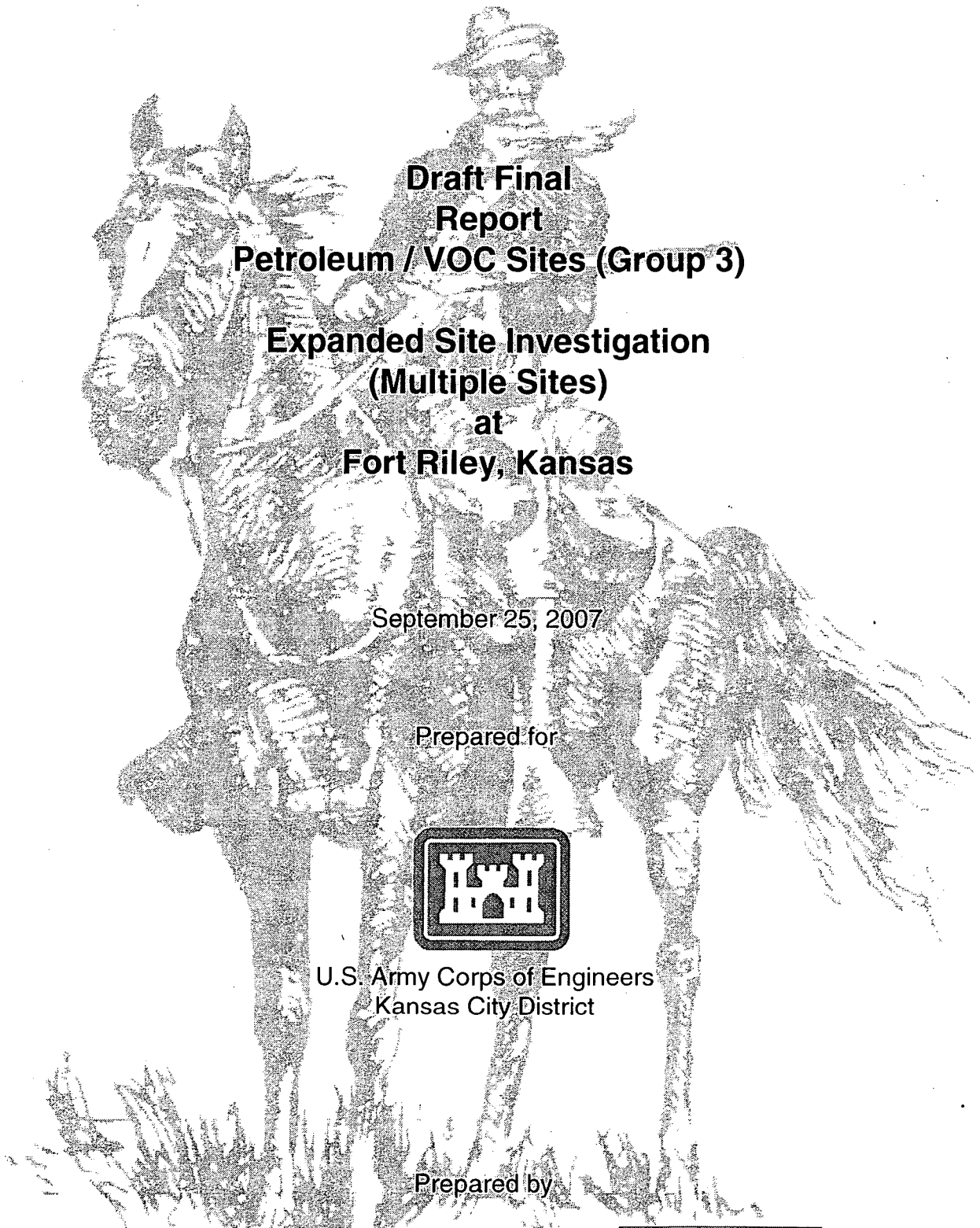

Draft Final Report
Petroleum / VOC Sites (Group 3)

Expanded Site Investigation (Multiple Sites) at Fort Riley, Kansas

September 25, 2007

Prepared for

U.S. Army Corps of Engineers
Kansas City District

Prepared by

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Table of Contents

Table of Contents

List of Tables

List of Figures

List of Acronyms and Abbreviations

AEHA	Army Environmental Hygiene Agency
AST	aboveground storage tank
BMcD	Burns & McDonnell Engineering Company, Inc.
BTEX	benzene, toluene, ethylbenzene, and xylene
bgs	below ground surface
CCC	Civilian Conservation Corps
CERCLA	Comprehensive Environmental Response, Compensation, and Liability Act
DA	United States Department of the Army
DAF	Dilution Attenuation Factor
1,2-DCA	1,2-dichloroethane
4,4'-DDE	4,4'-dichlorodiphenyldichloroethylene
DRO	diesel range organics
EDB	1,2-dibromoethane
ESI	Expanded Site Investigation
FFA	Federal Facility Agreement
FID	flame ionization detector
FS	feasibility study
ft	feet
GRO	gasoline range organics
HRS	Hazard Ranking System
IACH	Irwin Army Community Hospital
IRP	Installation Restoration Program
IWSA	*Installation-Wide Site Assessment for Fort Riley, Kansas*
J	estimated
KDHE	Kansas Department of Health and the Environment
KPSRL	Kansas Petroleum Site Remediation Level (s)
LBA	Louis Berger and Associates
MAAF	Marshall Army Airfield
MCL	Maximum Contaminant Level
MOGAS	motor gasoline
MP	Malcolm Pirnie, Inc.
µg/kg	micrograms per kilograms
µg/L	micrograms per liter
mg/kg	milligram per kilogram
mg/L	milligram per liter
NCP	National Contingency Plan
NPL	National Priorities List
PA	Preliminary Assessments
PAOC	Potential Area of Concern
PCB	polychlorinated biphenyl
PCE	Tetrachloroethene

List of Acronyms and Abbreviations

PID	photoionization detector
ppm	parts per million
POL	Petroleum, Oil, and Lubricant
PRG	Preliminary Remediation Goal
PWE	Directorate of Public Works – Environmental Division
QA	quality assurance
QCSR	Quality Control Summary Report
RCRA	Resource Conservation and Recovery Act
RI	remedial investigation
RSK	Risk-Based Standards for Kansas
SI	Site Investigation
SVOC	Semivolatile Organic Compound
TCE	Trichloroethene
TEPH	total extractable petroleum hydrocarbon
TPH	total petroleum hydrocarbon
TVPH	total purgeable petroleum hydrocarbon
USACE	United States Army Corps of Engineers
USEPA	United States Environmental Protection Agency
UST	Underground Storage Tank
VOC	Volatile Organic Compound

* * * * *

1.0 INTRODUCTION

1.1 PURPOSE OF EXPANDED SITE INVESTIGATION (ESI) REPORT

The Fort Riley Directorate of Public Works – Environmental Division (PWE) is performing the Installation Restoration Program (IRP) at Fort Riley, Kansas. This program, designed to identify and address potential threats to human health and the environment, has been underway for several years at the post. Numerous investigations, pilot studies, and environmental sampling events have been conducted by the United States Army Corps of Engineers (USACE) at several sites on the post to support the IRP effort.

Upon review of the public record, Fort Riley has determined that multiple potentially contaminated sites identified during previous investigations have not had a formal decision on their regulatory status signed by the parties to the Federal Facility Agreement (FFA). These multiple sites have been organized into five groups based on similar site characteristics or contaminants as indicated below:

- Pesticide / Polychlorinated Biphenyl (PCB) Sites
- Wastewater Sites
- Petroleum / Volatile Organic Compound (VOC) Sites
- Former Landfill / Incinerator Sites
- Former Vehicle Maintenance Shops / Gas Stations / Petroleum Dispensing Stations (collectively referred to as the Former Petroleum, Oil, and Lubricant [POL] Sites)

Table 1-1 presents a summary of the regulatory history for all of the sites investigated by group and includes the recommendation made for closed status. Any proposal for additional sampling is also presented, if applicable.

This ESI Report presents the field results and recommendations for the following Petroleum / VOC Sites (Figure 1-1):

- Abandoned VOC Tanks – Irwin Army Community Hospital (IACH) (FTRI-013)
- Waste Oil Aboveground Storage Tank (AST), 3rd Battery (FTRI-016)
- Waste Oil AST, 4th Battery (FTRI-017)
- Fire Training Area Facility 892 (FTRI-018)
- Fire Training Area, Camp Funston (FTRI-028)
- Consolidated Maintenance Facility Building 8100 (FTRI-039)

- Former Oil Testing Laboratory Building 1022 (FTRI-040)
- Furniture Repair Shops (FTRI-041)
- Print and Publications Shop Building 263 (FTRI-045)
- Building 727 Waste Pit (FTRI-051)

This report includes a complete summary of all previous investigative work conducted at each of the Petroleum / VOC Sites, as well as the results of field work completed as part of the ESI. The evaluation includes a critical analysis of the new data with respect to the historical data. The analysis considers whether or not the new data are consistent with the historical data and includes possible explanations for any variance observed. A recommendation on the determination of the future status of each of the Petroleum / VOC Sites is made.

Malcolm Pirnie, Inc. (MP) has a contract with the USACE to conduct this investigation. MP has subcontracted Burns & McDonnell Engineering Company, Inc. (BMcD) to prepare work plan documents, execute the field work, and prepare the ESI Reports.

The following installation-wide documents provided general guidance for conducting ESI field activities during the summer of 2006:

- *Installation-Wide Sampling and Analysis Plan for Environmental Investigations at Fort Riley, Kansas* (MP-BMcD, 2004a), which consists of the following two volumes:
    - *Volume I, Installation-Wide Field Sampling Plan*
    - *Volume II, Installation-Wide Quality Assurance Project Plan*
- *Installation-Wide Site Safety and Health Plan for Environmental Investigations at Fort Riley, Kansas* (MP-BMcD, 2004b)
- *Installation-Wide Investigative-Derived Waste Management Plan for Environmental Investigations, Fort Riley, Kansas* (BMcD, 2003)

The following project specific plan addenda were prepared specifically to support ESI field activities and data validation:

- *Sampling and Analysis Plan Addendum, Expanded Site Investigation (Multiple Sites) at Fort Riley, Kansas* (MP-BMcD, 2006a), which consists of the following two volumes:

- *Volume I, Field Sampling Plan Addendum*
- *Volume II, Quality Assurance Project Plan*

- *Site-Specific Safety and Health Plan, Expanded Site Investigation (Multiple Sites) at Fort Riley, Kansas* (MP-BMcD, 2006b)

- *Investigative-Derived Waste Management Plan Addendum, Expanded Site Investigation (Multiple Sites) at Fort Riley, Kansas* (MP-BMcD, 2006c)

1.2 SITE DESCRIPTION

General site conditions, including the physical setting, surface features, ecology, geology and hydrogeology, and climate have been summarized in the Installation-Wide Field Sampling Plan. Conditions specific to each ESI site are addressed in the individual site discussions.

1.3 REGULATORY HISTORY

Fort Riley was established in 1853 and has been owned and operated by the United States Department of the Army (DA) since that time. Environmental investigations and sampling events were performed at Fort Riley during the 1970s and 1980s. These investigations identified activities and facilities where hazardous substances had been released or had the potential to be released to the environment. Potential sources of contamination include a variety of landfills; printing, dry cleaning, and furniture shops; POL sites; and pesticide storage facilities. On July 14, 1989, the United States Environmental Protection Agency (USEPA) proposed inclusion of Fort Riley on the National Priorities List (NPL), and listed the installation on the USEPA NPL in August 1990, pursuant to the Comprehensive Environmental Response, Compensation, and Liability Act (CERCLA). The DA – Fort Riley, the Kansas Department of Health and the Environment (KDHE) and the USEPA entered into a FFA, to address environmental releases subject to Resource Compensation and Recovery Act (RCRA) and CERCLA or CERCLA alone.

The FFA, which became effective in June 1991, required Fort Riley to conduct a systematic site assessment to identify all potential areas of concern (PAOCs) at Fort Riley. The systematic site assessment was performed in 1992, with the results presented in the *Installation-Wide Site Assessment for Fort Riley, Kansas* (IWSA) dated 07 December 1992 and revised on 16 February 1993 (Louis Berger and Associates [LBA], 1993). The IWSA summarized existing data and identified 25 groups of PAOCs, with 23 sites being identified for further site investigation. Contaminants associated with these sites vary greatly from potential lead-contaminated soils at old firing ranges to potential releases of solvents due to practices at furniture repair shops. The IWSA was conducted consistent with the USEPA requirements

for Preliminary Assessments (PA) under CERCLA. Based on USEPA's PA method, potential risk posed by PAOCs was estimated using the Hazard Ranking System (HRS). The IWSA identified PAOCs subject to RCRA corrective actions and/or CERCLA where a release of hazardous substances to the environment has occurred or is considered likely, migration pathways from the site exist, and potential receptors are known to exist. Specifically, 23 PAOCs were identified and evaluated using the HRS PA score methodology. As outlined in the National Contingency Plan (NCP), the results of the PA were used to identify sites requiring further investigation.

These PAOCs were addressed under a Multiple Site Investigations project which was further broken down into these groupings: the Sensitive Receptor Lead Sites; "High Priority" Sites; and "Other Sites". The Sensitive Receptor Lead Sites investigation was expedited due to the accessibility of the areas to the general public (especially children). Only one area near the Coyler Manor Family Housing Area was identified as having elevated levels of lead in the soils, and a removal action involving excavation and off-site disposal of soil was performed. The High Priority Sites field investigations were completed in November 1993. The "Other Sites" grouping consisted of 14 sites which had very low PA HRS scores and had a low potential for release of contaminants to the environment. Field work for these "Other" sites was performed in the spring and summer of 1994. Site investigations for seven POL / underground storage tank (UST) sites were conducted from 1992 to 1995.

Fort Riley has a RCRA Part B permit that became effective October 1, 1998 and expires October 1, 2008. Part I of the permit allows Fort Riley to operate as a storage facility for hazardous waste. Part II of the permit defers corrective action requirements to those conditions specified in the Fort Riley FFA.

The permit states that the Installation-Wide Site Assessment and subsequent modifications thereto, shall constitute the identification of all known past and present sites/solid waste management units (SWMUs), effective with the issuance of Part II of the permit. Table 2.2 of the permit lists sites/SWMUs covered under the FFA and their current status (revised October 2000). The current status of the ESI sites/groupings listed in the permit are determined to not have the potential to pose a risk to human health or the environment. Although the RCRA permit states these sites pose no potential risk, the regulatory status under CERCLA is currently open; i.e., the sites have not received regulatory concurrence to terminate further response activities or to initiate a removal or to proceed to the next phase under CERCLA for a remedial investigation, if warranted.

1.4 RATIONALE AND TECHNICAL APPROACH

The objective of this ESI was to provide a defensible rationale for ending environmental investigations at the identified ESI sites, if that decision was supported by data. In the event that closed status was not supported by the data, then future work required for closed status was proposed. This was accomplished using a three step process:

- Documents were reviewed in late 2005 to determine if existing data were sufficient to support a recommendation for the future status of a site. If not sufficient, then data gaps were identified and additional fieldwork was planned. ESI sampling parameters were selected by Fort Riley.

- The project workplan was prepared (MP-BMcD, 2006d). This document presented the rationale for the collection of samples at each location and was approved by the regulatory agencies.

- Additional field sampling was conducted during the summer of 2006. Samples collected included surface and subsurface soil samples, groundwater samples, debris samples, and wipe samples. All results were validated and a Quality Control Summary Report (QCSR) was issued (MP-BMcD, 2006e).

- The data were evaluated and an ESI Report was prepared. Data collected as part of the ESI were compared to existing risk-based screening criteria. This process is described in the following section. See Section 1.6 for a description of the ESI Report organization.

1.5 RISK-BASED SCREENING CRITERIA

Field data were screened against existing risk-based screening criteria in order to determine if contaminants detected in soil or groundwater present a hazard to potential receptors. No effort was made to perform a formal risk assessment for any of the ESI sites. The screening process was developed in collaboration with Fort Riley and is described in the following bullets:

- Data were screened initially against USEPA Region 9 Preliminary Remediation Goals (PRGs) (USEPA, 2004a). These are risk-based standards and are more stringent than other regulatory standards available. For soil, the residential PRGs were used initially. For groundwater, the tap water PRGs were applied. If leaching to groundwater appeared to be a potential issue, then the soil data were screened against the dilution attenuation factor (DAF) 20 standards for "migration to groundwater."

- If soil at a site failed screening against the Region 9 residential PRGs, then the industrial PRGs were applied, assuming their use was justified based on current and/or future use of the site.

- If groundwater at a site failed screening against the tap water PRGs, then the USEPA Maximum Contaminant Levels (MCLs) (USEPA, 2004b) were applied.

- If soil failed screening against both residential and industrial PRGs, then the KDHE Risk-Based Standards for Kansas (RSK) screening standards (KDHE, 2003) were applied.

- If soil and/or groundwater failed screening against all regulatory standards, then an effort was made to justify closed status based on the lack of completed pathways to potential receptors. This was a qualitative assessment; no formal risk assessment was performed.

In the event that a recommendation for closed status could not be made, then recommendations were made for additional work at that location.

1.6 ESI REPORT ORGANIZATION

Each section of this ESI Report (Sections 2 through 11) consists of individual, stand alone descriptions of each site. Each discussion includes the following elements:

- Location and Setting – a brief description of the physical location of the site, including the nature of the surrounding area. A description of geology and hydrogeology is included. Any protected or special ecological and cultural features observed or known to occur at or near the site are described. Any significant receptors, especially water supply wells, are also described.

- Site Background and Previous Sampling Results – This section includes a brief history of the site. Also discussed are any previous site investigation activities and a discussion of analytical results from those activities.

- ESI Field Activities and Analytical Results – Significant observations which drove the sampling rationale are listed. The field activities are described in detail. A figure and table are provided showing the locations where samples were collected and listing the sampling media and analytes.

- Discussion and Recommendations – This section provides a discussion of both previous and ESI sampling results. Any anomalies in the data sets are described and explained, if possible. Based on a comparison of analytical data to screening criteria, a recommendation for closed status was made. If closed status is not indicated, then a recommendation for additional work was made.

This ESI Report, which addresses only the Petroleum / VOC Sites (Group Three), is organized as follows:

- Section 1.0 Introduction
- Section 2.0 Abandoned VOC Tanks – IACH (FTRI-013)
- Section 3.0 Waste Oil AST, 3rd Battery (FTRI-016)
- Section 4.0 Waste Oil AST, 4th Battery (FTRI-017)
- Section 5.0 Fire Training Area Facility 892 (FTRI-018)
- Section 6.0 Fire Training Area, Camp Funston (FTRI-028)
- Section 7.0 Consolidated Maintenance Facility Building 8100 (FTRI-039)
- Section 8.0 Former Oil Testing Laboratory Building 1022 (FTRI-040)
- Section 9.0 Furniture Repair Shops (FTRI-041)
- Section 10.0 Print and Publications Shop Building 263 (FTRI-045)
- Section 11.0 Building 727 Waste Pit (FTRI-051)
- Section 12.0 References

Additional reports will address the other four groups of ESI sites. Figure 1-1 shows the location of the Petroleum / VOC Sites.

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2.0 ABANDONED VOC TANKS - IACH (FTRI-013)

2.1 SITE LOCATION, LAND USE, POTENTIAL MIGRATION PATHWAYS, AND RECEPTORS

The abandoned VOC tanks (FTRI-013) were located approximately one-half mile north of the IACH in Camp Whitside (Figures 1-1 and 2-1). The Site consisted of two 650-gallon World War I-era tanks. Each tank was riveted steel, 3 feet (ft) in diameter, and 11 ft long. A short 2-inch stand pipe with a gate valve was on top of each tank. The tanks were covered with approximately five inches of soil; however, the tanks were exposed at the middle sections and east ends (Army Environmental Hygiene Agency [AEHA], 1988). The tanks were removed in September 1990.

The Site is located at the southern margin of the upland area of Fort Riley. The Site is underlain by bedrock (interbedded limestone and shale) which is covered by shallow unconsolidated material that consists of residual soil. The depth to bedrock as determined in the field investigation ranged from 1 to 2 ½ ft below ground surface (bgs). Groundwater was not encountered during the field investigation; however, groundwater in this area could occur at the interface between bedrock and the unconsolidated material, and within voids and fractures in the bedrock. Groundwater would be expected to flow to the southeast, towards the Kansas River flood plain. The Kansas River is located approximately 4,000 ft to the east of the Site.

There are no water supply wells in the immediate vicinity of the Site. The Fort Riley well field is located approximately 2 miles west-southwest of the Site, in the floodplain of the Republican River. The well field for the community of Ogden is located approximately 4 miles east-northeast of the Site, in the floodplain of the Kansas River. There are privately owned supply wells approximately 1 ½ miles to the southeast of the Site; however, they are on the opposite side of the Kansas River, which is a hydrologic boundary of the Kansas River alluvial aquifer.

No protected or special ecological or cultural features were observed or are known to occur at or near this Site. Current and future land use at this location, based on the post environmental overlay, is anticipated to be open space.

2.2 SITE BACKGROUND AND PREVIOUS SAMPLING RESULTS

The tanks were put into use in the 1920s for fuel storage to support a gravity flow fuel operation for quarrying. The tanks were used to store solvent during World War II. The solvent storage operating practices at this time are not known. As of 1988, the tanks were in a deteriorated state, with open stand

pipes. A strong odor was present and each tank contained about 100 gallons of material. The tanks contained primarily tetrahydrothiophene, and benzene, toluene, ethylbenzene, and xylene (BTEX) at concentrations greater than 10,000 parts per million (ppm) (AEHA, 1988). As previously stated, the tanks were removed subsequent to the late 1980s.

According to information provided by Fort Riley, a Draegar tube field test showed 110 ppm total petroleum hydrocarbon (TPH) during the 1990 KDHE "Buried Tank Leak Assessment." No other previous sampling data were available for this Site.

2.3 ESI FIELD ACTIVITIES AND ANALYTICAL RESULTS

An attempt was made to advance four direct-push borings in the vicinity of the former tank locations (Figure 2-1). However, due to shallow refusal (limestone bedrock at 1 to 2 ½ ft bgs) and the nature of the material present, the collection of continuous samples using a 2-inch Macrocore™ sampler was not possible. One soil sample was collected from each direct-push boring at the depth interval of 0 - 0.5 ft bgs. The soil sample planned for collection from 4 - 5 ft bgs was not collected due to shallow bedrock. Soil samples were screened using a photoionization detector (PID), with all readings at background. The soil samples were analyzed at an off-site laboratory for VOCs (USEPA Method 8260) and TPH – gasoline range organics (GRO) (USEPA Method 8015). No VOCs or TPH-GRO were detected in any of the soil samples.

Following the completion of field activities at the Site, all direct-push boring locations were surveyed. The survey data are included in Appendix A.

2.4 DISCUSSION AND RECOMMENDATIONS

As neither VOCs nor TPH-GRO were detected in the soil samples collected, the abandoned VOC Tanks Site (FTRI-013) is recommended for closed status.

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3.0 WASTE OIL AST, 3RD BATTERY (FTRI-016)

3.1 SITE LOCATION, LAND USE, POTENTIAL MIGRATION PATHWAYS, AND RECEPTORS

The Waste Oil AST for the 3rd Battery (FTRI-016) was located to the northwest of the Tactical Equipment Shop Building 7740 between Apennines Drive and Kitty Drive in the Custer Hill Troop Area (Figures 1-1 and 3-1). The 400-gallon used oil storage tank was placed in a truck bed, and surrounded by gravel and dry clean sweep material. The truck bed was on a paved surface. It has been decommissioned and removed. Two 1,000-gallon above ground tanks with built-in secondary containment were installed in June 1996.

The Site is located on the upland area of Fort Riley and is underlain by bedrock (interbedded limestone and shale) covered by shallow unconsolidated material. The unconsolidated soil consists of residual material and possibly loess. Depth to bedrock in the Custer Hill Troop Area typically ranges from 5 to 15 ft bgs. Groundwater is not typically found in the unconsolidated soils. Groundwater can occur in this area at the interface between bedrock and the unconsolidated material and within voids and fractures in the bedrock. Based on local topography, groundwater would be expected to flow west toward Dixon Creek.

The Fort Riley well field is located approximately 3 miles south-southwest of the Site, in the floodplain of the Republican River. The well field for the community of Ogden is located approximately 5 miles east of the Site, in the floodplain of the Kansas River. Aquifers in the upland area of Fort Riley do not have sufficient yield to support large capacity supply wells. There are no water supply wells located in the vicinity of Building 7740.

No protected or special ecological or cultural features were observed or are known to occur at or near this Site. Current and future land use at this location, based on the post environmental overlay, is anticipated to be maintenance.

3.2 SITE BACKGROUND AND PREVIOUS SAMPLING RESULTS

The 400-gallon AST was used for the storage of used motor oil. The tank was filled by the contents of 15-gallon cans dumped into the top hole. The tank was emptied when full by a used oil recycler. In the AEHA report, it was noted that it was unlikely that the operations of the used oil tank would cause material migration to the environment and that the integrity of the containment structures was well designed. The report also noted that at the time of the visit the tank was well maintained with no visual

signs of leaks, the used oil was well-contained, and was located on an impermeable surfaced lot (AEHA, 1988). The date the tank was placed into service is unknown, and sometime after 1988 the AST was decommissioned and removed. During a Site visit in 2006, the paved area where the AST had been located was free of noticeable stains.

No previous sampling data are available.

3.3 ESI FIELD ACTIVITIES AND ANALYTICAL RESULTS

No ESI field activities were conducted at Waste Oil AST, 3rd Battery Area.

3.4 DISCUSSION AND RECOMMENDATIONS

As no known environmental impacts are associated with this Site, this Site is recommended for closed status.

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4.0 WASTE OIL AST, 4TH BATTERY (FTRI-017)

4.1 SITE LOCATION, LAND USE, POTENTIAL MIGRATION PATHWAYS, AND RECEPTORS

The Waste Oil AST for the 4th Battery (FTRI-017) was located to the northwest of the Tactical Equipment Shop Building 7720 between Apennines Drive and Kitty Drive in the Custer Hill Troop Area (Figures 1-1 and 3-1). The 400-gallon used oil storage tank was on pallets over a concrete surface. It has been decommissioned and removed. Two 1,000-gallon above ground tanks with built-in secondary containment were installed in April and June 1996.

The Site is located on the upland area of Fort Riley and is underlain by bedrock (interbedded limestone and shale) covered by shallow unconsolidated material. The unconsolidated soil consists of residual material and possibly loess. Depth to bedrock in the Custer Hill Troop Area typically ranges from 5 to 15 ft bgs. Groundwater is not typically found in the unconsolidated soils. Groundwater can occur in this area at the interface between bedrock and the unconsolidated material and within voids and fractures in the bedrock. Based on local topography, groundwater would be expected to flow west toward Dixon Creek.

The Fort Riley well field is located approximately 3 miles south-southwest of the Site, in the floodplain of the Republican River. The well field for the community of Ogden is located approximately 5 miles east of the Site, in the floodplain of the Kansas River. Aquifers in the upland area of Fort Riley do not have sufficient yield to support large capacity supply wells. There are no water supply wells located in the vicinity of Building 7720.

No protected or special ecological or cultural features were observed or are known to occur at or near this Site. Current and future land use at this site, based on the post environmental overlay, is anticipated to be maintenance.

4.2 SITE BACKGROUND AND PREVIOUS SAMPLING RESULTS

The 400-gallon converted water tank was used for the storage of used motor and gear oil. The AEHA report indicates that the approximate date of use were from 1987 to 1988. The AEHA report also noted that the operation was not well maintained, and the survey team observed spilled oil in the vicinity of the AST (AEHA, 1988). The tank was located on a concrete pad and dry sweep was available for potential spills. There was the potential for surface water exposure through the nearby storm drain. Sometime

after 1988 the AST was decommissioned and removed. During a Site visit in 2006, the paved area where the AST had been located was free of noticeable stains.

No previous sampling data are available.

4.3 ESI FIELD ACTIVITIES AND ANALYTICAL RESULTS

No ESI field activities were conducted at Waste Oil AST, 4th Battery Area.

4.4 DISCUSSION AND RECOMMENDATIONS

As no known environmental impacts are associated with this Site, this Site is recommended for closed status.

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5.0 FIRE TRAINING AREA FACILITY 892 (FTRI-018)

5.1 SITE LOCATION, LAND USE, POTENTIAL MIGRATION PATHWAYS, AND RECEPTORS

The former Fire Training Area Facility 892 is located off Marshall Drive, along the southeastern boundary of Marshall Army Airfield (MAAF) (see Figures 1-1 and 5-1). The facility was constructed in 1987 to provide a training area for the crash rescue unit of the Fort Riley Fire Department after the former fire training area at the north end of the airfield was closed. The burn pit consisted of a 75-ft by 75-ft concrete pad surrounded by a six-inch concrete curb. The area immediately surrounding the concrete pad consisted of crushed aggregate paving. The concrete pad, upon which the fire training exercises were conducted, was designed to drain (via an underground drainage line) through an oil/water separator to the sanitary sewer. Product removed from the oil/water separator was stored in a 550-gallon UST. Fuel was stored on the Site in a 4,000-gallon UST (BMcD, 1998). The USTs, underground piping, concrete pad, oil/water separator, and associated piping have been removed, and the area is overgrown with native grasses (BMcD, 1998). The Site is flat and a ditch parallels Marshall Drive on the southeastern perimeter of the Site.

The Site is located approximately 3,500 ft east of the Kansas River. The Site lies within the southeast margin of the Kansas River alluvial floodplain, and is underlain by clay, silt, and sand of the Kansas River alluvial aquifer. Groundwater flows generally toward the north-northeast at MAAF and the water table is typically between 20 and 25 ft bgs (BMcD, 1998). Alluvial deposits can reach a thickness of up to 70 ft near the river and decrease in thickness toward the valley margin. The alluvium tends to coarsen with depth and lies on bedrock composed of limestone and shale (BMcD, 1998). The Kansas River alluvial aquifer is a source of drinking water at Fort Riley and surrounding communities.

Although the Site is located within the 500-year floodplain, it is considered unlikely that such a flood event would coincide with a burn event at the Site. There are no direct drainages from the Site to the river (LBA, 1993).

No protected or special ecological or cultural features were observed or are known to occur at or near this Site. Current and future land use at this site, based on the post environmental overlay, is anticipated to be as an airfield.

5.2 SITE BACKGROUND AND PREVIOUS SAMPLING RESULTS

This Site was first used for training beginning in 1988 and ending in 1991. The exercises were conducted by releasing fuel onto the concrete pad, followed by ignition of the fuel and extinguishing the resultant fire. The type of fuel used was reportedly JP-4, composed of approximately 65% gasoline and 35% kerosene; however, it is unknown whether the fuel was pure or a mixture of other petroleum POL products. The fuel was released onto the concrete pad from a 4,000-gallon UST through underground lines connected to the pad. At the conclusion of the training session, the pad was washed down with water which drained into the oil/water separator prior to discharge to the sanitary sewer (BMcD, 1998).

The two USTs at the Site (Tank 892A – water/used fuel storage and Tank 892B – fuel storage) were removed in March 1996, and the Site received a "closed" status from the KDHE. The underground piping, concrete pad, and oil/water separator were removed concurrently with the USTs. Soil samples collected from around the USTs and associated piping showed no measurable contamination present. BMcD inferred from the Permanent Tank Abandonment Report that the samples were screened on the Site visually and with a PID. However, the report did not specify how the samples were screened. In addition, the report stated that no groundwater was encountered during the UST removal, thus BMcD assumed that no groundwater samples were collected (BMcD, 1998).

As previously stated, the Kansas River alluvial aquifer is a source of drinking water. All of Fort Riley's supply wells are located upgradient of the 892 Site. The one supply well located at MAAF (a back-up supply) is located approximately one mile upgradient of the Site. The nearest public supply wells are those for the community of Ogden, which are located approximately 4 miles to the northeast of the Site. These supply wells are on the other side of the Kansas River, which is a hydrologic boundary for the alluvial aquifer system. There are no other public supply wells within 4 miles of the Site. There are no identifiable overland migration pathways from the Site to the river.

In 1998, BMcD conducted a field investigation, which included a soil-gas survey for VOCs; groundwater screening sampling for BTEX, trichloroethene (TCE), tetrachloroethene (PCE), and cis-1,2-dichloroethene; groundwater confirmation sampling for VOCs; and subsurface soil sampling for VOCs. Results are presented in the following bullets:

- Only BTEX compounds were detected in the soil-gas samples, with the highest concentrations located in a boring in the former crushed aggregate paving south of the former concrete pad. Concentrations of benzene, toluene, ethylbenzene, and xylenes in

soil-gas samples from this location were 8,000, 4,000, 200, and 500 micrograms per liter (µg/L), respectively. (BMcD, 1998).

- BTEX were the only compounds detected in the groundwater screening samples, with the highest concentrations located inside the former fenced UST area located just outside the former crushed aggregate paving area on the southeastern portion of the Site. These detections were below the USEPA MCLs, with the exceptions of two sample locations that had benzene detections above the MCL (7,000 and 6 µg/L). These locations were near the former USTs which appeared to be the source of the groundwater contamination. The extent of groundwater contamination was not defined (BMcD, 1998).

- The groundwater confirmation samples compared reasonably well with the screening samples, but only benzene, toluene, and xylenes were detected. No confirmation samples were collected in the vicinity of the former USTs (BMcD, 1998).

- There were no detections in the subsurface soil samples (BMcD, 1998).

In 1999, BMcD conducted additional field sampling which included groundwater screening sampling for BTEX and subsurface soil sampling for benzene, 1,2-dichloroethane (1,2-DCA), 1,2-dibromoethane (EDB), total extractable petroleum hydrocarbons (TEPH), and total purgeable petroleum hydrocarbons (TVPH) in the vicinity of the UST basin. Additionally, three monitoring wells (892-99-01, 892-99-02, and 892-99-03) were installed based on the results of the groundwater field screening and were sampled for VOCs, naphthalene, and EDB. Results are presented in the following bullets:

- BTEX compounds were detected in at least 2 of the 15 groundwater screening samples, with the highest concentrations located inside the former fenced UST area located just outside the former crushed aggregate paving area on the southeastern portion of the Site (Figure 5-2). Detections were below the USEPA MCLs, with the exceptions of two sample locations that had benzene detections above the MCL (8,000 and 6 µg/L). These locations were near the former USTs which appeared to be the source of the groundwater contamination (BMcD, 1999).

- Benzene, TVPH, and TEPH as kerosene were detected in soil samples collected from one of the two borings, but only TVPH was detected in the second boring (Figure 5-3). Levels of both TEPH and TVPH detected from one of the borings exceeded the Kansas Petroleum Site Remediation Level (KPSRLs). TVPH was also detected in the other

boring; however, due to the discrepancy between the reported concentration and the concentration reported by the Quality Assurance (QA) laboratory, it can not be determined if the concentration exceeds the KPSRL (BMcD, 1999).

- BTEX and 1,2-DCA were detected in only one of the three groundwater samples collected from the monitoring wells. This detection occurred in the sample collected from Monitoring Well 892-99-02, which is located in the immediate vicinity of the UST basin. Detections of 1,2-DCA, benzene, and toluene at concentrations of 550, 22,000, and 10,700 µg/L, respectively, were in excess of the USEPA MCLs. This indicates that contamination did migrate from the former UST basin into the underlying aquifer (BMcD, 1999).

- Data from the three monitoring wells, along with the groundwater screening, delineate the extent of groundwater contamination at the Site (BMcD, 1999).

Burning of fuels during the training exercises were conducted under a written exemption to Fort Riley's air permit with the State of Kansas. Because of the flammable liquids placed in the burn pit for ignition, it was considered a PAOC (LBA, 1993).

5.3 ESI FIELD ACTIVITIES AND ANALYTICAL RESULTS

Groundwater samples were collected from Monitoring Wells 892-99-01 and 892-99-03 (Figure 5-1). Groundwater was not collected from Monitoring Well 892-99-02 as there was an insufficient amount of water present for sampling. The field crew noted that a hydrocarbon odor was present at Monitoring Well 892-99-02 and that an oily residue was present on the water level indicator probe. The two groundwater samples collected were sent to an off-site laboratory for analysis of VOCs (USEPA Method 8260). No VOCs were detected in either groundwater sample.

5.4 DISCUSSION AND RECOMMENDATIONS

Historical and ESI sampling results can be summarized as follows:

- Investigations conducted in 1999 resulted in the detection of BTEX compounds in both soil-gas and groundwater screening samples. Benzene was detected in groundwater in excess of the USEPA MCL.

- Groundwater samples collected from monitoring wells installed in 1999 resulted in detections of 1,2-DCA, benzene, and toluene in samples from one well (892-99-02) in excess of USEPA MCLs.

- There were no detections of VOCs in groundwater samples collected from Monitoring Wells 892-99-01 and 892-99-03 for the ESI. No samples were collected from Monitoring Well 892-99-02 due to a lack of water.

Since no groundwater sample was collected from Monitoring Well 892-99-02, it is not possible to compare results with historical data or assess current conditions at this location. Fort Riley proposes to advance a direct-push boring adjacent to Monitoring Well 892-99-02 to collect surface and subsurface soil samples, and a groundwater sample for VOC analysis. This additional data will be used to support a recommendation for no additional investigation and site closure for the Fire Training Area Facility 892.

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6.0 FIRE TRAINING AREA, CAMP FUNSTON (FTRI-028)

6.1 SITE LOCATION, LAND USE, POTENTIAL MIGRATION PATHWAYS, AND RECEPTORS

The Fire Training Area, Camp Funston (FTRI-028) is located at the end of Well House Road to the west of Camp Funston (Figures 1-1 and 6-1). The Site is located to the east of the Southwest Funston Landfill. The Site is approximately 150 ft by 250 ft and vegetated with grass and is within 100 ft of Threemile Creek.

The Site lies within the Kansas River alluvial floodplain, and is underlain by clay, silt, and sand of the Kansas River alluvial aquifer. Groundwater flow direction is variable across the Site, but has historically been toward the east or southeast (USGS, 2000). The water table at the Site is approximately 15 ft bgs (ECC, 2006a, 2006b, and 2006c). Alluvial deposits can reach a thickness of up to 70 ft near the river and decrease in thickness toward the valley margin. The alluvium tends to coarsen with depth and lies on bedrock composed of limestone and shale. The Kansas River alluvial aquifer is a source of drinking water at Fort Riley and surrounding communities.

No special cultural features were observed or are known to occur at or near this Site. Wooded areas along the Kansas River are used during the winter months by bald eagles, a threatened species. There is a waterfowl management area approximately one mile up stream from the Site. Current and future land use at this site, based on the post environmental overlay, is anticipated to be open space.

There are no water supply wells in the immediate vicinity of the Fire Training Area. The well field for the community of Ogden is located approximately two miles northeast of the Site.

6.2 SITE BACKGROUND AND PREVIOUS SAMPLING RESULTS

The former Fire Training Area at Camp Funston was operated from approximately 1950 to 1982 (AEHA, 1988). The Fire Training Area was described as being an elevated, large-diameter "drum" into which flammable liquid was poured and ignited (LBA, 1992). The flammable liquid was reported by AEHA as being JP-4, diesel, oil, and motor gasoline (MOGAS). The site was decommissioned and in 1982 the top six inches of soil were removed from the area and disposed. Debris from the Site was removed and disposed in the Construction Debris Landfill.

The Site is within the area investigated as part of the remedial investigation (RI) / feasibility study (FS) for the Southwest Funston Landfill (Law Environmental, 1992). Numerous monitoring wells were installed in the area adjacent to and downgradient of the former Fire Training Area (Figure 6-1).

Monitoring wells which have been sampled recently in this area include Monitoring Wells SFL92-401, SFL92-403, SFL92-601, SFL92-603, SFL97-903, SFL94-02A, SFL94-03A, and SFL94-04B. Groundwater analytical results (VOCs and lead only) for these monitoring wells are presented in Table 6-1 (ECC, 2005, 2006a, 2006b, and 2006c). Monitoring Wells SFL97-903 and SFL94-02A had no detections of either VOCs or lead, so are not presented in Table 6-1.

Groundwater samples collected since early 2004 have had detections of vinyl chloride in excess of USEPA MCLs. In groundwater samples collected from Monitoring Wells SFL92-401, SFL92-403, and SFL92-601 during 2004 and/or 2005, vinyl chloride concentrations exceeded the USEPA MCL of 2 µg/L. Maximum concentrations detected during this period were 3.57 µg/L (SFL92-401), 4.48 µg/L (SFL92-403), and 2.57 µg/L (SFL92-601) (Table 6-1). Vinyl chloride did not exceed the USEPA MCL in samples collected from these wells during 2006.

6.3 ESI FIELD ACTIVITIES AND ANALYTICAL RESULTS

No ESI field activities were conducted at the former Fire Training Area at Camp Funston.

6.4 DISCUSSION AND RECOMMENDATIONS

Groundwater sampling data collected as part of the long-term monitoring effort at Southwest Funston Landfill were evaluated. VOCs were not detected in excess of USEPA MCLs in groundwater samples collected during 2006 from monitoring wells in the vicinity of the Site. The Fire Training Area at Camp Funston is recommended for closed status.

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7.0 CONSOLIDATED MAINTENANCE FACILITY BUILDING 8100 (FTRI-039)

7.1 SITE LOCATION, LAND USE, POTENTIAL MIGRATION PATHWAYS, AND RECEPTORS

The Consolidated Maintenance Facility Building 8100 is located on Custer Hill to the east of the intersection of First Division Road and Apennines Drive (Figures 1-1 and 7-1) (LBA, 1993). This facility, which covers approximately 18 acres, includes Building 8100 and an extensive paved area surrounded by a perimeter fence.

The site is located in the upland area of Fort Riley and is underlain by bedrock (interbedded limestone and shale), covered by shallow unconsolidated material. This unconsolidated soil consists of residual soil and possibly loess. The depth to bedrock in the vicinity of Building 8100, as determined during the ESI field investigation, ranged from 3.5 to 16.8 ft bgs. No groundwater was encountered in the unconsolidated soil during the field investigation. A temporary piezometer was installed in Boring DP05. After six days the boring was still dry and the piezometer was removed and the boring backfilled. Groundwater in this area could occur at the interface between bedrock and the unconsolidated material, and within voids and fractures in the bedrock. Based on the local topography, groundwater would be expected to flow to the east, towards the Forsyth Creek drainage. The Site is located adjacent to Forsyth Creek, which is a perennial stream. Overland flow from the Site would also enter this tributary. Forsyth Creek is a tributary to Threemile Creek, which discharges to the Kansas River approximately five miles downstream of the plant (LBA, 1993).

The Fort Riley well field is located approximately 2 ½ miles south-southwest of the Site, in the floodplain of the Republican River. The well field for the community of Ogden is located approximately 4 ½ miles east of the Site, in the floodplain of the Kansas River. Aquifers in the upland area of Fort Riley do not have sufficient yield to support large capacity supply wells. There are no water supply wells located in the vicinity of Building 8100.

No protected or special ecological or cultural features were observed or are known to occur at or near this Site. Current and future land use at this site, base on the post environmental overlay, is anticipated to be maintenance.

7.2 SITE BACKGROUND AND PREVIOUS SAMPLING RESULTS

A variety of activities are conducted at the Consolidated Maintenance Facility in repair shops, a machine/weld shop, a mechanical/electrical shop, paint booths, an oil testing laboratory, and a furniture

stripping and repair shop. Activities conducted at the Site generate hazardous waste streams, including TCE from the oil laboratory, paint wastes and filters, lead solder in air filters, lead acid battery waste, cutting oils, and radiator cleaning solution (LBA, 1993). In 2005, the oil laboratory ceased operations.

Building 8100 has a number of fuel storage tanks, used oil tanks, and waste cleaner solvent tanks. There are two 12,000-gallon heating oil tanks on the north end of the building. There are three 6,000-gallon tanks east of the building to service the dynamometer area; these contain diesel, gasoline, and heating oil. There are four tanks at the south end of the building that supply various grades of engine oil to the shop area; these include two 4,000-gallon and two 3,000-gallon ASTs. There is a cleaning fluid waste tank at the northeast corner of the building. This is a 2,000-gallon fiberglass tank that receives liquids from the northeast corner of the building via two cleaning fluid receptacles. There are also a 2,000-gallon cleaning fluid tank and a 4,000-gallon used oil tank at the south end of the building that receive used fluids from the south wing of the building (LBA, 1993).

The building has a network of floor drains and sub-floor industrial sewer drains that collect interior runoff from the building and route it to the four industrial sewer sumps. The industrial waste from the floor drains is pumped into the industrial sewer that leaves the northwest corner of the building and goes to the east water retention pond (LBA, 1993).

A large volume of the materials used at Building 8100 is petroleum hydrocarbons; however, there are a variety of activities that also use CERCLA and RCRA hazardous substances. The oil testing laboratory, in particular, has been identified as a source of such waste. The oil testing process has used PCE as part of the analytical procedures, and used PCE is generated. Other activities in the building that use hazardous materials include the paint shop, battery shop, photographic laboratory, and furniture repair. Petroleum-based solvents have been used for degreasing. More recently, the use of caustic-based solvent has become more common. Sediment and sludge from the floor sumps is handled as hazardous waste, indicating that used fluids at the facility contain hazardous components. The primary areas of concern at this building are the three USTs used to store spent and used cleaning solutions. These solutions have the potential to contain hazardous substances. Releases to the industrial sumps were evaluated as part of the Custer Hill industrial wastewater system (LBA, 1993).

The three USTs of concern were used to collect either used oil or used cleaning solutions. As of November 1992, all three tanks were used to collect used oil. The tanks are made of fiberglass with copper piping and were installed in 1983. Leaks from the tanks are not anticipated at this time due to the relative young age of the tanks. Tightness testing of the USTs is conducted on a regular basis to assess

system integrity. However, facility personnel indicate that on several occasions since the building was put into use (the mid 1970s), the tanks became overfilled with used oils and some oil flowed across the parking area towards the east and south to adjacent soils. The amounts released from the tanks was described as "minor" (LBA, 1993). All ASTs and USTs at Building 8100 were removed between 1994 and 1998. They were replaced by 7 new ASTs in 1998 for the storage of new and used oil. This facility received clean closure status from KDHE following removal of all the USTs. KDHE stated that there was no staining/odor and no measurable contamination, and that no further action was required at this site.

The ESI activities in 2006 were conducted to sample the facility perimeter to cover the down-gradient direction towards which contaminants might have migrated.

7.3 ESI FIELD ACTIVITIES AND ANALYTICAL RESULTS

Eight direct-push borings were advanced around the northern, eastern, and southern boundaries of the site (Figure 7-1). These direct-push borings were continuously sampled, using a 2-inch Macrocore™ sampler, from the ground surface to refusal. Twenty-one soil samples were collected. Soil samples were collected from each direct-push boring within the depth intervals of 0 to 2 ft bgs, 4 to 8 ft bgs, and 8 to 12 ft bgs. The field geologist prepared a lithologic log of each direct-push boring (Boring logs are included in Appendix B). Soil sample intervals were picked based upon PID readings and judgment of the field geologist. Soil samples were analyzed at an off-site laboratory for VOCs (USEPA Method 8260), TPH-GRO (USEPA Method 8015), and RCRA metals (USEPA Methods 6010/7000). Groundwater was not encountered in any boring. A temporary piezometer was installed in Boring DP05. The piezometer was left in place for six days with no groundwater accumulation. Following the completion of field activities at these sites, all direct-push boring locations were surveyed. The survey data is included in Appendix A.

Surface and subsurface soil analytical results (positive hits only) for the Consolidated Maintenance Facility Building 8100 are presented in Table 7-1. VOCs were only detected in three (including one duplicate) of the 23 (including two duplicates) soil samples analyzed for VOCs. Acetone was detected in Soil Sample 039-DP01/SB03 at 230 micrograms per kilograms (µg/kg) but was not detected in its duplicate (SB33). The detection was well below the USEPA Region 9 industrial screening level of 54,000 µg/kg. PCE was detected in Soil Sample SB02 (and its duplicate, SB22) from Boring 039-DP04 at 7.8 and 8.7 µg/kg, respectively. The detections were well below the USEPA Region 9 industrial screening level of 1,300 µg/kg. TPH was detected in 10 (including one duplicate) soil samples at levels ranging from 13 J (estimated) to 47 J milligrams per kilogram (mg/kg), well below the KDHE industrial RSK value of 20,000 mg/kg. Arsenic, barium, cadmium, chromium, and lead were detected in the soil samples with only arsenic detected at levels greater than the USEPA Region 9 industrial screening levels.

Arsenic was detected in all 23 (including two duplicates) samples at levels ranging from 4.8 to 15 mg/kg, above the USEPA Region 9 industrial screening level of 1.6 mg/kg but below the KDHE industrial RSK value of 38 mg/kg. These exceedences are a result of naturally occurring concentrations of arsenic, which are ubiquitous throughout Fort Riley soils at levels in excess of regulatory screening criteria. Direct-push locations and analytical results for soil samples are presented on Figure 7-2.

7.4 DISCUSSION AND RECOMMENDATIONS

Only two VOCs, one TPH, and five metals were detected in soil samples from the Consolidated Maintenance Facility Building 8100 site. Of these, only arsenic was detected at levels greater than the USEPA Region 9 industrial screening level, but less than the KDHE industrial RSK values. These exceedences are a result of naturally occurring concentrations of arsenic, which are ubiquitous throughout Fort Riley soils at levels in excess of regulatory screening criteria.

No groundwater was encountered at the Site. The Site is recommended for closed status.

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8.0 FORMER OIL TESTING LABORATORY BUILDING 1022 (FTRI-040)

8.1 SITE LOCATION, LAND USE, POTENTIAL MIGRATION PATHWAYS, AND RECEPTORS

The Former Oil Testing Laboratory Building 1022 (FTRI-040) is located at Camp Funston, just west of the intersection of Huebner and Campbell Hill Roads (Figures 1-1 and 8-1). This location is at the extreme north margin of the Kansas River floodplain. With the exception of Building 1020, located approximately 100 ft south of Building 1022, there are no other structures in the area; although, a new building is under construction immediately to the east. The area around Building 1022 is trimmed grass, with numerous trees. A narrow asphalt road also runs around the building. Threemile Creek is located to the northwest of Building 1022 (Figure 8-1) and discharges to the Kansas River approximately 1 ½ miles to the south of the Site. A drainage ditch present between Building 1022 and Building 1020 leads to Threemile Creek.

Building 1022 is underlain by either alluvial deposits and/or older terrace deposits of the Kansas River. During the field investigation, four direct-push boreholes were advanced to 40 ft bgs with no refusal met (Figure 8-1). The unconsolidated deposits were logged as a soft, brown clay, increasing in plasticity with depth. A sandy silt was logged in Boring DP03 at 37 ft bgs. Depth to groundwater varied from 36.3 to 37. 5 ft bgs with the direction of groundwater flow unknown. As the elevation of Threemile Creek is approximately 10 to 15 ft below the elevation of the ground surface, it is highly unlikely that groundwater within the Building 1022 area is discharging to Threemile Creek.

No protected or special ecological or cultural features were observed or are known to occur at or near this Site. Current and future land use at this site, based on the post environmental overlay, is anticipated to be open space.

There are no water supply wells in the immediate vicinity of Building 1022. The well field for the community of Ogden is located approximately two miles northeast of the Site.

8.2 SITE BACKGROUND AND PREVIOUS SAMPLING RESULTS

Building 1022 was originally built as a blacksmith shop at the Pack Train Station (or Packer's Camp). From the period 1975 to 1980, Building 1022 was used as the post oil testing laboratory. The procedures used are similar to those practiced at the current oil testing laboratory at Building 8100. Small quantities of waste are generated as part of the oil testing process. PCE was used to prepare slides for testing, and to clean slides and equipment. It probably took about three months to collect one quart of waste solvent for

disposal. A former supervisor of the oil testing laboratory stated that during the time period that the facility operated, solvents were used in small quantities, approximately one quart per day for testing and cleaning, and were mixed with used oil. The used oil was collected in containers for pickup and off-post disposal by a contractor. The general practice was to wipe equipment with industrial shop rags; small amounts of solvents were used with the rags. Following their use, the rags were placed in sealed containers and sent to the dry cleaning facility. There was no on-site disposal or dumping of waste solvents or other hazardous chemicals (LBA, 1993).

There is a wire storage bin outside Building 1022 (on the east wall), which stored paint, oil, herbicides, and compressed gas (as of late 1992).

There is no known history of environmental investigation around Building 1022. Assuming worst case practices (that all waste was disposed directly on the ground outside the building), only small quantities of waste would have been discharged to the soil.

8.3 ESI FIELD ACTIVITIES AND ANALYTICAL RESULTS

Four direct-push borings were advanced, one on each of the four sides of Building 1022 (Figure 8-1). These direct-push borings were continuously sampled, using a 2-inch Macrocore™ sampler, from the ground surface to 40 ft bgs. Groundwater was encountered at depths ranging from 36.3 to 37.5 ft bgs. Three soil samples were collected from each direct-push boring from depth intervals of 0 to 2 ft bgs, 4 to 8 ft bgs, and 8 to 12 ft bgs. The field geologist prepared a lithologic log of each direct-push boring (Boring logs are included in Appendix B). Soil samples were analyzed at an off-site laboratory for VOCs (USEPA Method 8260), TPH-diesel range organics (DRO) (USEPA Method 8015), pesticides (USEPA Method 8081A), and RCRA metals (USEPA Method 6010/7000). TPH-DRO analysis includes the hydrocarbons in the oil range. The probes were then advanced to the water table, and a temporary piezometer was set within each borehole. Groundwater samples were collected from the piezometers and analyzed for VOCs (USEPA Method 8260), TPH-DRO (USEPA Method 8015), pesticides (USEPA Method 8081A), and RCRA metals (USEPA Method 6010/7000; both filtered and unfiltered) with the exception of Piezometer DP01 from which metals (filtered and unfiltered) were not collected due to the limited amount of groundwater available. Following the completion of field activities at these sites, all direct-push boring locations were surveyed. The survey data are included in Appendix A.

Surface and subsurface soil analytical results (positive hits only) for the Former Oil Testing Laboratory Building 1022 are presented in Table 8-1. VOCs were not detected within any of the 12 soil samples. For pesticides, only 4,4'-dichlorodiphenyldichloroethylene (4,4'-DDE) was detected in Soil Samples

SB01 and SB02 (and its duplicate, SB22) from Boring 040-DP01 at 0.03 mg/kg, well below the USEPA Region 9 industrial PRG of 7.0 mg/kg. TPH as motor oil was detected in seven (including one duplicate) of the 14 (including two duplicates) soil samples at levels ranging from 13 J mg/kg to 72 mg/kg, which were also well below the KDHE industrial RSK of 20,000 mg/kg. Arsenic, barium, cadmium, chromium, lead, mercury, and selenium were detected in the soil samples with only arsenic detected at levels greater than the USEPA Region 9 industrial screening level. Arsenic was detected in all 14 (including two duplicates) samples with levels ranging from 3.1 to 4.8 mg/kg, which is above the USEPA Region 9 industrial screening level of 1.6 mg/kg, but below the KDHE industrial RSK value of 38 mg/kg. These exceedences are a result of naturally occurring concentrations of arsenic, which are ubiquitous throughout Fort Riley soils at levels in excess of regulatory screening criteria. The direct-push boring locations and analytical soil data are presented in Figure 8-2.

Groundwater analytical results (positive hits only) for the Former Oil Testing Laboratory Building 1022 are presented in Table 8-2. VOCs, TPH, and pesticides were not detected in any of the four groundwater samples. Total metals, including arsenic, barium, cadmium, chromium, lead, mercury, and selenium, were detected in three of the groundwater samples collected. As the total metals groundwater samples were collected from undeveloped piezometers, the groundwater samples were turbid and, therefore, were not screened against drinking water standards. Dissolved metals, including arsenic, barium, and lead, were detected in the four (including one duplicate) groundwater samples. Dissolved arsenic levels ranged from 0.018 to 0.026 milligram per liter (mg/L), above the MCL of 0.01 mg/L. Dissolved lead ranged from 0.009 to 0.016 mg/L with one sample at a level above the action level of 0.015 mg/L (Figure 8-3).

Due to the depth to groundwater at the Former Oil Testing Laboratory Building 1022 (36 to 38 ft bgs), the lack of water supply wells within the area, and the presence of the Fort Riley potable water system, groundwater at this site does not now and is unlikely to in the future to reach potential receptors.

8.4 DISCUSSION AND RECOMMENDATIONS

One pesticide, one TPH, and seven metals were detected in 14 (including two duplicates) soil samples from the Former Oil Testing Laboratory Building 1022 area. Of these, only arsenic was detected at levels greater than the USEPA Region 9 industrial screening level, but less than the KDHE industrial RSK values. Only metals were detected in the four (including one duplicate) groundwater samples with only dissolved arsenic and lead present at levels greater than MCLs or action levels. As no potential receptors of groundwater are present at the Site now or are anticipated in the future, the Site is recommended for closed status.

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9.0 FURNITURE REPAIR SHOPS (FTRI-041)

9.1 SITE LOCATION, LAND USE, POTENTIAL MIGRATION PATHWAYS, AND RECEPTORS

Three former furniture repair shops comprise FTRI-041. These include Building 319 at Main Post and former Buildings 1301 and 1605 at Camp Funston (Figures 1-1, 9-1, and 9-2). Activities related to the cleaning, repair, and finishing of furniture were conducted at these buildings. Chemicals used have included chlorinated solvents (e.g., methylene chloride), lacquers, thinners, paints, and cleaners.

During the preparation of this draft final document, it was discovered that the location of the former Building 1605, as noted in the work plan, was not correct. Rather than being located on the northeast corner of G Street and Seventh Street, former Building 1605 was in fact located on the southeast corner of that intersection (Figure 9-2). As a result of this error, subsurface soil and groundwater sampling were performed at the wrong location. It is Fort Riley's intention to conduct sampling at the former Building 1605 location in conjunction with other additional field activities proposed in the ESI Reports. In the interim, all discussion of soil and groundwater data collected from Direct-Push Borings DP07, DP08, and DP09 will be deleted from this section and supporting tables.

Building 319

Building 319 is located in the southern area of the Main Post, just south of the Union Pacific Railroad grade off Marshall Avenue (Figures 1-1 and 9-1). This area is on the northern margin of the Kansas River floodplain. The building is constructed of blond brick on a concrete slab. Two floor drains are located in the slab (on the building centerline near either end). These drains appear to have been part of the original structure. Based on interviews with tenants, the drains lead to the sanitary sewer. The immediate area around Building 319 is asphalt pavement, with some surrounding open grassy areas. There are only a few trees in the immediate area of the Site. Structures are present immediately to the west of Building 319.

Building 319 is at an approximate elevation of 1,060 ft, 15 to 25 ft above the Kansas River. The area is generally flat, with a drainage ditch east and north of the pavement around Building 319 collecting runoff. There are no wetlands on or adjacent to the Site. Building 319 overlies unconsolidated alluvial sediments of the Kansas River. These sediments are composed of clay, silt, sand, and gravel typical of floodplain deposits. The unconsolidated sediments as logged during this field investigation consist of clay and silt overlying sand. Depth to groundwater as measured during the ESI field investigation ranged from 21.5 to 22.8 ft bgs. The direction of flow is assumed to be to the southeast. Changes in groundwater flow directions in the alluvial materials may occur during flood stages of the Kansas River.

No protected or special ecological or cultural features were observed or are known to occur at or near this Site. Current and future land use at these locations, based on the post environmental overlay, is anticipated to be industrial or training/education.

The nearest supply well is located at the west side of MAAF, approximately 1 ½ miles south of the Site. In addition, there are several private supply wells located on the opposite side of the Kansas River, approximately 1 mile east of Building 319. The Kansas River acts as a hydrologic boundary for the alluvial aquifer system.

Former Buildings 1301 and 1605

Former Building 1301 was located on the north side of Fifth Street, between G and H Streets, and Former Building 1605 was located on the southeast corner of G Street and Seventh Street, in Camp Funston (Figures 1-1and 9-2). Former Building 1605 was located approximately 700 ft southeast of former Building 1301. Both buildings were demolished. The Former Building 1301 area is currently used for the storage of surplus material and the Former Building 1605 area is currently occupied by Building 1580, which is used as a Kansas Army National Guard vehicle maintenance facility. Other structures are present in the area, which is flat and covered with gravel. A room in the northwest corner of former Building 1301 was used for paint stripping. Five, one-inch diameter holes had been drilled through the floor of the room. Beneath the floor was approximately two ft of crawl space over the bare soil. Paint stripping chemicals may have been disposed through these holes.

The former Buildings 1301 and 1605 Sites lay on the floodplain of the Kansas River, which is located approximately 3,000 ft to the south-southeast. The Sites are underlain by unconsolidated alluvial deposits, which, as logged during the field investigation, consist of clay overlying silt overlying sand. Six inches of gravel fill were present at the ground surface at the borehole locations. Depth to groundwater as measured during the ESI field investigation ranged from 23 to 24 ft bgs. Groundwater movement is generally eastward toward the Kansas River (USGS, 2000).

No protected or special ecological or cultural features were observed and are known to occur at or near the Sites.

Fort Riley has no water supply wells located at Camp Funston. The nearest supply wells are those for the community of Ogden, which are located approximately 1 ½ miles northeast of the Sites. There are no other public supply wells within 4 miles of the Sites.

9.2 SITE BACKGROUND AND PREVIOUS SAMPLING RESULTS

Building 319

Building 319 was originally built as a Civilian Conservation Corps (CCC) Motor Transport Garage during the 1930s. It was subsequently used as a small arms shop and then a furniture repair shop. It is currently a training and educational facility. These industrial activities generated hazardous waste streams, which included VOCs and semivolatile organic compounds (SVOCs) associated with cleaners, solvents, paints, etc. as well as lead and copper residues in the waste cleaners.

A site investigation (SI) was conducted in 1994 around Building 319. A total of 40 soil gas and three groundwater screening samples were collected as part of this SI (Figure 9-3). The only positive detections of compounds of interest were at one soil-gas sampling location, which was located approximately 12 ft northwest of Building 319. Toluene was detected at a concentration of 2.7 µg/L in soil gas and total hydrocarbons were detected at a concentration of 17 µg/L in soil gas. These levels were below the threshold required to initial a Phase 2 investigation (LBA, 1995). These results suggested that soils around Building 319 were not contaminated by activities conducted at this Site.

Former Building 1301

Former Building 1301 was used as a furniture repair shop as part of the Military Correctional Facility at Camp Funston, which operated at this location from 1988 to 1992. When observed in October 1992, this building was empty and not in use. It was observed that the drilled holes were still in the floor and an inspection revealed numerous spills of paint sludge. It is possible that sludge and stripper seeped through the floor and onto the ground under the building.

A soil gas survey was conducted within and around the northwest corner of Building 1301 as part of the investigation of high priority sites at Fort Riley (Figure 9-4). There were no detections of VOCs in any of the soil gas samples collected (LBA, 1994).

Former Building 1605

Former Building 1605 was used for similar activities as Building 1301 between about 1984 and 1988 when it was destroyed by fire. It is possible that sludge and stripper may have seeped through the floor and onto the ground surface under the building.

A soil gas survey was conducted on the footprint of the former Building 1605 location as part of the investigation of high priority sites at Fort Riley. One of ten locations evaluated had FID concentrations of 660 µg/L (Figure 9-5). A Phase 2 survey was conducted, which included the collection of groundwater

and additional soil gas samples. There were no detections of VOCs in any of these additional samples (LBA, 1994).

9.3 ESI FIELD ACTIVITIES AND ANALYTICAL RESULTS

Three direct-push borings were advanced at each of the three existing/former building locations. At Building 319, Direct-Push Borings DP01, DP02, and DP03 were located to the northeast, east, and south of the building, respectively (Figure 9-1). At Former Building 1301, Direct-Push Borings DP04, DP05, and DP06 were evenly distributed around the buildings' footprints (Figure 9-2). The actual location of the Former Building 1301 footprint was difficult to determine in the field. Also, obstructions within this area made it difficult to locate there three borings. As noted in Section 9.1, Direct-Push Boring DP07, DP08, and DP09 were not spotted in the correct location; therefore, they will not be addressed in this discussion. The direct-push borings were continuously sampled, using a 2-inch Macrocore™ sampler, from the ground surface to a depth where groundwater was encountered. Three soil samples were collected from each direct-push boring from the depth intervals of 0 to 2 ft bgs, 4 to 8 ft bgs, and 8 to 12 ft bgs. The field geologist prepared a lithologic log of each direct-push boring (Boring logs are included in Appendix B). Soil samples were analyzed at an off-site laboratory for VOCs (USEPA Method 8260) and RCRA metals (USEPA Method 6010/7000). The probe was advanced to water, and groundwater samples were collected and analyzed for VOCs (USEPA Method 8260) and RCRA metals (USEPA Method 6010/7000; both filtered and unfiltered). Following the completion of field activities at these Sites, all direct-push boring locations were surveyed. The survey data are included in Appendix A.

Building 319

Subsurface soil analytical results (positive hits only) for Building 319 are presented in Table 9-1. No VOCs were detected at Building 319. Arsenic, barium, cadmium, chromium, lead, and selenium were detected in the soil samples, with only arsenic detected at levels greater than the USEPA Region 9 industrial screening level. Arsenic was detected in 8 of 9 samples at levels ranging from 1.7 to 4.8 mg/kg, above the USEPA Region 9 industrial screening level of 1.6 mg/kg but below the KDHE industrial RSK value of 38 mg/kg. The arsenic levels reported in these soil samples are typical for soil samples from Fort Riley. Direct-push boring locations and analytical results for soil samples are presented on Figure 9-6.

Groundwater analytical results (positive hits only) for Building 319 are presented in Table 9-2. Trichloromethane (chloroform) was the only VOC detected in DP01, DP02, and DP03. Trichloromethane was detected in all three borings at levels ranging from 2.6 to 3.5 µg/L, above the USEPA Region 9 PRGs for tap water of 0.17 µg/L but below the USEPA's MCL of 80 µg/L. Total metals including arsenic, barium, cadmium, chromium, lead, mercury, and selenium were detected in the groundwater samples. As

the total metals groundwater samples were collected from undeveloped piezometers, the groundwater samples were turbid and, therefore, were not screened against drinking water standards. Dissolved metals, including arsenic, barium, chromium, and lead were detected in the groundwater samples. Dissolved arsenic and lead were detected in Groundwater Sample 041-DP01 at levels greater than MCLs or action levels. Dissolved arsenic and lead were not detected in the other two groundwater samples. Direct-push boring locations and analytical results for groundwater are presented on Figure 9-7.

Due to the depth to groundwater at Building 319 (21 to 23 ft bgs), the lack of water supply wells within the area, and the presence of the Fort Riley potable water system, groundwater at this Site does not now and is unlikely in the future to reach potential receptors.

Former Building 1301

Subsurface soil analytical results (positive hits only) for the Former Building 1301 are presented in Table 9-1. Acetone was the only VOC detected at Former Building 1301. Acetone was detected at 200 µg/kg in Soil Sample 041-DP04/SB02 (7 to 8 ft bgs), below the USEPA Region 9 industrial PRG of 54,000,000 µg/kg. Arsenic, barium, cadmium, chromium, lead, and sodium were detected in the soil samples, with only arsenic detected at levels greater than the USEPA Region 9 industrial screening level. Arsenic was detected in all nine samples at levels ranging from 3 to 4.5 mg/kg, above the USEPA Region 9 industrial screening level of 1.6 mg/kg but below the KDHE industrial RSK value of 38 mg/kg. These exceedences are a result of naturally occurring concentrations of arsenic, which are ubiquitous throughout Fort Riley soils at levels in excess of regulatory screening criteria. Direct-push boring locations and analytical results for groundwater are presented on Figure 9-8.

Groundwater analytical results (positive hits only) for Former Building 1301are presented in Table 9-2. VOCs were not detected. Total metals including arsenic, barium, cadmium, chromium, lead, mercury, and selenium were detected in the groundwater samples. As the total metals groundwater samples were collected from undeveloped piezometers, the groundwater samples were turbid and, therefore, were not screened against drinking water standards. Dissolved metals, including arsenic, barium, and selenium were detected in the groundwater samples with only arsenic detected at levels greater than the USEPA MCLs. Arsenic was detected in Groundwater Sample 041-DP06 at levels greater than the USEPA MCL. Arsenic was not detected in the other two groundwater samples. Direct-push boring locations and analytical results for groundwater are presented on Figure 9-9.

Due to the depth to groundwater at Former Building 1301 (23 to 24 ft bgs), the lack of water supply wells within the area, and the presence of the Fort Riley potable water system, groundwater at this Site does not now and is unlikely in the future to reach potential receptors.

Former Building 1605

As noted in Section 9.1, Direct-Push Boring DP07, DP08, and DP09 were not spotted in the correct location for the former Building 1605. Analytical results from these boring are not valid and will not be discussed.

9.4 DISCUSSION AND RECOMMENDATIONS

Building 319

Six metals were detected in the nine soil samples from the Building 319 Site. Of these, only arsenic was detected at levels greater than the USEPA Region 9 industrial screening level but less than the KDHE industrial RSK values. One VOC and seven metals were detected in the three groundwater samples, with only dissolved arsenic and lead present at levels greater than MCLs or action levels. As no potential receptors of groundwater are present at the Site now or are anticipated in the future, the Site is recommended for closed status.

Former Building 1301

One VOC and six metals were detected in the nine soil samples from the Former Building 1301 Site. Of these, only arsenic was detected at levels greater than the USEPA Region 9 industrial screening level but less than the KDHE industrial RSK value. No VOCs and seven metals were detected in the three groundwater samples with only dissolved arsenic present at a level greater than the MCL. As no potential receptors of groundwater are present at the Site now or in the future, the Site is recommended for closed status.

Former Building 1605

As noted in Section 9.1, Direct-Push Borings DP07, DP08, and DP09 were not spotted in the correct location for the former Building 1605. As a result of this error, subsurface soil and groundwater sample collection were performed at the wrong location. It is Fort Riley's intention to conduct sampling at the correct former Building 1605 location in conjunction with other additional field activities proposed in the ESI Reports. Three direct-push borings will be advanced and sampled as described above in the first paragraph of Section 9.3. A decision on closed status for former Building 1605 will be made upon receipt and evaluation of this data.

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10.0 PRINT AND PUBLICATIONS SHOP BUILDING 263 (FTRI-045)

10.1 SITE LOCATION, LAND USE, POTENTIAL MIGRATION PATHWAYS, AND RECEPTORS

The Print and Publications Shop Building 263 (FTRI-045) is located at Main Post between Stuart and Cameron Avenues (Figures 1-1 and 10-1). The area around Building 263 is built up and is entirely surrounded by asphalt pavement. Areas of grass are present to the south of the building.

Building 263 is located on alluvial terrace deposits, just north of the bluff which delineates the northern boundary of the Kansas River floodplain. The alluvial terrace deposits consist of clay, silt, and sand, and lie on limestone or shale bedrock. In the vicinity of Building 263, these unconsolidated deposits range from 18 to 22 ft thick, based on soil borings previously advanced at the Site (LBA, 1995) and during this field investigation. Groundwater might be present at the interface between the bedrock and unconsolidated deposits during periods of high rainfall; however, it is more likely that groundwater would be present within voids and fractures in the bedrock. During SI activities conducted in March 1994 (LBA, 1995) and during the ESI field activities in August 2006, no groundwater was present in the unconsolidated material above bedrock. Groundwater present within the bedrock would probably flow toward the south.

The Fort Riley well field is located approximately 1 ½ miles west-northwest of the Site, in the floodplain of the Republican River. The back-up supply well for MAAF is located approximately 2 miles southeast of the Site, on the opposite side of the Kansas River. Several private supply wells are also located across the Kansas River, approximately 2 miles east of the Site. The Kansas River acts as a hydrologic boundary for the alluvial aquifer system.

No protected or special ecological or cultural features were observed or are known to occur at or near this Site. Current and future land use at this site, based on the post environmental overlay, is anticipated to be supply/storage.

10.2 SITE BACKGROUND AND PREVIOUS SAMPLING RESULTS

Building 263 housed the central print shop and a photographic processing facility on post for several decades. These activities made use of printing inks containing metal pigments, small quantities of chlorinated solvents (such as PCE), and photographic solutions containing elevated levels of certain metals, including silver. Hydrocarbon solvents were also used in the building. According to interviews with former employees, some of these compounds were discharged to the sanitary sewer. The potential

mechanisms for environmental releases were accidental spills or discharges around the building and leaks from sanitary sewer lines receiving discharges containing hazardous substances. Because of the asphalt paving around the building, migration of contamination to either surface water or air is prevented. The migration of contaminants to groundwater is considered the most likely pathway.

A series of environmental investigations were conducted at the Site in early 1994. A total of 51 soil-gas samples were collected around Building 263 at depths of either 4 or 12 ft bgs. Sixteen of these samples had detections of toluene, xylenes, dichloromethane, TCE, PCE and/or total flame ionization detector (FID) volatiles (Figure 10-2). None of the soil-gas detections exceeded 20 µg/L, with the exception of one detection of total FID volatiles (at 56 µg/L just north of Building 263). A total of 23 soil samples were collected from six borings. One soil sample had detections of toluene, TCE, and PCE (Figure 10-3). None of these detections were above regulatory standards or risk-based guidelines. An effort was made to collect groundwater samples; however, no water was present in the unconsolidated material above bedrock (LBA, 1995).

10.3 ESI FIELD ACTIVITIES AND ANALYTICAL RESULTS

Four direct-push borings were advanced at Building 263 (Figure 10-1). These direct-push borings were continuously sampled, using a 2-inch Macrocore™ sampler, from the ground surface to refusal. Three soil samples were collected from each direct-push boring from depth intervals of 0 to 2 ft bgs, 4 to 8 ft bgs, and 8 to 12 ft bgs. The field geologist prepared a lithologic log of each direct-push boring (Boring logs are included in Appendix B). Soil samples were analyzed at an off-site laboratory for VOCs (USEPA Method 8260). The probes were advanced to the refusal with no groundwater encountered; therefore, no groundwater samples were collected from the Building 263 Site. Following the completion of field activities at this Site, all direct-push boring locations were surveyed. The survey data are included in Appendix A.

VOCs were not detected in any of the 12 soil samples collected at Building 263.

10.4 DISCUSSION AND RECOMMENDATIONS

A previous investigation (LBA, 1995) at the Building 263 area indicated only low levels of VOCs present at limited locations within the soil. No VOCs were detected in soil samples during this field investigation. Groundwater was not encountered in the terrace deposits above the bedrock in either investigation. Based upon the above, Building 263 is recommended for closed status.

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11.0 BUILDING 727 WASTE PIT (FTRI-051)

11.1 SITE LOCATION, LAND USE, POTENTIAL MIGRATION PATHWAYS, AND RECEPTORS

Building 727 is one of the maintenance hangars located at MAAF. The Site is in the controlled active area on the north side of MAAF and is located on Ray Road (Figures 1-1 and 11-1). Building 727 is at an elevation of 1,061 ft, which is approximately 20 ft above the normal elevation of the Kansas River. The terrain surrounding the Site and the building is essentially flat. The area where the waste pit was located is landscaped and covered with grass. However, a concrete pad exists just west of the former pit.

The Site is located 500 ft southeast of the Kansas River. Although located on the floodplain of the Kansas River, it is protected from 100-year floods by a levee. Due to the topographic position and the use of the Site and surrounding area, there are no streams or other surface water bodies on or in the immediate vicinity of the Site. There are no wetlands at or adjacent to the Site. Surrounding land uses consist of activities associated with an airfield including hangar maintenance and airfield support operations.

The Site is underlain by alluvial sediments of the Kansas River, which overlie shale and limestone bedrock. The alluvial materials are composed of clay, silt, and sand, with some gravel. There is a layer of silt, with some clay, occurring at the surface with a thickness of up to 15 ft. The remaining alluvial materials are fine- to coarse-grained sand. These alluvial materials probably have a thickness of 60 to 80 ft. Groundwater is encountered at a depth of 20 to 25 ft bgs and flows in a general direction to the northeast.

The Fort Riley well field is located approximately 2 ½ miles west-northwest of the Site, in the floodplain of the Republican River. The back-up supply well for MAAF is located approximately 4,500 ft south of the Site. Several private supply wells are located approximately one mile to the northeast of the Site.

No protected or special ecological or cultural features were observed or are known to occur at or near this Site. Current and future land use at this site, based on the post environmental overlay, is anticipated to be as an airfield.

11.2 SITE BACKGROUND AND PREVIOUS SAMPLING RESULTS

Around 1983, an office area was added to the main hangar building. This office space was built directly over the old wash rack facility that dated from the World War II era. The wash rack had four service pits associated with it that were used by workers to stand underneath vehicles without the use of vehicle jacks. During construction of the addition to Building 727, three of the four service pits were removed. The

piping that carried "kerosene detergent" for the one remaining pit was also removed along with the other three pits. The remaining pit was left in place because it was not located under the office addition and was exposed on the eastern corner of the building until the summer of 1992, at which time the concrete pit was removed and the area backfilled. The main concern with the Building 727 service pit is that the remaining former service pit may have been used for unauthorized management of wastes generated by the maintenance hangar (LBA, 1995).

Several common hazardous materials, including petroleum fuels, industrial solvents, paints, and chemicals, were used in and around Building 727. Because some of these materials may have been disposed in the former service pit, the contaminants of concern at the Site were VOCs, SVOCs, TPH, and metals.

During the SI conducted in 1994, 30 soil-gas samples were collected from 15 sampling locations, but there were no detections. In addition, there were five soil samples collected from the vicinity of the former waste pit (Figure 11-2). There were no detections of either VOCs, SVOCs, or TPH-GRO in these soil samples. Three of the samples had detections of TPH-DRO ranging from 7 mg/kg to 16 mg/kg. All five samples had positive detections for arsenic, chromium, copper, lead, nickel, and zinc. Three samples had detections of beryllium. Two samples had detections of silver. Cadmium and selenium were detected in one sample each. The detections of arsenic in the soil samples, although above the lowest USEPA risk-based guidelines, were consistent with detections found across the Site. Beryllium was also detected above the residential guidelines for USEPA Region 10; however, these guidelines are not applicable at a non-residential usage area such as Building 727 (LBA, 1995).

A driven well point (MW01) was installed and developed to sample groundwater in September 1997 (Figure 11-1). A groundwater field sample, a field duplicate sample, a matrix spike sample, and a matrix spike duplicate sample were collected on September 25, 1997 and analyzed for VOCs, SVOCs, TPH (gasoline and diesel), and priority pollutant metals. VOC, SVOC, and TPH compounds were not detected in any of the samples collected. Several metals were detected in the groundwater samples; however, none exceeded their respective MCLs (BMcD, 1997).

11.3 ESI FIELD ACTIVITIES AND ANALYTICAL RESULTS

Two direct-push borings were advanced on the north side of the former waste pit (Figure 11-1). These direct-push borings were continuously sampled, using a 2-inch Macrocore™ sampler, from the ground surface to a depth where groundwater was encountered. Three soil samples were collected from each direct-push boring from the depth intervals of 0 to 2 ft bgs, 4 to 8 ft bgs, and 8 to 12 ft bgs. The field

geologist prepared a lithologic log of each direct-push boring (Boring logs are included in Appendix B). Soil samples were analyzed at an off-site laboratory for TPH-DRO (USEPA Method 8015) and RCRA metals (USEPA Methods 6010/7000). The probe was then advanced to the water table, and groundwater samples were collected and analyzed for TPH-DRO (USEPA Method 8015) and RCRA metals (USEPA Method 6010/7000; both filtered and unfiltered). Following the completion of field activities at the Site, all direct-push boring locations were surveyed. The survey data are included in Appendix A.

Surface and subsurface soil analytical results (positive hits only) for the former waste pit are presented in Table 11-1. TPH as motor oil was detected in two soil samples, 051-DP01/SB01 (0 to 2 ft bgs) and 051-DP02/SB01 (0 to 1 ft bgs) at 158 J and 30 J mg/kg, respectively, below the KDHE industrial RSK level of 20,000 mg/kg. Arsenic, barium, cadmium, chromium, lead and selenium were detected in the soil samples with only arsenic detected at levels greater than the USEPA Region 9 industrial screening level. Arsenic was detected in all six samples at levels ranging from 2.1 to 4.5 mg/kg, above the USEPA Region 9 industrial screening level of 1.6 mg/kg but below the KDHE industrial RSK value of 38 mg/kg (Figure 11-3). The arsenic levels reported in these soil samples are typical for soil samples from Fort Riley.

Groundwater analytical results (positive hits only) for the former waste pit are presented in Table 11-2. TPH-DRO was not detected in the groundwater samples. Total metals including arsenic, barium, cadmium, chromium, lead, mercury, and selenium were detected in the groundwater samples. As the total metals groundwater samples were collected from undeveloped piezometers, the groundwater samples were turbid and, therefore, were not screened against drinking water standards. Dissolved metals, including arsenic, barium, cadmium, chromium, and lead were detected in the groundwater samples. Arsenic (0.017 and 0.025 mg/L) and lead (0.032 and 0.061 mg/L) were detected in both groundwater samples at levels greater than their respective MCLs or action levels of 0.01 and 0.015 mg/L (Figure 11-4).

Due to the depth to groundwater at the former waste pit (20 to 25 ft bgs), the lack of water supply wells within the immediate area, and the presence of the Fort Riley potable water system, groundwater at this Site does not now and is unlikely in the future to reach potential receptors.

11.4 DISCUSSION AND RECOMMENDATIONS

TPH as motor oil and six metals were detected in the seven (including one duplicate) soil samples from the Building 727 Waste Pit area. Of these, only arsenic was detected at levels greater than the USEPA Region 9 industrial screening level, but less than the KDHE industrial RSK values. TPH was not detected in the groundwater. Seven total metals and five dissolved metals were detected in the two groundwater

samples. Dissolved arsenic and lead were detected in both groundwater samples at levels greater than their respective MCLs or action levels. Fort Riley proposes to advance three additional direct-push borings in the vicinity of the Building 727 Waste Pit to collect groundwater samples for analysis of lead and arsenic. This data will be used to support a recommendation for no additional investigation and site closure.

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12.0 REFERENCES

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Tables

Table 1-1
ESI Site Summary
Pesticide / PCB Sites
Expanded Site Investigation
Fort Riley, Kansas

Site Name		RCRA Regulatory History		CERCLA Regulatory History			
Pesticide / PCB Sites (Group 1)		**RCRA Part A: Interim Status** **Nov 1980-Sept 1998**	**RCRA Part B, Part II HSWA-defers to CERCLA** **Oct 1, 1998 to Oct 1, 2008**	**NPL August 1990/ FFA June 1991** **PA/PAOC**	**SI Reports**	**ESI 2006-2007**	**ESI 2006-2007, Actions Taken/Recommended**
DRMO Storage Area 1	FTRI- 006	Hazardous Waste Storage Facility AEHA, 1988 SWMU-No evidence of release	HSWA, 1998 No potential risk to HH & E based on SI	IWSA (LBA, 1993) Identified for Further Evaluation	LBA, 1995 Elevated POL contamination in NW corner - Deferred to UST Program No PCB detects above 50 ppm in soil	Confirm SI conclusion of no threat to HH & E against new PCB RSK of 4.3 ppm in soil	No actions are necessary to protect HH & E Transfer northern portion of site to Former Bldg 1245 Dispensing Station - FTRI-066; Closed Status
PCB Storage Building 343	FTRI- 007	AEHA, 1988 SWMU-Proposed environmental sampling				Confirm no threat to HH & E	**Sample concrete floor and exterior soil for PCBs** If sampling results show levels are protective of HH & E request Closed Status
PCB Storage Conexes 348	FTRI- 008	Hazardous Waste Storage Facility - Clean Closed 1990 AEHA, 1988 SWMU-Proposed environmental sampling				Confirm no threat to HH & E	No actions are necessary to protect HH & E; Closed Status
Pesticide UST at Camp Funston	FTRI- 010	AEHA, 1988 SWMU-Proposed environmental sampling Tank removed and clean closed in 1991				Confirm no threat to HH & E	No actions are necessary to protect HH & E; Closed Status
DRMO Storage Area 3	FTRI- 012	AEHA, 1988 SWMU-Proposed environmental sampling	HSWA, 1998 No potential risk to HH & E based on SI	IWSA (LBA, 1993) Identified for Further Evaluation	LBA, 1995 No potential risk to HH & E	No ESI field activities conducted	No actions are necessary to protect HH & E; Closed Status
DRMO Storage Area 2	FTRI- 015	AEHA, 1988 SWMU-No evidence of release	HSWA, 1998 No potential risk to HH & E based on SI	IWSA (LBA, 1993) Identified for Further Evaluation	LBA, 1995 One PCE GW result above MCL No potential risk to HH & E	Confirm SI conclusion of no threat to HH & E	No actions are necessary to protect HH & E; Closed Status
Former Livestock Dipping Facility	FTRI- 047		HSWA, 1998 No potential risk to HH & E based on SI	IWSA (LBA, 1993) Identified for Further Evaluation	LBA, 1995 Elevated levels of metals and pesticides in mixing pit No potential risk to HH & E	Confirm SI conclusion of no threat to HH & E	No actions are necessary to protect HH & E; Closed Status
Former Pesticides Facilities	FTRI- 048		HSWA, 1998 No potential risk to HH & E based on site visit of building 1022 and Camp Whitside HSWA, 1998 No potential risk to HH & E based on SI for Custer Hill Golf Course Pesticide Facility	IWSA (LBA, 1993) Recommended No Further Action	LBA, 1995 No potential risk to HH & E for Golf Course Pesticide Facility	Confirm SI conclusion of no threat to HH & E	No actions are necessary to protect HH & E; Closed Status
Mercury Contamination Areas	FTRI- 049		HSWA, 1998 No potential risk to HH & E based on site visit	Mercury removal in 1991/1992 IWSA (LBA, 1993) Identified for Further Evaluation Vaults retrofitted with air	LBA, 1995 No potential risk to HH & E	Confirm SI conclusion of no threat to HH & E	No actions are necessary to protect HH & E; Closed Status

Table 1-1
ESI Site Summary
Pesticide / PCB Sites
Expanded Site Investigation
Fort Riley, Kansas

Site Name		RCRA Regulatory History		CERCLA Regulatory History			
PCB Transformer Sites	FTRI- 050		HSWA, 1998 No potential risk to HH & E based on SI	IWSA (LBA, 1993) Recommended No Further Action	LBA, 1995 No PCB detects above 50 ppm in soil No potential risk to HH & E	Confirm SI conclusion of no threat to HH & E	No actions are necessary to protect HH & E; Closed Status
Milford Campground / Marina	FTRI- 055		HSWA, 1998 No potential risk to HH & E based on SI		LBA, 1995 No potential risk to HH & E	Confirm SI conclusion of no threat to HH & E	No actions are necessary to protect HH & E; Closed Status

AEHA - Army Environmental Hygiene Agency
AST - Aboveground Storage Tank
CERCLA - Comprehensive Environmental Response, Compensation, and Liability Act
DRMO - Defense Reutilization Marketing Office
ESI - Expanded Site Investigation
FFA - Federal Facility Agreement
HH&E - Human Health & Environment
HSWA - Hazardous and Solid Waste Amendment
IACH - Irwin Army Community Hospital
IWSA - Installation Wide Site Assessment
KDHE - Kansas Department of Health and Environment
LBA - Louis Berger and Associates
MCL - Maximum Contaminant Level
NPL - National Priorities List
PA - Preliminary Assessment
PAOC - Potential Area of Concern
PCB - Polychlorinated Biphenyl
PCE - Tetrachloroethene
POL - Petroleum, Oil, and Lubricant
PPM - Parts per Million
RCRA - Resource Conservation and Recovery Act
SI - Site Investigation
SWMU - Solid Waste Management Unit
TPH - Total Petroleum Hydrocarbons
UST - Underground Storage Tank
WWTP - Wastewater Treatment Plant

Table 1-1
ESI Site Summary
Wastewater Sites
Expanded Site Investigation
Fort Riley, Kansas

Site Name		RCRA Regulatory History		CERCLA Regulatory History			
Wastewater Sites (Group 2)		**RCRA Part A: Interim Status** **Nov 1980-Sept 1998**	**RCRA Part B, Part II HSWA-defers to CERCLA** **Oct 1, 1998 to Oct 1, 2008**	**NPL August 1990/ FFA June 1991** **PA/PAOC**	**SI Reports**	**ESI 2006-2007**	**ESI 2006-2007, Actions Taken/Recommended**
Industrial Wastewater System Custer Hill	FTRI- 020	AEHA, 1988 SWMU-No evidence of release	HSWA, 1998 No potential risk to HH & E or addressed under another regulatory program (Clean Water Act)	IWSA (LBA, 1993) East and West Ponds Identified for Further Evaluation Central Vehicle Wash Facility Recommended No Further Action	LBA, 1994 No CERCLA contaminants East Pond Free Product in GW West Pond No threat to HH & E Central Vehicle Wash Facility found POL in sediment	Confirm SI conclusion of no threat to HH & E	No actions are necessary to protect HH & E; Closed Status
Camp Funston WWTP Sludge Drying Beds	FTRI- 022	AEHA, 1988 SWMU-No evidence of release	HSWA, 1998 No potential risk to HH & E or addressed under another regulatory program (Clean Water Act)	IWSA (LBA, 1993) Recommended No Further Action		Confirm PA/PAOC conclusion of no threat to HH & E	No actions are necessary to protect HH & E; Closed Status
Custer Hill WWTP Sludge Drying Beds	FTRI- 023	AEHA, 1988 SWMU-No evidence of release	HSWA, 1998 No potential risk to HH & E or addressed under another regulatory program (Clean Water Act)	IWSA (LBA, 1993) Recommended No Further Action		Confirm PA/PAOC conclusion of no threat to HH & E	No actions are necessary to protect HH & E; Closed Status
Camp Forsyth WWTP Sludge Drying Beds	FTRI- 024	AEHA, 1988 SWMU-No evidence of release	HSWA, 1998 No potential risk to HH & E or addressed under another regulatory program (Clean Water Act)	IWSA (LBA, 1993) Recommended No Further Action		Confirm PA/PAOC conclusion of no threat to HH & E	No actions are necessary to protect HH & E; Closed Status
Main Post WWTP Sludge Drying Beds	FTRI- 025	AEHA, 1988 SWMU-No evidence of release	HSWA, 1998 No potential risk to HH & E or addressed under another regulatory program (Clean Water Act)	IWSA (LBA, 1993) Recommended No Further Action		Confirm PA/PAOC conclusion of no threat to HH & E	No actions are necessary to protect HH & E; Closed Status
Range Complex Wastewater Lagoons	FTRI- 026	AEHA, 1988 SWMU-No evidence of release	HSWA, 1998 No potential risk to HH & E or addressed under another regulatory program (Clean Water Act)	IWSA (LBA, 1993) Recommended No Further Action		Confirm evidence of no release	No actions are necessary to protect HH & E; Closed Status

AEHA - Army Environmental Hygiene Agency
AST - Aboveground Storage Tank
CERCLA - Comprehensive Environmental Response, Compensation, and Liability Act
DRMO - Defense Reutilization Marketing Office
ESI - Expanded Site Investigation
FFA - Federal Facility Agreement
HH&E - Human Health & Environment
HSWA - Hazardous and Solid Waste Amendment
IACH - Irwin Army Community Hospital
IWSA - Installation Wide Site Assessment
KDHE - Kansas Department of Health and Environment
LBA - Louis Berger and Associates
MCL - Maximum Contaminant Level
NPL - National Priorities List
PA - Preliminary Assessment
PAOC - Potential Area of Concern
PCB - Polychlorinated Biphenyl
PCE - Tetrachloroethene
POL - Petroleum, Oil, and Lubricant
PPM - Parts per Million
RCRA - Resource Conservation and Recovery Act
SI - Site Investigation
SWMU - Solid Waste Management Unit
TPH - Total Petroleum Hydrocarbons
UST - Underground Storage Tank
WWTP - Wastewater Treatment Plant

Table 1-1
ESI Site Summary
Petroleum / VOC Sites
Expanded Site Investigation
Fort Riley, Kansas

Site Name		RCRA Regulatory History		CERCLA Regulatory History			
Petroleum / VOC Sites (Group 3)		**RCRA Part A: Interim Status** **Nov 1980-Sept 1998**	**RCRA Part B, Part II HSWA-defers to CERCLA** **Oct 1, 1998 to Oct 1, 2008**	**NPL August 1990/ FFA June 1991** **PA/PAOC**	**SI Reports**	**ESI 2006-2007**	**ESI 2006-2007, Actions Taken/Recommended**
Abandoned VOC Tanks - IACH	FTRI- 013	AEHA, 1988 SWMU-Proposed environmental sampling		Tanks removed in September 1990 Field test showed 110 ppm TPH in soil		Confirm conclusion of no threat to HH & E	No actions are necessary to protect HH & E; Closed Status
Waste Oil AST, 3rd Battery	FTRI- 016	AEHA, 1988 SWMU-No evidence of release		After 1988, AST decommissioned and removed		Site visit to confirm evidence of no release	No actions are necessary to protect HH & E; Closed Status
Waste Oil AST, 4th Battery	FTRI- 017	AEHA, 1988 SWMU-No evidence of release		After 1988, AST decommissioned and removed		Site visit to confirm evidence of no release	No actions are necessary to protect HH & E; Closed Status
Fire Training Area Facility 892	FTRI- 018	AEHA, 1988 SWMU-No evidence of release	HSWA, 1998 Recommends investigation, review, or remediation	IWSA (LBA, 1993) Recommended No Further Action	USTs removed 1996 with clean closure Ground-water contamination above MCLs for 1,2-DCA, benzene, and toluene in 1999	Confirm no threat to HH & E	**Sample soil and goundwater for VOCs.** If sampling results show levels are protective of HH & E request Closed Status
Fire Training Area, Camp Funston	FTRI- 028	1982 soil removal AEHA, 1988 SWMU-No evidence of release	HSWA, 1998 No potential risk to HH & E based on site visit	IWSA (LBA, 1993) Recommended No Further Action Site investigated as part of Southwest Funston Landfill	Vinyl chloride above MCL in 2004 Below MCL in 2006 and 2007 in SFL wells	No ESI field activities	No actions are necessary to protect HH & E; Closed Status
Consolidated Maintenance Facility Building 8100	FTRI- 039			IWSA (LBA, 1993) Identified for Further Evaluation	All USTs and ASTs removed in 1994 with clean closure	Confirm no threat to HH & E	No actions are necessary to protect HH & E; Closed Status
Former Oil Testing Lab Building 1022	FTRI- 040		HSWA, 1998 No potential risk to HH & E based on site visit	IWSA (LBA, 1993) Recommended No Further Action		Confirm evidence of no release	No actions are necessary to protect HH & E; Closed Status
Furniture Repair Shops	FTRI- 041		HSWA, 1998 No potential risk to HH & E based on SI	IWSA (LBA, 1993) Identified for Further Evaluation Building 1605 soil removed in 1993	LBA, 1994 Buildings 1301 & 1605 No evidence of releases LBA, 1995 Building 319 No threat to HH & E	Confirm SI conclusion of no threat to HH & E	No actions are necessary to protect HH & E; Closed Status
Print and Publications Shop Building 263	FTRI- 045		HSWA, 1998 No potential risk to HH & E based on SI	IWSA (LBA, 1993) Recommended No Further Action	LBA, 1995 No potential risk to HH & E	Confirm SI conclusion of no threat to HH & E	No actions are necessary to protect HH & E; Closed Status
Building 727 Waste Pit	FTRI- 051		HSWA, 1998 No potential risk to HH & E based on SI	IWSA (LBA, 1993) Identified for Further Evaluation	LBA, 1995 No potential risk to HH & E	Confirm SI conclusion of no threat to HH & E	**Sample groundwater for lead and arsenic** If sampling results show levels are protective of HH & E, request Closed Status.

AEHA - Army Environmental Hygiene Agency
AST - Aboveground Storage Tank
CERCLA - Comprehensive Environmental Response, Compensation, and Liability Act
DRMO - Defense Reutilization Marketing Office
NPL - National Priorities List
PA - Preliminary Assessment
PAOC - Potential Area of Concern
PCB - Polychlorinated Biphenyl

T. 1-1
ESI Site Summary
Petroleum / VOC Sites
Expanded Site Investigation
Fort Riley, Kansas

Site Name		RCRA Regulatory History	CERCLA Regulatory History	

ESI - Expanded Site Investigation
FFA - Federal Facility Agreement
HH&E - Human Health & Environment
HSWA - Hazardous and Solid Waste Amendment
IACH - Irwin Army Community Hospital
IWSA - Installation Wide Site Assessment
KDHE - Kansas Department of Health and Environment
LBA - Louis Berger and Associates
MCL - Maximum Contaminant Level
PCE - Tetrachloroethene
POL - Petroleum, Oil, and Lubricant
PPM - Parts per Million
RCRA - Resource Conservation and Recovery Act
SI - Site Investigation
SWMU - Solid Waste Management Unit
TPH - Total Petroleum Hydrocarbons
UST - Underground Storage Tank
WWTP - Wastewater Treatment Plant

Table 1-1
ESI Site Summary
Former Landfill / Incinerator Sites
Expanded Site Investigation
Fort Riley, Kansas

Site Name		RCRA Regulatory History		CERCLA Regulatory History			
Former Landfill/Incinerator Sites (Group 4)		**RCRA Part A: Interim Status** **Nov 1980-Sept 1998**	**RCRA Part B, Part II HSWA-defers to CERCLA** **Oct 1, 1998 to Oct 1, 2008**	**NPL August 1990/ FFA June 1991** **PA/PAOC**	**SI Reports**	**ESI 2006-2007**	**ESI 2006-2007, Actions Taken/Recommended**
Whitside C/D Landfill	FTRI- 002	AEHA, 1988 SWMU-Proposed environmental sampling	HSWA, 1998 No potential risk to HH & E or addressed under another regulatory program (RCRA Subtitle D)	IWSA (LBA, 1993) Identified for Further Evaluation	LBA, 1995 No potential risk to HH & E	Confirm no threat to HH & E	No actions are necessary to protect HH & E; Closed Status
Main Post Landfill	FTRI- 004	AEHA, 1988 SWMU-No evidence of release	HSWA, 1998 No potential risk to HH & E based on SI	IWSA (LBA, 1993) Identified for Further Evaluation	LBA, 1995 No potential risk to HH & E	Confirm SI conclusion of no threat to HH & E	No actions are necessary to protect HH & E; Closed Status
Custer Hill Rubble Dump	FTRI- 005	AEHA, 1988 SWMU-No evidence of release	HSWA, 1998 No potential risk to HH & E based on site visit	IWSA (LBA, 1993) Recommended No Further Action		Confirm evidence of no release of hazardous substances and no threat to HH & E	No actions are necessary to protect HH & E; Closed Status
Hospital Incinerator - IACH	FTRI- 014	AEHA, 1988 SWMU-No evidence of release				Confirm evidence of no release of hazardous substances and no threat to HH & E	No actions are necessary to protect HH & E; Closed Status
Southeast Funston Landfill Incinerator	FTRI- 029	AEHA, 1988 SWMU-No evidence of release	HSWA, 1998 Recommends investigation, review, or remediation	IWSA (LBA, 1993) Recommended No Further Action	LBA, 1995 Detected lead in soil Removed impacted soil in 1999	Confirm no threat to HH & E	No actions are necessary to protect HH & E; Closed Status
Southeast Funston Landfill	FTRI- 036		HSWA, 1998 Recommends investigation, review, or remediation	IWSA (LBA, 1993) Identified for Further Evaluation	LBA, 1995 Detected lead, antimony & VC above MCL in GW	Confirm no threat to HH & E	No actions are necessary to protect HH & E; Closed Status
Old Whitside Incinerator	FTRI- 037		HSWA, 1998 No potential risk to HH & E based on SI	IWSA (LBA, 1993) Recommended No Further Action	LBA, 1995 No potential risk to HH & E	Confirm SI conclusion of no threat to HH & E	No actions are necessary to protect HH & E; Closed Status
Inactive Landfills - Camp Whitside	FTRI- 052		HSWA, 1998 No potential risk to HH & E based on SI	IWSA (LBA, 1993) Identified for Further Evaluation	LBA, 1995 No potential risk to HH & E	Confirm SI conclusion of no threat to HH & E	No actions are necessary to protect HH & E; Closed Status

AEHA - Army Environmental Hygiene Agency
AST - Aboveground Storage Tank
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DRMO - Defense Reutilization Marketing Office
ESI - Expanded Site Investigation
FFA - Federal Facility Agreement
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HSWA - Hazardous and Solid Waste Amendment
IACH - Irwin Army Community Hospital
IWSA - Installation Wide Site Assessment
KDHE - Kansas Department of Health and Environment
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PA - Preliminary Assessment
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PCB - Polychlorinated Biphenyl
PCE - Tetrachloroethene
POL - Petroleum, Oil, and Lubricant
PPM - Parts per Million
RCRA - Resource Conservation and Recovery Act
SI - Site Investigation
SWMU - Solid Waste Management Unit
TPH - Total Petroleum Hydrocarbons
UST - Underground Storage Tank
WWTP - Wastewater Treatment Plant

T. 1-1
ESI Site Summary
POL Sites
Expanded Site Investigation
Fort Riley, Kansas

Site Name		RCRA Regulatory History		CERCLA Regulatory History			
POL Sites (Group 5)		**RCRA Part A: Interim Status** **Nov 1980-Sept 1998**	**RCRA Part B, Part II HSWA-defers to CERCLA** **Oct 1, 1998 to Oct 1, 2008**	**NPL August 1990/ FFA June 1991** **PA/PAOC**	**SI Reports**	**ESI 2006-2007**	**ESI 2006-2007, Actions Taken/Recommended**
Tactical Vehicle Maintenance Shops	FTRI- 042		HSWA, 1998 No potential risk to HH & E based on site visit	IWSA (LBA, 1993) Recommended No Further Action - Deferred to UST Program		Site visits to confirm evidence of no release	No actions are necessary to protect HH & E; Closed Status
Former Gas Stations/Garages	FTRI- 043		HSWA, 1998 No potential risk to HH & E based on site visit	IWSA (LBA, 1993) Recommended No Further Action - Deferred to UST Program		Confirm SI conclusion of no threat to HH & E	No actions are necessary to protect HH & E; Closed Status except at Camp Forsyth I & 7th Streets location. **Collect subsurface soil samples for VOCs.**
6200 Area Fuel Oil Line	FTRI- 057				POL-contaminated soil removed in 1997 No potential risk to HH & E	Confirm conclusion of no threat to HH & E	No actions are necessary to protect HH & E; Closed Status
Underground Storage Tanks	FTRI- 059	AEHA, 1988 SWMU-No evidence of release under obsolete FTRI-015	HSWA, 1998 No potential risk to HH & E or addressed under another regulatory program (RCRA Subtitle I)	IWSA (LBA, 1993) Recommended No Further Action - Deferred to UST Program	USTs removed in 1990s Residual POL contamination of soil and ground water No potential risk to HH & E	Confirm conclusion of no threat to HH & E	No actions are necessary to protect HH & E for Closed Sites (See Table 5-1) Request Administrative Closure for Tanks 7903a & b and 7923 from KDHE, North Central District Office

AEHA - Army Environmental Hygiene Agency
AST - Aboveground Storage Tank
CERCLA - Comprehensive Environmental Response, Compensation, and Liability Act
DRMO - Defense Reutilization Marketing Office
ESI - Expanded Site Investigation
FFA - Federal Facility Agreement
HH&E - Human Health & Environment
HSWA - Hazardous and Solid Waste Amendment
IACH - Irwin Army Community Hospital
IWSA - Installation Wide Site Assessment
KDHE - Kansas Department of Health and Environment
LBA - Louis Berger and Associates
MCL - Maximum Contaminant Level
NPL - National Priorities List
PA - Preliminary Assessment
PAOC - Potential Area of Concern
PCB - Polychlorinated Biphenyl
PCE - Tetrachloroethene
POL - Petroleum, Oil, and Lubricant
PPM - Parts per Million
RCRA - Resource Conservation and Recovery Act
SI - Site Investigation
SWMU - Solid Waste Management Unit
TPH - Total Petroleum Hydrocarbons
UST - Underground Storage Tank
WWTP - Wastewater Treatment Plant

Table 6-1
Groundwater Detections 2004 - 2006
Fire Training Area, Camp Funston (FTRI-028)
Petroluem / VOC Sites
Expanded Site Investigation
Fort Riley, Kansas

SFL92-401		USEPA Region 9 PRGs	Date Sampled: USEPA MCLs/ Action Level	Mar-04	Sep-04	Mar-05	Sep-05	Mar-06	Sep-06
Volatiles	UNITS								
Chlorobenzene	ug/L	106	100	***0.35 J***	***0.59***	***1.04 J***	***0.49 J***	***0.73 J***	***0.960 J***
1,2-Dichlorobenzene	ug/L	370	600	U	U	U	U	U	***1.79 J***
1,4-Dichlorobenzene	ug/L	0.5	75	***0.46 J***	***0.64***	***0.94***	***0.54 J***	***0.79 J***	***0.870 J***
cis-1,2-Dichloroethene	ug/L	61	70	***0.62 J***	***0.58***	***0.62 J***	***0.64 J***	***0.44 J***	***0.260 J***
Trichloroethene	ug/L	0.028	5	U	U	U	U	U	***0.840 J***
Toluene	ug/L	723	1,000	U	U	U	U	***0.28 J***	U
Vinyl Chloride	ug/L	0.02	2	***3.57***	***3.3***	***3.49***	***3.19***	***1.68 J***	***1.21 J***
Metals	UNITS								
Lead, Total	ug/L	3.60E-06	15	***0.234 J***	U	U	U	U	U

SFL92-403		USEPA Region 9 PRGs	Date Sampled: USEPA MCLs/ Action Level	Mar-04	Sep-04	Mar-05	Sep-05	Mar-06	Sep-06
Volatiles	UNITS								
Benzene	ug/L	0.354	5	U	U	***0.67 J***	U	U	U
Chlorobenzene	ug/L	106	100	***0.33 J***	***0.23 J***	***0.3 J***	***0.27 J***	***0.42 J***	***0.360 J***
Carbon Disulfide	ug/L	1043	-	U	U	***0.43 J***	U	U	U
1,4-Dichlorobenzene	ug/L	0.5	75	***0.33 J***	U	***0.45 J***	***0.31 J***	***0.93 J***	***0.530 J***
1,1-Dichloroethane	ug/L	810	-	U	***0.23 J***	***0.22 J***	U	U	U
cis-1,2-Dichloroethene	ug/L	61	70	***0.76 J***	***0.73***	***0.85 J***	***0.74 J***	***0.42 J***	***0.200 J***
Trichloroethene	ug/L	0.028	5	U	U	U	U	U	***0.230 J***
Toluene	ug/L	723	1,000	U	U	U	U	***0.35 J***	U
Vinyl Chloride	ug/L	0.02	2	***4.48***	***4.02***	***3.89***	***3.55***	***1.11 J***	***0.77 J***
Metals	UNITS								
Lead, Total	ug/L	3.60E-06	15	***1.171 J***	U	U	U	U	U

Table 6-1
Groundwater Detections 2004 - 2006
Fire Training Area, Camp Funston (FTRI-028)
Petroluem / VOC Sites
Expanded Site Investigation
Fort Riley, Kansas

SFL92-601		USEPA Region 9 PRGs	Date Sampled: USEPA MCLs/ Action Level	Mar-04	Sep-04	Mar-05	Sep-05	Mar-06	Sep-06
Volatiles	UNITS								
Benzene	ug/L	0.35	5	***4.72***	***4.68***	***4.38***	***3.78***	***2.84***	***2.82***
Chloloethane	ug/L	5	-	U	U	U	***0.75 J***	U	***0.730 J***
1,4-Dichlorobenzene	ug/L	0.5	75	***0.45 J***	U	***0.55 J***	***0.32 J***	***0.94 J***	***0.770 J***
1,1-Dichloroethane	ug/L	810	-	***2.31***	***1.83***	***1.71 J***	***1.49 J***	***0.74 J***	***0.630 J***
1,2-Dichloropropane	ug/L	0.16	5	U	***0.23 J***	U	U	U	U
1,2,4-trimethylbenzene	ug/L	-	-	U	U	U	U	***0.77 J***	***1.89 J***
cis-1,2-Dichloroethene	ug/L	61	70	***0.23 J***	U	U	U	U	U
Dichlorodifluoromethane	ug/L	390	-	U	U	U	U	U	***1.87 J***
Isopropylbenzene	ug/L	-	-	U	U	U	U	***0.92 J***	***0.810 J***
Naphthalene	ug/L	6.2	-	***2.32***	U	***2.34***	***1.77 J***	***2.96***	***1.30 J***
Trichloroethene	ug/L	0.028	5	U	U	U	U	U	***1.24 J***
m&p-Xylenes	ug/L	-	-	U	U	***0.22 J***	U	***0.4 J***	***0.260 J***
o-Xylene	ug/L	-	-	U	U	U	***0.2 J***	***0.21 J***	***0.200 J***
total Xylenes	ug/L	206	10,000	U	U	***0.22 J***	***0.2 J***	***0.61 J***	U
Toluene	ug/L	723	1,000	***0.23 J***	***0.45 J***	***0.46 J***	***0.37 J***	***0.43 J***	U
Vinyl Chloride	ug/L	0.02	2	***2.57***	***1.24***	U	***0.82 J***	U	U
Metals	UNITS								
Lead, Total	ug/L	3.60E-06	15	NA	NA	NA	NA	NA	NA

Table 6-1
Groundwater Detections 2004 - 2006
Fire Training Area, Camp Funston (FTRI-028)
Petroluem / VOC Sites
Expanded Site Investigation
Fort Riley, Kansas

SFL92-603		USEPA Region 9 PRGs	Date Sampled: USEPA MCLs/ Action Level	Mar-04	Sep-04	Mar-05	Sep-05	Mar-06	Sep-06
Volatiles	UNITS								
Benzene	ug/L	0.35	5	U	U	U	U	U	U
Chlorobenzene	ug/L	0.35	5	***0.34J***	U	U	U	U	U
Chloroethane	ug/L	5	-	U	U	U	***0.43 J***	U	***0.270 J***
1,4-Dichlorobenzene	ug/L	0.5	75	***0.58 J***	U	U	***0.32 J***	U	U
1,1-Dichloroethane	ug/L	810	-	U	U	U	***1.49***	U	U
cis-1,2-Dichloroethene	ug/L	61	70	U	U	U	U	***0.36 J***	***0.310 J***
Naphthalene	ug/L	6.2	-	U	U	U	U	U	U
Trichloroethene	ug/L	0.028	5	U	U	U	U	U	***0.300 J***
m&p-Xylenes	ug/L	-	-	U	U	U	U	U	U
total Xylenes	ug/L	206	10,000	U	U	U	U	U	U
Vinyl Chloride	ug/L	0.02	2	U	***0.56***	U	***0.74 J***	***1.63 J***	***1.58 J***
Metals	UNITS								
Lead, Total	ug/L	3.60E-06	15	NA	NA	NA	NA	NA	NA

SFL94-03A		USEPA Region 9 PRGs	Date Sampled: USEPA MCLs/ Action Level	Mar-04	Sep-04	Mar-05	Sep-05	Mar-06	Sep-06
Volatiles	UNITS								
cis-1,2-Dichloroethene	ug/L	61	70	***0.16 J***	U	U	U	U	U
Trichloroethene	ug/L	0.028	5	U	U	U	U	U	***0.350 J***
Vinyl Chloride	ug/L	0.02	2	***0.62 J***	U	U	U	U	U
Metals	UNITS								
Lead, Total	ug/L	3.60E-06	15	NA	NA	NA	NA	NA	NA

Table 6-1
Groundwater Detections 2004 - 2006
Fire Training Area, Camp Funston (FTRI-028)
Petroluem / VOC Sites
Expanded Site Investigation
Fort Riley, Kansas

SFL94-04B		USEPA Region 9 PRGs	Date Sampled: USEPA MCLs/ Action Level	Mar-04	Sep-04	Mar-05	Sep-05	Mar-06	Sep-06
Volatiles	UNITS								
1,1,1-Trichloroethane	ug/L	3171	200	U	U	U	***0.21 J***	U	U
cis-1,2-Dichloroethene	ug/L	61	70	***0.25 J***	U	U	U	U	U
Vinyl Chloride	ug/L	0.02	2	***0.41 J***	U	U	U	U	U
Metals	UNITS								
Lead, Total	ug/L	3.60E-06	15	***0.708 J***	***1.13***	***2.64***	***3.4***	***2.52***	***2.37***

Notes:

1. All data screened against the USEPA MCLs/Action Levels (for lead). All exceedances are shaded. All detections are in bold.

USEPA Region 9 PRGs - United States Environmental Protection Agency Region 9 Preliminary Remediation Goals

USEPA MCLs - United States Environmental Protection Agency Maximum Contaminant Levels

References for data: ECC, 2005, 2006a, 2006b, and 2006c.

ug/L - micrograms per liter

mg/L - milligrams per liter

U - compound was not detected

J - qualified as estimated during quality control evaluation

Table 7-1
Soil Detections
Consolidated Maintenance Facility Building 8100 (FTRI-039)
Petroleum / VOC Sites
Expanded Site Investigation
Fort Riley, Kansas

Sample Point: / Date Sampled: / Sample Depth: / Laboratory Number:		USEPA Region 9 PRGs (res/ind)	KDHE RSKs (res/ind)	039-DP01/SB01 7/27/2006 0.5 - 1.5 ft 06072029	039-DP01/SB02 7/27/2006 7 - 8 ft 06072030	039-DP01/SB03 7/27/2006 9 - 11 ft 06072031	039-DP01/SB33 7/27/2006 9 - 11 ft 06072032 Duplicate
Volatiles	UNITS						
Acetone	ug/kg	1.4E07 / 5.4E07	1.7E06 / 6.2E06	120 U	120 U	***230***	120 U
Tetrachloroethene	ug/kg	480 / 1,300	79,000 / 140,000	6.2 U	6.2 U	6 U	6 U
Total Petroleum Hydrocarbons	UNITS						
Quantified as Motor Oil	mg/kg	--	2,000 / 20,000	12 U	12 U	***28 J***	***16 J***
Metals, Total	UNITS						
Arsenic, Total	mg/kg	0.39 / 1.6	11 / 38	***5.8***	***5.4***	***6.6***	***6.9***
Barium, Total	mg/kg	5,400 / 67,000	5,500 / 140,000	***130***	***180***	***200***	***250***
Cadmium, Total	mg/kg	37 / 450	39 / 1,000	1.2 U	0.62 U	0.6 U	0.6 U
Chromium, Total	mg/kg	210 / 450	390 / 4,000	***28***	***25***	***26***	***25***
Lead, Total	mg/kg	400 / 800	400 / 1,000	***14***	***9***	***13***	***13***

Notes:

1. All data screened against the USEPA Region 9 PRGs (industrial) with the exception of TPH which is screened against KDHE industrial RSKs. All exceedances are shaded. All detections are in bold.

USEPA Region 9 PRGs - United States Environmental Protection Agency Region 9 Preliminary Remediation Goals
KDHE RSKs - Kansas Department of Health and Environment Risk-Based Standards
res/ind - residential / industrial
ft - feet
ug/kg - micrograms per kilogram
mg/kg - milligrams per kilogram
J - qualified as estimated during QC evaluation
U - compound was not detected
NA - not applicable / not analyzed
QC - quality control

Table 7-1
Soil Detections
Consolidated Maintenance Facility Building 8100 (FTRI-039)
Petroleum / VOC Sites
Expanded Site Investigation
Fort Riley, Kansas

Sample Point: / Date Sampled: / Sample Depth: / Laboratory Number:		USEPA Region 9 PRGs (res/ind)	KDHE RSKs (res/ind)	039-DP02/SB01 7/27/2006 0 - 2 ft 06072033	039-DP02/SB02 7/27/2006 7 - 8 ft 06072034	039-DP02/SB03 7/27/2006 11 - 12 ft 06072035	039-DP03/SB01 7/27/2006 0 - 1 ft 06072036
Volatiles	UNITS						
Acetone	ug/kg	1.4E07 / 5.4E07	1.7E06 / 6.2E06	120 U	130 U	120 U	120 U
Tetrachloroethene	ug/kg	480 / 1,300	79,000 / 140,000	5.9 U	6.4 U	5.9 U	6 U
Total Petroleum Hydrocarbons	UNITS						
Quantified as Motor Oil	mg/kg	--	2,000 / 20,000	***13 J***	***42 J***	12 U	***17 J***
Metals, Total	UNITS						
Arsenic, Total	mg/kg	0.39 / 1.6	11 / 38	***7.4***	***6.6***	***5.1***	***6.4***
Barium, Total	mg/kg	5,400 / 67,000	5,500 / 140,000	***120***	***110***	***88***	***170***
Cadmium, Total	mg/kg	37 / 450	39 / 1,000	0.59 U	0.64 U	0.59 U	0.6 U
Chromium, Total	mg/kg	210 / 450	390 / 4,000	***26***	***20***	***24***	***25***
Lead, Total	mg/kg	400 / 800	400 / 1,000	***9.3***	***13***	***4***	***10***

Notes:

1. All data screened against the USEPA Region 9 PRGs (industrial) with the exception of TPH which is screened against KDHE industrial RSKs. All exceedances are shaded. All detections are in bold.

USEPA Region 9 PRGs - United States Environmental Protection Agency Region 9 Preliminary Remediation Goals
KDHE RSKs - Kansas Department of Health and Environment Risk-Based Standards
res/ind - residential / industrial
ft - feet
ug/kg - micrograms per kilogram
mg/kg - milligrams per kilogram
J - qualified as estimated during QC evaluation
U - compound was not detected
NA - not applicable / not analyzed
QC - quality control

Table 7-1
Soil Detections
Consolidated Maintenance Facility Building 8100 (FTRI-039)
Petroleum / VOC Sites
Expanded Site Investigation
Fort Riley, Kansas

Sample Point: Date Sampled: Sample Depth: Laboratory Number:		USEPA Region 9 PRGs (res/ind)	KDHE RSKs (res/ind)	039-DP03/SB02 7/27/2006 7 - 8 ft 06072037	039-DP03/SB03 7/27/2006 8 - 9 ft 06072038	039-DP04/SB01 7/27/2006 1 - 2 ft 06072040	039-DP04/SB02 7/27/2006 4 - 7 ft 06072041
Volatiles	UNITS						
Acetone	ug/kg	1.4E07 / 5.4E07	1.7E06 / 6.2E06	120 U	120 U	120 U	130 U
Tetrachloroethene	ug/kg	480 / 1,300	79,000 / 140,000	6 U	6.2 U	6.2 U	***7.8***
Total Petroleum Hydrocarbons	UNITS						
Quantified as Motor Oil	mg/kg	--	2,000 / 20,000	12 U	12 U	12 U	13 U
Metals, Total	UNITS						
Arsenic, Total	mg/kg	0.39 / 1.6	11 / 38	***4.8***	***7.6***	***6.9***	***7***
Barium, Total	mg/kg	5,400 / 67,000	5,500 / 140,000	***84***	***130***	***220***	***300***
Cadmium, Total	mg/kg	37 / 450	39 / 1,000	0.6 U	1.2 U	1.2 U	1.3 U
Chromium, Total	mg/kg	210 / 450	390 / 4,000	***25***	***39***	***29***	***30***
Lead, Total	mg/kg	400 / 800	400 / 1,000	***2.8***	***12***	***13***	***16***

Notes:

1. All data screened against the USEPA Region 9 PRGs (industrial) with the exception of TPH which is screened against KDHE industrial RSKs. All exceedances are shaded. All detections are in bold.

USEPA Region 9 PRGs - United States Environmental Protection Agency Region 9 Preliminary Remediation Goals
KDHE RSKs - Kansas Department of Health and Environment Risk-Based Standards
res/ind - residential / industrial
ft - feet
ug/kg - micrograms per kilogram
mg/kg - milligrams per kilogram
J - qualified as estimated during QC evaluation
U - compound was not detected
NA - not applicable / not analyzed
QC - quality control

Table 7-1
Soil Detections
Consolidated Maintenance Facility Building 8100 (FTRI-039)
Petroleum / VOC Sites
Expanded Site Investigation
Fort Riley, Kansas

Sample Point: Date Sampled: Sample Depth: Laboratory Number:		USEPA Region 9 PRGs (res/ind)	KDHE RSKs (res/ind)	039-DP04/SB22 7/27/2006 4 - 7 ft 06072042 Duplicate	039-DP05/SB01 7/27/2006 1 - 2 ft 06072043	039-DP05/SB02 7/27/2006 7 - 8 ft 06072044	039-DP05/SB03 7/27/2006 10 - 11 ft 06072045
Volatiles	UNITS						
Acetone	ug/kg	1.4E07 / 5.4E07	1.7E06 / 6.2E06	130 U	130 U	130 U	130 U
Tetrachloroethene	ug/kg	480 / 1,300	79,000 / 140,000	***8.7***	6.3 U	6.3 U	6.7 U
Total Petroleum Hydrocarbons	UNITS						
Quantified as Motor Oil	mg/kg	--	2,000 / 20,000	13 U	13 U	***43 J***	13 U
Metals, Total	UNITS						
Arsenic, Total	mg/kg	0.39 / 1.6	11 / 38	***9.5***	***5.6***	***6***	***6***
Barium, Total	mg/kg	5,400 / 67,000	5,500 / 140,000	***110***	***170***	***150***	***120***
Cadmium, Total	mg/kg	37 / 450	39 / 1,000	1.3 U	0.63 U	0.63 U	3.4 U
Chromium, Total	mg/kg	210 / 450	390 / 4,000	***43***	***27***	***22***	***11***
Lead, Total	mg/kg	400 / 800	400 / 1,000	***13***	***12***	***12***	***4.1***

Notes:

1. All data screened against the USEPA Region 9 PRGs (industrial) with the exception of TPH which is screened against KDHE industrial RSKs. All exceedances are shaded. All detections are in bold.

USEPA Region 9 PRGs - United States Environmental Protection Agency Region 9 Preliminary Remediation Goals
KDHE RSKs - Kansas Department of Health and Environment Risk-Based Standards
res/ind - residential / industrial
ft - feet
ug/kg - micrograms per kilogram
mg/kg - milligrams per kilogram
J - qualified as estimated during QC evaluation
U - compound was not detected
NA - not applicable / not analyzed
QC - quality control

Table 7-1
Soil Detections
Consolidated Maintenance Facility Building 8100 (FTRI-039)
Petroleum / VOC Sites
Expanded Site Investigation
Fort Riley, Kansas

Sample Point: Date Sampled: Sample Depth: Laboratory Number:		USEPA Region 9 PRGs (res/ind)	KDHE RSKs (res/ind)	039-DP06/SB01 7/27/2006 1 - 2 ft 06072039	039-DP07/SB01 7/28/2006 0 - 1 ft 06072132	039-DP07/SB02 7/28/2006 6 - 7 ft 06072133	039-DP07/SB03 7/28/2006 9 - 10 ft 06072134
Volatiles	UNITS						
Acetone	ug/kg	1.4E07 / 5.4E07	1.7E06 / 6.2E06	120 U	120 U	160 U	110 U
Tetrachloroethene	ug/kg	480 / 1,300	79,000 / 140,000	6 U	5.9 U	8 U	5.6 U
Total Petroleum Hydrocarbons	UNITS						
Quantified as Motor Oil	mg/kg	--	2,000 / 20,000	***20 J***	***21 J***	16 U	11 U
Metals, Total	UNITS						
Arsenic, Total	mg/kg	0.39 / 1.6	11 / 38	***7.4***	***7.4***	***14***	***15***
Barium, Total	mg/kg	5,400 / 67,000	5,500 / 140,000	***110***	***160***	***170***	***90***
Cadmium, Total	mg/kg	37 / 450	39 / 1,000	1.2 U	3 U	1.6 U	2.8 U
Chromium, Total	mg/kg	210 / 450	390 / 4,000	***33***	***29***	***54***	***8.6***
Lead, Total	mg/kg	400 / 800	400 / 1,000	***13***	***15.4***	***15.5***	2.8 U

Notes:

1. All data screened against the USEPA Region 9 PRGs (industrial) with the exception of TPH which is screened against KDHE industrial RSKs. All exceedances are shaded. All detections are in bold.

USEPA Region 9 PRGs - United States Environmental Protection Agency Region 9 Preliminary Remediation Goals
KDHE RSKs - Kansas Department of Health and Environment Risk-Based Standards
res/ind - residential / industrial
ft - feet
ug/kg - micrograms per kilogram
mg/kg - milligrams per kilogram
J - qualified as estimated during QC evaluation
U - compound was not detected
NA - not applicable / not analyzed
QC - quality control

Table 7-1
Soil Detections
Consolidated Maintenance Facility Building 8100 (FTRI-039)
Petroleum / VOC Sites
Expanded Site Investigation
Fort Riley, Kansas

Sample Point: Date Sampled: Sample Depth: Laboratory Number:		USEPA Region 9 PRGs (res/ind)	KDHE RSKs (res/ind)	039-DP08/SB01 7/28/2006 0 - 1 ft 06072135	039-DP08/SB02 7/28/2006 7 - 8 ft 06072136	039-DP08/SB03 7/28/2006 10.5 - 12 ft 06072137
Volatiles	UNITS					
Acetone	ug/kg	1.4E07 / 5.4E07	1.7E06 / 6.2E06	110 U	120 U	120 U
Tetrachloroethene	ug/kg	480 / 1,300	79,000 / 140,000	5.6 U	6.1 U	6.2 U
Total Petroleum Hydrocarbons	UNITS					
Quantified as Motor Oil	mg/kg	--	2,000 / 20,000	***130 J***	***47 J***	12 U
Metals, Total	UNITS					
Arsenic, Total	mg/kg	0.39 / 1.6	11 / 38	***5.7***	***7.4***	***7***
Barium, Total	mg/kg	5,400 / 67,000	5,500 / 140,000	***170***	***200***	***170***
Cadmium, Total	mg/kg	37 / 450	39 / 1,000	***0.91***	1.2 U	***0.85***
Chromium, Total	mg/kg	210 / 450	390 / 4,000	***25***	***30***	***31***
Lead, Total	mg/kg	400 / 800	400 / 1,000	***12.7***	***13.9***	***12.4***

Notes:

1. All data screened against the USEPA Region 9 PRGs (industrial) with the exception of TPH which is screened against KDHE industrial RSKs. All exceedances are shaded. All detections are in bold.

USEPA Region 9 PRGs - United States Environmental Protection Agency Region 9 Preliminary Remediation Goals
KDHE RSKs - Kansas Department of Health and Environment Risk-Based Standards
res/ind - residential / industrial
ft - feet
ug/kg - micrograms per kilogram
mg/kg - milligrams per kilogram
J - qualified as estimated during QC evaluation
U - compound was not detected
NA - not applicable / not analyzed
QC - quality control

Table 8-1
Soil Detections
Former Oil Testing Laboratory Building 1022 (FTRI-040)
Petroleum / VOC Sites
Expanded Site Investigation
Fort Riley, Kansas

Sample Point: / Date Sampled: / Sample Depth: / Laboratory Number:		USEPA Region 9 PRGs (res/ind)	KDHE RSKs (res/ind)	040-DP01/SB01 7/28/2006 0 - 2 ft 06072128	040-DP01/SB02 7/28/2006 4 - 8 ft 06072129	040-DP01/SB22 7/28/2006 4 - 8 ft 06072130 Duplicate	040-DP01/SB03 7/28/2006 10 - 12 ft 06072131
Pesticides	UNITS						
4,4'-DDE	mg/kg	1.7 / 7.0	25 / 56	***0.03***	***0.03***	***0.03***	0.01 U
Total Petroleum Hydrocarbons	UNITS						
Quantified as Motor Oil	mg/kg	--	,2000 / 20,000	***16 J***	***15 J***	***13 J***	11 U
Metals, Total	UNITS						
Arsenic, Total	mg/kg	0.39 / 1.6	11 / 38	***4.8***	***3.8***	***3.6***	***4.2***
Barium, Total	mg/kg	5,400 / 67,000	5,500 / 140,000	***110***	***160***	***150***	***190***
Cadmium, Total	mg/kg	37 / 450	39 / 1,000	0.54 U	***0.59***	***0.56***	***0.68***
Chromium, Total	mg/kg	210 / 450	390 / 4,000	***15***	***19***	***17***	***22***
Lead, Total	mg/kg	400 / 800	400 / 1,000	***9.9***	***9.9***	***10***	***10***
Mercury, Total	mg/kg	23 / 310	2 / 20	0.1 U	0.1 U	0.1 U	0.1 U
Selenium, Total	mg/kg	390 / 5100	390 / 10,000	***1.7***	***1.8***	***1.8***	***2.4***

Notes:

1. All data screened against the USEPA Region 9 PRGs (industrial) with the exception of TPH which is screened against KDHE industrial RSKs. All exceedances are shaded. All detections are in bold.

USEPA Region 9 PRGs - United States Environmental Protection Agency Region 9 Preliminary Remediation Goals
KDHE RSKs - Kansas Department of Health and Environment Risk-Based Standards
res/ind - residential / industrial
ft - feet
mg/kg - milligrams per kilogram
J - qualified as estimated during QC evaluation
U - compound was not detected
NA - not applicable / not analyzed
QC - quality control
R - qualified as rejected during QC evaluation

Table 8-1
Soil Detections
Former Oil Testing Laboratory Building 1022 (FTRI-040)
Petroleum / VOC Sites
Expanded Site Investigation
Fort Riley, Kansas

Sample Point: Date Sampled: Sample Depth: Laboratory Number:		USEPA Region 9 PRGs (res/ind)	KDHE RSKs (res/ind)	040-DP02/SB01 7/28/2006 0 - 2 ft 06072125	040-DP02/SB02 7/28/2006 6 - 8 ft 06072126	040-DP02/SB03 7/28/2006 10 - 12 ft 06072127	040-DP03/SB01 7/28/2006 0 - 2 ft 06072138
Pesticides	UNITS						
4,4'-DDE	mg/kg	1.7 / 7.0	25 / 56	0.01 U	0.01 U	0.01 U	0.01 U
Total Petroleum Hydrocarbons	UNITS						
Quantified as Motor Oil	mg/kg	--	,2000 / 20,000	***44 J***	12 U	12 U	***72***
Metals, Total	UNITS						
Arsenic, Total	mg/kg	0.39 / 1.6	11 / 38	***3.5***	***3.1***	***3.9***	***3.7***
Barium, Total	mg/kg	5,400 / 67,000	5,500 / 140,000	***110***	***140***	***150***	***120***
Cadmium, Total	mg/kg	37 / 450	39 / 1,000	0.56 U	0.58 U	0.6 U	***0.69***
Chromium, Total	mg/kg	210 / 450	390 / 4,000	***15***	***16***	***18***	***17***
Lead, Total	mg/kg	400 / 800	400 / 1,000	***22***	***8.4***	***8.7***	***16.6***
Mercury, Total	mg/kg	23 / 310	2 / 20	0.1 U	0.1 U	0.1 U	***0.2***
Selenium, Total	mg/kg	390 / 5100	390 / 10,000	1.1 U	1.2 U	1.2 U	2.4 U

Notes:

1. All data screened against the USEPA Region 9 PRGs (industrial) with the exception of TPH which is screened against KDHE industrial RSKs. All exceedances are shaded. All detections are in bold.

USEPA Region 9 PRGs - United States Environmental Protection Agency Region 9 Preliminary Remediation Goals
KDHE RSKs - Kansas Department of Health and Environment Risk-Based Standards
res/ind - residential / industrial
ft - feet
mg/kg - milligrams per kilogram
J - qualified as estimated during QC evaluation
U - compound was not detected
NA - not applicable / not analyzed
QC - quality control
R - qualified as rejected during QC evaluation

Table 8-1
Soil Detections
Former Oil Testing Laboratory Building 1022 (FTRI-040)
Petroleum / VOC Sites
Expanded Site Investigation
Fort Riley, Kansas

Sample Point: / Date Sampled: / Sample Depth: / Laboratory Number:		USEPA Region 9 PRGs (res/ind)	KDHE RSKs (res/ind)	040-DP03/SB02 7/28/2006 4 - 8 ft 06072139	040-DP03/SB03 7/28/2006 10 - 12 ft 06072140	040-DP04/SB01 7/31/2006 0 - 2 ft 06072194	040-DP04/SB02 7/31/2006 4 - 5 ft 06072195
Pesticides	UNITS						
4,4'-DDE	mg/kg	1.7 / 7.0	25 / 56	0.01 U	0.01 U	0.01 U	0.01 U
Total Petroleum Hydrocarbons	UNITS						
Quantified as Motor Oil	mg/kg	--	,2000 / 20,000	***14 J***	12 U	***37 J***	55 U
Metals, Total	UNITS						
Arsenic, Total	mg/kg	0.39 / 1.6	11 / 38	***3.9***	***3.2***	***4.3***	***3.5***
Barium, Total	mg/kg	5,400 / 67,000	5,500 / 140,000	***140***	***130***	***120***	***140***
Cadmium, Total	mg/kg	37 / 450	39 / 1,000	***0.73***	***0.63***	***0.8***	***0.58***
Chromium, Total	mg/kg	210 / 450	390 / 4,000	***19***	***19***	***15***	***17***
Lead, Total	mg/kg	400 / 800	400 / 1,000	***25.2***	***9.7***	***17***	***8.5***
Mercury, Total	mg/kg	23 / 310	2 / 20	0.1 U	0.1 U	0.1 U	0.1 U
Selenium, Total	mg/kg	390 / 5100	390 / 10,000	***2***	2.4 U	1.1 U	2.2 U

Notes:

1. All data screened against the USEPA Region 9 PRGs (industrial) with the exception of TPH which is screened against KDHE industrial RSKs. All exceedances are shaded. All detections are in bold.

USEPA Region 9 PRGs - United States Environmental Protection Agency Region 9 Preliminary Remediation Goals
KDHE RSKs - Kansas Department of Health and Environment Risk-Based Standards
res/ind - residential / industrial
ft - feet
mg/kg - milligrams per kilogram
J - qualified as estimated during QC evaluation
U - compound was not detected
NA - not applicable / not analyzed
QC - quality control
R - qualified as rejected during QC evaluation

Table 8-1
Soil Detections
Former Oil Testing Laboratory Building 1022 (FTRI-040)
Petroleum / VOC Sites
Expanded Site Investigation
Fort Riley, Kansas

Sample Point: Date Sampled: Sample Depth: Laboratory Number:		USEPA Region 9 PRGs (res/ind)	KDHE RSKs (res/ind)	040-DP04/SB02 7/31/2006 4 - 5 ft 06072195R Reanalysis	040-DP04/SB03 7/31/2006 8 - 12 ft 06072196	040-DP04/SB33 7/31/2006 8 - 12 ft 06072197 Duplicate
Pesticides	UNITS					
4,4'-DDE	mg/kg	1.7 / 7.0	25 / 56	NA	0.01 U	0.01 U
Total Petroleum Hydrocarbons	UNITS					
Quantified as Motor Oil	mg/kg	--	,2000 / 20,000	11 UR	11 U	11 U
Metals, Total	UNITS					
Arsenic, Total	mg/kg	0.39 / 1.6	11 / 38	NA	***3.7***	***3.5***
Barium, Total	mg/kg	5,400 / 67,000	5,500 / 140,000	NA	***130***	***140***
Cadmium, Total	mg/kg	37 / 450	39 / 1,000	NA	***0.63***	***0.59***
Chromium, Total	mg/kg	210 / 450	390 / 4,000	NA	***19***	***15***
Lead, Total	mg/kg	400 / 800	400 / 1,000	NA	***9.4***	***9.1***
Mercury, Total	mg/kg	23 / 310	2 / 20	NA	0.1 U	0.1 U
Selenium, Total	mg/kg	390 / 5100	390 / 10,000	NA	2.2 U	2.3 U

Notes:

1. All data screened against the USEPA Region 9 PRGs (industrial) with the exception of TPH which is screened against KDHE industrial RSKs. All exceedances are shaded. All detections are in bold.

USEPA Region 9 PRGs - United States Environmental Protection Agency Region 9 Preliminary Remediation Goals
KDHE RSKs - Kansas Department of Health and Environment Risk-Based Standards
res/ind - residential / industrial
ft - feet
mg/kg - milligrams per kilogram
J - qualified as estimated during QC evaluation
U - compound was not detected
NA - not applicable / not analyzed
QC - quality control
R - qualified as rejected during QC evaluation

Table 8-2
Groundwater Detections
Former Oil Testing Laboratory Building 1022 (FTRI-040)
Petroleum / VOC Sites
Expanded Site Investigation
Fort Riley, Kansas

Sample Point: Date Sampled: Sample Depth: Laboratory Number:		USEPA Region 9 PRGs (tap water)	USEPA MCLs/ Action Level	040-DP01/GW01 8/2/2006 LIQUID 06080326	040-DP02/GW01 8/2/2006 LIQUID 06080327	040-DP02/GW11 8/2/2006 LIQUID 06080328 Duplicate	040-DP03/GW01 8/2/2006 LIQUID 06080324
Metals, Total	UNITS						
Arsenic, Total	mg/L	NA	NA	NA	***0.383 J***	***1.07 J***	***0.052 J***
Barium, Total	mg/L	NA	NA	NA	***17.6***	***44.5***	***2.15***
Cadmium, Total	mg/L	NA	NA	NA	***0.081 J***	***0.247 J***	***0.004 J***
Chromium, Total	mg/L	NA	NA	NA	***0.799 J***	***2.51 J***	***0.237 J***
Lead, Total	mg/L	NA	NA	NA	***0.784 J***	***2.28 J***	***0.127 J***
Mercury, Total	mg/L	NA	NA	NA	***0.0018***	***0.0027***	***0.0004***
Selenium, Total	mg/L	NA	NA	NA	0.05 UJ	0.2 UJ	0.01 UJ
Metals, Dissolved	UNITS						
Arsenic, Dissolved	mg/L	4.50E-06	0.01	NA	***0.026***	***0.022***	***0.018***
Barium, Dissolved	mg/L	2.6	2	NA	***1.05***	***0.79***	***0.82***
Lead, Dissolved	mg/L	NA	0.015	NA	***0.01***	***0.01***	***0.016***

Notes:

1. All data screened against the USEPA Region 9 PRGs (tap water) except for lead which is screened against the USEPA MCL. All exceedances are shaded. All detections are in bold.

USEPA Region 9 PRGs - United States Environmental Protection Agency Region 9 Preliminary Remediation Goals

USEPA MCLs - United States Environmental Protection Agency Maximum Contaminant Levels

NA - not applicable / not analyzed

mg/L - milligrams per liter

J - qualified as estimated during QC evaluation

U - compound was not detected

QC - quality control

Table 8-2
Groundwater Detections
Former Oil Testing Laboratory Building 1022 (FTRI-040)
Petroleum / VOC Sites
Expanded Site Investigation
Fort Riley, Kansas

Sample Point: Date Sampled: Sample Depth: Laboratory Number:		USEPA Region 9 PRGs (tap water)	USEPA MCLs/ Action Level	040-DP03/GW01 8/2/2006 LIQUID 06080324R Reanalysis	040-DP04/GW01 8/2/2006 LIQUID 06080325
Metals, Total	UNITS				
Arsenic, Total	mg/L	NA	NA	***0.052 J***	***0.121 J***
Barium, Total	mg/L	NA	NA	NA	***5.56***
Cadmium, Total	mg/L	NA	NA	***0.007 J***	***0.022 J***
Chromium, Total	mg/L	NA	NA	***0.3 J***	***0.435 J***
Lead, Total	mg/L	NA	NA	***0.14 J***	***0.32 J***
Mercury, Total	mg/L	NA	NA	NA	***0.0008***
Selenium, Total	mg/L	NA	NA	0.01 UJ	***0.021 J***
Metals, Dissolved	UNITS				
Arsenic, Dissolved	mg/L	4.50E-06	0.01	NA	***0.018***
Barium, Dissolved	mg/L	2.6	2	NA	***1.15***
Lead, Dissolved	mg/L	NA	0.015	NA	***0.009***

Notes:

1. All data screened against the USEPA Region 9 PRGs (tap water) except for lead which is screened against the USEPA MCL. All exceedances are shaded. All detections are in bold.

USEPA Region 9 PRGs - United States Environmental Protection Agency Region 9 Preliminary Remediation Goals

USEPA MCLs - United States Environmental Protection Agency Maximum Contaminant Levels

NA - not applicable / not analyzed

mg/L - milligrams per liter

J - qualified as estimated during QC evaluation

U - compound was not detected

QC - quality control

Table 9-1
Soil Detections
Furniture Repair Shops (FTRI-041)
Petroleum / VOC Sites
Expanded Site Investigation
Fort Riley, Kansas

Sample Point: Date Sampled: Sample Depth: Laboratory Number:		USEPA Region 9 PRGs (res/ind)	KDHE RSKs (res/ind)	041-DP01/SB01 8/2/2006 1.5 - 2 ft 06080329	041-DP01/SB02 8/2/2006 7 - 8 ft 06080330	041-DP01/SB03 8/2/2006 11 - 12 ft 06080331	041-DP02/SB01 8/1/2006 0 - 1 ft 06080184
Volatiles	UNITS						
Acetone	ug/kg	1.4E07 / 5.4E07	1.7E06 / 6.2E06	110 U	130 U	100 U	110 U
Methylene Chloride	ug/kg	9,100 / 21,000	150,000 / 230,000	5.7 U	6.3 U	5.2 U	5.6 U
Metals, Total	UNITS						
Arsenic, Total	mg/kg	0.39 / 1.6	11 / 38	***3.5***	***4.8***	1 U	***3.8***
Barium, Total	mg/kg	5,400 / 67,000	5,500 / 140,000	***130***	***170***	***40***	***100***
Cadmium, Total	mg/kg	37 / 450	39 / 1,000	***0.68***	0.63 U	0.52 U	***1.3***
Chromium, Total	mg/kg	210 / 450	390 / 4,000	***14***	***15***	***2***	***15***
Lead, Total	mg/kg	400 / 800	400 / 1,000	***15.4***	***7.4***	***1.7***	***67.3***
Mercury, Total	mg/kg	23 / 310	2 / 20	0.1 U	0.1 U	0.1 U	0.1 U
Selenium, Total	mg/kg	390 / 5,100	390 / 10,000	2.3 U	1.3 U	1 U	2.2 U

Notes:

1. All data screened against the USEPA Region 9 PRGs (industrial). All detections are in bold.

USEPA Region 9 PRGs - United States Environmental Protection Agency Region 9 Preliminary Remediation Goals

KDHE RSKs - Kansas Department of Health and Environment Risk-Based Standards

res/ind - residential / industrial

ft - feet

NA - not applicable / not analyzed

ug/kg - micrograms per kilogram

mg/kg - milligrams per kilogram

R- qualified as rejected during QC evaluation

U - compound was not detected

QC - quality control

Table 9-1
Soil Detections
Furniture Repair Shops (FTRI-041)
Petroleum / VOC Sites
Expanded Site Investigation
Fort Riley, Kansas

Sample Point: Date Sampled: Sample Depth: Laboratory Number:		USEPA Region 9 PRGs (res/ind)	KDHE RSKs (res/ind)	041-DP02/SB01 8/1/2006 0 - 1 ft 06080184R Reanalysis	041-DP02/SB02 8/1/2006 6 - 7 ft 06080185	041-DP02/SB03 8/1/2006 11 - 12 ft 06080186	041-DP03/SB01 8/1/2006 0 - 1 ft 06080180
Volatiles	UNITS						
Acetone	ug/kg	1.4E07 / 5.4E07	1.7E06 / 6.2E06	560 UR	120 U	120 U	110 U
Methylene Chloride	ug/kg	9,100 / 21,000	150,000 / 230,000	28 UR	6.1 U	5.9 U	5.4 U
Metals, Total	UNITS						
Arsenic, Total	mg/kg	0.39 / 1.6	11 / 38	NA	***3***	***1.7***	***4.5***
Barium, Total	mg/kg	5,400 / 67,000	5,500 / 140,000	NA	***120***	***70***	***140***
Cadmium, Total	mg/kg	37 / 450	39 / 1,000	NA	0.61 U	0.59 U	***1.5***
Chromium, Total	mg/kg	210 / 450	390 / 4,000	NA	***11***	***6.3***	***15***
Lead, Total	mg/kg	400 / 800	400 / 1,000	NA	***5.9***	***3.3***	***55***
Mercury, Total	mg/kg	23 / 310	2 / 20	NA	0.1 U	0.1 U	0.1 U
Selenium, Total	mg/kg	390 / 5,100	390 / 10,000	NA	1.2 U	1.2 U	1.1 U

Notes:

1. All data screened against the USEPA Region 9 PRGs (industrial). All detections are in bold.

USEPA Region 9 PRGs - United States Environmental Protection Agency Region 9 Preliminary Remediation Goals

KDHE RSKs - Kansas Department of Health and Environment Risk-Based Standards

res/ind - residential / industrial

ft - feet

NA - not applicable / not analyzed

ug/kg - micrograms per kilogram

mg/kg - milligrams per kilogram

J - qualified as estimated during QC evaluation

R - data was rejected

U - compound was not detected

Table 9-1
Soil Detections
Furniture Repair Shops (FTRI-041)
Petroleum / VOC Sites
Expanded Site Investigation
Fort Riley, Kansas

Sample Point: / Date Sampled: / Sample Depth: / Laboratory Number:		USEPA Region 9 PRGs (res/ind)	KDHE RSKs (res/ind)	041-DP03/SB01 8/1/2006 0 - 1 ft 06080180R Reanalysis	041-DP03/SB02 8/1/2006 7 - 8 ft 06080181	041-DP03/SB03 8/1/2006 9 - 10 ft 06080182	041-DP04/SB01 7/31/2006 1 - 2 ft 06072198
Volatiles	UNITS						
Acetone	ug/kg	1.4E07 / 5.4E07	1.7E06 / 6.2E06	540 UR	120 U	120 U	120 U
Methylene Chloride	ug/kg	9,100 / 21,000	150,000 / 230,000	27 UR	6.2 U	6 U	5.8 U
Metals, Total	UNITS						
Arsenic, Total	mg/kg	0.39 / 1.6	11 / 38	NA	***3.1***	***3.5***	***3.7***
Barium, Total	mg/kg	5,400 / 67,000	5,500 / 140,000	NA	***220***	***120***	***100***
Cadmium, Total	mg/kg	37 / 450	39 / 1,000	NA	0.62 U	0.6 U	1.2 U
Chromium, Total	mg/kg	210 / 450	390 / 4,000	NA	***14***	***12***	***22***
Lead, Total	mg/kg	400 / 800	400 / 1,000	NA	***7.4***	***6.2***	***6***
Mercury, Total	mg/kg	23 / 310	2 / 20	NA	0.1 U	0.1 U	0.12 U
Selenium, Total	mg/kg	390 / 5,100	390 / 10,000	NA	***1.6***	1.2 U	2.3 U

Notes:

1. All data screened against the USEPA Region 9 PRGs (industrial). All detections are in bold.

USEPA Region 9 PRGs - United States Environmental Protection Agency Region 9 Preliminary Remediation Goals

KDHE RSKs - Kansas Department of Health and Environment Risk-Based Standards

res/ind - residential / industrial

ft - feet

NA - not applicable / not analyzed

ug/kg - micrograms per kilogram

mg/kg - milligrams per kilogram

J - qualified as estimated during QC evaluation

R - data was rejected

U - compound was not detected

Table 9-1
Soil Detections
Furniture Repair Shops (FTRI-041)
Petroleum / VOC Sites
Expanded Site Investigation
Fort Riley, Kansas

Sample Point: / Date Sampled: / Sample Depth: / Laboratory Number:		USEPA Region 9 PRGs (res/ind)	KDHE RSKs (res/ind)	041-DP04/SB02 7/31/2006 7 - 8 ft 06072199	041-DP04/SB03 7/31/2006 8 - 10.5 ft 06072200	041-DP04/SB33 7/31/2006 8 - 10.5 ft 06072201 Duplicate	041-DP05/SB01 7/31/2006 1 - 2 ft 06072202
Volatiles	UNITS						
Acetone	ug/kg	1.4E07 / 5.4E07	1.7E06 / 6.2E06	***200***	130 U	130 U	110 U
Methylene Chloride	ug/kg	9,100 / 21,000	150,000 / 230,000	6.4 U	6.3 U	6.3 U	5.6 U
Metals, Total	UNITS						
Arsenic, Total	mg/kg	0.39 / 1.6	11 / 38	***4.5***	***4***	***4.2***	***3***
Barium, Total	mg/kg	5,400 / 67,000	5,500 / 140,000	***220***	***200***	***260***	***130***
Cadmium, Total	mg/kg	37 / 450	39 / 1,000	0.64 U	***0.68***	0.63 U	0.56 U
Chromium, Total	mg/kg	210 / 450	390 / 4,000	***20***	***20***	***21***	***11***
Lead, Total	mg/kg	400 / 800	400 / 1,000	***10***	***8.4***	***10***	***4.9***
Mercury, Total	mg/kg	23 / 310	2 / 20	0.13 U	0.13 U	0.13 U	0.11 U
Selenium, Total	mg/kg	390 / 5,100	390 / 10,000	2.6 U	***2***	1.3 U	1.1 U

Notes:

1. All data screened against the USEPA Region 9 PRGs (industrial). All detections are in bold.

USEPA Region 9 PRGs - United States Environmental Protection Agency Region 9 Preliminary Remediation Goals

KDHE RSKs - Kansas Department of Health and Environment Risk-Based Standards

res/ind - residential / industrial

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NA - not applicable / not analyzed

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mg/kg - milligrams per kilogram

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Table 9-1
Soil Detections
Furniture Repair Shops (FTRI-041)
Petroleum / VOC Sites
Expanded Site Investigation
Fort Riley, Kansas

Sample Point: Date Sampled: Sample Depth: Laboratory Number:		USEPA Region 9 PRGs (res/ind)	KDHE RSKs (res/ind)	041-DP05/SB02 7/31/2006 6 - 7 ft 06072203	041-DP05/SB03 7/31/2006 9 - 10 ft 06072204	041-DP06/SB01 7/31/2006 0 - 1.5 ft 06072206	041-DP06/SB02 7/31/2006 6 - 7 ft 06072207
Volatiles	UNITS						
Acetone	ug/kg	1.4E07 / 5.4E07	1.7E06 / 6.2E06	110 U	110 U	120 U	110 U
Methylene Chloride	ug/kg	9,100 / 21,000	150,000 / 230,000	5.7 U	5.7 U	5.9 U	5.5 U
Metals, Total	UNITS						
Arsenic, Total	mg/kg	0.39 / 1.6	11 / 38	***3.5***	***3.5***	***3.1***	***4.1***
Barium, Total	mg/kg	5,400 / 67,000	5,500 / 140,000	***100***	***140***	***130***	***92***
Cadmium, Total	mg/kg	37 / 450	39 / 1,000	0.57 U	0.57 U	0.59 U	0.55 U
Chromium, Total	mg/kg	210 / 450	390 / 4,000	***10***	***13***	***15***	***10***
Lead, Total	mg/kg	400 / 800	400 / 1,000	***5.9***	***8.5***	***47***	***5.7***
Mercury, Total	mg/kg	23 / 310	2 / 20	0.11 U	0.11 U	0.1 U	0.1 U
Selenium, Total	mg/kg	390 / 5,100	390 / 10,000	1.1 U	1.1 U	1.2 U	1.1 U

Notes:

1. All data screened against the USEPA Region 9 PRGs (industrial). All detections are in bold.

USEPA Region 9 PRGs - United States Environmental Protection Agency Region 9 Preliminary Remediation Goals

KDHE RSKs - Kansas Department of Health and Environment Risk-Based Standards

res/ind - residential / industrial

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NA - not applicable / not analyzed

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Table 9-1
Soil Detections
Furniture Repair Shops (FTRI-041)
Petroleum / VOC Sites
Expanded Site Investigation
Fort Riley, Kansas

Sample Point: Date Sampled: Sample Depth: Laboratory Number:		USEPA Region 9 PRGs (res/ind)	KDHE RSKs (res/ind)	041-DP06/SB03 7/31/2006 9 - 10 ft 06072208	041-DP07/SB01 7/31/2006 0 - 1.5 ft 06072209	041-DP07/SB02 7/31/2006 4 - 8 ft 06072210	041-DP07/SB22 7/31/2006 4 - 8 ft 06072211 Duplicate
Volatiles	UNITS						
Acetone	ug/kg	1.4E07 / 5.4E07	1.7E06 / 6.2E06	110 U	110 U	110 U	110 U
Methylene Chloride	ug/kg	9,100 / 21,000	150,000 / 230,000	5.5 U	5.5 U	5.5 U	5.5 U
Metals, Total	UNITS						
Arsenic, Total	mg/kg	0.39 / 1.6	11 / 38	***3.3***	***3.9***	***3.3***	***3.2***
Barium, Total	mg/kg	5,400 / 67,000	5,500 / 140,000	***150***	***110***	***84***	***78***
Cadmium, Total	mg/kg	37 / 450	39 / 1,000	0.55 U	0.55 U	0.55 U	0.55 U
Chromium, Total	mg/kg	210 / 450	390 / 4,000	***10***	***12***	***9.2***	***8.7***
Lead, Total	mg/kg	400 / 800	400 / 1,000	***5.7***	***12***	***5.2***	***5.2***
Mercury, Total	mg/kg	23 / 310	2 / 20	0.1 U	0.1 U	0.1 U	0.1 U
Selenium, Total	mg/kg	390 / 5,100	390 / 10,000	1.1 U	1.1 U	1.1 U	1.1 U

Notes:

1. All data screened against the USEPA Region 9 PRGs (industrial). All detections are in bold.

USEPA Region 9 PRGs - United States Environmental Protection Agency Region 9 Preliminary Remediation Goals

KDHE RSKs - Kansas Department of Health and Environment Risk-Based Standards

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NA - not applicable / not analyzed

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Table 9-1
Soil Detections
Furniture Repair Shops (FTRI-041)
Petroleum / VOC Sites
Expanded Site Investigation
Fort Riley, Kansas

Sample Point: Date Sampled: Sample Depth: Laboratory Number:		USEPA Region 9 PRGs (res/ind)	KDHE RSKs (res/ind)	041-DP07/SB03 7/31/2006 8 - 9 ft 06072212	041-DP08/SB01 8/1/2006 1 - 2 ft 06080171	041-DP08/SB02 8/1/2006 6 - 7 ft 06080172	041-DP08/SB03 8/1/2006 10 - 11 ft 06080173
Volatiles	UNITS						
Acetone	ug/kg	1.4E07 / 5.4E07	1.7E06 / 6.2E06	120 U	110 U	120 U	120 U
Methylene Chloride	ug/kg	9,100 / 21,000	150,000 / 230,000	6 U	5.5 U	6.2 U	6.1 U
Metals, Total	UNITS						
Arsenic, Total	mg/kg	0.39 / 1.6	11 / 38	***3.4***	***3.6***	***3.6***	***4.1***
Barium, Total	mg/kg	5,400 / 67,000	5,500 / 140,000	***120***	***120***	***220***	***210***
Cadmium, Total	mg/kg	37 / 450	39 / 1,000	0.6 U	0.55 U	0.62 U	0.61 U
Chromium, Total	mg/kg	210 / 450	390 / 4,000	***11***	***12***	***15***	***19***
Lead, Total	mg/kg	400 / 800	400 / 1,000	***5.7***	***8.5***	***8.1***	***10***
Mercury, Total	mg/kg	23 / 310	2 / 20	0.1 U	0.1 U	0.1 U	0.1 U
Selenium, Total	mg/kg	390 / 5,100	390 / 10,000	1.2 U	1.1 U	1.2 U	1.2 U

Notes:

1. All data screened against the USEPA Region 9 PRGs (industrial). All detections are in bold.

USEPA Region 9 PRGs - United States Environmental Protection Agency Region 9 Preliminary Remediation Goals

KDHE RSKs - Kansas Department of Health and Environment Risk-Based Standards

res/ind - residential / industrial

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NA - not applicable / not analyzed

ug/kg - micrograms per kilogram

mg/kg - milligrams per kilogram

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Table 9-1
Soil Detections
Furniture Repair Shops (FTRI-041)
Petroleum / VOC Sites
Expanded Site Investigation
Fort Riley, Kansas

Sample Point: Date Sampled: Sample Depth: Laboratory Number:		USEPA Region 9 PRGs (res/ind)	KDHE RSKs (res/ind)	041-DP09/SB01 8/1/2006 1 - 2 ft 06080176	041-DP09/SB02 8/1/2006 7 - 8 ft 06080177	041-DP09/SB02 8/1/2006 7 - 8 ft 06080177R Reanalysis	041-DP09/SB03 8/1/2006 10 - 11 ft 06080178
Volatiles	UNITS						
Acetone	ug/kg	1.4E07 / 5.4E07	1.7E06 / 6.2E06	120 U	120 U	NA	110 U
Methylene Chloride	ug/kg	9,100 / 21,000	150,000 / 230,000	***7.7***	5.9 U	NA	5.4 U
Metals, Total	UNITS						
Arsenic, Total	mg/kg	0.39 / 1.6	11 / 38	***5.9***	***4***	NA	***2.2***
Barium, Total	mg/kg	5,400 / 67,000	5,500 / 140,000	***150***	***140***	NA	***77***
Cadmium, Total	mg/kg	37 / 450	39 / 1,000	0.59 U	0.59 U	NA	0.54 U
Chromium, Total	mg/kg	210 / 450	390 / 4,000	***23***	***19 R***	***12***	***8.5***
Lead, Total	mg/kg	400 / 800	400 / 1,000	***13***	***17.1***	NA	***25***
Mercury, Total	mg/kg	23 / 310	2 / 20	***0.1***	0.1 U	NA	0.1 U
Selenium, Total	mg/kg	390 / 5,100	390 / 10,000	1.2 U	1.2 U	NA	1.1 U

Notes:

1. All data screened against the USEPA Region 9 PRGs (industrial). All detections are in bold.

USEPA Region 9 PRGs - United States Environmental Protection Agency Region 9 Preliminary Remediation Goals

KDHE RSKs - Kansas Department of Health and Environment Risk-Based Standards

res/ind - residential / industrial

ft - feet

NA - not applicable / not analyzed

ug/kg - micrograms per kilogram

mg/kg - milligrams per kilogram

J - qualified as estimated during QC evaluation

R - data was rejected

U - compound was not detected

Table 9-2
Groundwater Detections
Furniture Repair Shops (FTRI-041)
Petroleum / VOC Sites
Expanded Site Investigation
Fort Riley, Kansas

Sample Point: / Date Sampled: / Sample Depth: / Laboratory Number:		USEPA Region 9 PRGs (tap water)	USEPA MCLs/ Action Level	041-DP01/GW01 8/2/2006 LIQUID 06080332	041-DP02/GW01 8/1/2006 LIQUID 06080187	041-DP03/GW01 8/1/2006 LIQUID 06080183	041-DP03/GW01 8/1/2006 LIQUID 06080183R Reanalysis
Volatiles	UNITS						
Trichloromethane	ug/L	0.17	80	***2.6***	***3.5***	***3***	NA
Metals, Totals	UNITS						
Arsenic, Total	mg/L	NA	NA	***0.027 J***	***0.076***	***0.077***	NA
Barium, Total	mg/L	NA	NA	***0.86***	***2.99***	***4.44***	NA
Cadmium, Total	mg/L	NA	NA	0.003 UJ	***0.004***	***0.003***	NA
Chromium, Total	mg/L	NA	NA	***0.099 J***	***0.34***	***0.418***	NA
Lead, Total	mg/L	NA	NA	***0.061 J***	***0.197***	***0.114***	NA
Mercury, Total	mg/L	NA	NA	0.0002 U	***0.0003***	0.0002 U	NA
Selenium, Total	mg/L	NA	NA	0.01 UJ	***0.046***	***0.026***	NA
Metals, Dissolved	UNITS						
Arsenic, Dissolved	mg/L	4.50E-06	0.01	***0.011***	0.01 U	0.01 U	NA
Barium, Dissolved	mg/L	2.6	2	***0.76***	***0.14***	***0.14***	NA
Chromium, Dissolved	mg/L	0.11*	0.1	***0.056***	0.005 U	0.005 U	NA
Lead, Dissolved	mg/L	NA	0.015	***0.025***	0.005 U	0.005 U	NA
Selenium, Dissolved	mg/L	0.18	0.05	0.01 U	0.01 U	0.01 UR	0.01 U

Notes:

1. All data screened against the USEPA Region 9 PRGs (tap water) or the USEPA action limit (for lead). All exceedances are shaded.
   All detections are in bold.

USEPA Region 9 PRGs - United States Environmental Protection Agency Region 9 Preliminary Remediation Goals

USEPA MCLs - United States Environmental Protection Agency Maximum Contaminant Levels

NA - not applicable / not analyzed

* for Chromium VI

ug/L - micrograms per liter

mg/L - milligrams per liter

J - qualified as estimated during QC evaluation

R - qualified as rejected during QC evaluation

U - compound was not detected

QC - quality control

Table 9-2
Groundwater Detections
Furniture Repair Shops (FTRI-041)
Petroleum / VOC Sites
Expanded Site Investigation
Fort Riley, Kansas

Sample Point: / Date Sampled: / Sample Depth: / Laboratory Number:		USEPA Region 9 PRGs (tap water)	USEPA MCLs/ Action Level	041-DP04/GW01 7/31/2006 LIQUID 06072176	041-DP05/GW01 7/31/2006 LIQUID 06072177	041-DP06/GW01 7/31/2006 LIQUID 06072178	041-DP07/GW01 7/31/2006 LIQUID 06072179
Volatiles	UNITS						
Trichloromethane	ug/L	0.17	80	0.5 U	0.5 U	0.5 U	0.5 U
Metals, Totals	UNITS						
Arsenic, Total	mg/L	NA	NA	***0.159***	***0.506***	***0.644***	***0.157***
Barium, Total	mg/L	NA	NA	***8.73***	***5.67***	***3.27***	***6.49***
Cadmium, Total	mg/L	NA	NA	***0.032***	***0.022***	***0.008***	***0.019***
Chromium, Total	mg/L	NA	NA	***0.641***	***0.446***	***0.478***	***0.748***
Lead, Total	mg/L	NA	NA	***0.448***	***0.391***	***0.203***	***0.379***
Mercury, Total	mg/L	NA	NA	***0.0008***	***0.0007***	0.0002 U	***0.0008***
Selenium, Total	mg/L	NA	NA	***0.16***	***0.288***	***0.042***	0.02 U
Metals, Dissolved	UNITS						
Arsenic, Dissolved	mg/L	4.50E-06	0.01	0.01 U	0.01 U	***0.026***	0.01 U
Barium, Dissolved	mg/L	2.6	2	***0.35***	***0.3***	***0.37***	***0.2***
Chromium, Dissolved	mg/L	0.11*	0.1	0.005 U	0.005 U	0.005 U	0.005 U
Lead, Dissolved	mg/L	NA	0.015	0.005 U	0.005 U	0.005 U	0.005 U
Selenium, Dissolved	mg/L	0.18	0.05	***0.047***	0.01 U	0.01 U	0.01 U

Notes:

1. All data screened against the USEPA Region 9 PRGs (tap water) or the USEPA action limit (for lead). All exceedances are shaded. All detections are in bold.

USEPA Region 9 PRGs - United States Environmental Protection Agency Region 9 Preliminary Remediation Goals

USEPA MCLs - United States Environmental Protection Agency Maximum Contaminant Levels

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ug/L - micrograms per liter

mg/L - milligrams per liter

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Table 9-2
Groundwater Detections
Furniture Repair Shops (FTRI-041)
Petroleum / VOC Sites
Expanded Site Investigation
Fort Riley, Kansas

Sample Point: / Date Sampled: / Sample Depth: / Laboratory Number:		USEPA Region 9 PRGs (tap water)	USEPA MCLs/ Action Level	041-DP08/GW01 8/1/2006 LIQUID 06080174	041-DP08/GW11 8/1/2006 LIQUID 06080175 Duplicate	041-DP09/GW01 8/1/2006 LIQUID 06080179
Volatiles	UNITS					
Trichloromethane	ug/L	0.17	80	0.5 U	0.5 U	0.5 U
Metals, Totals	UNITS					
Arsenic, Total	mg/L	NA	NA	***0.043***	***0.069***	***0.115***
Barium, Total	mg/L	NA	NA	***2.41***	***5.19***	***4.28***
Cadmium, Total	mg/L	NA	NA	0.003 U	***0.003***	***0.031***
Chromium, Total	mg/L	NA	NA	***0.163***	***0.271***	***0.52***
Lead, Total	mg/L	NA	NA	***0.091***	***0.165***	***0.243***
Mercury, Total	mg/L	NA	NA	***0.0005***	***0.0008***	***0.0007***
Selenium, Total	mg/L	NA	NA	0.02 U	0.02 U	***0.08***
Metals, Dissolved	UNITS					
Arsenic, Dissolved	mg/L	4.50E-06	0.01	0.01 U	0.01 U	0.01 U
Barium, Dissolved	mg/L	2.6	2	***0.22***	***0.23***	***0.39***
Chromium, Dissolved	mg/L	0.11*	0.1	0.005 U	0.005 U	0.005 U
Lead, Dissolved	mg/L	NA	0.015	0.005 U	0.005 U	0.005 U
Selenium, Dissolved	mg/L	0.18	0.05	0.01 U	0.01 U	0.01 U

Notes:

1. All data screened against the USEPA Region 9 PRGs (tap water) or the USEPA action limit (for lead). All exceedances are shaded. All detections are in bold.

USEPA Region 9 PRGs - United States Environmental Protection Agency Region 9 Preliminary Remediation Goals

USEPA MCLs - United States Environmental Protection Agency Maximum Contaminant Levels

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ug/L - micrograms per liter

mg/L - milligrams per liter

J - qualified as estimated during QC evaluation

R - qualified as rejected during QC evaluation

U - compound was not detected

QC - quality control

Table 11-1
Soil Detections
Building 727 Waste Pit (FTRI-051)
Petroleum / VOC Sites
Expanded Site Investigation
Fort Riley, Kansas

Sample Point: Date Sampled: Sample Depth: Laboratory Number:		USEPA Region 9 PRGs (res/ind)	KDHE RSKs (res/ind)	051-DP01/SB01 8/3/2006 0 - 2 ft 06080445	051-DP01/SB02 8/3/2006 6 - 8 ft 06080446	051-DP01/SB22 8/3/2006 6 - 8 ft 06080447 Duplicate	051-DP01/SB03 8/3/2006 10 - 11 ft 06080448
Miscellaneous Analyses	UNITS						
Quantified as Motor Oil	mg/kg	--	2,000 / 20,000	***158 J***	12 U	12 U	13 U
Metals, Total	UNITS						
Arsenic, Total	mg/kg	0.39 / 1.6	11 / 38	***2.7***	***2.6***	***2.3***	***3.3***
Barium, Total	mg/kg	5,400 / 67,000	5,500 / 140,000	***130***	***160***	***140***	***190***
Cadmium, Total	mg/kg	37 / 450	39 / 1,000	***0.56***	0.59 U	0.59 U	0.65 U
Chromium, Total	mg/kg	210 / 450	390 / 4,000	***12***	***9.6***	***8.7***	***16***
Lead, Total	mg/kg	400 / 800	400 / 1,000	***13***	***4.7***	***4.5***	***7.2***
Selenium, Total	mg/kg	390 / 5,100	390 / 10,000	***1.5***	1.2 U	1.2 U	***1.5***

Notes:

1. All data screened against the USEPA Region 9 PRGs (industrial). All detections are in bold.

USEPA Region 9 PRGs - United States Environmental Protection Agency Region 9 Preliminary Remediation Goals

KDHE RSKs - Kansas Department of Health and Environment Risk-Based Standards

res/ind - residential / industrial

ft - feet

mg/kg - milligrams per kilogram

J - qualified as estimated during QC evaluation

U - compound was not detected

QC - quality control

Table 11-1
Soil Detections
Building 727 Waste Pit (FTRI-051)
Petroleum / VOC Sites
Expanded Site Investigation
Fort Riley, Kansas

Sample Point: Date Sampled: Sample Depth: Laboratory Number:		USEPA Region 9 PRGs (res/ind)	KDHE RSKs (res/ind)	051-DP02/SB01 8/3/2006 0 - 1 ft 06080442	051-DP02/SB02 8/3/2006 7 - 8 ft 06080443	051-DP02/SB03 8/3/2006 11 - 12 ft 06080444
Miscellaneous Analyses	UNITS					
Quantified as Motor Oil	mg/kg	--	2,000 / 20,000	***30 J***	13 U	13 U
Metals, Total	UNITS					
Arsenic, Total	mg/kg	0.39 / 1.6	11 / 38	***3.6***	***2.1***	***4.5***
Barium, Total	mg/kg	5,400 / 67,000	5,500 / 140,000	***150***	***180***	***300***
Cadmium, Total	mg/kg	37 / 450	39 / 1,000	***0.72***	0.63 U	***0.79***
Chromium, Total	mg/kg	210 / 450	390 / 4,000	***13***	***10***	***20***
Lead, Total	mg/kg	400 / 800	400 / 1,000	***11.8***	***4.8***	***11***
Selenium, Total	mg/kg	390 / 5,100	390 / 10,000	***1.7***	1.3 U	***2.2***

Notes:

1. All data screened against the USEPA Region 9 PRGs (industrial). All detections are in bold.

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res/ind - residential / industrial

ft - feet

mg/kg - milligrams per kilogram

J - qualified as estimated during QC evaluation

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Table 11-2
Groundwater Detections
Building 727 Waste Pit (FTRI-051)
Petroleum / VOC Sites
Expanded Site Investigation
Fort Riley, Kansas

Sample Point: Date Sampled: Sample Depth: Laboratory Number:		USEPA Region 9 PRGs (tap water)	USEPA MCLs/ Action Level	051-DP01/GW01 8/3/2006 LIQUID 06080451	051-DP02/GW01 8/3/2006 LIQUID 06080449	051-DP02/GW11 8/3/2006 LIQUID 06080450 Duplicate
Metals, Total	UNITS					
Arsenic, Total	mg/L	NA	NA	***0.704***	***0.067***	***0.058***
Barium, Total	mg/L	NA	NA	***5.53***	***3.25***	***2.7***
Cadmium, Total	mg/L	NA	NA	***0.014***	***0.024***	***0.021***
Chromium, Total	mg/L	NA	NA	***0.345***	***0.301***	***0.282***
Lead, Total	mg/L	NA	NA	***0.364***	***0.269***	***0.243***
Mercury, Total	mg/L	NA	NA	***0.0002***	0.0002 U	0.0002 U
Selenium, Total	mg/L	NA	NA	***0.095***	***0.015***	***0.015***
Metals, Dissolved	UNITS					
Arsenic, Dissolved	mg/L	4.50E-06	0.01	***0.017***	***0.021***	***0.025***
Barium, Dissolved	mg/L	2.6	2	***0.71***	***1.2***	***1.19***
Cadmium, Dissolved	mg/L	0.018	0.005	0.003 U	***0.004***	***0.004***
Chromium, Dissolved	mg/L	0.11*	0.1	***0.02***	***0.053***	***0.039***
Lead, Dissolved	mg/L	NA	0.015	***0.032***	***0.053***	***0.061***

Notes:

1. All data screened against the USEPA Region 9 PRGs (tap water) or the USEPA action limit (for lead). All exceedances are shaded.
   All detections are in bold.

USEPA Region 9 PRGs - United States Environmental Protection Agency Region 9 Preliminary Remediation Goals

USEPA MCLs - United States Environmental Protection Agency Maximum Contaminant Levels

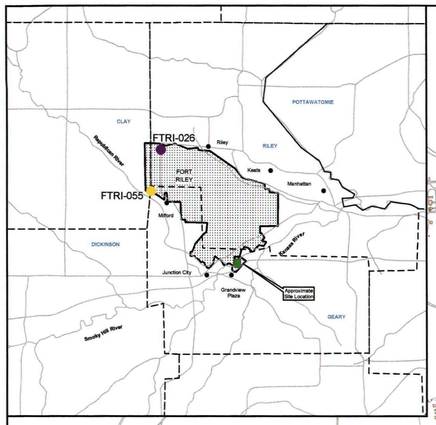
NA - not applicable / not analyzed

* for Chromium VI

mg/L - milligrams per liter

U - compound was not detected

Figures



LEGEND

- Pesticide/PCB Sites
- Wastewater Sites
- Petroleum/VOC Sites
- Former Landfills/Incinerators
- Petroleum, Oil & Lubricant Sites
- Well (Private/Public Supply)
- Buildings
- Railroad
- Roads

1,000 0 2,000
SCALE IN FEET

NORTH

Figure 1
ESI Site Map

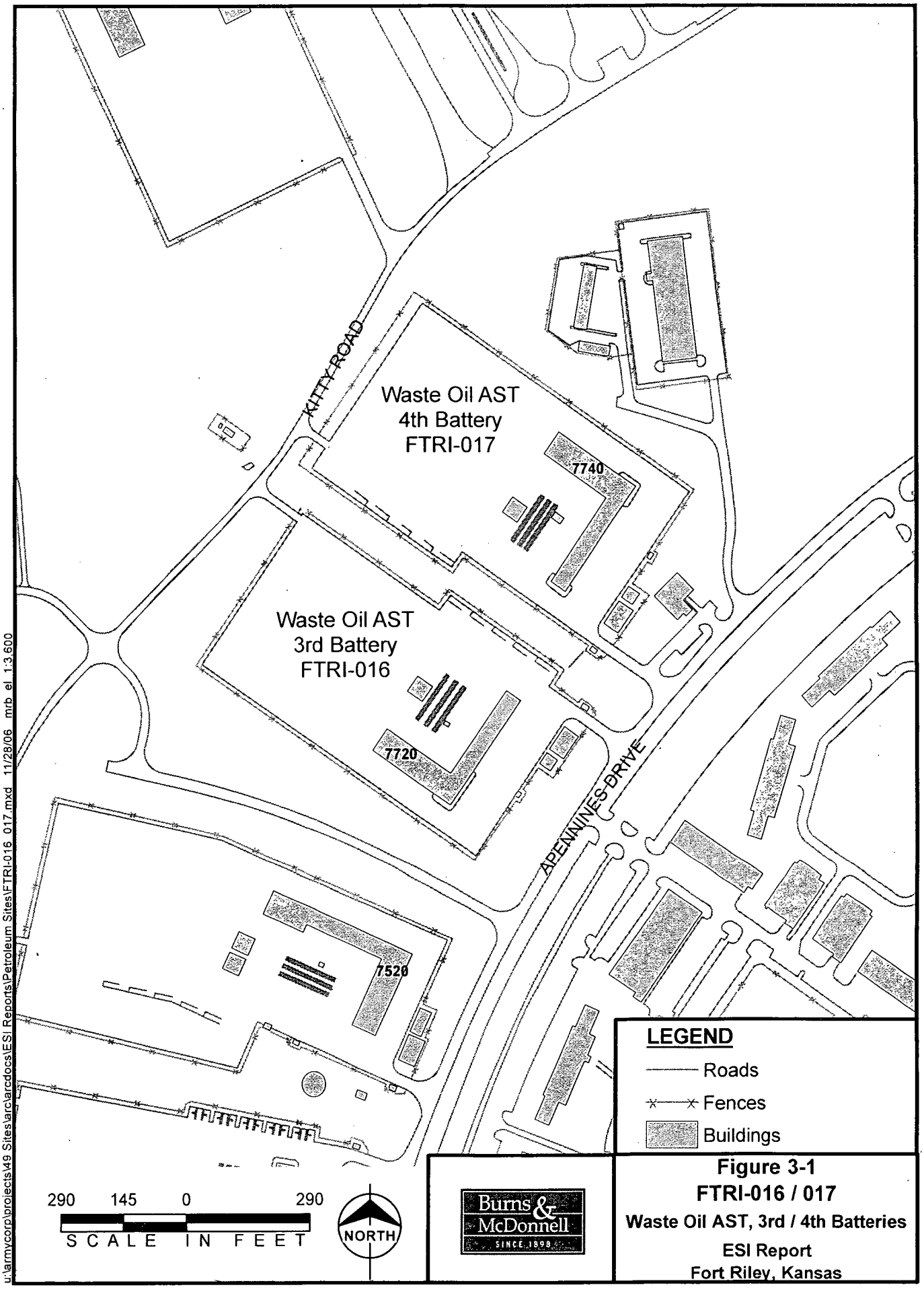
ESI Report
Fort Riley, Kansas

Barns & McDonnell

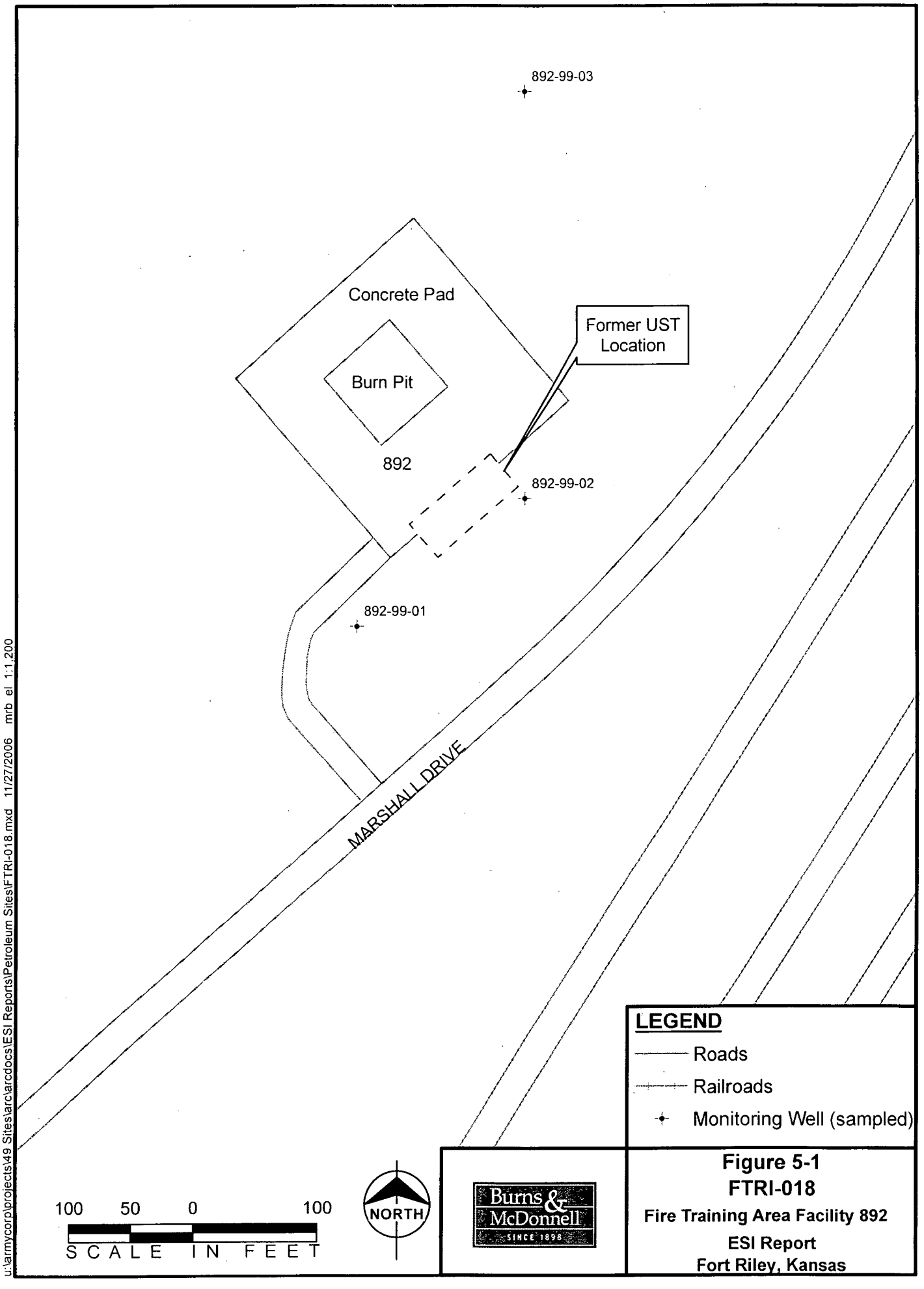
i:\arm\corp\projects\49 Sites\arc\arcdocs\ESI Reports\FtRiley_Figure 1-1.mxd 2/20/2007 mrb at 1:12,000

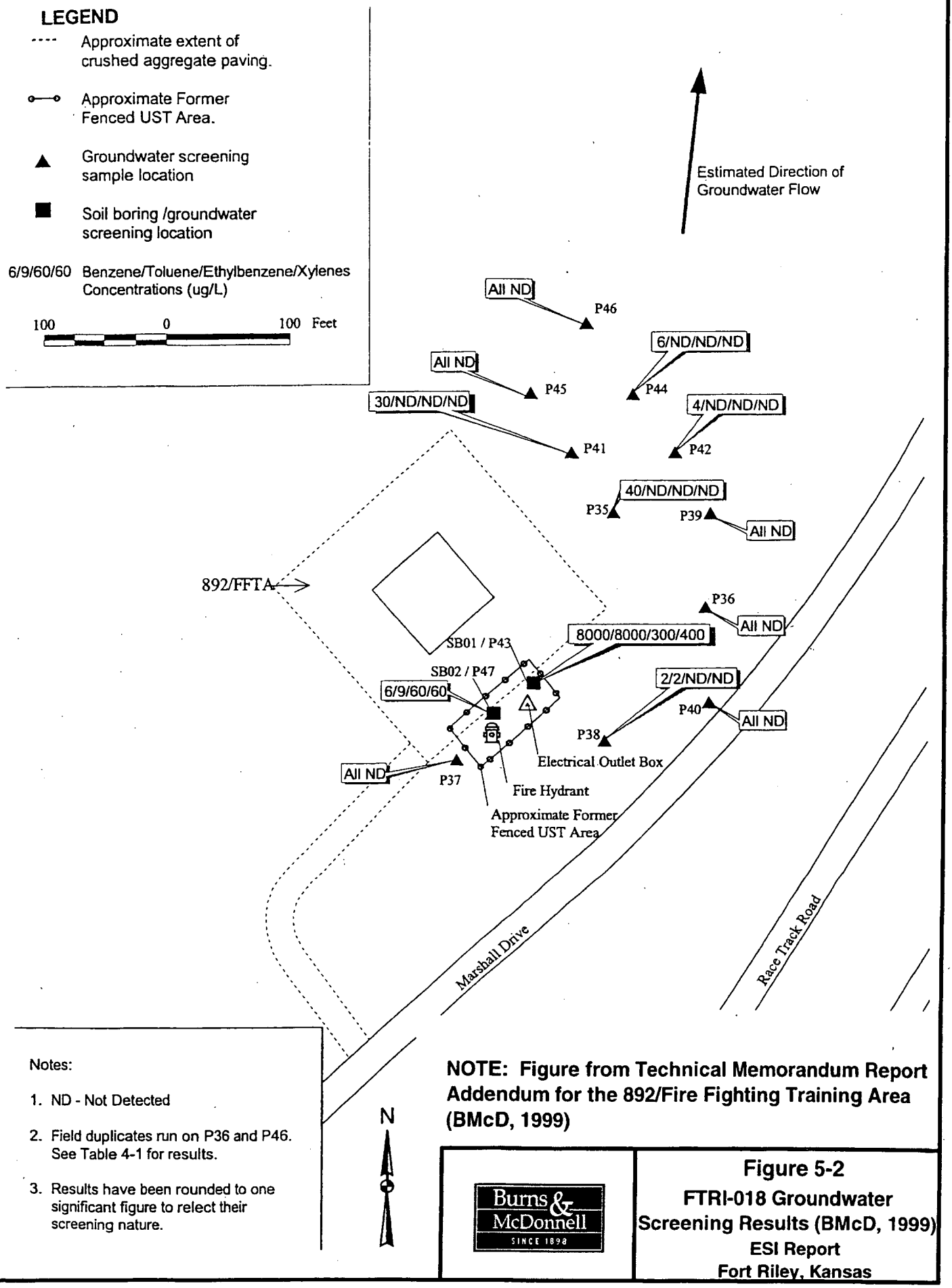
u:\armycorp\projects\49 Sites\arclarcdocs\ESI Reports\Petroleum Sites\FTRI-013.mxd 12/06/2006 mrb el 1:1,200

Figure 2-1
FTRI-013
Abandoned VOC Tanks
ESI Report
Fort Riley, Kansas



u:\armvcorp\projects\49 Sites\arclarcdocs\ESI Reports\Petroleum Sites\FTRI-016_017.mxd 11/28/06 mrb el 1:3,600


892-99-03
Concrete Pad
Former UST Location
Burn Pit
892
892-99-02
892-99-01
MARSHALL DRIVE
LEGEND
Roads
Railroads
Monitoring Well (sampled)
100 50 0 100
SCALE IN FEET
NORTH
Burns & McDonnell
SINCE 1898
Figure 5-1
FTRI-018
Fire Training Area Facility 892
ESI Report
Fort Riley, Kansas
u:\armycorp\projects\49 Sites\arcdocs\ESI Reports\Petroleum Sites\FTRI-018.mxd 11/27/2006 mrb el 1:1,200



Notes:

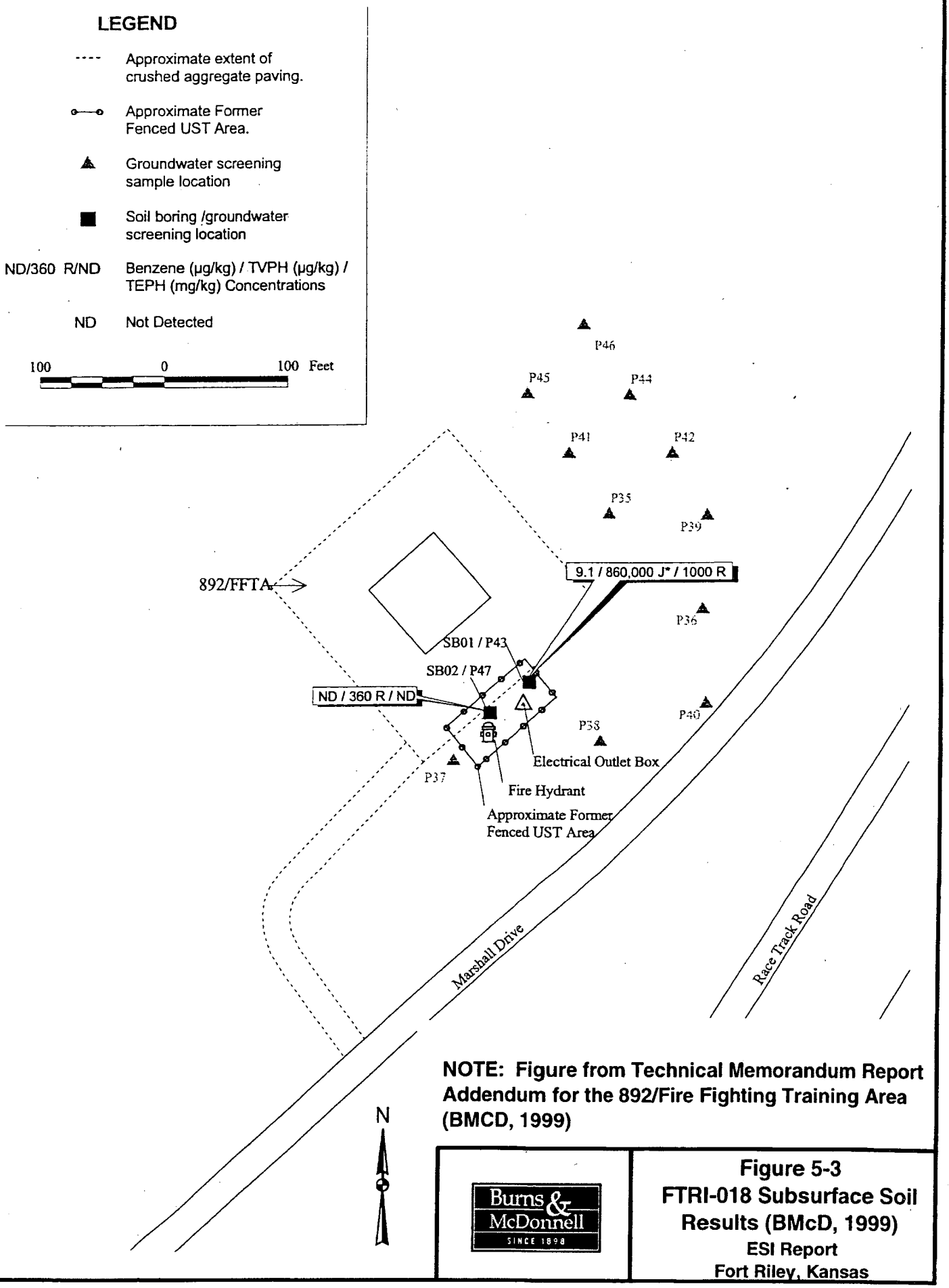
1. ND - Not Detected
2. Field duplicates run on P36 and P46. See Table 4-1 for results.
3. Results have been rounded to one significant figure to relect their screening nature.

NOTE: Figure from Technical Memorandum Report Addendum for the 892/Fire Fighting Training Area (BMcD, 1999)

Burns & McDonnell SINCE 1898

Figure 5-2
FTRI-018 Groundwater Screening Results (BMcD, 1999)
ESI Report
Fort Riley, Kansas

u:\armyco_ _ects\49 Sites\arcdocs\ESI Reports\Petroleum Sites\FTRI-018_1999gw.mxd mrb el 2/26/ _/



NOTE: Figure from Technical Memorandum Report Addendum for the 892/Fire Fighting Training Area (BMCD, 1999)

Burns & McDonnell SINCE 1898

Figure 5-3
FTRI-018 Subsurface Soil Results (BMcD, 1999)
ESI Report
Fort Riley, Kansas

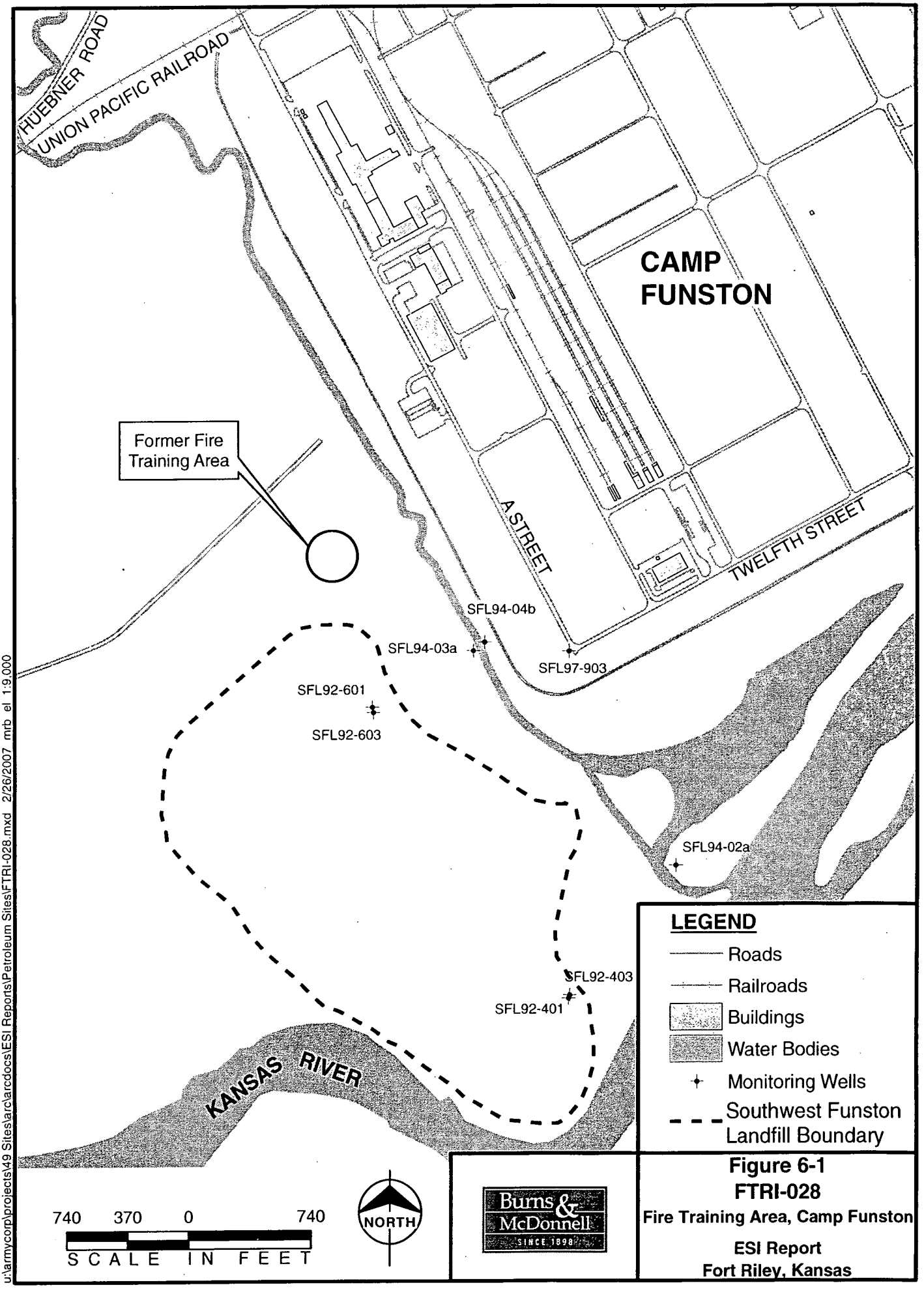
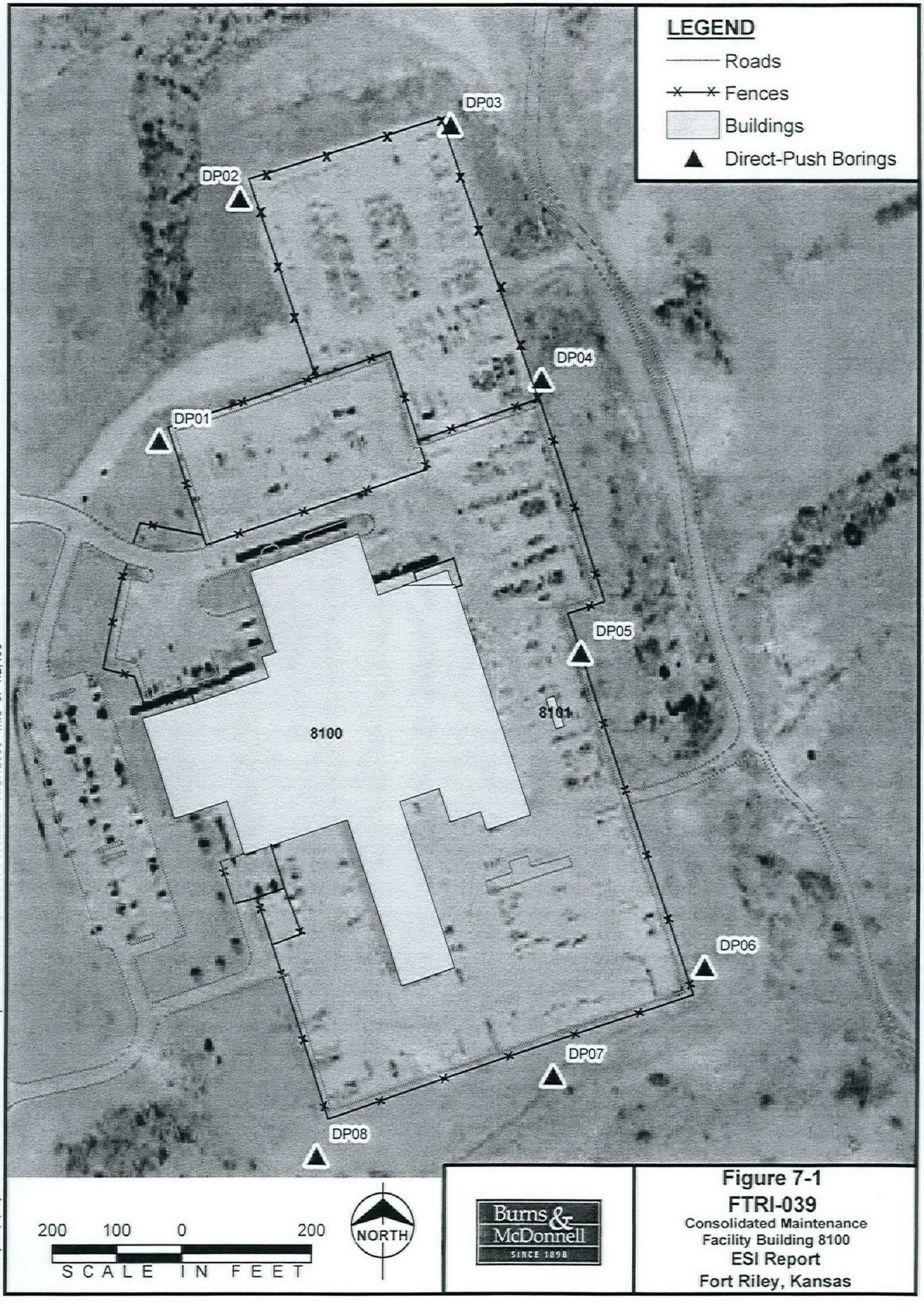


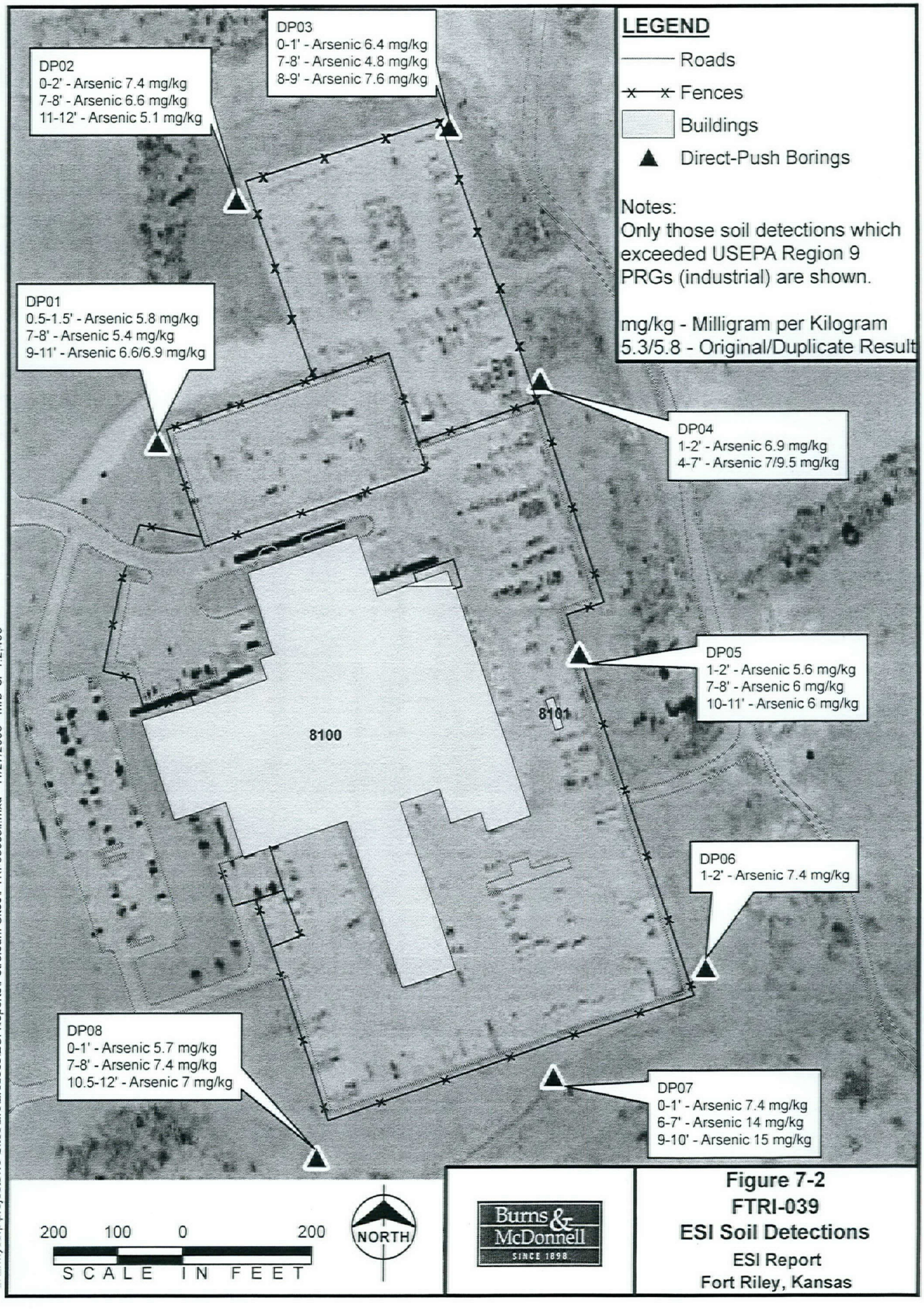
Figure 6-1
FTRI-028
Fire Training Area, Camp Funston
ESI Report
Fort Riley, Kansas

u:\armycorp\projects\49 Sites\arclarcdocs\ESI Reports\Petroleum Sites\FTRI-028.mxd 2/26/2007 mrb el 1:9,000



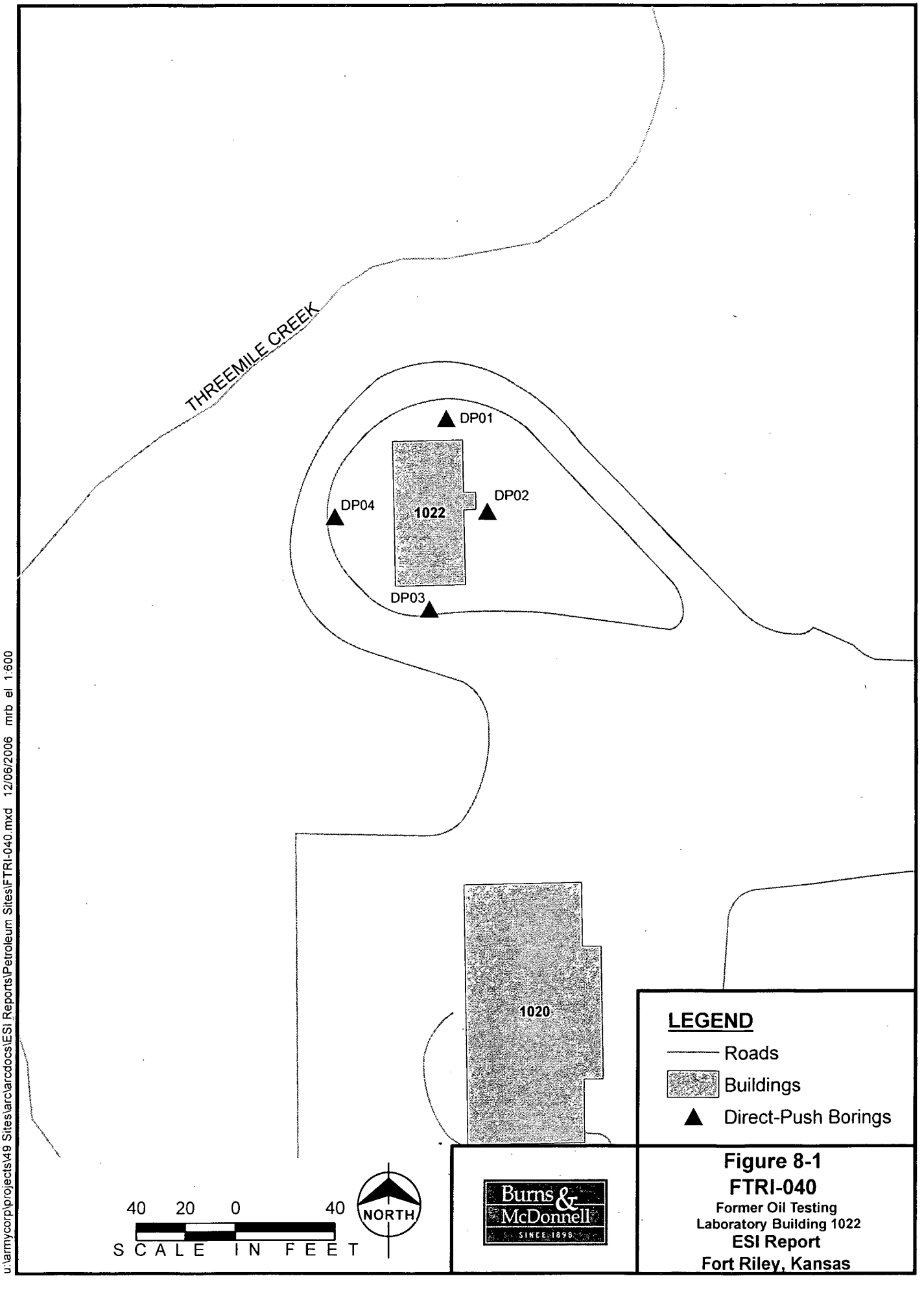
Burns & McDonnell
SINCE 1898

Figure 7-1
FTRI-039
Consolidated Maintenance Facility Building 8100
ESI Report
Fort Riley, Kansas



u:\armycorp\projects\49 Sites\arc\arcdocs\ESI Reports\Petroleum Sites\FTRI-039soil.mxd 11/27/2006 mrb el 1:2,400

Figure 7-2
FTRI-039
ESI Soil Detections
ESI Report
Fort Riley, Kansas



u:\armycorp\projects\49 Sites\arc\arcdocs\ESI Reports\Petroleum Sites\FTRI-040.mxd 12/06/2006 mrb el 1:600

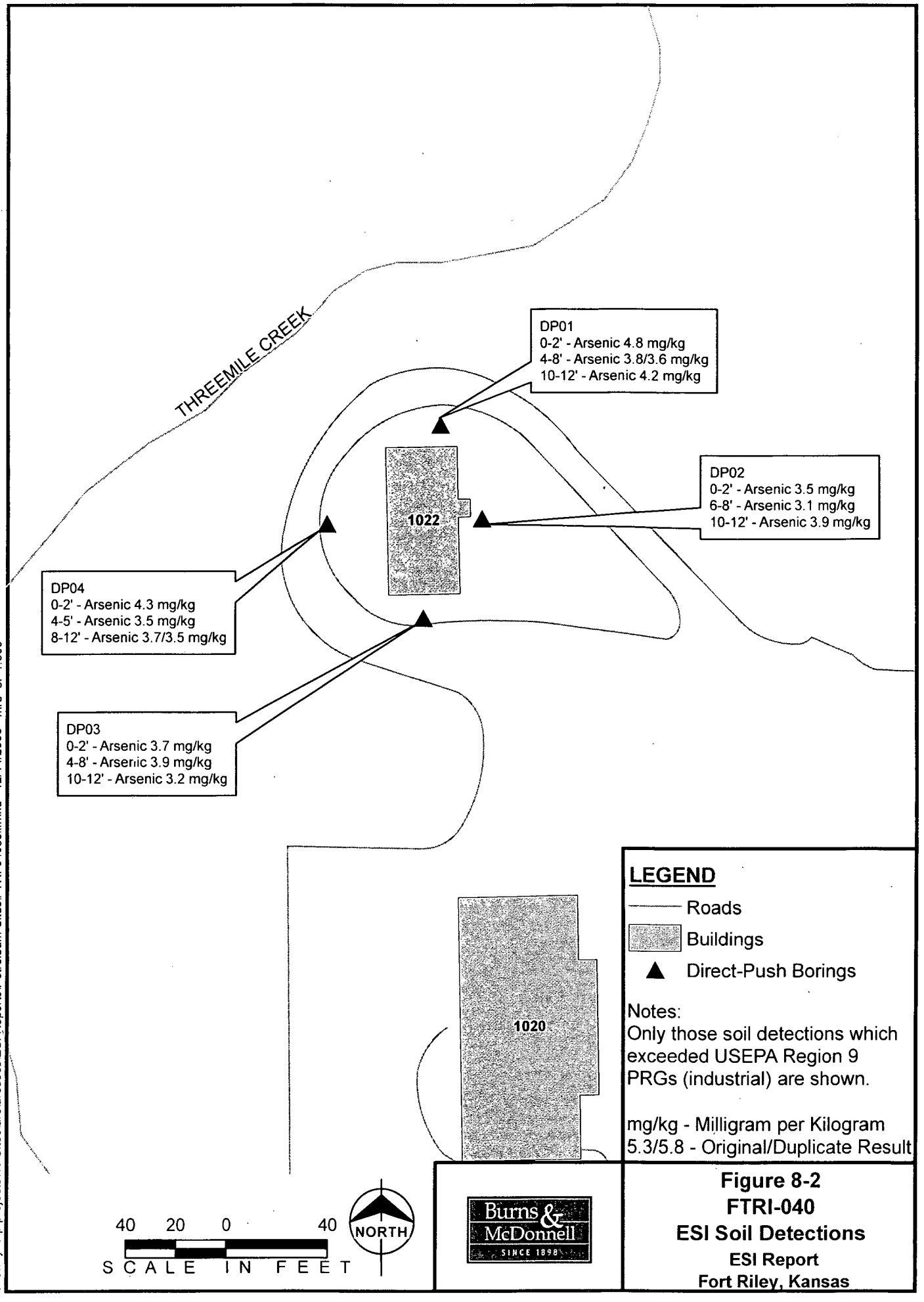


Figure 8-2
FTRI-040
ESI Soil Detections
ESI Report
Fort Riley, Kansas

u:\armycorp\projects\49 Sites\arcdocs\ESI Reports\Petroleum Sites\FTRI-040soil.mxd 12/14/2006 mrb el 1:600

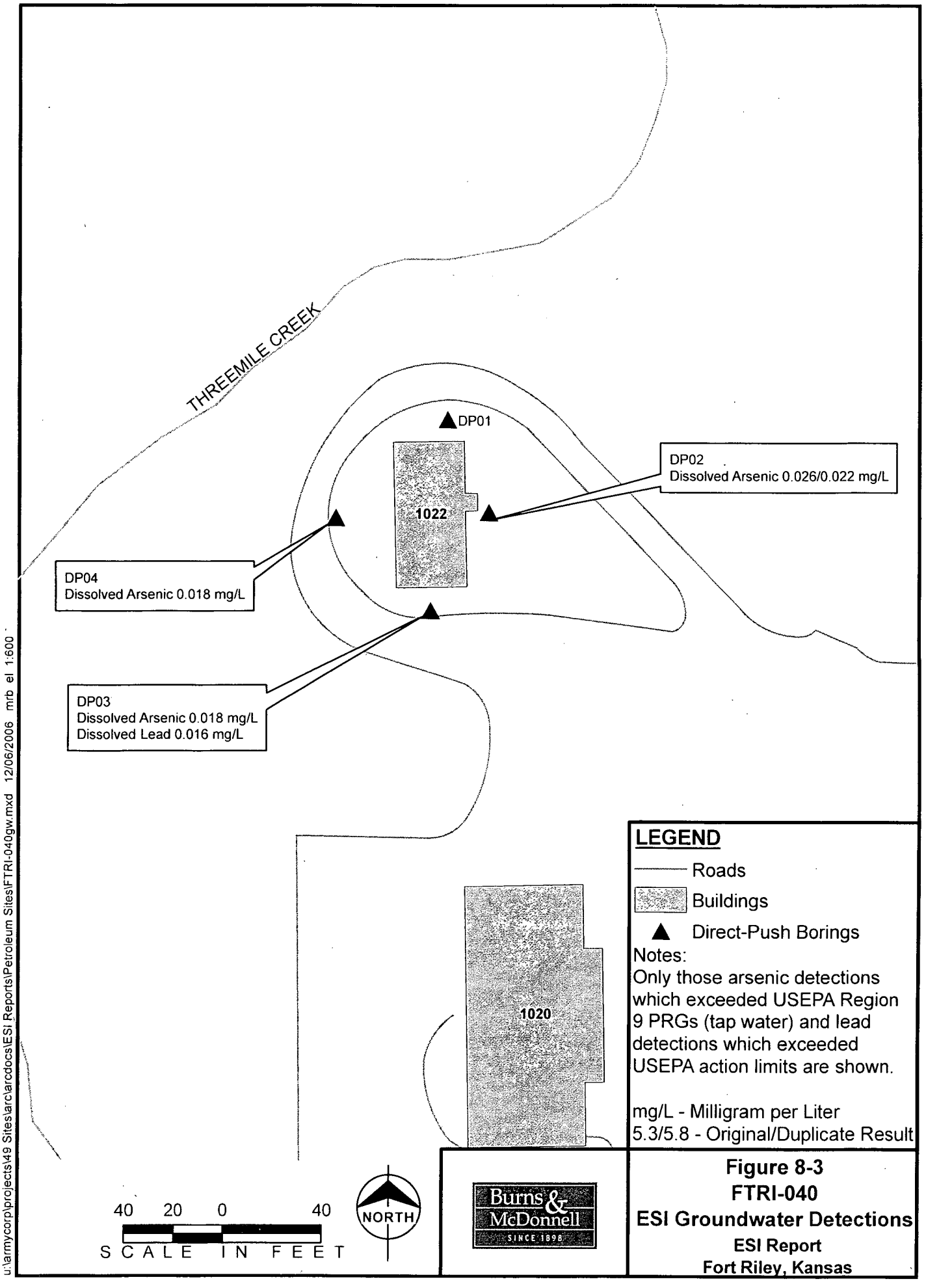
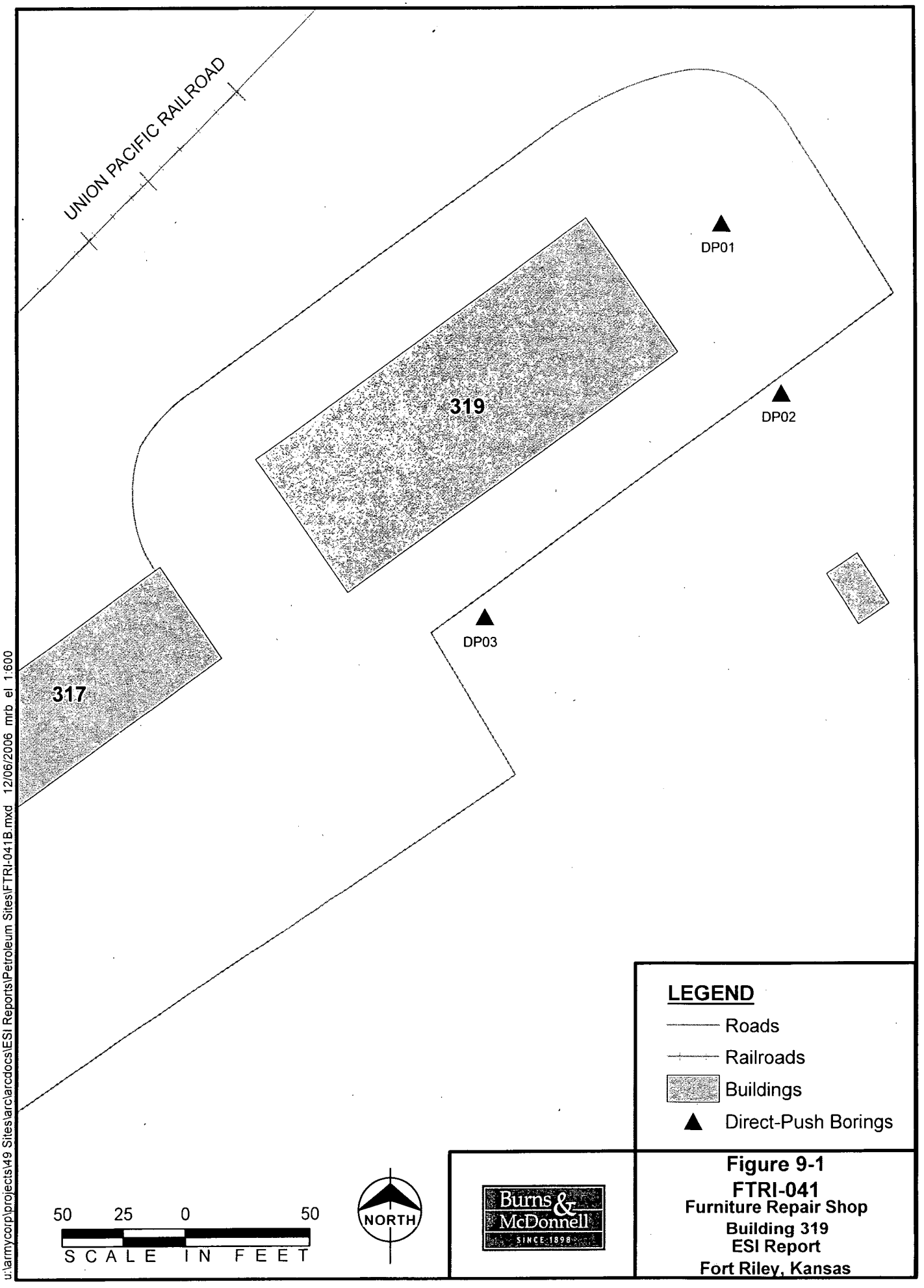


Figure 8-3
FTRI-040
ESI Groundwater Detections
ESI Report
Fort Riley, Kansas

u:\armycorp\projects\49 Sites\arc\arcdocs\ESI Reports\Petroleum Sites\FTRI-040gw.mxd 12/06/2006 mrb el 1:600



u:\armycorp\projects\49 Sites\arcdocs\ESI Reports\Petroleum Sites\FTRI-041B.mxd 12/06/2006 mrb el 1:600

Figure 9-1
FTRI-041
Furniture Repair Shop
Building 319
ESI Report
Fort Riley, Kansas

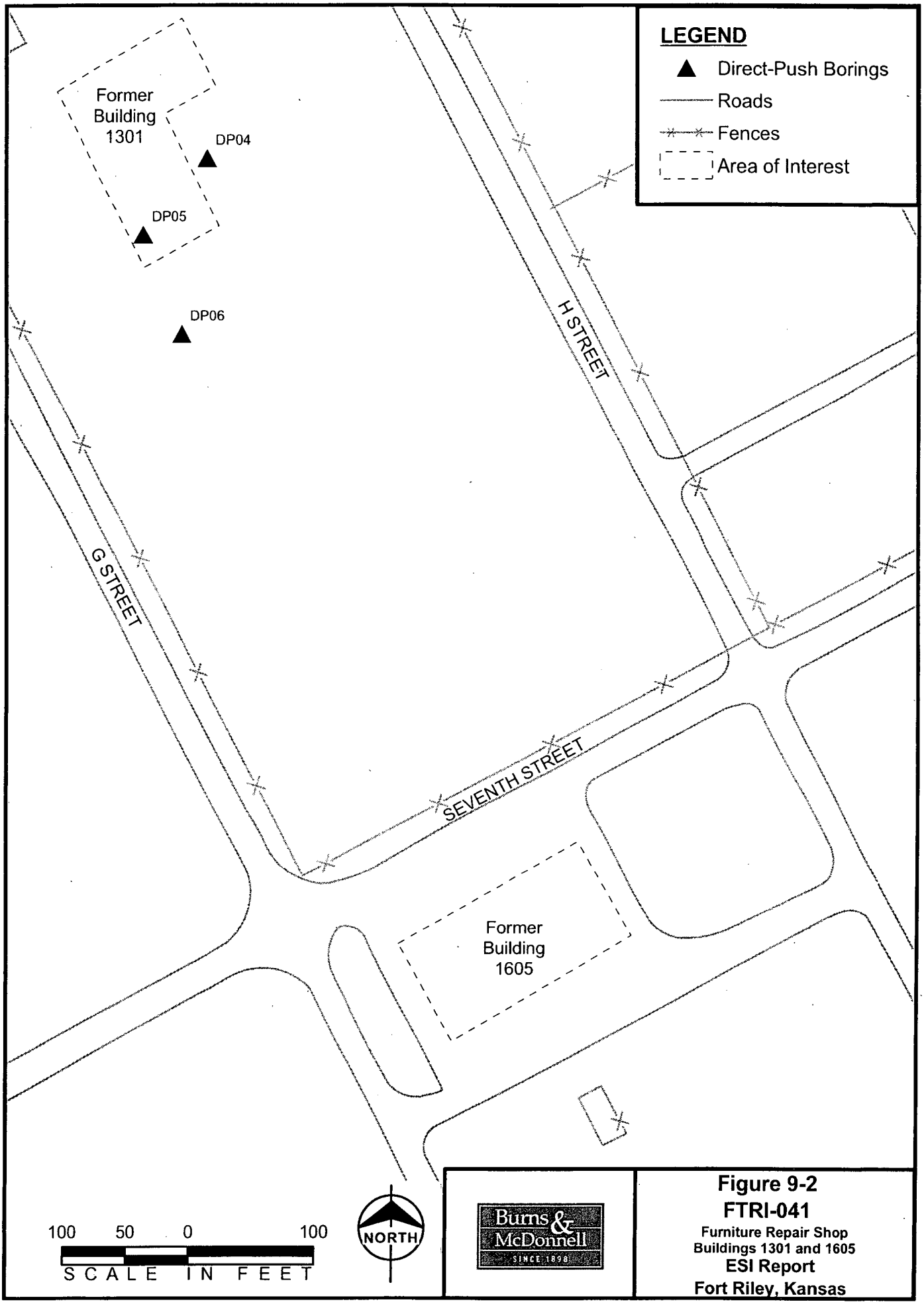
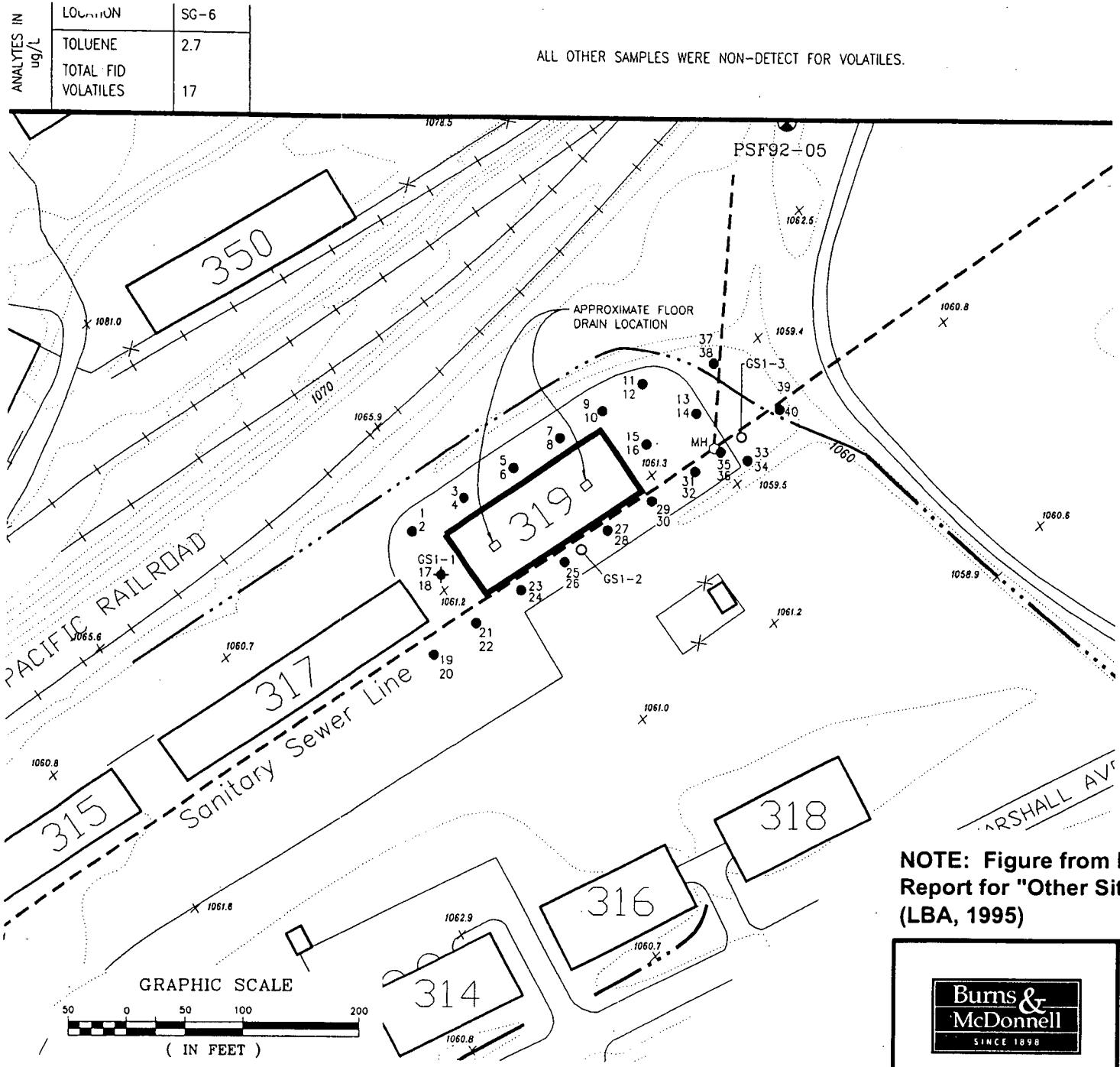


Figure 9-2
FTRI-041
Furniture Repair Shop
Buildings 1301 and 1605
ESI Report
Fort Riley, Kansas

u:\armycorp\projects\49 Sites\arc\arcdocs\ESI Reports\Petroleum Sites\Fig9-2_FTRI-041A.mxd 09/18/2007 mrb el sos 1:1,200

ANALYTES IN ug/L	LOCATION	SG-6
	TOLUENE	2.7
	TOTAL FID VOLATILES	17

ALL OTHER SAMPLES WERE NON-DETECT FOR VOLATILES.



N

LEGEND

- RI/FS MONITOR WELL
- SOIL GAS (4' and 12')
- SOIL GAS and GROUNDWATER SCREENING
- GROUNDWATER SCREENING
- ELEVATION CONTOUR
- DRAINAGE
- BUILDINGS
- ROAD
- RAIL LINES
- FENCE LINES
- SEWER LINE
- MH MANHOLE

NOTE: SOIL GAS SAMPLES
SOIL GAS SAMPLES HAVE PREFIX (319SG1-)
EVEN Numbers = 12' Sample
ODD Numbers = 4' Sample

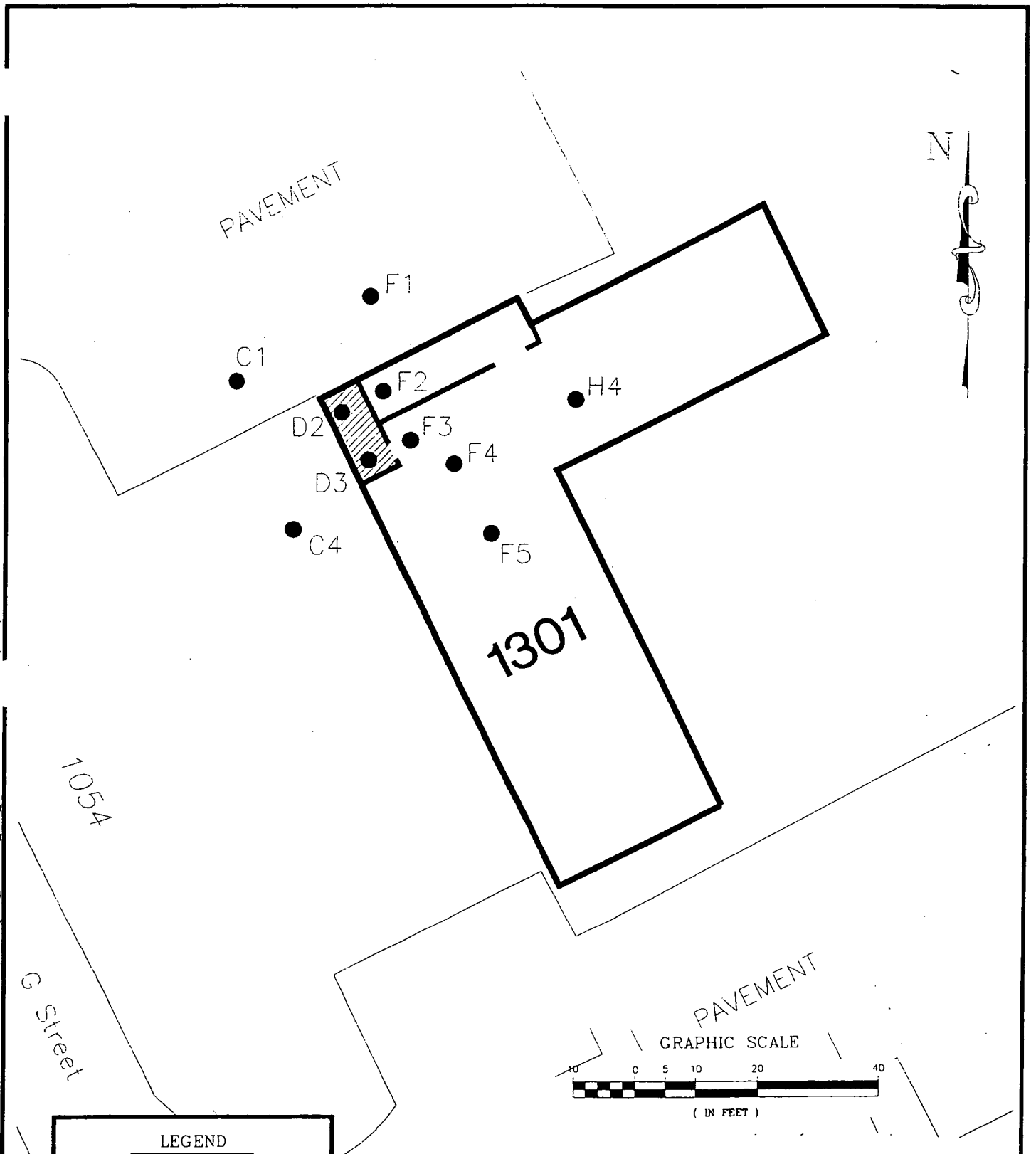
GS - GROUNDWATER SCREENING SAMPLES HAVE PREFIX (319)

NOTE: Figure from Draft Final Site Investigation Report for "Other Sites" at Fort Riley, Kansas (LBA, 1995)

Burns & McDonnell SINCE 1898

Figure 9-3
FTRI-041 Building 319 Soil Gas Results (LBA, 1995)
ESI Report
Fort Riley, Kansas

U:\armycorp\Projects\49 Sites\ARC\ArcDocs\ESI Reports\PCB Sites\Sept17\Fig9-3_Bld319_Soil_GasResults.mxd sos Sept 17, 2007



NOTE: Figure from Draft Final Site Investigation Report for High Priority Sites at Fort Riley, Kansas (LBA, 1994)

Burns & McDonnell SINCE 1898

Figure 9-4
FTRI-041Building 1301 Soil Gas Results (LBA, 1994)
ESI Report
Fort Riley, Kansas

Sept 17, 2007

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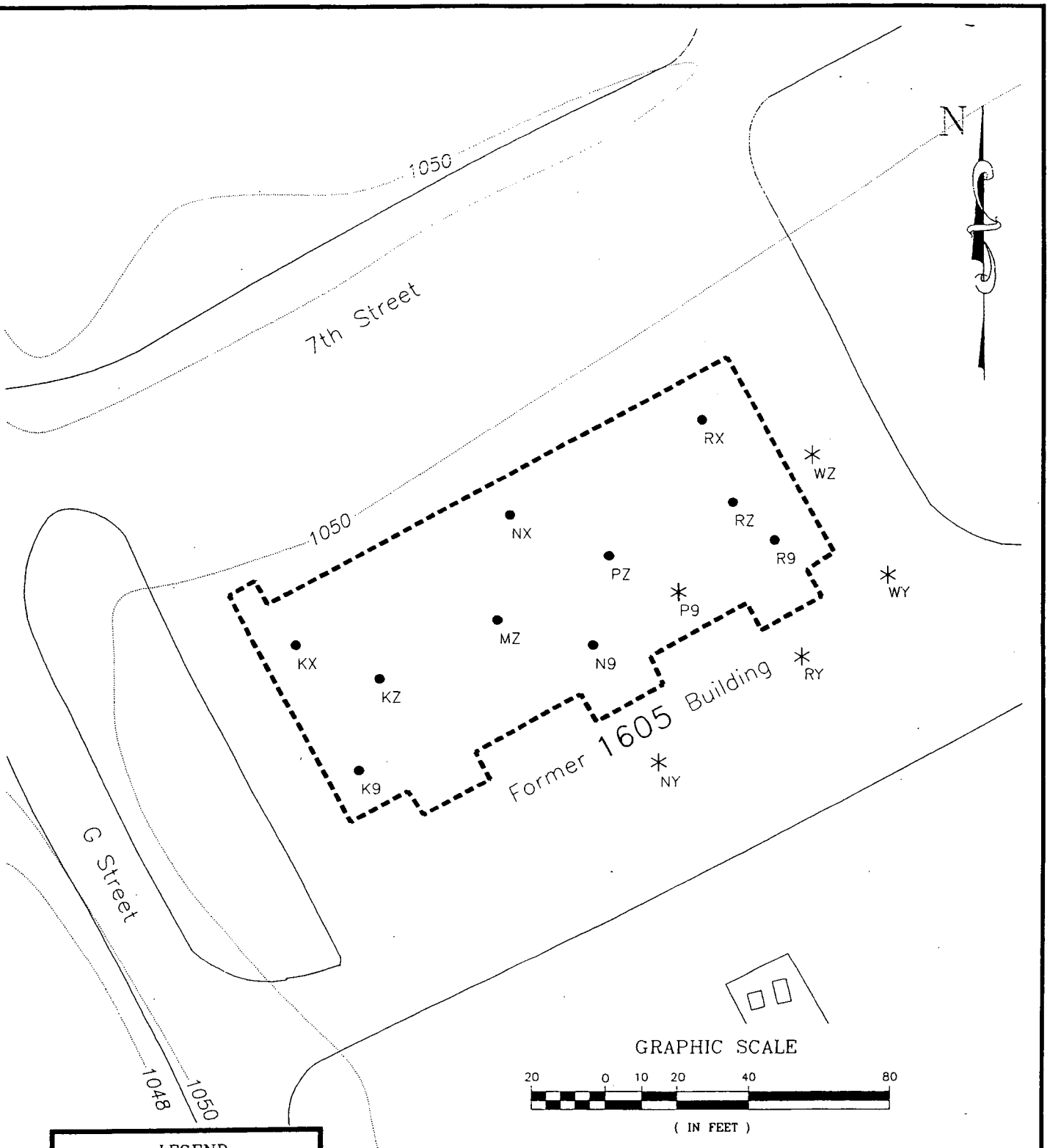

NOTE: Figure from Draft Final Site Investigation Report for High Priority Sites at Fort Riley, Kansas (LBA, 1994)

Burns & McDonnell SINCE 1898

Figure 9-5
FTRI-041Building 1605 Soil Gas Results (LBA, 1994)
ESI Report
Fort Riley, Kansas

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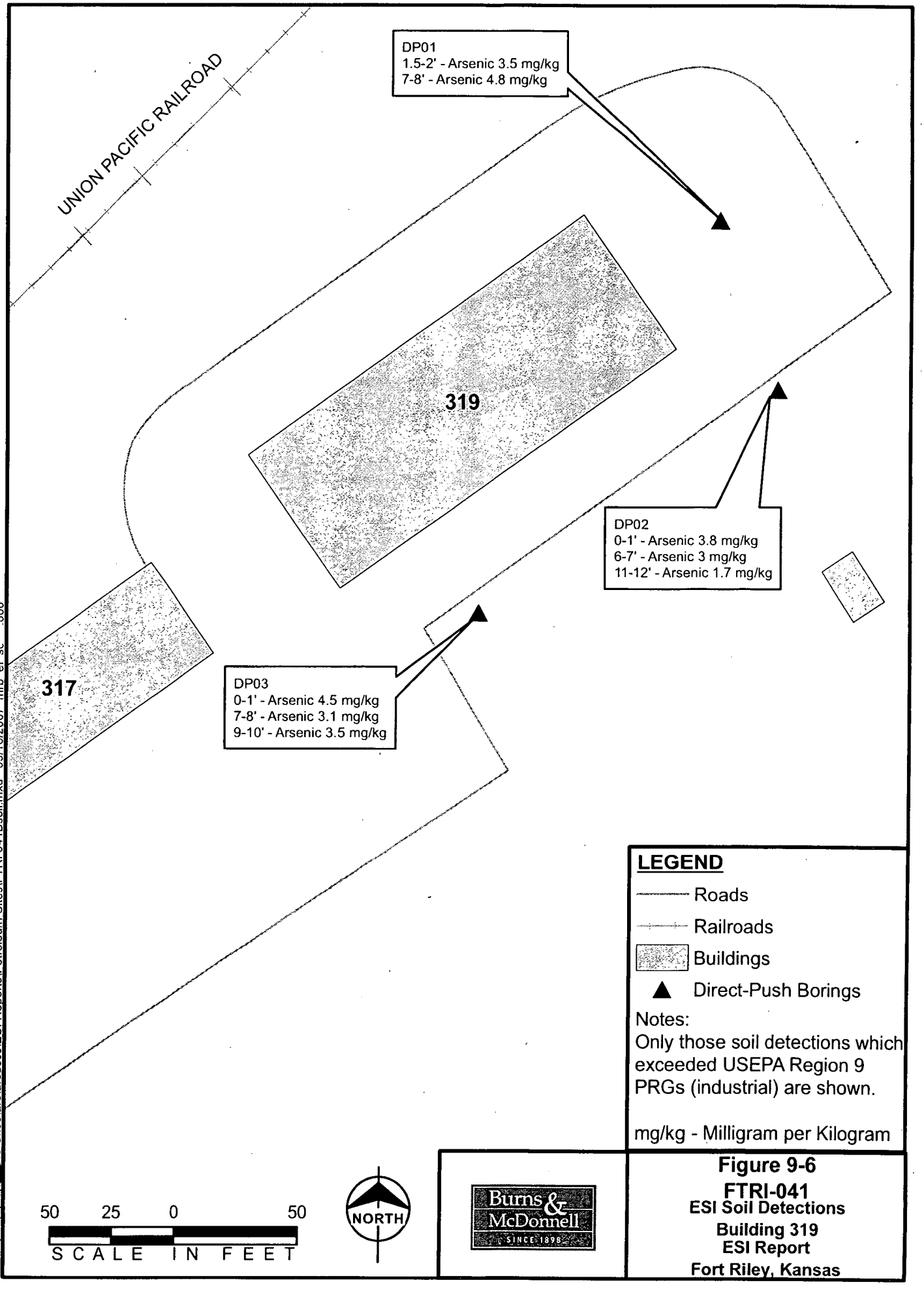
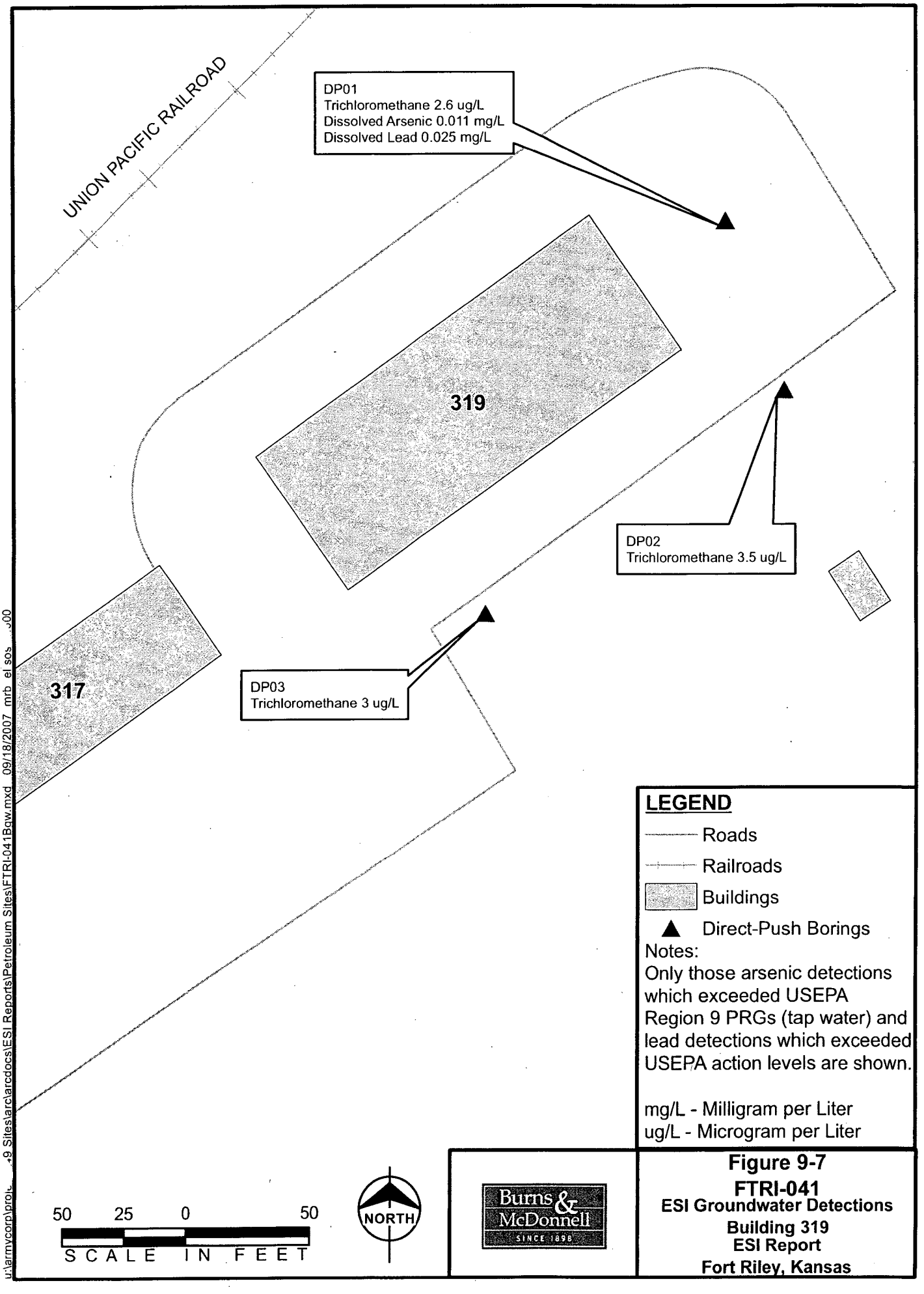
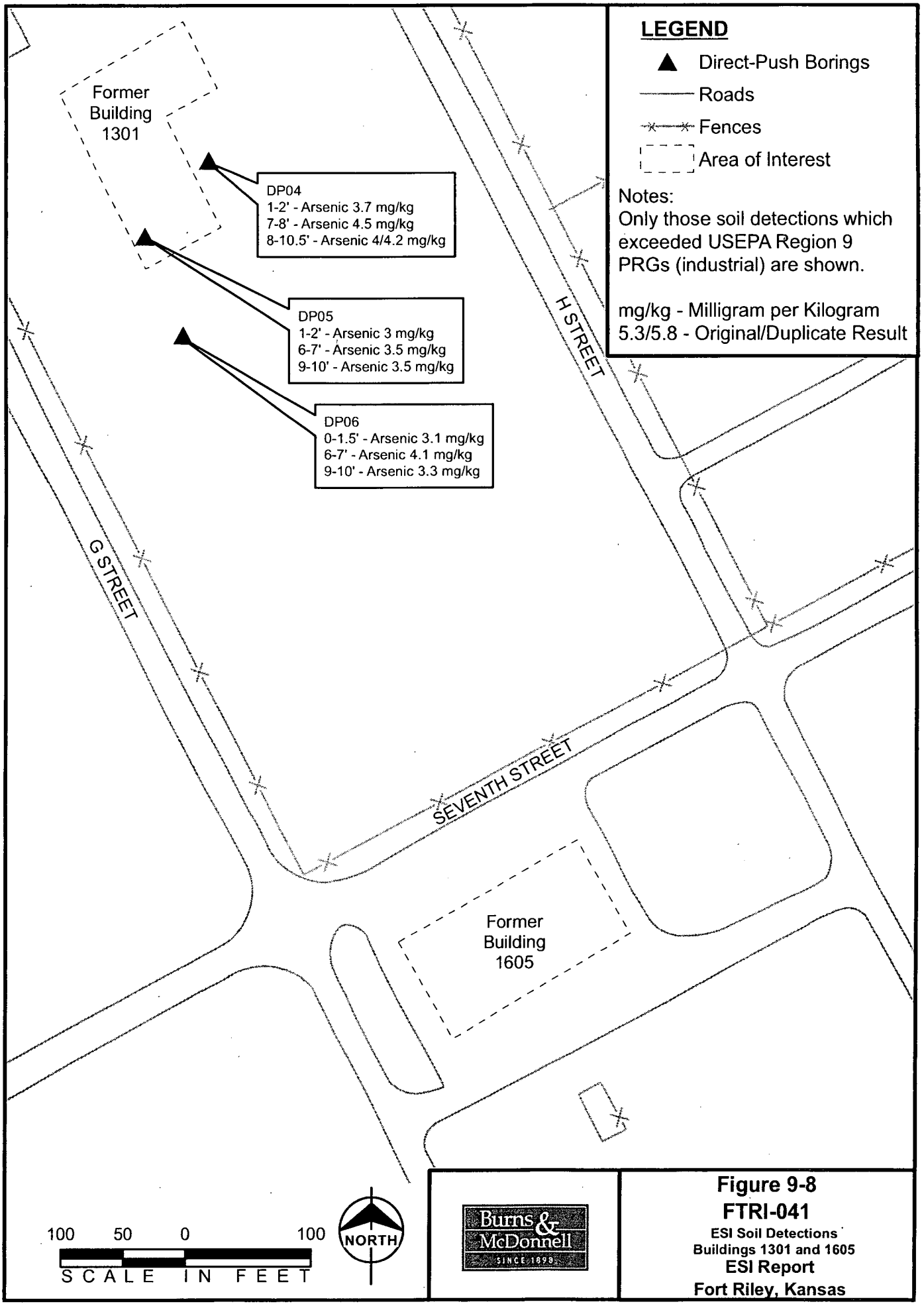


Figure 9-6
FTRI-041
ESI Soil Detections
Building 319
ESI Report
Fort Riley, Kansas

u:\armycorp\pro 9 Sites\arclardocs\ESI Reports\Petroleum Sites\FTRI-041Bsoil.mxd 09/18/2007 mrb el s .00


UNION PACIFIC RAILROAD
DP01
Trichloromethane 2.6 ug/L
Dissolved Arsenic 0.011 mg/L
Dissolved Lead 0.025 mg/L
319
DP02
Trichloromethane 3.5 ug/L
317
DP03
Trichloromethane 3 ug/L
LEGEND
Roads
Railroads
Buildings
Direct-Push Borings
Notes:
Only those arsenic detections which exceeded USEPA Region 9 PRGs (tap water) and lead detections which exceeded USEPA action levels are shown.
mg/L - Milligram per Liter
ug/L - Microgram per Liter
50 25 0 50
SCALE IN FEET
NORTH
Burns & McDonnell
SINCE 1898
Figure 9-7
FTRI-041
ESI Groundwater Detections
Building 319
ESI Report
Fort Riley, Kansas
u:\armycorp\proj...9 Sites\arc\arcdocs\ESI Reports\Petroleum Sites\FTRI-041Bgw.mxd 09/18/2007 mrb el sos ...00



u:\armycorp\projects\49 Sites\arc\arcdocs\ESI Reports\Petroleum Sites\Fig9-8_FTRI-041Asoil.mxd 09/18/2007 mrb el sos 1:1,200

Figure 9-8
FTRI-041
ESI Soil Detections
Buildings 1301 and 1605
ESI Report
Fort Riley, Kansas

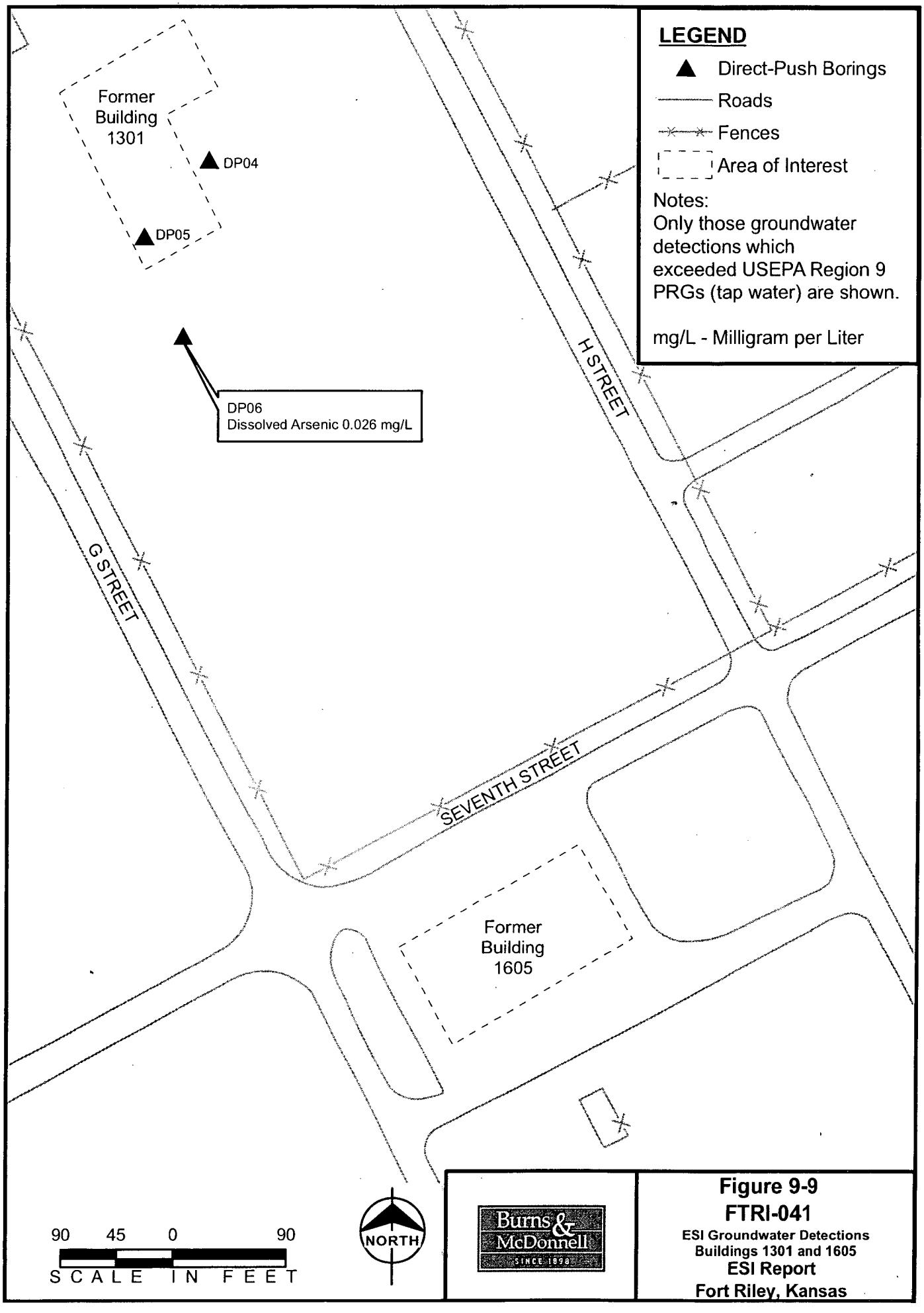


Figure 9-9
FTRI-041
ESI Groundwater Detections
Buildings 1301 and 1605
ESI Report
Fort Riley, Kansas

u:\armycorp\projects\49 Sites\arc\arcdocs\ESI Reports\Petroleum Sites\Fig9-9_FTRI-041Agw.mxd 09/18/2007 mrb el sos 1:1,200

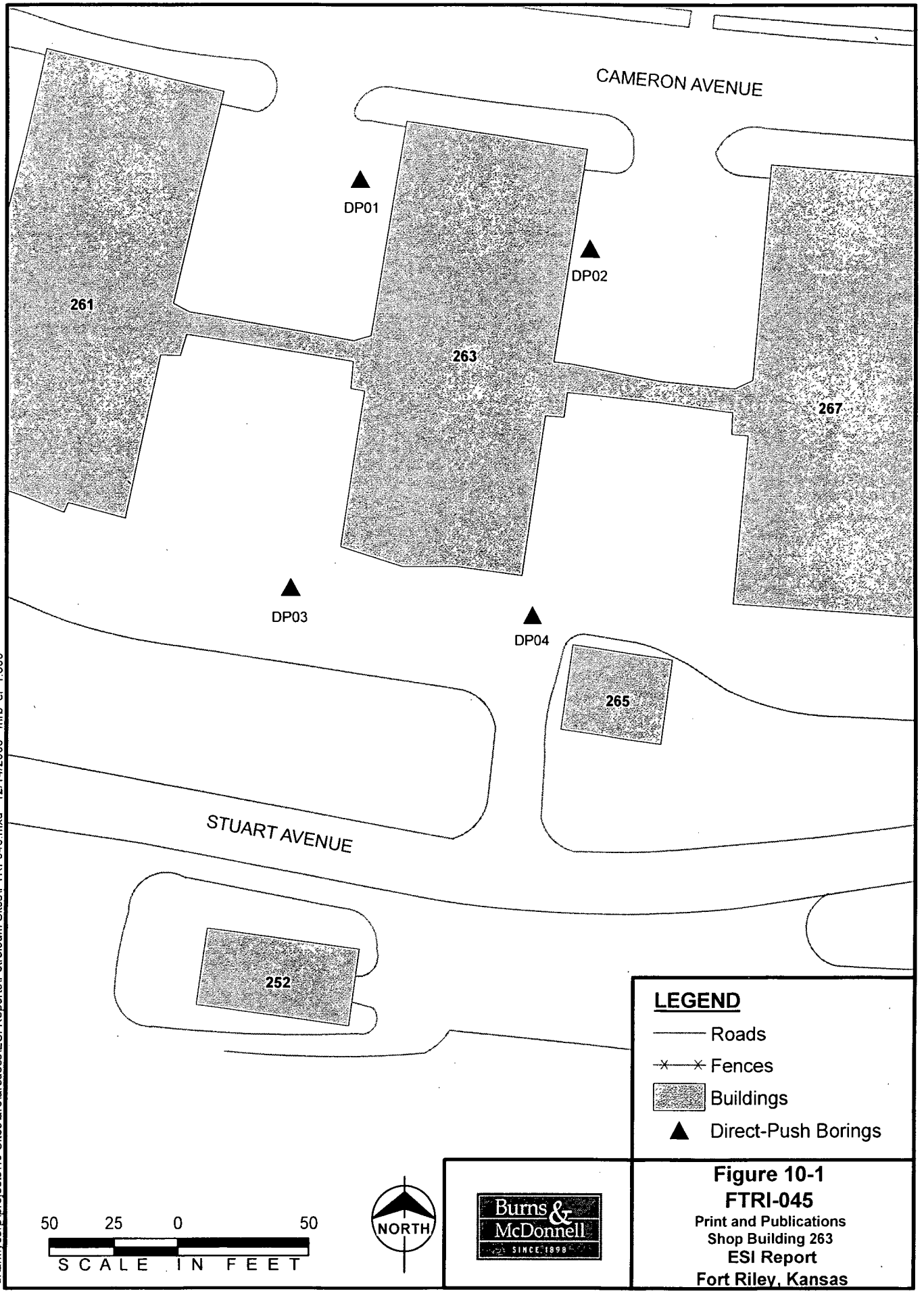
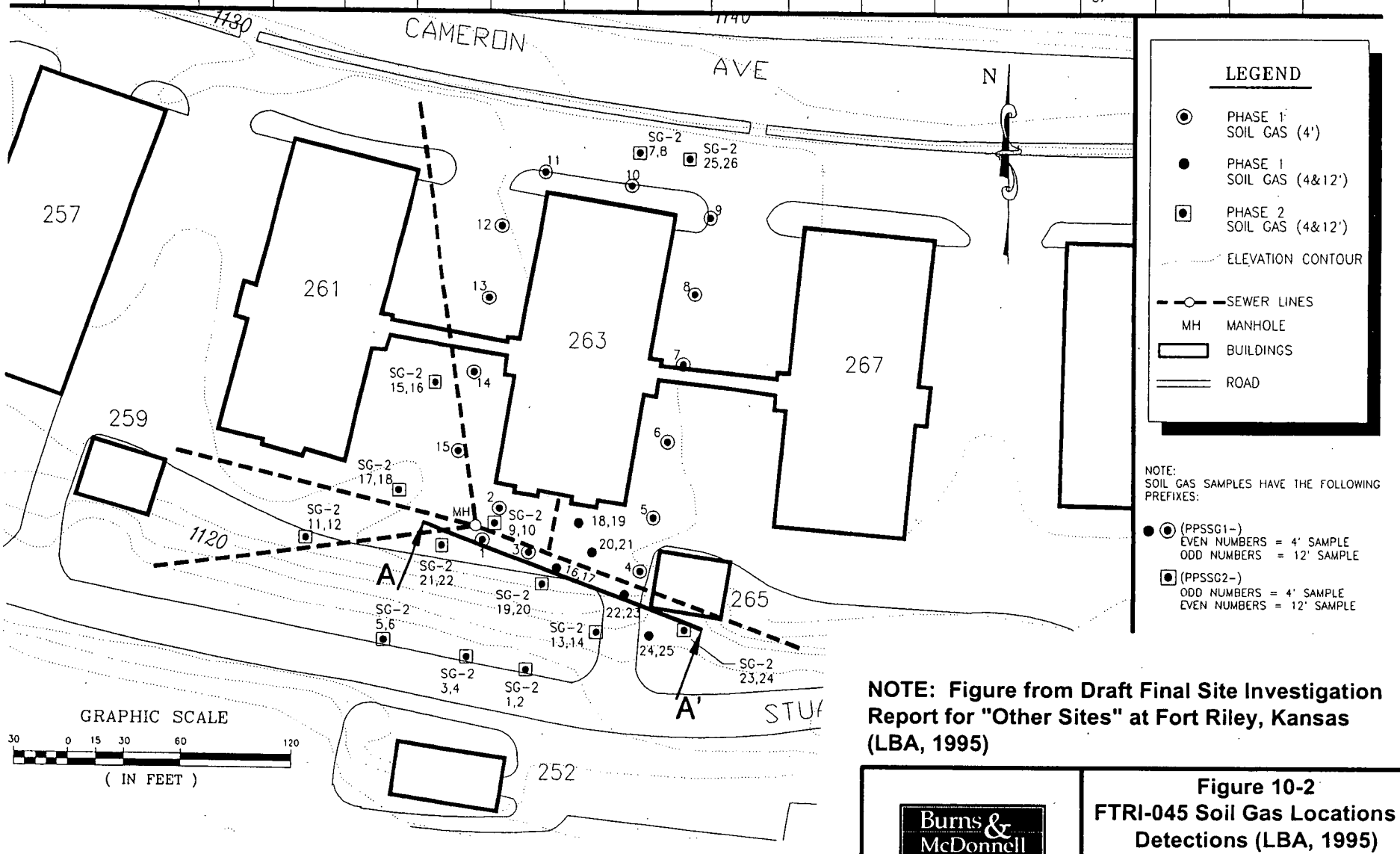


Figure 10-1
FTRI-045
Print and Publications
Shop Building 263
ESI Report
Fort Riley, Kansas

ANALYTES IN ug/L	LOCATION	PPSSG1-2	PPSSG1-3	PPSSG1-6	PPSSG1-8	PPSSG1-10	PPSSG1-14	PPSSG1-16	PPSSG1-17	PPSSG1-18	PPSSG1-20	PPSSG2-7	PPSSG2-8	PPSSG2-9	PPSSG2-19	PPSSG2-20	PPSSG2-26
	TOLUENE	–	–	–	–	–	–	–	–	1.0	3.5	6.1	–	–	–	–	–
	XYLENES	–	–	1.6	–	2.7	2.1	–	–	–	–	–	–	1.5	–	–	–
	DICHLOROMETHANE	–	1.1	–	1.0	–	–	–	–	–	–	–	–	–	–	–	–
	TRICHLOROETHYLENE	–	5.3	–	–	–	–	6.8	4.1	–	–	–	–	–	11.0	5.4	–
	TETRACHLOROETHYLENE	1.2	5.1	–	–	–	–	4.9	4.8	–	–	–	2.1	2.1	15.0	8.4	2.1
	TOTAL FID VOLATILES	–	–	–	–	56	–	–	–	–	–	–	–	37	–	–	–



NOTE: Figure from Draft Final Site Investigation Report for "Other Sites" at Fort Riley, Kansas (LBA, 1995)

Burns & McDonnell SINCE 1898

Figure 10-2
FTRI-045 Soil Gas Locations & Detections (LBA, 1995)
ESI Report
Fort Riley, Kansas

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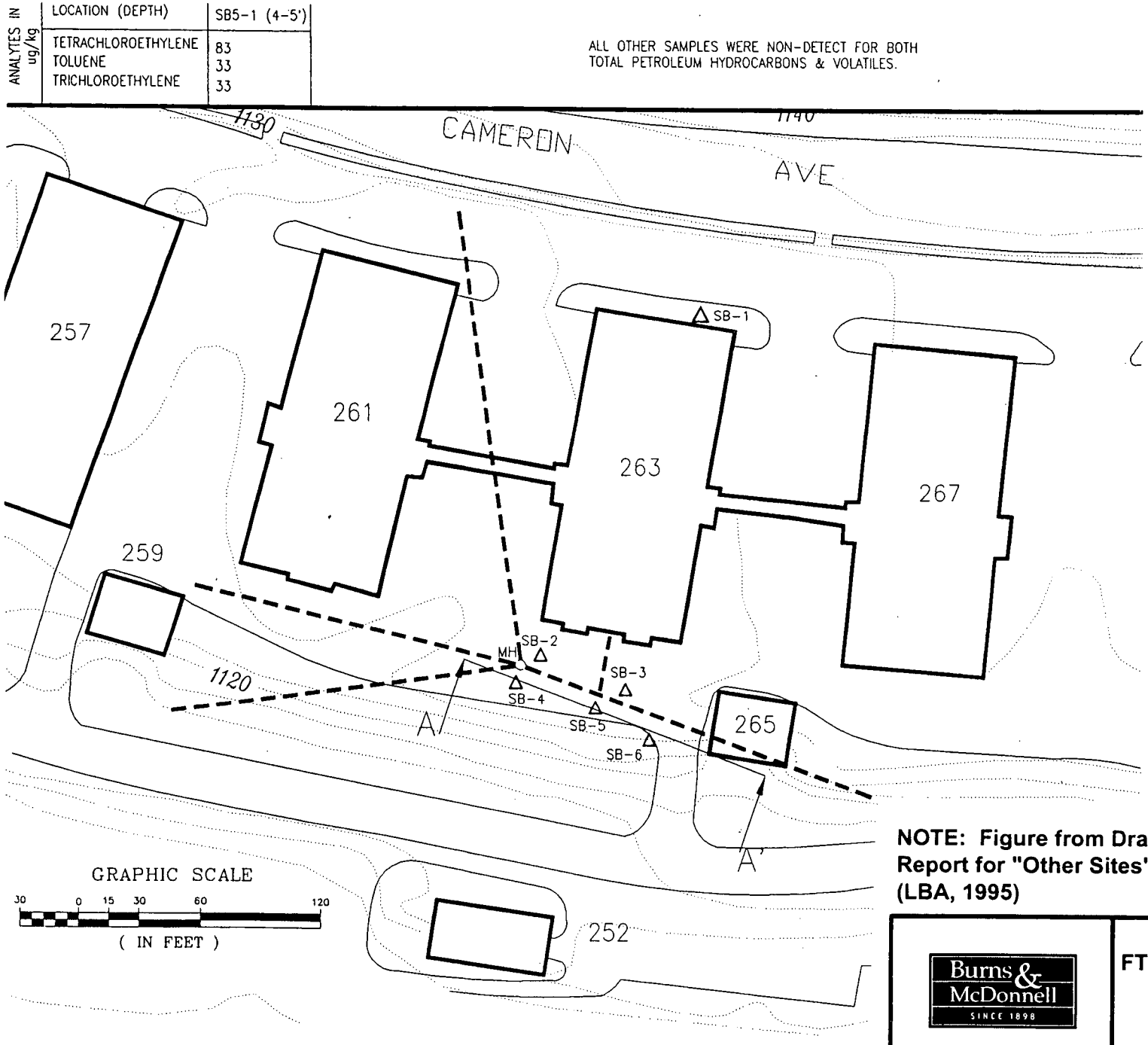
ANALYTES IN ug/kg	LOCATION (DEPTH)	SB5-1 (4-5')
	TETRACHLOROETHYLENE	83
	TOLUENE	33
	TRICHLOROETHYLENE	33

ALL OTHER SAMPLES WERE NON-DETECT FOR BOTH TOTAL PETROLEUM HYDROCARBONS & VOLATILES.



NOTE: Figure from Draft Final Site Investigation Report for "Other Sites" at Fort Riley, Kansas (LBA, 1995)

Burns & McDonnell SINCE 1898

Figure 10-3
FTRI-045 Soil Boring Locations & Detections (LBA, 1995)
ESI Report
Fort Riley, Kansas

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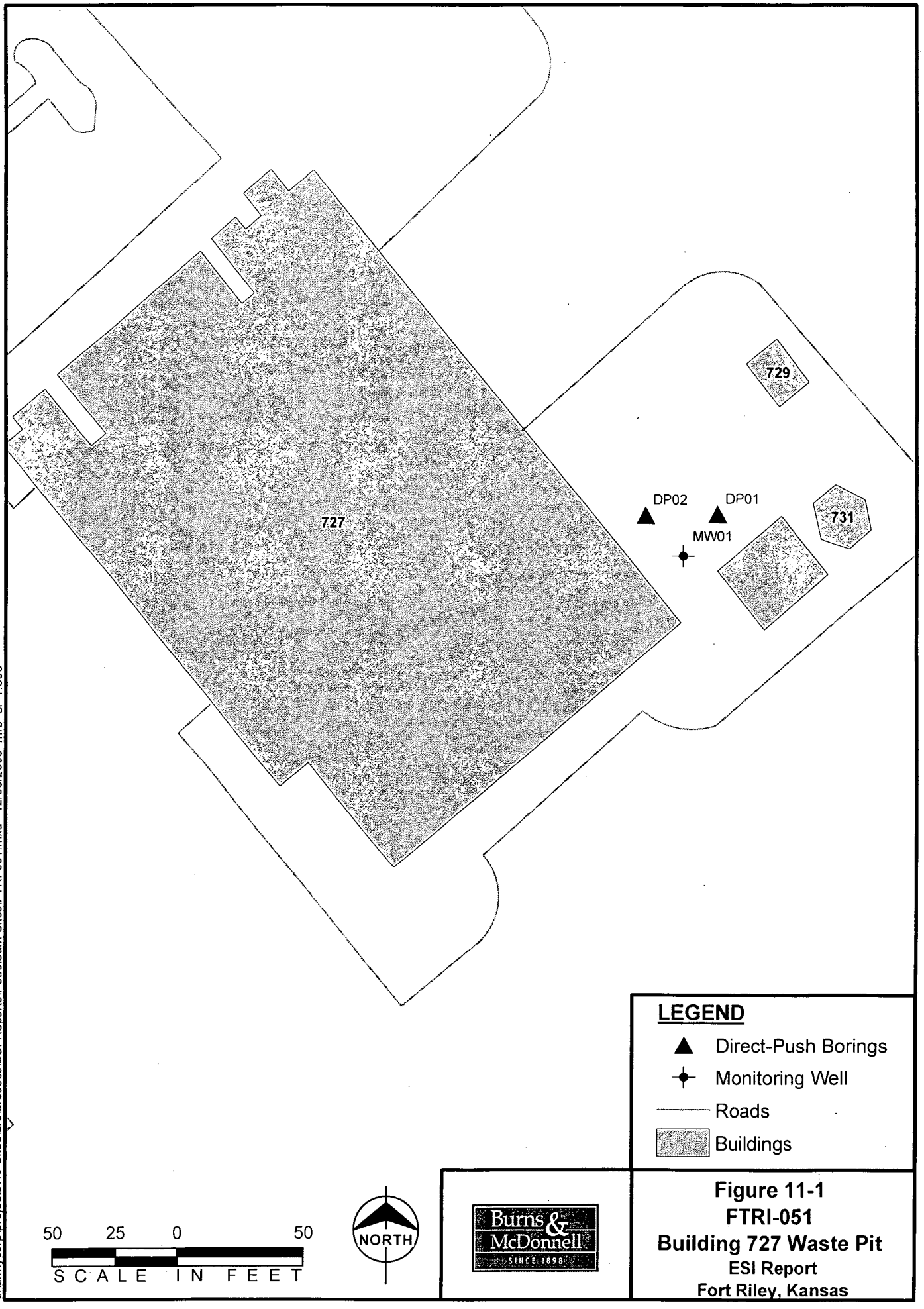

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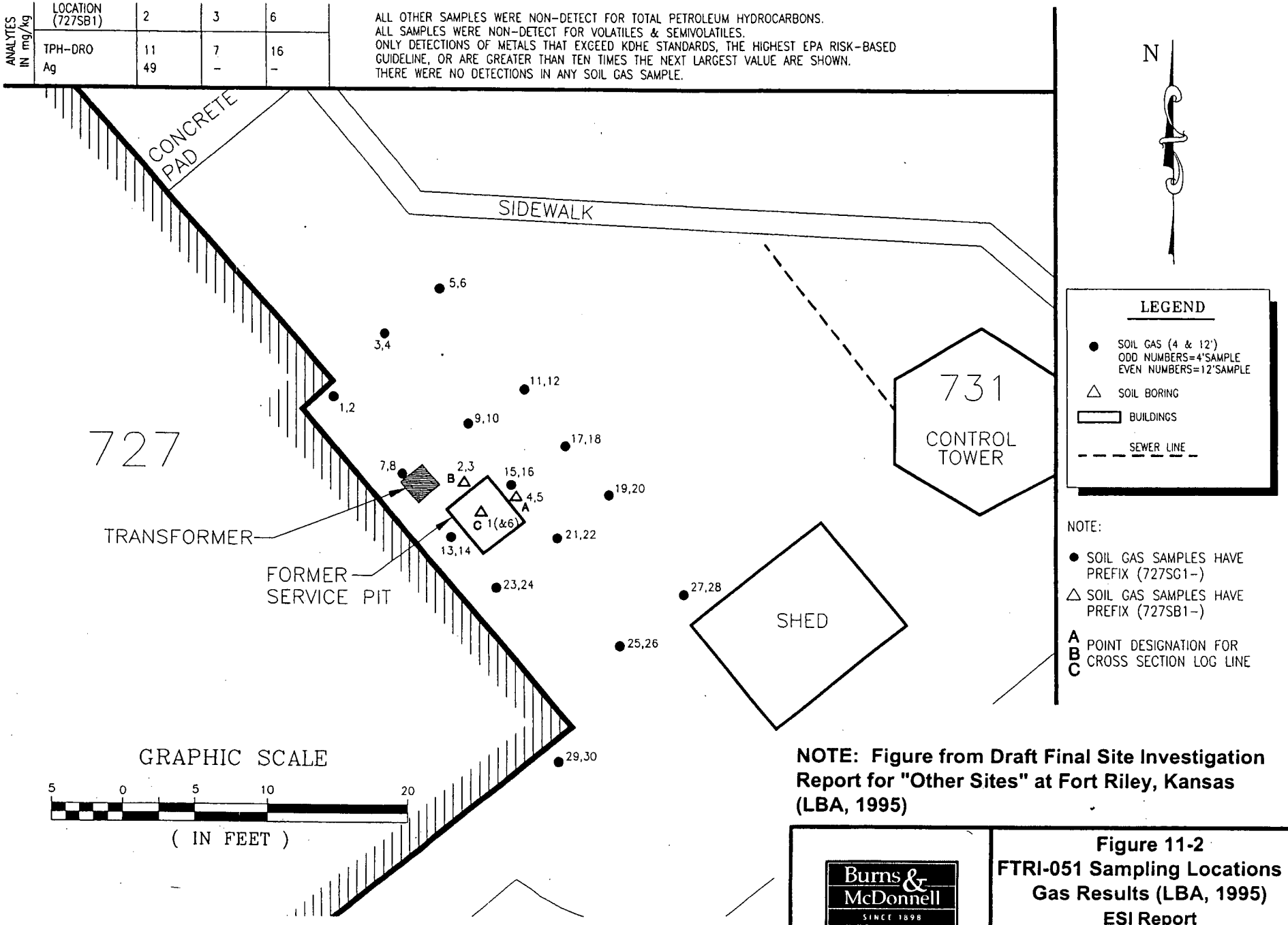
ANALYTES IN mg/kg	LOCATION (727SB1)	2	3	6
	TPH-DRO	11	7	16
	Ag	49	–	–

ALL OTHER SAMPLES WERE NON-DETECT FOR TOTAL PETROLEUM HYDROCARBONS.
ALL SAMPLES WERE NON-DETECT FOR VOLATILES & SEMIVOLATILES.
ONLY DETECTIONS OF METALS THAT EXCEED KDHE STANDARDS, THE HIGHEST EPA RISK-BASED GUIDELINE, OR ARE GREATER THAN TEN TIMES THE NEXT LARGEST VALUE ARE SHOWN.
THERE WERE NO DETECTIONS IN ANY SOIL GAS SAMPLE.



NOTE: Figure from Draft Final Site Investigation Report for "Other Sites" at Fort Riley, Kansas (LBA, 1995)

Burns & McDonnell SINCE 1898

Figure 11-2
FTRI-051 Sampling Locations & Gas Results (LBA, 1995)
ESI Report
Fort Riley, Kansas

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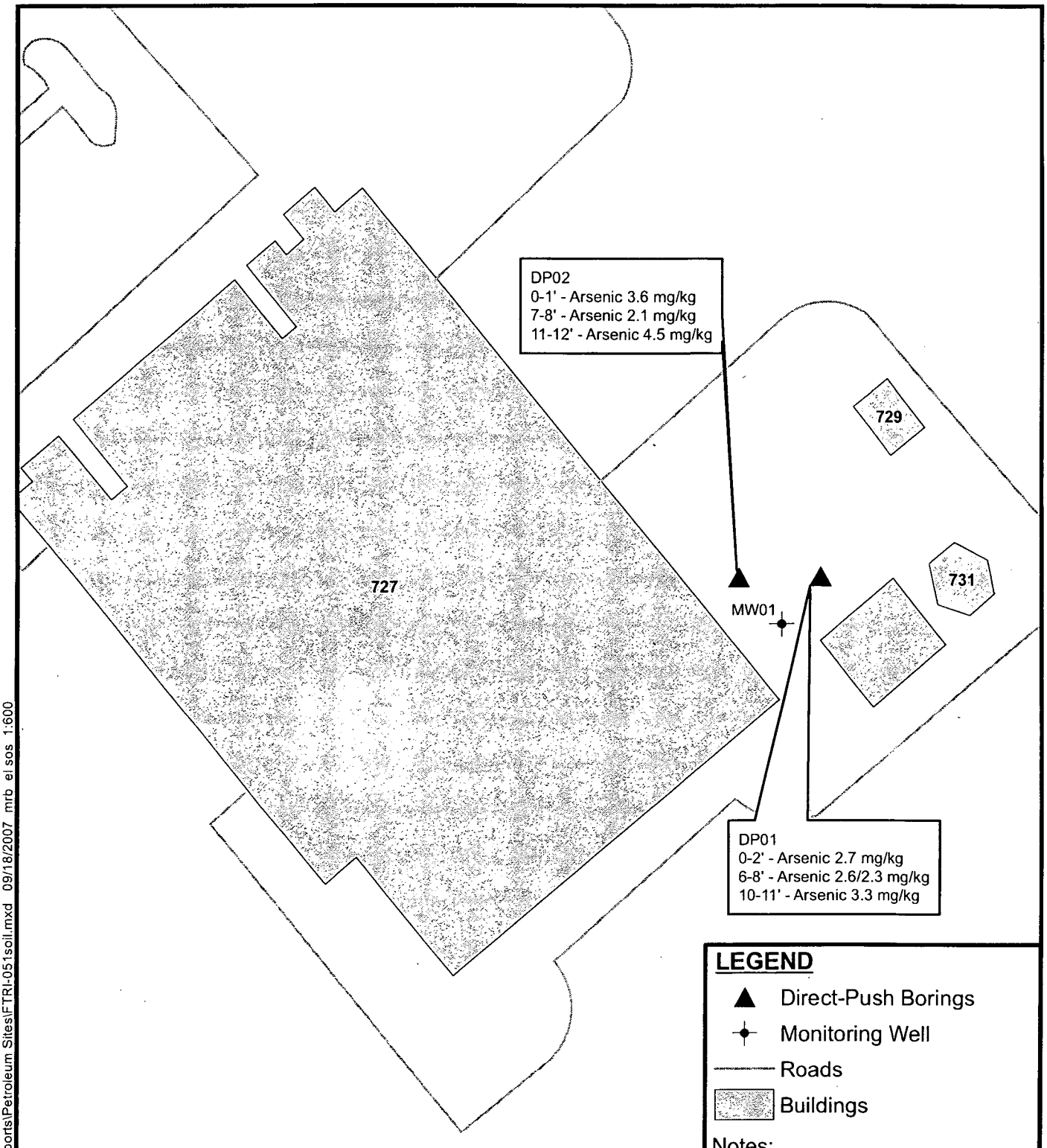

LEGEND

- Direct-Push Borings
- Monitoring Well
- Roads
- Buildings

Notes:
Only those soil detections which exceeded USEPA Region 9 PRGs (industrial) are shown.

mg/kg - Milligram per Kilogram
5.3/5.8 - Original/Duplicate Result

50 25 0 50
SCALE IN FEET

NORTH

Burns & McDonnell
SINCE 1898

Figure 11-3
FTRI-051
ESI Soil Detections
ESI Report
Fort Riley, Kansas

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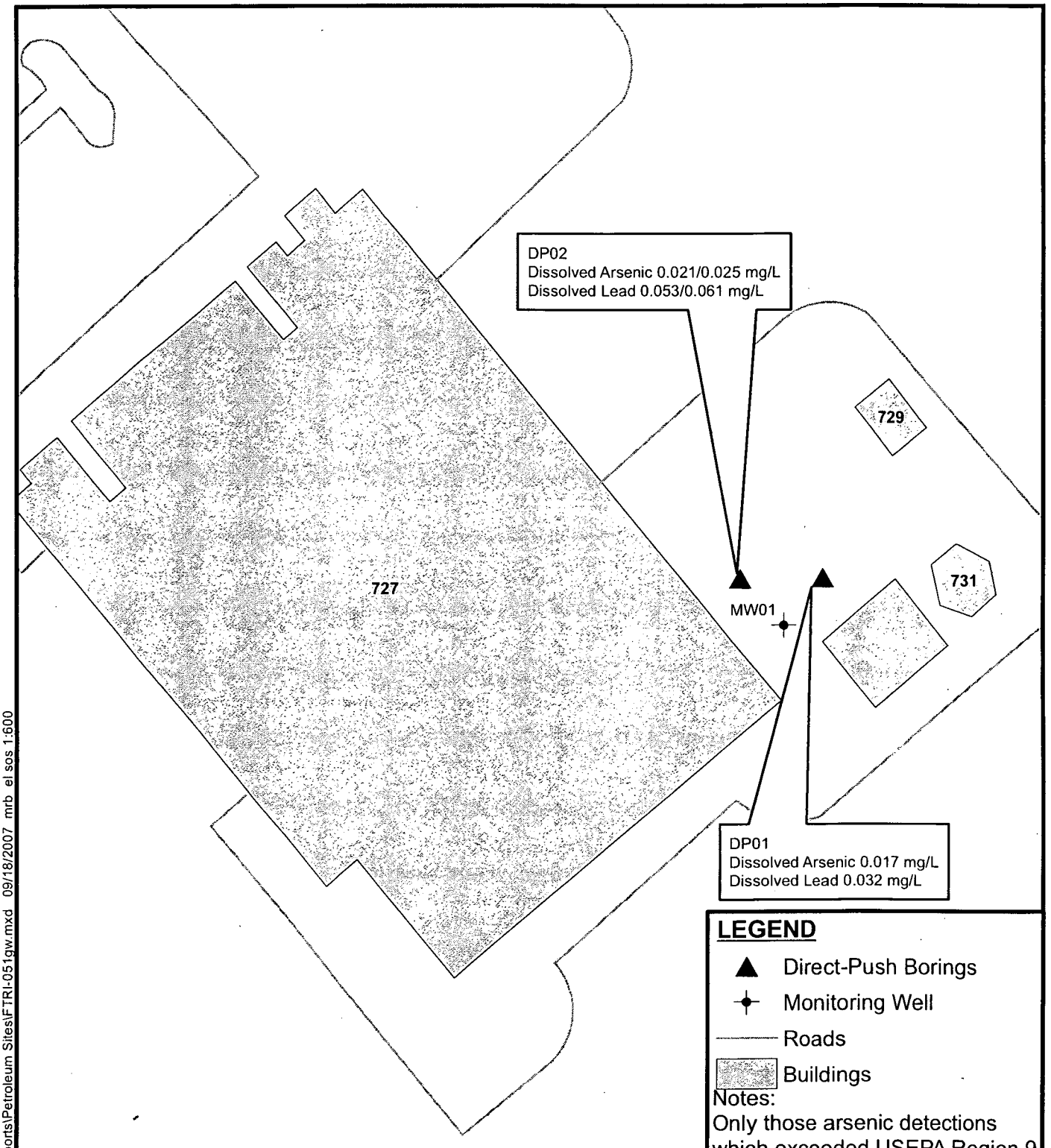

LEGEND

- Direct-Push Borings
- Monitoring Well
- Roads
- Buildings

Notes:
Only those arsenic detections which exceeded USEPA Region 9 PRGs (tap water) and lead detections which exceeded USEPA action limits are shown.

mg/L - Milligram per Liter
5.3/5.8 - Original/Duplicate Result

50 25 0 50
SCALE IN FEET

NORTH

Burns & McDonnell SINCE 1898

Figure 11-4
FTRI-051
ESI Groundwater Detections
ESI Report
Fort Riley, Kansas

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Appendix A
Survey Data

Appendix A
Survey Data

2319 N. Jackson, PO Box 1304
Junction City, Kansas 66441
www.kveng.com

Tel: 785-762-5040
Fax: 785-762-7744
E-mail: JC@kveng.com

KAW VALLEY ENGINEERING, INC.

FT. RILEY BORING LOCATIONS
DATUM = UTM Zone 14, NAD83 US SURVEY FEET
NAVD88 US SURVEY FEET

FTRI #	DP/SS #	NORTHING	EASTING	ELEVATION
6	DP01	14208376.505	2287408.367	1048.756
6	DP02	14208381.456	2287504.721	1047.943
6	DP03	14208431.877	2287593.007	1047.543
6	DP04	14207730.390	2287660.026	1048.259
6	S01	14207686.994	2287565.951	1049.288
6	S02	14207599.816	2287596.384	1045.594
6	S03	14207505.263	2287614.691	1044.987
6	S04	14207418.418	2287653.955	1044.954
6	S05	14207365.259	2287690.683	1044.762
8	S01	14193629.305	2272150.873	1080.205
10	DP01	14206804.229	2281176.617	1066.719
15	DP01	14205319.511	2287608.715	1047.200
15	DP02	14205364.243	2287700.360	1047.236
15	DP03	14205558.968	2287634.359	1047.847
47	DP01	14193817.289	2272262.635	1067.713
47	DP02	14193868.099	2272281.361	1069.249
47	DP03	14193871.592	2272338.808	1077.090
47	DP04	14193797.142	2272320.512	1072.063
47	DP05	14193766.053	2272363.992	1074.293
47	S01	14193843.424	2272331.183	1077.672
47	S02	14193819.956	2272350.436	1076.708
47	S03	14193817.656	2272372.372	1076.971
47	S04	14193790.460	2272373.007	1077.930
48	DP01	14207157.512	2262364.171	1333.163
48	DP02	14205816.147	2263972.003	1326.366
48	DP03	14201262.083	2273586.383	1121.195

FT. RILEY BORING LOCATIONS
DATUM = UTM Zone 14, NAD83 US SURVEY FEET
NAVD88 US SURVEY FEET

FTRI #	DP/SS #	NORTHING	EASTING	ELEVATION
50	S01	14194972.082	2256880.541	1070.159
50	S02	14194972.194	2256894.831	1070.426
50	S03	14194909.461	2256887.285	1069.471
50	S04	14194845.744	2256876.687	1071.476
50	S05	14194845.058	2256889.514	1071.411
50	S06	14195884.658	2258697.805	1080.352
50	S07	14195899.161	2258754.334	1079.695
50	S08	14195858.878	2258743.954	1080.669
50	S09	14195845.745	2258707.515	1080.657
50	S10	14195859.104	2258762.227	1080.302
50	S11	14193016.267	2267148.094	1087.008
50	S12	14192990.158	2267155.300	1086.062
50	S13	14193011.334	2267170.828	1086.555
50	S14	14193031.671	2267194.800	1087.602
50	S15	14193012.606	2267199.358	1086.575
50	S16	14199319.381	2273499.470	1100.237
50	S17	14199263.933	2273456.322	1100.560
50	S18	14199273.482	2273500.342	1099.653
50	S19	14199284.574	2273547.441	1099.082
50	S20	14199226.725	2273503.483	1099.098
50	S21	14207488.067	2280715.017	1071.344
50	S22	14207480.783	2280736.466	1071.466
50	S23	14207460.263	2280721.092	1070.942
50	S24	14207448.579	2280703.024	1070.683
50	S25	14207437.541	2280733.590	1070.171
20	DP01	14214435.121	2259673.953	1289.758
20	DP02	14214899.952	2259897.904	1295.065
20	DP03	14215453.812	2260175.200	1286.147
20	DP04	14215864.913	2260406.977	1272.983
20	DP05	14216206.838	2260726.902	1264.191
20	DP06	14216576.333	2260933.624	1256.688
20	DP07	14216480.082	2261304.192	1255.386
20	DP08	14216209.447	2261549.040	1255.435
20	DP09	14215776.275	2261262.854	1272.968
20	DP10	14215432.162	2261043.910	1275.827
20	DP11	14215106.193	2260841.222	1279.396
20	DP12	14214803.951	2260494.335	1279.345
20	DP13	14209618.231	2257473.237	1290.823
20	DP14	14209578.681	2257572.693	1291.510
20	DP15	14209531.301	2257473.316	1300.655
20	DP16	14209520.260	2257529.561	1289.617
20	DP17	14213651.062	2264920.772	1273.824
20	DP18	14213461.114	2265021.220	1273.685
20	DP19	14213680.216	2264993.297	1274.487
20	DP20	14213499.353	2265107.146	1277.704

FT. RILEY BORING LOCATIONS
DATUM = UTM Zone 14, NAD83 US SURVEY FEET
NAVD88 US SURVEY FEET

FTRI #	DP/SS #	NORTHING	EASTING	ELEVATION
22	DP01	14205206.575	2288136.306	1047.985
22	DP02	14204940.978	2288125.389	1048.827
22	DP03	14204832.227	2288405.146	1050.720
22	DP04	14204797.820	2288635.093	1046.938
22	DP05	14204986.546	2288823.601	1047.631
23	DP01	14208798.885	2266065.662	1275.268
23	DP02	14208764.370	2266162.061	1256.806
23	DP03	14208634.392	2266238.525	1259.403
23	DP04	14208560.847	2266138.269	1260.795
24	DP01	14193208.646	2258653.500	1072.482
24	DP02	14193358.947	2258825.277	1065.425
24	DP03	14193168.978	2258748.216	1064.545
24	DP04	14193252.025	2258841.294	1065.308
25	DP01	14194833.090	2273889.635	1058.048
25	DP02	14194915.370	2274079.787	1057.389
25	DP03	14194802.933	2274026.533	1057.754
25	DP04	14194665.039	2274017.322	1058.282
25	DP05	14194666.723	2273892.057	1058.286
26	DP01	14276373.567	2226137.084	1280.764
26	DP02	14275965.236	2226137.645	1285.592
26	DP03	14276482.952	2226546.154	1301.016
26	DP04	14275913.896	2226527.359	1303.105
13	DP01	14200416.246	2271150.251	1254.247
13	DP02	14200391.107	2271206.536	1255.964
13	DP03	14200364.935	2271111.676	1256.444
13	DP04	14200333.216	2271187.297	1256.555
39	DP01	14210872.411	2265406.896	1288.890
39	DP02	14211235.762	2265529.682	1281.037
39	DP03	14211344.589	2265857.569	1278.483
39	DP04	14210964.763	2265997.712	1288.688
39	DP05	14210553.565	2266058.667	1292.252
39	DP06	14210076.879	2266251.831	1290.152
39	DP07	14209911.317	2266018.310	1289.237
39	DP08	14209792.091	2265653.887	1288.902
40	DP01	14207103.516	2280239.619	1067.882
40	DP02	14207039.677	2280253.396	1068.880
40	DP03	14206998.143	2280224.720	1068.496
40	DP04	14207037.717	2280187.602	1067.570

FT. RILEY BORING LOCATIONS
DATUM = UTM Zone 14, NAD83 US SURVEY FEET
NAVD88 US SURVEY FEET

FTRI #	DP/SS #	NORTHING	EASTING	ELEVATION
41	DP01	14193241.008	2272346.837	1061.614
41	DP02	14193171.830	2272374.887	1060.710
41	DP03	14193080.468	2272250.149	1060.735
41	DP04	14206674.963	2285007.242	1052.031
41	DP05	14206616.269	2284955.970	1052.388
41	DP06	14206539.675	2284986.653	1052.609
41	DP07	14206310.229	2285089.663	1051.466
41	DP08	14206225.251	2285167.864	1050.837
41	DP09	14206349.896	2285201.869	1051.959
45	DP01	14192378.953	2269278.723	1125.500
45	DP02	14192359.330	2269370.160	1126.962
45	DP03	14192218.839	2269250.236	1123.491
45	DP04	14192208.121	2269346.907	1125.319
51	DP01	14190188.194	2274396.879	1061.150
51	DP02	14190191.496	2274360.534	1061.375
52	DP01	14201651.123	2273085.716	1181.923
52	DP02	14201891.640	2272215.134	1184.110
52	DP03	14201566.984	2272327.857	1171.548
52	S01	14201818.662	2273439.937	1142.787
52	S02	14201624.341	2273426.000	1139.820
52	S03	14201549.059	2273480.738	1130.635
5	S01	14206305.913	2257792.766	1293.040
14	S01	14199239.550	2272787.321	1123.614
14	S02	14199238.430	2272772.051	1124.821
14	S03	14199250.928	2272772.521	1124.826
36	DP01	14204558.334	2288817.482	1050.761
36	DP02	14204350.562	2289382.088	1047.908
36	DP03	14204728.536	2289638.780	1046.514
37	SB01	14200373.276	2274885.084	1075.807
37	SB02	14200336.726	2274952.453	1075.382

FT. RILEY BORING LOCATIONS
DATUM = UTM Zone 14, NAD83 US SURVEY FEET
NAVD88 US SURVEY FEET

FTRI #	DP/SS #	NORTHING	EASTING	ELEVATION
43	DP01	14192927.314	2257709.516	1068.491
43	DP02	14192921.518	2257792.787	1067.624
43	DP03	14192840.041	2257702.623	1069.184
43	DP04	14192822.943	2257784.472	1068.806
43	DP05	14192266.464	2258201.278	1067.532
43	DP06	14192263.336	2258269.872	1067.819
43	DP07	14192171.355	2258192.295	1067.471
43	DP08	14192158.279	2258265.081	1067.651
43	DP09	14199314.126	2273505.435	1099.991
43	DP10	14199284.241	2273543.303	1099.155
43	DP11	14199266.910	2273467.907	1100.294
43	DP12	14199235.324	2273504.847	1099.038
43	DP13	14202641.783	2276307.306	1069.826
43	DP14	14202713.995	2276405.927	1068.879
43	DP15	14202555.759	2276354.527	1067.861
43	DP16	14202626.759	2276468.487	1066.940
57	DP01	14202940.341	2261091.911	1265.152
57	DP02	14202922.358	2261021.712	1262.338

Appendix B
Boring Logs

Boring Logs
Consolidated Maintenance Facility 8100 (FTRI-039)

HTW DRILLING LOG

HOLE NO. FTRI-039 DP01

1. COMPANY NAME: Burns & McDonnell	2. DRILLING SUBCONTRACTOR: EPS	SHEET 1 OF 2 SHEETS
3. PROJECT: 40747 ESI 49 sites	4. LOCATION: Fort Riley	
5. NAME OF DRILLER: Dennis Elker / Paul Vogelsberg	6. MANUFACTURER'S DESIGNATION OF DRILL: Geoprobe / Direct Push	
7. SIZES AND TYPES OF DRILLING AND SAMPLING EQUIPMENT: Geoprobe 4200; 4' macrocore	8. HOLE LOCATION: NA	
	9. SURFACE ELEVATION: NA	
	10. DATE STARTED: 7/27/06	11. DATE COMPLETED: 7/27/06
12. OVERBURDEN THICKNESS: NA	15. DEPTH GROUNDWATER ENCOUNTERED: NA	
13. DEPTH DRILLED INTO ROCK: ~~12~~	16. DEPTH TO WATER AND ELAPSED TIME AFTER DRILLING COMPLETED: NA	
14. TOTAL DEPTH OF HOLE: 12	17. OTHER WATER LEVEL MEASUREMENTS (SPECIFY): NA	

18. GEOTECHNICAL SAMPLES	DISTURBED	UNDISTURBED	19. TOTAL NUMBER OF CORE BOXES
0	0	0	0

20. SAMPLES FOR CHEMICAL ANALYSIS	VOC	METALS	OTHER (SPECIFY)	OTHER (SPECIFY)	OTHER (SPECIFY)	21. TOTAL CORE RECOVERY %
6	3	3	TPH-DRO 3	—	—	

22. DISPOSITION OF HOLE	BACKFILLED	MONITORING WELL	OTHER (SPECIFY)	23. SIGNATURE OF INSPECTOR
NA	Bentonite	NA	NA	

ELEV. a	DEPTH b	DESCRIPTION OF MATERIALS c	FIELD SCREENING RESULTS d	GEOTECH SAMPLE OR CORE BOX NO. e	ANALYTICAL SAMPLE NO. f	BLOW COUNTS g	REMARKS h
		Top soil + gravel	0				
	1	CLAY, dark yellowish brown 4/4 10YR, stiff damp, trace plastic	0	3.9 / 4	SB01 0.5-1.5		
	2		0				
	3		0				
		CLAY very dark grayish brown (3/2 10YR) soft, damp highly plastic	0				1235
	4						
	5						

HTW DRILLING LOG

HOLE NO. FIRI-039 DP01

PROJECT 40747 ESI 49 sites

INSPECTOR

SHEET 2 OF 2 SHEETS

ELEV. a	DEPTH b	DESCRIPTION OF MATERIALS c	FIELD SCREENING RESULTS d	GEOTECH SAMPLE OR CORE BOX NO e	ANALYTICAL SAMPLE NO. f	BLOW COUNTS g	REMARKS h
		SAME AS Above					
		CLAY, dark yellowish brown (3/6 10YR) soft, damp,	0				
	6	highly plastic		3.8			
			0	1/4			
	7	limestone cobble	0		SB02		
					7-8		
			0				
	8	CLAY, dark grayish brown (4/2 10YR) soft, damp, highly plastic					1240
			0	3/3			
	9						
CLAY		very dark brown (2/2 10YR) soft damp; trace plasticity	0		SB03		
					9-11		
	10		0				
			0				
		CLAY, brown (4/3 10YR) medium					
	11	damp, non plastic					1245
				0.9			
			0	1/1			
	12	limestone					1250
		Refusal					

HTW DRILLING LOG

HOLE NO. FTRI-039 DP02

1. COMPANY NAME: Burns & McDonnell	2. DRILLING SUBCONTRACTOR: EPS	SHEET 1 OF 3 SHEETS
3. PROJECT: 40747 ESI 49 sites	4. LOCATION: Fort Riley	
5. NAME OF DRILLER: Dennis Eller / Paul Vogelsberg	6. MANUFACTURER'S DESIGNATION OF DRILL: Geoprobe / Direct Push	
7. SIZES AND TYPES OF DRILLING AND SAMPLING EQUIPMENT: Geoprobe 5400; 4' macrocore	8. HOLE LOCATION: NA	
	9. SURFACE ELEVATION: NA	
	10. DATE STARTED: 7/27/06	11. DATE COMPLETED: 7/27/06
12. OVERBURDEN THICKNESS: NA	15. DEPTH GROUNDWATER ENCOUNTERED: NA	
13. DEPTH DRILLED INTO ROCK: NA	16. DEPTH TO WATER AND ELAPSED TIME AFTER DRILLING COMPLETED: NA	
14. TOTAL DEPTH OF HOLE: 16.8	17. OTHER WATER LEVEL MEASUREMENTS (SPECIFY): NA	

18. GEOTECHNICAL SAMPLES	DISTURBED	UNDISTURBED	19. TOTAL NUMBER OF CORE BOXES
0	0	0	0

20. SAMPLES FOR CHEMICAL ANALYSIS	VOC	METALS	OTHER (SPECIFY)	OTHER (SPECIFY)	OTHER (SPECIFY)	21. TOTAL CORE RECOVERY %
6	3	3	TPH-DAZ 3	—	—	

22. DISPOSITION OF HOLE	BACKFILLED	MONITORING WELL	OTHER (SPECIFY)	23. SIGNATURE OF INSPECTOR
NA	Bentonite	NA	NA	

ELEV. a	DEPTH b	DESCRIPTION OF MATERIALS c	FIELD SCREENING RESULTS d	GEOTECH SAMPLE OR CORE BOX NO. e	ANALYTICAL SAMPLE NO. f	BLOW COUNTS g	REMARKS h
	0	CLAY, brown (4/3 10YR) dry, soft non plastic	0		SB01 0-2		
	1	CLAY, pale brown (6/3 10YR) soft, damp, non plastic w/silt	0	2.8/4			
	2		0				
	3		0				
	4		0				1320
	5		0				

HTW DRILLING LOG

HOLE NO: FTRI-039 DP02

PROJECT: 40747 ESI 49 sites

INSPECTOR: [illegible]

SHEET 2 OF 3 SHEETS

ELEV a	DEPTH b	DESCRIPTION OF MATERIALS c	FIELD SCREENING RESULTS d	GEOTECH SAMPLE OR CORE BOX NO e	ANALYTICAL SAMPLE NO. f	BLOW COUNTS g	REMARKS h
		SAME As Above					
			0				
	6			3.6/4			
			0				
					SB07		
	7	~~Clay~~ CLAY, very dark brown (7/2 10YR) soft, damp, non plastic	0		7-8		
	8		0				1325
			0				
	9	SILT, gray (5/1 10YR) soft, damp, non plastic		3.7/5			
			0				
	10	SILT, light olive gray (6/2 5Y) damp, soft, non plastic	0				
			0				
	11				SB03		
			0		11-12		
	12						1330
			0	3/4			
	13		0				
		SILT, light olive gray (6/2 5Y) damp, medium, non plastic					
	14		0				

Burns & McDonnell SINCE 1898

051601
Form MRK-55-2

PROJECT: 40747

HOLE NO: FTRI-039 DP02

HTW DRILLING LOG

HOLE NO: FTRI-039 DP02

PROJECT: 40747 ESI 49 sites

INSPECTOR:

SHEET 3 OF 3 SHEETS

ELEV. a	DEPTH b	DESCRIPTION OF MATERIALS c	FIELD SCREENING RESULTS d	GEOTECH SAMPLE OR CORE BOX NO. e	ANALYTICAL SAMPLE NO. f	BLOW COUNTS g	REMARKS h
		SAME AS Above	0				
	15		0				
	16		0				1335
			0	0.3 / 0.8			
	17	Refusal Bottom of hole					

HTW DRILLING LOG

HOLE NO. FTRI-039 DP03

1. COMPANY NAME: Burns & McDonnell	2. DRILLING SUBCONTRACTOR: EPS	SHEET 1 OF 2 SHEETS
3. PROJECT: 40747 ESI 49 Sites	4. LOCATION: Fort Riley	
5. NAME OF DRILLER: Dennis Eller / Paul Vogesberg	6. MANUFACTURER'S DESIGNATION OF DRILL: Geoprobe / Direct Push	
7. SIZES AND TYPES OF DRILLING AND SAMPLING EQUIPMENT: Geoprobe 4200; 4' macro core	8. HOLE LOCATION: NA	
	9. SURFACE ELEVATION: NA	
	10. DATE STARTED: 7/27/06	11. DATE COMPLETED: 7/27/06
12. OVERBURDEN THICKNESS: NA	15. DEPTH GROUNDWATER ENCOUNTERED: NA	
13. DEPTH DRILLED INTO ROCK: NA	16. DEPTH TO WATER AND ELAPSED TIME AFTER DRILLING COMPLETED: NA	
14. TOTAL DEPTH OF HOLE: 9.2	17. OTHER WATER LEVEL MEASUREMENTS (SPECIFY): NA	

18. GEOTECHNICAL SAMPLES	DISTURBED	UNDISTURBED	19. TOTAL NUMBER OF CORE BOXES
0	0	0	0

20. SAMPLES FOR CHEMICAL ANALYSIS	VOC	METALS	OTHER (SPECIFY)	OTHER (SPECIFY)	OTHER (SPECIFY)	21. TOTAL CORE RECOVERY %
6	3	3	TPH-DRO-3	—	—	

22. DISPOSITION OF HOLE	BACKFILLED	MONITORING WELL	OTHER (SPECIFY)	23. SIGNATURE OF INSPECTOR
NA	Bentonite	NA	NA	

ELEV a	DEPTH b	DESCRIPTION OF MATERIALS c	FIELD SCREENING RESULTS d	GEOTECH SAMPLE OR CORE BOX NO e	ANALYTICAL SAMPLE NO. f	BLOW COUNTS g	REMARKS h
	0	CLAY, pale brown (6/3 10YR) dry, non plastic, soft	0	3.2/4	SB01 0-1		
	1	CLAY, dark yellowish brown (3/6 10YR) damp, medium, trace plasticity	0				
	2		0				
	3	SILT, light yellowish brown (6/4 2.5Y) damp, soft, non plastic	0				
	4						1400
	5		0				

HTW DRILLING LOG

HOLE NO: FTRI-039 DP03

PROJECT: 40747 ESI 49 sites

INSPECTOR: [signature]

SHEET 2 OF 2 SHEETS

ELEV. a	DEPTH b	DESCRIPTION OF MATERIALS c	FIELD SCREENING RESULTS d	GEOTECH SAMPLE OR CORE BOX NO e	ANALYTICAL SAMPLE NO f	BLOW COUNTS g	REMARKS h
		SAME As Above	0				
	6		0	4/4			
	7		0		SB02 7-8		
			0				
	8						1405
			0	1.2/1.2	SB03 8-9		
	9						1410
		Refusal Bottom of hole					

Burns & McDonnell SINCE 1898

051601
Form MRK-55-2

PROJECT: 40747

HOLE NO.: FTRI-039 DP03

HTW DRILLING LOG

HOLE NO: FTRL-039 0P04

1. COMPANY NAME: Burns & McDonnell	2 DRILLING SUBCONTRACTOR: EPS	SHEET 1 OF 2 SHEETS
3. PROJECT: 40747 ESI 49 sites	4. LOCATION: Fort Riley	
5. NAME OF DRILLER: Dennis Eller / Paul Vogelsberg	6. MANUFACTURER'S DESIGNATION OF DRILL: Geoprobe / Direct Push	
7. SIZES AND TYPES OF DRILLING AND SAMPLING EQUIPMENT: Geoprobe 4200 / 4' macrocore	8. HOLE LOCATION: NA	
	9. SURFACE ELEVATION: NA	
	10. DATE STARTED: 7/27/06	11. DATE COMPLETED: 7/27/06
12. OVERBURDEN THICKNESS: NA	15. DEPTH GROUNDWATER ENCOUNTERED: NA	
13. DEPTH DRILLED INTO ROCK: NA	16. DEPTH TO WATER AND ELAPSED TIME AFTER DRILLING COMPLETED: NA	
14. TOTAL DEPTH OF HOLE: 8	17. OTHER WATER LEVEL MEASUREMENTS (SPECIFY): NA	

18. GEOTECHNICAL SAMPLES	DISTURBED	UNDISTURBED	19. TOTAL NUMBER OF CORE BOXES
0	0	0	0

20. SAMPLES FOR CHEMICAL ANALYSIS	VOC	METALS	OTHER (SPECIFY)	OTHER (SPECIFY)	OTHER (SPECIFY)	21 TOTAL CORE RECOVERY %
2	2	2	TPH-DRO 2	—	—	

22 DISPOSITION OF HOLE	BACKFILLED	MONITORING WELL	OTHER (SPECIFY)	23. SIGNATURE OF INSPECTOR
NA	Bentonite	NA	NA	

ELEV. a	DEPTH b	DESCRIPTION OF MATERIALS c	FIELD SCREENING RESULTS d	GEOTECH SAMPLE OR CORE BOX NO. e	ANALYTICAL SAMPLE NO. f	BLOW COUNTS g	REMARKS h
		CLAY, dark brown 3/3 10YR dry, soft, non plastic	0				
		Gravel					
	1		0		SB01 1-2		
		CLAY, dark yellowish brown (3/6 10YR) medium, damp medium plasticity		35/4			
	2		0				
	3		0				
	4						1500
			0				
	5						

HTW DRILLING LOG

HOLE NO: FTRI-039 DP04

PROJECT: 40747

INSPECTOR:

SHEET 2 OF 2 SHEETS

ELEV. a	DEPTH b	DESCRIPTION OF MATERIALS c	FIELD SCREENING RESULTS d	GEOTECH SAMPLE OR CORE BOX NO e	ANALYTICAL SAMPLE NO. f	BLOW COUNTS g	REMARKS h
		Same As Above			SB02 4-7		
		Gravel w/ silt	0	2:4 / 3			
	6	SILT, Pink (7/4 7.5YR) soft damp; trace plastic	0				
		SILT, light yellowish brown (6/4 10YR) soft, damp, trace plastic	0				1505
	7		0	0.6 / 1			1510
	8	Refusal					

HTW DRILLING LOG

HOLE NO: FTRI-039 DP05

1 COMPANY NAME: Burns & McDonnell	2 DRILLING SUBCONTRACTOR: EPS
SHEET 1 OF 2 SHEETS	
3 PROJECT: 40747 ESI 49 sites	4 LOCATION: Fort Riley
5 NAME OF DRILLER: Dennis Eller / Paul Vogelsberg	6 MANUFACTURER'S DESIGNATION OF DRILL: Geoprobe / Direct Push
7 SIZES AND TYPES OF DRILLING AND SAMPLING EQUIPMENT: Geoprobe 4200 w/ macrocore	8 HOLE LOCATION: NA
	9 SURFACE ELEVATION: NA
	10 DATE STARTED: 7/27/06 — 11 DATE COMPLETED: 7/27/06
12 OVERBURDEN THICKNESS: NA	15 DEPTH GROUNDWATER ENCOUNTERED: NA
13 DEPTH DRILLED INTO ROCK: NA	16 DEPTH TO WATER AND ELAPSED TIME AFTER DRILLING COMPLETED: NA
14 TOTAL DEPTH OF HOLE: 11	17 OTHER WATER LEVEL MEASUREMENTS (SPECIFY): NA

18 GEOTECHNICAL SAMPLES	DISTURBED	UNDISTURBED	19 TOTAL NUMBER OF CORE BOXES
0	0	0	0

20 SAMPLES FOR CHEMICAL ANALYSIS	VOC	METALS	OTHER (SPECIFY)	OTHER (SPECIFY)	OTHER (SPECIFY)	21 TOTAL CORE RECOVERY %
3	3	3	TPH-DAZ 3	—	—	

22 DISPOSITION OF HOLE	BACKFILLED	MONITORING WELL	OTHER (SPECIFY)	23 SIGNATURE OF INSPECTOR
NA	Bentonite	Piezometer ~~NA~~	NA	

ELEV. a	DEPTH b	DESCRIPTION OF MATERIALS c	FIELD SCREENING RESULTS d	GEOTECH SAMPLE OR CORE BOX NO. e	ANALYTICAL SAMPLE NO. f	BLOW COUNTS g	REMARKS h
	0	CLAY, dark brown (7.5YR) dry stiff, non plastic	0				
	1	CLAY, dark yellowish brown (7.5YR) soft, damp, highly plastic	0	3.1 / 4	SB01 1-2		
	2		0				
	3		0				
	4		0				1535
	5		0				

HTW DRILLING LOG

HOLE NO: FTRT-039 DPOS

PROJECT: 40747 ESI 49 sites

INSPECTOR: [illegible]

SHEET 1 OF 2 SHEETS

ELEV. a	DEPTH b	DESCRIPTION OF MATERIALS c	FIELD SCREENING RESULTS d	GEOTECH SAMPLE OR CORE BOX NO. e	ANALYTICAL SAMPLE NO f	BLOW COUNTS g	REMARKS h
	6	CLAY, dark brown (7/3 10YR) soft, damp, highly plastic	0	4/4			
			0		SB02 7-8		
	7		0				
			0				
	8	Gravel					1540
			0				
	9	SILT, olive gray, (5/2 5Y) damp, soft, high plasticity w/clay	0	3/3			
	10	CLAY, pale yellow (7/4 5Y) moist, soft, highly plastic w/silt	0		SB03 10-11		
			0				1545
	11	Refusal Bottom of hole set a piezometer					

Burns & McDonnell SINCE 1898

051601
Form MRK-55-2

PROJECT

HOLE NO.

HTW DRILLING LOG

HOLE NO. FTRI-039 DP06

1. COMPANY NAME: Burns & McDonnell	2. DRILLING SUBCONTRACTOR: EPS	SHEET 1 OF 1 SHEETS
3. PROJECT: 40747 ESI 49 Sites	4. LOCATION: Fort Riley	
5. NAME OF DRILLER: Dennis Eller / Paul Vogelsberg	6. MANUFACTURER'S DESIGNATION OF DRILL: Geoprobe / Direct Push	
7. SIZES AND TYPES OF DRILLING AND SAMPLING EQUIPMENT: Geoprobe 4200	8. HOLE LOCATION: NA	
	9. SURFACE ELEVATION: NA	
	10. DATE STARTED: 7/27/06	11. DATE COMPLETED: 7/27/06
12. OVERBURDEN THICKNESS: NA	15. DEPTH GROUNDWATER ENCOUNTERED: NA	
13. DEPTH DRILLED INTO ROCK: NA	16. DEPTH TO WATER AND ELAPSED TIME AFTER DRILLING COMPLETED: NA	
14. TOTAL DEPTH OF HOLE: 3.5	17. OTHER WATER LEVEL MEASUREMENTS (SPECIFY): NA	

18. GEOTECHNICAL SAMPLES	DISTURBED	UNDISTURBED	19. TOTAL NUMBER OF CORE BOXES
0	0	0	0

20. SAMPLES FOR CHEMICAL ANALYSIS	VOC	METALS	OTHER (SPECIFY)	OTHER (SPECIFY)	OTHER (SPECIFY)	21. TOTAL CORE RECOVERY %
1	1	1	TPH-DA2 1	—	—	

22. DISPOSITION OF HOLE	BACKFILLED	MONITORING WELL	OTHER (SPECIFY)	23. SIGNATURE OF INSPECTOR
NA	Bentonite	NA	NA	

ELEV a	DEPTH b	DESCRIPTION OF MATERIALS c	FIELD SCREENING RESULTS d	GEOTECH SAMPLE OR CORE BOX NO. e	ANALYTICAL SAMPLE NO. f	BLOW COUNTS g	REMARKS h
	0	CLAY, dark yellowish brown 3/6 10YR, damp, very stiff medium plasticity	0		SB01 1-2		Offset boring 2 previous times. Both attempts hit refusal at ~3'
	1		0	2.7 / 3.5			
			0				
	2		0				
	3	CLAY, light olive gray (3/2 5Y) damp, soft highly plastic w/silt & gravel	0				1635
		Bottom of hole Refusal					

PROJECT | HOLE NO

MRK FORM JUN 89 55

HTW DRILLING LOG

HOLE NO: FTRI-039 DP07

1 COMPANY NAME: Burns & McDonnell	2 DRILLING SUBCONTRACTOR: EPS	SHEET 1 OF 2 SHEETS
3 PROJECT: 40747 ESI 49 sites	4 LOCATION: Fort Riley	
5 NAME OF DRILLER: Dennis Eller / Paul Vogelsberg	6 MANUFACTURER'S DESIGNATION OF DRILL: Geoprobe / Direct Push	
7 SIZES AND TYPES OF DRILLING AND SAMPLING EQUIPMENT	8 HOLE LOCATION: NA	
	9 SURFACE ELEVATION: NA	
	10 DATE STARTED: 7/28/06	11 DATE COMPLETED: 7/28/06
12 OVERBURDEN THICKNESS: NA	15 DEPTH GROUNDWATER ENCOUNTERED: NA	
13 DEPTH DRILLED INTO ROCK: NA	16 DEPTH TO WATER AND ELAPSED TIME AFTER DRILLING COMPLETED: NA	
14 TOTAL DEPTH OF HOLE: 10	17 OTHER WATER LEVEL MEASUREMENTS (SPECIFY): NA	

18 GEOTECHNICAL SAMPLES	DISTURBED	UNDISTURBED	19 TOTAL NUMBER OF CORE BOXES
0	0	0	0

20 SAMPLES FOR CHEMICAL ANALYSIS	VOC	METALS	OTHER (SPECIFY)	OTHER (SPECIFY)	OTHER (SPECIFY)	21 TOTAL CORE RECOVERY %
6	3	3	TPH-DRO 3	—	—	

22 DISPOSITION OF HOLE	BACKFILLED	MONITORING WELL	OTHER (SPECIFY)	23 SIGNATURE OF INSPECTOR
NA	Bentonite	NA	NA	

ELEV. a	DEPTH b	DESCRIPTION OF MATERIALS c	FIELD SCREENING RESULTS d	GEOTECH SAMPLE OR CORE BOX NO e	ANALYTICAL SAMPLE NO f	BLOW COUNTS g	REMARKS h
	0	CLAY, dark yellowish brown (3/4 10YR) very stiff, damp, medium plasticity	0				
	1		0	3.2/4	5001 0-1		
	2		0				
	3		0				
	4		0				0815
	5		0				

HTW DRILLING LOG

HOLE NO. FTRI-039 DP07

PROJECT 40747 ESI 49 sites

INSPECTOR

SHEET 02 OF 2 SHEETS

ELEV. a	DEPTH b	DESCRIPTION OF MATERIALS c	FIELD SCREENING RESULTS d	GEOTECH SAMPLE OR CORE BOX NO. e	ANALYTICAL SAMPLE NO f	BLOW COUNTS g	REMARKS h
		SILT, pale yellow (7/3 5Y) soft, damp, non plastic w/gravel	0				
	6	SILT, Pale olive (6/4 5Y) soft, damp, trace plastic trace gravel	0	3.5/4	SB02 6-7		
	7		0				
			0				0820
	8	SILT, brownish yellow (6/8 10YR) damp, medium non plastic w/gravel	0				
	9		0	2/2	SB03 9-10		
	10		0				0825
		Refusal Bottom of hole					

HTW DRILLING LOG

HOLE NO. FTRI-039 DP08

1. COMPANY NAME: Burns & McDonnell	2. DRILLING SUBCONTRACTOR: EPS	SHEET 1 OF 3 SHEETS
3. PROJECT: 40747 ESI 49 sites	4. LOCATION: Fort Riley	
5. NAME OF DRILLER: Dennis Elder / Paul Vogelsberg	6. MANUFACTURER'S DESIGNATION OF DRILL: Geoprobe / Direct Push	
7. SIZES AND TYPES OF DRILLING AND SAMPLING EQUIPMENT: Geoprobe 4200; 4' macrocore	8. HOLE LOCATION: NA	
	9. SURFACE ELEVATION: NA	
	10. DATE STARTED: 7/28/06	11. DATE COMPLETED: 7/28/06
12. OVERBURDEN THICKNESS: NA	15. DEPTH GROUNDWATER ENCOUNTERED: NA	
13. DEPTH DRILLED INTO ROCK: NA	16. DEPTH TO WATER AND ELAPSED TIME AFTER DRILLING COMPLETED: NA	
14. TOTAL DEPTH OF HOLE: 16	17. OTHER WATER LEVEL MEASUREMENTS (SPECIFY): NA	

18. GEOTECHNICAL SAMPLES	DISTURBED	UNDISTURBED	19. TOTAL NUMBER OF CORE BOXES
0	0	0	0

20. SAMPLES FOR CHEMICAL ANALYSIS	VOC	METALS	OTHER (SPECIFY)	OTHER (SPECIFY)	OTHER (SPECIFY)	21. TOTAL CORE RECOVERY %
6	3	3	TPH-DRO 3	—	—	

22. DISPOSITION OF HOLE	BACKFILLED	MONITORING WELL	OTHER (SPECIFY)	23. SIGNATURE OF INSPECTOR
NA	Bentonite	NA	NA	

ELEV. a	DEPTH b	DESCRIPTION OF MATERIALS c	FIELD SCREENING RESULTS d	GEOTECH SAMPLE OR CORE BOX NO e	ANALYTICAL SAMPLE NO f	BLOW COUNTS g	REMARKS h
	0	CLAY, dark grayish brown 4/2 10YR, dry, soft non plastic	0		5801 0-1		
	1		0	3.4 / 4			
		CLAY, dark yellowish brown (4/4 10YR) damp, stiff, non plastic					
	2		0				
	3		0				
			0				
	4	CLAY, brown (4/3 10YR) damp medium, trace plasticity trace gravel, some silt					0845
			0				
	5						

HTW DRILLING LOG

HOLE NO. FTRI-039 DP08

PROJECT 40747 ESI 49 sites

INSPECTOR [illegible]

SHEET 2 OF 3 SHEETS

ELEV. a	DEPTH b	DESCRIPTION OF MATERIALS c	FIELD SCREENING RESULTS d	GEOTECH SAMPLE OR CORE BOX NO. e	ANALYTICAL SAMPLE NO. f	BLOW COUNTS g	REMARKS h
		SAME As Above	0				
	6		0	3.6 / 4			
	7	CLAY, dark brown (3/3 10YR) damp, medium, medium plasticity	0		5803 7-8		
	8	CLAY, yellowish brown (5/4 10YR) soft, damp, medium plasticity w/silt	0				0900
	9		0	4/4			
	10	SILT, olive (5/2 5Y) soft damp, highly plastic trace clay	0		10.5-12		
	11		0				
	12						0905
	13		0				
	14		0				

HTW DRILLING LOG

HOLE NO: FTRI-039 DP08

PROJECT: 40747 ESI 49 sites

INSPECTOR: [illegible]

SHEET 03 OF 3 SHEETS

ELEV. a	DEPTH b	DESCRIPTION OF MATERIALS c	FIELD SCREENING RESULTS d	GEOTECH SAMPLE OR CORE BOX NO e	ANALYTICAL SAMPLE NO. f	BLOW COUNTS g	REMARKS h
		SAME As Above	0				
				2.7			
	15		0	/4			
			0				
	16						0910
		Bottom of hole Refusal					

Burns & McDonnell SINCE 1898

051601
Form MRK-55-2

PROJECT 40747

HOLE NO. FTRI-039 DP08

Boring Logs
Former Oil Testing Lab 1022 (FTRI-040)

HTW DRILLING LOG

HOLE NO. FTRI-040 DP01

1. COMPANY NAME: Burns & McDonnell	2. DRILLING SUBCONTRACTOR: EPS	SHEET 1 OF 5 SHEETS

3. PROJECT: 40747 ESI 49 sites	4. LOCATION: Fort Riley
5. NAME OF DRILLER: Dennis Eller / Paul Vogelsberg	6. MANUFACTURER'S DESIGNATION OF DRILL: Geoprobe / direct push
7. SIZES AND TYPES OF DRILLING AND SAMPLING EQUIPMENT: Geoprobe 4200 / ~~Direct~~ 4' macrocore	8. HOLE LOCATION: NA
	9. SURFACE ELEVATION: NA
	10. DATE STARTED: 7/28/06 — 11. DATE COMPLETED: 7/28/06
12. OVERBURDEN THICKNESS: NA	15. DEPTH GROUNDWATER ENCOUNTERED: 36.3
13. DEPTH DRILLED INTO ROCK: NA	16. DEPTH TO WATER AND ELAPSED TIME AFTER DRILLING COMPLETED: NA
14. TOTAL DEPTH OF HOLE: 40'	17. OTHER WATER LEVEL MEASUREMENTS (SPECIFY): NA

18. GEOTECHNICAL SAMPLES	DISTURBED	UNDISTURBED	19. TOTAL NUMBER OF CORE BOXES
0	0	0	0

20. SAMPLES FOR CHEMICAL ANALYSIS	VOC	METALS	OTHER (SPECIFY)	OTHER (SPECIFY)	OTHER (SPECIFY)	21. TOTAL CORE RECOVERY %
9	3	3	TPH-DRO 3	Pesticide 3	—	

22. DISPOSITION OF HOLE	BACKFILLED	MONITORING WELL	OTHER (SPECIFY)	23. SIGNATURE OF INSPECTOR
NA	Bentonite	Piezometer	NA	

ELEV. a	DEPTH b	DESCRIPTION OF MATERIALS c	FIELD SCREENING RESULTS d	GEOTECH SAMPLE OR CORE BOX NO. e	ANALYTICAL SAMPLE NO. f	BLOW COUNTS g	REMARKS h
	0	CLAY, brown (4/3 10YR) dry soft, non plastic	0		SB01 0-2		
	1		0	32/4			
	2		0				
		Limestone gravel					
	3	CLAY, brown (4/3 10YR) damp soft, non plastic	0				
			0				1350
	4		0				
	5						

HTW DRILLING LOG

HOLE NO. FTRI-040 DP01

PROJECT 40747 ESI 49 sites

INSPECTOR [illegible]

SHEET 2 OF 5 SHEETS

ELEV a	DEPTH b	DESCRIPTION OF MATERIALS c	FIELD SCREENING RESULTS d	GEOTECH SAMPLE OR CORE BOX NO e	ANALYTICAL SAMPLE NO. f	BLOW COUNTS g	REMARKS h
		SAME As Above	0				
	6		0	4/4	SB02 4-8		
	7		0				
			0				
	8						1355
			0				
	9			4/4			
			0				
					SB03		
	10				10-12		
			0				
	11		0				
			0				
	12						1400
			0	3.3/4			
	13		0				
			0				
	14						

HTW DRILLING LOG

HOLE NO. FTRL-040 DP01

PROJECT 40747 EST 49 sites

INSPECTOR

SHEET 3 OF 5 SHEETS

ELEV a	DEPTH b	DESCRIPTION OF MATERIALS c	FIELD SCREENING RESULTS d	GEOTECH SAMPLE OR CORE BOX NO. e	ANALYTICAL SAMPLE NO. f	BLOW COUNTS g	REMARKS h
		SAME As Above	0				
	15		0				
			0				
	16						1405
			0				
	17		0				
				3.6/4			
	18		0				
		CLAY, brown (4/3 10YR) damp medium, trace plasticity w/silt	0				
	19		0				
							1410
	20		0				
		CLAY, brown (4/3 10YR) damp soft, w/silt, non plastic		3.3/4			
	21		0				
	22		0				
	23		0				

HTW DRILLING LOG

HOLE NO. FTRI-040 DP01

PROJECT 40747 ESI 49 Sites

INSPECTOR

SHEET 4 OF 5 SHEETS

ELEV. a	DEPTH b	DESCRIPTION OF MATERIALS c	FIELD SCREENING RESULTS d	GEOTECH SAMPLE OR CORE BOX NO. e	ANALYTICAL SAMPLE NO. f	BLOW COUNTS g	REMARKS h
		SAME As Above	0				
	24						1415
		CLAY, brown (4/3 10YR) soft damp, medium plasticity trace silt.	0				
	25		0	3.7/4			
	26						
		CLAY, brown (4/3 10YR) medium damp, highly plastic	0				
	27		0				
		CLAY, brown (4/3 10YR) soft, damp, highly plastic	0				1420
	28		0				
	29			3.9/4			
			0				
	30		0				
	31		0				
	32						1425

HTW DRILLING LOG

HOLE NO: FTRI-040 DP01

PROJECT: 40747 ESI 49 sites

INSPECTOR:

SHEET 05 OF 5 SHEETS

ELEV a	DEPTH b	DESCRIPTION OF MATERIALS c	FIELD SCREENING RESULTS d	GEOTECH SAMPLE OR CORE BOX NO. e	ANALYTICAL SAMPLE NO. f	BLOW COUNTS g	REMARKS h
		SAME As Above	0				
	33			3.2/4			
			0				
	34		0				
	35		0				
			0				
	36						1435
							▼ water
		CLAY, brown (4/3 10YR) wet, ~~soft~~, highly plastic	0				
	37			3.7/4			
			0				
	38		0				
	39		0				
			0				
	40						1445
		Bottom of hole					
		Set piezometer					

HTW DRILLING LOG

HOLE NO. FTRI-040 DP02

COMPANY NAME: Burns & McDonnell	2. DRILLING SUBCONTRACTOR: EPS
	SHEET 1 OF 5 SHEETS
3. PROJECT: 40747 ESI 49 sites	4. LOCATION: Fort Riley
5. NAME OF DRILLER: Dennis Eiler / Paul Vogelsberg	6. MANUFACTURER'S DESIGNATION OF DRILL: Geoprobe / Direct Push
7. SIZES AND TYPES OF DRILLING AND SAMPLING EQUIPMENT: Geoprobe 4200; ~~Direct~~ 4 macrocore	8. HOLE LOCATION: NA
	9. SURFACE ELEVATION: NA
	10. DATE STARTED: 7/28/06 — 11. DATE COMPLETED: 7/28/06
12. OVERBURDEN THICKNESS: NA	15. DEPTH GROUNDWATER ENCOUNTERED: 37'
13. DEPTH DRILLED INTO ROCK: NA	16. DEPTH TO WATER AND ELAPSED TIME AFTER DRILLING COMPLETED: NA
14. TOTAL DEPTH OF HOLE: 40	17. OTHER WATER LEVEL MEASUREMENTS (SPECIFY): NA

18. GEOTECHNICAL SAMPLES	DISTURBED	UNDISTURBED	19. TOTAL NUMBER OF CORE BOXES
0	0	0	0

20. SAMPLES FOR CHEMICAL ANALYSIS	VOC	METALS	OTHER (SPECIFY)	OTHER (SPECIFY)	OTHER (SPECIFY)	21. TOTAL CORE RECOVERY %
9	3	3	TPH-DRO 3	Pesticides 3	—	

22. DISPOSITION OF HOLE	BACKFILLED	MONITORING WELL	OTHER (SPECIFY)	23. SIGNATURE OF INSPECTOR
NA	Bentonite	Piezometer	NA	

ELEV. a	DEPTH b	DESCRIPTION OF MATERIALS c	FIELD SCREENING RESULTS d	GEOTECH SAMPLE OR CORE BOX NO. e	ANALYTICAL SAMPLE NO f	BLOW COUNTS g	REMARKS h
	0	CLAY, dark brown (3/3 10YR) soft, damp non plastic	0				
	1		0	3.1 / 4	SB01 0-2		
	2		0				
	3		0				
	4	CLAY brown (4/3 10YR) dam soft, non plastic	0				1150
	5		0				

HTW DRILLING LOG

HOLE NO: FTRI-040 DP02

PROJECT: 40747 ESI 49 sites

INSPECTOR:

SHEET 2 OF 5 SHEETS

ELEV. a	DEPTH b	DESCRIPTION OF MATERIALS c	FIELD SCREENING RESULTS d	GEOTECH SAMPLE OR CORE BOX NO. e	ANALYTICAL SAMPLE NO. f	BLOW COUNTS g	REMARKS h
		SAME As Above					
			0				
	6			3.2/4			
			0				
					SB02 6-8		
	7		0				
			0				
	8						1155
			0				
	9			3.6/4			
			0				
	10		0				
		clay, brown (7.5YR 4/3) soft. damp; trace plastic					
					SB03 10-12		
	11		0				
			0				
	12						1200
			0				
	13			3.6/4			
			0				
	14		0				

HTW DRILLING LOG

HOLE NO: FTRI-040 DP02

PROJECT: 40747 ESI 49 sites

INSPECTOR:

SHEET 3 OF 5 SHEETS

ELEV. a	DEPTH b	DESCRIPTION OF MATERIALS c	FIELD SCREENING RESULTS d	GEOTECH SAMPLE OR CORE BOX NO e	ANALYTICAL SAMPLE NO f	BLOW COUNTS g	REMARKS h
	15	SAME As Above	0				
			0				
	16						1205
			0				
	17		0	3.8 / 4			
	18		0				
	19		0				
		CLAY, brown (7/3 10YR) damp medium, trace plastic w/ silt					
	20		0				1210
			0				
	21			3.7 / 4			
			0				
	22		0				
			0				
	23						

HTW DRILLING LOG

HOLE NO. FTRI-040 DP02

PROJECT 40747 ESI 49 sites

INSPECTOR [illegible]

SHEET # 1 OF 5 SHEETS

ELEV a	DEPTH b	DESCRIPTION OF MATERIALS c	FIELD SCREENING RESULTS d	GEOTECH SAMPLE OR CORE BOX NO e	ANALYTICAL SAMPLE NO f	BLOW COUNTS g	REMARKS h
		SAME As Above	0				
	24						1215
			0				
	25		0	3.9/4			
	26		0				
		CLAY, brown (4/3 10YR) soft damp, highly plastic	0				
	27		0				
	28						1220
			0				
	29		0	3.2/4			
	30		0				
			0				
	31		0				
	32						1225

HTW DRILLING LOG

HOLE NO: FIRT-010 DP02

PROJECT: 40747 ESI 49 sites

INSPECTOR:

SHEET 5 OF 5 SHEETS

ELEV. a	DEPTH b	DESCRIPTION OF MATERIALS c	FIELD SCREENING RESULTS d	GEOTECH SAMPLE OR CORE BOX NO e	ANALYTICAL SAMPLE NO f	BLOW COUNTS g	REMARKS h
		SAME As Above	0				
	33		0	1.2/4			
			0				
	34						
			0				
	35						
			0				
		CLAY, brown (4/3 10YR) soft moist, highly plastic					1230
	36		0				
				1.1/4			
	37	wet					water
			0				
	38		0				
	39		0				
			0				
	40						1240
		Set piezometer					
	41						

Burns & McDonnell SINCE 1898

051601
Form MRK-55-2

PROJECT

HOLE NO.

HTW DRILLING LOG

HOLE NO. FTRI-040 DP03

1. COMPANY NAME: Burns & McDonnell	2. DRILLING SUBCONTRACTOR: EPS	SHEET 1 OF 5 SHEETS

3. PROJECT: 40747 ESI 49 sites	4. LOCATION: Fort Riley
5. NAME OF DRILLER: Dennis Eller	6. MANUFACTURER'S DESIGNATION OF DRILL: Geoprobe / Direct Push
7. SIZES AND TYPES OF DRILLING AND SAMPLING EQUIPMENT: Geoprobe 4200; 4' macrocore	8. HOLE LOCATION: NA
	9. SURFACE ELEVATION: NA
	10. DATE STARTED: 7/28/06 — 11. DATE COMPLETED: 7/28/06
12. OVERBURDEN THICKNESS: NA	15. DEPTH GROUNDWATER ENCOUNTERED: 36.8
13. DEPTH DRILLED INTO ROCK: NA	16. DEPTH TO WATER AND ELAPSED TIME AFTER DRILLING COMPLETED: NA
14. TOTAL DEPTH OF HOLE: 40'	17. OTHER WATER LEVEL MEASUREMENTS (SPECIFY): NA

18. GEOTECHNICAL SAMPLES	DISTURBED	UNDISTURBED	19. TOTAL NUMBER OF CORE BOXES
0	0	0	0

20. SAMPLES FOR CHEMICAL ANALYSIS	VOC	METALS	OTHER (SPECIFY)	OTHER (SPECIFY)	OTHER (SPECIFY)	21. TOTAL CORE RECOVERY %
9	3	3	TPH-DRO 3	Pesticide 3	—	

22. DISPOSITION OF HOLE	BACKFILLED	MONITORING WELL	OTHER (SPECIFY)	23. SIGNATURE OF INSPECTOR
NA	Bentonite	Piezometer	NA	

ELEV a	DEPTH b	DESCRIPTION OF MATERIALS c	FIELD SCREENING RESULTS d	GEOTECH SAMPLE OR CORE BOX NO. e	ANALYTICAL SAMPLE NO. f	BLOW COUNTS g	REMARKS h
	0	CLAY, very dark brown (2/2 10YR) soft, damp, non plastic	0	3.1 / 4.0	SB01 0-2		
	1		0				
	2		0				
	3	CLAY, brown (4/3 10YR) soft, damp, non plastic	0				
	4		0				1005
	5						

HTW DRILLING LOG

HOLE NO: FTRI-040 DP03

PROJECT: 40747 ESI 49 sites

INSPECTOR:

SHEET 2 OF 5 SHEETS

ELEV. a	DEPTH b	DESCRIPTION OF MATERIALS c	FIELD SCREENING RESULTS d	GEOTECH SAMPLE OR CORE BOX NO. e	ANALYTICAL SAMPLE NO f	BLOW COUNTS g	REMARKS h
		SAME AS Above	0				
	6			4/4	SB02		
			0		4-8		
	7	CLAY, dark brown (3/3 10YR) soft, damp, trace plastic	0				
			0				
	8						1010
		CLAY, brown (4/3 10YR) damp, soft, trace plastic trace silt	0				
	9						
			0	3.8/4			
	10						
			0				
					SB03		
	11		0		10-12		
			0				
	12						1015
			0				
	13		0	3.7/4			
			0				
	14						

HTW DRILLING LOG

HOLE NO FTRI-040 DP03

PROJECT 40747 ESI 49 sites

INSPECTOR [signature]

SHEET 03 OF 5 SHEETS

ELEV. a	DEPTH b	DESCRIPTION OF MATERIALS c	FIELD SCREENING RESULTS d	GEOTECH SAMPLE OR CORE BOX NO. e	ANALYTICAL SAMPLE NO. f	BLOW COUNTS g	REMARKS h
	15	SAME As Above	0				
			0				
	16						1020
			0				
	17		0	3.7/4			
	18		0				
		CLAY, brown (4/3 10YR) soft damp, medium plasticity w/silt	0				
	19						
			0				
	20						1025
			0				
	21		0	3.6/4			
	22		0				
			0				
	23						

HTW DRILLING LOG

HOLE NO. FTRI-040 DP03

PROJECT 40747 ESI 49 sites

INSPECTOR

SHEET 8 OF 5 SHEETS

ELEV. a	DEPTH b	DESCRIPTION OF MATERIALS c	FIELD SCREENING RESULTS d	GEOTECH SAMPLE OR CORE BOX NO. e	ANALYTICAL SAMPLE NO. f	BLOW COUNTS g	REMARKS h
		CLAY, brown (7.5YR 4/3) damp, stiff, non plastic w/ silt	0				
	24						1030
			0	3.5/4			
	25						
		CLAY, brown (7.5YR 4/3) damp soft, trace plastic w/ silt	0				
	26		0				
			0				
	27						
			0				
	28						1035
			0				
		CLAY, brown (7.5YR 4/3) damp, soft, highly plastic some silt					
	29		0				
				3.5/4			
	30		0				
			0				
	31						
			0				
	32						1040

HTW DRILLING LOG

HOLE NO: FIRI-040 DP03

PROJECT: 40747 ESI 49 sites

INSPECTOR:

SHEET 05 OF 5 SHEETS

ELEV a	DEPTH b	DESCRIPTION OF MATERIALS c	FIELD SCREENING RESULTS d	GEOTECH SAMPLE OR CORE BOX NO e	ANALYTICAL SAMPLE NO. f	BLOW COUNTS g	REMARKS h
		SAME As Above	0				
	33		0	3/4			
	34		0				
	35		0				
		CLAY, brown (4/3 10YR)	0				
	36	Soft, moist, highly plastic, some silt	0				1015
							▼ water
	37	SILT, brown (4/3 10YR) wet soft, * & sand	0	36/4			
	38		0				
	39		0				
		~~CLAY, brown (4/3 10YR) soft, moist, highly plastic, some silt~~	0				1035
	40	set a piezometer Bottom of hole					

HTW DRILLING LOG

HOLE NO. FTRI-040 DP04

1. COMPANY NAME: Burns & McDonnell	2. DRILLING SUBCONTRACTOR: EPS	SHEET 1 OF 5 SHEETS
3. PROJECT: 40747 ESI 49 sites	4. LOCATION: Fort Riley	
5. NAME OF DRILLER: Dennis Eiler	6. MANUFACTURER'S DESIGNATION OF DRILL: Geoprobe / Direct Push	
7. SIZES AND TYPES OF DRILLING AND SAMPLING EQUIPMENT: Geoprobe 4200; 4' macrocore	8. HOLE LOCATION: NA	
	9. SURFACE ELEVATION: NA	
	10. DATE STARTED: 7/31/06	11. DATE COMPLETED: 7/31/06
12. OVERBURDEN THICKNESS: NA	15. DEPTH GROUNDWATER ENCOUNTERED: 37.5	
13. DEPTH DRILLED INTO ROCK: NA	16. DEPTH TO WATER AND ELAPSED TIME AFTER DRILLING COMPLETED: NA	
14. TOTAL DEPTH OF HOLE: 40	17. OTHER WATER LEVEL MEASUREMENTS (SPECIFY): NA	

18. GEOTECHNICAL SAMPLES	DISTURBED	UNDISTURBED	19. TOTAL NUMBER OF CORE BOXES
0	0	0	0

20. SAMPLES FOR CHEMICAL ANALYSIS	VOC	METALS	OTHER (SPECIFY)	OTHER (SPECIFY)	OTHER (SPECIFY)	21. TOTAL CORE RECOVERY %
9	3	3	TPH-DRO 3	Pesticide 3	—	

22. DISPOSITION OF HOLE	BACKFILLED	MONITORING WELL	OTHER (SPECIFY)	23. SIGNATURE OF INSPECTOR
NA	Bentonite	Piezometer	NA	

ELEV. a	DEPTH b	DESCRIPTION OF MATERIALS c	FIELD SCREENING RESULTS d	GEOTECH SAMPLE OR CORE BOX NO. e	ANALYTICAL SAMPLE NO f	BLOW COUNTS g	REMARKS h
	0	Gravel Fill	0		SB01 0-2		
		CLAY, brown (10YR 4/3) soft dry; non plastic w/ gravel					
	1	CLAY, brown (10YR 4/3) soft damp; non plastic	0	2.1 / 4			
	2		0				
	3		0				
	4		0				0825
	5		0				

HTW DRILLING LOG

HOLE NO: FTRL-040 DP04

PROJECT: 40747 ESI 49 Sites

INSPECTOR: [illegible]

SHEET 2 OF 4.5 SHEETS

ELEV a	DEPTH b	DESCRIPTION OF MATERIALS c	FIELD SCREENING RESULTS d	GEOTECH SAMPLE OR CORE BOX NO. e	ANALYTICAL SAMPLE NO. f	BLOW COUNTS g	REMARKS h
		SAME As Above	0		SB02 5-6		
	6		0	2/4			
	7		0				
	8		0				0630
	9		0	4/4			
			0		SB03 8-12		
	10		0				
	11		0				
		CLAY, brown (4/3 10YR) damp medium trace plasticity w/silt	0				0535
	12						
			0				
	13		0				
	H		0				

HTW DRILLING LOG

HOLE NO. FTRI-040 DP04

PROJECT 40747 ESI 49 sites | INSPECTOR [illegible] | SHEET # 3 OF 4 SHEETS

ELEV. a	DEPTH b	DESCRIPTION OF MATERIALS c	FIELD SCREENING RESULTS d	GEOTECH SAMPLE OR CORE BOX NO. e	ANALYTICAL SAMPLE NO. f	BLOW COUNTS g	REMARKS h
		SAME As Above	0	3.6/4			
	15		0				
			0				0540
	16						
			0				
	17			3.3/4			
			0				
	18		0				
	19		0				
		CLAY, brown (4/3 10YR) damp stiff, trace plasticity w/silt	0				0550
	20						
		CLAY brown (4/3 10YR) damp soft, trace plasticity w/silt	0	3.5/4			
	21						
			0				
	22		0				
			0				
	23						

HTW DRILLING LOG

HOLE NO: FTRI-040 DP04

PROJECT: 40747 ESI 49 Sites

INSPECTOR:

SHEET 4 OF ~~4~~ 8 SHEETS

ELEV. a	DEPTH b	DESCRIPTION OF MATERIALS c	FIELD SCREENING RESULTS d	GEOTECH SAMPLE OR CORE BOX NO e	ANALYTICAL SAMPLE NO. f	BLOW COUNTS g	REMARKS h
	24	CLAY, brown (4/3 10YR) soft damp, medium plasticity some silt	0				0900
	25		0				
			0	27/4			
	26		0				
	27		0				
			0				
	28	CLAY, brown (4/3 10YR) soft damp, highly plastic w/silt					0910
			0				
				3.1/4			
	29		0				
	30		0				
	31		0				
			0				
	32						0920

Burns & McDonnell SINCE 1898

051601
Form MRK-55-2

PROJECT: 40747

HOLE NO.: FTRI-040 DP04

HTW DRILLING LOG

HOLE NO. FTRI-040 DP04

PROJECT 40747 ESI 49 sites

INSPECTOR [illegible]

SHEET 3 OF 5 SHEETS

ELEV. a	DEPTH b	DESCRIPTION OF MATERIALS c	FIELD SCREENING RESULTS d	GEOTECH SAMPLE OR CORE BOX NO. e	ANALYTICAL SAMPLE NO. f	BLOW COUNTS g	REMARKS h
		SAME As Above	0				
	33		0	3/4			
	34		0				
		SCL, brown (10YR) moist soft, highly plastic w/ clay	0				
	35						
			0				
	36						0930
			0				
	37	wet		3.7/4			▼ Water
			0				
	38		0				
	39		0				
			0				
	40						0940
		Set a piezometer Bottom of hole					

Boring Logs
Furniture Repair Shops (FTRI-041)

HTW DRILLING LOG

HOLE NO: FTRI-041 DP01

1. COMPANY NAME: Burns & McDonnell	2. DRILLING SUBCONTRACTOR: EPS	SHEET 1 OF 4 SHEETS
PROJECT: 40747 ESI 49 Sites	4. LOCATION: Fort Riley	
5. NAME OF DRILLER: Dennis Eller	6. MANUFACTURER'S DESIGNATION OF DRILL: Geoprobe ~~5400~~ / Direct Push	
7. SIZES AND TYPES OF DRILLING AND SAMPLING EQUIPMENT: Geoprobe 6400; 4" macrocore	8. HOLE LOCATION: NA	
	9. SURFACE ELEVATION: NA	
	10. DATE STARTED: 8/2/06	11. DATE COMPLETED: 8/2/06
12. OVERBURDEN THICKNESS: NA	15. DEPTH GROUNDWATER ENCOUNTERED: 22.8	
13. DEPTH DRILLED INTO ROCK: NA	16. DEPTH TO WATER AND ELAPSED TIME AFTER DRILLING COMPLETED: NA	
14. TOTAL DEPTH OF HOLE: 25	17. OTHER WATER LEVEL MEASUREMENTS (SPECIFY): NA	

18. GEOTECHNICAL SAMPLES	DISTURBED	UNDISTURBED	19. TOTAL NUMBER OF CORE BOXES
0	0	0	0

20. SAMPLES FOR CHEMICAL ANALYSIS	VOC	METALS	OTHER (SPECIFY)	OTHER (SPECIFY)	OTHER (SPECIFY)	21. TOTAL CORE RECOVERY %
6	3	3	—	—	—	

22. DISPOSITION OF HOLE	BACKFILLED	MONITORING WELL	OTHER (SPECIFY)	23. SIGNATURE OF INSPECTOR
NA	Bentonite	NA	NA	

ELEV. a	DEPTH b	DESCRIPTION OF MATERIALS c	FIELD SCREENING RESULTS d	GEOTECH SAMPLE OR CORE BOX NO. e	ANALYTICAL SAMPLE NO. f	BLOW COUNTS g	REMARKS h
	0	Asphalt					
	1			31/4			
		SILT, brown (5/3 10YR) soft, damp, non plastic w/sand			5801 1.5-2		
	2		0				
			0				
	3						
			0				
	4						
			0				
			0				
	5						

HTW DRILLING LOG

HOLE NO: FTRI-041 DP01

PROJECT: 40747 ESI 49 site

INSPECTOR:

SHEET 2 OF 4 SHEETS

ELEV. a	DEPTH b	DESCRIPTION OF MATERIALS c	FIELD SCREENING RESULTS d	GEOTECH SAMPLE OR CORE BOX NO. e	ANALYTICAL SAMPLE NO. f	BLOW COUNTS g	REMARKS h
		SAME As Above	0				
	6		0	3.7/4	SB02 7-8		
	7		0				
	8		0				
	9		0				1300
	10		0	3.1/4	SB03 11-12		
	11	SAND, light yellowish brown (6/4 10YR) loose, damp, fine grained;	0				
	12	SAND, pale brown (6/3 10YR) medium, damp, fine-medium grained	0				
	13		0				1305
	14	SAND, pale brown (6/3 10YR) loose, damp, fine-medium grained	0				

HTW DRILLING LOG

HOLE NO. FTRI-041 DA01

PROJECT 40747 ESI 49 sites

INSPECTOR

SHEET 3 OF 4 SHEETS

ELEV. a	DEPTH b	DESCRIPTION OF MATERIALS c	FIELD SCREENING RESULTS d	GEOTECH SAMPLE OR CORE BOX NO. e	ANALYTICAL SAMPLE NO. f	BLOW COUNTS g	REMARKS h
	15	SAME AS Above	0	3.1/4			
	16		0				
	17		0				1315
	18	SAND, brown (7.5YR 4/3) damp loose, fine-medium grained	0	3.3/4			
	19		0				
	20		0				
	21		0				1325
	22		0	2.8/4			
	23		0				water

HTW DRILLING LOG

HOLE NO. FTRL-041 DP01

PROJECT 40747 ESI 49 sites

INSPECTOR Curtis Carter

SHEET 04 OF 4 SHEETS

ELEV. a	DEPTH b	DESCRIPTION OF MATERIALS c	FIELD SCREENING RESULTS d	GEOTECH SAMPLE OR CORE BOX NO. e	ANALYTICAL SAMPLE NO. f	BLOW COUNTS g	REMARKS h
			0				
	24		0				
			0				
	25						1330
		Bottom of hole					

HTW DRILLING LOG

HOLE NO. FTRT-041 ~~DP01~~ DP02

1. COMPANY NAME: Burns & McDonnell	2 DRILLING SUBCONTRACTOR: EPS	SHEET 1 OF 3 SHEETS
3. PROJECT: 40747 ESI 49 sites	4. LOCATION: Fort Riley	
5. NAME OF DRILLER: Dennis Eiler	6. MANUFACTURER'S DESIGNATION OF DRILL: Geoprobe / Direct Push	
7. SIZES AND TYPES OF DRILLING AND SAMPLING EQUIPMENT: Geoprobe 4200 ; 1" macrocore	8. HOLE LOCATION: NA	
	9. SURFACE ELEVATION: NA	
	10. DATE STARTED: 8/1/06	11. DATE COMPLETED: 8/1/06
12. OVERBURDEN THICKNESS: NA	15. DEPTH GROUNDWATER ENCOUNTERED: ~~NA~~ ~21.5	
13. DEPTH DRILLED INTO ROCK: NA	16. DEPTH TO WATER AND ELAPSED TIME AFTER DRILLING COMPLETED: NA	
14. TOTAL DEPTH OF HOLE: 22	17. OTHER WATER LEVEL MEASUREMENTS (SPECIFY): NA	

18. GEOTECHNICAL SAMPLES	DISTURBED	UNDISTURBED	19. TOTAL NUMBER OF CORE BOXES
0	0	0	0

20. SAMPLES FOR CHEMICAL ANALYSIS	VOC	METALS	OTHER (SPECIFY)	OTHER (SPECIFY)	OTHER (SPECIFY)	21. TOTAL CORE RECOVERY %
6	3	3	—	—	—	

22. DISPOSITION OF HOLE	BACKFILLED	MONITORING WELL	OTHER (SPECIFY)	23. SIGNATURE OF INSPECTOR
NA	Bentonite	NA	NA	

ELEV a	DEPTH b	DESCRIPTION OF MATERIALS c	FIELD SCREENING RESULTS d	GEOTECH SAMPLE OR CORE BOX NO. e	ANALYTICAL SAMPLE NO. f	BLOW COUNTS g	REMARKS h
	0	CLAY, dark grayish brown (4/3 10YR) dry, soft, non plastic	0	3-3/4	SB01 0-1		
	1	CLAY, brown (4/3 10YR) damp soft, non plastic	0				
	2		0				
		SILT, brown (5/3 10YR) damp soft, non plastic	0				
	3		0				
	4						1325
			0				
	5						

HTW DRILLING LOG

HOLE NO: FTRI-041 DP02

PROJECT: 40747 ESI 49 sites

INSPECTOR: [illegible]

SHEET 2 OF 3 SHEETS

ELEV. a.	DEPTH b	DESCRIPTION OF MATERIALS c	FIELD SCREENING RESULTS d	GEOTECH SAMPLE OR CORE BOX NO e	ANALYTICAL SAMPLE NO. f	BLOW COUNTS g	REMARKS h
		SAME AS Above.	0		SB02 6-7		
	6			4/4			
			0				
	7		0				
			0				1330
	8		0				
					SB03		
	9			3.6/4	11-12		
			0				
	16		0				
	11		0				
		SAND, yellowish brown (5/4 10YR) loose, damp, fine-medium grained	0				1335
	12						
			0	1.2/2			
	13		0				
			0				1340
	14						

HTW DRILLING LOG

HOLE NO: FTRI-041 DP02

PROJECT: 40747 ESI 49 sites

INSPECTOR: [illegible]

SHEET # 3 OF 3 SHEETS

ELEV. a	DEPTH b	DESCRIPTION OF MATERIALS c	FIELD SCREENING RESULTS d	GEOTECH SAMPLE OR CORE BOX NO e	ANALYTICAL SAMPLE NO f	BLOW COUNTS g	REMARKS h
		SAME As Above					
			0				
	15		0	3.7			
		SAND, brown (7.5YR 4/3) damp loose, fine - medium grained		4			
	16		0				
			0				
	17						
			0				
	18						1345
			0				
	19			4			
			0	4			
	20		0				
	21		0				
			0				@ water
	22						1350
		Bottom of hole					

HTW DRILLING LOG

HOLE NO: FTRI-041 DP03

1. COMPANY NAME: Burns & McDonnell	2. DRILLING SUBCONTRACTOR: EPS
SHEET 1 OF 3 SHEETS	
3. PROJECT: ~~Burns~~ 40747 ESI 49 sites	4. LOCATION: Fort Riley
5. NAME OF DRILLER: Dennis Elder	6. MANUFACTURER'S DESIGNATION OF DRILL: Geoprobe / Direct Push
7. SIZES AND TYPES OF DRILLING AND SAMPLING EQUIPMENT: Geoprobe 4200; 4' macrocore	8. HOLE LOCATION: NA
	9. SURFACE ELEVATION: NA
	10. DATE STARTED: 8/1/06 — 11. DATE COMPLETED: 8/1/06
12. OVERBURDEN THICKNESS: NA	15. DEPTH GROUNDWATER ENCOUNTERED: 21.7
13. DEPTH DRILLED INTO ROCK: NA	16. DEPTH TO WATER AND ELAPSED TIME AFTER DRILLING COMPLETED: NA
14. TOTAL DEPTH OF HOLE: 22	17. OTHER WATER LEVEL MEASUREMENTS (SPECIFY): NA

18. GEOTECHNICAL SAMPLES	DISTURBED	UNDISTURBED	19. TOTAL NUMBER OF CORE BOXES
0	0	0	0

20. SAMPLES FOR CHEMICAL ANALYSIS	VOC	METALS	OTHER (SPECIFY)	OTHER (SPECIFY)	OTHER (SPECIFY)	21. TOTAL CORE RECOVERY %
6	3	3	—	—	—	

22. DISPOSITION OF HOLE	BACKFILLED	MONITORING WELL	OTHER (SPECIFY)	23. SIGNATURE OF INSPECTOR
NA	Bentonite	NA	NA	

ELEV. a	DEPTH b	DESCRIPTION OF MATERIALS c	FIELD SCREENING RESULTS d	GEOTECH SAMPLE OR CORE BOX NO. e	ANALYTICAL SAMPLE NO. f	BLOW COUNTS g	REMARKS h
	0	CLAY, grayish brown (5/2 10YR) soft, dry, non plastic	0		SB01 ~~DP03~~ 0-1		
	1	CLAY, very dark, grayish brown (3/2 10YR) medium, damp, trace plastic w/silt	0	3.3/4			
	2	SILT, brown (4/3 10YR) damp soft, non plastic	0				
	3		0				
	4		0				1220
	5		0				

HTW DRILLING LOG

HOLE NO. FTRI-041 DP03

PROJECT 40747 ESI 49 sites

INSPECTOR [signature]

SHEET # 2 OF 3 SHEETS

ELEV. a	DEPTH b	DESCRIPTION OF MATERIALS c	FIELD SCREENING RESULTS d	GEOTECH SAMPLE OR CORE BOX NO. e	ANALYTICAL SAMPLE NO. f	BLOW COUNTS g	REMARKS h
		SAME as Above.					
			0	1/4	5802 7-8		
	6		0				
	7		0				
			0				
	8						1225
			0		5803 9-10		
	9			1.1/4			
			0				
	10		0				
	11		0				
		SAND, light yellowish brown (6/4 10YR) loose, damp,					
	12	medium grained	0				1230
			0	1.7/2			
	13						
			0				
	17		0				1235

HTW DRILLING LOG

HOLE NO: FTRI-041 DP03

PROJECT: 40747 ESI 49 sites

INSPECTOR: [illegible]

SHEET 03 OF 3 SHEETS

ELEV. a	DEPTH b	DESCRIPTION OF MATERIALS c	FIELD SCREENING RESULTS d	GEOTECH SAMPLE OR CORE BOX NO e	ANALYTICAL SAMPLE NO f	BLOW COUNTS g	REMARKS h
		SAME As Above	0				
	15		0	3.7/4			
		SAND, ~~the~~ pale brown (6/3 10YR) damp, loose, fine-medium grained	0				
	16						
			0				
	17						
			0				
		SAND, grayish brown (5/2 10YR) damp, loose, fine-medium grained w/silt					
	18						1240
			0				
	19		0	3.7/4			
		SAND, light yellowish brown (6/4 10YR) damp, loose, fine-medium grained	0				
	20						
			0				
	21						
			0				
		wet					@Water
	22						1250
		Bottom of hole					
	23						

HTW DRILLING LOG

HOLE NO: FTRI-041 DP04

1. COMPANY NAME: Burns + McDonnell	2. DRILLING SUBCONTRACTOR: EPS
SHEET 1 OF 4 SHEETS	
PROJECT: 40747 ESI 49 sites	4. LOCATION: Fort Riley
5. NAME OF DRILLER: Dennis Eiler	6. MANUFACTURER'S DESIGNATION OF DRILL: Geoprobe / Direct Push
7. SIZES AND TYPES OF DRILLING AND SAMPLING EQUIPMENT: Geoprobe 4200; 4' macrocore	8. HOLE LOCATION: NA
	9. SURFACE ELEVATION: NA
	10. DATE STARTED: 7/31/06 — 11. DATE COMPLETED: 7/31/06
12. OVERBURDEN THICKNESS: NA	15. DEPTH GROUNDWATER ENCOUNTERED: 23'
13. DEPTH DRILLED INTO ROCK: NA	16. DEPTH TO WATER AND ELAPSED TIME AFTER DRILLING COMPLETED: NA
14. TOTAL DEPTH OF HOLE: 24	17. OTHER WATER LEVEL MEASUREMENTS (SPECIFY): NA

18. GEOTECHNICAL SAMPLES	DISTURBED	UNDISTURBED	19. TOTAL NUMBER OF CORE BOXES
0	0	0	0

20. SAMPLES FOR CHEMICAL ANALYSIS	VOC	METALS	OTHER (SPECIFY)	OTHER (SPECIFY)	OTHER (SPECIFY)	21. TOTAL CORE RECOVERY %
6	3	3	—	—	—	

22. DISPOSITION OF HOLE	BACKFILLED	MONITORING WELL	OTHER (SPECIFY)	23. SIGNATURE OF INSPECTOR
NR	Bentonite	NA	NA	

ELEV. a	DEPTH b	DESCRIPTION OF MATERIALS c	FIELD SCREENING RESULTS d	GEOTECH SAMPLE OR CORE BOX NO. e	ANALYTICAL SAMPLE NO. f	BLOW COUNTS g	REMARKS h
	0	Fill					
		CLAY, very dark grayish brown (3/2 10YR) soft, damp, trace plasticity; trace silt	0	3-1 / 4	SB01 1-2		
	1		0				
		CLAY, very dark brown (7/10YR) soft, damp, trace plasticity some silt					
	2		0				
	3		0				
	4		0				1030
			0				
	5						

HTW DRILLING LOG

HOLE NO. FTRI-041 DP04

PROJECT 40747 ESI 49 Sites

INSPECTOR

SHEET # 2 OF 4 SHEETS

ELEV. a	DEPTH b	DESCRIPTION OF MATERIALS c	FIELD SCREENING RESULTS d	GEOTECH SAMPLE OR CORE BOX NO. e	ANALYTICAL SAMPLE NO. f	BLOW COUNTS g	REMARKS h
		SAME AS Above	0				
	6	CLAY, very dark brown (7/2 10YR) soft, damp, medium plasticity some silt	0	3.7/4			
	7		0		SB02 7-8		
			0				
	8						1035
			0	2.7/4			
	9	SILT, grayish brown (5/2 10YR) soft, damp, highly plastic w/clay					
		CLAY, dark yellowish brown (3/4 10YR) damp, medium medium plasticity	0		SB03 8-10.5		
	10		0				
	11		0				
			0				
	12						1040
			0	3.1/4			
	13	SILT, dark grayish brown (4/2 10YR) soft, damp, trace plastic w/sand	0				
			0				
	14						

HTW DRILLING LOG

HOLE NO. FTRI-041 DP04

PROJECT 40747 ESI 49 sites

INSPECTOR

SHEET 3 OF 4 SHEETS

ELEV. a	DEPTH b	DESCRIPTION OF MATERIALS c	FIELD SCREENING RESULTS d	GEOTECH SAMPLE OR CORE BOX NO. e	ANALYTICAL SAMPLE NO. f	BLOW COUNTS g	REMARKS h
		SAME As Above	0				
	15	SAND, pale brown (5/3 10YR) loose, damp, fine grained	0				
	16		0				1050
	17		0	3/4			
		SAND, light yellowish brown (6/4 10YR) damp, loose, fine grained	0				
	19		0				
	20	SAND, brown (5/3 10YR) damp, loose, fine grained	0				1100
	21		0	3.2/4			
		SAND, brown (5/3 10YR) damp, loose, fine-medium grained	0				
	22		0				
	23		0				@ water

HTW DRILLING LOG

HOLE NO: FTRI-041 DP04

PROJECT: 40747 ESI 49 Sites

INSPECTOR: [signature]

SHEET # 4 OF 4 SHEETS

ELEV. a	DEPTH b	DESCRIPTION OF MATERIALS c	FIELD SCREENING RESULTS d	GEOTECH SAMPLE OR CORE BOX NO. e	ANALYTICAL SAMPLE NO. f	BLOW COUNTS g	REMARKS h
		SAND, dark grayish brown 4/2 10YR, fine-coarse grained loose, well graded	0				1110
	24	bottom of hole					

HTW DRILLING LOG

HOLE NO. FTRI-041 DP05

1 COMPANY NAME: Burns & McDonnell	2 DRILLING SUBCONTRACTOR: EPS
PROJECT: 40747 ESI 49 sites	4 LOCATION: Fort Riley
5 NAME OF DRILLER: Dennis Eiler	6 MANUFACTURER'S DESIGNATION OF DRILL: Geoprobe / Direct Push
7 SIZES AND TYPES OF DRILLING AND SAMPLING EQUIPMENT: Geoprobe 4200; 4" macrocore	8 HOLE LOCATION: NA
	9 SURFACE ELEVATION: NA
	10 DATE STARTED: 7/31/06 — 11 DATE COMPLETED: 7/31/06
12 OVERBURDEN THICKNESS: NA	15 DEPTH GROUNDWATER ENCOUNTERED: 23.6
13 DEPTH DRILLED INTO ROCK: NA	16 DEPTH TO WATER AND ELAPSED TIME AFTER DRILLING COMPLETED: NA
14 TOTAL DEPTH OF HOLE: 24	17 OTHER WATER LEVEL MEASUREMENTS (SPECIFY): NA

18 GEOTECHNICAL SAMPLES	DISTURBED	UNDISTURBED	19 TOTAL NUMBER OF CORE BOXES
0	0	0	0

20 SAMPLES FOR CHEMICAL ANALYSIS	VOC	METALS	OTHER (SPECIFY)	OTHER (SPECIFY)	OTHER (SPECIFY)	21 TOTAL CORE RECOVERY %
6	3	3				

22 DISPOSITION OF HOLE	BACKFILLED	MONITORING WELL	OTHER (SPECIFY)	23 SIGNATURE OF INSPECTOR
NA	Bentonite	NA	NA	

ELEV. a	DEPTH b	DESCRIPTION OF MATERIALS c	FIELD SCREENING RESULTS d	GEOTECH SAMPLE OR CORE BOX NO. e	ANALYTICAL SAMPLE NO. f	BLOW COUNTS g	REMARKS h
	0	Gravel, Fill					
		CLAY, very dark grayish brown (3/2 10YR) soft damp, medium plasticity, w/silt	0		SB01 1-2		
	1		0	33/4			
	2		0				
	3		0				
		CLAY, dark grayish brown (4/2 10YR) soft, damp, non plastic	0				1150
	4						
			0				
	5						

HTW DRILLING LOG

HOLE NO: FTRI-041 DP05

PROJECT: ~~FTRI~~ 40747 ESI 49 sites

INSPECTOR: Scott Cave

SHEET 2 OF 4 SHEETS

ELEV. a	DEPTH b	DESCRIPTION OF MATERIALS c	FIELD SCREENING RESULTS d	GEOTECH SAMPLE OR CORE BOX NO. e	ANALYTICAL SAMPLE NO f	BLOW COUNTS g	REMARKS h
		SAME As Above	0				
	6			3.5/4			
		SILT, brown (7.5YR 4/3) soft damp, non plastic w/sand	0		SB02 6-7		
	7		0				
			0				1155
	8						
			0				
	9						
			0	2.2/4			
	10						
			0				
	11		0		SB03 ~~9-11~~ 9-10		
		SAND, pale brown (10YR 6/3) loose, damp, fine grained w/silt	0				1200
	12						
		SILT, brown (7.5YR 4/3) damp, soft, non plastic	0	2.1/4			
	13						
			0				
			0				
	14						

HTW DRILLING LOG

HOLE NO. FTRI-041 DP05

PROJECT 40747 EST 77 sites

INSPECTOR

SHEET 03 OF 4 SHEETS

ELEV. a	DEPTH b	DESCRIPTION OF MATERIALS c	FIELD SCREENING RESULTS d	GEOTECH SAMPLE OR CORE BOX NO. e	ANALYTICAL SAMPLE NO. f	BLOW COUNTS g	REMARKS h
		SAME AS ABOVE	0				
	15		0				
			0				
	16						1210
			0	3.6/4			
	17		0				
	18		0				
	19		0				
		SAND, light yellowish brown (10YR 6/4) loose, damp, fine - medium grained	0				1215
	20						
			0	3.2/4			
	21		0				
	22		0				
			0				
	23						

HTW DRILLING LOG

HOLE NO. FTRI-041 DP05

PROJECT 40747 ESI 49 sites

INSPECTOR [signature]

SHEET 04 OF 4 SHEETS

ELEV a	DEPTH b	DESCRIPTION OF MATERIALS c	FIELD SCREENING RESULTS d	GEOTECH SAMPLE OR CORE BOX NO. e	ANALYTICAL SAMPLE NO. f	BLOW COUNTS g	REMARKS h
		SAND, dark grayish brown (10YR 4/2) loose, wet, fine-medium grain	0				water
	24	Bottom of hole					1230

HTW DRILLING LOG

HOLE NO. FTRI-041 DA06

1. COMPANY NAME: Burns & McDonnell	2. DRILLING SUBCONTRACTOR: EPS
SHEET 1 OF 4 SHEETS	
3. PROJECT: 40747 ESI 49 sites	4. LOCATION: Fort Riley
5. NAME OF DRILLER: Dennis Eller	6. MANUFACTURER'S DESIGNATION OF DRILL: Geoprobe / Direct push
7. SIZES AND TYPES OF DRILLING AND SAMPLING EQUIPMENT: Geoprobe 4230; 1" macrocore	8. HOLE LOCATION: N/A
	9. SURFACE ELEVATION: NA
	10. DATE STARTED: 7/31/06 — 11. DATE COMPLETED: 7/31/06
12. OVERBURDEN THICKNESS: NA	15. DEPTH GROUNDWATER ENCOUNTERED: 24
13. DEPTH DRILLED INTO ROCK: NA	16. DEPTH TO WATER AND ELAPSED TIME AFTER DRILLING COMPLETED: NA
14. TOTAL DEPTH OF HOLE: 25	17. OTHER WATER LEVEL MEASUREMENTS (SPECIFY): NA

18. GEOTECHNICAL SAMPLES	DISTURBED	UNDISTURBED	19. TOTAL NUMBER OF CORE BOXES
0	0	0	0

20. SAMPLES FOR CHEMICAL ANALYSIS	VOC	METALS	OTHER (SPECIFY)	OTHER (SPECIFY)	OTHER (SPECIFY)	21. TOTAL CORE RECOVERY %
6	3	3	—	—	—	

22. DISPOSITION OF HOLE	BACKFILLED	MONITORING WELL	OTHER (SPECIFY)	23. SIGNATURE OF INSPECTOR
NA	Bentonite	NA	NA	

ELEV. a	DEPTH b	DESCRIPTION OF MATERIALS c	FIELD SCREENING RESULTS d	GEOTECH SAMPLE OR CORE BOX NO e	ANALYTICAL SAMPLE NO f	BLOW COUNTS g	REMARKS h
	0	Gravel, fill	0		5001 0.15		
	1	CLAY, Very dark grayish brown (3/2 10YR) soft, damp, non plastic	6	1.5/4			
	2		0				
	3		0				
	4		0				1335
	5		0				

HTW DRILLING LOG

HOLE NO: FTR1-041 DP06

PROJECT: 40747 ESI 49 sites

INSPECTOR:

SHEET 6 2 OF 4 SHEETS

ELEV a	DEPTH b	DESCRIPTION OF MATERIALS c	FIELD SCREENING RESULTS d	GEOTECH SAMPLE OR CORE BOX NO e	ANALYTICAL SAMPLE NO. f	BLOW COUNTS g	REMARKS h
		SAME As Above	0		SB02		
					6-7		
				3/4			
	6		0				
		SILT, (brown 5/3 10YR) soft damp, non plastic					
			0				
	7						
			0				
							1340
	8						
			0				
					SB03		
	9				9-10		
			0				
				4/4			
	10		0				
			0				
	11						
			0				
							1345
	12						
				1 1/2			
	13						
	14						1350

HTW DRILLING LOG

HOLE NO. FTRI-041 DP06

PROJECT 40747 Est 49 miles

INSPECTOR [illegible]

SHEET 3 OF 4 SHEETS

ELEV. a	DEPTH b	DESCRIPTION OF MATERIALS c	FIELD SCREENING RESULTS d	GEOTECH SAMPLE OR CORE BOX NO. e	ANALYTICAL SAMPLE NO. f	BLOW COUNTS g	REMARKS h
		SAME As Above	0				
	15						
			0	3.8/4			
	16						
			0				
	17						
			0				
		SAND, light yellowish brown					
	18	(5/4 10YR) loose, damp	0				1355
		fine-medium grained					
			0				
	19						
				3.2/4			
			0				
	20						
			0				
	21						
			0				
			0				1405
	22						
			0				
	23						

HTW DRILLING LOG

HOLE NO. FTRI-041 DP06

PROJECT 40747 ESI 49 sites

INSPECTOR

SHEET 4 OF 4 SHEETS

ELEV. a	DEPTH b	DESCRIPTION OF MATERIALS c	FIELD SCREENING RESULTS d	GEOTECH SAMPLE OR CORE BOX NO. e	ANALYTICAL SAMPLE NO f	BLOW COUNTS g	REMARKS h
		SAME As Above	0				
		SAND, brownish yellow (10YR 6/6)		26/3			
	24	loose damp, fine-coarse grain	0				water
		wet					
			0				1415
	25						
		Bottom of hole					

Boring Logs
Print and Publications Shop 263 (FTRI-045)

HTW DRILLING LOG

HOLE NO: FTRI-045 DP01

1 COMPANY NAME: Burns + McDonnell	2 DRILLING SUBCONTRACTOR: EPS
SHEET 1 OF 3 SHEETS	
3 PROJECT: 40747 ESI 49 sites	4 LOCATION: Fort Riley
5 NAME OF DRILLER: Dennis Elder	6 MANUFACTURER'S DESIGNATION OF DRILL: Geoprobe / Direct Push
7 SIZES AND TYPES OF DRILLING AND SAMPLING EQUIPMENT: Geoprobe 5400; 4' macrocore	8 HOLE LOCATION: NA
	9 SURFACE ELEVATION: NA
	10 DATE STARTED: 8/3/06 — 11 DATE COMPLETED: 8/3/06
12 OVERBURDEN THICKNESS: NA	15 DEPTH GROUNDWATER ENCOUNTERED: NA
13 DEPTH DRILLED INTO ROCK: NA	16 DEPTH TO WATER AND ELAPSED TIME AFTER DRILLING COMPLETED: NA
14 TOTAL DEPTH OF HOLE: 19.5	17 OTHER WATER LEVEL MEASUREMENTS (SPECIFY): NA

18 GEOTECHNICAL SAMPLES	DISTURBED	UNDISTURBED	19 TOTAL NUMBER OF CORE BOXES
0	0	0	0

20 SAMPLES FOR CHEMICAL ANALYSIS	VOC	METALS	OTHER (SPECIFY)	OTHER (SPECIFY)	OTHER (SPECIFY)	21 TOTAL CORE RECOVERY %
3	3	—	—	—	—	

22 DISPOSITION OF HOLE	BACKFILLED	MONITORING WELL	OTHER (SPECIFY)	23 SIGNATURE OF INSPECTOR
NA	Bentonite	NA	NA	

ELEV. a	DEPTH b	DESCRIPTION OF MATERIALS c	FIELD SCREENING RESULTS d	GEOTECH SAMPLE OR CORE BOX NO. e	ANALYTICAL SAMPLE NO. f	BLOW COUNTS g	REMARKS h
	0	Asphalt					
	1						
	2	SAND, brown (4/3 10YR) damp soft, fine grained	0	2/2	5501 1.5-2		
		Gravel	0				
	3	CLAY, yellowish brown (5/6 10YR) very stiff, damp, trace plastic	0				1135
	4		0				
	5		0				

HTW DRILLING LOG

HOLE NO: FTRI-045 DP01

PROJECT: 40747 ESI 49 sites

INSPECTOR: [illegible]

SHEET 02 OF 3 SHEETS

ELEV a	DEPTH b	DESCRIPTION OF MATERIALS c	FIELD SCREENING RESULTS d	GEOTECH SAMPLE OR CORE BOX NO. e	ANALYTICAL SAMPLE NO. f	BLOW COUNTS g	REMARKS h
		SAME As Above					
		SILT, yellowish brown (5/6 10YR) damp, soft, non plastic w/sand	0	2.7/3	SB02 5.5-6.5		
	6		0				1140
	7		0				
			0	3.4/3.5	SB03 8.9		
	8						
			0				
	9						
		SILT, yellowish brown (5/6 10YR) damp, soft trace plasticity some sand	0				
	10						1145
			0				
	11		0	3.7/4			
	12		0				
	13		0				
		SAND, light yellowish brown (6/4 10YR) loose, damp fine grained					
	14						1155

HTW DRILLING LOG

HOLE NO: FTRI-01S DP01

PROJECT: 40747 ESI 49 sites

INSPECTOR:

SHEET 03 OF 3 SHEETS

ELEV. a	DEPTH b	DESCRIPTION OF MATERIALS c	FIELD SCREENING RESULTS d	GEOTECH SAMPLE OR CORE BOX NO. e	ANALYTICAL SAMPLE NO f	BLOW COUNTS g	REMARKS h
		SAME As Above	0	3.8/4			
	15		0				
	16		0				
	17		0				
	18		0				1205
		SAND, light yellowish brown (6/4 10YR) loose, damp; F.K. - coarse grained	0	1.2/1.5			
	19		0				1210
		Refusal Bottom of hole					
	20						

HTW DRILLING LOG

HOLE NO. FTRI-045 DF02

COMPANY NAME: Burns & McDonnell	2. DRILLING SUBCONTRACTOR: EPS
SHEET 1 OF 3 SHEETS	
3. PROJECT: 40747 ESI 49 sites	4. LOCATION: Fort Riley
5. NAME OF DRILLER: Dennis Eller	6. MANUFACTURER'S DESIGNATION OF DRILL: Geoprobe / Direct Push
7. SIZES AND TYPES OF DRILLING AND SAMPLING EQUIPMENT: Geoprobe 5400; 4' macrocore	8. HOLE LOCATION: NA
	9. SURFACE ELEVATION: NA
	10. DATE STARTED: 8/3/06 — 11. DATE COMPLETED: 8/3/06
12. OVERBURDEN THICKNESS: NA	15. DEPTH GROUNDWATER ENCOUNTERED: NA
13. DEPTH DRILLED INTO ROCK: NA	16. DEPTH TO WATER AND ELAPSED TIME AFTER DRILLING COMPLETED: NA
14. TOTAL DEPTH OF HOLE: 21.5	17. OTHER WATER LEVEL MEASUREMENTS (SPECIFY): NA

18. GEOTECHNICAL SAMPLES	DISTURBED	UNDISTURBED	19. TOTAL NUMBER OF CORE BOXES
0	0	0	0

20. SAMPLES FOR CHEMICAL ANALYSIS	VOC	METALS	OTHER (SPECIFY)	OTHER (SPECIFY)	OTHER (SPECIFY)	21. TOTAL CORE RECOVERY %
3	3	—	—	—	—	

22. DISPOSITION OF HOLE	BACKFILLED	MONITORING WELL	OTHER (SPECIFY)	23. SIGNATURE OF INSPECTOR
NA	Bentonite	NA	NA	

ELEV. a	DEPTH b	DESCRIPTION OF MATERIALS c	FIELD SCREENING RESULTS d	GEOTECH SAMPLE OR CORE BOX NO. e	ANALYTICAL SAMPLE NO. f	BLOW COUNTS g	REMARKS h
	0	Asphalt					
	1						
	2	CLAY, dark yellowish brown (4/4 10YR) very stiff, damp trace plasticity w/ silt	0	3.8/4	SB01 1.5-2		
	3		0				
	4		0				Sleve ~~Sampler~~ stuck in sampler Begin probing again 1020 0945
	5	SILT yellowish brown (5/5 10YR) medium, damp, non plastic w/sand	0				

HTW DRILLING LOG

HOLE NO. FTRT-015 DP02

PROJECT 40747 EST 49 sites

INSPECTOR [signature]

SHEET # 2 OF 3 SHEETS

ELEV. a	DEPTH b	DESCRIPTION OF MATERIALS c	FIELD SCREENING RESULTS d	GEOTECH SAMPLE OR CORE BOX NO e	ANALYTICAL SAMPLE NO f	BLOW COUNTS g	REMARKS h
		SAME As Above	0				
	6		0	3.5 / 3.5	SB02 5.6		
	7	SILT, brownish yellow (6/10YR) soft, damp medium plasticity, trace clay, trace sand	0				
	8		0				
		SILT, light yellowish brown (6/4 10YR) soft, damp non plastic	0				1025
	9		0	3/3	SB03 10-11.5		
	10		0				
	11	SAND, brownish yellow (6/10YR) loose, damp fine grained	0				1030
	12		0	2.6 / 3			
	13		0				
	14		0				

HTW DRILLING LOG

HOLE NO. FTRI-045 DP02

PROJECT 40747 ESI 49 sites

INSPECTOR

SHEET 3 OF 3 SHEETS

ELEV. a	DEPTH b	DESCRIPTION OF MATERIALS c	FIELD SCREENING RESULTS d	GEOTECH SAMPLE OR CORE BOX NO. e	ANALYTICAL SAMPLE NO f	BLOW COUNTS g	REMARKS h
		SAME As Above	0				1040
	15		0				
		SAND, light brownish yellow (6/4 10YR) loose, damp,	0	1.4/3			
	16	fine - medium grained	0				
	17		0				1045
	18		0	2.8/3			
	19		0				
	20	SAND, dark yellowish brown (7/4 10YR) damp, loose fine - coarse grained	0				1055
	21		0				1105
	22	Refusal Bottom of hole					

HTW DRILLING LOG

HOLE NO. FTRI-045 DP03

1. COMPANY NAME: Burns & MacDonnell	2. DRILLING SUBCONTRACTOR: EPS
SHEET 1 OF 3 SHEETS	
PROJECT: 40747 ESI 49 sites	4. LOCATION: Fort Riley
5. NAME OF DRILLER: Dennis Eller	6. MANUFACTURER'S DESIGNATION OF DRILL: Geoprobe/Direct Push
7. SIZES AND TYPES OF DRILLING AND SAMPLING EQUIPMENT: Geoprobe 5400; 4' macrocore	8. HOLE LOCATION: NA
	9. SURFACE ELEVATION: NA
	10. DATE STARTED: 8/3/06 — 11. DATE COMPLETED: 8/3/06
12. OVERBURDEN THICKNESS: NA	15. DEPTH GROUNDWATER ENCOUNTERED: NA
13. DEPTH DRILLED INTO ROCK: NA	16. DEPTH TO WATER AND ELAPSED TIME AFTER DRILLING COMPLETED: NA
14. TOTAL DEPTH OF HOLE: 17.9	17. OTHER WATER LEVEL MEASUREMENTS (SPECIFY): NA

18. GEOTECHNICAL SAMPLES	DISTURBED	UNDISTURBED	19. TOTAL NUMBER OF CORE BOXES
0	0	0	0

20. SAMPLES FOR CHEMICAL ANALYSIS	VOC	METALS	OTHER (SPECIFY)	OTHER (SPECIFY)	OTHER (SPECIFY)	21. TOTAL CORE RECOVERY %
3	3	—	—	—	—	

22. DISPOSITION OF HOLE	BACKFILLED	MONITORING WELL	OTHER (SPECIFY)	23. SIGNATURE OF INSPECTOR
N/A	Bentonite	NA	NA	

ELEV a	DEPTH b	DESCRIPTION OF MATERIALS c	FIELD SCREENING RESULTS d	GEOTECH SAMPLE OR CORE BOX NO e	ANALYTICAL SAMPLE NO f	BLOW COUNTS g	REMARKS h
	0	Asphalt					
	1	SILT, grayish brown (5/2 10YR) soft, damp, non plastic trace clay, trace sand	0	37 / 4	SB01 1.5-2		
	2		0				
	3		0				
	4		0				
	5	SILT, dark brown, ~~dar~~ (3/3 10YR) damp, soft, non plastic w/sand	0				0850

HTW DRILLING LOG

HOLE NO. FTRI-045 DP03

PROJECT 40747 ESI 49 sites

INSPECTOR [illegible]

SHEET # 2 OF 3 SHEETS

ELEV a	DEPTH b	DESCRIPTION OF MATERIALS c	FIELD SCREENING RESULTS d	GEOTECH SAMPLE OR CORE BOX NO. e	ANALYTICAL SAMPLE NO. f	BLOW COUNTS g	REMARKS h
		SAME As Above	0				
	6		0	3.5/4			
		SLCT, dark yellowish brown (3/4 10YR) damp, soft, trace plasticity, w/sand			SB02 7-8		
	7		0				
	8		0				
	9		0				0855
			0				
	10		0	4/4	SB03 10-11		
	11		0				
	12		0				
			0				
	D	SAND, brownish yellow (6/6 10YR) damp, loose, fine grained					0900
			0				
	14						

HTW DRILLING LOG

HOLE NO: FTRI-045 DP03

PROJECT: 40747 ESI 49 sites

INSPECTOR: [illegible]

SHEET 03 OF 3 SHEETS

ELEV. a	DEPTH b	DESCRIPTION OF MATERIALS c	FIELD SCREENING RESULTS d	GEOTECH SAMPLE OR CORE BOX NO e	ANALYTICAL SAMPLE NO f	BLOW COUNTS g	REMARKS h
		SAME AS Above.	0				
	15		0	29/4			
			0				
	16						
		SAND, brownish yellow (6/6104R) damp, loose, fine-medium grained	0				
	17						0910
			0	0.7/09			
							0915
	18	Refusal Bottom of hole					
	19						

HTW DRILLING LOG

HOLE NO. FTRI-045 DP04

1. COMPANY NAME: Burns & McDonnell	2. DRILLING SUBCONTRACTOR: EPS
SHEET 1 OF 3 SHEETS	
PROJECT: 40747 ESI 49 sites	4. LOCATION: Fort Riley
5. NAME OF DRILLER: Dennis Eiler	6. MANUFACTURER'S DESIGNATION OF DRILL: Geoprobe / Direct Push
7. SIZES AND TYPES OF DRILLING AND SAMPLING EQUIPMENT: Geoprobe 5400; 4" macrocore	8. HOLE LOCATION: NA
	9. SURFACE ELEVATION: NA
	10. DATE STARTED: 8/3/06 — 11. DATE COMPLETED: 8/3/06
12. OVERBURDEN THICKNESS: NA	15. DEPTH GROUNDWATER ENCOUNTERED: NA
13. DEPTH DRILLED INTO ROCK: NA	16. DEPTH TO WATER AND ELAPSED TIME AFTER DRILLING COMPLETED: NA
14. TOTAL DEPTH OF HOLE: 19.2	17. OTHER WATER LEVEL MEASUREMENTS (SPECIFY): NA

18. GEOTECHNICAL SAMPLES	DISTURBED	UNDISTURBED	19. TOTAL NUMBER OF CORE BOXES
0	0	0	6

20. SAMPLES FOR CHEMICAL ANALYSIS	VOC	METALS	OTHER (SPECIFY)	OTHER (SPECIFY)	OTHER (SPECIFY)	21. TOTAL CORE RECOVERY %
3	3	—	—	—	—	

22. DISPOSITION OF HOLE	BACKFILLED	MONITORING WELL	OTHER (SPECIFY)	23. SIGNATURE OF INSPECTOR
NA	Bentonite	NA	NA	

ELEV a	DEPTH b	DESCRIPTION OF MATERIALS c	FIELD SCREENING RESULTS d	GEOTECH SAMPLE OR CORE BOX NO e	ANALYTICAL SAMPLE NO f	BLOW COUNTS g	REMARKS h
	0	~~Asphalt~~ Asphalt	Ø				
	1	SILT, grayish brown (5/2 10YR) damp, soft, non plastic 4/clay	0		SB01 1-2		
	2		0	4/4			
	3	SILT, dark brown (3/3 10YR) damp, soft, non plastic trace clay w/sand	0				
	4		0				
	5		0				0805

HTW DRILLING LOG

HOLE NO: FTRI-045 DP04

PROJECT: 40747 EST 49 sites

INSPECTOR:

SHEET # 2 OF 3 SHEETS

ELEV. a	DEPTH b	DESCRIPTION OF MATERIALS c	FIELD SCREENING RESULTS d	GEOTECH SAMPLE OR CORE BOX NO. e	ANALYTICAL SAMPLE NO. f	BLOW COUNTS g	REMARKS h
	6	SILT, yellowish brown (5/6 10YR) damp; soft, non plastic some sand	0				
			0	3.1/4	5802 7-8		
	7	SAND, yellowish brown (5/8 10YR) loose, damp, fine grained	0				
	8		0				
	9		0				0810
	10	SAND, light yellowish brown (6/4 10YR) damp, loose, fine grained, trace silt	0	3.2/4			
			0		5803 11-12		
	11		0				
	12		0				
	13	SAND, very pale brown (7/4 10YR) loose, damp fine grained	0				0815
	14		0				

HTW DRILLING LOG

HOLE NO. FTRI-045 DRH

PROJECT 40747 ESI 49 sites

INSPECTOR [signature]

SHEET 3 OF 3 SHEETS

ELEV. a	DEPTH b	DESCRIPTION OF MATERIALS c	FIELD SCREENING RESULTS d	GEOTECH SAMPLE OR CORE BOX NO. e	ANALYTICAL SAMPLE NO f	BLOW COUNTS g	REMARKS h
		SAND, brownish yellow (6/6 10YR) medium, damp, fine-medium grained	0				
	15		0	3.6. 1/4			
	16		0				
			0				
	17						0825
		SAND, light brownish yellow (6/4 10YR) loose, damp, fine-coarse grained	0	2/2			
	18		0				
			0				
	19						0830
		Refusal Bottom of hole					

Boring Logs
Building 727 Waste Pit (FTRI-051)

HTW DRILLING LOG

HOLE NO. FTRI-051 DP01

1. COMPANY NAME: Burns & McDonnell	2. DRILLING SUBCONTRACTOR: EPS
PROJECT: 40747 ESI 49 sites	4. LOCATION: Fort Riley
5. NAME OF DRILLER: Dennis Eller	6. MANUFACTURER'S DESIGNATION OF DRILL: Geoprobe / Direct Push
7. SIZES AND TYPES OF DRILLING AND SAMPLING EQUIPMENT: Geoprobe 5400; 4' macrocore	8. HOLE LOCATION: NA
	9. SURFACE ELEVATION: NA
	10. DATE STARTED: 8/3/06 — 11. DATE COMPLETED: 8/3/06
12. OVERBURDEN THICKNESS: NA	15. DEPTH GROUNDWATER ENCOUNTERED: 29.7
13. DEPTH DRILLED INTO ROCK: NA	16. DEPTH TO WATER AND ELAPSED TIME AFTER DRILLING COMPLETED: NA
14. TOTAL DEPTH OF HOLE: 24'	17. OTHER WATER LEVEL MEASUREMENTS (SPECIFY): NA

18. GEOTECHNICAL SAMPLES	DISTURBED	UNDISTURBED	19. TOTAL NUMBER OF CORE BOXES
0	0	0	0

20. SAMPLES FOR CHEMICAL ANALYSIS	VOC	METALS	OTHER (SPECIFY)	OTHER (SPECIFY)	OTHER (SPECIFY)	21. TOTAL CORE RECOVERY %
6	~~3~~	3	TPH DRO 3	—	—	

22. DISPOSITION OF HOLE	BACKFILLED	MONITORING WELL	OTHER (SPECIFY)	23. SIGNATURE OF INSPECTOR
NA	Bentonite	NA	NA	

ELEV. a	DEPTH b	DESCRIPTION OF MATERIALS c	FIELD SCREENING RESULTS d	GEOTECH SAMPLE OR CORE BOX NO e	ANALYTICAL SAMPLE NO f	BLOW COUNTS g	REMARKS h
	0	SILT, pale brown (6/3 10YR) dry, soft, non plastic	0		SB01 0-2		
	1		0	3.9 / 4			
		SILT, pale brown (6/3 10YR) damp, soft, non plastic					
	2		0				
	3		0				
	4		0				1435
		SILT, brown (5/3 10YR) damp soft non plastic	0				
	5						

HTW DRILLING LOG

HOLE NO: FTRI-051 DP01

PROJECT: 40747 ESI 49 sites

INSPECTOR: [illegible]

SHEET 2 OF 4 SHEETS

ELEV a	DEPTH b	DESCRIPTION OF MATERIALS c	FIELD SCREENING RESULTS d	GEOTECH SAMPLE OR CORE BOX NO e	ANALYTICAL SAMPLE NO f	BLOW COUNTS g	REMARKS h
		SAME As Above	0				
	6		0	3.6/4	SB02 6-8		
	7		0				
			0				
	8						1440
			0				
	9	SILT, brown (7.5YR) soft moist, medium plasticity		3.9/4			
			0		SB03 10-11		
	10		0				
	11		0				
			0				
	12	CLAY dark grayish brown (2.5Y4/2) soft, damp, highly plastic					1445
			0	3.8/4			
	13		0				
			0				
	14						

HTW DRILLING LOG

HOLE NO. FTRI-051 DP01

PROJECT 40747 ESI 49 sites

INSPECTOR

SHEET # 3 OF 4 SHEETS

ELEV a	DEPTH b	DESCRIPTION OF MATERIALS c	FIELD SCREENING RESULTS d	GEOTECH SAMPLE OR CORE BOX NO. e	ANALYTICAL SAMPLE NO. f	BLOW COUNTS g	REMARKS h
		SAME As Above	0				
	15	SAND, yellowish brown (5/4 10YR) loose, dmp fine grained	0				
			0				
	16						1450
			0	3.7/4			
	17	SAND, very pale brown (7/3 10YR) loose, dmp fine grained	0				
	18		0				
			0				
	19	SAND, brown (4/3 10YR) dmp loose, fine-medium grained	0				
	20						1455
			0	3.8/4			
	21		0				
			0				
	22						
			0				
	23						

Burns & McDonnell SINCE 1898

051601
Form MRK-55-2

PROJECT 40747

HOLE NO. FTRI-051 DP01

HTW DRILLING LOG

HOLE NO. FTRI-051 DP01

PROJECT 40747 ESI 49 sites

INSPECTOR [illegible]

SHEET 3 OF 4 SHEETS

ELEV. a	DEPTH b	DESCRIPTION OF MATERIALS c	FIELD SCREENING RESULTS d	GEOTECH SAMPLE OR CORE BOX NO e	ANALYTICAL SAMPLE NO f	BLOW COUNTS g	REMARKS h
		SAME AS Above	0				▼ water
	25						1500

HTW DRILLING LOG

HOLE NO. FTRI-051 DF02

1. COMPANY NAME: Burns & McDonnell	2. DRILLING SUBCONTRACTOR: EPS
SHEET 1 OF 4 SHEETS	
PROJECT: 40747 ESI 49 sites	4. LOCATION: Fort Riley
5. NAME OF DRILLER: Dennis Eller	6. MANUFACTURER'S DESIGNATION OF DRILL: Geoprobe / Direct Push
7. SIZES AND TYPES OF DRILLING AND SAMPLING EQUIPMENT: Geoprobe 5400; 4' macrocore	8. HOLE LOCATION: NA
	9. SURFACE ELEVATION: NA
	10. DATE STARTED: 8/3/06 — 11. DATE COMPLETED: 8/3/06
12. OVERBURDEN THICKNESS: NA	15. DEPTH GROUNDWATER ENCOUNTERED: 23.8
13. DEPTH DRILLED INTO ROCK: NA	16. DEPTH TO WATER AND ELAPSED TIME AFTER DRILLING COMPLETED: NA
14. TOTAL DEPTH OF HOLE: 24'	17. OTHER WATER LEVEL MEASUREMENTS (SPECIFY): NA

18. GEOTECHNICAL SAMPLES	DISTURBED	UNDISTURBED	19. TOTAL NUMBER OF CORE BOXES
0	0	0	0

20. SAMPLES FOR CHEMICAL ANALYSIS	VOC	METALS	OTHER (SPECIFY)	OTHER (SPECIFY)	OTHER (SPECIFY)	21. TOTAL CORE RECOVERY %
6	—	3	TPH DRO 3	—	—	

22. DISPOSITION OF HOLE	BACKFILLED	MONITORING WELL	OTHER (SPECIFY)	23. SIGNATURE OF INSPECTOR
NA	Bentonite	NA	NA	

ELEV. a	DEPTH b	DESCRIPTION OF MATERIALS c	FIELD SCREENING RESULTS d	GEOTECH SAMPLE OR CORE BOX NO. e	ANALYTICAL SAMPLE NO. f	BLOW COUNTS g	REMARKS h
	0	SILT, pale brown, dry, soft non plastic	0		SB01 0-1		
	1		0	3.2/4			
		SILT, brown (5/3 10YR) damp, soft, non plastic					
	2		0				
	3		0				
	4		0				1305
	5		0				

HTW DRILLING LOG

HOLE NO. 051 FTRI-~~5~~ DP02

PROJECT 40747 ESI 49 sites

INSPECTOR

SHEET # 2 OF 4 SHEETS

ELEV. a	DEPTH b	DESCRIPTION OF MATERIALS c	FIELD SCREENING RESULTS d	GEOTECH SAMPLE OR CORE BOX NO. e	ANALYTICAL SAMPLE NO. f	BLOW COUNTS g	REMARKS h
		SAME As Above	0		SB02		
	6		0	3.7/4	7-8		
	7	SILT, brown (5/3 10YR) damp soft, medium plasticity	0				
			0				
	8						1310
			0		SB03		
	9				11-12		
		SILT, brown (5/3 10YR) moist soft, medium plasticity	0	4/4			
	10		0				
			0				
	11						
		CLAY, dark grayish brown (4/3 10YR) soft, damp highly plastic	0				
	12						1315
			0	3.3/4			
	13	SILT, brown (5/3 10YR) soft moist, medium plasticity w/sand	0				
			0				
	14						

HTW DRILLING LOG

HOLE NO. FTRI-051 DP02

PROJECT 40747 ESI 49 sites

INSPECTOR

SHEET 3 OF 4 SHEETS

ELEV. a	DEPTH b	DESCRIPTION OF MATERIALS c	FIELD SCREENING RESULTS d	GEOTECH SAMPLE OR CORE BOX NO. e	ANALYTICAL SAMPLE NO. f	BLOW COUNTS g	REMARKS h
		SAME AS Above	0				
	15		0				
		SAND, brownish yellow (6/6 10YR) loose, damp, fine-medium grained	0				
	16						1320
			0				
				2.8/4			
	17		0				
		SAND, light yellowish brown (6/4 10YR) loose, damp, medium grained					
	18		0				
	19		0				
	20		0				1325
			0				
				3.1/4			
	21		0				
	22		0				
	23		0				

HTW DRILLING LOG

HOLE NO. FTRI-051 DP02

PROJECT 40747 ESI 49 Sites

INSPECTOR [illegible]

SHEET # 4 OF 4 SHEETS

ELEV. a	DEPTH b	DESCRIPTION OF MATERIALS c	FIELD SCREENING RESULTS d	GEOTECH SAMPLE OR CORE BOX NO. e	ANALYTICAL SAMPLE NO. f	BLOW COUNTS g	REMARKS h
		SAME As Above	0				water 1330
	29	Bottom of hole					