/6.485 \\ 3/6.612 \\ \hline 0/6.70 \\ \hline 0/$	5	2/4.669 0//	1- 586 - -
	0/4.92 0/5.405 0/5.51 0/5.783 0/5.958 0/5.958 0/5.958 0/5.958 0/7.90 0/7.412	$\begin{array}{c} 0/4.803 \\ \hline 0/5.113 \\ 0/5.296 \\ \hline 0/5.616 \\ \hline 0/6.117 \\ 0/6.244 \\ \hline 0/6.485 \\ 3/6.612 \\ \hline 0/6.70 \\ \hline 0/$	5	2/4.669 0//	
- 6	0/4.92 0/5.405 0/5.51 0/5.783 0/5.958 0/6.968 0/7. 0/7.412	0/4.803 0/5.113 0/5.296 0/5.616 0/6.117 0/6.244 0/6.485 3/6.612 4/6.79 117 5/7.254	5	2/4.669 0//	4586 - -
- 6	0/4.92 0/5.405 0/5.51 0/5.783 0/5.958 0/5.958 0/5.958 0/5.958 0/7.95 0/7.412 0/7.412 0/7.412 0/7.928	0/4.803 0/5.113 0/5.296 0/5.616 0/6.117 0/6.244 0/6.485 3/6.612 4/6.79 117 5/7.254 .682 0/8.025	5	2/4.669 0//	4586 - - -
- 6 - 7 - 8 	0/4.92 0/5.405 0/5.51 0/5.783 0/5.958 0/5.958 0/5.958 0/6.968 0/7. 0/7.412 0/7.412 0/7.412 0/7.928 0/8.249 0/8.322 0/8.525 0/8.66	0/4.803 0/5.113 0/5.296 0/5.616 0/6.117 0/6.244 0/6.485 3/6.612 4/6.79 117 5/7.254 .682 0/8.025 0/8.391 2	5	2/4.669 0//	
- 6	0/4.92 0/5.405 0/5.51 0/5.783 0/5.958 0/5.958 0/5.958 0/5.958 0/5.968 0/7.928 0/7.928	0/4.803 0/5.113 0/5.296 0/5.616 0/6.117 0/6.244 0/6.485 3/6.612 4/6.79 117 5/7.254 .682 0/8.025 0/8.391 2	5	2/4.669 0//	

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C-R4A CHROMATOPAC CH=2 ())ORT No.=31 CHROMATOGRAM=1:LBR2CE() 93/09/22 12:55:27 Analysis File : 1:@FILE2. MAAF - HTW SLBR2-C (ECD) (ECD RANGE=0, 800 UL) ATTN: 6 0 1/0.787 · 0/0.986 1.2 >0/1.520 >1/1.898 3/2.529 2.4 50/2.791 0/3.083 0/3.194 3/3.447 3.6 2 7/3.999 8/4.205 0/4.838 4.8 9/5.125 9/5.274 >0/5.574 \$0,5.966---- 6- -80/6.180 0/6.325 0/6.559 0/6.807 0/7-1-7-3 ---7.2 11/7.515 > 0/7.831 > 0/8.089 8.4 0/8.588 ≫0/9.169 0/9.373 079.660 9.6 6/9.908 0/10.054 0/10.335 0/10.802 0/10.926 10.9 0/11.543

(FID)	SLBR2-C MAAF-H7W		ī
ATTN:	: 5 (RANGE=1, 800uL)		
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1	0/1.241 0/1.342		ס/0.8
	0/1.538	;	
2	0/2.097 0/2.004		1
	0/2.478		
3	0/3.195 0/3.076		/3.7
	0/3.806 0/4.001	· · · · · · · · · · · · · · · · · · ·	4/ J. ~
4	0/4.392	0/4.268	1 1 1
~	0/4.926	2/4.672	4.5
5	0/5.117 0/5.300		
6	0/5.790	0/5.622	1.
Ū	0/6.124 0/6.249		
7	<u>3/6.619</u> <u>4/6.800</u> <u>0/6.973</u> <u>0/7.121</u>		1 1 1 1
	5/7.267 0/7.410		1 1 1 1
	0/7.792	0/7.686	
8	0/8. 253 0/8. 323 0/8. 393		
8	0/8.665 0/8.940		

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3.6	6/3.752	-
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SAMPL	LE No. 14							
	A CHROMATOPAC		PORT No.=77	CHROMATOGRAM=	=2:LBR2DF.C24	93/09/23	09:40:20	
	vsis File : FI	LE-1	لر		F (51.1			
(FID))		SLBR2-9/	D- MAA	F = ESW			
ATTN:	1		(RANGE=	1, 800uL)				
	r							
Ū								
1	0/1.057	<u> </u>	<u>880</u>					
	0/1.251	9/1.354						
2	0/1.798							- ~ -
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DSER - High Priority Sites

ATTACHMENT B

BORING LOGS AND GROUNDWATER MONITOR WELL DATA

BORING LOG LEGEND										
Clay: Silt: Shale: Limestone: Silty Sand: Sand: Gravel:										
Field Screening with an HNu Me										

		НТ	WΓ	RILL	IN	GL) G				HOLE NO SB2	•
1. COMPANY NAME				2. DRILL	ING SL	JECONTR	ACTO			¹	SHEET 1	CED0
Louis Berger & Ass	ociates, In	с.			Wester	rn – Wite	hita, K				OF 3 SH	EEIS
3. PROJECT High Priority Site In							ange, C		rea, Fort Ri			
5. NAME OF DRILLER		_			6.	6. MANUFACTURER'S DESIGNATION OF DRILL Mobile drill B-57						
John Gornick 7. SIZES AND TYPES O)F	4.25 x 8" Hollo	w Ster	n Auger	8	HOLE L	OCATI	ON				
DRILLING AND SAM		CME continu				South of						
EQUIPMENT					⁹	. SURFAC 1185'(10		VATION				
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	OVERBURDEN THICKNESS								ER ENCOU	NTERED		
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N.A. 14. TOTAL DEPTHOF	HOLE	<u>,</u>				7. OTHER	WAT	R LEVE	L MEASURI	EMENTS (SPECIFY)	
20.0' 18. GEOTECHNICAL S		DISTURBED		UNDI	STURI	BED	19. TO	TAL NUN	ABER OF CO	ORE BOXE	ES	
N.A. 20. SAMPLES FOR CHI	ENICAT	VOC	N	METALS	то	HER (SPI	CIFY	OTHER	(SPECIFY)	OTHER	(SPECIFY)	21. TOTAL COF
20. SAMPLES FOR CHI ANALYSIS			Priori	ty Pollutant	EPA	6020 IC	Р/МС					RECOVERY
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		<u> </u>	<u> </u>	FIELD	CORE		-1-	1	si wie			
LITHL DEPTH	DESR	IPTION OF MATERI	ALS		BOX			BLOW		RE	EMARKS	
	5 bro 3 - Cla bro me	ay, dark yellow own, firm. 5' ay, dark yellowi own, firm with f nts that are wh	sh frag- iite,			OBO SB2-0 distur)01		Dry to	14.7 [•] .		
5	ang	ular to subrou	indec	1					1	140	DLE NO.	
		PROJECT Fort Riley High Pri	iority Sit	e Investigation	os						SB2	

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HTW DRILLING LOGG Site COMINAT NAME 2 DBULLING ELGONTRACTOR SHEET 1 COMINAT NAME 2 DBULLING ELGONTRACTOR SHEET 1 Indo Tringt State 1 Data Wattern - Withink IS OP 3 STRETS Indo Tringt State 1 Dot Tringt State Indo Tringt State Indo Tringt State 4 Monte Called State Indo Tringt State Indo Tringt State 4 Monte Called State Monte Called State MALE CALL ASS Legit Holess State Monte Called State COMERSING CMED State State COMERSING 4 Monte Called State Monte Called State COMERSING 4 State Monte Called State NA 118 State Monte Called State NA					нт	wn	RILL	N	GIA)G				HOLE NO. SB2	· ·
Lonis Derger & Associates, Inc. Lame Weatern - Weatern I, SC. [DF 3 SHEELS PRODECT ELOCATION EOD Ranze, ORXO rea, Eot Riler, KS Hah, Proding Site Investigation, Fort Riley, KS 6 MANURAUTICRES BESIGNATION OF DERLI Jahn Gernik 4 JAS 25 Holes Sem Auser 4 Mobile dial B-7 Streph Dry Priss OF 1452 52 Holes Sem Auser 4 Mobile JAS 7000 Streph Dry Priss OF CARE confinement core sampler 5 subh of east BL Streph Core Priss OF CARE confinement core sampler 5 subh of east BL Streph Core Priss OF CARE confinement core sampler 5 subh of east BL Streph Core Priss OF 110 NTE COMPLETID 28 September 1993 LOWEBURGENT THICKNESS L. DATE COMPLETID 28 September 1993 LOWEBURGENT THICKNESS NA NA NA NA Distrumento 10 OTHER WATER LEVEL MEASURED THE APPEND RULLING NA Distrumento 10 OTHER WATER LEVEL MEASURED THE APPEND RULLING NA Distrumento 10 OTHER WATER LEVEL MEASURED THE APPEND RULLING NA Could Distrumento 10 OTHER WATER LEVEL MEASURED APPEND RULLING NA Distrumento 10 OTHER WATER LEVEL MEASURED APPEND RULLING NA Could Distrumento 10 OTHER WATER LEVEL MEASURED APPEND RULLING NA Could Distrumento <t< td=""><td>001001</td><td>NY NIA MAT</td><td></td><td></td><td>111</td><td></td><td></td><td></td><td></td><td></td><td>R</td><td></td><td></td><td>SHEET 1</td><td></td></t<>	001001	NY NIA MAT			111						R			SHEET 1	
PROTECT Heb Thring's Bit Investigation, For Riley, KS Hob Trong's Bit Investigation, For Riley, KS Hob Trong Star Data Hob Trong Star Data Hob Trong Star Data E228 AND TYPES OF BELLINS AND SAMPLING EQUIPMENT CONSERVED NTHEORNES LOWER AND THEORNES LOWER AND THE CONSTRUCTION OF MATERIAL LOWER AND THE CONSTRUCTION OF MATERIALS LOWER AND THE CONSTRUCTIO	LOMPAN Louie R	erger & A	ssociat	tes, Inc.										OF 3 SH	EETS
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NAME OF DRILLER 6 MANUTARE DISSIDIERT Jain Gemids 425 x8" Liblew Skim Alasez 1 STER AND TYPES OF DRILLING AND SAMUTAND EOUTHWENT 425 x8" Liblew Skim Alasez 1 COVERBURDEN THEICHERS 11 1 NA 1 1 2 OVERBURDEN THEICHERS 11 11 NA 1 11 DEPTH DRULLED INTO ROCK 10 28 A 10 10 10 NA 10 10			nvestig	gation, F	ort Riley, KS				EODR	ange, (DB/OD at	ea, Fort Ri	ley,KS	· , T	
Join Controls Size AND TYPES OF DELLING AND SAMPLING BUILTMENT	NAME O	FDRILLEI						6.							
SIZE XAD TYPES OF BOUTHAGENT					105-08 TT .!!	av. 01	Auger								
DURNAUET 9. SURRACE ELEVATION 1187(top) 1187(top) 20 WERRURDEN THECKNESS 11. DATE COMPLETED 20 WERRURDEN THECKNESS 13. September 1933 21 OVERRURDEN THECKNESS 14. DEPTH OKALED INFO ROCK NA. NA NA. 14. DEPTH TO WATER AND ELARSED THE AFTER DRILLING OMMONATER 17. OTHER WATER LEVAL MEASUREMENTS (SPECIPY) 20 SUPCRED 17. OTHER WATER LEVAL MEASUREMENTS (SPECIPY) 20 SUPCRED 17. OTHER WATER LEVAL MEASUREMENTS (SPECIPY) 21 SUPCRED 17. OTHER (SPECIPY) 22 DISPOSITION OF HOLE VOC 22 DISPOSITION OF HOLE RECENTLIA 22 DISPOSITION OF HOLE RECENTLIA 22 DISPOSITION OF HOLE RECENTLIA 21 DISPOSITION OF HOLE RECENTLIA 22 DISPOSITION OF HOLE RECENTLIA 23 DISPOSITION OF HOLE RECENTLIA 24 DISPOSITION OF HOLE RECENTLIA 25 DISPOSITION OF HOLE RECENTLIA 26 O - 3' Clay, dark yellowish 3 DISPOSITION OF HOLE 3 Clay, dark yellowish 4 3 - 5' 4 3 - 5' Clay, dark yellowish DISPOSITION OF MATERIAL REVOLUTION OF MATERIAL 4 3 - 5' Clay, dark yello	SIZES AN	ND TYPES	OF MPI IN	NG				_							
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X Grouted ED_WIELANG LITH DEFTH DESRIPTION OF MATERIALS SCREEN ROX SCREEN ROX NO. SAMPLE BLOW REMARKS 1	2. DISPOS	ITION OF	HOLE		BACKFILLED	MONIT	ORING WELL	ОТ	HER (SP	ECIFY	1 .			OR	
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2 RESULTS NO. NO. COUNTS 1 Dry to 14.7'. 2 GO - 3' Clay, dark yellowish brown, firm. OBOD-SB2-001 4 3 - 5' Clay, dark yellowish brown, firm. OBOD-SB2-001 4 3 - 5' Clay, dark yellowish brown, firm. OBOD-SB2-001 disturbed HOLE NO.	1 1114	DEPTH		DESRIPT	ION OF MATERI	ALS	SCREEN I	30X	SAMPL						
1 1 2 0 - 3' Clay, dark yellowish brown, firm. 0BOD-SB2-001 disturbed 4 3 - 5' Clay, dark yellowish brown, firm with fragments that are white, angular to subrounded. 0BOD-SB2-001 disturbed							RESULTS	NO.	NO.		DUNIS				······
5 angular to subrounded.			Split Spoon	Clay, brow 3 - 5' Clay, brow	n, firm. dark yellowi n, firm with :	ish frag-			SB2-	001		Dry to	14.7 [•] .		
PROJECT HOLE NO.							l.								
		<u> </u>		IP	ROJECT			•	• •••						

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INSPECTOR High Priority Site Investigation, Fort Riley, KS LTTH. DEFTI DESKIPTION OF MATERIALS 6 7 7 10 10 10 10 10 10 10 10 10 10	HTW DRILLING I	ADG HOLE NO. SB2
ITTE DEFINITION OF MATERIALS SCREEN NOX SAME BLOW RESULTS 6	INSPECTOR	OF 2 SUFETS
$ \begin{array}{c} 7 \\ 8 \\ 8 \\ 10 \\ 10 \\ 11 \\ 12 \\ 12 \\ 12 \\ 12 \\ 10 \\ 10 \\ 10 \\ 10 \\ 10 \\ 10 \\ 10 \\ 10$	UTTU DEPTH DESCIPTION OF MATERIALS SCREEN BOX SAM	
PROJECT HOLE NO. SB2	$ \begin{array}{c} 6 \\ 7 \\ 7 \\ 8 \\ 8 \\ 7 \\ 10 \\ 10 \\ 10 \\ 11 \\ 12 \\ 12 \\ 13 \\ 13 \\ 13 \\ 13 \\ 14 \\ 14 \\ 14 \\ 14 \\ 14 \\ 14 \\ 14 \\ 14$	BOD-B2-003 adisturbed

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	HTWI	DRILL	INC	LOG	r	HOLE NO. SB2	
PROJECT High Priority Site Inv	restigation, Fort Riley, KS		INSPEC Ed W	TOR ieland		 SHEET 2 OF 3 SHEET	S
LITH. DEPTH	DESRIPTION OF MATERIALS	FIELD SCREEN RESULTS	CORE BOX NO.	SAMPLE NO.	BLOW COUNTS	 REMARKS	
	5 - 8.5 Clay, reddish brown, firm to hard. 8.5 - 10 ⁹ Clay, yellowish red, and very hard, undisturbed 10 - 14.7 ⁹ Clay, yellowish red, fin to hard.	1.		OBOD SB2-00 disturbe	2 d 	HOLE NO.	

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		HTW	DRILL	<u>ING</u>	LOC	.	· · · · · · · · · · · · · · · · · · ·	HOLE NO. SB2
OJECT ligh Priori	ty Site Inve	stigation, Fort Riley, KS		INSPECT Ed Wie	OR			SHEET 3 OF 3 SHEETS
ITH. D	EPTH	DESRIPTION OF MATERIALS	FIELD SCREEN RESULTS	CORE BOX NO.	SAMPLE NO.	BLOW COUNTS	F	REMARKS
	Πig	10 - 14.7' (cont.) Clay, yellowish red, firm to hard.	ith h				14.7 - 20' mo Stopped drill	ist. ing. Total depth=2

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PROJECT Fort Riley High Priority Site Investigations

HOLE NC

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LONGRAM MANE LONGRAM LONGRAM MANE LONGR		HT\X/	DRILIN	JGI ()G			HOLE NO. SB3		
Losis Briger & Associates, Inc. Lawe WesternWicking, KS LocATION HORDET Hick Index Segments Hick Index Segments Konter Construction Hick Index Segments Konter Construction Konter Constend Konter Construction Konter Construction Konter Con	1 COMPANY NAME	111 //	2. DRILLING	SUBCONTR	ACTOR			SHEET 1		
1 PROPERT 14 IDCNIRO 14			Layne Wes	tern - Witc	nita, KS			OF 3 SHI	EEIS	
I I I I I I I I I I I I I I I I I I I	3 PROJECT			4. LOCATI	ON more, OB/OD a	rea. Fort Ri	ley,KS			
AVAILES A		Fort Riley, KS		6. MANUFACTURER'S DESIGNATION OF DRILL						
7.1225 AND TYPE OF BULLING AND LAWELING	5. NAME OF DRILLER			Mobile drill B-57						
SUPPRENT STATES SUPPLY	7. SIZES AND TYPES OF	4.25 x 8" Hollow \$	Stem Auger	8. HOLE L	CATION west pit Appl	oximately 12	25' east of	SB2.		
11.83(1000) 11.0ATE COMPLETED 20.0428.00.000 MTRE BARRED 11.0ATE COMPLETED 20.0428.00.000 MTRE RATE 20.0428.00.000 MTRE RATE 21.050701700 FHOLE 10.0178.000 MTRE RATE L2VEL MEASUREMENTS (SPECIFY) 20.0507017000 FHOLE 10.0178.000 MTRE RATE L2VEL MEASUREMENTS (SPECIFY) 21.0507017000 FHOLE 0.0000 MTRE RATE L2VEL MEASUREMENTS (SPECIFY) 21.0507017000 FHOLE 0.0000 METRE RATE L2VEL MEASUREMENTS (SPECIFY) 22.01507017000 FHOLE 0.0000 METRE RATE REPUENTS (SPECIFY) 21.0150017000 FHOLE 0.0000 METRE RATE REPUENTS (SPECIFY) 21.0150017000 FHOLE 0.0000 METRE RATE REPUENTS (SPECIFY) 22.0150017000 FHOLE 0.0000 MATERIALS 22.0150017000 FHOLE 0.0000 MATERIALS 21.0150017000 FHOLE 0.0000 MATERIALS 22.0150017000 FHOLE 0.0000 MATERIALS 23.0000 MATERIALS 0.0000 MATERIALS 24.0000 MATERIALS 0.0000 MATERIALS 25.0000 MATERIALS 0.0000 MATERIALS 25.0000 MATERIALS 0.0000 MATERIALS 24.0000 MATERIALS 0.0000 MATERIALS 25.0000 MATERIALS 0.0000 MATERIALS 26.0000 MATERIALS 0.0000 MATERIALS 27.0000 MATERIALS 0.0000 MATERIALS 28.0000 MATERIALS 0.0000 MATERIALS 29.0000 MATERIALS 0.0000 MATERIALS		<u>CME continuous</u>		9. SURFACE ELEVATION						
22 OVERBURDEN THICKNES 29 September 1993 29 September 1993 12 OVERBURDEN THICKNES NA NA 13 DEPTH TORULED INTO ROCK NA NA 14 OTAL DEPTH OF HOLE IV. OTHER WATER LEVEL MEASUREMENTS (SPECIFY) 200 B. GEOTECHNICAL SAMPLES DISTURBED 14 OTAL DEPTH OF HOLE IV. OTHER WATER LEVEL MEASUREMENTS (SPECIFY) 200 B. GEOTECHNICAL SAMPLES DISTURBED 14 OTAL DEPTH TO PORCE VOC METALS NA OTHER WATER LEVEL MEASUREMENTS (SPECIFY) OTHER (SPECIFY) 20 BARDELS FOR GIEBMICAL VOC METALS NA Montroating went of the (SPECIFY) OTHER (SPECIFY) 21 DISPOSITION OF HOLE ACCEPTIED OTHER (SPECIFY) 22 DISPOSITION OF HOLE X Orthout of the (SPECIFY) 21 DISPOSITION OF MATERIALS FIELD CORME 22 DISPOSITION OF MATERIALS FIELD CORME 21 TH DESRIPTION OF MATERIALS FIELD COUNTS 22 OFTH DESRIPTION OF MATERIALS SCREEN NO 21 TH DESRIPTION OF MATERIALS SCREEN NO 21 TH DESRIPTION OF MATERIALS SCREEN NO 22 OFTH DESRIPTION OF MATERIALS SCREEN NO 3 OFTH <td></td> <td></td> <td></td> <td></td> <td></td> <td></td> <td>11 DATE</td> <td>OMPLETE</td> <td></td>							11 DATE	OMPLETE		
12. OVERBERRENT HICKNESS IS DEPTH GROUNDWATER ENCOUNTERED NA NA 1 DEPTH REPLIZED INTO ROCK NA NA OMMERCED. NA IS DEPTH REPLIZED INTO ROCK NA IS DEPTH REPLIZED 2000 IS OPTICE INCAL SAMPLES IS GEOTECTIONCAL SAMPLES DISTURBED UNDUSTURBED UNDUSTURBED IS ADPLISE FOR CHEMICAL VOC Metals EPA 6300 ICPMC EXAMPLISE FOR CHEMICAL Priority Publishant RECOVERY ANALYSIS ITTH DEPTH DESRIPTION OF HOLE ISCALED ITH DESRIPTION OF MATERIALS RESULTS NO NO NO ITH DESRIPTION OF MATERIALS RESULTS NO ISSUED NO ITH DESRIPTION OF MATERIALS RESULTS NO ITH DESRIPTION OF MATERIALS RESULTS NO ISSUED SERIES ISSUED SERIES ISSUED SERIES ISSUED SERIES										
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DS DEPTHORNELS COMMENCED NA IT. OTHER WATER LEVEL MASUREMENTS (SPECIFY) 200 DISTURBED UNDISTURBED 13 GEORDECTENCAL SAMPLES DISTURBED UNDISTURBED 14 TOTAL DEPTHOF HOLE DISTURBED UNDISTURBED 200 MA OTHER (SPECIFY) 14 GEORDECTENCAL SAMPLES DISTURBED UNDISTURBED 15 GEORDECTENCAL SAMPLES DISTURBED UNDISTURBED 21 SAMPLES FOR CHEMICAL VOC METALS AVALYSIS Priority Pollutant EPM 6330 HPLC AVALYSIS MONTORING WELL OTHER (SPECIFY) 21 DISPOSITION OF HOLE BACKFILLED MONTORING WELL OTHER (SPECIFY) 21 DISPOSITION OF HOLE X Grouted Epw 400 NITER (SPECIFY) 11	N.A.			N.A.	TO WATER AT	ID FLAPSET	TIME AF	TER DRILL	ING	
14 TOTAL DEPTHON FIGLE DISTURBED UNDISTURBED 19. TOTAL NUMBER OF CORE BOXES 18. GEOTECHNICAL SAMPLES DISTURBED UNDISTURBED 19. TOTAL NUMBER OF CORE BOXES NA. SAMPLES FOR CHEMICAL VOC METALS OTHER (SPECIFY) OTHER (SPECIFY) 21. DISPOSITION OF HOLE EACKFILED MONTORING WELL OTHER (SPECIFY) OTHER (SPECIFY) OTHER (SPECIFY) 21. DISPOSITION OF HOLE EACKFILED MONTORING WELL OTHER (SPECIFY) 23. SIGNATURE OF INSPECTOR 22. DISPOSITION OF HOLE EACKFILED MONTORING WELL OTHER (SPECIFY) 23. SIGNATURE OF INSPECTOR 11TH DEPTH DESRIPTION OF MATERIALS FIELD CORU Screen BOX SAMPLE BLOW REMARKS 1					NCED.					
200 200 18. GEOTECENECAL SAMPLES DISTURBED UNDISTURBED 19. TOTAL NUMBER OF CORE BOXES NA. 20. SMPLES FOR CHEMICAL VOC METALS OTHER (SPECIPY) DISPOSITION OF HOLE BACKPILLED MONTORING WELL M				17. OTHER	WATER LEVE	EL MEASURI	EMENTS (S	SPECIFY)		
BIG BEDTECHNICAL SAMPLES DIFFERING NA. 20 SAMPLES FOR CHEMICAL VOC METALS OTHER (SPECIPY) OTHER	20.0'			TO DECO	10 TOTAL NU	MBEROFO	ORE BOXE	s		
21 SAMPLES FOR CHEMICAL VOC METALS OTHER (SPECIFY) OTHER (SPEC		DISTURBED								
AVALYSIS AVA		voc	METALS	OTHER (SPI	CIFY) OTHE	R (SPECIFY)	OTHER	(SPECIFY)	21. TOTAL COR	
Z2 DISPOSITION OF HOLE HACKFITLED MONITORING WELL OTHER (SPECIPY) Z3 SIGNATURE OF INSPECTOR LITH DEPTH DESRIPTION OF MATERIALS FIELD CORE SAMPLE BLOW REMARKS 1		Pr						ĺ	RECOVERI	
Z. DISJON HONOF HOLE DESCRIPTION OF MATERIALS FIELD SCREEN RESULTS NO. Could SCREEN BOX NO. COUNTS REMARKS 1 DESRIPTION OF MATERIALS FIELD RESULTS NO. NO. COUNTS REMARKS 1 DESRIPTION OF MATERIALS RESULTS NO. NO. COUNTS REMARKS 1 DESRIPTION OF MATERIALS RESULTS NO. NO. COUNTS REMARKS 1 DESRIPTION OF MATERIALS RESULTS NO. NO. COUNTS REMARKS 1 DESRIPTION OF MATERIALS RESULTS NO. NO. COUNTS REMARKS 1 DESRIPTION OF MATERIALS RESULTS NO. NO. COUNTS REMARKS 1 DESRIPTION OF MATERIALS RESULTS NO. NO. COUNTS REMARKS 1 DESRIPTION OF MATERIALS RESULTS NO. NO. COUNTS REMARKS 1 DESRIPTION OF MATERIALS RESULTS NO. NO. COUNTS REMARKS 2 DESRIPTION OF MATERIALS RESULTS NO. NO. OBOD- SB3-001 3 DESRIPTION OF MATERIALS S.5 ppm Herein the clay. Herein the clay. 4 Herein the clay. Herein the clay. Herein the clay. Herein the clay. 4 Herein the						VATURE OF	INSPECTO	DR		
LITH DESRIPTION OF MATERIALS PIELD SCREEN RESULTS CORE SCREEN NO. SAMPLE NO. BLOW COUNTS REMARKS 1 1 1 1 1 0 0 20' dry. 2 1 1 1 0 0 0 20' dry. 3 0 0 0 0 20' dry. 0 20' dry. 4 1 0 0 0 20' dry. 0 20' dry. 4 0 0 0 20' dry. 0 20' dry. 0 1 0 0 0 0 20' dry. 0 20' dry. 3 0 0 0 0 20' dry. 0 20' dry. 4 0 0 0 0 0 20' dry. 0 20' dry. 4 0 0 0 0 0 0 0 0 0 4 0 0.5''' diameter in the clay. 0 0 0 0 0 0 0 1 0	22. DISPOSITION OF HOLE	DACKTILLED	ONTORING WELL							
LITH DEPTH DESRIPTION OF MATERIALS SCREEN BOX SAMPLE BLOW REMARKS 1 1 1 1 1 1 1 1 1 1 1 1 1		X				Er Wie	64			
1 1 0 - 20' dry. 1 0 - 4' 0 - 0' 3 0 - 4' 0 - 0' 1 0 - 0' 0 - 0' 3 0 - 0' 0 - 0' 4 0 - 0' 0 - 0' 4 0 - 0' 0 - 0' 1 0 - 0' 1 0 -	UTH DEPTH DESRI	PTION OF MATERIAL	s screen bo	X SAMPL	- 1		RE	EMARKS		
5 - shale streaks. 0.6 ppm $(45-60)$	4	y, dark yellowisl wn, firm, dry to htly moist. Also ttered limestone gments up to 0.5 meter in the cla 7.7' y, reddish brow n, with some gra	o 5" 3.5 ppm y.	SB3-C distur OBC SB3- undist	01 bed DD- 003 urbed	0 - 20*0	dry.			
		PROJECT Fort Riley High Priori	ity Site Investigations					OLE NO. SB3		

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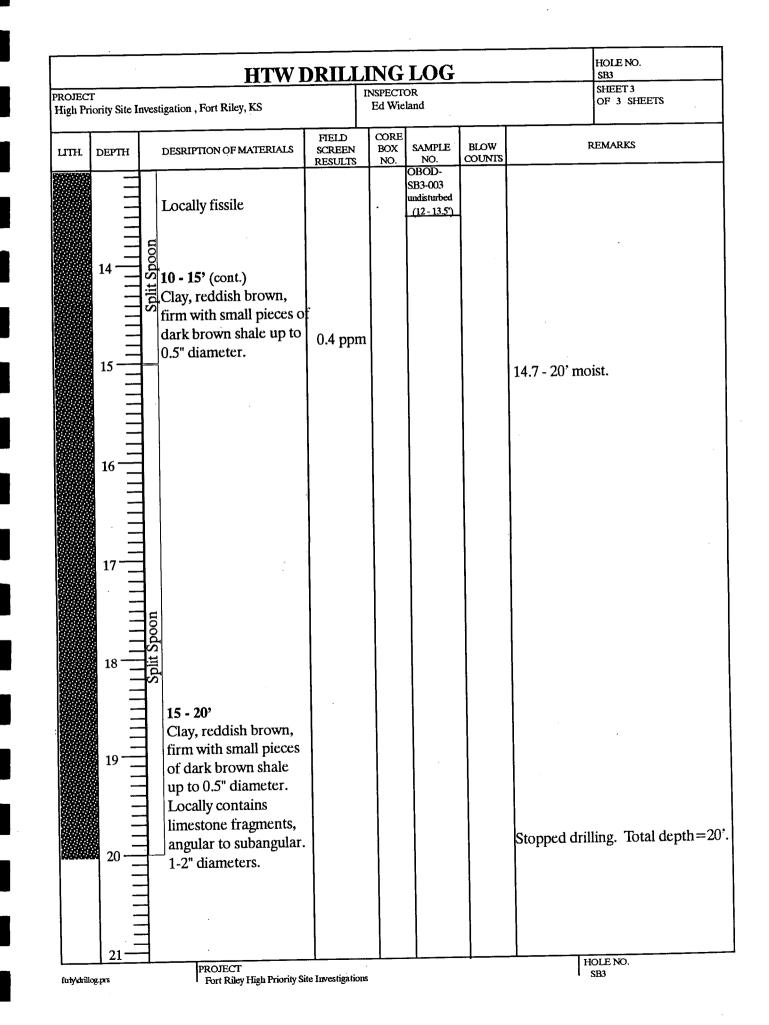
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PROJECT SIMPLET OK INTE DEFINIT DESCRIPTION OF MATERIALS PERID SCREEN DOXE MARKE INTE DESCRIPTION OF MATERIALS SCREEN DOXE MARKE REMARKE INTE DESCRIPTION OF MATERIALS SCREEN DOXE MARKE REMARKE 6	· · · · · · · · · · · · · · · · · · ·	HOLE NO. SB3					
High Trionity State Investigation , Fort Ruley, RS Die Windlak LITH DEFTH DESTRITION OF MATERIALS PIELD PLESTIN DOES NO. NO. RD.OWNER RLOW REMARKS 6	PROJECT			INSPEC	TOR		SHEET 2
LITE DEPTH DESRIPTION OP MATERIALS SCHEM NO. BLOW REMARKS 6	High Priority Site	Investigation, Fort Riley, KS		Ed W	leland		
4 -7.7 (cont.) (Clay, reddish brown, firm, with some gray shale streaks. 0.6 ppm 9 6 -1.5' (Clay, reddish brown, firm. 0.6 ppm 9 6 -1.5' (Clay, reddish brown, firm. 0.6 ppm 9 6 -1.5' (Clay, reddish brown, firm. 0.6 ppm 10 10 -1.5' (Clay, reddish brown, firm. with small limestone granules. 0.6 ppm 10 10 -1.5' (Clay, reddish brown, firm. with small picces of dark brown shale up 0.4 ppm 11 0 0 0 10 10 1.5' 0 11 0 0 0 12 0 0 0 13 0 0 0 14 0 1.5' 0 15 0 0 0 16 0 0 0 17 0 0 0 10 0 0 0 11 0 0 0 12 0 0 0 13 0 0 0	LITH. DEPTH	DESRIPTION OF MATERIALS	SCREEN	BOX	SAMPLE		REMARKS
		Clay, reddish brown, firm, with some gray shale streaks. 7.7 - 8.0' Clay, silty, reddish brown, undisturbed. 8.0 - 9.2' Clay,reddish brown, firm. 9.2 - 10' Clay,reddish brown, firm, with small limestone granules.	0.6 ppm		OBOD- SB3-003 undisturbed (4.5 - 6.0') OBOD- SB3-003 undisturbo		
	13-	to 0.5" diameter.	⁻ 0.4 pp	m			HOLE NO.

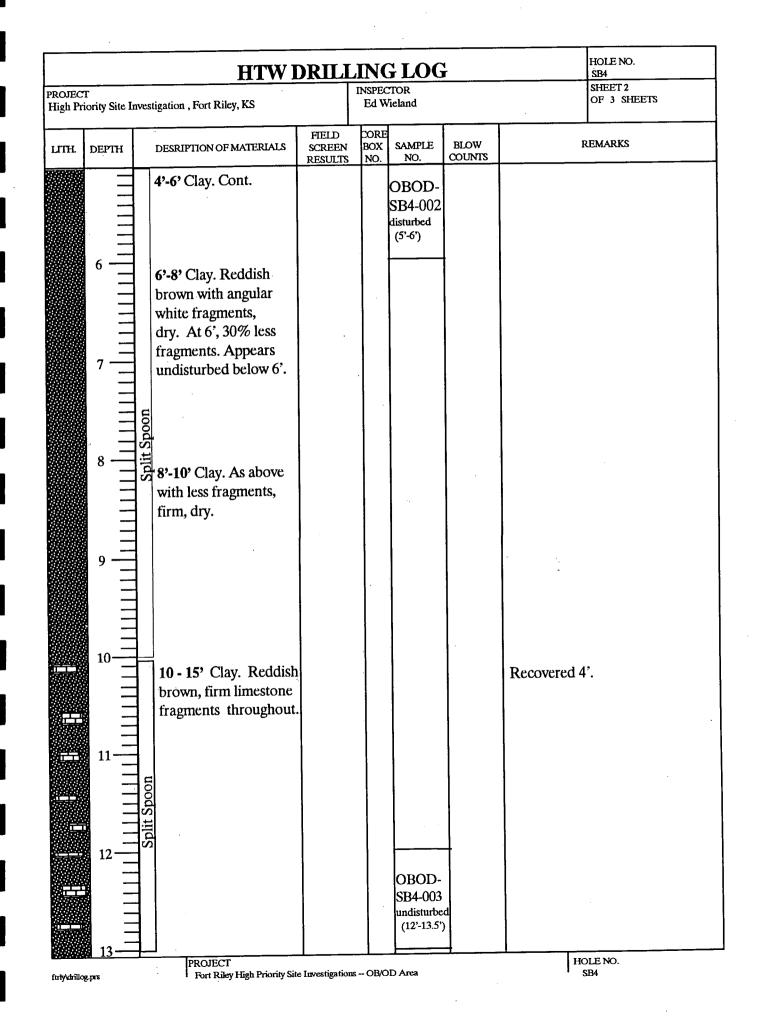
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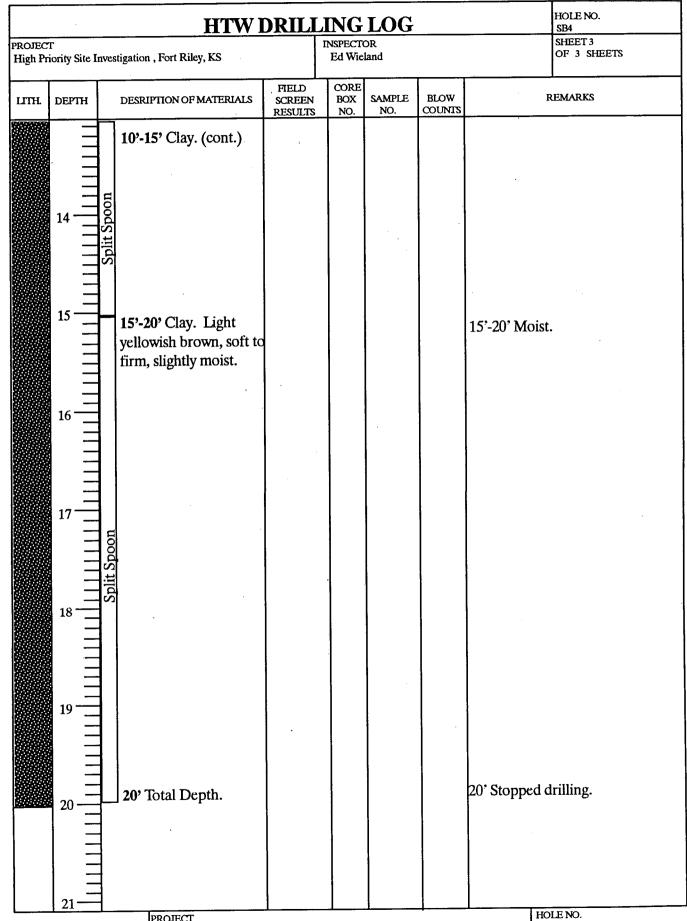
and seen

Fort Riley High Priority Site Investigations



				нт	ND	RILL	ÍN	GIC)G	r			HOLE NO SB4	
1 (1) (0)	VNAME			111				JBCONTR					SHEET 1	
							stern – Witchita, KS OF 3 SHEETS						IEETS	
3. PROJECT	<u>г</u>							LOCATI	ON					
High Priority Site Investigation, Fort Riley, KS								EOD Range, OB/OD area, Fort Riley,KS 6. MANUFACTURER'S DESIGNATION OF DRILL						
5. NAME OF DRILLER 6. M										SIGNATION	OFDRIL	L		
John Gornick Mobile drill B-57 7. SIZES AND TYPES OF 4.25 x 8" Hollow Stem Auger 8. HOLE LOCATION														
DRILLIN	G AND SAM	APLING		CME continu	ous cor	e sampler		North of						
EQUIPM		-					9			EVATION				
								1193'(to 0. DATE S				11. DATE	COMPLET	ED
							'	29 Sept					otember 19	
2 OVERBI	URDEN TH	ICKNESS		<u> </u>			1	5. DEPTH	GRO	UNDWAT	ER ENCOUR	VIERED		
N.A.								<u>N.A.</u>			DELAPSED	TTATE AT		UNG
	DRILLED I	NTO ROC	К				1	6. DEPTH COMME			DELAPSEL	I IMC AI		
N.A.	ENGLOR							7. OTHER	WAT	ER LEVE	L MEASURE	EMENTS (SPECIFY)	
4. TOTAL I 20.0'	DEPTHOF	HOLE												
	CHNICAL S	AMPLES	[DISTURBED		UNDI	STUR	BED	19. T	OTAL NUN	ABER OF CO	ORE BOXI	ES	
N.A.											CDECTER	OTUTE	(SDECTEV)	21 TOTAL COP
	ES FOR CHI	EMICAL	\vdash	VOC	_	METALS		HER (SPE			(SPECIFY)	UTHER	ISLECT 1	21. TOTAL COR RECOVERY
ANALYS	35				Priori Metal	ty Pollutant		A 8330 HP		1				
ABIADA	TONOT			ACKFILLED		S				() 23. SIGN	ATURE OF	INSPECTO	OR	L
12. DISPOSI	TION OF H		<u>⊢</u> ™					Grouted						
				X						ED WIELAND				
итн	DEPTH	DESI	UPII	ON OF MATERI	ALS	FIELD SCREEN RESULTS	CORE BOX NO.	SAMPLI NO.		BLOW COUNTS		RÍ	REMARKS	
						RESULIS	110.			0001110				
				lay. Dark										
	_	bro	wn	organic ma	tter,		ļ							
		firr	n.											
	1			T		ļ	1		ļ					
	•			ay. Reddisl	L .		ł							
				with white		1					0:10:)		
		frag	gme	nts, dry.		!			ļ		0'-15'I	лy.		
							1				1			
							1	{			1			
	2 —	e				1								
		uoo												
		<u>Š</u>						OBO						
								SB4-0						
	_	5					1	(2'-5'))					
	=													
	3													
									[
	-							1		l				
	4 —	4'-	6' C	Clay. Reddis	sh									
brown with white					1									
				ents, dry.		1								
			ıgın	unis, ury.										
						1					1			
	· -												<u> </u>	
	<u> </u>	1	IPR	OJECT				_				н	OLE NO.	





			нт	WD	RILL	IN(GL)G				HOLE NO	•
1. COMPAN					2. DRILLI	NG SL	BCONTR	ACTO				SHEET 1 OF 3 SH	EETS
	erger & Ass	ociates, In	nc.		Layne		m - Witc		<u>s</u>		<u> </u>	OF 3 SH	EEIS
3. PROJECT High Priority Site Investigation , Fort Riley, KS							4. LOCATION EOD Range, OB/OD area, Fort Riley,KS 6. MANUFACTURER'S DESIGNATION OF DRILL						
5 NAME OF DRILLER 6. N							MANUF Mobile			SIGNATION	OFDRILL		
	D TYPES O	F	4.25 x 8" Holl			8	HOLE L	OCATI	ON				
DRILLIN	G AND SAM		CME continu				North of SURFAC						
EQUIPMI	EN I						1194'(to	po)					
						1	0. DATE S 29 Sept				11. DATE (29 Sep	COMPLET tember 19	
	JRDEN THI	CKNESS				1				ER ENCOU		<u> +</u> +	
N.A. 13. DEPTH 1	DRILLED IN	VTO ROCI	ĸ			1	6. DEPTH			DELAPSEI	TIME AF	IER DRIL	LING
N.A.	DEPTHOF	HOLE				1	COMME 7. OTHER	WATE). ER LEVE	L MEASURI	EMENTS (S	PECIFY)	
18.0'			DISTURBED		UNDIS			19 TO		BER OF CO	ORE BOXE	<u>s</u>	
18. GEOTEO N.A.	CHNICAL SA	AMPLES	DISTURBED										
20. SAMPLE ANALYS	ES FOR CHE	MICAL	· VOC		METALS ty Pollutant	-	HER (SPE		OTHER	(SPECIFY)	OTHER (SPECIFY)	21. TOTAL COL RECOVERY
MINAL 12	10			Metal		EPA	8330 HF	PLC					
22. DISPOSI	TION OF H	OLE	BACKFILLED	MONT	ORING WELL	T			1.	ATURE OF			
			X				Grouted			m-2	ne	••	
LITH	DEPTH	DESR	UPTION OF MATER	IALS	SCREEN	CORE BOX	SAMPLI		BLOW		RE	MARKS	
						NO.	<u>NO.</u>		OUNTS				
			Clay. Dark br		0.1 ppm (0'-4')					Recove	ry 20°.		
			with limeston	e									
			nents. Well olidated. Som										
		orga											
	1 =	lorga	11103.				ļ						
			-									•	
	2 —	R								1			
		lood						Ì					
		plit S											
		Sp					<u> </u> .						
	3												
							OBO						
	_						SB5-0						
	\square						(3'-4')						
			Clay. Dark g		0.1 ppm (4'-8')		 			Recove	•rv 4'		
			, with calcarco								<i></i>		
			ules. Grading		ıy,								
			t brown, silty, v estone fragmer										
	A		some magnier		I	1	I			1			
		belc	w.										

Fort Riley High Priority Site Investigations -- OB/OD Area

			HOLE NO. SB5					
PROJEC High Pr	T riority Site In	HTW I		INSPEC		- <u>-</u>		SHEET 2 OF 3 SHEETS
LITH	DEPTH	DESRIPTION OF MATERIALS	FIELD SCREEN RESULTS	CORE BOX NO.	SAMPLE NO.	BLOW COUNTS	I	REMARKS
	DEPTH	4'-8' Clay. Cont. 4'-8' Clay. Cont. 8'-10' Clay. Light brown silty with calcareous shale and limestone fragments. Consolidate and undisturbed.	SCREEN RESULTS 0.2 ppm	BOX NO.	SAMPLE	COUNTS	Recovery 2'.	REMARKS
HI		10 - 14' Clay. Light brown, silty, no fragments. Well consolidated.	0.1 ppm		OBOD- SB5-003 (9'-10')			

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		HTW	DRILJ	LING	LOG		HOLE NO. SB5		
PROJECT High Pri	r iority Site Inv	estigation , Fort Riley, KS		INSPECT Mike M	OR		SHEET 3 OF 3 SHEETS		
ingii i ii						r			
LITH.	DEPTH	DESRIPTION OF MATERIALS	FIELD SCREEN RESULTS		SAMPLE NO.	BLOW COUNTS	REMARKS		
		10'-14' Clay. Cont.			-				
		14'-15' Silt, light gray, clayey with some very							
		fine sand.							
		15'-16' Silt, reddish brown, clayey with some very fine							
		sand and some limestonish							
	16	fragments. 16'-18' Clay, silty, olive							
		16'-18' Clay, silty, olive green. No fragments. Well consolidated.							
		well consolidated.							
		18' Total Depth.					18' Stopped drilling.		
	19								
				х. Х.	2				
							HOLE NO.		

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Fort Riley High Priority Site Investigations -- OB/OD Area

	нт	WD	RILL	IN	GL	DG				HOLE NO SB6).
1. COMPANY NAME			2. DRILLI	NG SU	JECONII	ACTO)R			SHEET 1	
Louis Berger & Associates, In	c			Weste	rn – Wite	hita, I				OF 3 SH	IEE1S
3. PROJECT		•		4	LOCAT		<u> </u>	rea Fort Dil	ev KS		
	BODECT EOD Range, OB/OD area, Fort Riley, KS gh Priority Site Investigation , Fort Riley, KS 6. MANUFACTURER'S DESIGNATION OF DRILL ME OF DRILLER 6. MANUFACTURER'S DESIGNATION OF DRILL										
5. NAME OF DRILLER John Gornick				ľ	Mobile						
7. SIZES AND TYPES OF	4.25 x 8" Hollo			8	. HOLE I						
DRILLING AND SAMPLING	CME continu	ous cor	e sampler		Northea						
EQUIPMENT				°	. SURPAC 1185'(to		EVATION				
				-1	0. DATE	_	ED	1	11. DATE	COMPLET	ED
					1 Octo					ober 1993	
12. OVERBURDEN THICKNESS				1		GRO	UNDWAT	ER ENCOU	VTERED		
N.A				-+	N.A.		ATER AN	DELAPSEL	TIME A	TER DRIL	LING
13. DEPTH DRILLED INTO ROCK	C				COMM	ENCE	D.				
N.A. 14. TOTAL DEPTH OF HOLE			<u> </u>	1	7. OTHE	R WAT	ER LEVE	L MEASURI	EMENTS (SPECIFY)	
18.0'											
18. GEOTECHNICAL SAMPLES	DISTURBED		UNDI	STURI	BED	19. TC	OTAL NUI	MBER OF CO	ORE BOX	ES .	
N.A.			IETALS		HED (OD	FCIEV		COPECTEV)	OTHER	(SPECIFY)	21. TOTAL COR
20. SAMPLES FOR CHEMICAL ANALYSIS	voc		ty Pollutant		6020 IC				C IIIIX	<u>,</u>	RECOVERY
MINUT 919		Metal			8330 H		1				
22. DISPOSITION OF HOLE	BACKFILLED		ORING WELL	01	HER (SP	ECIFY) 23. SIGN	IATURE OF	INSPECT	OR	~
	X	T			Grouted		ľ	Ç	ZH	m. Kel	Shan 1
	<u> </u>	I						<u> </u>			
LITH DEPTH DESR	IPTION OF MATERI	ALS	SCREEN	CORE BOX NO.	SAMPL NO.		BLOW		RÍ	EMARKS	
	A No Ducover							0'-18' D	177		
	4' No Recover	у.	0.1 ppm								
								1			
					Ì						
					ļ			1			
								1			
IIIIIIIIIIIIIIIIIIIIIIIIIIIIIIIIIIIII								Į .			
								1			
<u>–</u> ₽					1	1		l .			
2					1			1			
			1								
	3.4' Clay. (dist		Ц					ļ			
) Dry, modera		ļ		1						
	olidated, abun										
	el fragments.				1						
	or magnicino.										
	o Al Class (dia	turka	4								
	8.4' Clay. (dis				1	• 1		1			
zone	e) Gravel fragn	nents			1						
	than or equal (
	moist, dark br	own.		1							
					OBC	D- [
				1	SB6-	001					
				1	(disturb	ed)					
NS/SS/SS/SS/ 3			<u>+</u>						H	DLE NO.	

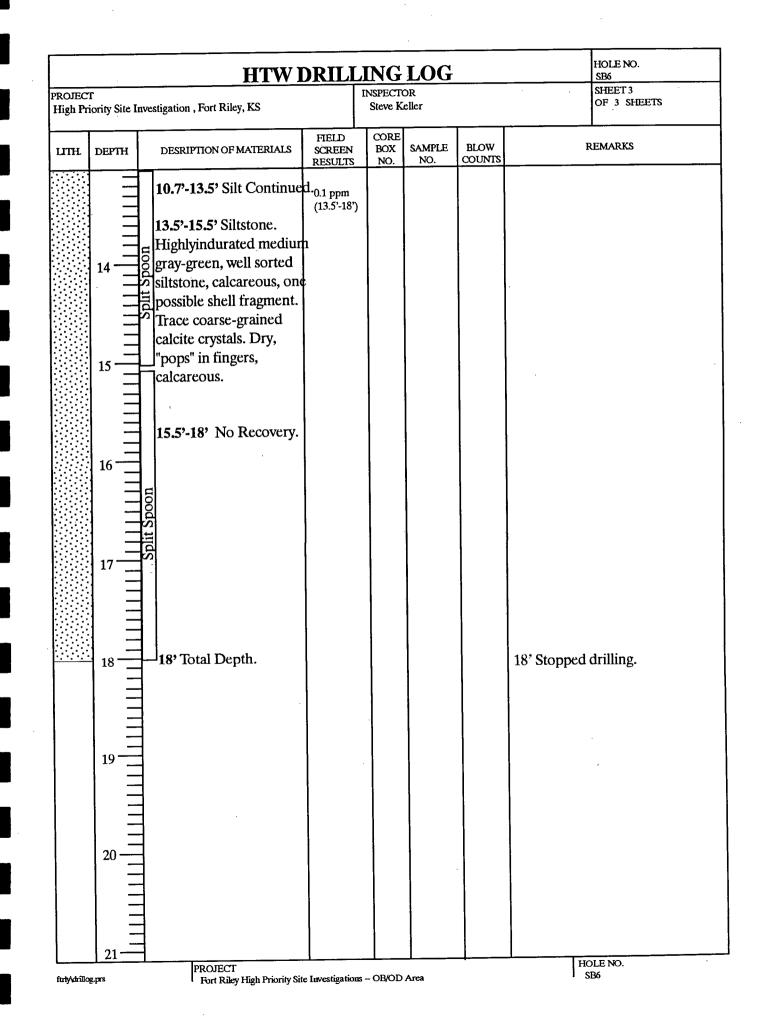
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		HOLE NO. SB6					
PROJEC High Pr	T iority Site In	HTW]		INSPEC			SHEET 2 OF 3 SHEETS
LITH.	DEPTH	DESRIPTION OF MATERIALS	FIELD SCREEN RESULTS	CORE BOX NO.	SAMPLE NO.	REMARKS	
		3.4'-8.4' Cont.	0.2 ppm				
	6				Cont.		
					OBOD- SB6-001 disturbed		
	7	plit Spoon			(4.5'-8')		
						8' Undisturb	ed.
		8.4'-9.5' Weathered shale. (undisturbed) Poorly indurated, semi- plastic, partings contain				Dy.	
	9	white powdery carbonate mineral. Dry and overall color medium yellow-green.	0.1 ppm (9.5'-13.5')				1
		9.5'-10.7' No Recovery.					
		10.7'-13.5' Silt. Medium yellow-green,				Dry.	ч.
		well sorted, dry, poorly indurated. Grades downward to unlaminated clay			OBOD		
		with some blocky fracturing, minor orange oxidation			SB6-002 (11.5'-12.5')		
		mottles, dry.					

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PROJECT Fort Riley High Priority Site Investigations - OB/OD Area HOLE NO. SB6



	HTW DRILL								HOLE NO. SB7					
1. COMPAN	NY NYA ME			111		2 DRILLI	NG SU	IG ST BOONTRACTOR SHEET 1						
Louis Be	erger & As	sociates.	Inc.					estern - Witchita, KS OF 2 SHEETS						
3. PROJECI	7						4.	LOCAT			an Fort Ri	lev KS		
the second division of			ion , Fo	rt Riley, KS				EOD Range, OB/OD area, Fort Riley,KS 6. MANUFACTURER'S DESIGNATION OF DRILL						
5. NAME OF		٤						6. MANUFACTORER'S DESIGNATION OF DAtabase Mobile drill B-57						
7. SIZES AN		OF		4.25 x 8" Hollo			8	HOLEL		ION				
DRILLIN	G AND SA	MPLING		CME continu	ous cor	e sampler	-+-	North of		EVATION	``			
EQUIPMI	ENT						-1^	1190'(to						
				10	DATE S					COMPLET ber 1993	ED			
							-+-	2 Octo			ER ENCOU		001 1775	
12. OVERBU N.A.	URDEN TH	ICKNES	S					N.A.						
13. DEPTH	DRILLED	INTO RC	CK				10				D ELAPSEI) TIME AF	TER DRIL	LING
N.A.						<u> </u>	$-\frac{1}{1}$	COMME 7. OTHEF	WAT	D. TER LEVE	L MEASURI	EMENTS (S	SPECIFY)	
14. TOTAL I 9.5'	DEPTHOF	HOLE												
9.5 18. GEOTE	CHNICAL	SAMPLE	s	DISTURBED		UNDIS	STURI	BED	19. TO	OTAL NUN	ABER OF CO	ORE BOXE	is	
N.A.								HER (SPI	10117	OTTER	(SPECTEV)	OTHER	SPECIEV	21. TOTAL CORE
20. SAMPLI ANALYS		EMICAL	-	VOC		METALS		6020 IC			(<u>1011/11</u>)	() IIIIA	L	RECOVERY
ANALIS	203				Metal			8330 HI	-					
22. DISPOSI	ITION OF I	HOLE	B/	ACKFILLED	MONI	ORING WELL	TO .	HER (SPI	ECIFY	123. SIGN	ATURE OF	INSPECTO	DR N	7
				X				Grouted		1	S	the m	r.U	
					L	FIELD k	ORE							
LITH	DEPTH	DE	SRIPTI	ON OF MATERI	ALS	SCREEN	BOX NO.	SAMPL NO.		BLOW COUNTS		. RE	MARKS	
			0 5' 5	oil black, m	oist.						Moist.			
				clayey soil.	.0100,	(0'-4.5')					1410130			
			game	ciayey son.										
	_	1 0 5	;,_3, (Jay. Mediu	ım									
	_			platic, mois										
	1			d zone mat							1			
				ngular grar							1			
		-0 1	d peb	-	10100			1						
			u peo											
								OBO	D					
	2 —							SB7-0	01					
	-	5						(1'-3')			1			
	_	Spoon												
						1								
		-S				1								
	3 —	1 2,	-4 5' (Clay High	v	1								
	3			1										
				undant ang		1	1							
				es and pebb			l							
			anuic	is and peop			Ì		!					
											Distur	bed soil	s.	
	4 —	-1 1								· ·				
			E) A	7' Clay. (sa	me ac	0.2 ppm	1							
			. 5'- 4. .5'-3')		ine as	(4.5'-9.5')	1	OBC	<u></u>	1				
	X =			' l'Clay. Cor	ntin_		ļ	SB7-						
				-				(4.5-5.5						
	<u>5 —</u>	u		next page.		- 		<u> </u>	<u>.</u>	4		но	DLE NO.	

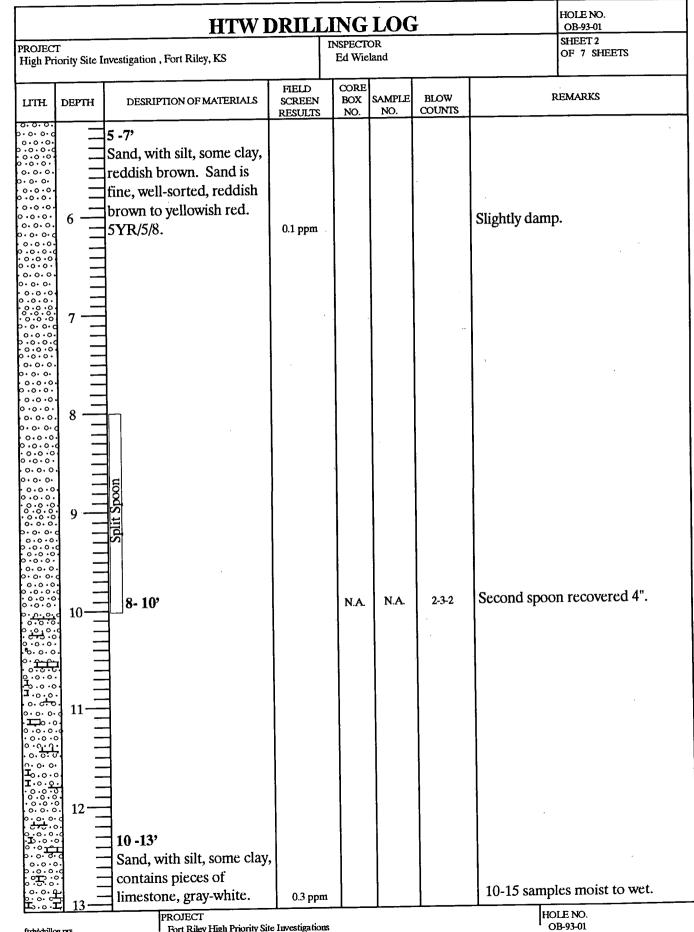
		HTWI	DRILI			۲ ۳	HOLE NO. SB7
ROJECT igh Priority	y Site Inve	estigation, Fort Riley, KS		INSPEC Steve	TOR Keller		SHEET 2 OF 2 SHEETS
ITH. DE	ртн	DESRIPTION OF MATERIALS	FIELD SCREEN RESULTS	CORE BOX NO.	SAMPLE NO.	BLOW COUNTS	REMARKS
		with trace black fracture coatings.			(cont.) SB7-002 OBOD SB7-003 (85'-9-5)		 5' Undisturbed Soils, nearly dry. 6' Intercalated because horizonta color layering is not necessarily stratigraphic bedding. 9.5' Stopped Drilling.

			HT	WI	DRILI	JN	GLO	G				HOLE NO SB8).
1. COMPAN					2. DRILI	ING S	G SUBCONTRACTOR SHEET 1 Actem Witchita KS OF 1 SHEETS						
	erger & As	sociates, I	nc.		Layne		rn Witchi					OF 1 SE	IEEIS
3. PROJEC. High Pri		vestigatio	n , Fort Riley, KS			6	4. LOCATION EOD Range, OB/OD area, Fort Riley,KS						
5. NAME O			,			6	6. MANUFACTURER'S DESIGNATION OF DRILL						
John Gor		-					Mobile dr		·				
7. SIZES AN			4.25 x 8" Hol			^ع	8. HOLE LOCATION Southeast of pit.						
EQUIPM	G AND SAI ENT	MPLING	CME continu	<u>ious co</u> i	re sampler	9	SOUTHEAST	-	TION				
							1180'(topo)			<u> </u>		
					1	10. DATE STA 2 October		1		11. DATE	COMPLET ber 1993	ED	
						-+	5. DEPTH G		TAWO	FR FNCOL		001 1995	
12. OVERBU 4.5'	URDENTH	ICKNESS					N.A.						
13. DEPTH	DRILLED I	NTO ROC	ĸ			1	6. DEPTH TO		ER AN	D ELAPSEE	TIME AF	TER DRIL	LING
0.5							COMMEN 7. OTHER W		LEVE	L MEASURE	EMENTS (S	PECIFY)	
14. TOTAL I 5'	DEPIHOF	HOLE										,	
18. GEOTE	CHNICAL S	AMPLES	DISTURBED		UND	ISTUR	BED 19	. TOTA	LNUN	BER OF CC	ORE BOXE	S	
N.A.													
20. SAMPLI		EMICAL	VOC		METALS		HER (SPECI		THER	(SPECIFY)	OTHER (SPECIFY)	21. TOTAL COR RECOVERY
ANALYS	15			Metal	ty Pollutant		X 8330 HPL						
22. DISPOSI	TION OF H		BACKFILLED		TORING WEL		HER (SPEC		SIGN	ATURE OF	INSPECTO	R	
22. DIGI COI			X				Grouted						
	i		Λ					$-\bot$					
LITH	DEPTH	DESR	UPTION OF MATER	IALS	FIELD SCREEN	CORE BOX	SAMPLE	BLC	ow		RE	MARKS	
LIIIL					RESULTS	NO.	NO.	COU	INTS				
		0'-2	8' Disturbed z	one	0.2 ppm								
			erial. Medium		(0'-4.5')				ĺ				
			brown, moist,										
	_												
	, =	14	tic, with minor										
	1		ilar limestone										
		-	ments. Sharp l	ower									
		cont	act.										
	_												
	2 —							-		2° Distu	rhad co	ile Moi	ct
			4.5' Clay.					.]			1000 80	115. IVIOI	.31.
			disturbed) Lig				OBOD						
		8 gray	-gree, moist, p	lastic			SB8-00	1					
			isturbed, with				(2'-3')						
		Hig mine	or silt content.										•
	3 —	Poss	sibly weathered	1						3' Undi	sturbed	. Moist	,
			e. Thin	2			OBOD						
			se-grained san	d			SB8-002	2					
¥			at approximat			1	(3'-4')						
			pproximately	J									
	4 —		thick. Abunda	nt	1	1		1					
	$=$			•									
		1 1	onaceous mat	CIIAL	0.2 ppm	1							
		4'-4	.5°.		(4.5'-9.5')								
10000000000		1											
		5' T	otal Depth.							5' Stop	ned Dri	llino	

								•				
			TTT		RILL		IN	Ţ		i	HOLE NO).
1. COMPAN			<u> </u>	VV L	2. DRILLI						SHEET 1	
Louis Bo	erger & Ass	ociates, In	ic.			Vestern	- Witchitz	a, KS			OF 7 SH	IEETS
3. PROJECT		netization	n, Fort Riley, KS				OCATION OD Rang		rea, Fort R	iley,KS		
	FDRILLER	vestigation	I, FOIT KIEY, KS			6. M	ANUFACT	URER'S DE	SIGNATIO	N OF DRIL	L	
Randy Sr	nith and Ed			<u> </u>			cker Soil I		- <u></u>			
7. SIZES AN	ID TYPES O	F IPLING	8.25" by 12" at 18" spoons	ugers C	D.D		ast Down	gradient We				
EQUIPM			Schram Rota Dual tube dr				JRFACE E 177 (topo)	LEVATION				
					all alle wall		DATE STA				COMPLET	
							25 Septem				ptember 19	93
	JRDEN THI	CKNESS				3	5.0'		ER ENCOU			
18' 13. DEPTH	3. DEPTH DRILLED INTO ROCK								DELAPSE		FTER DRIL	LING
33'	33' A. TOTAL DEPTH OF HOLE					17.0	OMMENC)' at 15 min		(SPECIFY)	
14. TOTAL J 51'	51'											
									MBER OF C			.
	D. SAMPLES FOR CHEMICAL VOC METALS						ER (SPECI	FY) OTHE	R (SPECIFY	OTHER	(SPECIFY)	21. TOTAL CO RECOVER
ANALYSIS N.A.												
					FORING WELL	OTH	ER (SPECI	FY) 23. SIGI	VATURE OF	INSPECT	OR	
					X				ED WIE	ians.		
LITH	DEPTH	DESR	IPTION OF MATER	IALS	FIELD SCREEN RESULTS	CORE BOX NO.	SAMPLE NO.	BLOW COUNTS		RI	EMARKS	
		redd	y, silty low plas lish brown.	ticity,		ΝΔ	NA	5.5.4	First s	;pool1	- no reco)very.
	5	5YF	R/4/4.		0.1 ppm	N.A	. N.A.	. 5-5-4	First s		- no reco ole no.	
	PROJECT Fort Riley High Priority Site Investigations										OLE NO. OB-93-01	

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Fort Riley High Priority Site Investigations

				TATO	TOC	r	HOLE NO.
		HTWI	<u>)RILL</u>	<u> </u>		<u>, </u>	OB-93-01
ROJEC	Г			INSPECT			SHEET 3
		vestigation, Fort Riley, KS		Ed Wiela	nd		OF 7 SHEETS
-		-					l
			FIELD	CORE			
LITH.	DEPTH	DESRIPTION OF MATERIALS	SCREEN RESULTS	BOX NO.	SAMPLE NO.	BLOW COUNTS	REMARKS
000		······································	RESULIS	NO	<u> 110.</u>	0001113	
	$ \neg$			1			
, 0 0 0							
$\circ \circ \circ \circ$							
		u					
0_0 0 0_0_0		00					10-15 samples moist to wet.
ঁচি	14						
૾ૢ૾ઌ૾૾૾		三13 -15'					
0 0 0		Sand, fine to medium		1			
م م		grade, yellow 10 YR/7/6					
<u> </u>							
်နှင့ ်	1 1	with chunks of		<u>,</u>			71. 1. 1
000		limestone gray-white.		N.A.	N.A.	16-15-17	Third spoon recovered 18".
000	15				ļ		
0000							
0 0 0 0 0 0 0				ļ			
000				1			
000	1 —						
>	1 =						
0000	1 16			1			15-20 samples moist to wet.
0 0 0							-
, o o o o o o					1	1	Note:
000							On 26 September 1993 at 08:35
0 0 0 0 0 0 0							water level 16.0' bgs draw do
000	, —					1	to 18 bs with bailing 6.5 gallons.
		15 -18'		1			At 09:20 water level was 16'.
000	· · · —	Sand, fine to medium			1		ALUTION WALL INVELWAS IU.
		grade, yellow/white, with					
, o o c o o o		pebbles of limestone and			1		
		4	1				Clay reacts with hydrochloric act
0000	×	other little fragments.					
0 0 0 0 0 0 0		Some clay as matrix.	0.4 ppm	N.A .	N.A.		Wet.
	18						
井井	4 -		1.				
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		5					
승규는	1 <u> </u>	К К			Į		1
	19	TT			1	1	
······	а — Б	ß		1			1
	9 -				1	1	
	3 _	18 -20'			1	1	
	g	Limestone, weathered,			1		Fourth spoon recovered 4".
	ㅋ _	olive $5Y/4/4$.		ļ		50/4 refusal	
	20		Į			July 10103dl	
		1			1		
	<u>н</u> —				1		6" surface casing set to 20.5'. 78
	8 -	20.5' End of auger drilling	1		1		
	ਬ –	Begin dual tube drilling.			1		gallons of water used in grout fo
	8 -		1		1		setting surface casing.
╺		1					
	<u></u>	PROJECT				<u> </u>	HOLE NO.

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		HTWI	DRIL		<u>NG</u>	LOG	۲ ۳	HOLE NO. OB-93-01
ROJEC	Г			IN	ISPECTO	OR /		SHEET 4
gh Pri	iority Site In	nvestigation, Fort Riley, KS		E	d Wiela	nd		OF 7 SHEETS
<u> </u>						·		<u>_</u>
тн	DEPTH	DESRIPTION OF MATERIALS	FIELD SCREEN		CORE BOX	SAMPLE	BLOW	REMARKS
			RESULTS	+	NO.	NO.	COUNTS	
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ΤŦ								
누누너								
	22		0.1		N.A.	N.A.		A manufacture 10 collons would
		22'-31'	0.1 ppm		N.A.	N.A.		Approximately 19 gallons used
		Brownish gray shale.		·				while dual tube drilling.
		Diowilish gray shale.						
		Interbedded clay lenses.						
		Moderately consolidated.						
		NT 1 1 1 1						
		Not indurated.						
	23 —							
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Fort Riley High Priority Site Investigations -- Marshall Army Air Field

HOLE NO. OB-93-01

	HTW	DRILL	JNG	LOG	۲ T	HOLE NO. OB-93-01	
IECT	y Site Investigation , Fort Riley, KS		INSPECT Ed Wielz	OR	<u> </u>	SHEET 5 OF 7 SHEETS	
<u> </u>		FIELD	CORE			I	
H. DI	EPTH DESRIPTION OF MATERIALS		BOX NO.	SAMPLE NO.	BLOW COUNTS	REMARKS	
	=			· ·			
30	Tannish gray shale.	0.1 ppm					
	Moderately indurated.						
3	1						
	Dark brownish gray shale	8					
	lenses.						
3	2						
田 田 3	³ Gray limestone.					Very hard to drill.	
出 3	4						
盟.				1			
	⁵⁵	0.1 ppm				Water.	
田							
	36						
盟							
田							
	37						

		HTW	DRILI	LING	LOC	r T	HOLE NO. OB-93-01
PROJEC High Pri	T iority Site I	nvestigation, Fort Riley, KS		INSPECTO Ed Wiela	OR	_	SHEET 6 OF 7 SHEETS
LITH	DEPTH	DESRIPTION OF MATERIALS	FIELD SCREEN RESULTS		SAMPLE NO.	BLOW COUNTS	REMARKS
		DESRIPTION OF MATERIALS Black well indurated shale.	SCREEN	CORE BOX NO.	SAMPLE NO.	BLOW COUNTS	End of water. Hard to drill.

PROJECT Fort Riley High Priority Site Investigations

		HTW	DRILI	LING	LOC	r T		HOLE NO. OB-93-01
PROJEC High Pr	T riority Site I	nvestigation, Fort Riley, KS		INSPECT Ed Wielz	OR		· · ·	SHEET 7 OF 7 SHEETS
LITH	DEPTH	DESRIPTION OF MATERIALS	FIELD SCREEN RESULTS	CORE BOX NO.	SAMPLE	BLOW COUNTS]	REMARKS
		Dark gray shale. Poorly indurated. Interbedded clay lenses.	0.1 ppm	NO.	NO.	COUNTS	of water use Approximate	= 50.8°. 108 gallons d in well construction. ely 50 gallons of vhile drilling.
L	53	PROJECT	1		1	1	НО	DLE NO.

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Fort Riley High Priority Site Investigations

OB-93-01

MONNTORING WELL AS-BUILT DIAGRAM Driller: Layee Wetter Dirilling Method: 8.25°x8° augers, 18° spoon to refutal, in' retary dual tuble to TD. Docation: OBCODAtes Dirilling Method: 2.25°x8° augers, 18° spoon to refutal, in' retary dual tuble to TD. Location: OBCODAtes SURFACE CASING: Size: 6" Ground Surface 1181.05.49° Top of PVC 1182.67.11' Ground Elevation: 0 Quter Casing Diff Hole Diameter: 20.5' Surface Scal Material Sw Enstonite Grout Type of Annular Scal Cement Grout v/5% Bentonite Diameter: 17.6' Type of Scal 1/4'' Dentonite Pellets Sump: Length: 17.6' Type of Filter Material Sump: 0.02 180 Go 40.8' Type of Scal NA Type of Scal Now at Base Depth to Water From Top of Riser 21.95'	I B	OUIS BERGER & SOCIATES, INC.	Client: U.S. Army Corps of Engin Project: Ft. Riley High Priority Prepared by: Ed Wieland Checked by:	Date: <u>3-OCT-93</u>
Elevations: Ground Surface 1181.05.49' Top of PVC 1182.67.11' Ground Elevation: 0 0 uter Casing 20.5' 0 uter Casing 0 uter Casing	Driller: <u>Layne We</u> Drilling Method: ⁸	stern 3.25"x8" augers, 18" spoon	to refusal,	Well No.:OB-93-01
20.5' Surface Seal Material Surface Seal Material Signature Signature 2" Material: PVC Sch: 40 Type of Annular Seal Cement Grout w/5% Bentonite Cement Grout w/5% Bentonite Diameter: 2" Material: PVC Sch: 40 Type of Seal 1/4" Bentonite Pellets Ide Type of Filter Material Clean Washed Sand Sump: Length: 0.3' Type of Seal Not Used NA Type of Seal NA Type of Seal Type of Backfill Depth to Water From Top of Riser 21.05'	Elevations: Ground Surface Top of PVC	<u>1181.05.49'</u> <u>1182.67.11'</u> 0		Size: <u>6</u> " Material: <u>Steel</u> Length: <u>20.5</u> ' Drill Hole Diameter:
Type of Seal Material: PVC 1/4" Bentonite Pellets Material: 0.02 Slot Size: 15' Length: 0.3' Type of Filter Material Sump: Clean Washed Sand Type of Seal NA Type of Seal None at Base Depth to Water Type of Backfill Depth to Water Type of Backfill Depth to Water		20.5' Surface S <u>5% Bento</u> Type of	Seal Material onite Grout Annular Seal	5.25" (20.5' - 50.8') Riser: Diameter: 2" Material: PVC Sch.: 40 Type of Joints: Flush Thread
40.8' Centralizer: Used X NA Type of Seal Not Used NA Type of Backfill Depth to Water Type of Backfill From Top of Riser 21.051		↓ Typ 1/4" Be	entonite Pellets	Diameter:2"Material:PVCSlot Size:0.02Length:15'
NA <u>None at Base</u> Type of Backfill Classifier Strend Depth to Water From Top of Riser		Clear	f Filter Material	Length: 0.3' Type of Cap: Th <u>readed PV</u> C Centralizer: Used X
		NA <u>None</u> Type o	of Backfill	From Top of Riser

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WELL SPECIFICATION FORM

CLIENT: Louis Berger & Associates, Inc.
JOB NUMBER: High Priority SI
WELL OWNER: Fort Riley & HQ 1st Division
ADDRESS:
CITY, STATE, ZIP CODE: Fort Riley, Kansas
PHONE: (913) 239-3343
WELL NUMBER OR OTHER IDENTIFICATION: OB-93-01
WELL INSTALLATION DATE: 28 September 1993
GEOLOGIST SUPERVISING INSTALLATION: Mike Miles (SAIC)
GROUND SURFACE ELEVATION (FT): 1181.05'
TOP OF CASING ELEVATION (FT):1182.67'
WELL STICK-UP (FT): 2.0'
TOTAL BORING DEPTH (FT): 50.8'
BORING DIAMETER (IN): 0' TO 20.5' = 6", 20.5' TO 50.8' = 5.25"
TOTAL DEPTH OF OUTER CASING (FT): 20.5'
OUTER CASING MATERIAL: Steel
OUTER CASING DIAMETER (IN): 6"
TOTAL DEPTH OF INNER CASING (FT. EXCLUDING SCREEN): 25.8'
INNER CASING MATERIAL:
INNER CASING DIAMETER (IN):
TOTAL LENGTH OF WELL SCREEN (FT): 15'
WELL SCREEN MATERIAL: PVC
WELL SCREEN DIAMETER (FT): 0.167
SCREEN SLOT SIZE (IN): 0.020"

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WELL SPECIFICATION FORM (Cont'd)

WELL NUMBER:	OB-93-01	
BACKFILL MATERIAL	AROUND SCREEN:	Clean Washed Silica Sand (10-20)
DEPTH RANGE OF BA	CKFILL (FT):	50.8 TO 21.25'
SEAL MATERIAL ABO	VE SCREEN:	/4" Bentonite Pellets
DEPTH RANGE OF SEA	AL (FT): 21.2	5' TO 17.6'
BACKFILL MATERIAL	AROUND CASING:	Cement Grout with 5% Bentonite Grout
DEPTH RANGE OF BA	CKFILL (FT):	17.6'
DESCRIPTION OF TOP	SEAL: Cement g	rout topped by a 3' diameter pad and 8" of 3/4" gravel.
DESCRIPTION OF WEI	·	steel cover, embedded 2' into grout and concrete with secure locking cap.
OTHER ADDITIONAL	INFORMATION: F	Backfilled hole with sand from 50.8' to 21.25' before setting well.
	<u> </u>	

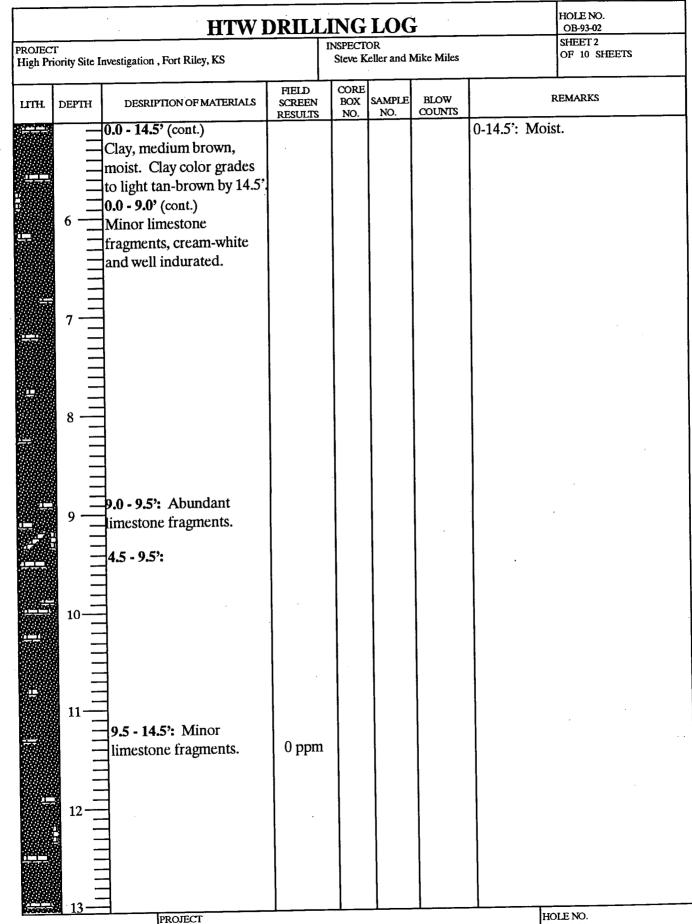
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WELL DEVELOPMENT RECORD

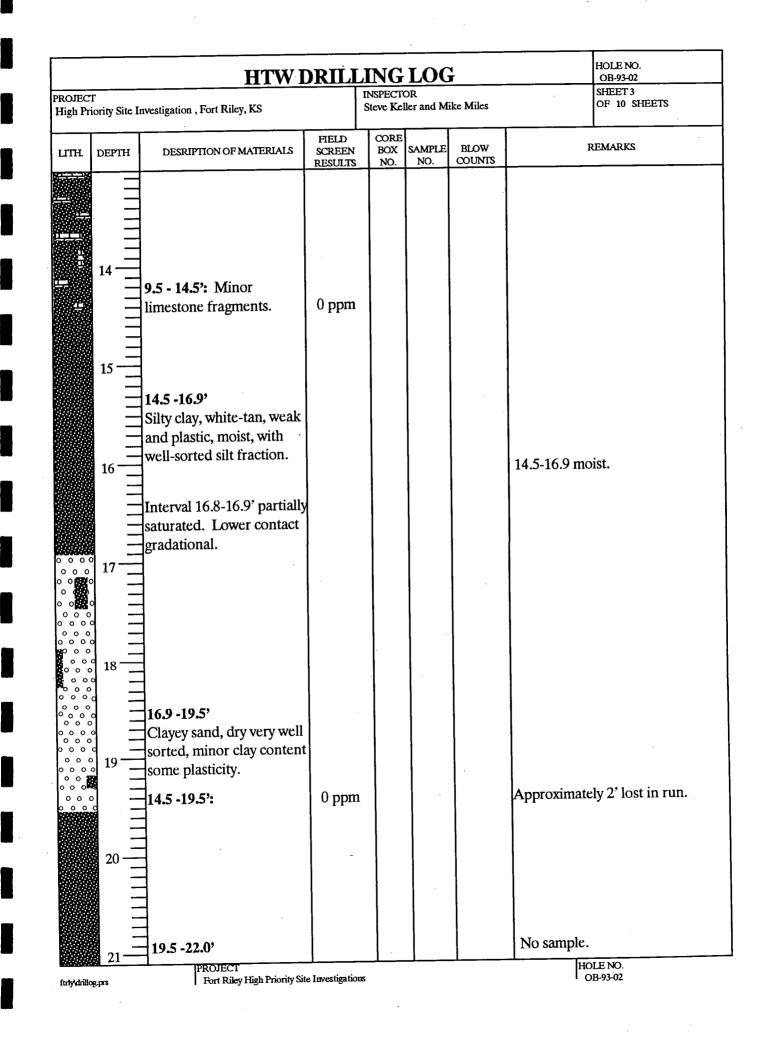
	Fort Riley - High Priority Sites ERSONNEL: Mike Miles (SAIC), Ray Weakly a	und Randy Smith (I avn	e Western)	SHEET:	1 OF: 1
D PI	ERSONNEL: Mike Miles (SAIC), Ray Weakly a				
	WELL NUMBER: OB-93-01				
	DATE OF INSTALLATION: 27 September 19	93			
	DATE OF DEVELOPMENT: 1 October 1993				
	STATIC WATER LEVEL: BEFORE DEVELOPM	MENT (FT): 23.4'	24	HOURS AFTER	(FT):
	QUANTITY OF WATER LOSS DURING DRILL	ING, IF USED (GAL):	50 gal.		
	QUANTITY OF STANDING WATER IN WELL	AND ANNULUS BEF	ORE DEVELOP	MENT (GAL): 8	gal.
		<u>START</u>	DUR	lING	EN
	PHYSICAL APPEARANCE	cloudy	clear	clear	clea
	SPECIFIC CONDUCTANCE (umhos/cm)	420	442	442	442
	TEMPERATURE (°C)	15.5	14.1	14.1	14.
	pH (s.u.)	6.83	7.10	6.55	6.6
	TURBIDITY (NTU)		6.22	2.11	1.2
			40.42		
	DEPTH FROM TOP OF WELL CASING TO BOT	TOM OF WELL (FI):	49.4'		
	SCREEN LENGTH (FT): 15'				ENT (ET).
	DEPTH TO TOP OF SEDIMENT: BEFORE DEV	ELOPMENT (FT): 4	AF	TER DEVELOPM	ENI (FI).
	TYPE AND SIZE OF WELL DEVELOPMENT EC	QUIPMENT: 1 7/8" S	Surge block, 1 1/	2" x 3 ' bailer, and	i 2" Grundfos
				· · · · · · · · · · · · · · · · · · ·	
	DESCRIPTION OF SURGE TECHNIQUE, IF US	ED: Surge, bail, and	1 pump.		
	DESCRIPTION OF SURGE TECHNIQUE, IF US	ED: Surge, bail, and	i pump.		
	DESCRIPTION OF SURGE TECHNIQUE, IF US HEIGHT OF WELL CASING ABOVE GROUND		1 pump.		

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HTW DRILLING LOG 08-93-02 1. COMPANY NAME 2. DRILLING SUBCONTRACTOR SHEET 1 Louis Berger & Associates, Inc. Lawne Western - Winchita, KS OF 10 SHEETS J. ROLECT High Priority Site Investigation, Fort Riley, KS 4. LOCATION EOD Rames, OBOD area, Fort Riley, KS State The Comparison of DRILL 6. MANUACTURER'S DESIGNATION OF DRILL 6. MANUACTURER'S DESIGNATION OF DRILL Distribution of DRILL John Gornick and Ed Roc Schram Rote Drill T66 OH Upgradient monitoring Well Distructer of State Prior DRILL DRILLING AND SAMPLING Schram Rote Drill T66 OH Upgradient monitoring Well 29 September 1993 DRILLING AND SAMPLING Schram Rote Drill T66 OH Upgradient monitoring Well 29 September 1993 Data tube drill using air and water 9. DRITH GRUNDWATER ENCOUNTERED 29 September 1993 29 September 1993 12 OVERBURDEN THECKNESS 15. DEPTH HOROUNDWATER ENCOUNTERED 20 September 1993 29 September 1993 12. OVERBURDEN THECKNESS 16. DEPTH FOR LARSED THE AFTER DRILLING COMMENCED 49.26' at 15 minutes 37.3' 13.0 DISTURBED UNDISTURBED 19. TOTAL NUMBER OF CORE BOXES	TAL COP COVERY
Louis Berger & Associates, Inc. Layne Western – Witchita, KS [OF 10 STEETS 3. PROJECT 4. LOCATION High Priority Site Investigation , Fort Riley, KS EOD Range, OB/OD area, Fort Riley, KS S. NAME OF DRILLER 6. MANUFACTURER'S DESIGNATION OF DRILL John Cornick and Ed Ree 6. MANUFACTURER'S DESIGNATION OF DRILL SIZES AND TYPES OF DRILLING AND SAMPLING Mobile BS7 4.25 x 8" auger 8. HOLE LOCATION SUBJECT Mobile BS7 4.25 x 8" auger 8. HOLE LOCATION TAIZES AND TYPES OF DRILLING AND SAMPLING Sufrara Rota Drill 166 OH Upgradient monitoring Well Dual tube drill using air and water 9. SURFACE ELEVATION 29 September 1993 12. OVERBURDEN THICKNESS 10. DATE STARTED 11. DATE COMPLETED 37.3' 13. DEPTH OROCK 15. DEPTH OROLONDWATER ENCOUNTERED 29 September 1993 12. OVERBURDEN THICKNESS 15. DEPTH OROCK 16. DEPTH TO WATER AND ELAPSED TIME AFTER DRILLING 34.7' ID TOTAL NUMBER OF CORE BOXES 16. DEPTH TO WATER AND ELAPSED TIME AFTER DRILLING 13. DEPTH ORALLED INTO ROCK 19. TOTAL NUMBER OF CORE BOXES NA. 20. SAMPLES FOR CHEMICAL VOC METALS OTHER (SPECIFY) OTHER (SPECIFY) 14. DEPTH DESRIPTION OF M	
3 PROJECT 4. LOCATION High Priority Site Investigation , Fort Riley, KS EOD Range, OB/OD area, Fort Riley, KS SAME OF DRILLER 6. MANUFACTURER'S DESIGNATION OF DRILL John Gornick and Ed Roe 6. MANUFACTURER'S DESIGNATION OF DRILL John Gornick and Ed Roe 8. HOLE LOCATION 7. SIZES AND TYPES OF Schram Rota Drill T66 OH Upgradient monitoring Well Dual tube drill using air and water 9. SURACE ELEVATION BOUTPMENT Dual tube drill using air and water 9. SURACE ELEVATION BOUTPMENT Dual tube drill using air and water 9. SURACE ELEVATION 20 September 1993 11. DATE COMPLETED 20 September 1993 12. OVERBURDEN THICKNESS 15. DEPTH TO WATER AND ELAPSED TIME AFTER DRILLING 31.3' 13. DEPTH DRILLED INTO ROCK 16. DEPTH TO WATER AND ELAPSED TIME AFTER DRILLING 31.7 16. DEPTH TO WATER AND ELAPSED TIME AFTER DRILLING 20.426' at 15 minutes 31.7 16. DEPTH TO WATER AND ELAPSED TIME AFTER DRILLING 20.426' at 15 minutes 32.5 DISTURBED UNDISTURBED 19. TOTAL NUMBER OF CORE BOXES NA 20. SAMPTES FOR CHEMICAL VOC METALS OTHER (SPECIFY) 20. SAMPTES FOR CHEMICAL	
High Priority Site Investigation, Fort Riley, KS EOD Range, OB/OD real, FORT Riley, KS NAME OF DRILLER 6. MANUEACTURERS DESIGNATION OF DRILL John Gornizk and Ed Roc 6. MANUEACTURERS DESIGNATION OF DRILL 1. SUZES AND TYPES OF DRILLING AND SAMPLING Mobile, BST4257,8° auger 8. HOLE LOCATION 2. SURFACE ELEVATION Schram Rota Drill T66 OH Upgradiatent monitoring Well Dual tube drill using air and water 9. SURFACE ELEVATION 2. OVERBURDEN THICKNESS 11. DATE COMPLETED 2. OVERBURDEN THICKNESS 15. DEPTH GROUNDWATER ENCOUNTERED 37.3 13. DEPTH HORUDEWATER ENCOUNTERED 3.7 16. DEPTH TO WATER AND ELAPSED TIME AFTER DRILLING 3.7 17. OTHER WATER LEVEL MEASUREMENTS (SPECIFY) 3.7 17. OTHER WATER LEVEL MEASUREMENTS (SPECIFY) 18. GEOTECHNICAL SAMPLES DISTURBED UNDISTURBED 19. TOTAL DEPTH OF HOLE 72.0° 19. TOTAL NUMBER OF CORE BOXES NA NA 19. TOTAL NUMBER OF CORE BOXES NA 20. SAMPLES FOR CHEMICAL VOC METALS NA 20. SIGNATURE OF INSPECTOR 11. TOTHER (SPECIFY) 21. SIGNATURE OF OR CHEMICAL NO. NO. NA	
NAME OF DRULEX John Gorids and Ed Roc SIZES AND TYPES OF DRULING AND SAMPLING Mobile B57.4.25 x 8" auger 8. HOLE LOCATION Schram Rota Drill T66 OH Upgradient monitoring Well Upgradient monitoring Well Dual tube drill using air and water 9. SURFACE ELEVATION 2. OVERBURDEN THICKNESS 10. DATE STARTED 29 September 1993 2. OVERBURDEN THICKNESS 15. DEPTH GRONDWATER ENCOUNTERED 29 September 1993 3.3' 3.3' 15. DEPTH GRONDWATER ENCOUNTERED 20 September 1993 3.7 '' 10. DATE STARTED 19.26' at 15 minutes 3.7 '' 10. ONTER WATER LEVEL MEASUREMENTS (SPECIFY) 3.6 GOTECHNICAL SAMPLES DISTURBED UNDISTURBED N.A NA 19. TOTAL NUMBER OF CORE BOXES N.A VOC METALS OTHER (SPECIFY) N.A VOC METALS OTHER (SPECIFY) 21. DISTURBED MONITORING WELL OTHER (SPECIFY) DIHER (SPECIFY) 22. DISPOSITION OF HOLE X <td>LAL COF</td>	LAL COF
SIZES AND TYPES OF DRILLING AND SAMPLING Mobile B574 25 x8* auger. 8. HOLE LOCATION Schram Rota Drill T66 OH Uppradient monitoring Well Dual tube drill using air and water 9. SURFACE ELEVATION approximately 1195' Dual tube drill using air and water 9. SURFACE ELEVATION approximately 1195' 20 OVERBURDEN THICKNESS 10. DATE STARTED 3. DEPTH DRILLED INTO ROCK 15. DEPTH TO WATER AND ELAPSED TIME AFTER DRILLING COMMENCED. 3.7.3' 62.0' 3.7.3' 15. DEPTH TO WATER AND ELAPSED TIME AFTER DRILLING COMMENCED. 4. TOTAL DEPTH OF HOLE 17. OTHER WATER LEVEL MEASUREMENTS (SPECIFY) 7.0' 10. DATE STARTED 2.0' DISTURBED 2.0' METALS 7.0' 10. TOTHER WATER LEVEL MEASUREMENTS (SPECIFY) 7.0' 10. OTHER (SPECIFY) 7.0' 10. TOTHER WATER LEVEL MEASUREMENTS (SPECIFY) 7.0' 10. TOTHER WATER LEVEL MEASUREMENTS (SPECIFY) 7.0' 10. TOTHER WATER LEVEL MEASUREMENTS (SPECIFY) 7.0' 10. THER (SPECIFY) 7.0' 10. THER (SPECIFY) 7.0' MONITORING WELL OTHER (SPECIFY) 7.0' NO. NO.	[AL COF
DRILLING AND SAMPLING Schram Rofa Drill 100 OFH Upgrading air and water Dual tube drill using air and water 9. SURFACE BLEVATION approximately 1195' 11. DATE COMPLETED 20. OVERBURDEN THICKNESS 15. DEPTH GROUNDWATER ENCOUNTERED 37.3' 62.0' 37.4' 16. DEPTH ORILLED INTO ROCK 3.0 EPTH DRILLED INTO ROCK 16. DEPTH TO WATER AND ELAPSED TIME AFTER DRILLING 3.1.7' COMMENCED 49.26' at 15 minutes 72.0' 17. OTHER WATER LEVEL MEASUREMENTS (SPECIFY) 72.0' 17. OTHER WATER LEVEL MEASUREMENTS (SPECIFY) 72.0' 19. TOTAL NUMBER OF CORE BOXES NA 19. TOTAL NUMBER OF CORE BOXES NA 19. TOTAL NUMBER OF CORE BOXES NA 19. TOTAL NUMBER OF INSPECTOR REV MATTER LED 10.500 FHOLE EACKFILLED MA NA 2. DISPOSITION OF HOLE EACKFILLED MAA SCREEN BOX SAMPLE BLOW REMARKS Clay, medium brown, RESULTS Mointor limestone BOX Minor limestone Minor limestone	FAL COF
EDUCTION IN EXAMPLES III. DATE STARTED III. DATE COMPLETED 20 September 1993 10 DATE STARTED 11. DATE COMPLETED 20 September 1993 20 September 1993 12 September 1993 37.3' 15. DEPTH GROUNDWATER ENCOUNTERED 62.0' 37.3' 15. DEPTH TO WATER AND ELAPSED TIME AFTER DRILLING 37.3' 16. DEPTH TO WATER AND ELAPSED TIME AFTER DRILLING 37.4' 17. OTHER WATER LEVEL MEASUREMENTS (SPECIFY) 3.7 17. OTHER WATER LEVEL MEASUREMENTS (SPECIFY) 3.7 10. DISTURBED 19. TOTAL NUMBER OF CORE BOXES 3.6 ROTECHNICAL SAMPLES DISTURBED 19. TOTAL NUMBER OF CORE BOXES NA 19. TOTAL NUMBER OF CORE BOXES REG NA 19. TOTAL NUMBER OF INSPECTOR REG NA 19. TOTAL NUMBER OF INSPECTOR REG NA 2. DISPOSITION OF HOLE EACKFILLED MONITORING WELL OTHER (SPECIFY) 23. SIGNATURE OF INSPECTOR LITH DEPTH DESRIPTION OF MATERIALS SCREED NO. SAMPLE BLOW REMARKS 11. DLET OF OUT IN OF MATERIALS SCREED NO. NO. COUNTS 0-14.5': MOIST. 11. DEPTH DESRIPT	TAL COF
IDENTIFICATION OF HOLE IDENTIFICATION OF MATERIALS IDENTIFICATION OF MATERIA	TAL COP COVERY
26 September 1993 29 September 1993 20 OVERBURDEN THICKNESS 37.3' 37.3' 15. DEPTH GROUNDWATER ENCOUNTERED 37.3' 16. DEPTH TO WATER AND ELAPSED TIME AFTER DRILLING COMMENCED. 37.7' 10 OMENCED. 3.0EPTH TO WATER AND ELAPSED TIME AFTER DRILLING COMMENCED. 49.26' at 15 minutes 3.0EVEND DISTURBED UNDISTURBED 10.0THER WATER LEVEL MEASUREMENTS (SPECIFY) 72.0' 3.0EOTECHNICAL SAMPLES DISTURBED UNDISTURBED 10.0THER KOR CHEMICAL VOC METALS 0.SAMPLES FOR CHEMICAL VOC METALS 0.SENSTITION OF HOLE MONITORING WELL OTHER (SPECIFY) 2.DISPOSITION OF MATERIALS SCREEN SOX SAMPLE 0.0 - 14.5' OLay, medium brown, moist. Clay, color grades to light tan-brown by	FAL COF
62.0° 37.3° 16. DEPTH TO WATER AND ELAPSED TIME AFTER DRILLING 37.7° 16. DEPTH TO WATER AND ELAPSED TIME AFTER DRILLING 37.7° 16. DEPTH TO WATER AND ELAPSED TIME AFTER DRILLING 37.7° 16. DEPTH TO WATER AND ELAPSED TIME AFTER DRILLING 37.7° 17. OTHER WATER LEVEL MEASUREMENTS (SPECIFY) 3. TOTAL DEPTH OF HOLE 17. OTHER WATER LEVEL MEASUREMENTS (SPECIFY) 3. GEOTECHNICAL SAMPLES DISTURBED UNDISTURBED 19. TOTAL NUMBER OF CORE BOXES NA OTHER (SPECIFY) OTHER (SPECIFY) OTHER (SPECIFY) OTHER (SPECIFY) 0. SAMPLES FOR CHEMICAL VOC METALS OTHER (SPECIFY) OTHER (SPECIFY) 0. SAMPLES FOR CHEMICAL VOC METALS OTHER (SPECIFY) OTHER (SPECIFY) 0. SAMPLE SPOR CHEMICAL VOC METALS OTHER (SPECIFY) OTHER (SPECIFY) 0. SAMPLE SPOR CHEMICAL VOC METALS OTHER (SPECIFY) OTHER (SPECIFY) OTHER (SPECIFY) 2. DISPOSITION OF HOLE E	FAL COP COVERY
3/3 3/3 30. DEPTH DRILLED INTO ROCK 16. DEPTH TO WATER AND ELAPSED TIME AFTER DRILLING COMMENCED. 49.26 at 15 minutes 34.7 17. OTHER WATER LEVEL MEASUREMENTS (SPECIFY) 72.0° 17. OTHER WATER LEVEL MEASUREMENTS (SPECIFY) 3. GEOTECHNICAL SAMPLES NA. DISTURBED UNDISTURBED 19. TOTAL NUMBER OF CORE BOXES NA. NA NA ITHER (SPECIFY) OTHER (SPECIFY) 2. DISPOSITION OF HOLE BACKFILLED MONITORING WELL OTHER (SPECIFY) 23. SIGNATURE OF INSPECTOR LITH DEPTH DESRIPTION OF MATERIALS FIELD SCREEN CORE RESULTS SAMPLE BLOW REMARKS ITH DESRIPTION OF MATERIALS FIELD SCREEN CORE RESULTS SAMPLE BLOW REMARKS ITH DESRIPTION OF MATERIALS FIELD SCREEN SO. NO. NO. 0-14.5': Moist. ILITH DEPTH DESRIPTION oF MATERIALS FIELD SCREEN SAMPLE BLOW REMARKS ILITH DEPTH DESRIPTION OF MATERIALS FIELD SCREEN NO. NO. 0-14.5': Moist. ILITH DEO. 1.0.0.9.0' Minor limestone <td>TAL COF</td>	TAL COF
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NA MA 0. SAMPLES FOR CHEMICAL ANALYSIS N.A. VOC METALS OTHER (SPECIFY) OTHER	TAL COF
N.A. N.A. NA. 2 DISPOSITION OF HOLE BACKFILLED MONITORING WELL OTHER (SPECIFY) 23. SIGNATURE OF INSPECTOR 11TH DEPTH DESRIPTION OF MATERIALS FIELD CORE SAMPLE BLOW REMARKS 11TH DEPTH DESRIPTION OF MATERIALS FIELD SCREEN BOX SAMPLE BLOW REMARKS 1 0.0 - 14.5' 0-14.5': Moist. 1 0-14.5': 1 1 1 1 1 1 1 1 <td>COVERY</td>	COVERY
N.A. 2. DISPOSITION OF HOLE BACKFILLED MONITORING WELL OTHER (SPECIFY) 23. SIGNATURE OF INSPECTOR X LITH DEPTH DESRIPTION OF MATERIALS FIELD SCREEN BOX NO. COUNTS - 0.0 - 14.5' Clay, medium brown, moist. Clay color grades to light tan-brown by 14.5'. 1 - 0.0 - 9.0' - Minor limestone - fragments, cream-white	
2. DISPOSITION OF HOLE BACKFILLED MONITORING WELL OTHER (SPECIFY) 23. SIGNATURE OF INSPECTOR X LITH DEPTH DESRIPTION OF MATERIALS SCREEN BOX SAMPLE BLOW REMARKS 0.0 - 14.5' 	
Z DISPOSITION OF NOTE Interview X mmic \mathcal{S}_{max} LITH. DESRIPTION OF MATERIALS SCREEN SCREEN RESULTS GORE BOX NO. BLOW COUNTS REMARKS	~
LITH. DESRIPTION OF MATERIALS FIELD SCREEN RESULTS CORE BOX NO. SAMPLE NO. BLOW COUNTS REMARKS	W.
LITTH. DEPTH DESRIPTION OF MATERIALS SCREEN RESULTS BOX NO. SAMPLE NO. BLOW COUNTS REMARKS	
LITH DEPTH DESCIPTION OF MATERIALS Social is no. NO. COUNTS $=$ 0.0 - 14.5' 0-14.5': Moist. $=$ Clay, medium brown, 0-14.5': Moist. $=$ Iight tan-brown by 14.5'. 1 $=$ 0.0 - 9.0' $=$ Minor limestone	
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Clay, medium brown, moist. Clay color grades to light tan-brown by 14.5'. 10.0 - 9.0' Minor limestone fragments, cream-white	
Imoist. Clay color grades to Iight tan-brown by 14.5'. Imoist. Clay color grades to Im	
Light tan-brown by 14.5°. 1 - 0.0 - 9.0° Minor limestone fragments, cream-white	
10.0 - 9.0' Minor limestone fragments, cream-white	
Minor limestone fragments, cream-white	
fragments, cream-white	
fragments, cream-white	
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HOLE NO.	,
Fort Riley High Priority Site Investigations OB-93-02	,



Fort Riley High Priority Site Investigations



	HTWI	RÌLL	ING	LOC	۲ ۳		HOLE NO. OB-93-02
DJECT gh Priority Site I		INSPECT		SHEET 4 OF 10 SHEETS			
IH. DEPTH	DESRIPTION OF MATERIALS	FIELD SCREEN RESULTS	CORE BOX NO.	SAMPLE NO.	BLOW COUNIS		REMARKS
	 19.5 -22.0' (cont.) 22.0-23.2' Clay, light brown, moist, with abundant limestone fragments. 23.2 -31.7' Clay. 23.2 -24.5' Light grean gray with thin bedding or lamination, 					the end of m	oist. At 23.2, it was oisture in all sample 62') were dry.
25	and minor angular granu- les. Dry, non-plastic, and weekly indurated. Possi- bly lacustrine as opposed to colluvial-looking clay from 22.0 - 23.2'. 19.5 - 24.5 '	0 ppm					
26	24.5 -27.0' 27.0 -29.3'					No sample.	
28	Light grean gray with thin bedding or lamination, and minor angular granu- les. Dry, non-plastic, and weekly indurated. Possi- bly lacustrine as opposed to colluvial-looking clay from 22.0 - 23.2'.						OLE NO.

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Fort Riley High Priority Site Investigations -- Marshall Army Air Field

OB-93-02

		HTWI	DRILL	<u>ING</u>	LOG	1 F	HOLE NO. OB-93-02
PROJEC High Pr	T iority Site I	nvestigation, Fort Riley, KS	I	NSPECT Steve Kel	OR ller and Mi	ike Miles	SHEET 5 OF 10 SHEETS
LITH.	DEPTH	DESRIPTION OF MATERIALS	FIELD SCREEN RESULTS	CORE BOX NO.	SAMPLE NO.	BLOW	REMARKS
		29.5' Clay. Color is light to medium olive brown, minor angular limestone fragments, dry and blocky with no laminea, moder- ately indurated, and becomes silty at base. 30.5 - 34.5' 31.7 - 37.3' Clay. Light green-gray, minor to no silt, minor	0 ppm	NO	NO.		
	36 - 1 - 1 - 1 - 1 - 1 - 1 - 1 - 1 - 1 - 1	orange-brown oxidation mottles. Laminated and slightly fissile, but less fissile and more blocky towards base.					

HOLE NO. OB-93-02

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	HTW	DRILI	ING	LÕC	Y J	HOLE NO. OB-93-02
PROJECT High Priority Site	Investigation , Fort Riley, KS		INSPECT	OR ller and M		SHEET 6 OF 10 SHEETS
LITH. DEPTH	DESRIPTION OF MATERIALS	FIELD SCREEN RESULTS		SAMPLE NO.	BLOW COUNTS	REMARKS
38-	37.3': Shale, bedrock, dry.					Dual tube drilling began.
39-	39.3': Light grayish green, well indulated with interbed- ded lenses of weathered shales with oxidation					
	stains. 40.0': Dark gray shale, poorly indulated. Dry.	0 ppm				
41 42-						
43 -						
44 -						
tuty/drillog.prs	PROJECT Fort Riley High Priority Si	ite Investigatio	115		 	HOLE NO. OB-93-02

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		HTWI	DRIL	LING	LOC	т Т		HOLE NO. OB-93-02
ROJEC High Pr	T iority Site I	investigation , Fort Riley, KS		INSPECT	OR	like Miles		SHEET 7 OF 10 SHEETS
LITH.	DEPTH	DESRIPTION OF MATERIALS	FIELD SCREEN RESULTS	CORE BOX NO.	SAMPLE NO.	BLOW COUNTS		REMARKS
		45.0' Light gray shale. Soft, dry.					Easy to drill.	
	46				. ,			
	47 —	1						
	48 - -							
	49 —							
	50							
	53 —							DLE NO.

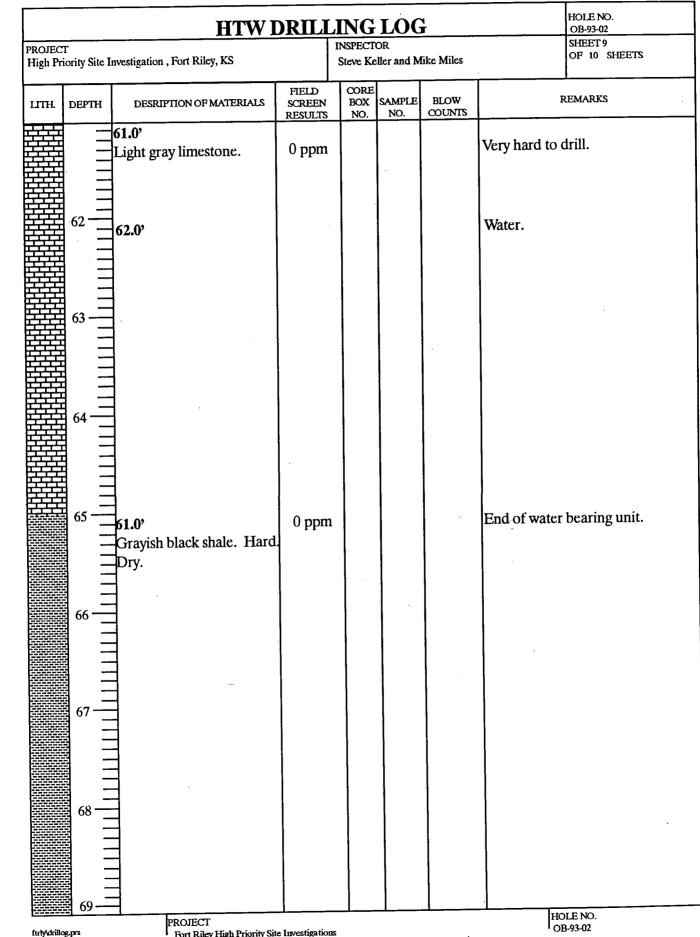
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PROJECT Fort Riley High Priority Site Investigations HOLE NO OB-93-02

		HTWI	DRILI	ING	LOC	т Т		HOLE NO. OB-93-02
ROJECT High Priority Site Investigation, Fort Riley, KS					OR eller and M			SHEET 8 OF 10 SHEETS
ITH.	DEPTH	DESRIPTION OF MATERIALS	FIELD SCREEN RESULTS	CORE BOX NO.	SAMPLE NO.	BLOW COUNTS	R	EMARKS
		 53.0° Gray shale. Well indurated. Interbedded lenses of stiff-very stiff clay. Dry. 60.0° Gray weathered shale. Dry. 	0 ppm				Hard to drill.	
furly/drill		PROJECT Fort Riley High Priority Sit	te Investigation	us			HO	LE NO. 1-93-02



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Fort Riley High Priority Site Investigations

		HTWI	ORILL	ING	LOC	HOLE NO. OB-93-02	
PROJEC	т			INSPECT	OR		SHEET 10
High Pr	iority Site In	nvestigation, Fort Riley, KS		Steve Ke	ller and N	fike Miles	OF 10 SHEETS
LITH	DEPTH	DESRIPTION OF MATERIALS	FIELD SCREEN RESULTS	CORE BOX NO.	SAMPLE NO.	BLOW COUNTS	REMARKS
	70 71 72 73 74 75 76 77 77 76 77 77 77 77 77 76 77 77	72.0' Dark gray shale with inter- bedded blackish-gray clay lenses.	0 ppm				End of boring. Total depth = 72'. Used approximately 55 gallons of water while drilling. 120 gallons of water in grout for surface casing.
ftrty\chill	og.prs	PROJECT Fort Riley High Priority Sit	te Investigation	s			OB-93-02

		LOUIS BEI ASSOCIAT		Project: _! Prepared b	. Army Corps of E Ft. Riley High Pric Y: Y: Y:	Date: <u>3-OCT-</u>	of 1
ال:•ر	or. Lavn	e Western				UT DIAGRAM Well No.: OB-93-02 Date Installed: 29-SEP-92	3
	ation: <u>OF</u>	air rotary du	al tube to TI)			
Elevat Gro Toj	ions: ound Surfac o of PVC	e <u>1207.49'</u> <u>1209.11'</u>				SURFACE CASING:Size:6"Material:SteelLength:37.3'	
Grou	<u>nd E</u> levatio:	n: <u>0 </u>	Outer	Casing		Drill Hole Diameter: $\frac{8'' (0' - 37.3')}{5.25'' (37.3' - 72')}$	
			5% Bente	Seal Material onite Grout Annular Seal		Riser:2"Diameter:2"Material:PVCSch.:40Type of Joints:Flush ThLength:58.2'	 ad
	Surface	43.9'	Cement G	rout w/5% Bento		<u>Screen:</u> Diameter:2"	
	Ground	53.2'	-	pe of Seal entonite Pellets		Material:PVCSlot Size:0.02Length:15'	
	Depth from			f Filter Materia n Washed Sand_		<u>Sump:</u> Length: Type of Cap: T <u>hreaded I</u>	<u>P</u> VC
		72.0'				Centralizer: Used Not Used	<u>X</u>
		NA		e of Seal at Base		Depth to Water	
		72.0'	Type of Clean W	of Backfill Vashed Sand		From Top of Riser	9.3'_

WELL SPECIFICATION FORM

CLIENT: Louis Berger & Associates, Inc.
JOB NUMBER: High Prioirty SI
WELL OWNER: Fort Riley & HQ 1st Division
ADDRESS:
CITY, STATE, ZIP CODE: Fort Riley, Kansas
PHONE: (913) 239-3343
WELL NUMBER OR OTHER IDENTIFICATION: OB-93-02
WELL INSTALLATION DATE: 29 September 1993
GEOLOGIST SUPERVISING INSTALLATION: Mike Miles (SAIC)
GROUND SURFACE ELEVATION (FT): 1207.49'
TOP OF CASING ELEVATION (FT): 1209.11'
WELL STICK-UP (FT): 2.0'
TOTAL BORING DEPTH (FT): 72'
BORING DIAMETER (IN): 0' TO 37.3' = 6", 37.3 TO 72.0' = 5.25"
TOTAL DEPTH OF OUTER CASING (FT): 37.3'
OUTER CASING MATERIAL: Steel
OUTER CASING DIAMETER (IN):6"
TOTAL DEPTH OF INNER CASING (FT. EXCLUDING SCREEN): 56.2'
INNER CASING MATERIAL: PVC
INNER CASING DIAMETER (IN):2"
TOTAL LENGTH OF WELL SCREEN (FT): 15'
WELL SCREEN MATERIAL:PVC
WELL SCREEN DIAMETER (FT): 0.167
SCREEN SLOT SIZE (IN): 0.020"

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WELL SPECIFICATION FORM (Cont'd)

WELL NUMBER: OB-93-02
BACKFILL MATERIAL AROUND SCREEN: Clean Washed Silica Sand
DEPTH RANGE OF BACKFILL (FT): 71.2' TO 53.2'
SEAL MATERIAL ABOVE SCREEN: 1/4" Bentonite Pellets
DEPTH RANGE OF SEAL (FT): 53.2' TO 43.9'
BACKFILL MATERIAL AROUND CASING: 5% Bentonite Grout
DEPTH RANGE OF BACKFILL (FT): 41.9'
DESCRIPTION OF TOP SEAL: 5% Bentonite grout capped by 8" of 3/4" gravel and 6" of concrete.
DESCRIPTION OF WELL COVER: 6" Steel Casing with locking cap, embedded 2' into the concrete. OTHER ADDITIONAL INFORMATION:

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WELL DEVELOPMENT RECORD

CLIENT	: Fort Riley - High Priority Sites	JOB NO	: High Priorit	y SI	
FIELD F	PERSONNEL: Ed Wieland (SAIC), Brian Meie	r (Layne Western)		SHEET: 1	OF: 1
1.	WELL NUMBER:OB-93-02 DATE OF INSTALLATION:29 September	1993			
3.	DATE OF DEVELOPMENT: 2 October 199				
4.	STATIC WATER LEVEL: BEFORE DEVELO		<u>1'</u> 2	4 HOURS AFTER (F	T):
5.	QUANTITY OF WATER LOSS DURING DRI	LLING, IF USED (GAL):55 gal		
6.	QUANTITY OF STANDING WATER IN WE	LL AND ANNULUS BE	FORE DEVELOP	MENT (GAL): 8 <u>.5 g</u>	gal.
		<u>START</u>	DUF	UNG	END
7.	PHYSICAL APPEARANCE	cloudy (milky)	clear	clear	clear
	SPECIFIC CONDUCTANCE (umhos/cm)	448	448	445	445
	TEMPERATURE (°C)	15.2	15.9	15.9	15.9
	pH (s.u.)	7.02	6.63	6.72	6.73
	TURBIDITY (NTU)		34.9	9.08	5.31
		<u></u>	<u>.</u>		
8.	DEPTH FROM TOP OF WELL CASING TO B	OTTOM OF WELL (FT):73.2'		
9.	SCREEN LENGTH (FT): 15'				- <u></u>
10.	DEPTH TO TOP OF SEDIMENT: BEFORE D	EVELOPMENT (FT):	7 <u>4'</u> AFT	ER DEVELOPMENT	(FT):
11.	TYPE AND SIZE OF WELL DEVELOPMENT	EQUIPMENT: <u>17/8</u> "	Surge block, 1 1/	2" x 3 ' bailer, and 2'	" Grundfos Pump.
12.	DESCRIPTION OF SURGE TECHNIQUE, IF	USED: <u>Surge</u> , bail, an	nd pump.		
13.	HEIGHT OF WELL CASING ABOVE GROUN			·	
14.	QUANTITY OF WATER REMOVED (GAL):	360 gal	TIME OF REM	IOVAL (HR:MIN) <u>:</u>	4:18

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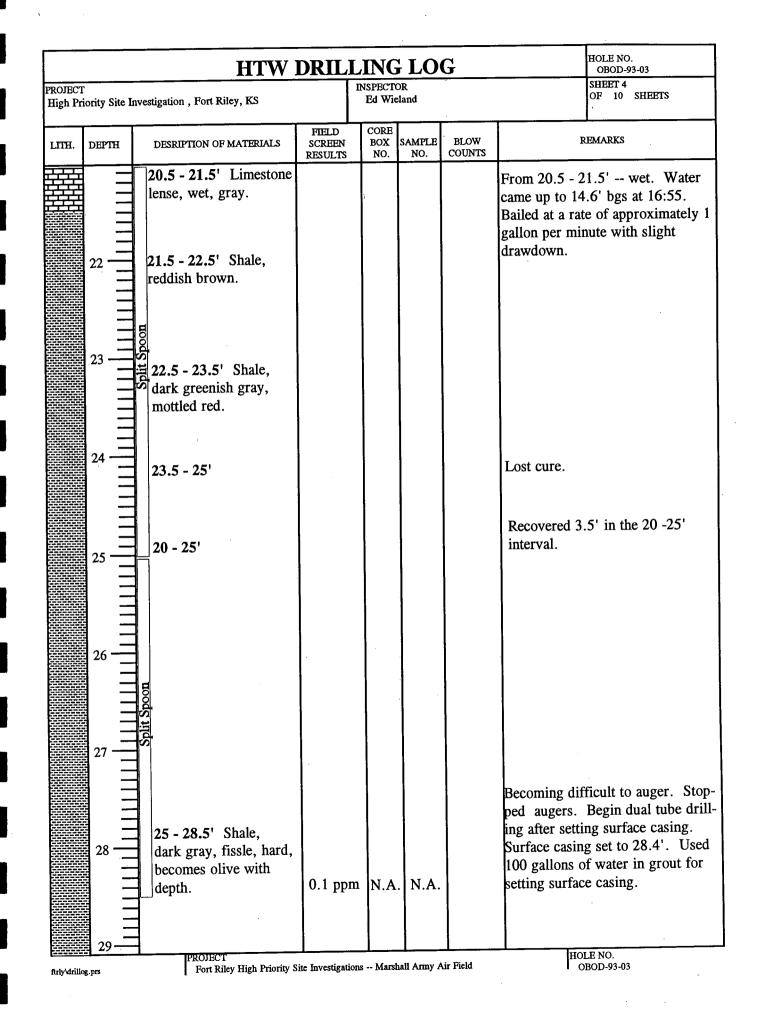
				HT	WI	DRILL	INC	FL	0	5			HOLE NO OBOD-93-		
1. COMPAN	IY NAME					2. DRILLI	NG SUBO	G SUBCONTRACTOR SHEET 1 estern Witchita, KS OF 10 SHEETS						SHEETS	
	Berger & A	ssociates,	Inc.			Layne	Western	Wit OCATI	chita,	, KS					
3. PROJECT High Priority Site Investigation, Fort Riley, KS						I E	EOD Range, OB/OD area, Fort Riley,KS								
5. NAME O	F DRILLER							6. MANUFACTURER'S DESIGNATION OF DRILL Mobile drill B-57							
7. SIZES A	rnick and I			4.25 x 8" Hol			8. H	OLE L	OCA	TION					
DRILLIN EOUIPM	IG AND SA	MPLING		CME continue Schram dual	ous cor	<u>e sampler</u> ta drill T660		entral URFAC	dowr CE EL	igradient w EVATION					
EQUIIM				Solifulli Guur				170'(t	opo)			44 D 4 177	COMPLET	VD	
								DATE : 26 Sej		TED per 1993		11. DATE 28 Se	eptember 1	993	
12. OVERB	URDEN TH	CKNESS		L			15.	DEPTH 67.0'	GRO	UNDWATI	R ENCOUN				
	DRILLED I	NTO ROCI	<u>c</u>					DEPTH			D ELAPSEI .2' at 15 mi	TIME AF	TER DRILL	ING	
48.5' 14. TOTAL	DEPTH OF	HOLE					17.	OTHE	R WA	TER LEVEL	MEASURE	MENTS (S	PECIFY)	<u> </u>	
77.0'				DISTURBED			TURBEI)	19. 1	OTAL NUN	ABER OF CO	ORE BOXE	2S		
18. GEOTE N.A.	CHNICAL S	AMPLES		DISIORDED		ONDES	TORDEA								
20. SAMPL ANALY	ES FOR CH	EMICAL		VOC	· • •	METALS	OTHE	R (SPE	CIFY) OTHER	(SPECIFY)	OTHER	(SPECIFY)	21. TOTAL CORI RECOVERY	
ANALI N.A.	212				·										
22. DISPOS	ITION OF I	IOLE	B/	ACKFILLED	MONT	ORING WELL	OTH	OTHER (SPECIFY)			23. SIGNATURE OF I		10		
						X				E	O WIELA	~			
	DEPTH	DESI		ON OF MATERIA	ALS	FIELD SCREEN	CORE BOX	SAME	LE	BLOW		RI	MARKS		
LITH						RESULTS	NO.	NO	<u>).</u>	COUNTS					
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				lty grayish		0.4 ppn		N	.A.		0 - 10	dry.			
	5_	bro		OJECT			1					Н	OLE NO.		
			Ĩ	Fort Riley High P	riority S	Site Investigatio	ons						OBOD-93-0	2	

	HOLE NO. OBOD-93-03					
PROJECT High Priority Site	HTW Investigation , Fort Riley, KS		INSPECTO Ed Wiel	R	SHEET 2 OF 10 SHEETS	
Ingli Thomy one			CORE			
LITH. DEPTH	DESRIPTION OF MATERIALS	FIELD SCREEN RESULTS	BOX NO.	SAMPLE NO.	BLOW COUNTS	REMARKS
	5 - 10' Clay, silty, soft,brown.	0.4 ppm		N.A.		0 -10' dry. 10 -15' moist.
	PROJECT					HOLE NO. OBOD-93-03

I Fort Riley High Priority Site Investigations

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NOPECT OR Tigh Priority Site Investigation , Fort Riley, KS NUMET 3 OF 10 SHIELTS DESCRIPTION OF MATERIALS DEFTH DESCRIPTION OF MATERIALS FIELD SCREEN RESULTS CORE NO. BLOW COUNTS REMARKS 10 - 15' (cont.) Clay: brown, soft, moist, with limestone fragments (white). 0.4 ppm N.A. N.A. 10 -15' moist. 14 7 Clay: brown, soft, moist, with limestone fragments (white). 0.4 ppm N.A. N.A. 10 -15' moist. 14 15 Clay: brown, fissilish. 15 - 17' Shale, grayish brown. 15 - 17' Shale, grayish brown. 16 17 - 20' 16 17 - 20' Shale dark reddish brown. 18 19 17 - 20'			HTW	DRIL	LING	LO	G	HOLE NO. OBOD-93-03
TH. DESTRIPTION OF MATERIALS SCREEN BOX SAMPLE BLOW REMARKS NO. NO. NO. COUNTS NO. NO. COUNTS REMARKS	PROJECT High Priority Site Investigation , Fort Riley, KS)R		SHEET 3
10 - 15' (cont.) Clay: brown, soft, moist, with limestone ragments (white). 14 15 16 15 16 17 Shale, grayish brown. 16 17 18 19 19 19 19	TH. D	EPTH	DESRIPTION OF MATERIALS	SCREEN	BOX			REMARKS
15 15 - 17' 16 15 - 17' 16 17 - 20' Shale, dark reddish brown and dark olive brown. 18 19 19 19 19 19 19 Shale is soft, clayer and fissle,			Clay: brown, soft, moist, with limestone					10 -15' moist.
15 - 17' Shale, grayish brown. 16 17 - 10' Shale, dark reddish brown and dark olive brown. 18 19 19 Shale is soft, clayer and fissle,	1	4	Clay: gray to light					
17 - 17 - 20' Shale, dark reddish brown and dark olive brown. 18	1							
IN-20 Shale, dark reddish brown and dark olive brown. 18 19 19 11 19 11 11 12 13 14 15 18 19 19 11 12 13 14 15 16 17 18 19 19 11 12 13 14 15 16 17 18 19 11 11 12 13 14 15 16 17 18 19 19 11 11 11 12 13 14 15 16 <td></td> <td></td> <td></td> <td></td> <td></td> <td></td> <td></td> <td></td>								
Shale is soft, clayer and fissle,		17	brown and dark olive					
Shale is soft, clayer and fissle,								
weathered. Recovered 4 in the		19						Shale is soft, clayer and fissle, not
$\begin{array}{c ccccccccccccccccccccccccccccccccccc$		20 —	20 - 20.5'	0.2 ppr	n N.A	. N.A.		



		HTW	DRILL	ING	LO	G	HOLE NO. OB-93-03
PROJECT High Pr	r riority Site L	nvestigation , Fort Riley, KS	I	NSPECTO Ed Wie	OR		SHEET 5 OF 10 SHEETS
LITH.	DEPTH	DESRIPTION OF MATERIALS	FIELD SCREEN RESULTS	CORE BOX NO.	SAMPLE NO.	BLOW COUNTS	REMARKS
	30 —						
	31 —						
		,					
	32						· · ·
				ĺ			
	33 —						
				1			
	H 34 —	Dark gray limestone with	0.1 ppm	N.A.	N.A.		Very hard to drill.
		interbedded clay and					
		shale. Shale is well indurated.					
		4					
		4					
]					
		4			1		
		1					
		ł					
		3					
	37 —	PROJECT	<u> </u>		<u> </u>		HOLE NO.

OB-93-03

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		HTW	DRIL	LINC	F LO	G		HOLE NO. OB-93-03
ROLLC	T			INSPECT	OR		· · · · ·	SHEET 6
High Pi	riority Site In	vestigation, Fort Riley, KS		Ed Wie	land			OF 10 SHEETS
_							 	
	DURING	DESRIPTION OF MATERIALS	FIELD SCREEN	CORE BOX	SAMPLE	BLOW	· ,	REMARKS
LITH.	DEPTH	DESKIPTION OF MATERIALS	RESULTS	NO.	NO.	COUNTS		
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2000								
<u> </u>	1 I							
	4							
	38							
			1					
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	비							
							1	
	표 그							
	∄							
	40 — T						Bogin to see	an organic material
<u> </u>	9	Light gray shale with	0.1 ppn	n N.A	N.A.			all organic material
		interbedded clays. Shale					the cuttings.	
		is well indurated.						
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6886.								
	∄ 41 <u>-</u>		1		-			
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					1	1		
						1		
						1		
	∃ 44 —	Vallervich man classes						
		Yellowish gray clayey	1				 	
		shale.						
		1						
		1			1			
		1						
		1			1			
	羀 45——	PROJECT	1					LE NO.

Fort Riley High Priority Site Investigations

HOLE NO. OB-93-03 . .

		нту	DRIL	LING	FIO	G	ı	HOLE NO. OB-93-03
ROJECT High Prior	ity Site Ir	ivestigation, Fort Riley, KS		INSPECT Ed Wi	OR	<u> </u>	1	SHEET 7 OF 10 SHEETS
LITH. D	EPTH	DESRIPTION OF MATERIALS	FIELD SCREEN RESULTS	CORE BOX NO.	SAMPLE NO.	BLOW COUNTS	R	EMARKS
	$\begin{array}{c} & & \\ 46 \\ & & \\ 47 \\ & & \\ 48 \\ & & \\ 49 \\ & & \\ 50 \\ & & \\ 51 \\ & & \\ 51 \\ & & \\ 52 \\ & & \\ 53 \\ \end{array}$	Dark gray limestones with interbedded clays and shales.					Very hard. S water injectio	tarted to drill with n.

PROJECT Fort Riley High Priority Site Investigations

		HOLE NO. OB-93-03						
ROJECT		SHEET 8						
Iigh Pri	iority Site In	vestigation, Fort Riley, KS		INSPECTO Ed Wie	land		OF 10 SHEETS	
<u> </u>	<u> </u>		FIELD	CORE BOX				
LITH.	DEPTH	DESRIPTION OF MATERIALS	SCREEN RESULTS	BOX NO.	SAMPLE NO.	BLOW COUNTS	REMARKS	
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HOLE NO OB-93-03

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PROJECT Fort Riley High Priority Site Investigations

		HTW	DRIL	LINC	LO	G	HOLE NO. OB-93-03
OIECI	<u>г</u>			INSPECT	OR	<u> </u>	SHEET 9
gh Pri	ority Site Inv	estigation, Fort Riley, KS		Ed Wi	eland	OF 10 SHEETS	
TH.	DEPTH	DESRIPTION OF MATERIALS	FIELD SCREEN RESULTS		SAMPLE NO.	BLOW COUNTS	REMARKS
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开							
	63 —						
ΞŦ.	···					•	
뷺							
Жан-							
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中井							
H							4
H	64 —				1		
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5							
H							
<mark>└┼</mark> ┾							
							Becoming very hard to drill.
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7490	65						
				l'			
<u> </u>							
ΗŤ				1			
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╈	4						
	66 —						
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ф¥рт Г	1		0.1 nn	m N.A	N.A		
<u> </u>	67 —				1		Water.
$\frac{1}{1}$	1~ -(Fray limestone.		1			water.
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	HTW	DRILL	ING	LO	<u>G</u>	HOLE NO. OB-93-03
JECT			NSPECTO	OR		SHEET 10 OF 10 SHEETS
gh Priority Site Inv	vestigation, Fort Riley, KS		Ed Wie	land		OF 10 SHEETS
TH. DEPTH	DESRIPTION OF MATERIALS	FIELD SCREEN RESULTS	CORE BOX NO.	SAMPLE NO.	BLOW COUNTS	REMARKS
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뛰 그						
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표 그					1	
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프뤼 그			ļ		1	
범 그						
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표 -				1		
出コ						
日日 71				1		· ·
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			NT A			
표 그		0.1 ppm	N.A.	N.A.	Į	
주주					1	
ᄨᆧᆞᅴ				1		
			1		1	
루리						
ヨー		1			1	
田一						
범 그		ļ	1		1	
논란		:		1		
			1			
五 二			1			
도 교	x		•			
						End of water bearing unit.
74	Deddiah kasawa shalas and	0.1			1	- C
	Reddish brown shales and		IN.A.	. N.A.		
	clays.				-	
					4	
75						
					Ì	
						Granned drilling Total depth -
	4	1				Stopped di lining. 1 otar depui –
·····	1	1				11. Used 100 gallons of water 1
//	4					setting surface casing (grout).
	1			1		Used 140 gallons of water in wel
	4					construction Used approximatel
	1					construction. Used approximate
	4					
	1					drilling.
77	4					
75	PPOF CT					Stopped drilling. Total de 77'. Used 100 gallons of v setting surface casing (grou Used 140 gallons of water construciton. Used approv 60 gallons of water in dual drilling.

والمراجعة والمراجع والمراجع والمناسب والمعالية والمعالية والمراجع والمراجع والمراجع والمراجع والمحافظ والمراجع والمراجع

PROJECT Fort Riley High Priority Site Investigations HOLE NO. 0B-93-03

MONITORING WELL AS-BUILT DIAGRAM Driller: Layne Western Well No.: OB-93-03 Drilling Method: & 25*x8* auger with CME continuous sampler to refusal, air court dual tube to TD. Date Installed: 28-SEP-93 Location: OB/OD Area Elevations: Ground Surface 1172.88' Street Ground Elevation: O Outer Casing Size: 6* Surface Seal Material Svaface Seal Material 9*0 (- 28.5') 5.25* (28.5' - 77') Surface Seal Material Svaface Seal Material 9*0 (- 28.5') 5.25* (28.5' - 77') Surface Seal Material Svaface Seal Material PVC Screen: Type of Annular Seal Comment Grout w/3% Bentonite Diameter: 2" Material: O.02 Sot Size: 0.02 Stare Type of Filter Material Contralizer: Used Not Used Upper filter Material O.02 Sot Size: 0.02 Sot Size: 0.02 Material: O.02 Not Used Not Used		LOUIS BERGER & ASSOCIATES, INC	Project: <u>Ft. Riley High I</u>	nd Date: <u>3-OCT-93</u>
Locations: OB/OD Area Elevations: Ground Surface 1172.88' Top of PVC 1174.82' Ground Elevation: 0 28.5' 28.5' 9 9 9 9 9 9 9 9 9 9 9 9 9		ne Western d: 8.25"x8" auger with CM	E continuous sampler to refusal,	Well No.:OB-93-03
Ground Elevation: Ground Elevation: 28.5' 28.5' 28.5' Cuter Casing Drill Hole Diameter: 8" (0' - 28.5') 5.25" (28.5' - 77'). Riser: Diameter:2" Material:PVC Sch.:40 Type of Joints: Flush Thread Length:64' Cement Grout w/5% Bentonite Cement Grout w/5% Bentonite 1/4" Bentonite Pellets Type of Seal 1/4" Bentonite Pellets Type of Filter Material Clean Washed Sand 77.0' NAType of Seal NAType of Baakfill	Elevations: Ground Surfa	B/OD Area		Size: 6" Material: Steel
Surface Seal Material Sw face Seal Material Sw Bentonite Grout Type of Annular Seal Cement Grout w/5% Bentonite Type of Seal 1/4" Bentonite Pellets Start Type of Filter Material Clean Washed Sand Type of Seal NA Type of Seal NA Type of Seal NA Type of Seal NA	_	Oute	r Casing	Drill Hole Diameter: 8" (0' - 28.5')
Type of Seal 1/4" Bentonite Pellets 58.7' Type of Filter Material Clean Washed Sand 77.0' Type of Seal NA Type of Backfill Type of Backfill Type of Backfill		Surfac <u>5% Be</u> Type	ntonite Grout	Diameter: 2" Material: PVC Sch.: 40 Type of Joints: Flush Thread
NA Type of Seal	Su		Bentonite Pellets	Diameter:2"Material:PVCSlot Size:0.02
NA Type of Seal	Depth from		e of Filter Material	Length: 0.3°
NA Depth to Water Type of Backfill From Top of Riser			ype of Seal	Centralizer: Oseu ——
			e of Backfill	From Top of Riser

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WELL SPECIFICATION FORM

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CLIENT: Louis Berger & Associates, Inc.
JOB NUMBER: High Prioity SI
WELL OWNER: Fort Riley & HQ 1st Division
ADDRESS:
CITY, STATE, ZIP CODE: Fort Riley, Kansas
PHONE: (913) 239-3343
WELL NUMBER OR OTHER IDENTIFICATION: OB-93-03
WELL INSTALLATION DATE: 9-28-93
GEOLOGIST SUPERVISING INSTALLATION: Mike Miles (SAIC)
GROUND SURFACE ELEVATION (FT): 1172.88'
TOP OF CASING ELEVATION (FT): 1174.82'
WELL STICK-UP (FT): 2.0'
TOTAL BORING DEPTH (FT): 77.0'
BORING DIAMETER (IN): 0' TO 28' = 6", 28' TO 77' = 5.25"
TOTAL DEPTH OF OUTER CASING (FT): 28.5'
OUTER CASING MATERIAL: Steel
OUTER CASING DIAMETER (IN):6"
TOTAL DEPTH OF INNER CASING (FT. EXCLUDING SCREEN): 62.0'
INNER CASING MATERIAL:PVC
INNER CASING DIAMETER (IN): 2"
TOTAL LENGTH OF WELL SCREEN (FT): 15'
WELL SCREEN MATERIAL: PVC
WELL SCREEN DIAMETER (FT): 0.167
SCREEN SLOT SIZE (IN): 0.020"

WELL SPECIFICATION FORM (Cont'd)

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WELL NUMBER: OB-93-03
BACKFILL MATERIAL AROUND SCREEN: Clean Washed Silica Sand DEPTH RANGE OF BACKFILL (FT): 77' TO 58.7'
SEAL MATERIAL ABOVE SCREEN: 1/4" Bentonite Pellets DEPTH RANGE OF SEAL (FT): 58.7' TO 51.8'
BACKFILL MATERIAL AROUND CASING: 5% Bentonite Grout
DEPTH RANGE OF BACKFILL (FT): 49.8'
DESCRIPTION OF TOP SEAL: 5% Bentonite Grout capped with a concrete pad.
DESCRIPTION OF WELL COVER: 6" steel casing embedded in the concrete with a locking cap.
OTHER ADDITIONAL INFORMATION:

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WELL DEVELOPMENT RECORD

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CLIENT:	Fort Riley - High Priority Si	tes	JOB NO:	High Priority	/ SI	
FIELD PE	ERSONNEL: Ed Wieland (SA	AIC), Brian Meier (La	yne Western)		SHEET:	1 OF: 1
1.	WELL NUMBER: OB-93-)3				
2.	DATE OF INSTALLATION:	29 September 1993				
3.	DATE OF DEVELOPMENT:	2 October 1993			,	
4.	STATIC WATER LEVEL: BE	FORE DEVELOPME	NT (FT): 50.34'	24	4 HOURS AFT	ER (FT):
5.	QUANTITY OF WATER LOSS	S DURING DRILLIN	G, IF USED (GAL):	60 gal.		
6.	QUANTITY OF STANDING V	VATER IN WELL AN	ID ANNULUS BEFO	RE DEVELOP	MENT (GAL):	9.3 gal.
			<u>START</u>	DUR	ING	END
7. 1	PHYSICAL APPEARANCE		muddy	cloudy	clear	clear
2	SPECIFIC CONDUCTANCE (u	mhos/cm)	900	590	590	590
	TEMPERATURE (°C)		15.0	15.9	16.0	16.0
1	pH (s.u.)		8.15	6.87	6.95	6.95
	TURBIDITY (NTU)			42.0	11.3	11.8
8.	DEPTH FROM TOP OF WELL	CASING TO BOTTO)M OF WELL (FT):	79'		<u>.</u>
9.	SCREEN LENGTH (FT): 1	5'				
10.	DEPTH TO TOP OF SEDIMEN	IT: BEFORE DEVEL	OPMENT (FT): 79	.4' AF	TER DEVELO	PMENT (FT):
11.	TYPE AND SIZE OF WELL D	EVELOPMENT EQU	IPMENT: 17/8" St	urge block, i 1/	2" x 3 ' bailer,	and 2" Grundfos Pump
12.	DESCRIPTION OF SURGE TE	CHNIQUE, IF USED	: Surge, bail, and	pump.		
13.	HEIGHT OF WELL CASING	ABOVE GROUND SU	JRFACE (FT):	.8		
14.	QUANTITY OF WATER REM	OVED (GAL):	553 gal	TIME OF REM	IOVAL (HR:M	IN): 4:00

		НТ	WD	RILL	,IN	GL	DG				HOLE NO. OB-93-04;	SB1
. COMPANY NAME				2. DRILL	NG SU	BCONTRA	CTOR				SHEET 1 OF 8 SH	EETS
Louis Berger & A	ssociates,	Inc.		Layne		m - Witc		<u>s</u>				
3. PROJECT High Priority Site	Investigatio	on , Fort Riley, KS				FOD Rat	nge. C	B/OD an	ea, Fort Ri	ley,KS		
5. NAME OF DRILLER					6.	6. MANUFACTURER'S DESIGNATION OF DRILL Mobile drill B-57, Schram Rotodrill T-660H Dual Tube						
John Gornick		4.25 x 8" Hol	low Ste	m Auger	-18.	HOLELC						
7. SIZES AND TYPES DRILLING AND SA	OF MPLING	CME continue	ous core	e sampler		South of	burn p	oit				
EQUIPMENT		NX Core			 ٩.	SURFACI 1160'(to		ATION				
		5.25 tricore-r	everse	circulation	10	DATE S	TARTI	ED		11. DATE	COMPLETE	D
				· · · · · · · · · · · · · · · · · · ·		27 Sept			R ENCOUN		ober 1993	
2. OVERBURDEN TE	ICKNESS				1	47.0 -	48.0"					
20.5' 13. DEPTH DRILLED	INTO ROCH	<u> </u>			10	5. DEPTH	TO W	ATER ANI	D ELAPSED	TIME AF	TER DRILLI	NG
36.5'						COMME 7. OTHER	WATE	R LEVEL	MEASURE	MENTS (S	PECIFY)	
4. TOTAL DEPTH O	HOLE	1										
18. GEOTECHNICAL	SAMPLES	DISTURBED		UNDIS	TURB	ED		TAL NUM	BER OF CO	ORE BOXE	S	
N.A.	_			IETALS	101	HER (SPEC			(SPECIFY)	OTHER	SPECIFY)	21. TOTAL COR
20. SAMPLES FOR C ANALYSIS	HEMICAL	VOC	_	y Pollutant	EPA	6020 IC	Р/МС			l		RECOVERY
			Metals	S	EPA	8330 HF	PLC					·
22. DISPOSITION OF	HOLE	BACKFILLED	MONIT	ORING WELL	OT	HER (SPE	CIFY)	23. SIGN	ATURE OF	INSPECTO		
				X				2	مانی الارم ماعند الم	<u> </u>	• .	
LITH. DEPTH	DESI	RIPTION OF MATERL	ALS		CORE BOX NO.	SAMPLE NO.		BLOW OUNTS		RE	MARKS	
		ay, brown to re	ddish			OBOD SB1-0 disturb	01 ed		0 - 5'	dry. 2	.5' of re	covery (hai
		own, firm to ha	rd.	0.2 ppr	nN.	A. N./	A .		piece	caught	in barrel)
F07070707000		PROJECT						L	14	<u></u> Тн	OLE NO.	

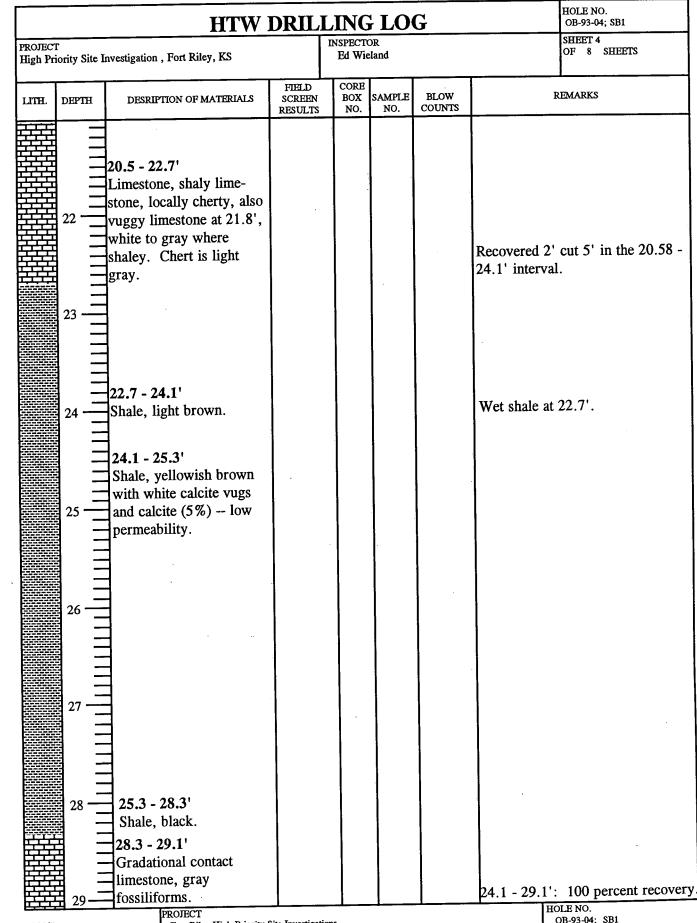
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		HOLE NO. OB-93-04; SB1					
PROJECT High Pr	r iority Site I	HTW I		INSPEC			SHEET 2 OF 8 SHEETS
LITH.	DEPTH	DESRIPTION OF MATERIALS	FIELD SCREEN RESULTS	CORE BOX NO.	SAMPLE NO.	BLOW COUNTS	REMARKS
ruyddi		5 - 10' Clay, brown to light reddish brown, firm to hard, dry to damp.		om N.	OBOD SB1-00 undisturbe	1 - - - - - - - - - - - - - - - - - - -	5 -10' dry to damp. appears undistubed. 10 -15' damp.

	HOLE NO. OB-93-04; SB1					
ROJECT High Priority Site	Investigation , Fort Riley, KS]	INSPECTO Ed Wie			SHEET 3 OF 8 SHEETS
lith. Depth	DESRIPTION OF MATERIALS	FIELD SCREEN RESULTS	CORE BOX NO.	SAMPLE NO.	BLOW COUNTS	REMARKS
	 10 - 15' (cont.) Clay, dark brown to brown, soft to hard, damp. 15 - 19' Clay, light brown, firm, damp. 19 - 20' Clay, as above, with limestone fragments, white, 0.5-1.5" diamete cherty, light gray. 15 - 20' 20.5': 	0.4 ppm	N.A.	. N.A.		10 -15' damp. 15 -19' damp (moist). Limestone is wet, has chemical bonding. End of auger; refusal. Start NX Core.

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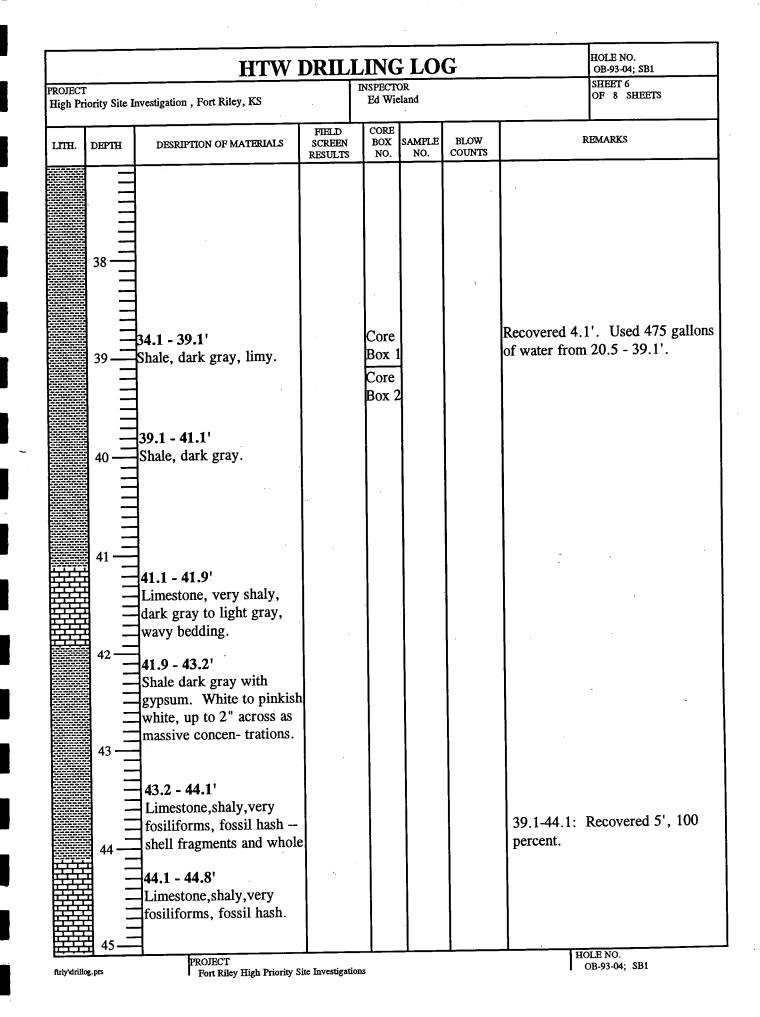
Fort Riley High Priority Site Investigations

OB-93-04; SB1

	HOLE NO. OB-93-04; SB1						
PROJECT High Priority Sit	e Investigation, Fort Riley, KS	DRILI	INSPECTO Ed Wie	OR		· · ·	SHEET 5 OF 8 SHEETS
LITH. DEPTH	DESRIPTION OF MATERIALS	FIELD SCREEN RESULTS	CORE BOX NO.	SAMPLE NO.	BLOW COUNTS	I	REMARKS
<u> </u>	DESRIPTION OF MATERIALS 29.1-29.7' Limestone as above, grading to limy shale. Massive gypsum up to 1" diameter. 29.7 - 34.1' Shale, limy, dark gray to	SCREEN RESULTS	CORE		BLOW COUNTS		
37 -	EROLECT.					н	DLE NO.

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Fort Riley High Priority Site Investigations

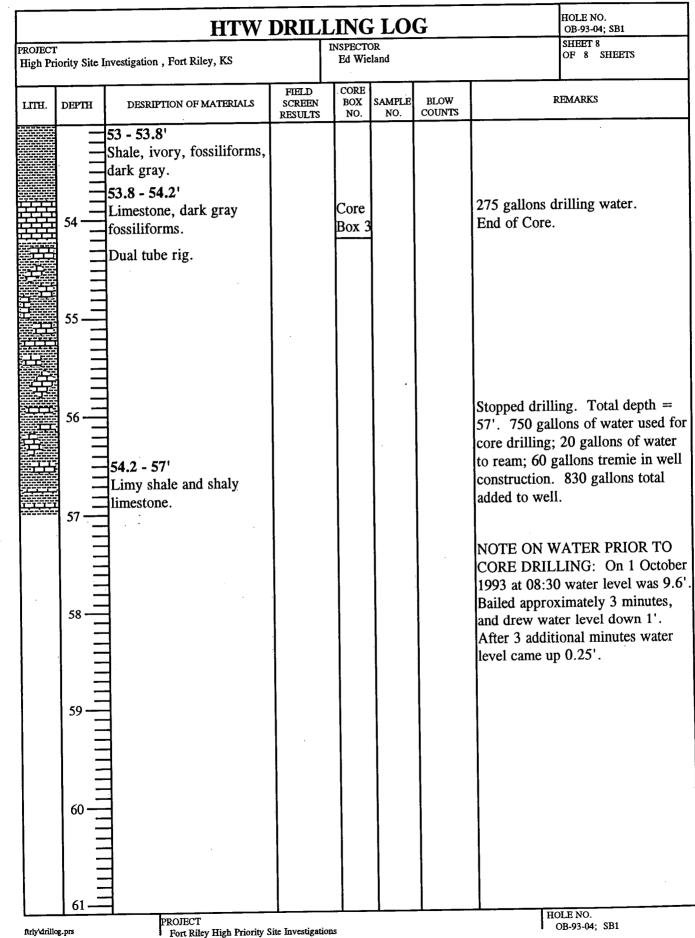


		HTW	DRILI	LING	LO	G	HOLE NO. OB-93-04; S	B1
ROJECI	•			INSPECTO			SHEET 7	
Tion Pr	iority Site I	nvestigation, Fort Riley, KS		Ed Wie	land		OF 8 SHE	EIS
		0						
			FIELD	CORE		DI OW	REMARKS	
LITH.	DEPTH	DESRIPTION OF MATERIALS	SCREEN RESULTS	BOX NO.	SAMPLE NO.	BLOW COUNTS	KENNIG	
			RISCEIG					
		44.8 - 46'						
┱╧┲╧┲╧	i —	Limestone soft, yellowish						
		brown with dark blueish						
	- 1	gray chert blelbs.			4			
	46	Bray chere chere						
	- 1					}		
	1 -	· · ·	1					
	1 _	i						
	4 -							
	47	1		1				
	∃¨ —	4			ļ			
		1	1			1		
		Lost 47.8 - 48.35 in				ļ	· · · · · ·	
	4 —							
		vuggy section. Vugs are						
	g —	present across the full						
		cross-sect- ion of core				1	Driller reported soft zo	one her wi
╺╧╧╧┿		(horizontal).			1.	ļ	hard section below.	
				1			hard section below.	
		1						
	8 –	48.8 - 49.2' Shale, dark	1					
							49.1-54.1': 100 perc	ent recove
	₫ 49 <u>—</u>	gray, wavy budding.		ì				
		49.2' Fossil hash.				1		
	4 _	49.4 - 49.7' Limestone,						
	H _	yellowish brown, vuggy,						
	뤼 _	up to 0.25" diameter.		1				
	ä –							
	H 50 —	49.7 - 50.2' Chert, light		Í				
	A _	gray-outs fossils.				1		
	퓌 ニ		1					
	H –	50.2 - 50.9' Limestone,						
	귀 그	yellowish brown, minor						
	H _	vugs, 0.0625' diameter.						
	∄ 51 —	-						
	뢰 _	50.9' - 51.9' Limestone,				· .		
	- 7							
	뢰 -	shaley, dark gray to						
╏╴╴╴╴	3 -	locally black, wavy						
	ㅋ -	bedding with fossil hash.			1			
	H 52 -	1						
FFF-	∃ <i>"</i> –	-1			1	1		
臣共	리 그	-		Core	2			
臣立	되 -	51.9' - 53' Limestone,		Box	2			
臣母	립 -							
臣中	됨 :	light gray, hard, slightly		Core	- 1		1	
F	범 53	fossilforms.	1	Box	5	1		

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Fort Riley High Priority Site Investigations



В	LOUIS BERG	S, INC.	Project: <u>Ft.</u> Prepared by: Checked by:	Riley High Pri	Date: Date:	Page 1 of 1 3-OCT-93
	Western	vith CME	continuous sampler		Well No.: Date Installed:	B-93-04
Location: <u>OB</u> Elevations: Ground Surface Top of PVC				<u>а П</u> р	SURFACE C. Size: Material: Length:	ASING: 6" Steel 20'
Ground Elevation	20.0'	Outer	Casing		Drill Hole Diam 8" (0' - 2 5.25" (20' -	20')
	Î	5% Bent	Seal Material onite Grout Annular Seal		<u>Riser:</u> Diameter: Material: Sch.: Type of Joints: Length:	2" <u>PVC</u> <u>40</u> <u>Flush Thread</u> <u>43.8'</u>
l Surface	31.8'	Cement G	rout w/5% Bentonia		<u>Screen:</u> Diameter:	 PVC
om Ground	37.0'		entonite Pellets		Material: Slot Size: Length:	0.02
Depth from			f Filter Material m Washed Sand_		Sump: Length: Type of Cap: 7	0.3' Th <u>readed PV</u> C
	56.8'		pe of Seal		Centralizer: Us No	ed <u>X</u> ot Used
,	NA NA	Type	e at Base of Backfill 7ashed Sand		Depth to Water From Top of Ri at Completion:	ser 23.1'
Form: ftrly\mwdiagrm.						Note: Not to Sca

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محالب معاجمة المتابعية والمروا لمفامر والماروان والهاري

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WILL STEENIGHTON, ONLY
CLIENT: Louis Berger & Associates, Inc.
JOB NUMBER: High Prioirity SI
WELL OWNER: Fort Riley & HQ 1st Division
ADDRESS:
CITY, STATE, ZIP CODE: Fort Riley, Kansas
PHONE: (319) 239-3343
WELL NUMBER OR OTHER IDENTIFICATION: OB-93-04
WELL INSTALLATION DATE: 1 October 1993
GEOLOGIST SUPERVISING INSTALLATION: Mike Miles (SAIC)
GROUND SURFACE ELEVATION (FT):1158.32'
TOP OF CASING ELEVATION (FT): 1160.07'
WELL STICK-UP (FT): 2.0'
TOTAL BORING DEPTH (FT): 57.0'
BORING DIAMETER (IN): 0.0' TO 20.0' = 6", 20.0' TO 57.0' = 5.25"
TOTAL DEPTH OF OUTER CASING (FT): 20.0'
OUTER CASING MATERIAL: Steel
OUTER CASING DIAMETER (IN): 6"
TOTAL DEPTH OF INNER CASING (FT. EXCLUDING SCREEN): 41.8'
INNER CASING MATERIAL:
INNER CASING DIAMETER (IN): 2"
TOTAL LENGTH OF WELL SCREEN (FT): 15'
WELL SCREEN MATERIAL: PVC
WELL SCREEN DIAMETER (FT): 0.167
SCREEN SLOT SIZE (IN): 0.020"

WELL SPECIFICATION FORM

WELL SPECIFICATION FORM (Cont'd)

WELL NUMBER: OB-93-04
BACKFILL MATERIAL AROUND SCREEN: Clean Washed Silica Sand
DEPTH RANGE OF BACKFILL (FT): 56.8' TO 37'
SEAL MATERIAL ABOVE SCREEN: 1/4" Bentonite Pellets
DEPTH RANGE OF SEAL (FT): 37' TO 31.8'
BACKFILL MATERIAL AROUND CASING: 5% Bentonite Grout
DEPTH RANGE OF BACKFILL (FT): 31.8'
DESCRIPTION OF TOP SEAL:
DESCRIPTION OF WELL COVER: 6" steel casing with locking cap, embedded into the grout and concrete pad.
OTHER ADDITIONAL INFORMATION:

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WELL DEVELOPMENT RECORD

CLIENT:	Fort Riley - High Priority Sites	ot	B NO:	High Priority	SI		
FIELD PE	ERSONNEL: Steve Keller (SAIC)				SHEET:	1 01	7: 1
1.	WELL NUMBER: OB-93-04						
2.	DATE OF INSTALLATION: 1 October 1993						
3.	DATE OF DEVELOPMENT: 9 October 1993						
4.	STATIC WATER LEVEL: BEFORE DEVELOP	MENT (FT):	32.87'	24	HOURS AFT	ER (FT):	
5.	QUANTITY OF WATER LOSS DURING DRILL	LING, IF USED	(GAL):	750 gal.			
6.	QUANTITY OF STANDING WATER IN WELL	AND ANNULU	IS BEFOR	E DEVELOPM	IENT (GAL):	49 gal.	
		<u>START</u>		DURI	NG		<u>END</u>
7.	PHYSICAL APPEARANCE	cloudy	slig	htly cloudy	clear		clear
	SPECIFIC CONDUCTANCE (umhos/cm)	455	-	560	550		550
	TEMPERATURE (°C)	13.0		14.1	15.4		15.6
1	pH (s.u.)	6.60	_	6.76	7.0	-	6.93
	TURBIDITY (NTU)		-	46.2	6.2	-	5.4
0	DEPTH FROM TOP OF WELL CASING TO BO	TTOM OF WEL	L (FT):	58.25'			
	SCREEN LENGTH (FT): 15'						
	DEPTH TO TOP OF SEDIMENT: BEFORE DE	VELOPMENT (I	FT):	AFTER	R DEVELOPN	MENT (FT)	:
			. —				
11.	TYPE AND SIZE OF WELL DEVELOPMENT E	QUIPMENT:	1 7/8" Su	rge block, 1 1/2	" x 3 ' bailer,	and 2" Gru	Indfos Pum
				<u> </u>			
12.	DESCRIPTION OF SURGE TECHNIQUE, IF US	SED: Surge, b	bail, and p				
10	HEIGHT OF WELL CASING ABOVE GROUND	SURFACE (FT):	15			
	QUANTITY OF WATER REMOVED (GAL):	1025 gal		TIME OF REM	IOVAL (HR:1	MIN):	3:45
14.							

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		<u></u>		HT	WT	RILL	INC	L	OG	1 F			HOLE NO. EP-93-01	
1 COMPANY NAME 2. DRILLING							NG SUBC	ONTR	ACTOR	R			SHEET 1 OF 6 SH	IEETS
Louis Berger & Associates, Inc. Layne W							estern – Witchita, KS OF 6 SHEETS							
3. PROJECT High Priority Site Investigation, Fort Riley, KS						C	uster H	ill East	Pond, Fort	Riley	OPPER			
5. NAME OF	DRILLER						6. M	ANUFA	ACTUR oil Ma	RER'S DESI ax 90, Schi	IGNATION	or DRILL adrill	Ŀ	
Randy St 7. SIZES AN	D TYPES O	F	_	Auger, then d	rive 2'	split spoon	8. H	OLEL	OCATI	ON				
DRILLIN	G AND SAM	PLING		ahead of auge intervals, 0-18	r; repea	nt @ 5'		Inthw	est (up E ELE	ogradient) VATION				
EQUIPMI	en i			air circulation	<u>,10 -</u>	56 1010130	1	288.40) (topo)				
								DATE S					COMPLETE tober 1993	Ω2
12. OVERBU	RDEN THI	KNESS					15. I	DEPTH	GROU	NDWATE	RENCOUN	TERED		
18'							2	9' BLS	TOW	ATTER AND	FLAPSED	TIME AF	TER DRILL	ING
13. DEPTH 20'	DRILLED IN	TO ROCK						OMM	ENCEL). 18.1	' after 50	minutes		
14. TOTAL	DEPTH OF I	HOLE					17.0	OTHER	WAT	ER LEVEL	MEASURE	MENTS (S	(PECIFY)	
38'	CHNICAL SA	MPLES		DISTURBED		UNDIS	TURBED		19. TC	TAL NUM	BER OF CO	ORE BOXE	2S	
N.A.	TIMICAL 37	1111 100								Lower A	CDDCHT30	OTTIVE	(SPECIFY)	21. TOTAL CORE
20. SAMPLI ANALY	ES FOR CHI	MICAL		VOC	M	IETALS	OTHE	R (SPE	CIFY)	OTHER (SPECIFY)	UINER		RECOVERY
N.A.	212													
22. DISPOS	TION OF H	OLE	B	ACKFILLED	MONIT	ORING WELL	OTHE	R (SPE	CIFY)	23. SIGN/	ATURE OF	INSPECTO	or . K	M
			ļ			Х						ST.	m. he	Jelin
LITH.	DEPTH	DESR		ON OF MATERIA	ALS	FIELD SCREEN RESULTS	CORE BOX NO.	SAMP NO		BLOW COUNTS		RI	EMARKS	
	$\begin{array}{c} 1 \\ 1 \\ 1 \\ 2 \\ 3 \\ 4 \\ 1 \\ 1 \\ 1 \\ 1 \\ 1 \\ 1 \\ 1 \\ 1 \\ 1$	長 4.5 の ma	5' -6 . 100	0'-4.5' .5' Clay. D n-brown wi ray mottles	ith	0.1 ррт	N.A.	Ν	.А.	5-7-13-4		t Moist		
	(Ka	10 -0		ROJECT								H	OLE NO. EP-93-01	

HTW DRILLING LOG	
PROJECT INSPECTOR SHEET 2 High Priority Site Investigation , Fort Riley, KS Steve Keller OF 6 SHEETS	
LITH. DEPTH DESRIPTION OF MATERIALS BESULTS NO. NO. COUNTS	
4.5'-6.5' Continued. Slightly moist and plastic, with no sand. 6 9 Auger 4.5'-9.5' 9 9.5'-9.9' Clay. Slightly moist, weak, slightly plastic, with no gravel or mottles 9.9'-10.1' Silt. Light salmon dry, friable usaturated, well sorted, weakly consolidated, blocky.	

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PROJECT Fort Riley High Priority Site Investigations -- East Pond HOLE NO. EP-93-01

HTW DRILLING LOG							HOLE NO. EP-93-01			
ROJECT	······································	1	NSPECTO	OR		SHEET 3				
ligh Prio	rity Site I	Investigation, Fort Riley, KS	5	steve Ke	ller		OF 6 SHEETS			
LITH. I	DEPTH	DESRIPTION OF MATERIALS	FIELD SCREEN RESULTS	CORE BOX NO.	SAMPLE NO.	BLOW COUNTS	REMARKS			
1	14	Auger 9.5'-14.5'								
	15	14.5'-15.8' Clayey Sil Light green gray, wet, almost saturated, weakly consolidated, well sorted.		N.A.	N.A .	50	Cuttings moist at start of 14.5' 15.8' drive. Drive stopped because of refusal (50 blows). Slight moisture at end of drive (15.8'), however, no standing water.			
	16	Auger 14.5'-18' 18' Refusal.Silt or Siltstone. Refusal in very dry, weakly indurated buff silt or					Dry.			
	17	siltstone. Well sorted, "pops" under finger pressure, indicating low clay content.					X.			
	18	End Auger drilling.	Bkgd 0.0 ppm BH 0.1 ppm BS 0.1 ppm							
		18' Start Reverse-Air Drilling. 18'-20' Silt								
	19	Light tan to white buff, weakly consolidated, dry, well sorted with only minor clay.								
	20	20'-29' Silt. W ith thin minor limestone stringers. Slightly moist 20'-21', rest of interval is dry.					20'-21' Slight moisture.			
rly\drillog.prs	21—	PROJECT Fort Riley High Priority Si					HOLE NO. EP-93-01			

		HTW	DRIL	LING	LO	<u>G</u>		HOLE NO. EP-93-01	
PROJECT High Priority Site Investigation , Fort Riley, KS				INSPECT Steve K	OR Keller	SHEET 4 OF 6 SHEETS			
LITH. DEPTH DESRIPTION OF MATERIALS			FIELD SCREEN RESULTS	CORE BOX NO.	SAMPLE NO.	BLOW COUNTS	REMARKS		
		211 201 Silt Light tap to	RESOLIS				21'-29' Dry	· ·	
		21'-29' Silt.Light tan to tan-gray & weakly							
÷		consolidated. Limestone							
		stringers buff, well		ļ					
		indurated, very-fine-			l .	ļ.	1.		
	22	grained, & resistant.							
		granicu, & resistant.							
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1	29-	PROJECT				<u> </u>	<u></u>	OLE NO.	

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		HTW	DRILI		LO	G	HOLE NO. EP-93-01
ROJECT High Pr	r iority Site	Investigation, Fort Riley, KS		INSPECT Steve Ke	OR		SHEET 5 OF 6 SHEETS
LITH.	DEPTH	DESRIPTION OF MATERIALS	FIELD SCREEN RESULTS	CORE BOX NO.	SAMPLE NO.	BLOW COUNTS	REMARKS
		29'-30' Silt. Medium					ł
	1 =	orange-brown, moist to					
		very moist, plastic, trace					
		of oxidation mottles,					
] _	produces yellow-brown					
	30	water.			1		
		30'-38' Very dry starting					
		at 30'. Intercolated					
		light olive-brown, olive,			i i		
	31	medium yellow-olive.					
] _	Very weakly consolidated,					
	1 =	little or no clay, very well					
	1 =	sorted.			}		
piququ	1 =						
	32	-					
						ļ	
	3 =	-				1	
	; =	-					
] =	1	-				
	1	-				Į	
	33	1		-			
	1 =	1					
	1 =						
	4 =	_					
1939	- 1						
	34	3					
	: -	-					
	=	-					
	3 -	-					
	3 I I	<u>.</u>					
	35 —						
	: =	1					
	: =	4					
	:	4				Ì	NOTE: First water was at 29'
				1			evidenced by moist to very mois
	24						plastic clay in samples 29'-30'.
	36					· ·	Samples from 30'-38' are bone of
	i] I						When driller raised bit up through
[:::::	:H =						zone 29'-30', abundant water wa
	:] _	-					blown out. Zone 30'-38' remain
	i =	1					dry.
1	:] 37 <u> </u>		1			<u> </u>	HOLE NO.

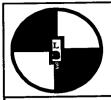
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Fort Riley High Priority Site Investigations -- East Pond

		HTW	DRILI			<u>G</u>	HOLE NO. EP-93-01
ROJEC'I Iigh Pr	r iority Site In	nvestigation, Fort Riley, KS		INSPECTO Steve Kel	OR		SHEET 6 OF 6 SHEETS
			FIELD SCREEN	CORE BOX	SAMPLE	BLOW	REMARKS
			RESULTS	NO.	NO.	COUNTS	· · · · · · · · · · · · · · · · · · ·
	DEPTH 38 39 40 41 41	38' Total Depth	SCREEN RESULTS Bkgd 0.1 pp BH 0.3 ppm BS 0.1 ppm	NO.		BLOW COUNTS	Dry. 38' Stopped Drilling.
	42						
	44						HOLE NO.

Fort Riley High Priority Site Investigations -- East Pond



LOUIS BERGER & ASSOCIATES, INC.

Client: <u>U. S. Army Corps of Engineers</u> Project: <u>Ft. Riley High Priority SI</u>	
Prepared by: Dave Stein	Date: <u>5-OCT-93</u>
Checked by: _Julie Jaglowski	Date: <u>15-DEC-93</u>

MONITORING WELL AS-BUILT DIAGRAM

	Western Hollow Stem	Auger, Dual/Tube Air Rotary	Well No.: <u>EP-93-01</u> Date Installed: <u>9-OCT-93</u>
	er Hill East Por	10	
Elevations: Ground Surface Top of PVC	<u>1288.40'</u> <u>1291.21'</u>		SURFACE CASING: Size: <u>6"</u> Material: <u>Steel</u> Length: <u>18'</u>
Ground Elevation:			
	18'	Outer Casing	Drill Hole Diameter: <u>12"</u> <u>8.25" OD</u>
		Surface Seal Material <u>5% Bentonite Grout</u> Type of Annular Seal	Riser:2"Diameter:2"Material:PVCSch.:40Type of Joints:Flush ThreadLength:20.88'
ound Surface	<u>18'</u> 21'	Grout Type II Portland Cement Type of Seal Bentonite Pellets	Screen:Diameter:2"Material:PVCSlot Size:0.02Longth15'
Depth from Ground Surface		Type of Filter Material Silica Sand (16/30)	Length: <u>15</u> <u>Sump:</u> Length: <u>4"</u> Type of Cap: T <u>hreaded PV</u> C
	<u></u>	Type of Seal NA	Centralizer: Used <u>X</u> Not Used
	NA	Type of Backfill	Depth to Water From Top of Riser at Completion: <u>18.18</u> '
			Note: Not to Scale

Form: ftrly\mwdiagrm.prs

WELL SPECIFICATION FORM

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CLIENT: Louis Berger & Associates, Inc.
JOB NUMBER: High Priority SI
WELL OWNER: Fort Riley & HQ 1st Division
ADDRESS:
CITY, STATE, ZIP CODE: Fort Riley, Kansas
PHONE: (913) 239-3343
WELL NUMBER OR OTHER IDENTIFICATION: EP-93-01
WELL INSTALLATION DATE: 9 October 1993
GEOLOGIST SUPERVISING INSTALLATION: Dave Stein
GROUND SURFACE ELEVATION (FT): 1288.40'
TOP OF CASING ELEVATION (FT): 1291.21'
WELL STICK-UP (FT): 2.81
TOTAL BORING DEPTH (FT): 38'
BORING DIAMETER (IN): 8.25"
TOTAL DEPTH OF OUTER CASING (FT):18.0'
OUTER CASING MATERIAL: Steel
OUTER CASING DIAMETER (IN): 4"
TOTAL DEPTH OF INNER CASING (FT. EXCLUDING SCREEN): 23'
INNER CASING MATERIAL: PVC
INNER CASING DIAMETER (IN): 2"
TOTAL LENGTH OF WELL SCREEN (FT): 15'
WELL SCREEN MATERIAL:PVC
WELL SCREEN DIAMETER (FT): 0.167
SCREEN SLOT SIZE (IN):020

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WELL SPECIFICATION FORM (Cont'd)

WELL NUMBER: EP-93-01
BACKFILL MATERIAL AROUND SCREEN: Silica Sand
DEPTH RANGE OF BACKFILL (FT): 38' TO 21'
SEAL MATERIAL ABOVE SCREEN: Bentonite Pellets
DEPTH RANGE OF SEAL (FT): 21' TO 18'
BACKFILL MATERIAL AROUND CASING: Grout (Type II Portland Cement)
DEPTH RANGE OF BACKFILL (FT): 0'
DESCRIPTION OF TOP SEAL:
DESCRIPTION OF WELL COVER:
OTHER ADDITIONAL INFORMATION:

WELL DEVELOPMENT RECORD

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CLIENT	CLIENT: Fort Riley - High Priority Sites JOB NO: High Priority SI										
FIELD	PERSONNEL: Mike Miles (SAIC), Brian Meyer (La	nyne Western)	SH	EET:	1 of	1					
1.	WELL NUMBER: EP-93-01										
2.	DATE OF INSTALLATION: 8 October 1993										
3.	DATE OF DEVELOPMENT: 13 October 1993										
4.	STATIC WATER LEVEL: BEFORE DEVELOPME	NT (FT):	24 HOURS AF	TER (FT):	17.93'	(toc)					
5.	QUANTITY OF WATER LOSS DURING DRILLING	G, IF USED (GAL):	0		_						
6.	QUANTITY OF STANDING WATER IN WELL AN	ND ANNULUS BEFC	DRE DEVELOPMEN	IT (GAL):	11 gal.						
		<u>START</u>	DURING			END					
7.	PHYSICAL APPEARANCE	cloudy	clear	clear	-	clear					
	SPECIFIC CONDUCTANCE (umhos/cm)	1200	1250	1280		1280					
	TEMPERATURE (°C)	15	16	16	-	16					
	pH (s.u.)	6.38	6.48	6.42	-	6.43					
	TURBIDITY (NTU)	323	2.4	11.7	-	22.6					
8.	DEPTH FROM TOP OF WELL CASING TO BOTTO)M OF WELL (FT):	38'								
9.	SCREEN LENGTH (FT): 15'										
10.	DEPTH TO TOP OF SEDIMENT: BEFORE DEVEL	OPMENT (FT):	AFTER D	DEVELOPME	NT (FT)	: 38'					
11.	TYPE AND SIZE OF WELL DEVELOPMENT EQUIPMENT: 1.5" diam.x3' stainless steel bailer and 1.5" diam. Grumdfos										
	Redi-Flow submersible pump.										
12.	DESCRIPTION OF SURGE TECHNIQUE, IF USED: Surged with pump at successive intervals of screen.										
13.	HEIGHT OF WELL CASING ABOVE GROUND SU	RFACE (FT): 2.	0,								
14.	QUANTITY OF WATER REMOVED (GAL): 4	00 gal.	TIME OF REMO	OVAL (HR:M	IIN): 5	:40					

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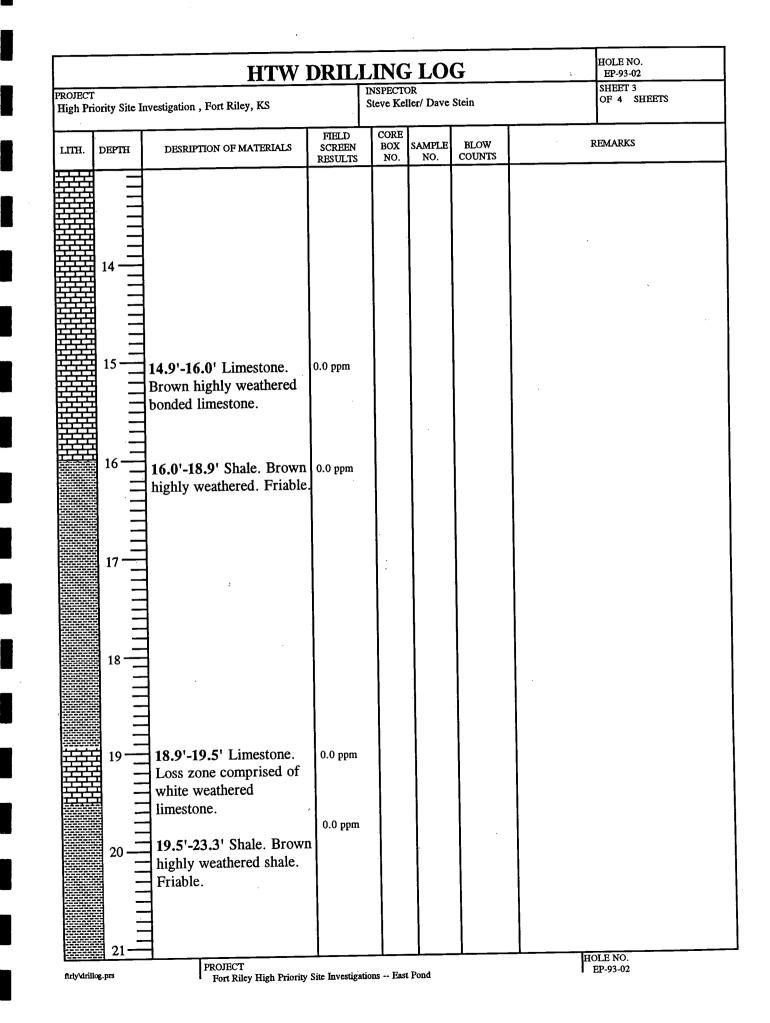
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COMPANY MAKE Low Burger Associates, Inc. Laye Works - Wicklag, KS Low Burger Associates, Inc. Laye Works - Wicklag, KS Low Burger Associates, Inc. Laye Works - Wicklag, KS Low Burger, Berl KL,	HTW DRILLIN								L	06	۱ ۲			HOLE NO. EP-93-02	
Lovie Begref & Auscister, Enc. Layte Wetter = Without, So FORDET High Photoly Site Investigation , Fort Riley, KS Ande of DEBLIDAR Ander Status = Destination (Fort Riley, KS Ande of DEBLIDAR Ander Status = Destination (Fort Riley, KS Bould Anderson (Fort Riley, KS Bould And	1 COMPANY NAME 2. DRILLING						IG SUBC	ONTR	ACTO	R			SHEET 1	IEETS	
3. FROIET High Theiry Size Investigation , Fort Riley, ES Courter Hill Bar Pool, Fort Riley Adder Sol Max 90, Schramm Rodefil Acter Sol Max 90, Schram 90, Schramm Rodefil Acter Sol Max 90, Schramm	Louis Berger & Associates, Inc. Layne We									KS					
S. MAR OF PRILIZE Rendy Smith Accer Soil Max 90, Schemme Roaddill Accer Soil Max 90, Scheme Roaddille Accer Soil Max 90, Scheme Roaddille Accer	3 PROIECT				ort Riley, KS				Custer Hill East Pond, Fort Riley						
Randy Snith Auger, den drive 2' solit spoon 2. Result BLOCKTON DELLING AND SAMPLING Alled drager, repeat 4.5. F. BOSL BLOCKTON DELLING AND SAMPLING Interval. 1278.32 (More BLPATTON Interval. 11278.32 (More BLPATTON Interval. 1278.32 (More BLPATTON Interval. 1278.32 (More BLPATTON 100 (More BLB) 11. DATE COMPLETED 7.5 5.5 (More BLP) 7.5 5.5 (More BLP) 7.5 5.5 (More BLP) 10. DATE BLAD NTO ROCK 16. OPATH IN WATER AND ELAPSED TIME AFTER DRULING 10.4 17. OTHER WATER LEVEL MEASUREMENTS GARDETY) 3.9 10. OTHER WATER LEVEL MEASUREMENTS GARDETY) 3.9 10. OTHER GARDETY) 1.00000 10. OTHER GARDETY) 1.000000 10. OTHER GAR	5. NAME OF	5. NAME OF DRILLER						6. M	ANUF.	ACTU	RER'S DESI ax 90. Schu	IGNATION ramm Rota	OF DRILL drill	.	
7. BUELLING AND SAMELING Iback of angers repeat at 5 ⁻⁰ bill def angers repeat	Randy S	mith			Auger then d	rive 2' s	plit spoon 2	· 8. H	OLEL	OCAT	ION				
EQUIPMENT intervals 9.5000000000000000000000000000000000000	DRILLIN	G AND SAM	er Apling		ahead of auge	r; repeat	t at 5'	- 1 s	outh d	lowng	radient wel	1			
ID. DATE STARTED ID. DATE STARTED 12. OVERBURDEN THICKNESS 15. DEPHT GROUNDWATE ENCOUNTEED 7.5 15. DEPHT GROUNDWATE ENCOUNTEED 7.5 15. DEPHT GROUNDWATE ENCOUNTEED 15. DEPHT GROUNDWATE ENCOUNTEED 16. DEWT GROUNDWATE ENCOUNTEED 16.4 16. DEWT GROUNDWATE ENCOUNTEED 16.4 16. DEWT GROUNDWATE ENCOUNTEED 16.4 16. DEWT GROUNDWATE ENCOUNTEED 16.7 17. OTALE MADE END FORCE 16.000000000000000000000000000000000000	EQUIPM	ENT			intervals.										
12. OPERORD INTERNET 9.5' (0n pilo bit advancing auge) 13. DEPTH DEALED DITO ROCK 16. OPEN LANSED TIME AFTER DEALLING 16.4' 16.4' 14. TOTAL DEPTH OF HOLE 17. OTHER WATER LEVEL MEASUREMENTS (SPECIFY) 23.9' 18. OPENCTRINKAL SAMPLES DISTURBED 18. OPENCTRINKAL SAMPLES DISTURBED UNDISTURBED 19. TOTAL DEPTH OF HOLE 19. TOTAL NUMBER OF CORE BOXES NA. NA. 20. SAMPLE FOR CHEMICAL VOC MATERIAL OTHER (SPECIFY) 11. DEPTH DESTRITION OF MATERIALS SCREEN SCREEN 11. DESTRITION OF MATERIALS 11. DESTRITION OF MATERIALS SCREEN SON 11. DESTRITION OF MATERIALS 11. DESTRITION OF MATERIALS SCREEN SON 11. DESTRITION OF MATERIALS 11. DESTRITION OF MATERIALS 12. Auger 0'-4.5' 13. GOUNTS 14. DESTRITION OF MATERIALS 15. Silight Moisture 11. DESTRITION OF MATERIALS 12. Silight Moisture								10. 1	DATE S	START	ED 993		7 Oct	COMPLETE	ED
1.5.9 DEFINITION ANDER AND PLANED THE AFTER DERLING 16.4 16.0 EPTH TO WATER AND PLANED THE AFTER DERLING 1.6.4 17. OTHER WATER LEVEL MEASUREMENTS (SPECIPY) 2.9 18. CONTENNEAL SAMPLES 18. CONTENNEAL SAMPLES DISTURBED 19. TOTAL NUMBER OF CORE BOXES NA. NA. 20. SAMPLES FOR CHEMICAL VOC MATTAS OTHER (SPECIPY) OTHER (SPECIPY) OTHER (SPECIPY) 21. DEFORTION OF HOLE BACKPILLED N.A. BACKPILLED 22. DEFORTION OF HOLE BACKPILLED N.A. BACKPILLED N.A. DESERPTION OF MATERIALS STREED SOL SAMPLE DESERPTION OF MATERIALS STREED SOL SAMPLE BLOW REMARKS NO. 2.0.0.115 NO. 3.0.0.116 SLIGHT		JRDEN THI	CKNESS		I				5' (0	n nilol	bit advance	ing auger)	1		
16.4* 17. OTHER WATER LEVEL MEASUREMENTS (SPECIPY) 14. TOTAL DEFINIOP HOLE 19. TOTAL NUMBER OF CORE BOXES 18. GEOTECHNICAL SAMPLES DISTURBED UNDESTURBED 19. TOTAL NUMBER OF CORE BOXES N.A. 20. SAMPLES FOR CHEMICAL VOC METALS OTHER (SPECIPY) OTHER (SPECIPY) 20. SAMPLES FOR CHEMICAL VOC METALS OTHER (SPECIPY) OTHER (SPECIPY) OTHER (SPECIPY) 20. SIGNATURE OF HOLE JACKHILED MONTORING WELL OTHER (SPECIPY) OTHER (SPECIPY) OTHER (SPECIPY) 21. DISFORTION OF HOLE JACKHILED MONTORING WELL OTHER (SPECIPY) 23. SIGNATURE OF INSPECTOR 22. DISFORTION OF HOLE JACKHILED KONTORING WELL OTHER (SPECIPY) 23. SIGNATURE OF INSPECTOR 23. SIGNATURE OF INSPECTOR X SIGNATURE OF INSPECTOR X X 24. THE DESERPTION OF MATERIALS SIGNATURE NO. SIGNATURE REMARKS 3 THE DISCURSE NO. COUNTS REMARKS 4 THE DISCURSE SIght Moisture Slight Moisture	13. DEPTH	DRILLED I	NTO ROCK					16. 1	DEPTH	TO W	ATER AND	ELAPSED	TIME AF		ING
2.3-9 18. GEVITECRINCAL SAMPLES DISTURBED UNDESTURBED 19. TOTAL NUMBER OF CORE BOXES N.A. 20. SAMPLES FOR CHEMICAL VOC METALS OTHER (SPECIFY) OTHER (SPECIFY) <td< td=""><td></td><td>DEPTH OF</td><td>HOLE</td><td></td><td></td><td><u> </u></td><td></td><td>- 17.</td><td>OTHER</td><td>R WAT</td><td>ER LEVEL</td><td>MEASURE</td><td>MENTS (S</td><td>PECIFY)</td><td></td></td<>		DEPTH OF	HOLE			<u> </u>		- 17.	OTHER	R WAT	ER LEVEL	MEASURE	MENTS (S	PECIFY)	
N.A. VOC METALS OTHER (SPECIFY) O	23.9'				DISTURBED		UNDIS	TURBEL)	19. T	DTAL NUM	BER OF CO	ORE BOXE	25	
20. SAMPLES FOR CHEMICAL VOL DIMENSION OF HOLE BACKHELLED MONITORING WELL OTHER (SPECIFY) 23. SIGNATURE OF INSPECTOR SHALL STREET TION OF MATERIALS RESULTS NO. NO. COUNTS REMARKS 1.TH. DEPTH DESRIPTION OF MATERIALS RESULTS NO. NO. COUNTS REMARKS 1.TH. DEPTH DESRIPTION OF MATERIALS RESULTS NO. NO. COUNTS REMARKS 1.TH. DEPTH DESRIPTION OF MATERIALS RESULTS NO. NO. COUNTS 1.TH. DEPTH DESRIPTION OF MATERIALS RESULTS NO. COUNTS 1.TH. DEPTH DESRIPTION OF MATERIALS RESULTS NO. COUNTS 1.TH. DEPTH DESRIPTION OF MATERIALS RESULTS NO. NO. COUNTS 1.TH. DEPTH DESRIPTION OF MATERIALS RESULTS NO.	N.A.				NOO		ETALS	OTHE	R (SPE	CIFY)	OTHER (SPECIFY)	OTHER	(SPECIFY)	21. TOTAL CORI
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LITH. DEPTH DESRIPTION OF MATERIALS PLOY SCREEN BOX SAMPLE BLOW REMARKS 1	22. DISPOS	ITION OF H	IOLE	B/	ACKFILLED	MONITO			a (ori	λ <u>μ'</u> Ι)	25. SIGN	(2H	m. Kl	V.
LITH. DEPTH DESRIPTION OF MATERIALS SCREEN BOX SAMPLE BLOW REMARKS 1 1 1 1 4 1 4 4 4 4 4 4 4 4 4 5 6 6 6 6 7 6 7 6 7 7 6 7 7 7 7 7 7 7 7						<u> </u>		<u> </u>			<u> </u>		<u> </u>		
2 3 4 4 4 5 4 5 1 4 4 5 1 4 5 1 4 5 1 5	LITH.	DEPTH	DESR	IPTIC	ON OF MATERIA	ALS	SCREEN	BOX					RI	MARKS	
				5'-6 gani pist,	.5' Clay. B ic looking, , slightly pl	slight		N.A	. N	I.A.	2-2-4-7				
				PI	ROJECT Fort Riley High	Priority S	Site Investigati	ons Ea	st Pond	I			ł	EP-93-02	

HTW DRILLING LOG		HOLE NO. EP-93-02						
Magn Friority Site Investigation , Fort Riley, KS Steve Keller OP 4 SHEPTS LITH DESRUTION OF MATURALS FEED SCHEPN PSULTS CORE NO. BAMPTE NO. BLOW NO. REMARKS 4.5'-6.5'(Cont.) Clay. FEED PSULTS CORE NO. BLOW NO. REMARKS 7 4.5'-6.5'(Cont.) Clay. NO. COUNTS REMARKS 8 pilot bit at 9.5', & total depth of 8" hole was 8.5'. 0.0 ppm Bex 1 of 1 At pilot hole 9.5', approximately 0.1' to 0.2' of cuttings were wet. 9 9.1'-14.9' Limestone. Weathered. White and brown bonded. Lost zones of fractured, highly weathered limestone at 11' and 13'. The zone at 13' is highly porous. It is suspected that the lost, porous zones at 11' and 13' are considered the initial water bearing zones at EP-93-02. Bex 1 0.0 ppm At pilot hole 9.5', approximately 0.1' to 0.2' of cuttings were wet.								SHEET 2
Implified use intergences (Finitely, Interpreted) FIELD FIELD FIELD REMARKS Implified use intergences (Finitely, Interpreted) DESTRYTION OF MATERIALS SCREEN RO. RO. REMARKS Implified use intergences (Finitely, Intergence) Implified use intergences (Finitely, Intergence) REMARKS REMARKS Implified use intergences (Finitely, Intergence) Implified use intergences (Finitely, Intergence) REMARKS REMARKS Implified use intergences (Finitely, Intergence) Implified use intergences (Finitely, Intergence) Remarks REMARKS Implified use intergences (Finitely, Intergence) Implified use intergences (Finitely, Intergence) Remarks Remarks Implified use intergences (Finitely, Intergence) Implified use intergences (Finitely, Intergence) Remarks Remarks Implified use intergences (Finitely, Intergence) Implified use intergence Implified use intergence Remarks Implified use intergence Implified use intergence Implified use intergence Implified use intergence Remarks Implified use intergence Implified use intergence Implified use intergence Implified use intergence Remarks Implified use intergence Implified use intergence Impl	PROJECT		Fort Bilow KS	,				OF 4 SHEETS
LITH. DEFINI DESRUTION OF MATERIALS SCREEN BXX SAMPLE BLOW EEMARKS 0 4.5'-6.5'(Cont.) Clay. NO. NO. COUNTS COUNTS EEMARKS 0 - <t< td=""><td>High Pr</td><td>ionity Sile I</td><td>nvesugauon, Fort Kney, KS</td><td></td><td></td><td></td><td></td><td></td></t<>	High Pr	ionity Sile I	nvesugauon, Fort Kney, KS					
4.5'-6.5'(Cont.) Clay. 6 9 9.1'-14.9' Limestone. Weathered. White and brown bonded. Lost zones of fractured, highly weathered limestone at 10 11' and 13'. The zone at 13' is highly procus. It is suspected that the lost, porous zones at 11' and 13' are considered the 11 11' and 13'. The zone at 11' and 13'. The zone at 13' are considered the 11' and 13'. The zone at 12' are considered the 11' and 13'. The zone at 13' are considered the 11' and 13'. The zone at 11' and 13'. The zone at 13' are considered the 11' and 13'. The zone at 12' are considered the 11' and 13'. The zone at 13' are considered the 11' and 13'. The zone at 13' are considered the 11' and 13'. The zone at 11' and 13	LITH.	DEPTH	DESRIPTION OF MATERIALS	SCREEN	BOX			REMARKS
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			Auger 4.5'-9.5'. Auger to refusal of pilot bit at 9.5', & total depth of 8" hole was 8.5'. 9.1'-14.9' Limestone. Weathered. White and brown bonded. Lost zones of fractured, highly weathered limestone at 11' and 13'. The zone at 13' is highly porous. It is suspected that the lost, porous zones at 11' and 13' are considered the initial water bearing zones	0.0 ppm	Box 1	NU.		First water suspected at either 11' or 13' based on fractured
		리 1		1	1			
		<u></u>	PROJECT			1	<u></u>	HOLE NO.

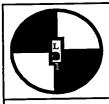
contrative of observer.

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	HOLE NO. EP-93-02					
PROJECT	HTW	SHEET 4 OF 4 SHEETS				
High Priority Site	Investigation , Fort Riley, KS		Steve Ke	41er		
LITH. DEPTH	DESRIPTION OF MATERIALS	FIELD SCREEN RESULTS	CORE BOX NO.	SAMPLE NO.	BLOW COUNTS	REMARKS
	23.3'-23.9' Limestone. White weathered limestone. 23.9' Total Depth.	0.0 ppm				23.9' Stopped Drilling HOLE NO. EP-93.02

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LOUIS BERGER & F ASSOCIATES, INC. P

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Client: U.S. Army Corps of Engineers Project: Ft. Riley High Priority SI	
Prepared by: Dave Stein	Date: <u>5-0CT-93</u>
Checked by: Julie Jaglowski	Date: <u>15-DEC-93</u>

MONITORING WELL AS-BUILT DIAGRAM

Driller: <u>Layne</u> W	estern		Well No.: <u>EP-93-02</u>
Drilling Method:	Hollow Stem	Auger, Dual/Tube Air Rotary	Date Installed: 9-OCT-93
2 111118			
Location: Custer	Hill East Pon	d	
levations:			SURFACE CASING:
Ground Surface	1278.32	-	Size: <u>6"</u>
Top of PVC	1280.12	[] q p	Material: <u>Steel</u>
			Length: <u>9'</u>
Ground Elevation:			
		Outer Casing	Drill Hole Diameter: 12"
			8.25" OD
	9.0'		
			<u>Riser:</u> 2"
		Surface Seal Material	Material: PVC
		<u>5% Bentonite Grout</u>	Sch.: 40
			Type of Joints: Flush Thread
		Type of Annular Seal	Length:14.8'
		Grout Type II Portland Cement	
Ground Surface		N N	
urf	9.0'		<u>Screen:</u> Diameter: 2"
I S		Type of Seal	Diameter.
Juc		Bentonite Pellets	Material: <u>rvc</u> Slot Size: <u>0.02</u>
roi	11.0'		Length: $10'$
			2018011
E			
epth from		Type of Filter Material Silica Sand (16/30)	Sump: Length: 4"
p t h		Type of Filter Material	Type of Cap: Threaded PVC
Del		Silica Sand (16/30)	
			Controlizer: Used X
	23.0'		Centralizer: Used <u> </u>
		Type of Seal	not Oscu
	NA	NA	
		Type of Backfill	Depth to Water
	NA		From Top of Riser at Completion: <u>9.92'</u>

Form: ftrly\mwdiagrm.prs

WELL SPECIFICATION FORM

CLIENT: Louis Berger & Associates, Inc.
JOB NUMBER: High Priority SI
WELL OWNER: Fort Riley & HQ 1st Division
ADDRESS:
CITY, STATE, ZIP CODE: Fort Riley, Kansas
PHONE: (319) 239-3343
WELL NUMBER OR OTHER IDENTIFICATION: EP-93-02
WELL INSTALLATION DATE: 9 October 1993
GEOLOGIST SUPERVISING INSTALLATION: Dave Stein
GROUND SURFACE ELEVATION (FT): 1278.32'
TOP OF CASING ELEVATION (FT): 1280.12'
WELL STICK-UP (FT):1.8'
TOTAL BORING DEPTH (FT): 23'
BORING DIAMETER (IN): 8.25"
TOTAL DEPTH OF OUTER CASING (FT):9'
OUTER CASING MATERIAL: Steel OUTER CASING DIAMETER (IN): 4"
OUTER CASING DIAMETER (IN): 4
TOTAL DEPTH OF INNER CASING (FT. EXCLUDING SCREEN): 13'
INNER CASING MATERIAL:PVC
INNER CASING DIAMETER (IN):
TOTAL LENGTH OF WELL SCREEN (FT): 10'
WELL SCREEN MATERIAL:PVC
WELL SCREEN DIAMETER (FT): 0.167
SCREEN SLOT SIZE (IN): 020

WELL SPECIFICATION FORM (Cont'd)

WELL NUMBER: EP-93-02
BACKFILL MATERIAL AROUND SCREEN: Silica Sand
DEPTH RANGE OF BACKFILL (FT): 23' TO 11'
SEAL MATERIAL ABOVE SCREEN: Bentonite Pellets
DEPTH RANGE OF SEAL (FT): 11' TO 9'
BACKFILL MATERIAL AROUND CASING: Grout (Type II Portland Cement)
DEPTH RANGE OF BACKFILL (FT): 9'
DESCRIPTION OF TOP SEAL:
DESCRIPTION OF WELL COVER:
OTHER ADDITIONAL INFORMATION:

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WELL DEVELOPMENT RECORD

CLIENT:	Fort Riley - High Priority Si	tes	JOB NO:	High Priority SI			
FIELD P	ERSONNEL: Mike Miles (SA	AIC), Brian Meyer (Lay	vne Western)	SHI	EET:	1 of	1
1.	WELL NUMBER: EP-93-0					<u> </u>	
2.	DATE OF INSTALLATION:	6 October 1993	<u> </u>				
3.	DATE OF DEVELOPMENT:	13 October 1993			_		<u> </u>
4.	STATIC WATER LEVEL: BE	FORE DEVELOPMEN	NT (FT): 7.5'	24 HOURS AFT	ER (FT):	9.56' –	<u></u>
5.	QUANTITY OF WATER LOS	S DURING DRILLING	G, IF USED (GAL):	40 gal.		. <u>.</u>	
6.	QUANTITY OF STANDING V	VATER IN WELL AN	D ANNULUS BEFO	ORE DEVELOPMEN	T (GAL):	2.6 gal.	
			<u>START</u>	DURING			<u>END</u>
7.	PHYSICAL APPEARANCE		cloudy	cloudy	clear	-	clear
	SPECIFIC CONDUCTANCE (L	mhos/cm)	900	890	820	-	860
	TEMPERATURE (°C)		19.5	20.5	19.1	-	19.0
	pH (s.u.)		6.64	6.53	6.32	-	6.41
	TURBIDITY (NTU)				<u>,</u>	-	19.7
8. 9.	DEPTH FROM TOP OF WELL SCREEN LENGTH (FT): 10		M OF WELL (FT):	23'			
10.	DEPTH TO TOP OF SEDIME	NT: BEFORE DEVEL	OPMENT (FT):	23' AFTEI	R DEVELO	PMENT (F	·T): 23'
11.	TYPE AND SIZE OF WELL D	EVELOPMENT EQUI	PMENT: 1.5" c	liam.x3' stainless stee	l bailer and	1.5" diam	Grumdfos
12.	DESCRIPTION OF SURGE T	CHNIQUE, IF USED	: Surged with pur	np at successive interv	als of screen	n.	
13.	HEIGHT OF WELL CASING	ABOVE GROUND SU	RFACE (FT): 2	2.0'			
14.	QUANTITY OF WATER REM		40 gal.	TIME OF REM	OVAL (HR:	MIN): 6	5:22

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COMPANY NAME Lordinger & Associate, Inc. Lape Water - Wicking KS Got \$ Signature - Wicking KS Sig		HTW DRILLING LOG HOLE NO. HP-93-03													
Lowing Lowing Lines (Constraints) (Constrain	1. COMPAN	Y NAME	<u>. </u>				2. DRILLI	NG SUBC	SUBCONTRACTOR SHEET 1						
Total Producting Size Investigation , Fort Riley, KS Cutter ERIT Date Ford, Fort Riley A MAR OF DRIAL Address of Balland And Same State (Second Control of Contr			ssociates,]	Inc.			Layne		esterni – whether, Ko						
	3. PROJECT High Pri	ority Site I	nvestigatio	n,F	ort Riley, KS			l c	uster Hill	East Pond,	Fort Riley	00 DDW 1			
EAMOY SHALL Auger, this drive 2' and store 2' 8. HOLL LOCATION DELEDS AND CAMPLING Index of target, then drive 2' and store proceed as 0 9. SUBARCE BLEVATION DEVELOPMENT Index of target, then drive 2' and store proceed as 0 9. SUBARCE BLEVATION DEVELOPMENT Index of target, then drive 2' and store proceed as 0 9. SUBARCE BLEVATION DEVELOPMENT 10. DATE STARTID 11. DATE COMPLETED 12. OVERBRADENT THECKNESS 5. G' 13. DEPTH REALED INTO ROCK 5. G' 6.7 5. G' 13. DEPTH REALED INTO ROCK COMMENCED. 6.7 15. DEPTH TO WATER ANPLESE TIME AFTER DRILLING 7.3.25 INTO BED UNDEFUGE 14. TOTAL NOMER OF CORE FOXES 11. OTHER WATER LEVEL MIASUREMENTS GPECIFY) 17. OTHER WATER INFOLMENCE INTO BED 20. SAMPLES DISTUBRED 10. DEPTH DESTREPTION OF MATERIALS 21. DEFORTION OF HOLE INTO ROPE MATERIALS 22. DEFORTION OF BOLE INCREPTION OF MATERIALS 23. CONTROL INTO ROPE MATERIALS 24. Structure INTO ROPE MATERIALS 25. HOLE OF FOLE INTO ROPE MATERIALS 26. DEPTH DESTREPTION OF MATERIALS 27. DEFORTION OF BOLE INTO ROPE MATERIALS 28. ANT SE INTO ROPE MATERIALS </td <td>5. NAME OF</td> <td colspan="5"></td> <td>6. M A</td> <td>ANUFAC cker Soil</td> <td>TURER'S DE Max 90, Sc</td> <td>SIGNATION hramm Rota</td> <td>OF DRILL drill</td> <td></td> <td></td>	5. NAME OF						6. M A	ANUFAC cker Soil	TURER'S DE Max 90, Sc	SIGNATION hramm Rota	OF DRILL drill				
DBELIAND AND SAMPLING intervals. 2 LBR WONGTOWN INTER INCOME 1233.15 (4pc) 12. OVERGURDEN THICKNESS 1.0 DATE STARTED 21 October 1993 6.7 7 October 1993 21 October 1993 6.7 5.6 1.0 DETT STARTED 21 October 1993 6.7 5.6 1.0 DETT GENERAL STARTED 21 October 1993 6.7 5.6 1.0 DETT GENERAL STARTED 21 October 1993 6.7 5.6 1.0 DETT GENERAL STARTED 21 October 1993 6.7 5.6 1.0 DETT GENERAL STARTED 1.1 DETT GENERAL STARTED STAR							· 8. H	OLE LOC.	ATION						
LICENSE 123.13 (0p0) 12. OVERBURDEN THICKNESS 11. DATE GOMPLETED 12. OVERBURDEN THICKNESS 15. DEPTH GOMONWATER ENCOUNTERED 6.7 15. DEPTH FOR DECOUNTERED 13. DEPTH GOMONWATER ENCOUNTERED 26.3 14. TOTAL DEPTH OP HOLE 17. OTHER WATER LEVEL MEASURGENENTS GPECTED 3.25 17. OTHER WATER LEVEL MEASURGENENTS GPECTED 14. TOTAL DEPTH OP HOLE 19. TOTAL COMPLEX 3.26 NA. 20. SAMPLES FOR CHEMICAL VOC MARKEN FOR CHEMICAL VOC AMALYSIS 0. OTHER (SPECTED) 21. DEPTH DESTURATION OF HOLE 22. DISPOSITION OF HOLE MONTORNO WAL 23.25 MARKEN FOR CHEMICAL VOC MEPALS VIDENT VOC X X XALL OTHER (SPECTED) 21. DEPTH DESTRIPTION OF MATERIALS STEED NO. 22. DISPOSITION OF HOLE MARKEN LED 33.3 NA. 34.4 DESTRIPTION OF MATERIALS STEED NO. 22. DISPOSITION OF MATERIALS STEED 33.4 NO. 34.5 NO. 35.5 SIGNATURE OF COME STERIES 34.5 STEED	DRILLIN	G AND SA	MPLING		ahead of auge	r; repea	t at 5'	1 1							
12. OVERSURDEN TELEVEN DEVICES 15. DETT GROUNDWATER ENCOUNTERED 5.0 15. DETT GROUNDWATER ENCOUNTERED 5.0 15. DETT GROUNDWATER ENCOUNTERED 15. DETT GROUNDWATER ENCOUNTERE GROUPS 15. DETT GROUPS 15.	EQUIPMI	ENT			intervals.									<u> </u>	
12. OF REMOVED IN THE LASS 5.6° 6.7 15. DEFINIT D RULLED INTO ROCK 26.3 15. DEFINIT ORALED INTO ROCK 26.3 15. DEFINIT ORALED INTO ROCK 26.3 17. OTHER WATER LEVEL MEASUREMENTS (SPECIPY) 33.12 19. TOTAL NUMBER OF CORE BOXES 0 SAMPLE DISTURBED 19. TOTAL NUMBER OF CORE BOXES 0 NA. 0 20. SAMPLE NOR CHEMICAL VOC METALS 21. DEROSITION OF HOLE BACKFILLED MONTORING WEL OTHER (SPECIPY) 22. DEROSITION OF HOLE BACKFILLED MONTORING WEL OTHER (SPECIPY) 23. SIGNATURE OF INSPECTOR RECOVERY 24. THE DESTRIPTION OF MATERIALS SCREEN 25. THE DESTRIPTION OF MATERIALS SCREEN NO. COUNTS 26. THE AVER DEVICED NO. NO. NO. COUNTS 25. THE AVER DEVICENCY THE AVER DEVICENCE REMARKS 26. THE AVER DEVICENCE NO. NO. NO. 27. DEROSITION OF MATERIALS SCREEN NO. COUNTS 28. THE AVER DEVICENCE NO. NO. NO. NO. 29. THE AVER DEVICENCE NO. NO. NO. SCREEN 30. THE AVER DEVICENCE NO. NO. SCREN							-1 -	7 October	r 1993		21 Oc				
13. DEPTH DERLIED ENTO ROCK 14. COTAL DEPTH OF HOLE 11. OTHER WATER LAND EARLEN'S (SPECIPY) 33.25' 11. OTHER (SPECIPY) N.A. 11. OTHER (SPECIPY) 3. SAMPLES FOR CHEMORAL VOC M.A. 10. OTHER (SPECIPY) 3. SAMPLES FOR CHEMORAL VOC M.A. 10. OTHER (SPECIPY) 3. DEPTH TO BERLETION OF MATERIALS SCREEN BOURDATION OF HOLE 10. OTHER (SPECIPY) 11. DEPTH DESRETION OF MATERIALS 11. DEPTH DESRETION OF MATERIALS 11. DEPTH DESRETION OF MATERIALS 12. DISPOSITION OF HOLE ACKPILED 13. OTHER (SPECIPY) 21. SIGNATURE OF NOSPECTOR 14. DEPTH DESRETION OF MATERIALS 15. OTHER (SPECIPY) N.A. 14. DEPTH DESRETION OF MATERIALS 15. OTHER (SPECIPY) REMARKS 14. DEPTH DESRETION OF MATERIALS 15. OTHER (SPECIPY) SAMPLE BLOW 14. DERRETION OF MATERIALS SAMPLE BLOW <td></td> <td>JRDEN TH</td> <td>ICKNESS</td> <td></td> <td></td> <td></td> <td></td> <td>5</td> <td>5.6'</td> <td></td> <td></td> <td></td> <td></td> <td></td>		JRDEN TH	ICKNESS					5	5.6'						
14. TOTAL DEPTH OF HOLE 17. OTHER WATER LEVEL MEDSURANTS (STELPS) 33.25' 19. OTHER WATER LEVEL MEDSURANTS (STELPS) N.A. DISTORBED UNDISTURBED 0 SAMPLES FOR CHEMICAL VOC MALASS FOR CHEMICAL VOC METALS 0 SAMPLES FOR CHEMICAL VOC ANALYSIS BACKPILED HONTORENG WALL 0. DISTORTION OF HOLE BACKPILED 11. TH. DEPTH DESRUPTION OF MATERIALS OTHER (SPECTPY) 11. DEPTH DESRUPTION OF MATERIALS SCREEN 11. TH. DEPTH DESRUPTION OF MATERIALS SCREEN 11. TH. DEPTH DESRUPTION OF MATERIALS SCREEN 11. TH. DEPTH DESRUPTION OF MATERIALS SCREEN 12. TH. DESRUPTION OF MATERIALS SCREEN NO. 13.2 SCREEN SCREEN NO. NO. 14. TH. DEPTH DESRUPTION OF MATERIALS SCREEN 1	13. DEPTH	DRILLED I	NTO ROCK	5					OMMEN	CED.				ING	
	14. TOTAL		HOLE		<u> </u>			17. 0							
20. SAMPLES FOR CHEMICAL VOC METALS OTHER (SPECIPY) OTHER (SPEC	18. GEOTEC		SAMPLES		DISTURBED		UNDIS			0					
ANALYSIS N.A. 22. DISPOSITION OF HOLE <u>BACKFILLED</u> HONTORBIG WELL OTHER (SPECIPY) 23. SIGNATURE OF INSPECTOR X LITH. DEFTH DESRIPTION OF MATERIALS SCREEN RESULTS NO. SAMPLE BLOW RESULTS NO. COUNTS 1 2 3 4 4 4 4 4 4 4 5 1 1 1 1 1 3 4 4 4 4 4 5 1 DEDWOYT 1 1 DEDWOYT 1 1 DEDWOYT 1 1 DEDWOYT 1 1 DEDWOYT 1 1 DEDWOYT 1 1 DEDWOYT 1 1 DEDWOYT 1 DEDWOYT 1 1 DEDWOYT 1 1 DEDWOYT 1 1 DEDWOYT 1 1 DEDWOYT 1 1 DEDWOYT 1 1 DEDWOYT 1 DEDWOYT 1 1 DEDWOYT 1 DEDWOY	1	ES FOR CH	IEMICAL		VOC	M	IETALS	OTHE	R (SPECII	TY) OTHER	(SPECIFY)	OTHER ((SPECIFY)	21. TOTAL CORI RECOVERY	
22. DISPOSITION OF HOLE	ANALY														
ZZ DISCONISION OF MATERIALS X Statute LITH. DESTIFITION OF MATERIALS FIELD. SCREEN RESULTS CORE BOX NO. SAMPLE BLOW NO. BLOW REMARKS 1 1 1 1 1 1 2 1 1 1 1 1 3 1 1 1 1 1 4 Auger 0'-4.5' 1 1 1 1 4 Auger 0'-4.5' 1 1 1 5'-5.6' Almost dry. 9 9 9 9 10 1 5'-5.6' Almost dry.		TTON OF			CKETLED	MONIT	ORING WELL	OTHE	R (SPECI	FY) 23. SIGI	NATURE OF	INSPECTO	OR		
LITH DEPTH DESRIPTION OF MATERIALS SCREEN RESULTS BOX SAMPLE BLOW REMARKS 1	22. DISPOS	IIION OF I	1012									3#	m. Kel	ll	
Auger 0'4.5' 4 - Auger 0'4.5' 4 - Auger 0'4.5' 5 - 5.6' Almost dry. Buller	LITH.	DEPTH	DESR		ON OF MATERIA	ALS	SCREEN	BOX				RE	MARKS		
				5'-6. llow	.5' Silt. Li -gray with	mino	r	N.A.	N.A.	7-12-12-					
Fort Riley High Priority Site Investigations East Pond	·····	<u>. ></u>	- <u> </u> v	PD	OFFCT								OLE NO. EP-93-03		

HTW DRILLING LOG Herein PRODUCT INSERTOR DESERTOR INSERTOR DESERTOR DESERTOR DESERTOR DESERTOR DESERTION OF MATERIALS SCRIM DESERTION OF MATERIALS SCRIM A.5'-6.5' Silt. Cont. and motions. Well Sorted:	PROJECT IBph Priority Site Investigation , Fort Riley, KS DISSPECTOR Sever Keller Statter 2 Box Statter 3 Statter 2 OF 5 SHEPTS LTH DEFTH DESTRIPTION OF MATERIALS SCHENN SCHENN NO. CORB BOX NO. BLOW COUNTS REMARKS ITH DEFTH DESTRIPTION OF MATERIALS SCHENN SCHENN NO. CORB BOX NO. BLOW COUNTS REMARKS ITH DEFTH DESTRIPTION OF MATERIALS SCHENN NO. NO. BLOW COUNTS REMARKS ITH DEFTH DESTRIPTION OF MATERIALS SCHENN NO. NO. BLOW COUNTS REMARKS ITH DEFTH DESTRIPTION OF MATERIALS SCHENN NO. NO. SAMPLE COUNTS REMARKS ITH DEFTH DESTRIPTION OF MATERIALS SCHENN NO. SAMPLE COUNTS SCHENN COUNTS SCHENTS ITH DEFTH DESTRIPTION OF MATERIALS SCHENN NO. SCHENTS SCHENTS ISO Auger 4.5'-6.5' Siltstone count S.6'-5.9' wet and nearly saturated. ISO Auger 4.5'-6.7' Fefusal. S.7'-6.5' moist. ITH Inter-93-02. Inter-93-02. Dry. ITH Inter-93-02. Inter-93-02. Inter-93-02. ITH Inter-93-02. Inter-93-02. Inter-93-02. ITH			HOLE NO. EP-93-03					
High Priority Sile Investigation, Port Riley, KS Steve Keller ITTIL DBPTH DESKIFTION OF MATERIALS FIELD SCREEN NO. CORE NO. PLOW NO. REMARKS ITTIL DBPTH DESKIFTION OF MATERIALS FIELD SCREEN NO. BCONTS REMARKS ITTIL DBPTH DESKIFTION OF MATERIALS FIELD SCREEN NO. PLOW NO. REMARKS ITTIL DBPTH DESKIFTION OF MATERIALS FIELD SCREEN NO. PLOW NO. REMARKS Ittilde Ittilde Auger 4.5'-6.5' Screen Screen Screen Indurated, equal to the siltstone at 8.5' in EP-93-02. Screen Sc	High Priority Sile Investigation, Port Riley, KS Sever Keller LITE DBFTH DESERPTION OF MATERIALS FIELD SCREEN NO. CORE NO. NO. REMARKS LITE DBFTH DESERPTION OF MATERIALS FIELD SCREEN NO. COUNTS REMARKS and mottles. Well sorted, friable, and innon-plastic. Local well gendurated stringers, 5.9'-6.5' moist. 5.6'-5.9' wet and nearly saturated. 6	PROF	<u>г</u>			INSPECT	OR		
LTHE DEFTH DESRIPTION OF MATERIALS SCREEN NO. SAMPLE BLOW REMARKS 4.5'-6.5' Silt. Cont. and mottles. Well sorted, friable, and non-plastic. Local well of mon-plastic. Local well sorted, friable, and non-plastic. Local well sorted, straber, and number of equal to 125' thick. Oxidation is in wet zone 5.6'- -5.9'. S.6'-5.9' wet and nearly saturated. 7	LTEL DEF/TI DESRIPTION OF MATTREALS SCREEN BOX SAMPLE BLOW REMARKS 4.5'-6.5' Silt. Cont. and mottles. Well sorted, friable, and pinon-plastic. Local well indurated stringers, 6'-5.9' wet and nearly saturated. 5.6'-5.9' wet and nearly saturated. 5.9'-6.5' moist.	High Pr	iority Site	Investigation , Fort Riley, KS		Steve Ke	ller		
4.5'-6.5' Sit. Cont. and mottles. Well sorted, friable, and pon-plastic. Local well indurated stringers, is in wet zone 5.6'- 5.9'. 5.6'-5.9' wet and nearly saturated. 5.9'-6.5' moist. 5.9'-6.5' moist. 7 - refusal. 6.7' Siltstone. Dry, well indurated, equal to the siltstone at 8.5' in EP-93-02. Dry. 9 - 9'-13' Limestone. Gray chips mixed with shale dust (i.e. rock flour). Soft cuttings. 0.0 ppm 10	 4.5'-6.5' Silt. Cont. and mottles. Well sorted, friable, and pnon-plastic. Local well indurated stringers, is in wet zone 5.6'- 5.9'. Auger 4.5'-6.7' 7 refusal. 6.7' Siltstone. Dry, well indurated, equal to the siltstone at 8.5' in EP-93-02. 9 - 9'-13' Limestone. Gray chips mixed with shale dust (i.e. rock flour). Soft cuttings. 10	LITH.	DEPTH	DESRIPTION OF MATERIALS	SCREEN	BOX			REMARKS
				 4.5'-6.5' Silt. Cont. and mottles. Well sorted, friable, and non-plastic. Local well indurated stringers, is in wet zone 5.6'- 5.9'. Auger 4.5'-6.7' refusal. 6.7' Siltstone. Dry, well indurated, equal to the siltstone at 8.5' in EP-93-02. 9'-13' Limestone. Gray chips mixed with shale dust (i.e. rock flour). 		NO.	NO.	COUNTS	5.9'-6.5' moist.

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HOLE NO. EP-93-03

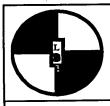
HTW DRILLING LOG HOLE NO. EP-93-03											
PROJEC High Pr	Г riority Site I	nvestigation , Fort Riley, KS		INSPECTO	DR ller/ Dave		SHEET 3 OF 5 SHEETS				
LITH.	DEPTH	DESRIPTION OF MATERIALS	FIELD SCREEN RESULTS	CORE BOX NO.	SAMPLE NO.	BLOW COUNTS	REMARKS				
		 13'-20' Shale. Brown to gray. Very easy drilling. Cuttings appear as rock flour. Shale was weathered based on easy drilling. 20'-30' Shale. Brown weathered. The drilling was very easy, smooth. Cuttings appeared as rock flour. 	0.0 ppm 0.0 ppm		NO.		Air coring produces dust as cuttings (i.e. Shale). Chips of Limestone appear as the cuttings when drilling through limestone using air rotary.				
	<u>21</u>					_l	HOLE NO.				

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		HTW	DRIL		F LO	G	HOLE NO. EP-93-03	
DJEC gh Pi	T riority Site I	nvestigation, Fort Riley, KS		INSPECT Steve K	OR		SHEET 4 OF 5 SHEETS	
Ħ.	DEPTH	DESRIPTION OF MATERIALS	FIELD SCREEN RESULTS	CORE BOX NO.	SAMPLE NO.	BLOW COUNTS	REMARKS	
		20'-30' Shale. Cont.						
	22							
	ļ							
	23							
	24 —							
	25							
	26 —							
				1				
	₿ 27 — <u></u>							
		4						
		1						
		4						
		1						
		4			1	1		

		HOLE NO. EP-93-03 SHEET 5						
ROJECT High Pr		nvestigation , Fort Riley, KS		INSPECT Steve Ke	ller/Dave :	files	OF 5 SHEETS	
LITH.	DEPTH	DESRIPTION OF MATERIALS	FIELD SCREEN RESULTS	CORE BOX NO.	SAMPLE NO.	BLOW COUNTS	R	EMARKS
	30 31 32 33 34 35 36 36	 30' Limestone. Encountered a competent limestone. Drilling became more difficult. Drill mast shook noticeably. 31' Limestone. Gray. At 31', drilling encountered a high gasoline-like odor eminating from the borehole. 31'-33.25' Limestone. Revisited borehole after further investigations. 33.3' Total Depth 	0.0 ppm 0.0 ppm				October 1993 Liquid rose to	approximately 16 tess on the rod pip

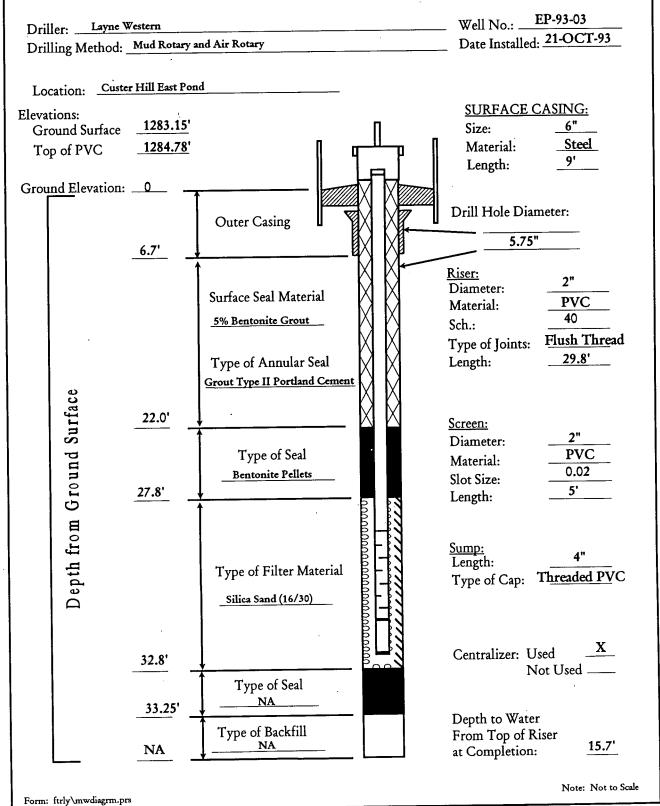
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LOUIS BERGER & ASSOCIATES, INC.

	my Corps of Engineers iley High Priority SI		High Priority SI Page 1 of 1
Prepared by:	Mike Miles (SAIC)	Date:	22-OCT-93
Checked by:		Date:	15-DEC-93

MONITORING WELL AS-BUILT DIAGRAM



WELL SPECIFICATION FORM

CLIENT: Louis Berger & Associates, Inc.
JOB NUMBER: High Priority SI
WELL OWNER: Fort Riley & HQ 1st Division
ADDRESS:
CITY, STATE, ZIP CODE: Fort Riley, Kansas 66442-6000
PHONE: (913) 239-3343
WELL NUMBER OR OTHER IDENTIFICATION: EP-93-03
WELL INSTALLATION DATE: 12 October 1993
GEOLOGIST SUPERVISING INSTALLATION: Mike Miles (SAIC)
GROUND SURFACE ELEVATION (FT): 1283.15'
TOP OF CASING ELEVATION (FT):1284.78'
WELL STICK-UP (FT):2.0'
TOTAL BORING DEPTH (FT): 33.25'
BORING DIAMETER (IN): 5.25"
TOTAL DEPTH OF OUTER CASING (FT): 6.7'
OUTER CASING MATERIAL: Steel
OUTER CASING DIAMETER (IN):4"
TOTAL DEPTH OF INNER CASING (FT. EXCLUDING SCREEN): 27.8'
INNER CASING MATERIAL: PVC
INNER CASING DIAMETER (IN):
TOTAL LENGTH OF WELL SCREEN (FT): 5'
WELL SCREEN MATERIAL:PVC
WELL SCREEN DIAMETER (FT): 0.167
SCREEN SLOT SIZE (IN):0. 020"

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WELL SPECIFICATION FORM (Cont'd)

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WELL NUMBER: EP-93-03
BACKFILL MATERIAL AROUND SCREEN: Clean Washed Sand (10-20) DEPTH RANGE OF BACKFILL (FT): 33.25' TO 25.17'
SEAL MATERIAL ABOVE SCREEN: 1/4" Bentonite Pellets
DEPTH RANGE OF SEAL (FT): 25.17' TO 22.0'
BACKFILL MATERIAL AROUND CASING: Grout
DEPTH RANGE OF BACKFILL (FT): 22.0' TO 0'
DESCRIPTION OF TOP SEAL: Grout to surface with a 3' concrete pad placed around well.
DESCRIPTION OF WELL COVER: 6" steel casing with locking cap.
OTHER ADDITIONAL INFORMATION: Well had been previously drilled to 31'. Two additional feet were drilled on October 21, 1993 to a depth of 33'. 6" of sand was placed beneath the screen bottom. Limestone layer at 31' was approx. 6"-8" thick then graded back to soften
shale. No additional cuttings could be found.

WELL DEVELOPMENT RECORD

CLIENT	F: Fort Riley - High Priority Sites	JOB NO	: High Priority SI	
FIELD	PERSONNEL: Kate Dickerson (LBA), Ed (Layne We	stern)	SHEET:	1 of 1
1.	WELL NUMBER: EP-93-03			
2.	DATE OF INSTALLATION: 21 October 1993			
3.	DATE OF DEVELOPMENT: 25 & 26 October 199	3		
4.	STATIC WATER LEVEL: BEFORE DEVELOPMEN	T (FT): 14.9' (T	o Prod.) & 15.7' (to water) 24 HC	OURS AFTER (FT):
5.	QUANTITY OF WATER LOSS DURING DRILLING,	IF USED (GAL)	:	
6.	QUANTITY OF STANDING WATER IN WELL AND	ANNULUS BEF	FORE DEVELOPMENT (GAL):	11 gal.
	· · · · · · · · · · · · · · · · · · ·	<u>START</u>	DURING	END
7.	PHYSICAL APPEARANCE	muddy	silty clear	clear
	SPECIFIC CONDUCTANCE (umhos/cm)			
	TEMPERATURE (°C)			
	pH (s.u.)			
	TURBIDITY (NTU)			14.9
8. 9.	DEPTH FROM TOP OF WELL CASING TO BOTTOM SCREEN LENGTH (FT): 5'	I OF WELL (FT)	33'	
10.	DEPTH TO TOP OF SEDIMENT: BEFORE DEVELO	PMENT (FT):	AFTER DEVELOPM	ENT (FT):
11.	TYPE AND SIZE OF WELL DEVELOPMENT EQUIP Redi-Flow submersible pump.	MENT: 1.5"	diam.x3' stainless steel bailer and	1.5" diam. Grumdfos
12.	DESCRIPTION OF SURGE TECHNIQUE, IF USED:	Surged with pur	np at successive intervals of screer	1.
13.	HEIGHT OF WELL CASING ABOVE GROUND SUR	FACE (FT):	2.0'	
14.	QUANTITY OF WATER REMOVED (GAL): 650	gal.	TIME OF REMOVAL (HR:M	1IN): 8:00

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	ING LOG					OLE NO. R-93-01				
. COMPANY NAME			2. DRILLIN		TRACTO	R			HEET 1 F 5 SH	EETS
Louis Berger & Associate 3. PROJECT	s, inc.		Layne V	4. LOCA	TION					
High Priority Site Investiga	tion, Fort Riley, KS			Nort	iwest Wa	ash Rack	Reservoir, I SIGNATION	Fort Riley,KS	<u>s</u>	
5. NAME OF DRILLER John Gornick					ow stem		SIGNATION	OF DRILL		
. SIZES AND TYPES OF 8.25" O.D. Auger					LOCAT	ION ner of res	ervoir			
DRILLING AND SAMPLING 5' continuous split spoon s EQUIPMENT				9. SURF	ACE ELE	EVATION		· · ==		
				1295	.96 E STARI			11. DATE CO	MPLETE	D
				- 50	ctober 1	993		5 Octobe		
2. OVERBURDEN THICKNESS				15. DEP 14'		UNDWAT	ER ENCOUN	TERED		
30' 3. DEPTH DRILLED INTO RO	CK			16. DEP	TH TO W		D ELAPSED	TIME AFTE	R DRILLI	NG
1'.				17. OTH	PLETED	. 12. FR LEVE	85' 1 hour	40 minutes MENTS (SPEC	CIFY)	
4. TOTAL DEPTH OF HOLE 31'				10.	06' 110	3 hour 6	October 199	3		
18. GEOTECHNICAL SAMPLE	5 DISTURBED		UNDIST	URBED	19. TC	OTAL NU	MBER OF CO	DRE BOXES		
N.A. 20. SAMPLES FOR CHEMICAL	voc	<u></u> М	IETALS	OTHER (S	PECIFY)	OTHER	(SPECIFY)	OTHER (SP	ECIFY)	21. TOTAL COP
ANALYSIS										RECOVERY
2. DISPOSITION OF HOLE	BACKFILLED	MONITY	ORING WELL	OTHER (S	PECIFY	23. SIGN	IATURE OF	INSPECTOR		<u> </u>
2. DISPOSITION OF HOLE	DACKTHALL		X					an		ten
<u> </u>		<u> </u>		DRE					0	
LITH. DEPTH DE	SRIPTION OF MATER	IALS	SCREEN B	OX SAMI		BLOW COUNTS		REMA	RKS	_
				1			Samplin		tated u	vith auger
			ĺ					No blow		
					1					ng method.
							-			
				1						
					ļ					
		wn								
	own to dark bro	WII								
	<i>y</i> .									
	mple grades to a									
lig	hter brown clay	'a 4'.								
	- 5')	r000 0**	d roots
	w to moderate	_						Organic gr througho		
		na amd	1 1							
	asticity. Massiv nse.	ve and	0 ppm	N.A. N	.A.		Very m		ut uie	Sampio.

Fort Riley High Priority Site Investigations

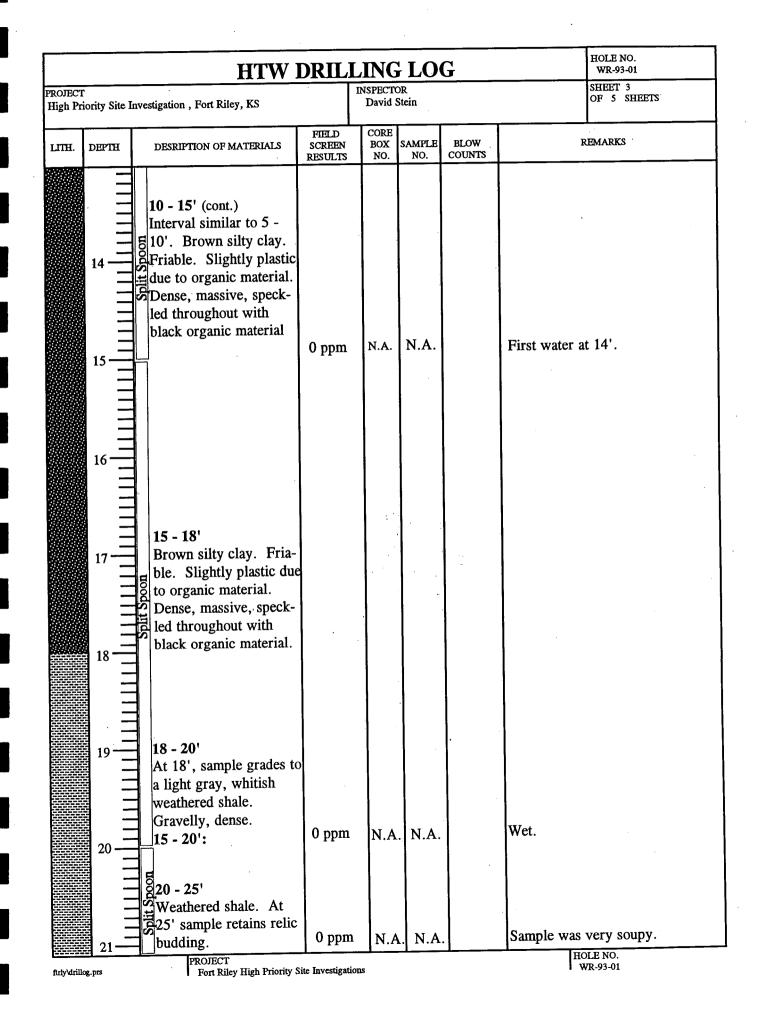
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	HOLE NO. WR-93-01						
PROJECT High Priority Site In	HTW .		INSPEC			SHEET 2 OF 5 SHEETS	
LITH. DEPTH	DESRIPTION OF MATERIALS	FIELD SCREEN RESULTS	CORE BOX NO.	SAMPLE NO.	BLOW COUNTS		REMARKS
	5 - 10' Brown silty clay. Friable. Slightly plastic due to organic material. Dense, massive, speck-led throughout with black organic material.	0 ppm	N.A			Dry.	
13	PROJECT Fort Riley High Priority					Н	OLE NO. WR-93-01

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Fort Riley High Priority Site Investigations



25		HOLE NO. WR-93-01					
International size internation in terms (international size international size internatione size international size international size international	PROJECT		INS	SPECTOR			
LTH. DEFIN DESERTION OF MATERIALS SCREEN BOX SAMPLE BOW REMARKS 22 23 23 24 24 24 24 20 25 (cont.) 24 20 25 (cont.) Weathered shale. At 25 0 ppm N.A. N.A. N.A. Sample was very soupy. Weathered shale and limestone). 25 26 26 26 27 27 28 25 30' Sample is similar to the	High Priority Site Inv	restigation, Fort Riley, KS	I	David Ste	in		UF 5 SHEETS
23	LITH. DEPTH	DESRIPTION OF MATERIALS	SCREEN	BOX			REMARKS
sequence from 20 - 25'. 0 ppm N.A. N.A. 29 Weathered shale. 0 ppm N.A. N.A.	23 24 25 26 27 28	 encountered at 24.5'. 20 - 25' (cont.) Weathered shale. At 25 sample retains relic budding. budding. 25 - 30' Sample is simialr to the sequence from 20 - 25' 	0 ppm				Soupy

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Fort Riley High Priority Site Investigations

	HOLE NO. WR-93-01						
ROJECT Iigh Priorit	ROJECT Iigh Priority Site Investigation, Fort Riley, KS			LING INSPECTO David S)R	SHEET 5 OF 5 SHEETS	
LITH. DE	EPTH DESI	RIPTION OF MATERIALS	FIELD SCREEN RESULTS	CORE BOX NO.	SAMPLE NO.	BLOW COUNTS	REMARKS
31	0	30' (cont.) uple is simialr to the uence from 20 - 25'. athered shale.	SCREEN RESULTS	BOX NO.			REMARKS Soupy Competent bedrock encountered 30'. Sample fizzed when acid was dropped on sample. Wet. Total depth = 31'.
3	34						· · · · · · · · · · · · · · · · · · ·

B	OUIS BERGER & SSOCIATES, INC.	Client: U.S. Army Corps of Er Project: Ft. Riley High Prior Prepared by: Steve Keller Checked by:	Date: <u>8-OCT-93</u>
Driller: Layne V	Vestern	VELL AS-BUI	
	r Hill Wash Rack Reservoir	r	SURFACE CASING:
Elevations: Ground Surface Top of PVC	1278.49' 1281.67'		Size: <u>NA</u> Material: <u>NA</u> Length: <u>NA</u>
Ground Elevation:	_0Outer 0	Casing	Drill Hole Diameter: NA 8"
υ	Surface S <u>5% Bent</u> Type of	Seal Material onite Grout Annular Seal rout w/5% Bentonite	Riser:2"Diameter:2"Material:PVCSch.:40Type of Joints:Flush ThreadLength:15'
n Ground Surface	1021 Be	pe of Seal entonite Pellets, ated 12 hours	Screen:2"Diameter:2"Material:PVCSlot Size:0.02Length:15'
Depth from Ground		f Filter Material	Sump: Length: 0.4' Type of Cap: Threaded PVC
		be of Seal	Centralizer: Used <u>X</u> Not Used <u>—</u>
		of Backfill ntonite Pellets	Depth to Water From Top of Riser at Completion:
Form: ftrly\mwdiagrm.pr	s		Note: Not to Scale

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WELL SPECIFICATION FORM

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CLIENT: Louis Berger & Associates, Inc.
JOB NUMBER: High Prioiry Sites
WELL OWNER: Fort Riley & HQ 1st Division
ADDRESS:
CITY, STATE, ZIP CODE: Fort Riley, Kansas 66442-6000
PHONE: (913) 239- 3343
WELL NUMBER OR OTHER IDENTIFICATION: WR-93-01
WELL INSTALLATION DATE: 6 October 1993
GEOLOGIST SUPERVISING INSTALLATION: Dave Stein
GROUND SURFACE ELEVATION (FT): 1278.49'
TOP OF CASING ELEVATION (FT): 1281.67'
WELL STICK-UP (FT): 3'
TOTAL BORING DEPTH (FT): 27.0'
BORING DIAMETER (IN): 8.25"
TOTAL DEPTH OF OUTER CASING (FT): 5' Protective Casing
OUTER CASING MATERIAL: Steel
OUTER CASING DIAMETER (IN): 4"
TOTAL DEPTH OF INNER CASING (FT. EXCLUDING SCREEN): 12'
INNER CASING MATERIAL: PVC
INNER CASING DIAMETER (IN): 2"
TOTAL LENGTH OF WELL SCREEN (FT): 15'
WELL SCREEN MATERIAL: PVC
WELL SCREEN DIAMETER (FT): 0.167
SCREEN SLOT SIZE (IN): 020

WELL SPECIFICATION FORM (Cont'd)

WELL NUMBER: WR-93-01	
BACKFILL MATERIAL AROUND SCREEN:	Silica Sand
DEPTH RANGE OF BACKFILL (FT): 2	7' TO 17.7'
SEAL MATERIAL ABOVE SCREEN: Be	entonite Slurry
DEPTH RANGE OF SEAL (FT): 17.7' TO) 4.7'
BACKFILL MATERIAL AROUND CASING:	Grout
DEPTH RANGE OF BACKFILL (FT): 4.7	······································
DESCRIPTION OF TOP SEAL:	
DESCRIPTION OF WELL COVER:	
OTHER ADDITIONAL INFORMATION:	
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WELL DEVELOPMENT RECORD

CLIENT	: Fort Riley	- High Priority Si	tes	JOB NO): High Priori	ty SI				
FIELD P	ERSONNEL:	Steve Keller (S	AIC)			SHEET:	1 of	1		
1.	WELL NUM	BER: WR-93-	01							
2.	DATE OF INSTALLATION: 6 October 1993									
3.	DATE OF DE	EVELOPMENT:	10 & 11 Octobe	er 1993						
4.	STATIC WAT	FER LEVEL: BE	FORE DEVELOP	MENT (FT): 10.85	5 (bls) 24 HC	OURS AFTER (FT	j): _			
5.	QUANTITY	OF WATER LOS	S DURING DRILI	LING, IF USED (GAI	.):0					
6.	QUANTITY	OF STANDING V	VATER IN WELL	, AND ANNULUS BE	FORE DEVELO	PMENT (GAL):	11 gal.			
				START	DU	RING		<u>END</u>		
7.	PHYSICAL A	PPEARANCE		slightly cloudy	clear	clear	-	clear		
	SPECIFIC CO	NDUCTANCE (u	mhos/cm)	440		420	-	442		
	TEMPERATU	RE (°C)		14.8	15.2	13.8	-	14.5		
	pH (s.u.)			6.42	6.65	6.17	-	6.50		
	TURBIDITY (NTU)		323	2.4	11.7	-	4.1		
8. 9. 10.	SCREEN LEN	IGTH (FT): 15'		TTOM OF WELL (F1		fer developmi	ENT (FT)			
11.	<u>Redi-Flow</u> sub	mersible pump.	EVELOPMENT E		-	ss steel bailer and		. Grumdfos		
12.	DESCRIPTIO	N OF SURGE TE	CHNIQUE, IF U	SED: Surged with p		intervals of screen				
13.	HEIGHT OF	WELL CASING A	ABOVE GROUNE	SURFACE (FT):	3.0'					
14.	QUANTITY (OF WATER REM	OVED (GAL):	802 gal.	TIME OF	REMOVAL (HR:	MIN): 4	4:08		
			· ·							

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	HTW DRILLIN							NG LOG HOLE NO. WR-93-02						
1. COMPAN	Y NAME					2. DRILLING	G SUI	SCONTR	ACTOR	Ł			SHEET 1 OF 6 SH	EETS
Louis B	erger & As	sociates, l	nc.			Layne W	ester	n – Wit LOCATI	chita, I	<u>(s</u>				
3. PROJECT		vectiontio	n F	ort Riley, KS				Northw	est Wa	sh Rack F	leservoir,	Fort Riley	,KS	
5. NAME OF		ivesugauo	<u> </u>	011 1010), 120			6.	MANUF	ACTUR	ER'S DES	IGNATION	OF DRILL	Ĺ	
John Gor	nick				<u> </u>	<u> </u>	1_	Hollow HOLE L						· · · · ·
7. SIZES AN	D TYPES C	F IN DIG		8.25" O.D. /	uger	oon sampler	- ^{8.}	Southea	st com	er of rese	rvoir			
EQUIPMI	G AND SAN ENT	IPLING		5 conditious	apin ap	Son Sumptor	9.	SURFAC	EELE	VATION				
							-	1295.9		FD		11. DATE	COMPLETE	D
							1	5 Oct	ober 1	993		5 Oc	tober 1993	
12. OVERBU	JRDEN THI	CKNESS					15	. DEPTH 31.2'	GROU	NDWATE	R ENCOUN	TERED		
38.5'							16	DEPTE	TO W	ATER AN	D ELAPSEI) TIME AF	TER DRILLI	NG
13. DEPTH : 0.5'	DRILLED I	NIO ROCK	•					COMPI	ETED.	22.6	BLS, 3.5 MEASURE	hours		
14. TOTAL	DEPTH OF	HOLE					17	. OTHEI 15.11	7:43	ER LEVEL hour 700	tober 1992	MENIS (C	, i Le li 1)	
39' 18. GEOTEC	TINICAL S	AMPLES		DISTURBED		UNDIST	URBI	ED	19. TC	TAL NUM	BER OF C	ORE BOXI	ES	
N.A.	-INICAL S											Loguro	(CDECIEN)	21. TOTAL CORE
20. SAMPL		EMICAL		VOC	M	IETALS	OTH	IER (SPI	CIFY)	OTHER	(SPECIFY)	OTHER	(SPECIFY)	RECOVERY
ANALY	SIS													
22. DISPOS	TTON OF H		B	ACKFILLED	MONIT	ORING WELL	OTI	IER (SPI	CIFY)	23. SIGN	ATURE OF	INSPECT	OR	\sim
22. DISPOS					1	X						Sth	or K	Jun-
					<u></u>		ORE		<u> </u>	L			·	
LITH.	DEPTH	DESR	IPTI	ON OF MATERL	ALS	SCREEN B	OX NO.	SAMPL NO.		BLOW OUNTS		R	EMARKS	
-						RESULTS	10.							
				Road Fill C										
				ay-brown to	5									
				poorly	• . •									
				lated clay w										
	1	mino	or a	ngular grav	el.									
		Dry	anc	l non-plasti dium olive	с,									
				nottles, 1.5'										
	=	gree	11 11	1011103, 1.5	1.0 .									
		1 1 8'	_ 4 '	Lost recove	erv.									
	2			Dost iccord	, j ,			·						
		Ö												
		S												
	al 3 —													
		1						ł						
	S _													
		-	.					·						
	× –			Road Fill. C										
				covered, lig	giit		l							
		$\left \right _{1}^{\text{olv}}$	ve-g	green and clay, as 0'	-1 8'									
			UK (ciay, as U	1.0		1				Dev			
						0 ppm					Dry.		TOT D MO	
			PI	ROJECT Fort Riley High I								1	HOLE NO. WR-93-02	

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	HOLE NO. WR-93-02					
PROJECT High Priority Site	HTW DRILL PROJECT High Priority Site Investigation , Fort Riley, KS					SHEET 2 OF 6 SHEETS
LITH. DEPTH	DESRIPTION OF MATERIALS	FIELD SCREEN RESULTS	CORE BOX NO.	SAMPLE NO.	BLOW COUNTS	REMARKS
6 7 8	4'-9' Road Fill. Cont.					
9 — 10 — 11 — 12 —	9'-10.3' Road Fill. Brown clay with limestone gravel, dry. 10.3'-12.2' Clay. Native (weathered formation) Light gray-green with abundant brown and black mottling and black fracture coatings. Dry to moist, plastic, with interbedded maroon zones. 12.2'-14' Silt. Weak, maroon to light maroon-gray, almost dry, nonplastic, well sorted, with little or no clay. Minor lamination and fissility.	,				Dry to moist.

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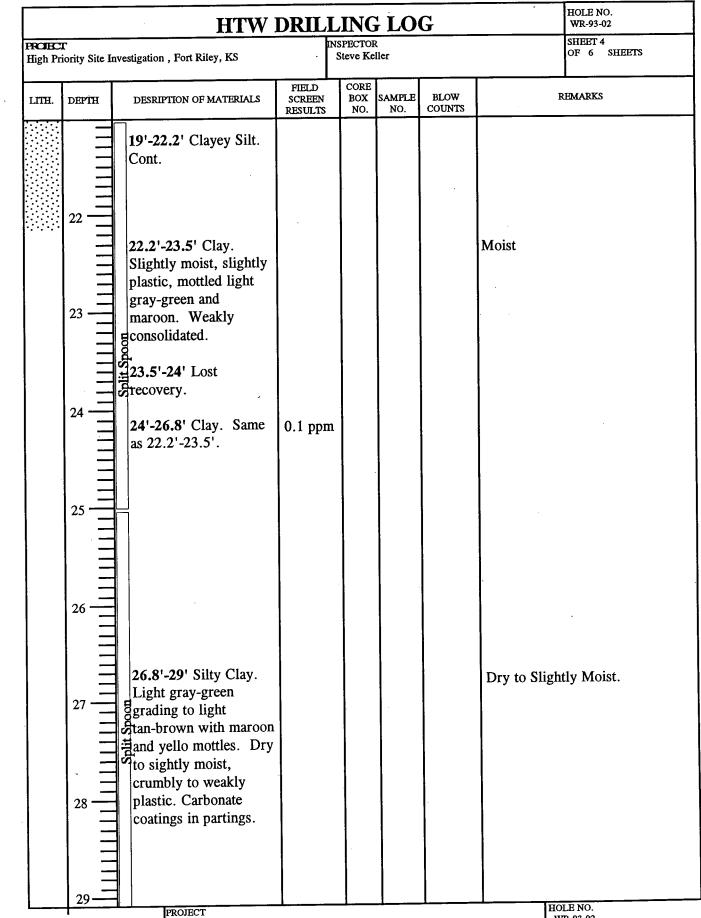
PROJECT Fort Riley High Priority Site Investigations -- ash Rack HOLE NO. WR-93-02

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;		HOLE NO. WR-93-02						
ROJECT ligh Pri	ority Site Inv	vestigation, Fort Riley, KS	I	NSPECTO Steve H				SHEET 3 OF 6 SHEETS
LITH.	DEPTH	DESRIPTION OF MATERIALS	FIELD SCREEN RESULTS	CORE BOX NO.	SAMPLE NO.	BLOW COUNTS		REMARKS
		12.2'-14' Clay. Cont.						
		14'-16.5' Silt. Variegated maroon, maroon-gray; dry. Minor clay content, and wak lamination and fissility. Nonplastic,	0.1 ppm				Dry.	
		well sorted.						
	17	16.5'-17.3' Clay. Silty clay, sight gray-green, dry, blocky fracture, minor maroon mottling					Dry.	
		17.3'-18.2' Silt. Maroon, dry, nonplastic, with weak fissility.						
	19	18.2'-19' Lost recovery.					Dev	
	20	19'-22.2' Clayey Silt. (or Silty Clay) Dry, nonplastic, weakly consolidated, fissility poor to none. Intercalated light	0.1 ppm				Dry.	,
		gray-green and deep maroon. Well sorted.						

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Fort Riley High Priority Site Investigations -- Wash Rack



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Fort Riley High Priority Site Investigations -- Wash Rack

WR-93-02

HTW DRILLING LOG HOLE NO. WR-93-02										
PROJECT High Priority Site I	Investigation, Fort Riley, KS		INSPECTOR Steve Keller			SHEET 5 OF 6 SHEETS				
LIIH. DEPIH	DESRIPTION OF MATERIALS	FIELD SCREEN RESULTS	CORE BOX NO.	SAMPLE NO.	BLOW COUNTS	REMARKS				
	29'-31.2' Lost recovery. 31.2'-31.8' Clay. Mott- led gray-green, saturated, with maroon and tan mottles. Driller says possible loss and water bearingzone in 31.8'-34'. 34'-34.4' Lost recovery, except for mixed noncohesive clay and silt. Wet. 34.4'-37' Claystone. Hard, with saturated fractures, zone of moisture.	RESULTS	NO.	NO.	COUNTS	Wet.				
37						HOLE NO.				

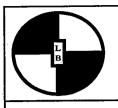
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PROJECT Fort Riley High Priority Site Investigations -- Wash Rack WR-93-02

	HOLE NO. WR-93-02						
FROHECT High Priority Site Investigation, Fort Riley, KS				R ler			SHEET 6 OF 6 SHEETS
LITH. DEPTH	DESRIPTION OF MATERIALS	FIELD SCREEN RESULTS	CORE BOX NO.	SAMPLE NO.	BLOW COUNTS		REMARKS
	37'- 38.5' Claystone. Hard, with saturated fractures, zone of moisture. 38.5'-39' Limestone. Dry, gray, well indurated, fine-grained. 39' Total Depth.					Saturated. 39' Stopped	Drilling.

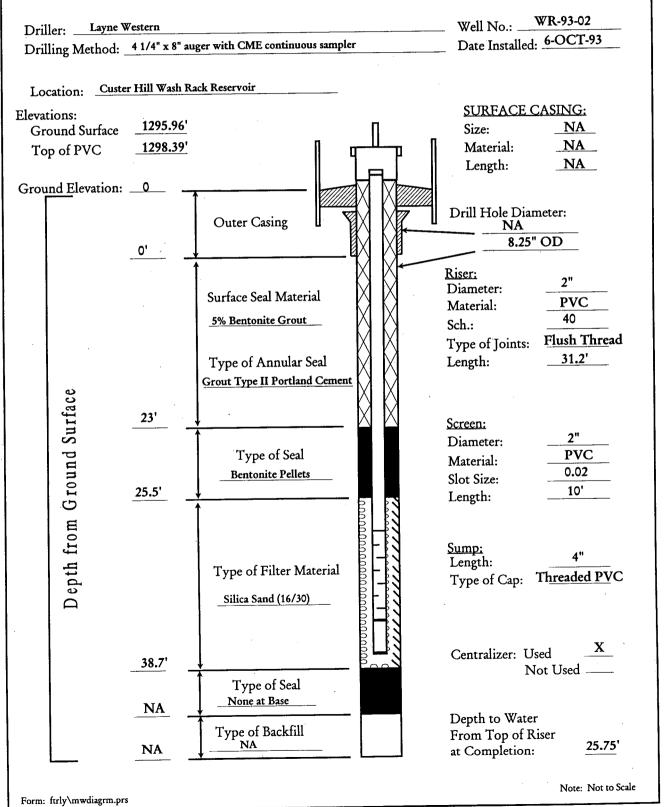
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LOUIS BERGER & ASSOCIATES, INC.

Client: U.S. Army Corps of Engineers Project: Ft. Riley High Priority SI	Project No.: High Priority SI Page: Page 1 of 1
Prepared by: Dave Stein	Date: <u>8-OCT-93</u>
Checked by:	Date:

MONITORING WELL AS-BUILT DIAGRAM



WELL SPECIFICATION FORM

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WELL SPECIFICATION FORM (Cont'd)

WELL NUMBER: WR-93-02
BACKFILL MATERIAL AROUND SCREEN: Silica Sand
DEPTH RANGE OF BACKFILL (FT): 38.7' TO 25.5'
SEAL MATERIAL ABOVE SCREEN: Bentonite Pellets
DEPTH RANGE OF SEAL (FT): 25.5' TO 23'
BACKFILL MATERIAL AROUND CASING: Grout (Type II Portland Cement)
DEPTH RANGE OF BACKFILL (FT):
DESCRIPTION OF TOP SEAL:
DESCRIPTION OF WELL COVER:
OTHER ADDITIONAL INFORMATION:

WELL DEVELOPMENT RECORD

	PERSONNEL: Steve	Keller (SA	JC)				SHEET:	1 of	1
	WELL NUMBER:	WR-93-0	12						
	DATE OF INSTALLA		6 October 1993						
	DATE OF DEVELOP	_	11 October 1993	<u>. </u>		<u> </u>			
	STATIC WATER LEV	-		MENT (FT):	24.1 (bl	s) 24 HC	URS AFTER (FT)	:	
	QUANTITY OF WAT			-) (GAL):	0			
	QUANTITY OF STAI					DRE DEVELO	PMENT (GAL):	21 gal	
	2								
				<u>START</u>			JRING		<u>END</u>
•	PHYSICAL APPEARA	NCE		almost clear	al	most clear	clear		clear
	SPECIFIC CONDUCT	ANCE (ur	nhos/cm)	670		630	620		620
	TEMPERATURE (°C)			16.3		15.5	15.5		15.1
	pH (s.u.)			6.59	-	6.61	6.52		6.51
	TURBIDITY (NTU)			35.9			8.8		6.7
						a 0 7 1			
	DEPTH FROM TOP C	OF WELL	CASING TO BOT	TOM OF WE	LL (FT):	38.7'			
	DEPTH FROM TOP C		CASING TO BOT	TOM OF WE	LL (FT):	38.7			
).	SCREEN LENGTH (F	°T): 10'					TER DEVELOPM	ENT (F	
•	SCREEN LENGTH (F DEPTH TO TOP OF S	°T): 10' SEDIMEN	T: BEFORE DEV	VELOPMENT	(FT):	AF			
0.	SCREEN LENGTH (F	°T): 10' SEDIMEN	T: BEFORE DEV	VELOPMENT	(FT):	AF	TER DEVELOPM		
0.	SCREEN LENGTH (F DEPTH TO TOP OF S TYPE AND SIZE OF <u>Redi-Flow submersible</u>	T): 10' SEDIMEN WELL DE	T: BEFORE DEV	VELOPMENT QUIPMENT:	(FT): - 1.5" d	AF	ess steel bailer and	1.5" dia	
0. 1.	SCREEN LENGTH (F DEPTH TO TOP OF S TYPE AND SIZE OF	T): 10' SEDIMEN WELL DE	T: BEFORE DEV	VELOPMENT QUIPMENT:	(FT): - 1.5" d	AF	ess steel bailer and	1.5" dia	
3. 0. 10. 11.	SCREEN LENGTH (F DEPTH TO TOP OF S TYPE AND SIZE OF <u>Redi-Flow submersible</u> DESCRIPTION OF SU	T): 10' SEDIMEN WELL DE	T: BEFORE DEV VELOPMENT EC CHNIQUE, IF US	VELOPMENT QUIPMENT: ED: Surged	(FT): 	AF iam.x3' stainle p at successive	ess steel bailer and	1.5" dia	
). 10. 11.	SCREEN LENGTH (F DEPTH TO TOP OF S TYPE AND SIZE OF Redi-Flow submersible DESCRIPTION OF SU HEIGHT OF WELL C	T): 10' SEDIMEN WELL DE pump. URGE TEC	T: BEFORE DEV VELOPMENT EC CHNIQUE, IF US BOVE GROUND	VELOPMENT QUIPMENT: ED: Surged SURFACE (F	(FT): 	AF iam.x3' stainle p at successive .5'	ess steel bailer and e intervals of screer	1.5" dian	n. Grun
). 0. 11. 12.	SCREEN LENGTH (F DEPTH TO TOP OF S TYPE AND SIZE OF <u>Redi-Flow submersible</u> DESCRIPTION OF SU	T): 10' SEDIMEN WELL DE pump. URGE TEC	T: BEFORE DEV VELOPMENT EC CHNIQUE, IF US BOVE GROUND	VELOPMENT QUIPMENT: ED: Surged	(FT): 	AF iam.x3' stainle p at successive .5'	ess steel bailer and	1.5" dian	
0. 1. 12.	SCREEN LENGTH (F DEPTH TO TOP OF S TYPE AND SIZE OF Redi-Flow submersible DESCRIPTION OF SU HEIGHT OF WELL C	T): 10' SEDIMEN WELL DE pump. URGE TEC	T: BEFORE DEV VELOPMENT EC CHNIQUE, IF US BOVE GROUND	VELOPMENT QUIPMENT: ED: Surged SURFACE (F	(FT): 	AF iam.x3' stainle p at successive .5'	ess steel bailer and e intervals of screer	1.5" dian	n. Grun
0. 1. 2.	SCREEN LENGTH (F DEPTH TO TOP OF S TYPE AND SIZE OF Redi-Flow submersible DESCRIPTION OF SU HEIGHT OF WELL C	T): 10' SEDIMEN WELL DE pump. URGE TEC	T: BEFORE DEV VELOPMENT EC CHNIQUE, IF US BOVE GROUND	VELOPMENT QUIPMENT: ED: Surged SURFACE (F	(FT): 	AF iam.x3' stainle p at successive .5'	ess steel bailer and e intervals of screer	1.5" dian	n. Grun
). 10. 11. 12. 13.	SCREEN LENGTH (F DEPTH TO TOP OF S TYPE AND SIZE OF Redi-Flow submersible DESCRIPTION OF SU HEIGHT OF WELL C	T): 10' SEDIMEN WELL DE pump. URGE TEC	T: BEFORE DEV VELOPMENT EC CHNIQUE, IF US BOVE GROUND	VELOPMENT QUIPMENT: ED: Surged SURFACE (F	(FT): 	AF iam.x3' stainle p at successive .5'	ess steel bailer and e intervals of screer	1.5" dian	n. Grun
). 10. 11. 12.	SCREEN LENGTH (F DEPTH TO TOP OF S TYPE AND SIZE OF Redi-Flow submersible DESCRIPTION OF SU HEIGHT OF WELL C	T): 10' SEDIMEN WELL DE pump. URGE TEC	T: BEFORE DEV VELOPMENT EC CHNIQUE, IF US BOVE GROUND	VELOPMENT QUIPMENT: ED: Surged SURFACE (F	(FT): 	AF iam.x3' stainle p at successive .5'	ess steel bailer and e intervals of screer	1.5" dian	n. Grun

LOUIS BERGER AND ASSOCIATES, INC. WELL DEVELOPMENT FORM

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			<u> </u>	НТ	WI	DRILI	IN	GL	00				HOLE NO. WR-93-03	
1. COMPAN						2. DRILL	NG SU	BCONT	ACTO	R			SHEET 1 OF 5 SE	UPETS
	Berger & A	ssocia	ates, Inc.			Layne		m Wi		<u>KS</u>			01 5 51	
3. PROJECT High Pri	r iority Site I	nvesti	igation , I	Fort Riley, KS				Northw	est W	ash Rack	Reservoir,	Fort Riley	KS	
5. NAME O							6.				SIGNATION	OF DRILL		
John Go				8.25" O.D.	Auger		- 8	Holiow stem auger 8. HOLE LOCATION						
7. SIZES AL DRILLIN	ND TYPES (IG AND SAI	of MPLIN	١G	5' continuou		oon sample	oler Northwest corner of reservoir							
EQUIPM							^{9.}	9. SURFACE ELEVATION 1288.13						
								0. DATE	STAR			11. DATE	COMPLET	ED
								6 Oct					ober 1993	
12. OVERB 34'	URDEN THI	ICKNI	ESS					47.0	- 48.0	11	R ENCOUN			
	DRILLED I	NTO I	ROCK	<u></u>			1				D ELAPSED 5' 1 hour 1	TIME AF	TER DRILL	ING
N.A.				<u> </u>				COMPI	NAT	ER LEVEI	MEASURE	MENTS (S	PECIFY)	
14. TOTAL 34'	DEPTH OF	HOLI	3				ſ	15.11	' 7:4	3 hour 7	October 19	992		
	CHNICAL S	AMPI	ES	DISTURBED		UNDI	STURB	ED	19. T	DTAL NU	MBER OF CO	ORE BOXE	S	
N.A.	TA DOD OU	100		VOC	<u>, </u>	IETALS	Тот	HER (SPI	CIFY	OTHER	(SPECIFY)	OTHER (SPECIFY)	21. TOTAL CORE
20. SAMPL ANALY	ES FOR CH	EMIC.	^L	VUC	<u> </u>						<u> </u>	·		RECOVERY
1														
22. DISPOS	ITION OF H	IOLE	B	ACKFILLED	MONIT	ORING WELL	OT	HER (SPI	CIFY)	23. SIGN	ATURE OF	INSPECTO	∩ →	Ft.
						Х					<		and	Alen
LITH.	DEPTH	 	DESRIPTIO	ON OF MATERI	ALS		CORE BOX NO.	SAMPL NO.		BLOW COUNTS		RE	MARKS	
		Π									Samplir	ng was i	rotated v	with auger
													ow coun	
														ing method.
											_			
	1													
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	2													
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	<u>ا م</u>													
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]							
			0 - 5'				1							
		- H I I I	-	silty clay.	Mass	4		ł						
	g			ense. Orga							1			
				1 speckled										
		7	through	nout sample	e fill									
]	materia	ıl.		0 ppm	N.A	. N.	A .		Dry.			
	×L	ليب		OFCT		-+	-					нс	LE NO.	

Fort Riley High Priority Site Investigations

WR-93-03

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		HTW	DRIL	LIN	G LO	G		HOLE NO. WR-93-03	
PROJEC High Pr	T riority Site I	nvestigation, Fort Riley, KS		INSPEC				SHEET 2 OF 5 SHEET	S
LITH.	DEPTH	DESRIPTION OF MATERIALS	FIELD SCREEN RESULTS	CORE BOX NO.	SAMPLE NO.	BLOW COUNTS		REMARKS	:
	$\begin{array}{c} \\ \\ \\ \\ \\ \\ \\ \\ \\ \\ \\ \\ \\ \\ \\ \\ \\ \\ \\$	5 - 10' Brown silty clay. Mass ive. Dense. Sample stratigraphy is similar to 0 - 5' interval. 10 - 15' Interval similar to 5 - 10'. Brown silty clay. Massive. Dense.					Dry.		
		PROJECT						HOLE NO.	

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Fort Riley High Priority Site Investigations

WR-93-03

PROJECT High Priority Site Investigatio	HTW DRILLING LOG PROJECT INSPECTOR High Priority Site Investigation , Fort Riley, KS Inspector									
		David S	R tein			SHEET 3 OF 5 SHEETS				
LITH. DEPTH DESR	IPTION OF MATERIALS	FIELD SCREEN RESULTS	CORE BOX NO.	SAMPLE NO.	BLOW COUNTS		REMARKS			
$= 10^{\circ}.$	15' (cont.) val similar to 5 - Brown silty clay. sive. Dense.	0 ppm	N.A.	N.A.						
20	bon and gray bonded silty clay. ble. Encountered op of a weathered e zone.	0 ppm 0 ppm	N.A.	N.A.		Dry.				

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Fort Riley High Priority Site Investigations

WR-93-03

	HTW		LING		G	<u>.</u>	HOLE NO. WR-93-03
OJECT			NSPECTOR		<u> </u>		SHEET 4
gh Priority Site	Investigation, Fort Riley, KS		David Ste	in .			OF 5 SHEETS
ITH. DEPTH	DESRIPTION OF MATERIALS	FIELD SCREEN RESULTS	CORE BOX NO.	SAMPLE NO.	BLOW COUNTS		REMARKS
	20 - 25' (cont.) Sample grades to a greenish gray silty clay. At 25' sample graded into a maroon silty clay interbedded with a greenish silty clay.			N.A.		First water a Dry sample, sample at 24	however the tip of th
29-	25 - 30' Sample is similar to the interval 20 - 25'. Relic bedding is apparent.		N.A	. N.A.		Dry. Sampl wet stringers weathered.	e is very dense with s, where material is

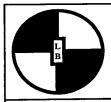
	HTW	DRILI	LING I	.00	Ĵ	•	HOLE NO. WR-93-03
ROJECT			INSPECTOR David Steir				SHEET 5 OF 5 SHEETS
High Priority Site	Investigation, Fort Riley, KS						
LITH. DEPTH	DESRIPTION OF MATERIALS	FIELD SCREEN RESULTS		IPLE IO.	BLOW COUNTS	F	EMARKS
	At 25.5' exits a 2" zone of weathered maroon shale. 25 - 30' (cont.) Sample is similar to the interval 20 - 25'. Relic bedding is apparent. 30 - 34' Sample represents a weathered zone. Broken fragments of limestone and weather- ed sandy limestone. Light brown and gray.	0 ppm	N.A. N	.A.		wet stringers, weathered.	is very dense with where material is edrock at 34'. = 34'.

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PROJECT Fort Riley High Priority Site Investigations ι

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LOUIS BERGER & ASSOCIATES, INC.

Client: U.S. Army Corps of Engineers Project: Ft. Riley High Priority SI	•
Prepared by: Dave Stein	Date: <u>7-OCT-93</u>
Checked by:	Date:

MONITORING WELL AS-BUILT DIAGRAM

Driller: <u>Layne</u>	Western		Well No.:	WR-93-03
Drilling Method:	4 1/4" x 8" au	iger with CME continuous sampler	Date Installe	d: <u>7-OCT-93</u>
Location: Cust	er Hill Wash R	ack Reservoir		
Elevations:			SURFACE	CASING:
Ground Surface	1288.13'	Π	Size:	_NA_
Top of PVC	1290.37'		Material:	<u>NA</u>
Ground Elevation:			Length:	NA
		Outer Casing	Drill Hole Dia	ameter:
	0'		8.2	
Ð		Surface Seal Material <u>5% Bentonite Grout</u> Type of Annular Seal <u>Grout Type II Portland Cement</u>	<u>Riser:</u> Diameter: Material: Sch.: Type of Joints: Length:	2" <u>PVC</u> 40 <u>Flush Thre</u> ad 21.25'
Ground Surface			Screen:	2"
q (0		Type of Seal	Diameter: Material:	PVC
u n		Bentonite Pellets	Slot Size:	0.02
l Gro	16' _		Length:	15'
Depth from		Type of Filter Material	<u>Sump:</u> Length: Type of Cap:	4" Threaded PVC
	34.0'		Centralizer: U I	Jsed X Not Used
	NA	Type of Seal <u>None at Base</u>	Depth to Wat	Ar
	NA	Type of Backfill	Depth to Wate From Top of 1 at Completion	Riser
				Note: Not to Scale

Note: Not to Scale

WELL SPECIFICATION FORM

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CLIENT: Louis Berger & Associates, Inc.
JOB NUMBER: High Priority SI
WELL OWNER: Fort Riley & HQ 1st Division
ADDRESS:
CITY, STATE, ZIP CODE: Fort Riley, Kansas
PHONE: (913) 239-3343
WELL NUMBER OR OTHER IDENTIFICATION: WR-93-03
WELL INSTALLATION DATE: 7 October 1993
GEOLOGIST SUPERVISING INSTALLATION: Dave Stein
GROUND SURFACE ELEVATION (FT): 1288.13'
TOP OF CASING ELEVATION (FT): 1290.37'
WELL STICK-UP (FT): 2.25'
TOTAL BORING DEPTH (FT): 34'
BORING DIAMETER (IN): 8.25"
TOTAL DEPTH OF OUTER CASING (FT): 5' Protective Casing
OUTER CASING MATERIAL: Steel
OUTER CASING DIAMETER (IN):4"
TOTAL DEPTH OF INNER CASING (FT. EXCLUDING SCREEN): 19'
INNER CASING MATERIAL: PVC
INNER CASING DIAMETER (IN): 2"
TOTAL LENGTH OF WELL SCREEN (FT): 15'
WELL SCREEN MATERIAL: PVC
WELL SCREEN DIAMETER (FT): 0.167
SCREEN SLOT SIZE (IN): 020

WELL SPECIFICATION FORM (Cont'd)

WELL NUMBER: WR-93-03
BACKFILL MATERIAL AROUND SCREEN: Silica Sand
DEPTH RANGE OF BACKFILL (FT): 34' TO 16'
SEAL MATERIAL ABOVE SCREEN: Bentonite Pellets
DEPTH RANGE OF SEAL (FT): 16' TO 14'
BACKFILL MATERIAL AROUND CASING: Grout (Type II Portland Cement)
DEPTH RANGE OF BACKFILL (FT): 0'
DESCRIPTION OF TOP SEAL:
DESCRIPTION OF WELL COVER:
OTHER ADDITIONAL INFORMATION:

LOUIS BERGER AND ASSOCIATES, INC. WELL SPECIFICATION FORM

;

DECEMBER 1993

WELL DEVELOPMENT RECORD

CLIENT:	Fort Riley - High Priority Si	tes	JOB N	O: High Priority	' SI		
FIELD P	ERSONNEL: Steve Keller (S	AIC) , Julie Jaglowsk	i (LBA), Randy Sr	nith (Layne)	SHEET:	1 of	1
1.	WELL NUMBER: WR-93	03					
2.	DATE OF INSTALLATION:	7 October 1993					
3.	DATE OF DEVELOPMENT:	12 October 1993	<u></u>			<u></u>	
4.	STATIC WATER LEVEL: BE	FORE DEVELOPME	ENT (FT): 13.1	(bls) 24 HOU	RS AFTER (FT):		
5.	QUANTITY OF WATER LOS	S DURING DRILLIN	G, IF USED (GA	L): 0			
6.	QUANTITY OF STANDING	VATER IN WELL A	ND ANNULUS BI	EFORE DEVELOP	MENT (GAL):	17 gal.	
			<u>START</u>	DUR	ING		<u>END</u>
7.	PHYSICAL APPEARANCE	S	lightly cloudy	almost clear	clear	_	clear
	SPECIFIC CONDUCTANCE (u	mhos/cm)	480	413	445	_	430
	TEMPERATURE (°C)		16.2	16.6	16.2	_	16.0
	pH (s.u.)		6.73	6.95	6.91	_	6.47
	TURBIDITY (NTU)		108	44.7	30.8	-	22.0
			ON OF WELL (F	Г): 34'			
8.	DEPTH FROM TOP OF WELL		UM OF WELL (F	1). J 4		-	
9.	SCREEN LENGTH (FT): 15		LODMENT (ET):		ER DEVELOPMEN		
10.	DEPTH TO TOP OF SEDIMEN	11: BEFORE DEVE	LOPMENT (FT).	Al II			
11.	TYPE AND SIZE OF WELL D	EVELOPMENT EQU	JIPMENT: 1.5	5" diam.x3' stainless	s steel bailer and 1.	5" diam.	Grumdf
	Redi-Flow submersible pump.						
12.	DESCRIPTION OF SURGE TE	CHNIQUE, IF USEI	D: Surged with p	oump at successive i	ntervals of screen.		
			······································	<u></u>			
13.	HEIGHT OF WELL CASING	ABOVE GROUND SI	URFACE (FT):	2.25'			
14.	QUANTITY OF WATER REM	OVED (GAL): 6	521 gal.	TIME OF R	EMOVAL (HR:MI	N): 6:	27

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